

The Changing Electronic Gaming Machine (EGM) Industry and Technology

FINAL REPORT

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The interpretations of data and secondary materials expressed in this paper are those of the researchers and do not necessarily reflect the views of either the Gambling Research Panel or the Department of Justice. Needless to say, in relation to a project that involved researching technology, the task remains incomplete. We are mindful of the complexity of the Victorian EGM system, and although we have attempted to present an account of this complex system, we are aware that this task requires much further work, and the development of new insights beyond the scope of this project.

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Executive Summary

Project aim and scope

The primary aim of the project was to analyse the composition and transformation over time of the technological basis of the Victorian electronic gaming machine (EGM) industry, so as to develop an understanding of the relation between technology and consumption behaviour. This meant focusing on the technology itself to understand what the capacities and capabilities of the EGM system actually are, and how innovations and manipulations of technology relate to the consumption behaviour of those who use EGMs.

The researchers took a broad view of what is meant by the technological basis of the EGM industry. This included all aspects of the workings of EGMs themselves and the material processes of their design, testing, approval and implementation. Also included was the technology that allows the linking of machines as in-venue or wider area networks. In addition, the situation of the end-use of EGMs in gaming venues and their appearance, marketing, location and other aspects of commercial presentation were included. The regulation of EGM gambling is also grounded in, dependent on, and mediated by technology.

These elements were viewed as forming the socio-technical framework of EGM gambling consumption, comprising an industry sector that is in a constant process of transition, driven in large part by technical and regulatory innovation.

The individual consumer is connected to this technical system as the end-user. EGM gambling consumption is, in many ways, a special kind of consumption. It is a dematerialised and potentially continuous form of consumption, with no apparent physical limitation. Supporters of EGM gambling consumption advocate its particular mix of commodified bets and leisure expenditure as an enjoyable form of recreation. The contemporary networked model of commercialised EGM gambling also has its share of detractors, who deride it as state sanctioned dealing in a dangerous and potentially ‘addictive’ commodity, with insufficient safeguards and an unjustifiably high level of social costs.

Any attempt to resolve the tension between these conflicting views entails a questioning of the current configuration of EGM technologies. A key question is whether current arrangements produce the best possible balance between enjoyment of EGM consumption, and management of the social harms associated with this consumption. The research detailed in this report leads us to conclude that this balance is currently not being produced. Many relevant risks associated with EGM gambling are currently unmanaged, and the harm minimisation function prescribed in the Gambling Regulation Act is very much the poor cousin of regulatory activity. The questions that follow from this broad conclusion must be how to best evaluate the extent of this imbalance, how to benchmark it, and then how to best innovate and make use of technology and technical platforms to manage and minimise the risks associated with it. We are convinced that improving the regulator’s utilisation of both existing and emerging technology can greatly improve the management of the risks associated with EGM gambling. However, real commitment to principles of evidence based harm minimisation will be required to achieve such an improved regulatory system.

Key findings

A summary of the key findings of this report is listed below, with further detailed discussion incorporated at the conclusion of this Executive Summary. We have also listed a number of opportunities for action by government to redress systemic gaps and address currently unmanaged risks.

- The EGM gambling industry is highly dynamic, which itself presents regulatory risks. The EGM system in Victoria is constantly being upgraded and refined, making the system more attractive to consumers and allowing for more effective marketing via utilisation of the high quality information derived from the operators' central monitoring and control systems.
- Aspects of the current parameters of the EGM system broadly conceived present unmanaged risks in relation to problem gambling activity, noting that data currently obtainable from the CMCS would allow the regulator to utilise a sound evidence base to readily identify and address such risks.
- Consumption of EGM gambling in Victoria has gone through a number of different phases, including periods of considerable intensification.
- Researching technology with problem gamblers identified aspects of EGMs that were more likely to intensify and potentially problematise gambling consumption, including 'free' spin features, multi-line betting, bank note acceptors and ready access to ATMs.
- The basic structure of EGM technology is not clearly portrayed in public information about machine outcomes, nor is it understood by gamblers, particularly in relation to 'common sense' ideas about 'the law of averages' and the average return to player ratio provided by EGMs.
- There are clear differences in aggregate EGM consumption data that reveal the market as uneven and complex, including hotels generating much higher average consumption levels than clubs, and very significant differences between the top 25% of venues (87% of which are hotels) and the remaining 75%.
- Current EGM consumption patterns correlate closely with measures of socio-economic disadvantage, with disadvantaged areas much more likely to have high densities of EGMs and to spend much more money on EGM consumption. This characteristic of the industry increases the relative risks associated with EGM consumption.
- The complex technological basis of the Victorian EGM industry presents considerable challenges to the regulator, and these require development of a more sophisticated and systematic approach to the management of technical change and innovation than is presently utilised. This is particularly so in relation to the minimisation of harm.
- There are further currently unmanaged or poorly managed risks for the regulator, the government and the community in relation to EGM gambling, in particular in relation to consumer safety, and the potential for development of risk profiles at the operator, venue, EGM and individual levels.

Opportunities to address regulatory gaps and risks

We have identified the following specific opportunities for regulatory and other innovation, arising from the research. Further related discussion can be found in Section six.

Data monitoring and risk management

The Central Monitoring and Control Systems (CMCS) utilised by EGM operators provide a substantial amount of data which have the potential to greatly improve risk management practices and reduce harm associated with EGM use. This potential is not currently realised and this represents a major defect in the arrangements for minimisation of harm. The regulator could address this gap by:

1. establishing a capacity for monitoring data derived from the CMCS systems operated by EGM providers for the purpose of meeting the harm minimisation objective of the Act;

2. developing risk management profiles at the game/platform, venue and operator levels in order to provide benchmarks against which to undertake harm minimisation monitoring activities;
3. ensuring that innovations in EGM game and platform design are not fully approved and deployed until they have been subject to harm minimisation scrutiny via limited initial deployment and the use of actual EGM data and a risk management profile;
4. continually monitoring actual EGM platform and game performance against risk management profiles established at the game/platform level and venue level;

The following factors are able to be measured systematically and as such are likely to form the basis of a risk profile system:

- Expenditure per specific EGM game/platform per annum,
- Numbers of EGMs per venue,
- Use rate of EGM game/platform,
- 'Free' spins won,
- Use rate of gamble feature,
- Credit values of EGMs,
- Geographic and social significance of location, for example, in or near a shopping centre or within an area of relative socio-economic disadvantage,
- Hours of availability of EGMs,
- Average expenditure per EGM,
- Values of banknotes inserted within sessions of play,
- Bet values,
- Aggregate expenditure at venue,
- Expenditure rates for high credit value EGMs (particularly \$1 credit values),

Risks identified include those relating to harm incurred to individual EGM users and risks associated with money laundering by criminals using high credit value EGMs. The risk profile would aid in the efficient use of resources in relation to the targeting consumers at risk of suffering harm from EGM gambling. In venues this would include:

- Observation of a high rate of 'regulars' who visit frequently and for prolonged periods,
- Observation of high rate of patrons exhibiting apparent preoccupation with particular EGM games/platforms,

This would also aid in the identification of EGM activity that would fit the profile of possible money laundering.

The regulator has the opportunity to utilise available technical capacity to:

5. Undertake development of a risk profiling tool for application at the EGM game/platform, venue and operator levels, including identification of acceptable/unacceptable risk parameters;
6. Develop a strategy to address issues in relation to any venues and/or particular EGM games/platforms identified as 'high risk', in conjunction with venue and gaming operators, including requiring operators to develop risk management plans for specific venues;
7. Review the operation of risk management strategies periodically and be empowered to require amendments to risk management plans where this is believed to be necessary to address risks associated with particular EGM games/platforms or venues.

Technical development and approval systems

Current practice for development of technical standards and approval of gaming equipment is largely non-transparent and appears not to explicitly address harm minimisation principles to the same extent and depth as probity and revenue issues. In large part this may be a function of the state based jurisdictional issues associated with the regulation of gambling, but from a consumer safety perspective there appears to be no justification for a plethora of differing parameter settings and standards between states and territories. Issues of consumer safety and harm minimisation should be part of a coherent national strategy in relation to the technical features of EGM games/platforms and their approval. We do not believe this is presently the case.

There is currently no definitive evidence of direct causal relationships between particular characteristics of EGM games/platforms and a high incidence of problematic gambling. Problem gamblers identified a number of characteristics as important in the development of problematic behaviour, suggesting a multi-faceted approach is required. Clear goals and a coherent strategy in relation to EGM technology and consumer safety/harm minimisation must be set. By definition, the development of EGMs that are innovative, successful, secure, fair, *and safe* for consumers should be the aim. This aim should apply to ongoing revision of technical standards, including EGM configuration and technical parameter values. Consistency and appropriateness should be goals of a process to evaluate and set parameter values accordingly so as to best balance all the responsibilities of the regulator. However, this process must utilise actually available data and continue to monitor and evaluate the impacts of actual technical innovation on EGM consumption. This is essentially a continuation of the opportunity for an evidence-based approach, and needs to be a priority medium-term strategy.

Regulators have the current opportunity to:

8. Establish a national evidence-based approach to the incorporation of consumer safety into the innovation stage of processes of technological development. The long-term goal of this process will be to retain the attractive features of gaming machines for safe recreational or leisure gambling but to ameliorate the aspects or extents of design features of Australian-style machines that are unsafe for consumers, seeking to shape but not stymie the imperative of manufacturers to pursue innovation;
9. Re-establish a technical capacity (e.g., for at least some testing of EGMs whether randomly or as a matter of course) within the regulator, noting that outsourcing of testing may have lead to a deterioration in technical sophistication and understanding within the regulator, and that reacquisition of such a capacity may assist in identifying EGM games/platforms which require more regular/systematic monitoring for risk management purposes;
10. Develop transparent and coherent strategies at a national technical working group level to clarify the purposes of the technical standards, including processes for agreement on and implementation of harm minimisation strategies and specific measures, again drawing on the available evidence base of specific jurisdictions (we note that some jurisdictions do not have access to data of the quality available in Victoria, for example). The strategy should include as a matter of priority a process to evaluate the basis for, and continuing appropriateness of, parameter value settings, including their appropriateness in relation to distinctions between gambling specific venues (such as casinos) and social venues which provide gaming opportunities (such as clubs and hotels). We note that some jurisdictions already set some parameter values at different levels in venues of different types.

Further research and continuing monitoring

On the available evidence the two most likely EGM level characteristics contributing to the development of problem gambling are bank note acceptors (BKNTLIM) and the ‘free game’ features incorporated into many EGM games. In the case of the former, the ready availability of ATM facilities appears to assist problem gamblers to expend all available cash reserves during sessions of play without experiencing the inhibiting factor of contact with a cashier or other person. The ‘near miss’ effect and direct inducements to increase bet size in the course of gambling are also factors particularly worthy of further attention. We were unable to pursue these (and some other) issues as fully as we wished because of the unavailability of EGM level data. The extremely high credit limits available on EGMs in Victoria and in some other jurisdictions (particularly those where BNAs are allowed) pose a clear risk of money laundering, particularly on high credit value EGMs (which appear to be less favoured by problem gamblers). This requires immediate attention by the regulator.

In this context, the regulator has the opportunity to:

11. As a priority, conduct further studies utilising EGM level data drawn from the CMCS, as well as other quantitative and qualitative data, to develop a better understanding of:
 - (i) the relationship between problem gambling behaviour (including incidents of expenditure of all available cash assets during sessions of play) and BNA availability and parameter limits. This may involve cross jurisdictional studies involving jurisdictions where BNAs are not universally fitted;
 - (ii) the effect of ‘free spin’ features on player behaviour, in particular the extent to which players increase bets in anticipation of achievement of ‘free spin’ features;
 - (iii) the structure of reinforcement schedules (size and frequency of wins); and
 - (iv) the relationship between player behaviour, and venue size (measured by the number of EGMs) and type.

A suitably qualified and experienced expert independent of Government should be contracted to also conduct CMCS data analysis.

Harm minimisation as underpinning philosophy

Harm minimisation in the context of EGM gambling consumption has multiple and varied meanings across Australian jurisdictions and appears presently to be largely based on impressionistic conceptions and ideas, and in particular on concepts revolving around consumer information and attitude change.¹ Harm minimisation in other fields of public risk has evolved in multiple directions, which although they incorporate information provision and attitude change also utilise material change to assist in the management of risk. Examples include road safety, drug misuse and abuse, and the incidence of smoking-related disease. In each of these areas attitude change has been utilised, but as an adjunct to material changes in certain parameters around the risk. Modifying attitudes is not necessarily always possible, or effective. Evidence from water consumption modelling for example suggests that attitudes are intransigent and changes in practices limited – eventually the technical system must be modified. Similarly we believe that the philosophical commitment to harm minimisation must be clarified and either explicitly withdrawn as an object of the legislation or implemented with the necessary conviction to bring about a serious attempt at understanding the nature of harm, the relative risk of particular EGM venues and games/platforms, and the consistency of management practices at all levels with the goals of consumer safety and harm minimisation.

¹ This is not altogether surprising given the different histories of gambling industries and regulation in each state and territory. We note that the national gambling research program has published as an initial offering a report entitled *Problem Gambling and Harm: Towards a National Definition*. See <http://www.gamblingresearch.org.au>

Clarification of harm minimisation as underpinning philosophy requires:

12. Explicit endorsement by the Victorian and other Australian governments of a commitment to harm minimisation as the underpinning principle of gambling regulation, on at least the same footing as revenue protection and probity issues are presently addressed;
13. Development of an agreed national framework for developing risk management strategies with a focus on consumer safety and harm minimisation, including in the areas of technology innovation and regulation as a technical practice;
14. Sharing of risk profile tools for mandatory application to EGM and other gambling activities on a national basis if possible;
15. Development of harm minimisation goals in relation to EGM gambling and gambling more generally, including explicit commitments to information sharing, development of a national evidence base derived from actual gambling system data sources, and agreement on explicit independent evaluation of all harm minimisation measures using all available data. If possible this should be undertaken on a consistent national basis.

Project findings in further detail

The EGM gambling industry is highly dynamic, which itself presents regulatory risks. The EGM system in Victoria is constantly being upgraded and refined, making the system more attractive to consumers and allowing for more effective marketing via utilisation of the high quality information derived from the operators' central monitoring and control systems.

- Innovation processes in technology are a key driver of change in the EGM industry. Research and development budgets as a proportion of revenue of gaming machine manufacturers in Australia are relatively large in comparison to businesses as a whole.
- Innovation in game software has made EGMs more attractive to consumers. Free spins and other game features are very popular. Competition between manufacturers has widened circles of influence on design (notably from Japan) and led to improved themes in artwork and intensified graphics, animation, lighting and sound components, making EGMs a more stimulating experience for many gamblers.
- Market arrangements and technological and other innovations in EGMs are mutually implicated in processes of change. In Victoria, management agreements between the gaming operator duopoly and key account gaming venues ensure that new products and/or games usually go into the most successful venues first. Products that have already proven successful gradually replace relatively less well-performed parts of the network. This continual refinement and commercial development of the EGM gambling network is systematic and strategic, based on the quality management information stream provided by the central monitoring and control system (CMCS). It is highly likely that regulators will lag substantially in their capacity to assess the impact of change unless they adopt a very active approach to utilisation of data and comprehension of technical and associated innovation.
- Technical specifications are another driver of change, albeit less dynamic. The annual revision of technical specifications for EGMs (National Standard) aims to progress toward a unified set of technical arrangements and protocols nationally, erasing some differences between jurisdictions. Notwithstanding this process, clear differences in technical protocols and other arrangements exist between jurisdictions, often due to historical factors surrounding the emergence of the various state/territory based sectors.

- Consumption levels, as the key measure of industry performance, and rates of change in technology are uneven and continue to differentiate along a number of different lines, including venue type, RTP levels, social distribution of EGMs and game type.
- Technical parameters have a significant impact on a range of outcomes. Changes in parameter settings appear to have had a clear impact on consumption of EGM gambling.
- There are marked differences in certain parameters between some jurisdictions, and these may impact on a range of factors, such as expenditure per EGM or money laundering, for example.
- Different EGM systems will produce different aggregate consumption results. For example, South Australia has a far greater density of EGMs than Victoria, and a far higher proportion of EGMs in SA are in more lucrative hotel venues (in comparison to clubs). This has produced a steady growth in per capita consumption to a point where it is on a par with (post-smoking ban Victoria). However, in Victoria where EGMs are on average newer, include more features and incorporate bank note acceptors (which are not permitted in SA) expenditure per EGM is considerably higher than in SA.
- In Victoria, a small decrease in the number of gaming venues and an increase in the average number of machines per venue correlate with growth in EGM gambling consumption. There is emerging evidence that larger venues lead to greater levels of EGM consumption.

Aspects of the current parameters of the EGM system broadly conceived present unmanaged risks in relation to problem gambling activity, noting that data currently obtainable from the CMCS would allow the regulator to utilise a sound evidence base to readily identify and address such risks.

- The context of EGM gambling appears to present a number of risks in relation to problem gambling activity. Hotel venues appear to present the highest risk as the site for problem gambling activity. Club venues, however, also present risks. Data obtainable from existing CMCS networks would provide an excellent evidence base to identify and manage relative risk.
- Sustainable EGM gambling industries exist or are being implemented in other jurisdictions that are configured differently to the Victorian industry. Measures being taken in the UK to introduce different strata of gaming venues with appropriately configured EGMs (particularly in terms of maximum bet and maximum win) are intended to avoid replicating the costs of problem gambling that have emerged in Australia.
- No evidence was identified suggesting that changes in the parameters of EGM gambling consumption to reduce the losses (or rate of losses) of gamblers would make EGM gambling a less attractive leisure activity for recreational gamblers.
- No evidence was identified to suggest that changes in the parameters of EGM gambling consumption that reduce the losses (or rate of losses) of gamblers would adversely impact on gaming machine manufacturers.

Consumption of EGM gambling in Victoria has gone through a number of different phases, including periods of considerable intensification.

- Development of the EGM system in Victoria and its configuration arises in part from the intersection of Victoria's unique ownership and licensing arrangements and the

capacities of the Central Monitoring and Control Systems (CMCS) which are utilised by each of the duopoly operators.

- The EGM system has undergone repeated periods of intensification associated with differing system-wide technical interventions. In the first phase, the ‘roll out’ of EGMs was undertaken in a systematic pattern, which identified potential market opportunities and supplied EGMs into those particular locations. The CMCS allowed real-time monitoring and adjustment of EGM locations. Overall, this resulted in the concentration of EGMs into areas of relative socio-economic disadvantage, where, by and large, EGMs continue to be concentrated. Strong growth in consumption accompanied this initial phase.
- The second phase of EGM growth was associated with the intensification of EGM performance on a per machine basis. This is attributable to innovations including the introduction of bank note acceptors (BNAs). Reduction in average return to player (RTP) across the life of the industry has also compounded this by delivering a greater proportion of turnover to venues, operators and government.
- The most recent phase of EGM growth is associated with the consequences of the global cap on EGM numbers and has resulted in a concentration of EGMs into a smaller number of larger venues and a convergence of venue management policy, resulting in more consistent (although still quite divergent) EGM performance. At present, the EGM industry is still responding to the decline in consumption associated with the prohibition on smoking, and growth rates appear to be recovering quite strongly.
- Current technological innovations that continue to drive EGM gambling consumption include ‘bonusing’ and stand alone jackpot features. Both of these features encourage higher betting levels. Looming innovations may include a capacity to provide a small network of machines for group play amongst friends, and machines with some of the characteristics of ‘virtual’ play.
- Rationalisation of venue numbers will likely continue, leading to an increase in the average number of EGMs per venue and increased turnover per venue. This will also have the effect of more venues becoming predominantly focused on gaming as their leading business stream.

Researching technology with problem gamblers identified aspects of EGMs that were more likely to intensify and potentially problematise gambling consumption, including ‘free’ spin features, multi-line betting, bank note acceptors and ready access to ATMs.

- The most significant EGM feature contributing to intensification of consumption is ‘free games’ of ‘free spins’. Problem gamblers set their goals in such a way that winning such free games is more important than the net outcome of a gambling session.
- Problem gamblers lean toward smaller credit value machines, smaller bets but maximum lines. Bet size is the parameter of EGM gambling that is varied in anticipation of machine events.
- Betting on maximum lines is a response to the perception of near misses and fear of missing a win.
- Problem gamblers believe the stops on virtual reels remain in a constant order, even when a parameter such as bet size or the number of lines bet is varied, or a feature game is being played. This is an incorrect assumption.

- Problem gamblers are strongly attached to favourite machines, do not report a preference for software upgrades and have relatively less interest in new product than in their preferred EGMs.
- Access to ATMs and the availability of BNAs concern problem gamblers in relation to their capacity to limit losses. However, BNAs are valued for their ‘quietness’, which is viewed as an aid to anonymity.

The basic structure of EGM technology is not clearly portrayed in public information about machine outcomes, nor is it understood by gamblers, particularly in relation to ‘common sense’ ideas about ‘the law of averages’ and the average return to player ratio provided by EGMs.

- Gamblers believe that the theoretical RTP shown on the information screen of an individual EGM has some relationship to actual machine outcomes experienced in a gambling session on that particular machine. However, theoretical RTP has very little relationship to actual RTP achieved in a gambling session on a particular machine. The legislated requirement for actual RTP in Victoria is not calculated on a per machine basis (diverging from the National Standard), as most gamblers believe. Informing gamblers that actual RTP is calculated by averaging all those EGMs that have been in a particular venue for 12 months may, over time, change this perception. Some conception of the sheer volume of play required to approach legislated RTP would emerge, for example.
- Non-linear pay-tables are not well explained to, or understood by, EGM gambling consumers. Inducements to increase the number of lines gambled are built into the structure of EGM games and the effects of machine outcomes. However, changing betting parameters alters the pay-table (by changing the number and order of symbols on virtual reels) in such a way that increasing the number of lines gambled does not proportionally increase the likelihood of winning (either in the frequency or size of prizes).
- Problem gamblers retain erroneous cognitions about the capacity of gamblers to influence machine outcomes, even after entering into counselling/treatment relationships through which the false nature of their beliefs about EGMs is explicitly addressed.
- The structure of contributions to wider area network (WAN) jackpots effectively reduces the actual RTP of all jackpot-linked EGMs in a venue. However, this is not reflected in the calculation of legislated RTP as jackpot contributions are incorporated in the calculation of quantum of RTP within the venue.

There are clear differences in aggregate EGM consumption data that reveal the market as uneven and complex, including hotels generating much higher average consumption levels than clubs, and very significant differences between the top 25% of venues (87% of which are hotels) and the remaining 75%.

- There is a significantly greater level of consumption of EGM gambling in hotel venues than clubs (around twice that of club venues, on average). This is consistent for both operators and across venues co-situated in a variety of local areas.
- There is an apparent relationship between venue size (measured by EGM numbers) and average consumption per EGM. The concentration of EGMs into a smaller number of larger venues is a response to the observable phenomenon of higher average consumption per EGM in larger venues and the relationship between higher aggregate consumption and relatively high consumption per EGM.

- Tattersalls' venues have consistently outperformed Tabcorp venues across the life of the Victorian EGM industry. The performance of the two operators' venues has converged very recently.
- The top 25 per cent of venues consistently generate very high shares of net aggregate consumption (around 55%). In some venues consumption reaches \$25 million per annum. A range of factors which provide some degree of explanation for this include the ease of access and relative anonymity available in hotel venues, and the generally more commercial orientation of hotel management. This appears particularly marked in the case of hotels owned and/or operated by chains/key accounts.
- Return to player (RTP) declined after the initial roll-out phase of the industry in Victoria, until the year following the introduction of the smoking ban in gambling venues (2002).

Current EGM consumption patterns correlate closely with measures of socio-economic disadvantage, with disadvantaged areas much more likely to have high densities of EGMs and to spend much more money on EGM consumption. This characteristic of the industry increases the relative risks associated with EGM consumption.

- The socio-spatial distribution of the EGM system in metropolitan Melbourne and Victoria is uneven. Greater machine densities can be found in areas of socio-economic disadvantage. High machine density is strongly correlated with high per capita consumption. This finding is consistent with a range of published studies in Victoria, NSW and South Australia.
- The EGM system has been integrated into the preferred leisure venues of working and middle class Australians in metropolitan and suburban areas, and in regional and rural towns. The segments of the Australian population whose cultural tastes do not include frequent or regular times spent in hotel or club venues are much less likely to gamble on EGMs.
- Direct marketing material delivered to residential addresses encourages visits to local venues to gamble and to participate in venue promotions and offers involving EGM gambling consumption. This was something that gamblers said they found attractive or difficult to resist.

The complex technological basis of the Victorian EGM industry presents considerable challenges to the regulator, and these require development of a more sophisticated and systematic approach to the management of technical change and innovation than is presently utilised. This is particularly so in relation to the safety of EGM products and the minimisation of harm.

- The regulation of the Victorian EGM industry is itself an increasingly technical practice. Some of the functions of the regulator are data-driven and based on a risk analysis. Further aspects of regulation that are currently underdeveloped will also need to be technically based.
- The regulator has a responsibility to ensure EGM gambling products are as safe as possible and that the harm derived from EGM gambling is minimised. These responsibilities are currently not on an equal footing with probity and revenue protection.
- Crucial aspects of the regulators responsibilities are outsourced to private sector organisations with the technical capabilities to perform key tasks on behalf of the regulator. This includes EGM testing, approvals and on-site checks. There is a residual risk to the regulator due to reduced in-house technical capabilities.

- The regulator has implemented sound systems of surveillance and monitoring to meet the revenue protection and probity functions embodied in the legislation. Coupled with testing and approvals processes that are relatively independent of these systems, this has the advantage of making collusion necessary to significantly compromise the EGM system. Nevertheless, such collusion is possible and cases are known to the regulator.
- There is a risk associated with the potential for money laundering which is thought by some industry informants to be particularly marked in relation to EGMs of \$1 credit value. EGM venues in NSW and Victoria allow the insertion of up to \$9,949 (Vic) and \$10,000 (NSW) and have limited capacity to track these operations. In comparison, the Queensland limit of \$200 considerably reduces this risk.
- The regulator has not to date developed an equivalent system to manage the harm minimisation/responsible gambling function of the GRA (s1.1(2)). Most of the activity associated with regulation of the industry appears to be focused on revenue protection issues, and although this is undoubtedly important it is not an object of the legislation to maximise government revenues, whereas the minimisation of harm is such an object. On the basis of the research undertaken for this project it appears that harm minimisation is very much the poor cousin of the three main aims of regulation. The CMCS data system used for risk management regulation of EGMs collects considerable evidence about many facets of EGM operations, but the regulator principally utilises these data for evidence building around revenue issues, rather than harm minimisation. Yet the potential for establishing a very comprehensive basis for regulation of responsible gambling activities and the development, implementation and evaluation of harm minimisation interventions is considerable.
- The regulator reported difficulty in the provision of data describing the system-wide prevalence of particular EGM features, configurations and technical modifications including the fitting of BNAs. Industry sources confirmed that data of this type are routinely scrutinised for commercial purposes, and accordingly the researchers were surprised to discover that the regulator does not store or manage these data in a manner which facilitates ready research into the effects of particular innovations and the modelling of risks.

There are further currently unmanaged or poorly managed risks for the regulator, the government and the community in relation to EGM gambling, in particular in relation to consumer safety, and the potential for development of risk profiles at the operator, venue, EGM and individual levels.

- Consumer protection via the probity function is currently reasonably well-recognised and dealt with through regulatory processes. On the evidence compiled in this study, the issue of consumer safety is less well-recognised and should be explicitly addressed.
- Comparatively speaking EGM gambling as it is currently configured in Victoria is a very unsafe form of consumption.
- From the available data and evidence considered in this study it is clear that an optimum balance has not yet been found between consumption and social harm. It is also clear that safe EGM consumption is not a goal that can succeed without utilisation of technical measures. Research into changing the configuration of EGM technology has shown that changes to some parameters can have a disproportionate effect on problem gamblers. However, making EGM gambling consumption safe is not only an activity focused on problem gamblers. Evidence suggests that current

arrangements also place a significant proportion of regular hotel and club gamblers at risk.

- A conservative reading of the current research shows that at least one in every five patrons in gaming venues at any time are at risk of, or currently suffering, gambling problems. Recent research in Victoria suggests that as many as one in two patrons in gaming venues at any time is in this category.
- In Victoria, there is currently no risk management strategy for identifying and managing the risks associated with EGM gambling consumption by individuals. Whilst risk management principles are applied to revenue protection and probity issues, quite properly, these same principles have not been applied in the area of harm minimisation for individuals who may suffer harm associated with EGM use. It is an established principle of public health interventions that activities or interventions focused on the prevention of disease or the reduction of harm should always be based on evidence, usually located at a minimum of three levels – i.e., at the level of understanding the nature of the problem and its effects on the population, at the level of establishing the likelihood that interventions will be effective in responding to these actual problems, and at the level of evaluating the actual effects of interventions. In this respect it was found that the CMCS would enable risk profiling at the venue level to be undertaken by first identifying and then utilising key indicators, and this profiling could be utilised in turn to develop actual risk management plans at the system, network and venue levels. This would assist industry in the management of risk to their customers and also provide the regulator with an assurance that risks were identified and well managed, a key goal of harm minimisation.
- The research literature and our own discussions with problem gamblers indicate that current harm minimisation approaches have had very limited impact on problem gambling behaviour. In contrast, actual material changes in the conditions of implementation and operation of EGM technology, and the EGM system more broadly, can be clearly associated with changes in gamblers' behaviour. The most striking examples of this are the impact on EGM gambling consumption of BNAs, including their re-configuration in Queensland and the ACT, and the smoking prohibition in Victoria. While behaviour modification has a role, it is likely to be only one element of a successful harm minimisation strategy, which must include material and technical change. Other examples include reductions in smoking rates generally, which are associated with the prohibition of smoking in public places, workplaces, bans on advertising, and increased taxation of smoking products as well as consumer education and behaviour modification. Similarly, material change in road safety outcomes has arisen as a consequence of multiple material interventions including enforcement of limits on alcohol consumption and speed, the enforcement of seat belt use, improved safety and design standards for vehicles and better traffic management, which have been combined with attitudinal change activities to reduce the mortality rate associated with road traffic. The EGM system currently includes ample technical capacity to access information to assist enormously in the design and testing of potentially useful and effective material modifications, but this capacity is overwhelmingly under-utilised from a regulatory perspective.
- It is evident from consultations that the development of national technical standards for EGMs provides a sound basis for coordinated regulatory innovation in relation to responsible gambling and consumer safety. Responsible gambling measures are incorporated in the National Standards 8.0 and the Victorian Appendix and address a range of technical issues. However, regulators face 'technology risk' in that they appear to be constantly engaged in catching up with innovations in game software,

structure, etc. Achieving an optimum balance between consumption and social harm requires regulatory innovation that engages with responsible gambling at all stages and levels of the innovation chain as it already does in seeking to ensure that probity, game fairness and revenue protection are in-built capacities of all EGMs.

Boundaries of the research

The key research questions the researchers were able to address satisfactorily in the course of the Report include:

- The complex relationship between EGM technology and individual gamblers and the diverse factors that structure this relationship;
- The role of technology as a driver of change in the industry;
- The configurations of the EGM technical system that have produced the consumption patterns that have emerged across time;
- Changes in the system that have produced particular accelerations or decelerations in the consumption growth patterns in particular contexts;
- How the nexus between the EGM gambling consumption, problem gambling and the issue of harm can be understood through the lens of technology;
- What broad elements of EGM technology may most affect people who suffer harm from gambling, and place some other gamblers at risk; and
- To what extent EGM and network technologies themselves offer potential tools for intervention in the harmful consumption of EGM gambling.

Key research questions the researchers were not able to address satisfactorily in the Report include:

- Patterns of EGM gambling consumption at the machine level; and
- The effect of particular EGM game or platform configurations on the precise dimensions of individual sessions.

Structure of the Report

The Report is in six sections. The first section sets out the background of the Project and the objectives guiding the researchers. It also includes theoretical ideas about commodification and consumption that underpin the research approach. The second section focuses on EGM technology and the network technical platform of the EGM gambling system. The regulatory and market contexts of this system are then considered, particularly in relation to the ways in which these contexts are both produced and shaped by the technical.

Sections three and four focus on descriptions and analysis of aspects of aggregate EGM gambling consumption data. Section three correlates phases of growth and decline in the aggregate consumption data with changes in the EGM technical system. It also looks at the outcomes of EGM gambling consumption and the effective and efficient operation of the EGM technical system in terms of state revenues. Section four describes differentiation within the EGM gambling consumption data, along dimensions including venue type, gaming operator and price of EGM use. This section also looks at a comparison between selected local government areas to describe socio-economic parameters of EGM markets.

Section five turns to the human end of the EGM-consumer relation, reporting on research conducted with 62 self-identified problem gamblers in Victoria. This section isolates a range

of elements of EGM technology and aspects of EGM games that these respondents find particularly attractive.

The sixth section describes the role of technology in the operation of the Victorian EGM gambling industry. It also identifies areas in which the technical capacities that currently ensure the protection of revenue and the probity of the product being offered could be extended to properly satisfy legislative requirements, and address the question of achieving an optimum balance between consumption and safety.

1. Introduction

1.1 Project background

The Australian Institute for Primary Care (AIPC), in the Faculty of Health Sciences at La Trobe University ('the researchers') conducted a study of the transformation of the electronic gaming machine (EGM) industry in Victoria and of the technologies on which the industry is based for the Victorian Gambling Research Panel (GRP). This transformation was analysed over the decade beginning in about 1993, following the expansion of commercialised gaming, through the establishment of Crown Casino (1994)² and the introduction of EGMs to clubs and hotels throughout the State (1992). The technological basis of the industry was initially viewed historically, but in the later highly commercialised phase of the Victorian gaming sector the focus was largely on the way technology shapes the EGM market and the experience of EGM gambling consumption.

The research mapped the current operating parameters of the material EGM technical system in Victoria. It also considered the utilisation of the EGM network and its latent capacity. In the Victorian context, industry growth is restricted in terms of new machines by the statewide cap on total machine numbers and restrictions on the deployment of machines in particular venues and areas – through requirements to situate EGMs in clubs and hotels in equal numbers, in defined ratios between urban and non-urban localities, and the implementation of regional caps.³ Given such restrictions, the EGM industry, like any comparable industry sector, must seek to maximise returns from existing operating units, whether per machine or per venue. A central task of the study was thus to develop an understanding of the impacts of changing the configuration and variable performance of key elements of the system, notably machines, games, and venues. These elements, and others, substantially structure, enhance or constrain the commercial imperative to optimise efficiency and maximise return within the highly regulated structure of the Victorian EGM sector. The researchers however also take the view that these key elements are themselves a product of the intersections of the market and systems of regulation, and thus the research was required to engage with the resulting complex and very dynamic system.

1.2 Research objectives, approach and limitations

This study was related to Project 2 of the Victorian Gambling Research Panel's (GRP) 2002-2003 Research Plan. The project required the AIPC, as successful tenderer, to propose and use an innovative research design and methodology to enable the tracing and documentation of technological changes and of patterns of distribution and use of EGMs in Victoria over time, and to describe identifiable impacts on player behaviour and well-being. The GRP also required an identification of possible future EGM changes and their implications for players and for government policies on harm minimisation.

Undertaking such a task requires the identification of indicators of the specific configuration of the technical system at particular points in time at the whole network level. The researchers sought summary data, with the assistance of the Office of Gaming Regulation (OGR) under the relevant provisions of the *Gambling Regulation Act 2003*, in order to develop a detailed understanding of the shape of the EGM network in terms of the numbers, distribution, host venues, game types and credit values of machines and the transformation of this network over time. The researchers are grateful for the assistance of the OGR in providing summary data on

² Crown Casino operated in temporary premises from 1994 until the opening of the permanent site in 1997.

³ See SACES 2005

venue and operator performance, and detailed venue level data for a sample of ten Local Government Areas (LGAs) which included EGM numbers and net losses. Unfortunately detailed data at the individual machine level was not available. This meant that one of the key research strategies of the project, to document in detail the configuration of the EGM system in terms of machine types, credit values, utilisation levels and performance, could not be realised. In addition, systematic data were not available on the ongoing transformation of the EGM system through the commissioning of new machines and their introduction to the network and the decommissioning of old machines. No data were available on turnover of EGM units (i.e., individual machines), which would provide a key indicator of the rate of transformation of the EGM system and the impact of new products on EGM gambling consumption. However discussions with industry participants provided some information about the rate of EGM replacement.

We selected a number of Victorian local government areas (LGAs) for more detailed analysis, which allowed for some comparison between metropolitan, regional and rural localities, and between those areas with relatively high or low densities of EGM gambling opportunities (Table 1.1 below).

Table 1.1 Local government areas (LGAs) for detailed data analysis

Inner Metropolitan LGAs	Boroondara Greater Dandenong* Maribyrnong* Monash Banyule
Outer Metropolitan LGAs	Casey Hume
Regional LGAs	Ballarat Greater Shepparton
Rural LGAs	East Gippsland

* These LGAs are the basis of regional areas (Dandenong Plus and Maribyrnong Plus) in which legislation has capped EGM numbers. (Regional caps also apply in Darebin Plus, La Trobe and Bass Coast.)

Included in the sample were metropolitan LGAs with very high historical and current densities of EGMs (Maribyrnong and Greater Dandenong) as well as one with very low density (Boroondara). Both outer metropolitan LGAs have EGM densities close to average levels, as do Monash and Banyule. Regional and rural LGAs selected have above average EGM densities but are representative of non-metropolitan Victoria in socio-economic terms as measured by the Australian Bureau of Statistics socio economic index for areas (SEIFA) index of comparative disadvantage (IoD). Metropolitan LGAs selected have SEIFA IoD scores ranging from very disadvantaged (Maribyrnong, Greater Dandenong) to very advantaged (Boroondara) with other LGAs at or above average on this measure. Further, expenditure in the LGAs on a per capita basis ranges from very high (Maribyrnong, Greater Dandenong) to very low (Boroondara) with other LGAs presenting average consumption per capita at rates proximate to the Victorian average. Table 1.2 summarises some relevant data relating to the sample LGAs.

Table 1.2 Selected characteristics of sample LGAs

Locality	1993-94		2002-03		SEIFA
	\$ pc	EGM density	\$ pc	EGM density	1996
Ballarat	\$294	5.5	\$565	7.8	988
Shepparton	\$106	2.6	\$431	5.7	982
East Gippsland	\$146	1.4	\$499	8.6	971
Boroondara	\$33	1.3	\$123	1.5	1,134
Banyule	\$339	3.8	\$504	5.3	1,059
Monash	\$259	3.3	\$766	7.4	1,056
Greater Dandenong	\$354	5.7	\$789	8.9	921
Casey	\$196	2.6	\$499	4.2	1,017
Hume	\$107	2.5	\$549	5.1	976
Maribyrnong	\$553	8.5	\$963	11.8	888
Vic average	\$194	3.9	\$482	5.6	1,016

The GRP required the researchers to document the impact of changes in the technical system on the wellbeing of gamblers. A process of researching EGM technology with self-identified problem gamblers through Gamblers Help agencies was undertaken. The GRP also required the researchers to draw some conclusions on the future directions of the EGM industry and the technological capabilities that will shape this future. In particular, the researchers were required to consider their findings in relation to government policies on harm minimisation, problem gamblers, and communities. To this extent the researchers consulted with stakeholders and analysed the EGM system with a view to the potential for technologically defined harm minimisation measures. The researchers took the view that as technology shapes the EGM industry, it may also offer a potential 'toolkit' for achieving an optimum number of the objectives of a maximum number of stakeholders and interested parties.

1.3 Specific research tasks and project scope

The GRP specified areas of interest in relation to the objectives of the research. These included:

- changes to machine and software design and distribution that are relevant to understanding EGM usage patterns and assessing the incidence of problem gambling associated with EGMs, including its social and economic impacts;
- problem and recreational gamblers' attitudes toward different machine and software design features, and machine access options in a range of venues and locations (including perceptions of venue operators), including such EGM changes as availability of increased 'lines' of play, the use of note acceptors capable of accepting varying denominations, and other machine options which may have an impact on harm minimisation and/or problem gambling behaviour;
- any research which throws light on the relative harm which might come from certain types of game or machine characteristics;
- any locational or demographic correlates of changes in EGM technology;
- patterns of EGM use by different user groups that will assist government policy on matters related: location of machines of various types; measures directed at those user groups; methods for enhancing the effectiveness of self-exclusion programs (for example, new innovations that might be introduced, such as player bet limits); and

measures to limit under-age gambling and gambling related to the proceeds of crime; and

- existing or emerging gambling groups that may be influenced by changing EGM technologies or design features.

The researchers were also expected to consult with other contractors undertaking research commissioned by the GRP under the 2002-2003 Research Program. A detailed Discussion Paper was released in August 2004, providing information on many of these research tasks.

1.4 EGMs, consumption and commodification: Some theoretical background

Gaming machines were installed in a casino and integrated into the leisure pursuits of those who visit hotel and club venues in Victoria during the 1990s. There is evidence that EGMs have broadened the population base utilising these venues, particularly along cultural and gender lines. It was the intention of the researchers to try and understand the emergence of EGM gambling in the context of contemporary thinking about post-industrial society and consumption (Bauman 1997; Beck 1992; Bourdieu 1997; Castoriadis 1997; Featherstone 1991; Lupton 1999; Rojek 1995), in an effort to get away from unproductive debates about what gamblers 'get' from EGM gambling. It was not intended to exhaustively explore these ideas or the relevant literature in the Discussion Paper, or indeed in the Project Report ('this Report'). Rather, for background on the researchers' conceptualisation of the issues involved, we believe it is useful to briefly outline some key concepts connected with contemporary forms and modes of consumption, as they relate to the construction of the tightly controlled and regulated market space of the EGM industry.

Gambling on EGMs is described in this Report as a form of private consumption. The concept of consumption has become central to consideration of the social organisation of resources and the formation of identity in contemporary society, balancing the historical concentration on roles within the social organisation of production. Consumption has been interpreted in a variety of ways including as central to status and class positions, as a fantasy mechanism, and as the 'demand-side' of the equation of economic activity and exploitation (Edwards 2000: 3). A key dimension of consumption activity is its definition as leisure, as the "conceptual flipside to its supposedly opposed notion of production or work" (Edwards 2000: 4). Although a monetary measure of EGM gambling consumption is used in this Report, intangible components of leisure such as enjoyment associated with 'going out and socialising' are also an important element of the activity of consumption.

A key to understanding the structure of the consumption of EGM gambling is the category of 'commodification.' The researchers define commodification as the processes by which social relations, and (in this case) leisure pursuits are transformed or 'reduced' to a commercial transaction which can be packaged for sale and consumption. It is also useful to consider the way in which the 'demand' for newly available commodities of this nature is induced and managed by those who provide them. It can be argued that gambling has become increasingly commodified as it has been 'lifted out' (Giddens 1990) of local and community contexts and transformed into a range of commercially provided commodities. With EGM gambling the traditional gambling relationship between an individual who offers a bet and one who accepts⁴ has been commodified and reproduced as a series of button pushes, in addition to other less well understood practices on the part of both consumers and operators.

⁴ Internet betting exchanges enable even the traditional activity of inter-personal betting to be transformed into a transaction incorporating an embedded commercial component.

Understanding the nature of this transformation and its marketing is of central importance to this research.

This is not, of course, to say that commercialised gambling does not take place in social contexts, since in all cases it does. However, the system of interpersonal social relations embedded in the traditional idea of the gambling transaction has been substantially replaced by the exchange of money for a commodity (the simulated spin of the reels) in EGM gambling. The ingenuity and inventiveness of the process of commodification finds its expression in technology, in this case the EGM, its component parts and the platform of the EGM network, as well as in the regulatory framework which allows this transaction to lawfully occur. This process has culminated in the production of gambling as a potentially infinite series of regulated units of consumption (bets), and produced a gambling industry that constantly innovates and rapidly develops variations on the form of the commodity.

The origins of contemporary commercial gambling in Australia lie in the historical development of gambling cultures post-1788 (Charlton 1987), which has been described and analysed in an increasingly wide range of literature (AIGR 1999; Lynch 1990; O'Hara 1981, 1988). This literature demonstrates that gambling was a predominantly social activity that emerged from the milieu of colonial life. In this early period of British settlement, gambling was also a social practice that was frequently the site of conflicts about values (O'Hara 1981). The controversial nature of gambling was not helped by the apparent links between gambling and colourful, and sometimes criminal, figures in the Australian social landscape (Buggy 1977). However, the contest over gambling was also influenced by the belief that Australians would continue to gamble, legally or illegally, and that prohibition only kept gambling money in the underground or 'black' economy (Hollidge 1966). Illegal gambling activity, particularly in relation to starting price (SP) bookmaking and 'two-up' was viewed as a predominantly working-class activity (O'Hara 1988), and governments were historically faced with moral arguments to prohibit gambling and practical concerns about 'cleaning up' problems surrounding a popular social activity (Dixon 1996).

The progressive historical outcome of these arguments in Australia has been for governments to exercise their legislative, fiscal and policy capacities in order to legalise gambling activities, establish regimes for taxation, probity and control, and seek to eliminate incidental criminal activity (Dixon 1996). This course of action, taken primarily by state and territory governments, can be understood as a concerted strategy to make gambling as fully governable as possible, that is, as capable of being directed and controlled within a legally constituted framework. This strategy constitutes an essential first step in the process of commodifying gambling and ensures that gambling transactions are structured to occur within legal forms of commercial practice and taxation. The framework of law is not only essential but fundamental to the successful commercial operation of a gambling (or any other) industry.

Gambling in Australia has moved through phases in which it became increasingly fully governable. Since the phase of commercial expansion of gambling which commenced with the first wave of casinos in the 1970s (AIGR 1999), it has evolved into an increasingly broad and diverse industry. Computer and information technologies have played a central role in the development of both gaming and wagering markets. It can be argued that, at least in the case of commercial EGM gaming networks, gambling has become 'hyper-commodified'. The idea of hyper-commodification relates to specific qualities of the nature of the commodities in question, and particularly to the way in which commodities are developed and offered to consumers. The first such quality is the heightened intensity of the rate of change of commodities, that is, the increasingly rapid re-development and diversification of

commodities in the light of perceived consumer preference, technical advancement, and market research. Thus, the commodities in question must be capable of rapid re-development and deployment, and for this reason information based products, being de-materialised forms of consumption, are clearly prime candidates for hyper-commodification. The second quality of hyper-commodification is the rapidity of consumption that is made possible by the structure of a particular commodity, for example, the speedy repetition and continuity of EGM gambling. A further quality is the generalisation of the processes of circulation themselves. Most EGMs in Australia are nodes within webs of networked machines, which create objects for remote surveillance and (sometimes) a gambling pool in the form of linked jackpots which increase the value of particular markets. Networked EGMs are thus an example of the almost 'perfect' integration of a particular commodity into a sophisticated network facilitating two-way communication and permitting very large numbers of almost effortless commercial transactions. Such hyper-commodification has enormous potential to generate substantially increased business volumes with very low 'friction' in the form of transaction costs and hence lower overall costs and greater profit, particularly at the expanding margins of the business.

Technology lies at the heart of industrial society's system of mass production and consumption. Whilst the development of techniques for mass-production of material goods or services founded a particular form of commodification and consumption, the EGM provides a classic example of the hybrid post-industrial system of production, via which a material object, the EGM itself, is manufactured for the purpose of intensifying the circulation of a *de-materialised* mass consumption unit (an electronic bet). Gambling on EGMs is perhaps more fully capable of regulation and control than any previous gambling product, integrated as it is into real-time networks of automatic financial accountability, regulation and taxation. At the same time as EGM gambling is thus fully integrated into these broader social contexts of control it is in a sense 'set free' from the restrictions of material consumption, with the only limitations placed on the circulation of EGM gambling being those imposed on the technical system (eg. numbers of machines, reel spin speed, minimum/maximum bets, etc.). Despite its less than glamorous image, in a sense EGM gambling, as a coherent set of sophisticated technical practices, lies at the cutting edge of hyper-commodified consumption in contemporary Australian society. A fuller understanding of EGM technology and its associated technical practices is therefore very likely to lead us toward improved appreciation of both the social appeals and dangers of EGM gambling, and will greatly assist in forming views as to the most likely avenues for effective regulation to reduce or limit harm.

1.5 Discussion paper responses and consultation

In pursuit of the project objectives a Discussion Paper was circulated and otherwise made available via the internet. The number of responses to the Discussion Paper was modest, possibly due to its level of detail and the specialised nature of its subject matter, however this was more than compensated for by the fact that several of the respondents were leading global authorities in their fields of expertise in relation to gambling. This section deals with responses to the Discussion Paper, along with consultations with interested parties undertaken by the researchers.

1.5.1 Responses to the Discussion Paper

A number of responses⁵ addressed the process of commodification and the technological base of the gambling industry, discussed in Section 1.5 of the Discussion Paper. Dr Gerda Reith from the University of Glasgow concurred with the general argument of the paper, commenting that

[o]ngoing trends appear to centre on the development of continuous, dispersed, convenient technologies that are constantly updated to sustain novelty and reinvigorate interest. These link in with other, existing forms of technology in the gambling field, such as lottery-based products, as well as those outwith it, such as mobile phone technology.

Professor Terry Austrin and Dr Bruce Curtis emphasise the way in which the core technology of EGMs, random number generators (RNGs), is leading to a convergence in forms of gambling shaped by the computerised medium.

The general point regarding technology is brought into sharper practical and pragmatic focus by Professor Bill Eadington of the University of Nevada, in highlighting that along with the efficiencies of 'technologisation' come a bundle of risks.

It is pretty obvious to see that we will never go back to the days of money clips and change purses, not while these more convenient alternatives are available. Now, almost all the value we need for making desired purchases as we go about our day-to-day business is contained in the plastic cards we carry in our wallets or purses, or in our bank accounts that can be accessed via computers and the internet.

This broad economic and social trend has also occurred in the gaming industry in a variety of innovative and clever ways. Compared to the late 1980s, we initially saw a transition away from old-fashioned "coin-in-the-slot" machines to the next generation of gaming devices that relied primarily on bill acceptors. More recently, technologies have developed that utilize "ticket-in, ticket-out" systems such as IGT's EZPay™ and Bally's e-Ticket, or smart card systems such as the one offered by GRIPS GmbH.

These systems create clear cost efficiencies for the casino and a number of conveniences for the player. Large amounts of coin no longer have to be transported across the casino floor to be fed through coin-counting machines. Change personnel no longer have to push around carts filled with rolls of quarters or nickels or dollar tokens. With the new technologies, customers do not have to wait for hand-paid jackpots, nor do they have to soil their hands with the grime and grit that hours of coin play at a slot machine would invariably create. And soon to be gone forever will be the plastic cups that players lug around carrying their stakes or their winnings from one machine to another. Furthermore, from the operations side, these new systems mesh well with player loyalty programs and data base management and analysis of player spending patterns. These bi-products have revolutionized casino marketing strategies. Thus, the benefits of new technologies related to slot machines and "new" money have been substantial.

However, because casinos are in the gaming business, and because gaming is far more politically vulnerable than most other industries, the issue of electronic money in casino transactions cannot be treated in the same manner as it is elsewhere in the

⁵ Some responses took the form of submission by the authors of papers produced for other purposes. In this section all comments, submitted papers, etc are treated in the same manner.

economy, such as with buying groceries at the supermarket or for gasoline purchases. It is critically important for the major actors around the gaming industry—casino companies, gaming machine manufacturers, and regulators—to understand what the risks might be of moving too quickly on technologies that are becoming increasingly common elsewhere in the economy.

Dr Reith and Prof. Eadington both note the dynamism of EGM/gaming industries and their interdependence on other technological systems (including the financial transactions and telecommunications systems) for their operation and potentially, for their market expansion opportunities. Whilst Prof. Eadington's comments are addressed to the casino industry, they are of direct relevance to the club and hotel gaming venues and networks operating in Australia with regard to the fact that there is clearly a certain level of 'transaction costs' associated with the EGM gambling industry. Transaction costs here refer to the costs associated with remaining a legitimate or acceptable business or sector in the eyes of community and government.

As Prof. Eadington notes, the supply of gambling services cannot be simply equated with other forms of consumption such as everyday household items. Such concerns lead, in May 2003 in Nevada, to the deferment of regulations that would have allowed gamblers to transfer up to \$1000 dollars a day into gaming machines and "permitted every gaming device on the casino floor to be transformed into an ATM machine". Whilst the financial transaction system and gaming networks are maintained as operationally separate in Australia at this point in time, this example has the benefit of highlighting that as technological platforms they are not distinct. As has been described elsewhere (SACES 2005b) the capabilities for remote gambling on club, hotel or casino EGM networks, particularly from the home, are in-built into current technological platforms. What is currently lacking is any impetus for such an innovation. However, such an impetus, for example strong internet-facilitated interstate or international competition for gaming revenues, can be envisaged in the future.

The seamless integration of EGM networks into the contemporary universe of consumption is also underlined by Dr Reith.

[T]echnological systems seem to be being incorporated into wider commercial systems, namely branding, that associates products with popular media programmes, celebrities, commodities, etc in order to generate more than simply interest and novelty, but also deeper emotional bonds and relationships between consumers and products, and indeed, even redefine what's meant by that relationship. Beyond crude advertising, this kind of product design attempts to build up relationships between commodities/ activities and consumers that build on local and global knowledge, and generate empathetic bonds and even loyalty. Most EGMs incorporate these kinds of features in their designs, but there seems to be (anecdotal) evidence that these are becoming more sophisticated, adapting to local markets and using local knowledge in more deliberate ways. Given that gamblers sometimes claim to have 'feelings' for machines that go beyond the merely functional, and that strategies such as loyalty cards are beginning to generate other kinds of links between gamblers and gambling providers, the inter-relationships between the specific design of gambling technology and the emotional/personal responses of players seems an interesting one for deeper investigation.

The complexity of relationships between EGM gambling technology, gambling providers and gamblers are apparent here, as is the dynamism of EGM gambling as a particular form of contemporary consumption. Indeed EGM gambling offers specific commercial potentials due

to technological capacities that are capable of capturing and storing individual, machine, venue and network consumption data.

These potentials are then linked by Dr Reith to a very important point regarding the potential presented by technology in relation to responsible gambling features (RGFs).

In terms of RGFs, which can have uneven effects and unintended consequences – one recent approach is the specific *targeting* of specific features towards gamblers displaying problematic behaviour, and ignoring those who aren't. Such targeting would be achieved through utilising a combination of existing informational and technological systems (eg as held in machines, cards, venues), and would reduce disruption to non-problem players as well as gambling revenues.

The same technological capabilities that contribute to the marketing versatility and revenue integrity of EGM networks can be understood as offering an opportunity for the identification, potentially using actual gambling data, of individuals whose EGM gambling consumption may have reached problematic levels of time (or money) expended. The minimising of disruption to non-problem gamblers would also be an advantage of such a system.

Professor Mark Dickerson took up the theme of responsible gambling in emphasising that EGMs are part of a broader category of “continuous forms” of gambling, which the body of gambling research shows is the strongest risk factor in relation to problem gambling. Prof. Dickerson argues we need to be wary of simplistic interventions in the structural characteristics of gaming machines, such as slowing spin rates, citing the relatively longer intervening periods between bets in another continuous gambling form, namely off-course betting on races or sports events. A key point here is that the “intervening experience still works as entertainment and eroding self-control”. The implication here is that machine spin rates would have to become excessively slow to disrupt this background experience of being entertained. Prof. Dickerson states that his own modelling suggests impaired control is driven by emotion during the gambling experience and that “losing control within a session may be a natural, pleasant part of the process at the time”. When it is considered that most EGM gambling consumption takes place in the context of concurrent consumption of alcohol this point becomes even more salient.

The second important point raised by Prof. Dickerson involves the broad framework in which EGM gambling consumption is sold and regulated. He explains that the transformation of pokies from “mechanical three wheelers” has seen the rate of expenditure per hour escalate dramatically but at no time has this more voracious, evolved form of the EGM been considered or evaluated in relation to standard principles of consumer protection. Professor Dickerson cites, by way of a comparative example, various proposals to introduce automated selling of ‘scratchies’ (scratch lotto tickets) in which field-testing had suggested regular players would consume an average of 800 scratchies per session. According to Prof. Dickerson, such proposals have been rejected by regulators on the grounds that they are too dangerous for consumers, yet understood as continuous forms of gambling, automated ‘scratchie’ terminals would actually provide an RNG-based gambling consumption experience very similar to that currently provided by EGMs. Logically, therefore, application of the consumer protection principles underlying the prevention of automated scratchie sales would force a change in the current method of “selling the entertainment product of gaming”.

The public health model of harm minimisation (as he conceives it) is therefore both inappropriate and ineffective according to Professor Dickerson.

The current business practice is to warn players about the possible harmful effects of gambling by placing signs in venues and on machines and providing a range of pamphlets on how to gamble responsibly. How reasonable is it to warn players and yet at the very same time and place offer gambling in a way that is known to promote impaired control in the average regular player? In other words what is the value of a warning that is known to be ineffective?

Refining such arguments may make the case that the gambling industry and governments are failing in their duty of care unless and until they provide continuous gambling products in a way that ensures that the typical regular player can maintain their self-control over their expenditure of time and money.

According to Prof. Dickerson, the technology is available to “sell all continuous forms of gambling safely with acceptable standards of protection of all consumers”.

The obvious principle that could guide the future responsible provision of continuous forms of gambling is that the point of sale should be removed from the addictive process inherent in the gambling sequence itself:

- to a point in *time* prior to the commencement of the session, and
- to a *place* away from the gaming room floor.

Contemporary smart card design has the potential to enable regular gamblers, whether they prefer TAB betting, EGM play or casino table games, to pre-commit, setting session and weekly budgets for cash and time and then be free to enjoy their session, including the experience of losing control, without harmful impacts.

Professor Dickerson thus sets out two priorities for responsible gambling that have direct relevance to the EGM technical system. First, the rate at which losses can be accrued with the current technical parameters (spin rates, bet sizes, number of lines gambled, maximum credit limits per machines) needs to be assessed in relation to principles of consumer protection and this applies to all gamblers. Secondly, using technology to mediate between the purchase of EGM gambling consumption and the experience of that consumption itself may offer an opportunity to limit gambling-related problems, by enabling the totality of the EGM gambling consumption experience, including loss or impairment of control, to be governed by an alternative set of sessional, temporal or financial parameters controlled by the gambler.

1.5.2 Consultation

A limited number of formal consultations were undertaken. These were supplemented by a larger number of informal conversations and telephone contacts as the researchers sought to develop a basic technical knowledge of the operations of EGMs and EGM networks, and subsequently to understand the technical in the context of the regulatory environment. This proved a very challenging and time consuming task – as one government official remarked: “There is virtually no-one who knows how it all works”. We cannot claim to have joined this select group. The wide-ranging informal learning process undertaken will not be dealt with here.⁶ In this section, formal consultation with government and industry representatives is summarised.

Consultations and a venue tour were provided by the Victorian Office of Gaming Regulation (OGR), in particular the Director of Gaming, Mr Michael Murray, who is responsible for

⁶ We note that a number of interlocutors requested that their conversations with us be informal and that they not be identified.

gaming operations and the conduct of gaming in clubs, hotels and Crown Casino. The OGR has a direct link into the CMCS of the two gaming operators for real-time checks. The principal mechanism for compliance is random site visits, with the aim being to visit each venue at least once a year and to sample ten per cent of machines (i.e. approximately 2,750 machines per annum). These inspections try and capture new products, both hardware and software, as soon as possible after they are deployed in venues, interrogating E-proms and game data. This is done under an audit program and involves physical removal of the devices and insertion into a program device from OGR to determine compliance.

New machines are also checked by the regulator for artwork, values, signage, etc. It was noted that new products are usually first deployed in the most popular venues, which means that these venues have a greater proportion of machines with the player information screens mandatory on new machines. Due to this tendency for new machines to be deployed in the most popular venues, the regulator estimated that greater than 90% of EGMs in Metro Melbourne had BNAs, compared to an estimated 10% in non-metro areas. The lifecycles of EGMs were very varied, according to the regulator, with some manufacturer's successful machines (notably Aristocrat's) seeming to outlast many others.

The regulator receives weekly reports on EGM works and daily reports on the 'significant events' generated on the network. (These specified events range in importance and include such events as opening logic boxes, changing software, failure of communication between an EGM and the next point in the monitoring system etc.) The regulator noted that significant events are generated by operators moving EGMs, updating software, introducing new machines etc. The regulator described this as a continuous process, which he described as amounting to several hundred events per day. Capturing the turnover of hardware and software in detail was not a component of the current monitoring system. That Crown may change up to 500 machines per day and Tattersalls' and Tabcorp may change up to 1000 per week, including swaps, warehousing, new software, etc, would limit what could be sensibly analysed at the moment.

The regulator noted that whilst a CMCS has two core functions, of capturing financial data and monitoring the integrity of the network, many have the potential to do more. Tattersalls' is running what was described as a 'very basic' system that cannot even run jackpots, which were instead being piggy-backed on the Keno network. Tabcorp by comparison has a relatively sophisticated CMCS that is capable of tracking individual EGMs by identification numbers and which could, with some difficulty, match these numbers to financial data. (In comparison, the compilation and analysis of detailed operating performance data at the venue level is a key information stream in the ongoing commercial management of the operators' EGM networks, which are organised into operating regions with marketing representatives etc. It should be noted that the researchers did not make a request to either gaming operator for a sample of management machine or venue level operating data.) Other aspects of the EGM network such as BNAs were not captured by the monitoring system, however, the regulator observed that the machine reconciliation system could be modified to employ an expanded code system to enable tracking of innovations in the network.

The regulator advised that new products are approved with advice from the accredited testing facility (ATF). The outsourcing of testing had changed the approvals culture only in the sense that staff of the regulator no longer keep up with technical changes in a direct way, as was the case to some extent when testing was conducted in-house. Approvals tend to be taken for granted on advice from the tester, which the regulator described as a risk. There is no in-house testing facility at present. The regulator was of the view that the approvals process generally

works but with some reservations, where corners may be cut by not fully testing player information systems for example.

The regulator acknowledged the importance of product and process innovation for gaming machine manufacturers and operators. 'Pushing the envelope' in terms of allowable technical or other developments is regarded as a commercial imperative. Hypothetically, regulators can find themselves under considerable and escalating pressure should significant financial and other investments be placed in jeopardy by decisions preventing these investments being brought to market. The regulator said that operators in Victoria deal with manufacturers about product innovations and that manufacturers will come to the VCGR, sometimes with requests for clarification and/or interpretation of regulations but usually with new products. In this respect it was reasoned that the 'manufacturers know the system' and the "\$20 million decision" doesn't really come up. In relation to this process, it was also the case that there is no way of knowing how much discussion there is between the tester and the manufacturer.

Consultation with NSW regulators offered further insight into the relationships between approving authorities, manufacturers and testers. The NSW technical approvals staff are required to examine developments in the design phase, during which consultation occurs and changes can be made during the process of development. However, this does not preclude some designs being pushed through and 'tested' at the approvals level. Testers could not be relied on one hundred per cent as it was possible to provide inadequate indicators. It was suggested that regulators need to keep up-to-date in relation to technology, a task that was acknowledged as increasingly difficult. It was also suggested that each jurisdiction's administrative processes were different in the pathways presented for gaining approvals for new games and machines.

Regulators in Victoria and NSW both argued that the multiple requirements and the separation of roles in the design, approvals and testing processes were a key safeguard of the integrity of EGMs and the network more broadly. It was observed that *collusion* had been required to compromise the checks in place and that such incidents had been rare. However, to maintain this level of system integrity the necessity for accredited testing facilities to measure up to key performance indicators, including staffing levels, quality accreditation, the performance of machines in the field etc., was regarded as important. In Victoria, a large proportion of the testing is done by two ATFs. In the past few years the regulator could recall only one EGM that had failed the statutory RTP test. The reasons for this failure were unclear. Whilst the original regime required testing of each individual machine, this has now been superseded by requirements for installation to be undertaken in compliance with various regulations. The numbers of inspectorate staff have been reduced from 20+ to six. However, it was considered that the level of risk is minimised by the combination of observation and inspection of machines in the field.

In relation to harm minimisation goals and technological capability, regulators in both Victoria and NSW agreed that if technical measures to reduce harmful impacts of gambling could be engineered then these would be beneficial to the industry as a whole. However, it was necessary to develop measures that whilst reducing harm for problem gamblers would not inconvenience the average consumer. The Victorian regulator commented that there were currently no plans in place to use the capabilities of CMCS in relation to responsible gambling features/harm minimisation measures. It was considered that the Tattersall's system probably could not do this at present, in any event.

Ms Vicki Flannery from the Australian Gaming Council (AGC) was strongly focused on the reduction of harm to problem gamblers as the main area of responsibility for the industry and government, and was concerned to point out that emphasising technology-based responsible gaming initiatives should not distract attention from the need for a broader strategy including education and awareness raising. In particular, self-exclusion as a gateway to treatment was recommended as a harm reduction program, where gamblers who self-excluded were directed to treatment. Of technology-based initiatives, 'smart cards' were argued to be based on an understanding that gamblers 'lose control', an assumption she suggested had not been proven. A 'black market' in smart cards might also be an unintended consequence of this approach. People experiencing difficulty might also view the card as a device to defer treatment.

Messrs. Leigh Barrett and Neil Murray of Tabcorp Ltd also assisted with discussion of some specific issues. They advised that the advantage of bank note acceptors (BNAs) for their customers was considerable, limiting the need to carry change and reducing the pressure on the system at peak times, by permitting people to avoid the need to queue for change and leave machines whilst changing cash. They noted that the company takes the view that customers enjoy contact with venue staff, but on their own terms. Mr Murray advised that BNAs were deployed with Tabcorp between 1997 and 2002. He also advised that the company replaced about 15 to 20% of its machines every year, and that in recent years the company had focused more on the quality of its product than on conservative financial management, which had been the key of its relative success in the early to mid 1990s. He also advised that although it is possible to change credit values on EGMs, and that this is sometimes done, it was by no means common. Further, the relative proportion of particular credit values is a matter of network policy plus some finessing at the local/venue level. There have been examples of 'topping-up' EGM numbers in specific areas (such as parts of the Mornington Peninsula during peak holiday times) but that this was no longer company policy. The establishment of the return to player (RTP) level was 'guess work', and the current RTP levels reflect the limitation in EGM numbers at the global level.

Messrs Murray and Barrett also advised that EGMs are located where it is believed demand is strongest, consistent with regulation, and that growth corridors are obvious candidates for placement. Hotels are thought to be better performing because of easier accessibility, and to be better capable of making good commercially based decisions. Similarly, larger venues were seen as offering better choices for patrons and because they have better facilities are likely to be better performing. There is a case to be made for increasing venue size. Many smaller venues are seen as offering only gambling. Hotels do not get access to new or 'better' machines as a matter of course, and in fact current practice is to buy new EGMs on the basis of one per venue. The company commenced a program to achieve 'product parity' with their opposition in 2000, and now believe that this has been achieved. Mr Murray advised that in his experience there had been no 'science' to the decision to cap EGM numbers at 30,000. His recollection was that the first 'moratorium' on EGM numbers occurred as a result of public disquiet when there were about 14,000 EGMs deployed, and that subsequently halts were announced at the 17,000 and 30,000 levels. These were essentially accidental, and had not been determined by consultation with the industry.

He also indicated that in his view special gaming areas (where certain restrictions on EGM parameters are relaxed subject to card or PIN based play) are unlikely to operate successfully at local venues, although there may be a small number of venues where they might be taken up. He felt that this was more a market segment applicable to casino operations. In the context of regional caps he suggested that these have no impact on problem gamblers, given that EGMs in most suburban venues are fully engaged for no more than four to five hours per

week. He advised that there is some degree of reflexivity between manufacturers and operators but believes that machine and game design is a highly intuitive process. In his view the future direction of EGM development will incorporate more games with stand-alone jackpots and ‘bonusing’ features. There is also likely to be some growth in linked games involving multiple players in a pseudo-social game experience, as well as the possibility of very engrossing virtual-style games.

The researchers were sensitised to perspectives of self-identified problem gamblers about game features via consultation with counsellors from Gamblers’ Help agencies. The counsellors commenced from the observation that there is a culture of ‘freebies’ in the broader community, for example fly-buys and loyalty programs, and that in this context free spins on EGMs were very attractive to gamblers and seen as very problematic by those seeking help. Along with certain features, such as the 3-scatter feature on the very popular machine Queen of the Nile, were seen as contributing directly to the success of this particular EGM. There seemed to be reasonable consensus amongst counsellors that the duration of time spent gambling on machines was less negotiable than the expenditure of money (where both were available). The effect of the high capacity of EGMs for fast play and the widespread availability of multi-line betting was therefore seen to drive problem gamblers’ expenditure of money up. In effect the cost of EGM gambling time was relatively high, if problem gamblers utilised the full capabilities and features of the machine design.

The cacophony of sound when a machine paid out, which was contrasted to the silence when money was paid in, was viewed as important by counsellors, who commented that problem gamblers crave the music and sounds that really bring the machine to life when a pay-out occurs. Counsellors believed that this contrast should be removed, so that winning was not so important to maintaining the full experience of the EGM. Access to favoured games was also described as an important issue as particular music and artwork were highly regarded by problem gamblers as important to the creation of the atmosphere that induced them to want to play. The issue of downloading games from venue controllers to particular EGMs was viewed as somewhat uncertain, with the capacity to select a favourite game from a greater number of EGMs being considered by problem gamblers to be a positive thing. However, at the same time this was seen as ineffective if the total package created by lighting, artwork, sound etc was not reproduced.

The counsellors commented on the attractiveness of EGM venues for particular social groups. In particular, women who are socially isolated are attracted to the safe social environment of many venues, which enable them to undertake social activity alone – a rare opportunity for many women. This activity can nurture feelings of independence (often from controlling husbands), particularly in the phase of gambling when it is fun and relationships of recognition (nodding acquaintance) and friendship can be experienced with venue staff and other regular gamblers. Many women problem gamblers pointed out that EGMs gave women a legitimate reason to be in these social venues, since they were not seen as morally deficient as they might be otherwise when attending a pub or other licensed venue on their own. Other groups where problems are occurring include apprentices, recently arrived migrants and some international students. Access to cash, high family expectations about success, issues of transition and isolation were viewed as relevant here. The casino was seen to exert some pull over those who are attracted by perceptions of glamour and excitement.

In relation to consumer protection strategies, counsellors generally viewed smartcards and ‘pre-commitment’ strategies as being worth a try in changing the current progression of problem gamblers. A key here was seen to be that a stored value card of some sort should

require human contact to top-up and that there should be some kind of short duration limit (eg. daily, or weekly at the most) on the amount of money that could be spent. There was some consistency between these views and those of Professor Dickerson (discussed above). Counsellors were also in favour of venue staff having some role in the identification of people at risk with the key aim of facilitating earlier referral to counselling/treatment programs because, as a general rule, problem gamblers exhaust all capital (financial, familial and social) before taking action to address gambling. This was somewhat consistent with the view of Ms. Vicki Flannery of the Australian Gaming Council (also discussed above). Counsellors noted that experienced venue staff say they can identify problem gamblers, and that some gamblers actually appeal directly to staff for help. A key sign was reported to be a noticeable decline in the desire for social contact over time – a kind of ‘natural progression’ from sociability to concentrated anti-social behaviour. It was noted in discussions that research into the identification of problem gamblers by venue staff is planned as part of the National Gambling Research Plan 2004-2008 being overseen by the Ministerial Council on Gambling (MCG).

Counsellors also described the difficulty of avoiding a ‘relapse’ following the taking of action to address gambling problems. In particular, loyalty program promotional material was viewed as a big problem in this context. Offer which provide strong incentives, such as a free breakfast’, but which also reawaken feelings of attachment and contact between individuals and a venue are difficult to resist. Personalised material, such as birthday cards, or invitations to select or ‘special’ celebrations stimulate the gamblers urge for social inclusion, particularly for socially isolated or lonely people. The price of gambling can seem a small one for enjoying this sense of having a place to go or to belong. However, the eventual cost was described as often being very steep where a relapse into problematic gambling behaviour occurs.

In summary, the responses to the project Discussion Paper and the formal consultation process provided a sound footing for the researchers. An informal process of learning through consultation and discussion was possible thanks to the generosity of many within government, industry, counselling services, community organisations and amongst gamblers themselves. The substance of these processes informs the various discussions and analyses that follow.

1.6 Literature review

A literature review was conducted as a basis for the conduct of the research and for the production of the project Report. The literature review was initially included and circulated as part of the project Discussion Paper. It is attached here, in slightly updated form, at Appendix A. The review focussed on the now substantial problem gambling and harm minimisation literatures. A significant corpus of literature exists that links EGMs and problem gambling behaviour and establishes EGM gambling as the form of gambling most likely to lead to gambling problems. In particular, the literature review sought to identify studies within the broader literature that involved changes to the operation of EGMs and/or specific technically-based harm minimisation measures. Only a relatively small number of such studies were found. However, all of these were relatively recently published, suggesting that the areas of material change to technological platforms and/or technical parameters is an emerging area of research interest.

The literature review includes:

- a summary of selected recent approaches to problem gambling;
- reviews of problem gambling literature based on behaviourist, need-state or cognitive theoretical perspectives;

- a review of studies directly concerned with EGM design and gambling behaviour; and
- a review of literature on EGM technology and harm minimisation measures.

Some references to the literature reviewed are included in the body of the Report following. However, for reasons of readability this is not generally the case and interested readers are directed to the literature review for further detail and commentary.

In the interim period between the finalisation of the project literature review and the production of the Final Report, three additional research reports of relevance were published and one further review of research was brought to the researchers' attention. Selected features of these four publications are summarised here.

A review of gambling research conducted for the Independent Gaming Authority of South Australia (IGA) includes a summary of research into the operant conditioning effects of EGM technology (Delfabbro & LeCouteur 2003, 81-9), including some research not viewed by the authors of this Report. The authors distinguish the random ratio (RR) schedule, similar to that on which EGMs are based, as a particular type of variable ratio schedule that can lead to potentially long intervals before reinforcement (winning). The intermittent nature of reinforcement on a RR schedule are "very effective in maintaining behaviour" (Delfabbro & LeCouteur 2003, 82) as people become accustomed to not being rewarded for varied and, at times, quite lengthy periods and 'learn' the value of persisting (strong resistance to extinction).

Studies of the effect of RR schedules on EGM play have found that gamblers are more likely to increase their rate of play following small wins and slow down after relatively large wins (Dickerson 1992; Delfabbro & Winefield 1999). In the process of emulating Dickerson's (1992) study of schedule-based behaviour, which was conducted using pull-handle gaming machines, Delfabbro and Winefield also found that rates of play on electronic gaming machines were significantly faster than for pull-handle machines (11-12 spins per minute compared to 7-8 spins per minute) (Delfabbro & LeCouteur 2003, 83).

The review also summarises a PhD research project along similar lines, conducted by Haw (2000) (Delfabbro & LeCouteur 2003, 86). This study was notable for being based on actual gambling data supplied by Aristocrat Pty Ltd from 700 EGMs operating in NSW Clubs. Findings of this research included that structural variations between different EGMs were important, with the availability of bank note acceptors and multiple line betting significantly increasing gambling turnover. The reviewers note that this is consistent with the findings of the Productivity Commission (1999). The review thus includes further evidence for a behavioural component to problem gambling and for the key role of reinforcement schedules as part of the successful design of EGM technology. (See Table A.5 and elsewhere in the Literature Review for other research in this area.)

Three research reports commissioned as part of the research program of the Gambling Research Panel (GRP) in Victoria also contain findings relevant to the current study. The first of these was a study of the impact of the implementation of regional caps on EGM numbers in Victoria (SACES 2005b). This study was carried out in a context where there had been a shock to growth in EGM expenditure (via the smoking ban) which to some extent may have confounded the results, but where growth in EGM expenditure did seem to be returning to a level at least in line with growth in the economy. Regional caps were viewed as one possible measure to restrain growth rates in particular areas by changing the availability of machines.

However, whilst the results were mixed, overall the SACES study suggests that the caps implemented in the five regions to date were not substantial enough to produce a verifiable change in the pattern of expenditure growth. This was supported by anecdotal evidence at the venue level that queuing for particular machines, in particular venues and/or at specific times of day is an infrequent and relatively insignificant phenomenon that does not discourage gamblers from gambling on EGMs.

A 'crowding out' effect significant enough to lead to a change in expenditure did not appear to have occurred. Neither was a 'crowding out' of problem gamblers by recreational gamblers that might lead to a net reduction in social harm apparent, as measured by gaming revenues in 'leakage areas' (venues in areas adjacent to the cap regions). There was, however, some evidence of increased intensity of use of remaining EGMs in some locations where machine numbers were reduced. The Victorian regulator was of the opinion that as machines would obviously be removed from the least profitable clubs and hotels in the area then the caps would be unlikely to cut deeply into performance, which the regulator believed was confirmed by an apparent lack of extra effort by gaming and venue operators to improve performance in the cap regions. Overall, it would appear that at an aggregate level there remains a significant level of 'excess capacity' in the Victorian EGM network.

A second report, released at the end of 2005, focused on the impact of harm minimisation measures on EGM gambling consumption behaviour (Caraniche 2005). With the cooperation of gaming venues across the state, the researchers surveyed a total of 418 EGM gamblers about their EGM gambling. The researchers endeavoured to recruit a representative sample of respondents by recruiting: across a range of metropolitan and non-metropolitan venues; in Tabcorp and Tattersall's venues; at different times of day; on different days of the week; and at different stages of gambling activity (pre- during and post-gambling) (Caraniche 2005, 78-81). The Canadian Problem Gambling Index (CPGI) was administered to all respondents to enable the researchers to discern between 'recreational' and 'problem' gamblers (Caraniche 2005, 78). Based on CPGI scores the respondents were allocated to sub-groups as follows: non-problem gamblers 31.1%; low-risk gamblers 16.5%; moderate-risk gamblers 25.4%; and problem gamblers 27.0% (Caraniche 2005, 81).

Of interest to this study was the fact that the recruitment process in actual gambling venues produced a sample including 52.4% were either current problem gamblers (27.0%) or were at-risk of problematic gambling behaviour or becoming problem gamblers (25.4%) (Caraniche 2005, 80). Unless an inadvertent over-sampling of problem gamblers occurred – and given the stratified sampling process used by the researchers this seems unlikely to any significant extent – this raises serious questions about risks to patrons of gaming venues. Participation in EGM gambling in hotels and clubs has been calculated as being in the range 31.5% - 34.0% in Victoria (SACES 2005c, iv). Although prevalence studies suggest that problem gamblers comprise 0.8% - 2.4% of the adult population in Australia at any particular point in time (Banks 2002, 4), the Productivity Commission estimated that the number of regular gamblers who were problem gamblers was around 15% (Banks 2002, 2). However, the 'density' of regular gamblers, at-risk gamblers and/or problem gamblers in actual venue settings has not been adequately quantified. Blaszczyński (2005a) has estimated that nationally 18% - 25% of those in club and hotel gaming venues at a particular time are likely to be problem gamblers (see also, PC 1999). In Victoria, the likelihood that such a high proportion of gamblers in gaming venues at any particular time are problem gamblers or at-risk gamblers tends is also supported by evidence that problem gamblers gamble more frequently and for longer periods (Caraniche 2005, 82) and are therefore more likely to be in a venue at a particular time. In addition, problem and at-risk gamblers in Victoria attend gaming venues far more frequently

than recreational gamblers who may gamble as infrequently as once a year and still be considered as 'participating' in EGM gambling (see for example the *Victorian Longitudinal Community Attitudes Survey* series).

A third report commissioned by the GRP examined the community impacts of gaming machine gambling by comparing Local Government Areas (LGA) in Victoria with comparable LGAs in Western Australia (WA), where EGMs are restricted to Burswood Casino (SACES 2005c). The study found that the prevalence rate of problem gamblers was 2.14% in Victoria compared to 0.7% in WA, and that 86% of problem gamblers in counselling in Victoria had EGM-related gambling problems compared to 18% in WA (SACES 2005c, v). An important survey finding emerging from this report was that the use of ATMs by patrons in clubs and hotels is 25% in Victoria compared to 14% in WA. The authors conclude that this difference can be attributed to the withdrawal of cash for gambling in gaming venues as the availability of ATMs in both states is in proportion to their respective populations (SACES 2005c, iv). This supports the argument that a range of venue and other social and technical components function as parts of the totality of the EGM gambling system and facilitate EGM gambling consumption, and that not all of these components are specifically gaming technologies.

2. EGM technology

This section examines characteristics of EGMs and related components that together form the EGM technical system. Some background is provided on the broader technological developments that have lead toward the production of EGM technology. Technical testing of EGMs or ancillary technologies is not part of the GRP's Project Brief. However, some understanding of the probabilistic and other parameters of EGM operation is useful. In this respect the Productivity Commission Report into Australia's Gambling Industries (1999), which compiled gaming machine manufacturer, gaming operator and other submissions as well as the Commission's extensive research on machine performance, provides an essential starting point as regards the many complexities of gaming machine technology from the lay perspective.⁷ The PC report has guided the researchers in their initial understanding of these issues. At a general level, as the Productivity Commission pointed out, technology continues to re-shape or act as a 'driver' of innovation and change in the gambling industry at many levels (see Box below).

- Technological advances have enabled gambling suppliers to improve their services and increase the entertainment experience for consumers. For example, gaming machines are continually being updated with new graphics, feature games and linked jackpots to maintain consumer interest;
- Technological change has also created much greater access to gambling products – so called *convenience gambling*. Gambling machines are available in pubs and clubs throughout Australia; and the proliferation of interactive gambling products such as internet gambling and telephone betting, mean that consumers no longer have to leave home to gamble;
- Technological developments have also increased the tempo of gambling. The traditional forms of gambling (lotteries and racing) were non-continuous – there was a time delay between when a ticket or bet was purchased and (when) the event took place. Today, the trend is toward continuous forms of gambling. For example, a new Keno game starts every five minutes. It takes only a few seconds for each spin on a gaming machine; and the introduction of bill acceptors on gaming machines, in some jurisdictions, has meant that players do not have to leave their machine to get change.
- Further, technology has created higher levels of security for players and service providers. For example, Star City Casino (sub. 33, p.34) has introduced Pitcam (small cameras located on each gaming table to record play) to resolve disputes, deter criminal behaviour, and ensure the integrity of gaming operators. It also has a computer system to monitor gaming machines and more than 1,000 cameras providing surveillance.
- Finally, advances in information technology have enabled gambling providers to collect considerable detail on their clients. For example, many casinos and clubs provide gamblers with membership cards which when inserted into gaming machines can earn consumers free prizes or money. The cards simultaneously collect information about each consumer's expenditure pattern and level (Source: Productivity Commission 1999:2.21).

2.1 What is an EGM?

There is a variety of terminology in use to refer to the class of devices known colloquially in Australia as 'poker machines' or 'pokies'. However, despite the use of such a general covering term, not all gaming machines have the same technological base. In Victoria, virtually all current poker machines are electronic gaming machines (EGMs).⁸ This is not the case internationally, where EGMs of the kind manufactured by Aristocrat for example are known as Australian-style machines, to distinguish their particular combination of video and gaming technology.

A variety of different types of gaming machines feature in discussions and articles by researchers from different countries. Often conclusions or hypotheses about gaming machine play seem to be generalised across jurisdictions with quite different machine types. This is

⁷ See in particular Volume 3, Appendix U of the PC Report, available from <http://www.pc.gov.au>.

⁸ In this discussion paper 'gaming machine' is used as a generic term to cover any machine on which an individual can gamble with a facility for continuous staking. The term 'EGM' is reserved for Australian-style electronic gaming machines.

probably due to their common features such as continuous staking, rapid play, and appearance. However, different types of machines are operated in jurisdictions such as Australia, Canada, the United Kingdom and the United States.

What can therefore make discussion of EGM technology confusing is the fact that a one-to-one relationship between technological design features and individual gaming machine types and terms does not exist. Thus, machines with very similar presentation may have very different underlying technologies (eg. machines with reels) and machines that appear to differ dramatically may be utilising the same underlying technology (eg. random number generators). There also appears to be a dynamic ongoing process of innovation occurring in gaming machine design and in the ways and combinations whereby emerging technologies are applied to different machines in the various markets and regulatory jurisdictions. Common terms referring to gaming machines are outlined in Table 2.1 below.

Table 2.1 Gaming Machine terminology

Terminology	Description
Electronic Gaming Machines (EGMs)	Combine video and gaming machine technology. Usually five virtual reels mapping the selections of random number generators (RNGs) onto screen. Dominate the Australian market. Major manufacturers include Aristocrat and IGT.
Fruit machines	Traditional English machines, usually with only 3 reels that offer small stand alone cash prizes. Major manufacturer Bell technologies.
Poker machines (pokies)	Generic term given to gaming machines in Australia. Includes older machines with reel 'steppers'. Not to be confused with video poker machines on which an electronic version of the table game is played.
Slots	American term for gaming machines with a minimum of three reels. Covers a wide range of machines found in US jurisdictions including in some cases video poker and lottery machines.
Video Lottery Terminals (VLTs)	Combine video technology and RNG generated lottery style games. Major market is Canada.

In Victoria, the TAB was licensed to establish and operate coin-less gaming venues (called Tabaret) in Melbourne in 1990. However these operations were not popular with the public (AIGR 1999: 176). The *Gaming Machine Control Act 1991* provided for two gaming operators (Tabcorp and Tattersall's) to purchase and install EGMs in clubs and hotels and to operate a Central Monitoring System (CMS) for their contracted venues (AIGR 1999: 176). These machines were subsequently introduced from 1992.

The Early Slot Machines

When slot machines were first invented they were totally mechanical. When you pulled the handle, this caused the reels to spin. If winning symbols appeared under the payline, the machine paid out accordingly. Each symbol on each reel on old mechanical slot machines corresponded to a mechanical slot on each reel. Most of these machines had about 22 stops (slots) on each reel. Players could calculate their odds of winning by counting the number of symbols on each reel and multiplying the results. The problem with the old slots is that they had a small number of possibilities ($22 \times 22 \times 22 = 10,648$). Therefore, only relatively small prizes could be won (Horbay 2004).

Many of this first wave of machines introduced by Tabcorp and Tattersall's were of the type most commonly found in Las Vegas and elsewhere in North America, known as 'steppers'. These machines have three to five spinning reels, all of the same diameter, and could be linked to progressive jackpots. The lifespan of many of these machines in Victoria's new gaming market was relatively short. None of these machines are currently in operation in local venues in Victoria. The progression of gaming machines from one technological platform to the next provides a useful backdrop to the research, as does the way gaming technology and video technology were combined in the EGM form. A chronology of selected developments in gaming and video technologies is summarised in Table 2.2 below.

Table 2.2 Chronology of developments in gaming and video technologies

Date	Company	Machine and Game Innovations
1895	Charles Fey	First slot machine is invented
1907	Mills Novelty Company	Teams up with Charles Fey to produce the Mills Liberty Bell ‘The Liberty Bell featured a cast iron case, with a Liberty Bell embedded on the front of the machine. The machine’s reel selections had pictures of playing cards.
1910	Mills Company	Operator Bell introduced with fruit symbols; ‘Sources have it that over 30 thousand of these cast iron machines were made, up until about 1915, when wood cabinets were introduced to help control costs.’
1960s	Nevada Electronics	Solid state ‘21’ electromechanical machines introduced Electro-mechanical slots replace mechanical reel slots in USA up to 1970s.
1966	Ping Pong	1st interactive video dot game
1972	Atari	Pong, 1 st successful arcade video game
1974	Atari	Tank: first use of Rom chips to store graphic data
1974	Gamex Industries	First solid state electronic machines installed at Caesars Palace Were quite rapidly replaced by Microprocessor units.
1970s	Summit Coin	Develops an electronic kit to convert electro-mechanical machines into commercial microprocessor slots (personal computer came later).
1970s	Dale Electronics	Poker-matic – solid state21 poker machine introduced to Nevada casinos. Dice, roulette, horse racing and other forms follow.
1974	Gamex	Dwight Crevelt designs the concept of Slot Accounting Systems
1975	Fortune Coin	Introduced the first video bell slot blackjack machine in Las Vegas.
1976	Bally Gaming	Introduced black and white video poker game – with some interest.
1976	Fortune Coin	Changed their blackjack game to colour draw poker – instant success.
1977	Apple	First commercially viable personal computer
1978	Atari	Football: 1st scrolling video game display
1981	IBM	Releases a PC which is broadly accessible with DOS operating system General public uptake of computerisation now financially in reach.
1982	Atari	Pole Position: 1 st photorealistic graphics in video games
1983	Cinematronics	Dragons Lair: interactive animated film with stereo sound.
1984	Microsoft/IBM	Launch first graphical user interface and multitasking environment for IBM computers
1984	Atari	I, Robot: 3D polygon graphics
1985	Electronic Data Tech.	Subsidiary of IGT developed. Player tracking systems with its ‘player club card’ (thus targeting the average player as opposed to the high roller).
1985		Microprocessors become prevalent in gaming machines
1985	International Games Technology IGT	Telnaes patent – invention of the virtual reel which increased the number of possible stop positions and enabled huge progressive jackpots. Sold on to other gaming machine manufacturers (such as Sigma machines) and introduced to 2/3 of IGT slot machines.
1987	IGT	First MegaBucks jackpot of \$5 million dollars won at Harrah’s casino in Reno.
1990	Sigma Games	First slant-top reel slot machine - comfortable position
1992	Sega	Virtual Racing: 1 st high powered multi-player simulator
	Sigma Games	Embedded bill validator in all machines (allowed wagering with bills) The Derby horse racing machine provided the first red, white & blue-themed game.
1994	Microsoft	Launches public internet web domain for downloading of software
	Sigma Games	Coinless slot machines
1997	Sigma Games	Customizable sound packages, reel features and attract modes SG150 Plus reel slot model. Sigma machines Select Series, a line up of games designed to promote longer play and enhanced casino revenue. The Select Series includes Treasure Tunnel® and Treasure Wheel®.
1998	Sigma Games	1. new slant top machine – enhanced comfort, easy servicing, the SR-3000. 2. video platform Pentium®-powered DPX-80 series
1999	Sigma Games	Throw the Dough®
2003	IGT	Patent on IGT’s Telnaes (virtual reel) technology lapses, opening use of the technology to other manufacturers.
2004		Thermal sensors initiate play – enticing passers-by to complete game.

Data sources: Slots Magazine www.slotmagazine.com; Crevelt, Dwight & Crevelt, Louise (1989, 1991); Helsinki Uni. of Tech www.hut.fi/~eye/videogames/arcade.html; <http://www.mastering-slot-machines.com>

Gaming machines have passed from being mechanical devices through intermediate stages, notably the electro-mechanical Bally machines of the mid-1960s and onto the video-style machines that from the 1970s on started to predominate in the U.S. market. These transformations flowed through to the Australian market of the time, NSW clubs. In contrast,

EGMs are computerised and are operated by a central processing unit (CPU). They incorporate sophisticated video technology, which simulates the workings of ‘virtual reels’ viewed on the EGM screen. The choice of symbol to be displayed is produced by algorithms applied to the product of the EGM’s computerised random number generators (RNGs). The following section looks at the components of electronic computerised gaming machines (EGMs) in more detail.

2.2 Components of EGMs

As discussed above, the components of gaming machines vary from type to type. The EGMs common in Victorian are in an important sense video machines. These have seven main components that are visible to the gambler:

- Top Box – the cabinet above the monitor that contains artwork, the payable, game rules and lighting;
- Monitor – displaying the game reels, credit and win meters, game denomination and other game play information;
- Play buttons – for selecting the number of lines to play and the amount to bet per line, as well as collect winnings, reserve machine and bet (gamble double-up) buttons;
- Coin slot – insert coin to receive game credits;
- Bank Note Acceptor (BNA) – insert bank notes to receive game credits;
- Belly Panel – features artwork including name and thematic presentation; and
- Coin Tray – into which winnings in the form of coins or tickets drop (GHS 2002: 11).

The other components of EGMs are those involved in its performance. These are located inside the EGM cabinet. They include:

- Logic Cage – a locked box which houses the computer circuit boards which run the EGM, including the game software, memory chips, and chips controlling the monitor, coin mechanism etc.;
- Hopper – which stores inserted coins and pays out when the collect button is pushed;
- Ticket Printer – for paying out wins for collection;
- Coin Mechanism – validates coins and prevents cheating, before forwarding to hopper;
- Cash Box – stores coins in the base of the machine once the hopper is full;
- Stacker Box – storage for the BNA;
- Hard Meters – mechanical meters recording all play regardless of computer resets etc.;
- Audit Switch – allows venue staff to access audit information including play history, etc (GHS 2002: 11-12).

Access is restricted to the logic box and requires a technician’s licence issued by the Victorian Casino and Gaming Authority (VCGA). Specified events such as the unauthorised opening of the EGM require the attendance of Inspectors from the Office of Gaming Regulation (OGR).

2.3 How do EGMs work?

The central operation of the EGM is the selection of a series of random numbers by the random number generators (RNG) which are then mapped onto the monitor as though they were a series of 'stops' on the (virtual) reels of the EGM. RNGs generate numbers with frequency measured in nanoseconds, utilising pulses from processes within the computer itself. RNGs generate numbers constantly whenever the machine is switched on. When the play button is pushed the closest pulse is translated into a number. This number then goes to the probability table, which contains a predetermined range of numbers assigned to each symbol on a reel.

EGMs usually have five reels, but players have an option of playing multiple lines on these reels (up to a maximum of 20 in most cases). There can be anywhere between 20 and 60 symbols (stops) on a reel strip so that these 'reels' may vary in 'length'. Symbols must always appear on virtual reels in the same order as on the reel strips (National Standard 3.9.59). However, where the gambler changes their betting strategy by, for example, betting more lines, the length of virtual reels may change and hence the order of symbols on the virtual reel. There may be many of the EGM's key winning symbols on some reels, but only one on the longest reel for example. This means that near misses, that is, the appearance of the winning symbols on the monitor but without generating a win, do not need to be specifically programmed. Regular appearances of a 'near miss' will occur as part of the configuration of symbols and reels.

The possible combinations of results that can appear in the course of the game process on common EGMs is approximately 80 million, which is the limit imposed by the OGR in Victoria. This is called the EGM game cycle and is calculated by multiplying the number of symbols on each reel. The game cycle is not then a 'cycle' as such but the number of possibilities from which one is selected randomly each time the game process is initiated. Industry sources described the typical EGM game cycle as taking approximately six years (+ or -15%) of 24-hour play to play out. The game process is described in Table 2.3, below.

Table 2.3 The EGM game process

1. Player inserts coin/note into EGM	When the EGM is in idle mode, the virtual reels may be simulating spinning. When the player inserts a coin/note the EGM changes to live mode.
2. EGM converts coin/note to credits and displays value on credit meter	The EGM will accept the coin or note if it is valid and will calculate the number of credits it is worth. This value is displayed on the credit meter showing the credits the gambler has available.
3. Player selects number of lines and credits to gamble and hits the gamble/play button	This activates the virtual reel display on-screen, simulating actual reels spinning. Symbols on virtual reels are fixed where no change is made in gambling parameters.
4. EGM sends message to central monitoring system (CMS) to check it is online.	It is a Government requirement that EGMs must be linked and monitored by a central monitoring system (CMS) hosted by the gaming operator.
5. CMS sends an acknowledgement to EGM that it is online	The CMS tells the EGM that it is okay for the process initiated by the gambler to continue
6. EGM picks random numbers for each reel	The EGM's computer processor selects a random number for each of the five virtual reels.
7. EGM calculates what symbols are displayed on the reel.	The numbers for each reel are compared on the table that has the symbol for each number on that reel. The number determines the symbol that appears as the centre line. Symbols above and below are also displayed.
8. EGM calculates wins.	EGM calculates wins by checking which lines are being played and then checking if there are wins on these lines.
9. EGM recalculates credit meter by paying all wins and taking away all bets.	EGM does the credit calculation. This is always: Credits before game – credits per line x number lines played) + (wins on each line x credits gambled per line) = Credits after game.
10. EGM displays credit and win meters and game outcome. Gambler can commence game process again.	EGM is ready for the next game. If credits remain cash can be taken out or gram process can be recommenced from stage 3.

Source: Adapted from GHS 2002.

The EGM game process is obviously a key aspect of the EGM technical system. Central to this is the concept of randomisation. The basis of the concept of randomisation in EGM is the idea that every machine event is a separate event unrelated to any preceding event. As the Productivity Commission described, the “stopping point for each reel is determined *entirely* randomly and no single position on any reel has a higher probability of selection than any

other selection. The outcome of each reel is also *entirely* independent” (PC 1999, U.3). However, the “gambler’s fallacy” refers to the erroneous belief that in games of pure chance (eg electronic gaming machines and X-Lotto, Powerball) the probability of future events is affected by the history of the game (SACES 2005a, 10). This leads to the belief that a machine is ‘due’ to pay out after a sequence of losing bets. The eventual reinforcement (win) provided by the random ratio schedule of the EGM thus inevitably confirms this fallacy. However it is purely the mathematical structure of an EGM’s combination of symbols, virtual reels and their linking to the payout table that determines each machine event.

Not all gaming machines in all markets necessarily operate on the same extended concept of randomness. In the UK for example, randomisation historically had a guaranteed cycle (although this was likely to change under the liberalisation of gaming). Fruit machines historically paid out a minimum percentage over a restricted period of time (Parke & Griffith 2004). The UK fruit machines operated using an ‘adaptive logic’ which monitored cash and cash out, constantly adjusting to achieve the required percentage (Turner & Horbay 2004). No evidence was found to suggest that an EGM industry would not be sustainable if based on a conception of randomisation with a guaranteed cycle. Details on the development and institutionalising of the version of randomisation found in Australian-style EGMs were also not found.

2.4 What is an EGM network?

An EGM network is a number of units linked together using a computerised information technology to allow communications and control between the centralised system controller and other parts of the network such as venue jackpot controllers and EGMs. The functions of which EGM networks are capable include monitoring, surveillance, jackpots, and collection and reporting of commercial and other data. These functions are directed from central or local controllers. The base units of the system (EGMs) are not considered to be full terminals (as in a LAN computer network for example) as the system cannot be directed, controlled or otherwise interacted with from an individual machine although feedback is provided to individual machines from external locations on the network, such as a jackpot controller.

The Victorian Systems Document Revision 2.0 (VSD) sets the technical requirements for the Centralised Monitoring and Control System (CMCS) run by each of the two gaming operators in Victoria. The matters covered by the VSD include: venue requirements; CMCS software, security and integrity requirements; venue gaming equipment (hardware and software); jackpots; and significant events. The VSD also sets the requirements for all player interactions with the network level of the EGM technical system, including: cashless gaming, such as the use of cards, accounts and pin numbers to gamble on EGMs; player loyalty systems, including the storage, privacy and security of player gambling data; and the operation of bank note acceptor (BNA) devices.

2.5 Capacities of EGM networks

As Austrin and Curtis (2002) point out the major ‘rationalisation’ occurring in the gambling industry has been technologically driven in the move toward a ‘single platform’, computerised information technology networks which secure electronic surveillance, linked jackpots, real time betting and wagering and continuous gambling (2002: 36). At the heart of this media is the random number generator (RNG) technology (Austrin & Curtis 2002), which increasingly constitutes the ‘chance’ element of gambling whilst facilitating the speed and continuity of gambling activity. In such a system the gambling event itself becomes ‘cybernetic’, that is, it occurs ‘inside’ computer technology. Commercialised EGM gambling

thus appears to embody this process of rationalisation identified by Austrin and Curtis, particularly when consideration is given to the variety and scope of the operations that now take place wholly or largely within the 'media' of the EGM technical system.

Central monitoring of EGM networks across Australia shares the core operational priority of all gambling regulatory regimes, that of revenue protection. The capabilities and goals of centralised monitoring of EGM networks vary between jurisdictions however. Consultation with government officials in New South Wales, for example, revealed that the network in that state does not permit two-way communication as the Victorian CMCS does.

2.5.1 Monitoring and surveillance

EGM networks enable real-time surveillance and monitoring of all connected machines. The legalisation of the gaming industry was resisted for some time in many jurisdictions because it was not possible to adequately monitor and determine regulatory compliance. Distrust of gambling products, which may have inhibited some potential gamblers, may even be ameliorated due to the notion of individual machines being connected to a wider system that operates under the continual surveillance of government.

Effective monitoring systems also hold implications for venue management, broadening the range of gambling (and regulatory) services many venues are now able to offer. Computerised forms of centralised or distributed intelligence, which replace earlier more localised controls such as reliance on staff assessments, camera monitoring and auditing of records, overcame many of these labour intensive, time-delayed and uncertain systems. This has also played a part in the "desegregation" of gambling (Miers 1996), where previously disparate forms of gambling become housed in the same venue. For example, the desegregation of gaming and wagering activities in hotels is possible due to the technological media which allows the televising, computerising and monitoring of contemporary gambling.

Gaming and venue operators are able to meet different needs to those of government through the implementation of online surveillance and monitoring systems. These interests include creating a simple, reliable, integrated and informative accounting and service delivery system and protecting commercial interests by maintaining the security of each machine and monitoring abnormal events. In many Australian jurisdictions gaming machines were legalised following the development of centralised monitoring systems so that the machines and the monitoring systems were introduced simultaneously (for example, Queensland and Victoria). Consequently, Australian regulators, operators and venues have not had the connectivity problems reported in some US jurisdictions (Christiansen 2003). An obvious exception is New South Wales where an earlier gaming machine industry predates modern networked systems.

2.5.2 Commercial management

Central monitoring systems provide gaming operators with an ongoing management information system. In Victoria, data on the performance of machines, types of machines, venues and locations, for example, is directly produced by the CMCS of each operator. Indirectly, these data may be used in conjunction with specific promotions information to assess the success of various marketing initiatives. Venue management can ascertain the cyclical performance of particular machines and their locations within the venue.

In Victoria, the duopoly operator system means that management of EGM gaming is also governed by commercial agreements between the gaming operators, key gaming accounts

(owner/operators of multiple venues), and individual venue owners/operators. Performance targets embedded in management agreements need to be met or gaming operators can take steps to improve performance, including in some cases reductions in the number of EGMs within comparatively poorly performing venues. The historical distribution of EGMs in Victoria has been partly driven by the performance criteria set by operators, which has led to the ‘migration’ of machines to venues in particular locations or the transformation in the combinations (denominations, bet sizes, RTP, etc.) of EGMs to improve revenue performance.

The CMCS of each of the two gaming operators (and Crown Casino) also provides a management information stream for the Victorian Government to account for, collect and distribute shares of gaming revenue rapidly and efficiently.

2.5.3 *Jackpots and progressives*

Linked EGMs can participate in the generation of pools that enable individual gamblers to win larger prizes. Participating machines contribute a percentage of their stakes (commonly around 2%) to the jackpot prize pool to generate in-venue or wider area network jackpots. Jackpots can have multiple levels, associated with game features on a single EGM. Some may be localised or internal to the gaming venue whilst others are external and hosted at the network level. For example, Tabcorp’s Cash Express linked jackpot offers four levels of jackpots: grand; major; minor; and mini. The operation of the various jackpots, and their effect on return to player (RTP) levels and other aspects of EGM system performance, is complex. Doubts remain as to how comprehensively these effects have been tested and how well regulators understand jackpots. Certainly, there appears to be little information currently and freely available about their operation and performance. For example, it is unclear how much very large jackpot wins effect aggregate consumption data. The role of large jackpot wins in the calculation of RTP is therefore also unknown. The operation of jackpots therefore requires further research and regulatory investigation.

There is some anecdotal evidence, particularly regarding the activities of ‘professional gamblers’ in Victorian gaming venues,⁹ suggesting that the operation of network level jackpots may affect the performance of, and participation in, the EGM technical system. In February 2003, it was reported that the Wild Cash jackpot in Tabaret venues in Casey were targeted by a “pokie syndicate” who reserved machines and played a large number of machines at high volume as they approached a jackpot payout trigger figure, excluding other gamblers to increase their chances of winning (IGT 2003: 2). When promotions advertise that a jackpot ‘must’ or ‘will’ be paid at a certain level (for example between \$9,500 and the maximum allowable win of \$10,000), then there is an issue as to whether there are actions that an EGM gambler (or team of gamblers) can take to influence the outcome of the gambling event.

At the technical level, jackpots are hosted on a specific jackpot controller. The jackpot controller has its own RNG and a random number is generated that matches a win in the table in the jackpot controller. This number is matched to an individual machine by a specific algorithm. The jackpot controller can be used to apply a number of variables (such as jackpot value, rate of activity on EGMs, value of bets, or venue location) that can be built into the process by which a jackpot winner is selected, and these may influence specific outcomes.

⁹ See for example Greg Thom ‘Heavies scoop casino jackpots’, Herald-Sun 29 December 1997, in which it is alleged that professional gamblers were ‘muscling in’ in large numbers during periods when jackpots were set to pay out.

What is clear is that jackpots are not entirely random. Jackpots can be advertised as going off at certain levels or at certain times of the week. In addition, in the case of wide-area jackpots operators can use a jackpot controller to bias against wins occurring in particular venues. It is unclear what such manipulation of the EGM system has on the perceptions of EGM gamblers about 'randomness'. Jackpots are, however, a marketing selling point with regular gamblers/loyalty club members who recognise that scheduled jackpots are the best chance for them to have a significant win.

Networked EGMs can also participate in linked progressive bonusing games that when randomly triggered allow gamblers to access a second game screen. In Victoria the major example of this is Aristocrat's 'Hyperlink' progressive game, which in a second game allows players to use a push button to stop virtual reels. This can reveal numbers that are added to the four-level jackpot and give access to the mini, minor, major or grand cash prize. New Aristocrat game Zorro includes a two-level stand-alone progressive jackpot. No evidence came to light in the course of the research on the impact of progressives, or other popular bonusing features such as Mr Cashman (also Aristocrat), on gambler behaviour. It was unclear from consultation how well the operation of such EGM features were understood by regulators. There is a clear gap in the research evidence base in relation to such EGM features and responsible gambling.

2.5.4 *Player loyalty schemes*

Gambling loyalty schemes are important aspects of gambling industry marketing and revenue consolidation, and accordingly need to be considered in any assessment of the EGM system, since they have the potential to have important impacts on player choices and behaviour. A program such as Harrah's Total Rewards which allows players to spend loyalty points accrued gambling on other consumer items and services is regarded as a key to Harrah's claiming a significantly increased share of their loyalty scheme members' gambling budgets (Young 2003: 51) in Las Vegas where competition for casino dollars is particularly vigorous.

Gambling operators in Victoria operate player loyalty schemes for EGM gamblers. Crown Casino, for example, operates a loyalty program called Crown Club. Points are earned on both table games and EGMs, by inserting a Crown Club Card into gaming machines or by advising table game staff. These loyalty points can be used for meals, accommodation and other merchandise. In July 2003, Crown introduced the Play Safe program for EGM gambling. This enables Crown Club cardholders to set pre-determined limits on spend and time spent gambling in a 24-hour period. When these limits are reached warnings flash on the screen, not stopping the individual from gambling, but making them aware that further gambling will not earn any Crown Club loyalty points.

The Crown Casino Play Safe initiative satisfies Victorian Government regulations¹⁰ requiring all gambling operators to implement similar pre-determination options for all loyalty scheme members from 1 July 2003. These regulations require gambling operators to:

- give members information on problem gambling;
- allow members to set spend and time limits on their gaming machine play
- enable members to opt out of the loyalty scheme
- not allow self-excluded gamblers to use the loyalty scheme

¹⁰ Gaming Machine Control (Loyalty Schemes) Regulations 2003, available from <http://www.ogr.vic.gov.au/>

- enable members to have ongoing access to information about their use of gaming machines.

Information about use of gaming machines must be provided via ‘player activity statements’ to all loyalty scheme members (at least annually and on demand). These activity statements must contain details of any pre-determined limits set by gamblers and details of all gambling activities, including sessions, time spent, money gambled and net monthly win or loss.

The network level of the EGM technical system enables computerised loyalty programmes for EGM gamblers, such as Tatts Advantage Club Card currently in operation on a trial basis in Victoria. Patron identity and record of play are linked, through a machine-readable card, to a system of points which earns access to ‘complimentary’ benefits and promotions. The card is inserted in a card reading mechanism in the EGM and requires a PIN. Participation in this programme requires some form of identification. Player details are stored and accessed at the level of the CMCS, so that the card is theoretically valid across the Tattersall’s network of venues, and point balances could be accessed from any venue.

As well as encouraging customer fidelity network level loyalty programmes provide an important commercial resource for gaming operators. Data collected via such schemes enable the operator to understand patterns of gambling consumption and venue requirements for meeting their clients’ perceived needs, and can provide feedback to venues on the preferences of EGM gambling consumers. Such an information base is also likely to be crucial in the ongoing targeting of promotions and other inducements to gamble, on spatial or personal bases. Such commercial strategies are common to all consumption-based industries and are enhanced in their effectiveness by ongoing data collection at the network level. Loyalty programs also provide operators with a database of consumers who can be targeted by EGM gambling promotions or other inducements. The Victorian Government’s regulations restricting gambling advertising do not include promotional material sent directly to loyalty scheme members by gambling operators. Gaming operators use a combination of personalised and generic direct marketing to loyalty club members to try and stimulate consumption with special offers or other ‘community’ based activities such as prize give-aways or parties. Supply driven aspects of EGM consumption are not widely explored in the gambling research literature. Problem gamblers interviewed for this research spoke about the danger of direct marketing material which some describe as dangerous and confronting for them (see Section 5.2).

Loyalty program cards may also be used to give gamblers access to games that may not be available to other gamblers. Different RTPs can be offered to loyalty card members. Some EGMs such as the Ambassador range manufactured by Ainsworth Gaming Technology support this capability.

An assessment of loyalty club data has been carried out as part of Gambling Research Panel program, however this assessment was not made available to the researchers and has to date not been publicly released.

2.5.5 *Harm minimisation*

The network level of the EGM technical system may offer a range of potential opportunities in the area of harm minimisation. Centralised information systems mean that player information could be held at the network level, allowing account, card or PIN number gambling, for example. This could enable gamblers to have a ‘roaming profile’ detailing their gambling limits whenever they opted to participate in EGM gambling. The researchers were

advised that such a 'roaming profile' in relation to gambling may need to have similar security checks and privacy safeguards as other commercial arrangements that specify parameters of personalised consumption activity and authorise the compiling of detailed records or 'logs' of that activity. An existing example of this is data derived from the use of corporate or personal credit cards.

2.5.6 *What doesn't the EGM network do, that it might?*

The future possibilities of the EGM system not only lie at the level of individual machines and game software. There are also possible future developments that lie in the architecture and capacities of information technology networks. Potential development of what EGM networks currently do can be surmised from current developments in other gambling jurisdictions and gambling forms. These include:

- Central serving of EGM or other gaming options. A central server (such as a CMCS) could hold a potentially unlimited range of EGM games that may be selected and downloaded by gamblers. An individual gambler could always access their favourite 'machine'. Currently this is limited by the capabilities of the EPROM (erasable program only memory) or central chip in current generation EGMs. The central serving of game software is reportedly developing rapidly in the US.
- Remote access to EGM networks. The provision of online gambling services via the internet and interactive television (iTV) means competition for gaming dollars has gone online. Although the *Interactive Gambling Act 2001* (IGA) currently outlaws gambling on offshore internet casino sites by those resident in Australia, this may not always be the case. It is also debatable whether the IGA prevents offshore internet gaming by Australians in its current form. The eventual possibility that Club members, for example, could access their local EGM network via their networked digital entertainment facilities from their own homes should not be overlooked. It is also likely that mobile telephones may be utilised as platforms for EGM-style gaming from remote locations.

The capacity for EGM gambling to develop in such directions is almost certainly already embedded in the technological platform of networks of EGMs connected to centralised control systems. It is the researchers' firm belief that creative and technological innovation will continue to re-structure the gaming industry in the context of the emerging 'network society' (Castells 2000).

2.6 **Regulation, monitoring and other technical systems**

As the Productivity Commission described, there are a range of measures by which jurisdictions can place restrictions and other controls on the gaming machine market, for example:

- caps on the number permitted in a region, state/territory or both;
- caps on the number permitted in particular types of venues;
- rules about the type of machines permitted (for example, poker machines, draw card machines, or multi-terminal gaming machines such as for horse racing or roulette);
- approved arrangements for manufacturers;
- monitoring requirements;
- revenue verification requirements; and

- restrictions on the type of venue in which gaming machines may be placed (applying in all jurisdictions and generally limited to licensed clubs, hotels or casinos, with different rules for each) (PC 1999: 13.4).

The numbers of machines in Australian states and territories in mid-2003 are shown in Table 2.4 below.

Table 2.4 Numbers of EGMs in Australian gaming jurisdictions, by venue type, June 2003

State/Territory	Casinos	Clubs	Hotels	Total
ACT	-	4,910	60	4,970
NSW	1,500	76,830	24,628	102,958
NT	635	633	238	1,506
Qld	3,468	19,280	17,013	39,761
SA	828	1,684	12,918	15,430
Tas.	1,159	193	1,842	3,194
Vic.	2,500	13,671	13,729	29,900
WA	1,283	-	-	1,283
Total Australia	11,373	117,201	70,428	199,002

Source: Tasmanian Gaming Commission, Liquor & Gaming Branch, correspondence (2004)

Ownership arrangements for gaming machines outside casinos were summarised by the Productivity Commission (1999: 13.13) as follows:

- in New South Wales, Queensland and the ACT: venues buy (or lease) gaming machines from approved manufacturers or financiers;
- in South Australia venues buy gaming machines from the state supply board;
- in the Northern Territory all gaming machines are owned by the Territory government (this was also the arrangement in Queensland until 1997);
- Victorian venues contract with one of two gaming license holders – Tabcorp and Tattersall's – who own and maintain the machines and retain one-third of each machine's net takings, rather than a lease rental or service fee;
- in Tasmania gaming machines are leased from the Federal Group of companies (the licensee of the two casinos. The Federal Group have exclusive rights to supply gaming machines to clubs and hotels until 2009; and
- Casinos are free to own or lease the machines they operate.

2.7 The regulation of EGMs in Victoria

Until 1 July 2004 the EGM industry in Victoria was governed by the *Gaming Machine Control Act 1991* (henceforth GMCA) and the *Casino Control Act 1991* (CCA). However these Acts were repealed by the *Gambling Regulation Act 2003* (henceforth GRA) from 1 July 2004.

Under Section 12 of the GMCA, the Minister had the power to make regulations regarding the numbers and the distribution of EGMs. The current regulations include provision for:

- a total of 27,500 EGMs in all venues outside of Crown Casino;
- a venue limit of 105 EGMs;

- a minimum of 20 per cent of the 27,500 EGMs outside Crown Casino to be located outside the Melbourne Statistical District;
- a bet limit of \$10;¹¹
- a 50-50 split of EGMs outside Crown Casino between Hotel and Club venues (as defined according to the granting of specific classes of liquor licences under the *Liquor Control Act 1987*);
- a 50-50 split in EGMS outside Crown Casino between the two gambling operators, Tabcorp and Tattersall's.

Gaming in Victoria was principally administered by the Office of Gambling Regulation (OGR), established in 2001, and the Victorian Casino and Gaming Authority (VCGA). The GRA will replace the VCGA with the Victorian Commission for Gambling Regulation (VCGR) which has also assumed the functions and powers of the Director of Gaming and Betting and the Director of Casino Surveillance. The GRA has also consolidated all current legislation dealing with gambling. The review to the Victorian Civil and Administrative Tribunal (VCAT) of decisions made in relation to gambling venues has been maintained and somewhat expanded (see below).

Section 1.1 of the GRA sets out the objectives of the Act as follows:

- (2) The main objectives of this Act are—
- (a) to foster responsible gambling in order to—
 - (i) minimise harm caused by problem gambling; and
 - (ii) accommodate those who gamble without harming themselves or others;
 - (b) to ensure that gaming on gaming machines is conducted honestly;
 - (c) to ensure that the management of gaming machines and gaming equipment is free from criminal influence and exploitation;
 - (d) to ensure that other forms of gambling permitted under this or any other Act are conducted honestly and that their management is free from criminal influence and exploitation;
 - (e) to ensure that—
 - (i) activities authorised by a minor gaming permit benefit the community or charitable organisation to which the permit is issued;
 - (ii) practices that could undermine public confidence in community and charitable gaming are eliminated;
 - (iii) bingo centre operators do not act unfairly in providing commercial services to community or charitable organisations;
 - (f) to promote tourism, employment and economic development generally in the State.
- (Gambling Regulation Act, 2003: s.1.1)

In addition, Chapter 3, Division 2 of Part 6 of the Act requires the payment of taxes and levies in respect of EGM operations and other parts of Chapter 3 of the Act provide for the keeping of accurate records of financial details and monitoring of issues associated with probity, etc.

Responsible gambling is an objective of the GRA on an equal footing with those designed to ensure EGM gambling is fair, crime and exploitation free and of social and economic benefit to the State.

¹¹ For all machines approved after 1 January 2003 not located in a “specified area” (see section 5.5.3) until 1 January 2008. From 1 January 2008, for all machines not located in a “specified area”.

2.7.1 *Regional caps*

The Victorian government announced its policy for the ‘capping’ of poker machine numbers in selected regions in 2001. This policy may relate directly to patterns of EGM consumption and as such is relevant for consideration in this research, particularly as the relationship between EGM density and expenditure per capita in local areas of Victoria is very strong. Thus, the policy may be very relevant to the techniques of deployment utilised by EGM operators and represents an important element for consideration within the EGM system.

Five regions were originally selected for capping. These were ‘Maribyrnong plus’, ‘Greater Dandenong plus’, ‘Darebin plus’, Bass Coast Shire and La Trobe City. The policy was implemented by ministerial Direction (see Victoria, DTF, 2001). VCGA was required to give consideration to the Minister’s gazetted notice of 15 February 2001, and consequently advised the government that a total of 406 poker machines were to be redeployed. The VCGA directed that machines must be removed from affected areas by 14 February 2004, and provided directions as to the numbers to be reduced in each year.

The selection by the government of the five regions where caps were to be implemented was undertaken by ranking Victorian Local Government Areas (LGAs) on three characteristics. These were comparative disadvantage (measured by the ABS SEIFA Index of Disadvantage); poker machine density (poker machines per 1,000 adults within the LGA); and poker machine losses per adult. The approach to capping regions was subject to some criticism at the time it was announced (see Livingstone 2001a). Reductions in EGM numbers in capped regions have subsequently occurred.

The researchers view the implementation of caps as a potential comparative frame in relation to the EGM technical system. In relation to detailed aggregate level data, it is unlikely that any meaningful changes will be able to be discerned in EGM revenue performance given the short period in which caps have been in force and the lead-in time toward their full implementation. However, other changes made in response to the caps measure, for example marketing and promotions efforts, may be of interest in relation to the management of the EGM system.

2.7.2 *Restrictions on advertising*

The Productivity Commission found (1999: 16.38) that there were grounds for “tighter controls on gambling advertising, where it is felt that the information provided by a gambling supplier would have the effect of reinforcing inherently false beliefs about the odds of winning or about the way gambling technologies work”. In the interim period between the PC’s study and the adoption of the GRA (which effectively prohibits most advertising of EGMs), Victoria enacted relatively stringent legislation restricting the advertising of EGMs. This move has not been emulated in other Australian jurisdictions to date. Relevant legislation in relation to gambling advertising is summarised in Table 2.5, below. As with other elements of gambling promotion and marketing, advertising has significant potential to influence player behaviour and choices and the effects of regulation related to advertising are important to the development of an overall understanding of the relationship between regulation and player behaviour.

The Victorian *Gaming Machine Control (Advertising) Regulations 2001* include a number of general restrictions on gaming advertisements which broadly emulate technical standards for the artwork on machines (see Table 2.6, below). These general restrictions also prevent the depiction of minors gambling on EGMs, or anything likely to encourage minors to gamble on

EGMs. There is also a restriction on advertisements for gaming outside EGM gaming venues that offer an inducement to commence gambling on EGMs. Under these regulations gaming advertising is to also carry a warning messages relating to financial, personal, family and health risk associated with EGM gambling.

A different approach to gaming and advertising can be found in New Zealand, for example, where advertising codes are in place in addition to legislation. The Code for Gaming and Gambling (2001) provides a series of guidelines under the principle of social responsibility. These relate to: not directing advertising to minors; not promoting reliance on gaming as relieving financial stress; not encouraging excessive consumption; not implying a promise of winning; and should not exaggerate the connection between gaming and the use to which gaming profits may be put. Under a separate principle advertising should not state or imply skill can influence a game, and the chances of winning or the size of a prize should not be exaggerated.

In the UK, the advertising of gambling has been considered as part of the Joint Committee review of the Draft Gambling Bill and the UK Government's response to the Joint Committee's recommendations (DCMS 2004). It appears likely that the current level of self-regulation of advertising in the British gambling industry will continue. However the Government has also signalled an intention to put in place a statutory power in the event that "existing arrangements are seen to have lost their protective effect" (DCMS 2004: 24). Neither the Joint Committee nor the Government are in favour of "tobacco style" health warnings on gambling products. However, gambling advertisements should carry information on "sources of guidance on gambling behaviour" (DCMS 2004: 24), a requirement that is to be carried through regulations or licence conditions following consultation with stakeholders including the Advertising Standards Authority (DCMS 2004: 24).

The UK proposals contrast with the situation in Australia. The planned Gambling Commission in the UK would administer all gambling and as such would set broad industry-wide proscriptions in a relatively timely manner in relation to the liberalisation of commercialised gambling in the UK. In Australia, specific legislated advertising restrictions are relevant only to gambling operators in each state or territory. Advertising of a particular gambling form is usually dealt with in a separate act or set of regulations. This reflects the comparatively fragmented nature of the regulation and administration of gambling in Australia. Selected gambling advertising legislation in Australian jurisdictions is shown in Table 2.5, below.

Table 2.5 Gambling advertising legislation, selected Australian jurisdictions

Regulator	Legislation	Provisions
Victoria The Victorian Casino and Gambling Authority www.vcga.vic.gov.au	<i>Gaming Machine Control Act 1991, Gaming Machine Control (Advertising) Regulations 2001.</i> Repealed by the Gambling Regulation Act 2003 on 1 July 2004	Prohibits any advertising of gaming machines by pubs, clubs or the casino.
NSW Department of Gaming & Racing www.dgr.nsw.gov.au	<i>Gaming Machines Act 2001</i> <i>Gaming machines regulations 2002</i>	Ss 43 & 43 prohibit gaming machine advertising or signage. Regulations allow advertising within industry, on telephone hold systems or internet sites, or telephone directories, etc
ACT ACT Gambling & Racing Commission http://www.gamblingandrac ing.act.gov.au/	<i>Gambling & Racing Control Act, 1999; Gambling and Racing Control (Code of Practice) Regulations 2002</i>	Act authorises regulations to be made regarding advertising (s.18). Regulations prohibit ads that shows minors gambling or encourages minors to gamble, is false/misleading, suggests that games of chance require skill, requires info re: counselling to be adjacent to ads, prohibits certain inducements (ss. 28-30).
Queensland Office of Gaming & Regulation www.qogr.qld.gov.au Liquor Licensing Division www.liquor.qld.gov.au .	<i>Gaming Machine Act 1991</i> ss. 228, 229.	Advertising not to be deceptive, misleading or false, nor indecent. Qld Responsible Gambling Code of Practice requires adherence to Advertising Code of Ethics of Australian Association of National Advertisers. Ads should not misrepresent odds, chances of winning, etc. Not to be directed at minors or vulnerable/disadvantaged groups
South Australia Office of the Liquor & Gambling Commissioner www.ilgc.sa.gov.au	<i>Gaming Machines Act 1992, [Name of venue] Advertising Code of Practice 2001</i>	Act requires compliance with Advertising Code of Practice; Code prohibits: ads targeting minors or disadvantaged groups, unrealistic depictions of gambling, implication of skill, links between winnings and the use to which they may be put, gaming sounds in electronic ads, TV radio ads during peak listening/ viewing times (Schedule 1, s. na)
Tasmania Gaming Operations Branch www.tas.gov.au Tasmanian Gambling industry Group	<i>The Gaming Control Act 1993</i>	No reference to advertising; other than to prohibit advertising by any person other than a licence holder (s.112R). Advertising Code of Ethics has been adopted by the industry (GIG), and applies to Wrest point Casino, Country Club Casino, Oasis and TasKeno venues and all TAB locations..
Northern Territory Northern Territory Racing Gaming & Licensing Commission www.nt.gov.au/ntt .	<i>NT Gaming Control Act, NT Gaming Machine Act</i>	Code of Practice for responsible Gambling and Responsible Gambling Manual require honest, responsible advertising and promotions, with adherence to AANA, AFA and FACTS codes for gambling advertising. Problem gambling warnings required for signage.
Western Australia The Department of Racing Gaming & Liquor www.orgl.wa.gov.au	<i>The Gaming Commission Act 1987</i>	Contains no reference to advertising
Commercial Television Australia (formerly FACTS)	CTVA Code of Practice, 'Commercials Relating to Betting or Gambling', section 6.12 and 6.13	This is in addition to State and Territory regulations

Source: Gambling and gaming regulator websites as indicated.

2.7.3 EGM technical specifications

The base technical specification against which gaming equipment is evaluated in Victoria are contained in a National Standard developed by the CEOs Regulators National Standards Working Party, a committee made up of regulators from Australia and New Zealand. The National Standards Working Party convenes an annual Manufacturers Forum, at which

questions related to that year's updates in the technical standards are settled. The *Australia/New Zealand Gaming Machine National Standards* (henceforth National Standard) version 7.0 was released in December 2003 and is currently under review in Victoria. National Standard 6.01 and *Victorian Appendix 6.0* to the National Standard are current in Victoria. The Assistant Director Gambling Operations and Audit in the Office of Gaming Regulation/VCGR has responsibility for approvals of gaming equipment in accordance with the required technical standards.

The key technical parameters defined in the National Standard and their current values in selected jurisdiction is shown in Table 4.4, in the following section. There are also technical requirements contained in the *Victorian Appendix* (section V9) relating to responsible gambling. These requirements, which are supplementary to and do not take the place of other requirements under the GMCA or the CCA, are shown in Table 2.6, below.

The *Victorian Appendix* specifies "significant events" in the operation of the EGM technical system. All significant events need to be detected and notified within ten seconds of occurrence. These events are categorised under four types and require four different responses:

- Type 1 – information only (no de-activation) (eg. activation of game play including normal commencement and conclusion of business, incorrect PIN entered three times consecutively on Player Card);
- Type 2 – events that lead to automatic de-activation but also allow for immediate automatic re-activation when the problem goes away (eg. authorised door open, reel error – reel position does not agree with software control, testing of game, coin jam);
- Type 3 – events that lead to automatic de-activation and require manual re-activation (eg. failure of communication link between a gaming machine and its next point in the monitoring system if logic door has not been opened, use of stolen or unauthorised machine card); and
- Type 4 – events that lead to automatic de-activation and require manual re-activation, but only after the OGR audit procedures are satisfied. These procedures may involve immediate approval for re-activation, or the approval is withheld until physical inspection by an OGR Inspector is completed (*Victorian Appendix, V8.3*).

Type 4 events are those that may require the involvement of on-site inspections by the regulator. Some type 4 events specified by the *Victorian Appendix* include: loading of unapproved software; modification of software; failure of internal machine tests; failure or tests by any element of the system; opening of the logic box cabinet (housing the computer boards); changing of any meter other than in game play; and winning of a jackpot prize greater than the large win limit.

The regulator adopts a risk management approach to the analysis and assessment of significant events, of which there are several hundred reported each day. The regulator reviews audit processes annually with a view to refinement of this risk management approach, particularly where a particular type or set of events is thought to warrant closer observation.

Table 2.6 EGM technical standards, responsible gaming requirements

Component	Technical standard
<i>Game Artwork, Name and Screen Display</i>	
V9.1.1 Artwork must not:	be factually incorrect; be misleading or deceptive; suggest that playing a gaming machine is likely to improve a person's social status; suggest that playing a gaming machine is likely to make a person more attractive to others; suggest that playing a gaming machine is likely to result in a person's financial betterment; describe money spent in playing a gaming machine as an investment; suggest that a player's skill can influence the outcome of a game that is purely a game of chance; or suggest that a person's chances of winning a prize are influenced by the length of time for which a person plays a game.
V9.1.2 Game name must not:	suggest that playing a gaming machine is likely to improve a person's social status; suggest that playing a gaming machine is likely to make a person more attractive to others; suggest that playing a gaming machine is likely to result in a person's financial betterment; be misleading or deceptive; describe money spent in playing a gaming machine as an investment; suggest that a player's skill can influence the outcome of a game that is purely a game of chance; or suggest that a person's chances of winning a prize are influenced by the length of time for which a person plays a game.
V9.1.3	Games can offer what might otherwise appear to be an illusion of control if it is clear to players that no action of the player can influence the outcome of the game or any element of the game. Advice to players may be provided in the static artwork or via game play information which makes clear and in readily available and visible format that no action of the player can influence the outcome of the game.
<i>Spin Rate</i>	
V9.2	For a game approved by the Authority after 1 January 2003, unless the game is to be operated in the approved "specified area"* the spin rate or interval between spins on the gaming machine must not be less than 2.14 seconds per play.
<i>Maximum Bet Limit</i>	
V9.3	Game on gaming machines must not allow a bet above the maximum amount as determined from time to time by the Minister in accordance with the GMCA and CCA.
<i>Display of Time</i>	
V9.4.1	The time of day must be displayed by a time display which may be located on the video screen of the gaming machine.
V9.4.2	The time of day displayed must be clearly visible to a person playing a game on the gaming machine.
V9.4.3	The time of day displayed must be to an accuracy of within 5 minutes and must indicate whether the hour is before or after noon.
V9.4.4	The time of day must be displayed continuously while the machine is operating and available for use for gaming.
V9.4.5	The time of day displayed must not obscure any other information relevant to gaming on gaming machines.
<i>Game Fairness Objectives</i>	
V3.23 added to 3.9.59 of National Standard 6.01	"However such games may be acceptable where the issue of illusion of control is explicitly addressed via approved artwork, approved decals or other approved means."

Source: *Victorian Appendix* to the National Standard. * See section 5.5.3.

These responsible gaming technical standards are part of the gaming machine approvals process conducted by the OGR/VCGR.

2.7.4 *EGM networks technical specifications*

The Victorian Systems Document Version 2.0 (VSD) stipulates the technical standards of the Central Monitoring and Control Systems (CMCS) of the two gaming operators, Tabcorp and Tattersall's. Crown casino has its own Technical Requirements Document Version 3.0.

These documents contain system requirements in relation to monitoring, jackpots and communication protocols (VSD: 1). The CMCS must be capable of fulfilling the broad functions of:

- logging, searching and reporting of gaming machine events;
- collection of individual device financial and meter data;
- reconciliation of meter data against cash box hard count;
- configuration of the gaming equipment;
- systems security;
- real time commands to gaming equipment;
- validation of gaming equipment in the field; and
- performance reporting as specified from time to time by the Authority.

The CMCS must have sufficient processing, memory, communications interfaces and hard disk storage to efficiently monitor all gaming devices in all venues (VSD: 11).

Sections of the VSD of particular interest include Section 6.1.2 in relation to Jackpot Fairness. Section 8 of the VSD specifies "significant events" related to gaming machines that are determined by the CMCS. It is a requirement of the VSD (3.2.24) that significant events be detected and recorded within ten seconds. Section 9 of the VSD contains CMCS standards for "player inputs" including cashless gaming, loyalty programmes and bank note acceptors (BNAs).

2.7.5 *The role of Local Government*

The GRA expanded the role of local government in relation to the approval of gaming premises. Regulatory or related powers exercised by local authorities may have substantial impacts on the pattern of EGM deployment and may vary substantially according to local preferences, etc. Accordingly, the impact of local activity in this area (or the lack of it) is an important factor for consideration in the analysis of local levels of EGM consumption, both historically and as a potential area for regulatory development.

During the Kennett coalition government (1992–99), local governments' planning powers in relation to gaming venues were restricted to premises where the gaming room occupied a floor area greater than 25 per cent of that of the total licensed floor area of the venue. This effectively precluded local governments having any planning power in relation to venues. In accordance with amendments to the *Gaming Machine Control Act 1991*, which commenced in 2000, the VCGA began to take account of local government submissions in its determination of applications relating to EGM venues. These amendments provided an opportunity for local governments to submit an assessment of the socio-economic impact of proposals for new venues or increases in the number of poker machines at existing venues within the local government area. In practice, few local governments actually undertook such submissions (although a number did and committed substantial resources to the process).

The GRA however requires the VCGR to consult with LGAs on applications for premises approval and to allow LGAs 45 days from this consultation for the preparation of submissions. LGAs also have a right to apply for review by VCAT of VCGR decisions. The Victorian Government is currently considering amendments to the Victorian Planning Provisions to require a planning permit for additional gaming machines, with a proposed exception for existing gaming venues to allow up to an additional four machines without a planning permit being required. This would have the effect of allowing LGAs to consider planning applications for new venues or additional EGMs (subject to appeal rights) and to engage in the licensing process for the same matter (also subject to appeal). The date at which these amendments would be implemented is not yet known.

2.8 Regulation of EGM networks as technical practice

Whilst regulation can be understood via its functions of control monitoring and enforcement (as described above), the regulation of EGM networks can also be understood as providing for an ensemble of technical practices which maintain and refine the material EGM technical system. These technical practices operate across a range of technical standards and legislative requirements. Game software design principles, for example, are grounded in legislation and commercial innovation and shaped by technical standards and the approvals process. In practice EGM game software designers and regulators are involved in a process of dialogue with the express aim of producing legal, fair, technically compatible and commercially successful EGM games. This reduces the commercial risk of designers and manufacturers developing products that are unacceptable to regulators. The National Standard attempts to further generalise this process across jurisdictions to reduce cost and testing inefficiencies.

2.8.1 EGM design, manufacture and testing arrangements

The regulator administers a Roll of Suppliers which lists approved manufacturers and suppliers of EGMs and restricted gaming machine components and approved suppliers of testing services to machine manufacturers or gaming operators. Testers undertake the technical testing to ensure gaming equipment complies with technical standards¹² and forwards these to the product approval section of the regulator. It is an intention of the National Standard that testing carried out in one participating jurisdiction in the working party should satisfy approvals processes in other jurisdictions. However, we note that South Australian legislation and regulation now requires the regulator to have regard to guidelines issued by the relevant authority with regard to the extent to which a game may exacerbate problem gambling. If it appears that the game may exacerbate problem gambling, the Commissioner must refuse to certify the machine.¹³

A working party of regulators forms the National Assessment Panel for Approved Testing Facilities, out of the National CEOs forum, the peak body of EGM gambling regulators. This working party accredits testing facilities at a national level, and then assesses each one annually to ensure they continue to meet the required standards for ongoing accreditation. At the time of writing the deliberations of the National Assessment Panel are confidential.

The testing of gaming machines in development can involve informal dialogue between testers, regulators and manufacturers to ensure proposals conform to requirements. What is tested is the chips, software or ‘game set’ of a particular product. In practice individual machines are not actually tested. However, the regulator closely monitors new products, with

¹² See [http://www.ogr.vic.gov.au/domino/web_notes/ogr/ogrmmaps.nsf/\\$Manuf&Suppliers?OpenView](http://www.ogr.vic.gov.au/domino/web_notes/ogr/ogrmmaps.nsf/$Manuf&Suppliers?OpenView)

¹³ see <http://www.iga.sa.gov.au/pdf/040218/gl-gm.pdf>, <http://www.iga.sa.gov.au/pdf/040218/gl-cas.pdf>, <http://www.iga.sa.gov.au/pdf/040218/gag-exp.pdf>

anomalous performance data being the key indicator that a particular machine may not conform to required standards and further investigation is required. The regulator acknowledged there are new technical challenges, particularly as there is no longer any in-house testing capability available. Rather the ATF assessment must be accepted, and the regulator nominated a system integrity risk in not paying sufficient attention here.

2.8.2 Licensing of persons¹⁴

There are two licences relevant to individuals involved in the operation of the EGM system. Special Employees work in either club or hotel gaming venues or Crown Casino. Technicians are licensed to perform maintenance or repairs on gaming equipment.

2.8.3 Licensing of venue operators

Venue operators are licensed for a period of five years to operate gaming venues. As part of licensing venue operators the VCGR undertakes investigations into the applicant and any associates in relation to their suitability and probity for participating in the gaming industry. A venue operator's licence and a gaming venue license are necessary to the operation of gaming premises and to seek specific operating conditions such as variations in numbers of EGMs or 24-hour gaming.

2.8.4 Licensing of gaming venues

Gaming venues must be approved under the GRA. These premises become an approved gaming venue once they have been included on a Venue Operator's licence and not until both these requirements have been met.

The administration of the EGM technical system includes, at a minimum, the legislated measures described above. There are a number of technical practices such as venue inspections, gaming equipment inspections and equipment testing that flow from the specification of these requirements and from other technical specifications related to EGM gambling outlined in this section. The OGR/VCGR cannot undertake these tasks exclusively. Rather the licensing of technicians, for example, puts in place a system whereby the technical practices of required by regulation are carried out by accredited individuals and bodies, approved by the OGR/VCGR for such tasks. The regulator also receives a continuous 'feed' of information pertaining to the operation of the EGM system, the sheer volume of which precludes total scrutiny. Whether the risk management programs and procedures put in place by the regulator to manage this information flow in an optimal manner to enable timely detection of, and intervention in, matters relevant to sound regulation is therefore a crucial question.

2.8.5 Monitoring and surveillance

The Systems Audit Group within the OGR monitor the EGM gaming system at the CMCS level. The scale of the system means it can take several weeks to perform a complete systems audit.

The regulator monitors the feed from the CMCS on a day-to-day basis and performs random audits of selected EGMs, including a limited number of field-checks of EPROM and communications hardware. The regulators risk management program provides for every

¹⁴ See http://www.ogr.vic.gov.au/domino/web_notes/ogr/ogrsite.nsf/pages/emp_lic

gaming venue to be audited at least once a year. New products, both new game software and new physical boxes are captured by the audit as soon as possible after deployment into a gaming venue. Financial data from the EGM system also comes into the OGR and could be matched to the operators' data and audit data on a machine-by-machine basis if required.

2.9 EGM technical parameters

Technical standards for EGMs in Victoria are set by the regulator (VCGR), which can also make and amend standards for gaming machine types and games in Victoria with Ministerial approval. These standards include the *Australian/New Zealand Gaming Machine National Standard v8.0* (National Standard) developed by gaming regulators in Australian states and territories and New Zealand, who have been working towards creating a single common standard for gaming machine technical standards across all jurisdictions. Victorian regulators have developed the *Victorian Appendix v7* to the National Standard. The extent to which the National Standard is implemented in any jurisdiction remains the prerogative of regulators. The rationales for the National Standard are reduced costs for manufacturers supplying to multiple gaming jurisdictions and for regulators in testing machines and games already approved by other jurisdictions under the common standard.

The National Standard defines the parameters/limits that will be established for gaming machines. In practice there is variation in the *values* set for particular gaming machine parameters in different jurisdiction due to policy differences. These values can be seen as an important set of variables in the configuration of the EGM technical system. It is the parameters of gaming machines which determine the contours of EGM gambling participation, including how much can be gambled in a single bet, the maximum prizes that can be won and the expected level of return to player (RTP) as a percentage of money gambled over a period of time.

Not only do the parameters applied to the operation of EGMs differ considerably between states in Australia, there is frequently also a difference in parameters between different types of venues within states. The process of setting EGM parameters is one that is wholly at the discretion of the regulator in each jurisdiction. Whilst the National Standard represents an incremental move towards ever more synchronised technical requirements, its rationale is the lowering of the costs of running and regulating the gaming industry rather than the development of standardised enforcement regimes. Parameters are thus not a really a part of the move toward technical uniformity; rather they are particular internal values characterising the gaming network of each state which can be manipulated without compromising the efficient operations of the existing EGM technical system. A summary of key parameter values in selected jurisdictions is shown in Table 2.7, below.

Table 2.7 EGM parameter values in selected jurisdictions, December 2004.

Name	Definition	Victoria	NSW	SA Clubs/hotels	SA Casino	Qld Clubs/hotels	Qld Casinos
BKNTLIM	Maximum credit balance which may exist on a gaming machine or account beyond which note must be disabled to a High Credit Balance condition.	\$9,949*	\$10,000	Note acceptors prohibited	Note acceptors prohibited	\$100	Set by casino
CRECANLIM	Maximum number of credits payable form the hopper for non-tokenised gaming machines before a cancel credit or ticket pay must be used.	Entered via Setup Mode or CMCS parameter	Set by Operator	Entered via Setup Mode or CMCS parameter	Set by Operator	Controlled by QCOM, set by QOGR	Controlled by QCOM, set by QOGR
GAMBWIN	The maximum win that can be obtained from each single gamble attempt.	Hotels/clubs: \$10,000 Casino: not specified	\$10,000	\$10,000	\$10,000	Set by Licensed Operator	Set by casino
LARGEWIN	Substantial Win amount – winds greater than or equal to this value must generate a gaming machine Event.	\$10,000	Not specified	Set by CMCS parameter (current \$1,000)	Set by Operator	Set by Licensed Operator	Not specified
MAXHOPPER	Maximum amount of money payable from the hopper for tokenised gaming machines before a cancel credit or ticket pay must be used.	Entered via Setup Mode or CMCS parameter	Set by Operator	Set by CMCS parameter	Set by Operator	Controlled by QCOM, set by QOGR	Controlled by QCOM, set by QOGR
MAXNPWIN	Maximum non-progressive win permitted in any game element (any individual primary or feature or gamble or bonus element).	Not specified	\$10,000 APD or AAD; \$500,000 MTGM	\$10,000	\$10,000	\$10,000	Not specified
MAXPWIN	Maximum progressive win permitted in a gaming machine game.	Not specified	\$10,000 s/alone; \$100,000 linked	\$10,000 stand alone	\$10,000 stand alone	\$25,000	Not specified
MAXRTP	Maximum theoretical acceptable return to player.	99.99%	Not specified	Not specified	Not specified	92.00%	Not specified
MAXWAGER	Maximum wager permitted in a gaming machine game.	\$10*	\$10 APM/ AAD; \$100 MTGM	Base and feature games \$10	Base and feature games \$10	\$5	Not specified
MINRTP	Minimum acceptable return to player.	87.00%	85.00%	87.50%	87.50%	85.00%	90.00%
PSAVACT	Period of time a gaming machine must be in “Idle Mode” before activating power save.	Not required	Manual PSM activation only	Required – 15 minutes	Not required	Required – 15 minutes	Not required

Source: Australia/New Zealand Gaming Machine National Standard Revision 8.0, December 2004. * Unless game operating in unrestricted mode in specified area (applies to new games approved after 1 January 2003).

A key EGM parameter value is the return to player (MAXRTP-MINRTP), which is contained in the EGM pay table and sets the theoretical average return from each machine to gamblers as a share of the cumulative amount staked (excluding gambling on features such as double-up bets). In Victoria, gaming operators set the precise return to player (RTP) value on EGMs (at all times within the allowable parameters) at the CMCS level. Approval of the regulator is not required to make changes to RTP. The RTP should not be confused with expenditure or loss, as it is perfectly possible to lose a small amount betting one cent on one line and achieve the same RTP as someone who loses a relatively larger amount betting one dollar across multiple lines. As the Productivity Commission found in its laboratory tests, player style is thus important (PC 1999: U.4).

As Table 4.4, above, highlights the theoretical RTP varies across jurisdictions and venue types (see MINRTP in Table 4.4). The calculation of RTP may also vary from that described in the National Standard according to the legislation operating in each jurisdiction. No evidence was discovered that might be considered a basis for the standard RTP minimum level in the Australian EGM gambling industry, which is commonly in the range 85.0%-87.5% except for Queensland casinos and Western Australia where the RTP is 90.0%. In New Zealand, RTP for casino EGMs is 87.0% whilst for 'community' venues (hotels etc.) the RTP is a significantly lower 78.0%. The policy reason for this is to return relatively higher levels of revenue to government for disbursement amongst community groups.¹⁵

In Victoria, gaming machine legislation requires that the theoretical minimum RTP be achieved within each venue cumulatively (not necessarily on each and every EGM) across the period of one calendar year. This reflects the volatility of EGM operation. However, only EGMs that have been situated in a particular venue for one whole year need satisfy this test. Given the dynamism of the EGM system (see Section 2.10) this does not equate to all machines operating in gaming venues. The Victorian measure of RTP does not match the definition of RTP contained in the National Standard, which specifies minimum RTP should be calculated per individual gaming machine.

The RTP set on a machine influences the characteristics of gambling sessions. The shorter the period of operation the further an individual EGM is likely to diverge from minimum RTP. As the Productivity Commission's machine trials also showed the level of RTP can influence how quickly a gambler loses their money. An EGM set in minimum RTP will consume more gamblers' funds per hour. Viewed another way, given a fixed pattern and budget of play gambling on an EGM with relatively high RTP will extend the duration of a gambling session (PC 1999, U.5)

However, at the individual gambling session level, it remains questionable gamblers could detect variations in the theoretical RTP current on a particular machine by reference to machine events. Gamblers' understanding of minimum RTP is confounded somewhat by the relationship between the random ratio (RR) schedules that determine reinforcement to players (wins) and the chances of winning the top prize on a particular. The chance of winning the top prize on an EGM is likely to vary enormously between machines within a particular venue. Logic would suggest that the RR schedule of machines with relatively remote chances of

¹⁵ One New Zealand observer of the gaming machine industry pointed out to the researchers that this policy setting has had the effect of creating a wider dependency on gambling losses for provision of community infrastructure at the local level. This has changed the structure of policy debate and the dynamics of policy formation somewhat, as proposed changes to EGM policy that may negatively impact on revenue have implications for a range of community groups and their activities.

paying out the top prize would provide more frequent smaller wins (reinforcement) to gamblers. The inverse of this would also seem likely; i.e. EGMs that are more likely to pay out their top prize would provide less frequent smaller intermittent wins. The size of the top prize may also influence the precise RR schedule operating in a particular EGM. It can be said that there are a variety of ways to skin the minimum RTP cat – that a mix of RR schedules and hence structures of prize frequency and win size are part of the EGM gambling’s overall ‘product mix’.

The manipulation of RTP is undoubtedly a key element in the management of gaming machine networks by gaming operators (see Section 4.3). Under-performing machines are most likely to have their RTP altered in the first instance. This is done remotely at the stratus (network) level and is therefore a simple and cheap way of trying to improve revenue from a particular machine. Only operators can alter RTP settings. In late 1998-early 1999 one operator did a one-month trial of reduced RTP set close to the minimum required. The opinion formed by the operator was that gamblers did not notice or act on the change.

At the network level of the EGM technical system, RTP is further influenced by gambling on jackpot machines (see section 2.5.3 above).

The bet size and number of lines chosen by the gambler also determine the rate of financial loss. Variations in the dimensions of gambling sessions according to these parameters were tested and documented by the Productivity Commission (PC 1999, Appendix U, see Table U.5 for comparisons). The Productivity Commission found that minimum bet on a single line bought the most time on EGMs, whilst the higher bets and number of lines decreases the time on EGMs. Repeated trials were heavily skewed toward shorter sessions, most likely reflecting the impact wins in extending some sessions. The influence of number of credits bet and number of lines played on the outcome of session duration appeared very similar in these trials.

Another technical parameter value of interest is the bank note limit (BKNTLIM). As can be seen in Table 2.7 above, there is a variety of current policy settings in the various jurisdictions in relation to this parameter value. Of particular interest is the prohibition on banknote acceptors (BNAs) in South Australia. One hypothesis that could be tested on the basis of this difference is that the absence of BNAs results in both lower levels of expenditure per EGM and lower rates of growth in expenditure per EGM in South Australia than Victoria, for example (see Section 3.4.2).

2.10 Technological innovation and the changing EGM system

Change in the EGM industry has been summarised earlier in terms of a transformation from a folk model of fund raising in community venues to a multi-billion dollar commercialised and corporatised industry. As discussion of the network capabilities of the Victorian industry above has outlined, computerised information and communication technology now provides the platform for the sophisticated, rapid and continuous sale and consumption of a gaming commodity. It is the purpose of this section to outline the contemporary dynamics that continue to drive change and renewal of the EGM system in Victoria. The focus here is primarily on up-stream innovation in EGM technology itself. Other dynamics of the EGM system, such as the commercial management strategies governing deployment and configuration of operators’ stocks of EGMs, are dealt with in the context of the discussion of consumption patterns in Sections 3 and 4.

The EGM system is dynamic in the sense there is a constant turnover of games and machines. New products are the result of lengthy processes of research and development (R&D) by gaming machine manufacturers. The leading Australian manufacturer of EGMs is Aristocrat who has approximately two-thirds of the Australian gaming machine market (slightly less in Victoria). Aristocrat reported spending \$AU59.0 million on R&D in 2004 across research teams in Sydney, Melbourne, Los Angeles and Tokyo (Aristocrat 2005, 18). In 2004, Aristocrat had the game 'Zorro' approved and rolled out in major Australian markets including Victoria. The Zorro themed game was described as the company's first "double jackpot stand alone progressive" product (Aristocrat 2005, 11). The Zorro game reflects a trend prominent in the US toward branded games where a fee is paid back to the branding agent. Aristocrat also reported the approval and roll-out of their 'Players Choice', the company's first multi-game multi-denomination product, in NSW. This machine featured four popular Aristocrat games: 'Queen of the Nile 2'; 'Indian Dreaming 2'; '50 Lions'; and 'Pyramid Power' (Aristocrat 2005, 11). Aristocrat's '50 Lions' game was their first game allowing gambling on 50 lines concurrently. Another recent Aristocrat progressive product innovation 'Hyperlink' was reported to be operating well on the Tabcorp network in Victoria (Aristocrat 2005, 11).

Aristocrat had a new and innovative gaming product approved in early 2006. Marketed under the name 'Reelpower', this game allows gamblers to bet not just on lines but also on vertical sequences of symbols shown on a single simulated reel. 'Reelpower' games also enable gamblers to stake up to ten times the amount for the reels purchased, potentially increasing the size of wins. The 'Reelpower' technology has been the subject of an alleged infringement of Aristocrat's intellectual property (patent) by a competitor manufacturer in the US. At the time of writing it was not known what the attitude of Australian/Victorian regulators was to the advent of 'reel betting'.

New gaming products are directed into venues owned by the gaming operators' key accounts. Key accounts have their own management groups within the operator organisations and have first rights to new machine placements. These key accounts, including ALH, Anzac House (RSL), BLM (Mathieson group), Castello, Taverner Group, etc., operate many of the large and popular venues in Victoria. These key accounts maintain close professional links with manufacturers and the Victorian gaming operators, seeking to maximise revenue through capital investments in new gaming technology. Expectations of how new products are likely to perform are often based on actual performance data from NSW, Aristocrat's home state and the jurisdiction where most products are first licensed. Expected revenue levels are set in warranty agreements between manufacturer and buyer on purchase. If new products (EGMs or games) fail to deliver a specified return or performance relative to the market (eg. top 10% of revenue earners) buyers can be entitled to a replacement.

Key Account Managers liaise with key account gaming venues on a regular (weekly) basis, consulting on performance and strategy. Variables that can be manipulated in the drive to improve revenue performance include in-venue promotions and external marketing. For example, personalised letter drops of material from the gaming operators are done, or groups of venues sometimes collaborate on promotions that originate from Area Managers (approximately 15 Area Managers would cover Victoria for each gaming operator). The costs of these initiatives may be shared between gaming and venue operators. At least one operator arranges the layout of machines in their venues, although gaming machine manufacturers also offer services in this area. The recent shock to revenue following the ban on smoking in gaming areas (SACES 2005b) presented a challenge to gaming and venue managers in terms

of implementing smoking areas and led to innovations in some venues such as live entertainment in smoking areas on Friday and Saturday nights and the provision of complimentary coffee, soft drinks and food being more frequent and of higher quality.

Key account and venue managers look at under-performing machines and consider alternative configurations for these machines, eg, RTP, credit values. Each operator is likely to deploy new machines on 4-8 occasions annually ensuring a flow of innovative and fresh products into the Victorian EGM gambling market. New machines are generally not linked to jackpot or progressive games initially but are allowed to play as standalones to emphasise their new features. Jackpot linked machines are more likely to be older under-performing machines which can nevertheless be attractive to those who want to play for jackpots.

The turnover of machines in the Victorian EGM gambling market is driven to a large extent by the investment decisions of the operators in concert with their key accounts. Over time this drives change in the range and mix of products available in the EGM market and therefore the range and mix of game features available to EGM gambling consumers in the context of the Victorian EGM system. The average turnover time for a particular game in the Victorian market was estimated variously, in a range between three and five years, with conversions and upgrades increasing the turnover rate. Brand new EGMs could take as long as seven to ten years to fully penetrate a large market such as those in NSW and Victoria, (i.e. reach the peripheries of the market, to be then in turn supplanted by new machines). The rate of turnover of machines in Victoria is substantially more rapid than in a market such as South Australia where regulatory change to reduce the total number of EGMs by around 3,000 has slowed the injection of new machines considerably.

Successful game bases can be the basis of a variety of games. For example 'Golden Pyramids' is almost identical to 'Queen of the Nile'. Dolphin Treasure is essentially 'Queen of the Nile' with 20 lines. Variation is, of course, one of the key methods of supply side industrial innovation as Alfred Marshall (1890) documented more than 100 years ago, and the EGM industry is a good place to view the material expression of this process. A proportion of older EGMs are also upgraded and game upgrades also flow into the market as new technical platforms are released by gaming manufacturers. Warranties on the performance of upgraded and overhauled EGMs also ensure these 're-cycled' elements of the system are monitored and managed intensively from a commercial perspective.

According to the regulator, the decline in the number of venues in Victoria with less than 20 EGMs has also transformed the EGM gambling system, homogenising the industry somewhat as increasing numbers of venues adopt EGM gambling as their number one business driver. This trend towards larger numbers of machines per venue shows a significant correlation with increased revenue per EGM (see Section 4.4). Larger venues by machine number also allow for a 'product mix' that caters for various market segments. As one industry source described it 'certain machines are there for certain groups', for example older-style machines and older versions of games are familiar and safe for those gamblers who do not like change. Older gamblers are not always comfortable with touch screen or other innovative technology. Demand-driven innovations, based on intelligence from venue managers and staff and surveys of EGM gamblers can be correlated with loyalty club data to shape identifiable gambling segments and tailor promotions to these segments. Gaming machine manufacturers spend a significant proportion of their development dollars on research about likes and dislikes with end-users of their products.

In such a way the model of the commercialised EGM industry operates in a very different way to the historical folk model. There are a range of supply-side and demand-side innovations that shape the transformation in the industry, many of which are themselves enabled by the technical capabilities of the EGM system and its computerised information technology base. It therefore should be clear by now that technology lies at the very heart of virtually all aspects of the commercial EGM industry and has been a key driver in the paradigm shift in the way EGM industries operate in Australia. In the case of Victoria, the folk model EGM sector never existed, although club and hotel patrons were historically well acculturated to other forms of fund-raising and gambling in these venues. Whilst this may explain some of the success of EGM gambling consumption in club and hotel venues it may also account to some degree for the relatively high social costs and unsustainable financial losses incurred amongst problem and moderate-high risk gamblers, in that the sophisticated and high-tech EGM gambling system introduced to local club and hotel venues throughout the State may have already ‘had their number’, so to speak.

2.11 Regulation, technology and changing contexts of EGM gambling markets

In his follow-up discussion of the Productivity Commission’s (1999) analysis of Australia’s gambling industry, the PC Chairman Gary Banks stated that “[r]egulation was found to be driven mainly by revenue-raising and probity considerations, rather than the more fundamental objectives of consumer protection and amelioration of social costs” (Banks 2002, 8). In relation to the introduction of a high-tech EGM gaming network into Victorian clubs and hotels and the establishment of Crown Casino this is illustrated by recent changes to the Gambling Act, to the National Standards and to the Victorian Appendix to the National Standard. Significant inclusions have been made in statutes, regulations and guidelines to specify responsible gambling aims and responsibilities of regulators and gaming operators. In contrast extensive provisions and rules governing revenue protection and probity have existed since the inception of these various elements of the regulatory framework.

This is hardly surprising, since making gambling as fully governable and taxable as possible has always been the ultimate goal of gambling regulation, closely followed by concerns about fairness that go to the heart of questions of the legitimacy of any industry. Indeed, responsible gambling would be a much more a matter of concern at the level of governance if such provisions and rules were not by now becoming evident (it is, after all, now six years since the Productivity Commission handed down its report). However, now these legislated requirements are in place the difficult phase of meaningful implementation remains.

The challenge that the changing nature of EGM markets, driven by a new level of technically mediated commodity consumption, poses for regulators is that just like questions of revenue protection and probity the issue of responsible gambling can only be adequately dealt with through the CIT base on which the industry now runs. Currently, whilst regulatory concerns with revenue and probity appear appropriate to the commercialised network model of the EGM industry, responsible gambling seems to be dealt with in a manner conceived for a folk model of the EGM sector.

There is a range of historical factors that no doubt influence this situation. Regulatory approaches have been historically fragmented and structured differently for each state or territory jurisdiction. There appears to have been no evidentiary basis for the scale of the EGM gambling industries introduced in the past fifteen years other than some kind of ‘mini-NSW’ approach. Arbitrary decisions on basic components of the EGM systems introduced, for example the number of machines to be deployed, may not have particular regulatory implications in terms of technical capacities for revenue protection and probity, but yet may

have been and continue to be very significant in relation to questions of consumer harm and social costs.

Technical regulation of revenue protection and probity aspects of the EGM industry has kept pace to a greater extent with the technological transformation of the sector. Whilst risks remain in relation to testing and approvals processes due to the de-skilling of the technical competence of the regulator, moves to improve the consistency and efficiency of the testing and approvals process through a rationalisation and homogenisation of requirements nationally are an impressive achievement. The collaborative development of the National Technical Standards highlights ongoing efforts to provide a streamlined regulatory environment that is friendly to industry innovators, particularly the gaming machine manufacturers, for whom regulatory uncertainty is a major risk.

The National Standards are a sound regulatory basis for sustainable management of innovation in the EGM industry but have yet to show benefits in relation to the questions of consumer harm and social costs. These costs and risks are now well documented in gambling research and acknowledged by interested parties across the industry. A growing area of debate within this research concerns the appropriateness of aspects of the technology itself and of the policy settings that determine technical parameter values in relation to striking the right balance between safe recreation and enjoyment and the opportunity for destructive consumption behaviour. A huge risk appears to exist here for Governments, in that the timely development of an evidence base or information system to enable appropriate adjustment of technical aspects of gambling consumption should keep pace with the technical performance of regulatory responsibilities in the areas of revenue protection and probity. Technology and technical parameter values in other words may offer a pathway to an EGM gambling sector that is innovative, interesting, profitable and safe, or at least finds the optimum balance of all these necessary elements.

The risk of a lag in regulators' technical responses to responsible gambling imperatives is amplified by the potential for change in key external factors (eg. HDI, real wages) that are closely related to sustaining current living standards. Analysis in this Report suggests that fluctuations in HDI are not necessarily accompanied by fluctuations of similar magnitude in gambling consumption (see Section 3.5). However, both the Australian economy and EGM gambling consumption have been riding on the back of a very long and very big boom. There is a political risk attached to being 'caught short' in relation to questions of responsible regulation of gambling in the event of a downturn in this boom. This is particularly the case given that the mass of EGM consumers are drawn from those who are relatively socio-economically disadvantaged and therefore more likely to feel the impact of even a relatively mild decline in economic conditions. Commercial risks may be serious, both for gambling operators and particularly for those club and hotel venues that have skewed their business model strongly toward earning high revenues from EGM gambling. More certainly, the transaction costs of doing business associated with the gambling industry are likely to rise sharply in conditions where external factors impact on consumption. This is likely to be exacerbated if there are lingering community perceptions of past market exploitation or lack of concern for a level of consumer harm that might have been addressed or at least ameliorated by seemingly straightforward transformations in technology and/or technical parameters governing the scale of consumer losses.

3. Consumption of EGM gambling: Part 1

This section provides an overview of the consumption of gambling and particularly of gaming machine gambling. Two key levels of analysis are presented in the main: aggregate data for the state of Victoria; and more detailed data for selected Victorian Local Government Areas (LGAs). The researchers have come to the view that the best comparative measure of the extent of consumption of gambling is the value of real expenditure by consumers. It is noted that the Productivity Commission and others (PC 1999; ACIL 2001) have sought to assess the value of the benefits to consumers by adaptation of the concept of *consumers' surplus*,¹⁶ which has been aggregated to produce various estimates of the benefits to consumers associated with expenditure on gambling. However, the researchers share the view also articulated by the Productivity Commission that the consumption of gambling is, as consumption expenditure, neither a unique nor special case, even though an argument might be made that the consumption of gambling using EGMs itself represents a particular socio-symbolic form of consumption. It is also the case that certain negative *externalities*¹⁷ are probably associated with this form of consumption that are not associated with alternative forms of consumption. It is also generally accepted that goods or services with such externalities should be taxed at a comparatively high rate in order to 'compensate' society generally.

However, as consumption, expenditure on gambling must either be diverted from other forms of consumption expenditure, or from savings. That is, resources allocated to gambling activity would be re-allocated to other consumption or to saving were gambling opportunities somehow to evaporate. As such, the consumption of gambling represents one consumption alternative amongst many and, particularly in mature economies, does not confer particular benefits relating to expanded levels of economic activity or employment opportunities that would otherwise be unavailable. However, because of the particular externalities associated with the consumption of gambling, its consumption provides revenue opportunities for government that are not available from other forms of consumption. It is also argued that gambling provides export consumption that would not be available from other forms of consumption. It is possible that this is the case in respect of certain gambling types (for example, particular racing 'carnivals,' some casino gambling including 'high-roller' junkets, and other 'destination' gambling forms) but the argument that there is significant extra-jurisdictional consumption of Victorian EGM gambling is not convincing. In fact, it appears from recent research by the National Institute of Economic and Industry Research (NIEIR 2003) that there is a net outflow of EGM consumption into New South Wales from Victoria, although this may be contested (see Stubbs & Storer 2003). EGM consumption in Victoria is almost certainly a predominantly local activity, and the evidence is that most consumers travel around 2.5 kilometres to engage in the activity (KPMG 2000: 57; McMillen et al. 2004: 83).

It might be added that the development and manufacture of EGMs and software, although of course an essential input for the consumption of EGM gambling, should be considered as a component of manufacturing industry. Again, were opportunities for this form of manufacturing to evaporate, it is extremely unlikely that the resources required to

¹⁶ Consumers' surplus may be defined as "the extra satisfaction or utility gained by consumers from paying an actual price for a good which is lower than they would have been prepared to pay ... The consumers' surplus is maximised only in perfect competition" (Pass, *et al*, 1993, p.94)

¹⁷ Externalities are defined as "factors that are not included in [calculations of the value of transactions] but which have an effect on human welfare." (Pass *et al*, 1993, p.189)

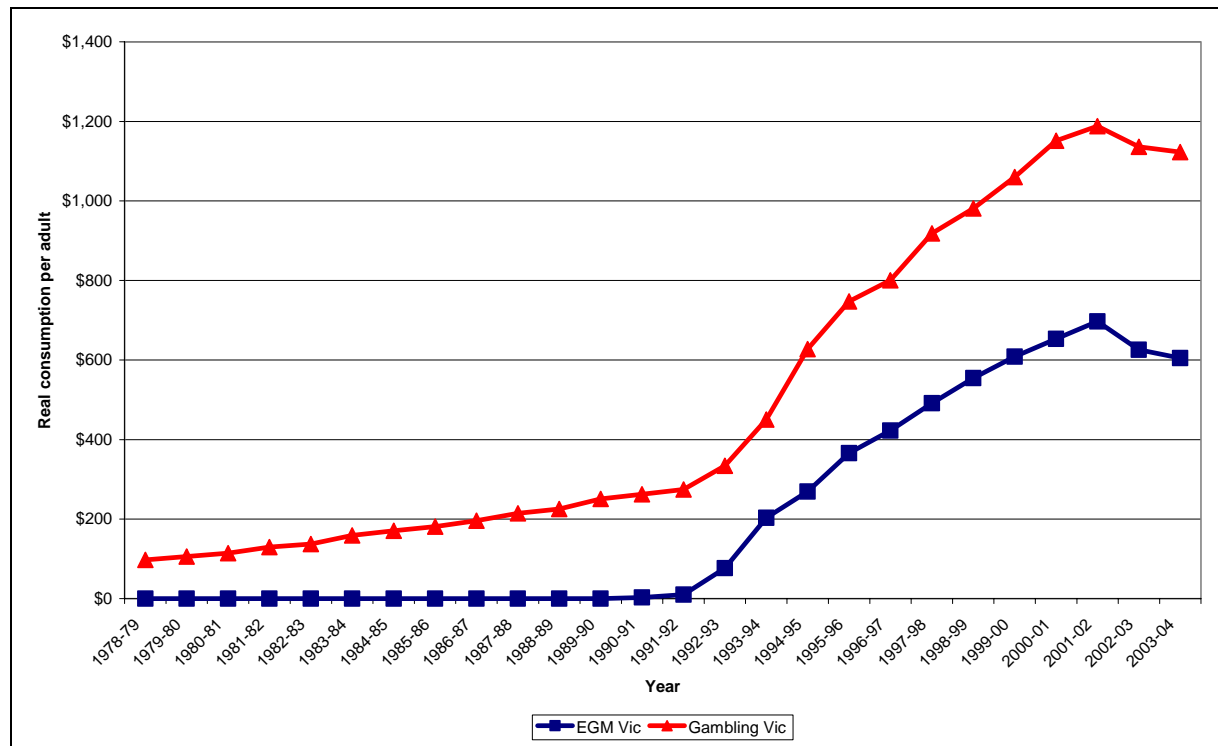
manufacture EGMs would remain idle beyond the short-term. There would of course be costs associated with the re-deployment of resources, including personal financial and other costs born by the workforce.

Before dealing in some detail with data on real EGM gambling consumption, the following preliminary section briefly quantifies the expansion of Victoria’s gambling industry and role of EGM gambling as the predominant driver of this expansion.

3.1 EGM gambling and expansion of the Victorian gambling industry

Gambling policy has generally been liberalised in Australia over the past two decades, with the gambling industry entering a new phase of commercialised expansion. There has been a rapid increase in the number of gambling commodities available for consumption and their delivery has been increasingly computerised information technology (CIT) based. The extent of the growth in expenditure on gambling products in Victoria and the significance of the EGM gambling component of this growth is shown in Figure 3A below.

Figure 3A Real gambling and EGM consumption per adult, Victoria, 1978-79 to 2003-04,



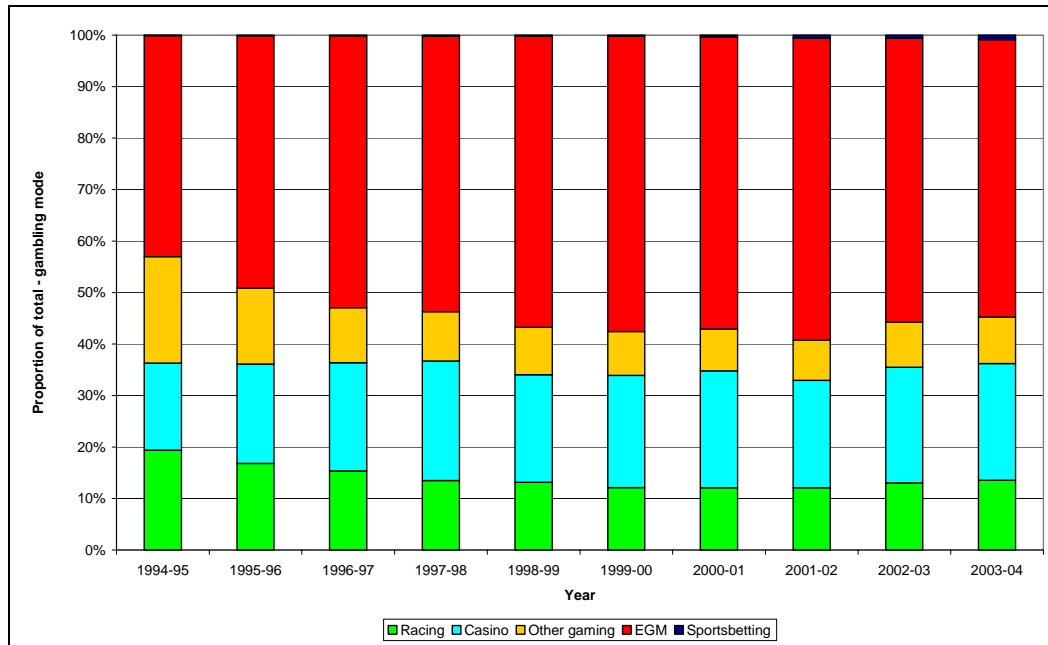
Source: OESR 2005

Clearly, the legalisation of EGMs and the casino in 1990-91 greatly accelerated consumption of gambling overall, particularly the former. EGM consumption accounted for more than 70% of the growth in total gambling consumption in Victoria between 1990-91 and 2003-04. An exponential model derived from the growth rate in real per capita consumption of gambling for the period 1978-79 to 1990-91¹⁸ suggests that had EGM gambling not been introduced real gambling consumption per adult in Victoria in 2003-04 would have been about \$840 per adult per year, as opposed to the actual value of \$1,123. In any event, there is little doubt that EGM consumption accounted for a substantial proportion of the growth in Victorian gambling

¹⁸ $y = 90.619e^{0.0858x}$

consumption after 1991. Figure 3B, shows the trend in share of expenditure of different forms of gambling following the liberalisation of gaming in Victoria.

Figure 3B Real gambling expenditure, proportions by mode of gambling, Victoria, 1994-95 to 2003-04*

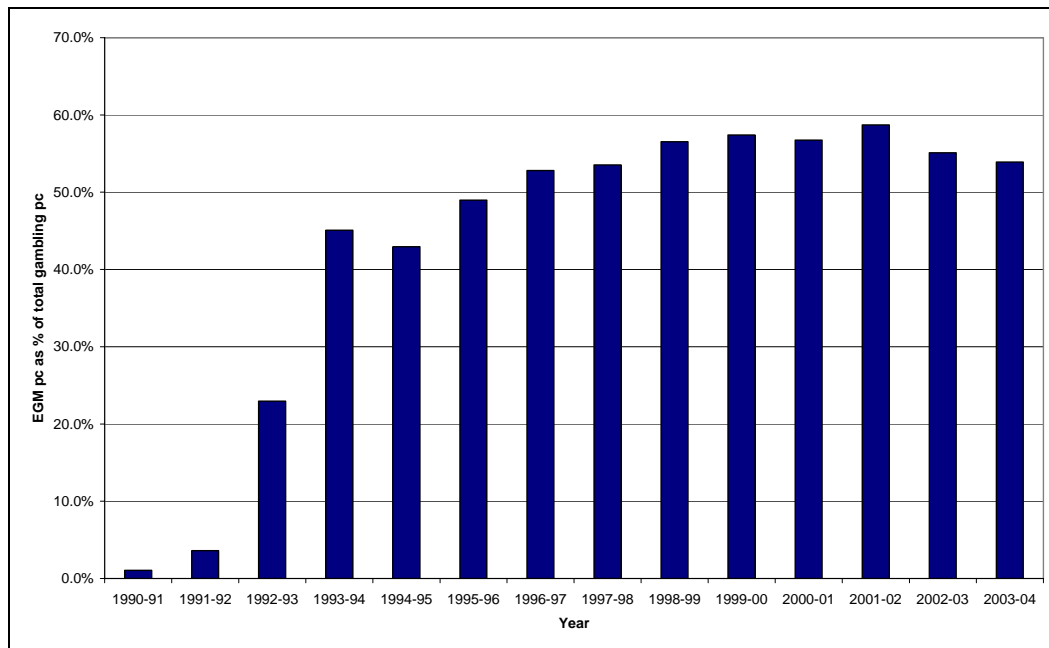


Source: OESR 2005 *Casino includes all table and EGM gaming in casinos. EGM includes all EGM gambling in hotel and club venues.

Real expenditure on EGM gambling declined as proportion of total gambling expenditure after peaking in 2001-02 at approximately sixty per cent. This declined to about fifty five per cent in 2003-04, almost certainly as a consequence of the ban on smoking in local gaming venues (SACES 2005b). The proportion of total gambling expenditure on racing rebounded a little in late years of the series, as did the expenditure share of minor gaming. Casino gaming is the second largest component of the total and has been relatively stable for some years. Sports betting has been growing at a rapid rate, but commencing from a very low base.

Figure 3C, below, also illustrates the change in real EGM gambling expenditure as a proportion of total expenditure, but presented on the basis of per capita expenditure. This proportion grew rapidly from the introduction of EGMs and constituted more than half of all gambling consumption by 1996-97.

Figure 3C Real per capita EGM gambling expenditure as a proportion of total real per capita gambling expenditure, Victoria, 1990-91 to 2003-04



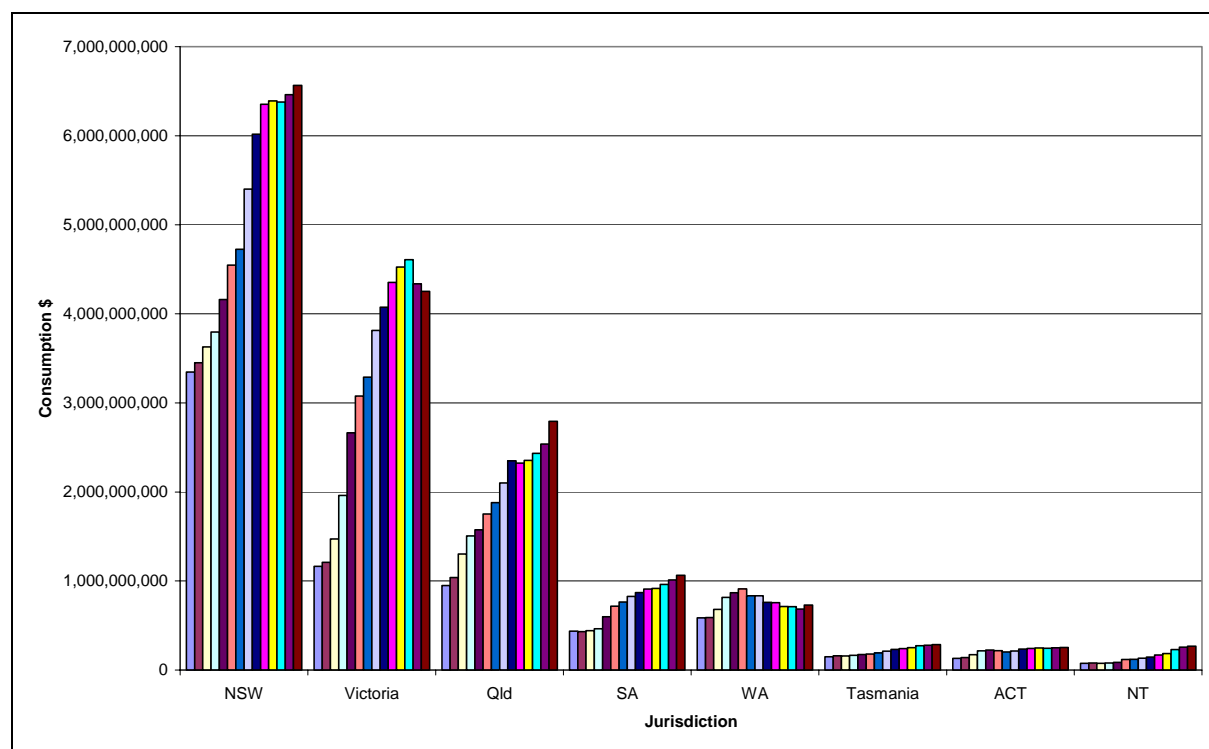
Source: OESR 2005

The ratio peaked at around 58% of all per capita gambling consumption in 2001-02, after which it declined slightly, almost certainly as a consequence of the introduction of the ban on smoking in gambling venues (see Section 3.4.4). However, well over half of all gambling consumption, measured on this per capita basis, remained attributable to EGM consumption at the end of this series. It is clear from this that expansion of the Victorian gambling industry can be disproportionately attributed to rapid growth in club and hotel EGM gambling consumption.

3.2 Gambling consumption in Australia, 1990 - 2004

The value of gambling consumption has grown significantly in real terms (i.e., adjusted for the effects of inflation) over the period since 1990, as Figure 3.1 demonstrates.¹⁹

Figure 3.1 Real gambling consumption, Australian states & territories, 1990-91 to 2003-04, (2003-04\$)



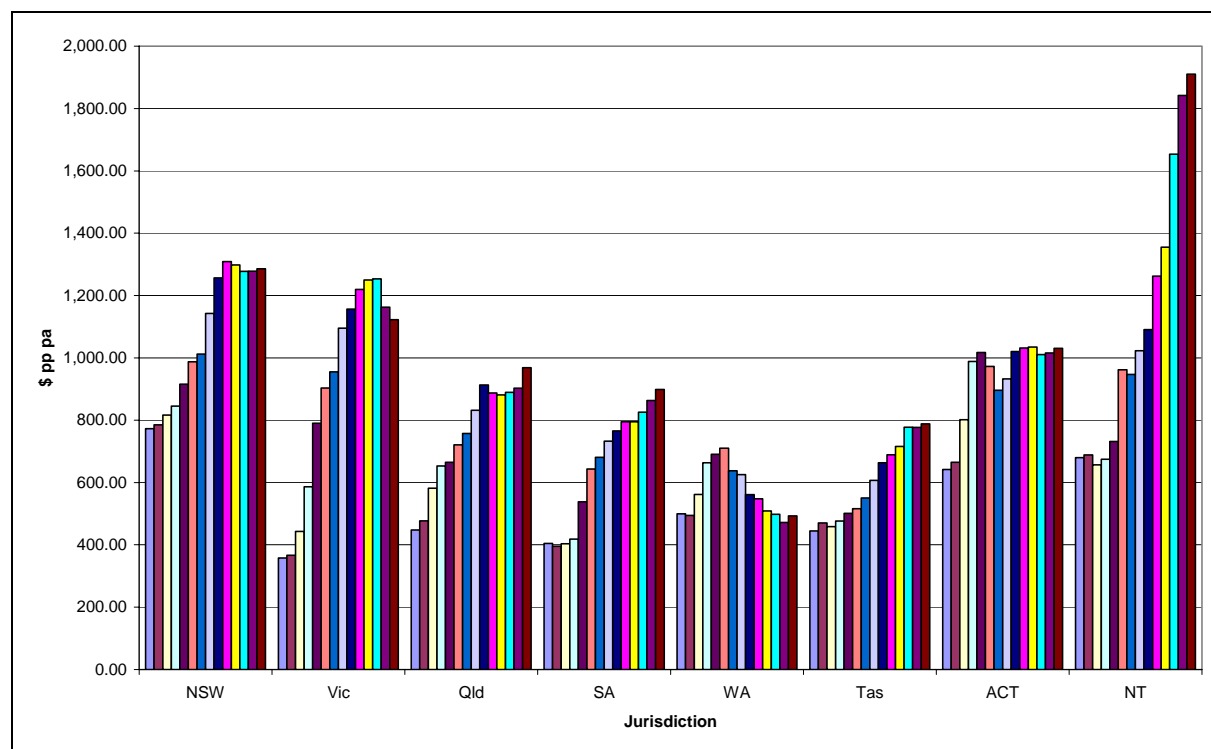
Source: OESR 2005.

Gambling consumption increased to about \$6.5 billion in NSW and to a peak of around \$4.5 billion in Victoria over the period displayed. Growth was also strong in most other states and territories, with the exception of Western Australia where consumption declined markedly in the second half of the period. Real consumption also declined in Victoria in the last year of this series. Figure 3.2, below, allows comparison of the magnitude of per capita consumption. It is important to note that differences in population size and in population growth rates between jurisdictions can increase the difficulty of comparing rates of growth over an extended period of time.

The researchers therefore take the view that estimates of real expenditure (i.e., the value of consumption adjusted for inflation) allow for better comparability between jurisdictions over time. Further, we have also shown real (adult) per capita levels of consumption in order to more accurately identify patterns of growth across jurisdictions and over time, given that there is variation in population and in rates of population growth between jurisdictions and within jurisdictions over time.

¹⁹ Note that Figure 3.1 and similar figures show annual data for each jurisdiction from left to right, commencing in 1990-91 or as otherwise indicated and concluding in 2004-05 or as otherwise indicated. Where per capita consumption is illustrated in this section, it has been calculated using ABS estimates of the adult population, i.e. persons aged 18 years or more, as noted in the AGS explanatory notes (OESR 2005). Unless otherwise stated, all values are expressed in \$2003-04.

Figure 3.2 Real adult per capita consumption of gambling, Australian states & territories, 1990-91 to 2003-04 (2003-04\$)



Source: OESR 2005.

The Northern Territory and NSW ended the period illustrated in Figure 3.2 with the highest real per capita consumption of gambling, although the rate at which consumption grew between 1990-91 and 2001-02 was easily strongest in Victoria. In WA, real adult per capita consumption actually declined over the full period, from about \$499 in 1990-91 to \$493 in 2003-04. In NSW and Victoria over the same period, consumption grew respectively from \$772 to \$1,286 and from \$358 to \$1,123 (derived from OESR 2005). The pattern for most jurisdictions was therefore generally one of strong growth tapering off considerably in more recent years (and declining in Victoria in the last two year of the series and in NSW and the ACT in 2002-03). The strongest real per capita consumption growth was in Victoria, where such consumption grew by 214% between 1990-91 and 2003-04. Table 3.1 sets out the relevant growth rates for all Australian states and territories over the same period.

Table 3.1 Growth in real adult per capita gambling consumption and household disposable income, 1990-91 to 2003-04, Australian states and territories.

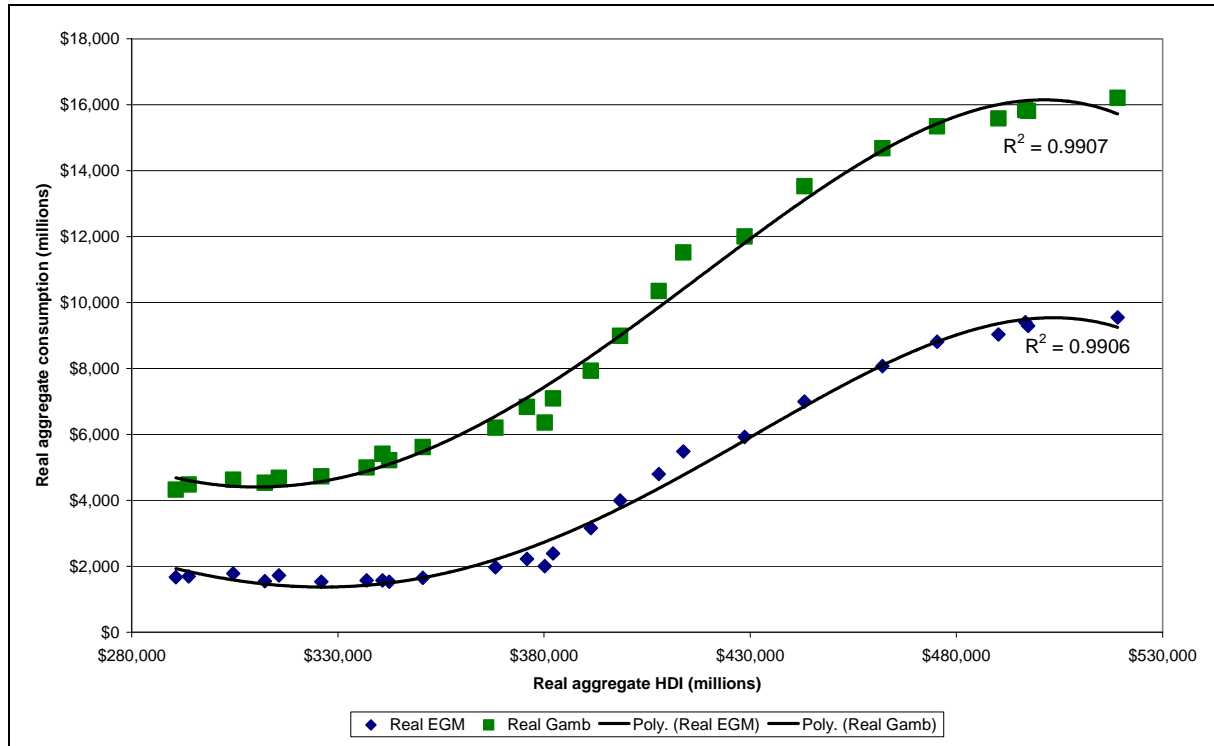
Increase (%)	NSW	Vic	Qld	SA	WA	Tas	ACT	NT
Gambling	66.5%	213.9%	116.0%	122.0%	-1.2%	77.4%	60.5%	181.0%
HDI	32.2%	34.9%	54.7%	25.9%	56.9%	19.6%	40.7%	63.0%

Source: OESR 2005

All jurisdictions except WA recorded strong growth in real adult per capita gambling consumption, averaging 96.8%, while household disposable income grew by an average of 38.1% (OESR, 2005). It is important to observe that there is a strong apparent relationship between growth in household disposable income (HDI) and growth in real gambling expenditure. Figure 3.3 plots the real aggregate value of household disposable income against real aggregate gambling consumption and real aggregate EGM consumption from 1978-79

until 2003-04 for Australia. Figure 3.3 also incorporates fourth order polynomial trend lines with R^2 values calculated.

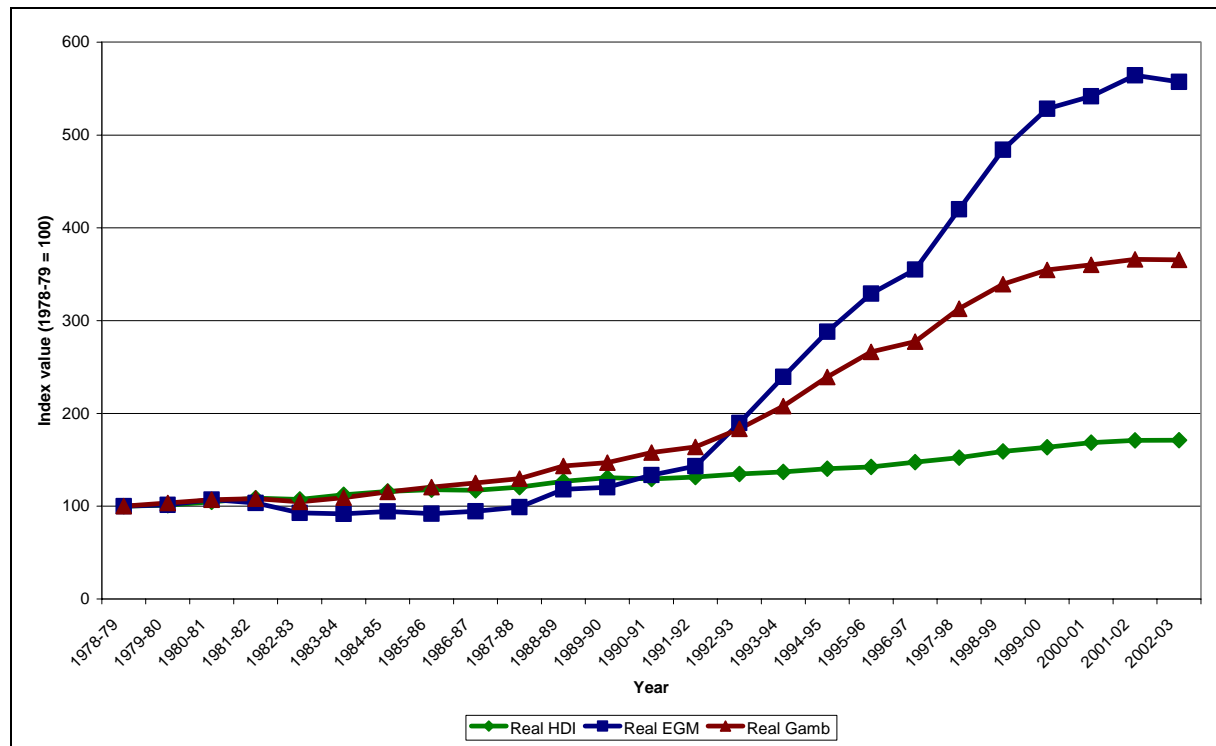
Figure 3.3: Real aggregate HDI vs. real aggregate gambling consumption and real aggregate EGM gambling consumption, 1978-79 to 2003-04, Australia



Source: OESR 2005

It may be observed that R^2 values for each trend line are in excess of 0.99, indicating a strong 'fit' with observed data. Pearson product moment correlations values for both these data sets are also in excess of 0.95. In simple terms, it appears that aggregate consumption of both gambling and EGMs rises or falls as the aggregate level of HDI rises or falls. It may therefore be possible to argue that aggregate gambling and EGM consumption is determined to a great degree by the aggregate value of HDI. However, the magnitude of relative growth in each case is worthy of note. Between 1978-79 and 2003-04, real aggregate HDI increased by a factor of about 1.7, whereas aggregate gambling consumption increased by a factor of about 3.65 and aggregate EGM consumption increased by a factor of around 5.6.

Figure 3.4: Indices of real aggregate HDI, gambling consumption and EGM gambling consumption, Australia, 1978-79 to 2003-04

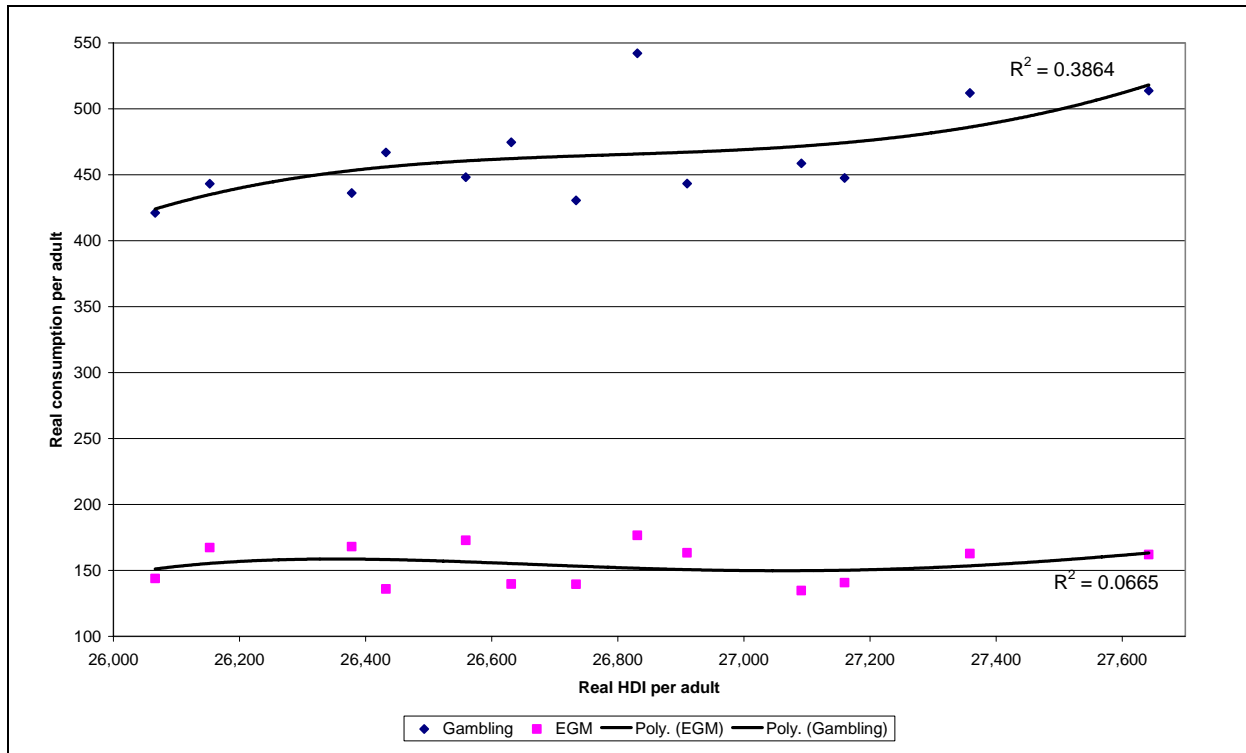


Source: derived from OESR 2005

Figure 3.4 displays indices for each of these categories between 1978-79 and 2003-04, thus illustrating relative growth. It should also be observed that over this period the proportion of household disposable income attributable to gambling consumption grew from 1.5% to 3.1%, and the proportion of HDI attributable to EGM consumption grew from 0.6% to 1.8%. We have also calculated the relationship between real adult per capita consumption of gambling and EGMs, and real adult per capita HDI as illustrated in Figure 3.5 and 3.6.²⁰

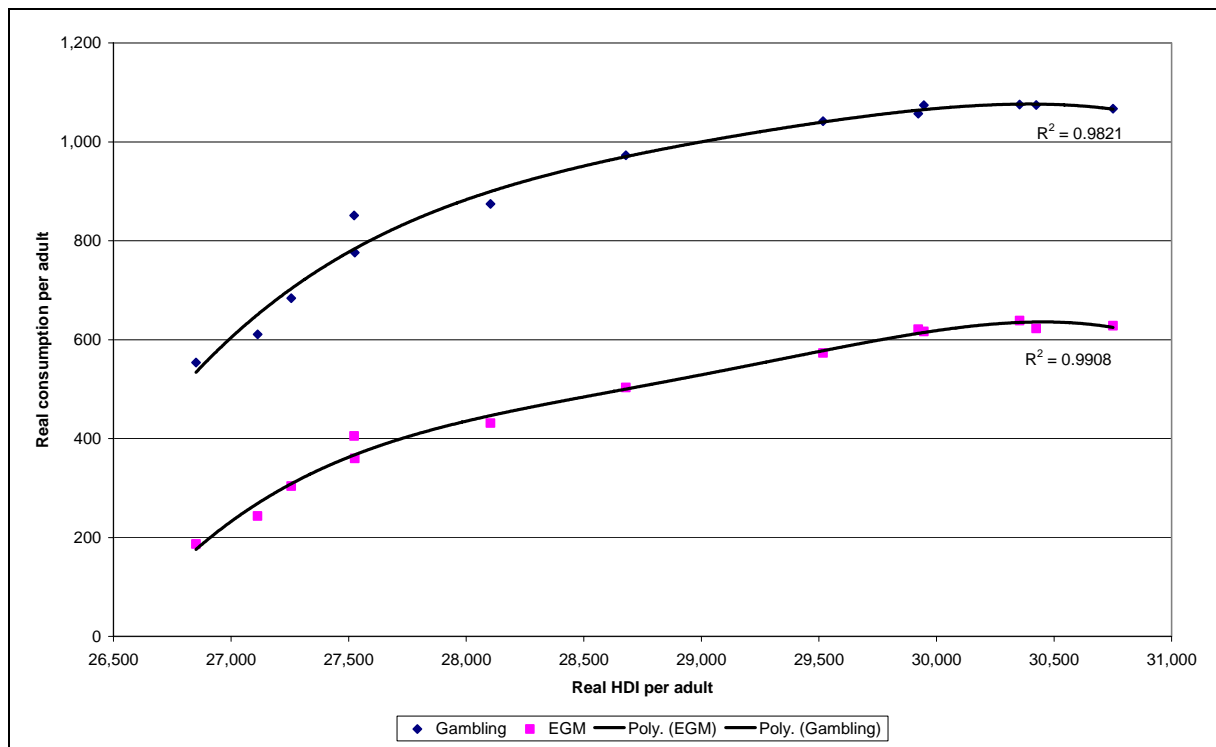
²⁰ It is possible that a particular segment of the income distribution may account for a disproportionate proportion of the consumption of EGMs. If growth in HDI was also disproportionate this could confound the apparent clarity of the relationship between HDI and gambling consumption to some degree. An example of this might be that the two lowest income quintiles may account for a high proportion of EGM consumption but may have experienced lower growth in HDI.

Figure 3.5: Real HDI per adult vs. real adult per capita consumption of gambling and EGM gambling, Australia, 1978-79 to 1990-91*



Source: derived from OESR, 2005 * Note: 90% of HDI assumed to be at the disposal of adults.

Figure 3.6: Real HDI per adult vs. real adult per capita consumption of gambling and EGM gambling, Australia, 1991-92 to 2003-04*



Source: derived from OESR, 2005 * Note: 90% of HDI assumed to be at the disposal of adults.

As Figures 3.5 and 3.6 demonstrate, the relationship between real per capita EGM and gambling consumption and real HDI per adult was markedly less robust during certain periods, notably during the period prior to the legalisation of EGMs in Victoria and other jurisdictions outside NSW. In fact, the R^2 values for the fourth order polynomial trend line describing the period between 1978-79 and 1990-91 (real HDI per adult vs. real per capita gambling consumption, 0.3864, real per capita HDI vs. real per capita EGM consumption 0.0665) are much lower than for the second half of that series, from 1991-92 until 2003-04 (0.9821 and 0.9908 respectively). The Pearson product moment correlation values are similarly less robust during the earlier period (HDI vs. gambling, 0.593 for the period between 1978-9 and 1990-91 and 0.938 for the period from 1991-92 until 2003-04; HDI vs. EGM consumption, 0.019 and 0.964 respectively).

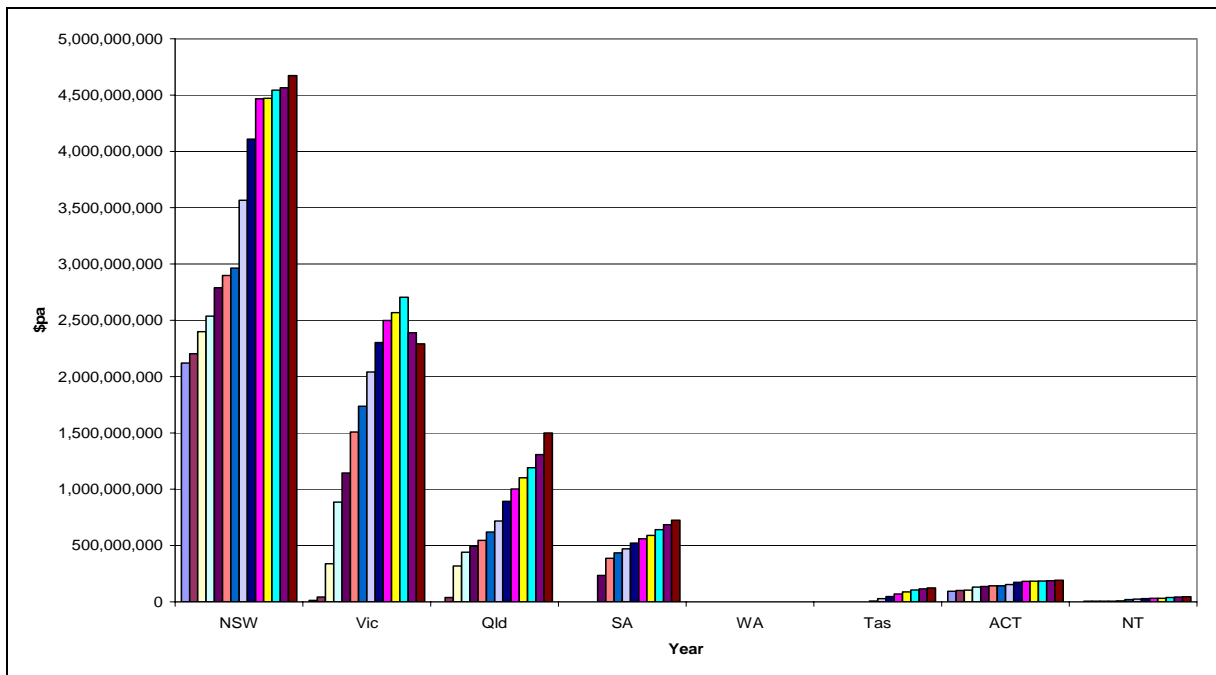
We would hypothesise on the basis of these data and our understanding of the development of the EGM industry in Australia over the relevant period that this discontinuity is primarily related to the rapid deployment of a large number of additional EGMs in Australia (particularly in Victoria, Queensland and South Australia) and the parallel regulatory changes enacted in the NSW market during the early to mid 1990s (i.e., allowing EGMs to be deployed in hotels as well as in licensed clubs).

It must also be noted that HDI per adult increased more strongly in the second half of the series (i.e., from 1991-92 to 2003-04) than in the first half. Yet, as Figure 3.4 illustrates, the discontinuity in the growth pattern for EGM consumption (which accounted for 73% of total growth in the per capita consumption of gambling between 1978-79 and 2003-04) is very marked after 1991-92. We also note that the concept of co-linearity may confound the apparently clear relationship between the data sets displayed. For example, were the aggregate value of any goods for which a market exists (for example, the sale prices of paintings by Mark Rothko and his colleagues from the Abstract Expressionist school) and which has grown steadily in real value over the relevant period to be plotted against aggregate HDI an apparently strong relationship might be calculated, even though increases in aggregate value of these particular goods may have no causal relationship with HDI growth. Any apparent relationship would arise because both data sets are growing in real terms over the relevant period. This underlines the importance of developing a satisfactory explanation for any such relationship, no matter how strong it appears to be on a statistical basis. Such an explanation must look to explanation at social, regulatory and individual levels to account for changes in behaviour, as well as to apparently straightforward 'economic' relationships.

The phenomenon briefly described above provides a demonstration of change in EGM markets. In this case, regulatory change leading to substantial increases in EGM supply is almost certainly quite closely associated with the development of a capacity for EGM consumption to consume an increasing proportion of the available disposable income. Thus, growth in real EGM consumption per capita appears to be strongly related to growing real HDI per capita. Yet until the supply of EGMs was enhanced by a series of regulatory changes, growing HDI had no impact on the consumption of EGM gambling and only a relatively weak impact on the consumption of gambling. We can assume that growth in the consumption of EGM gambling is strongly supply driven.

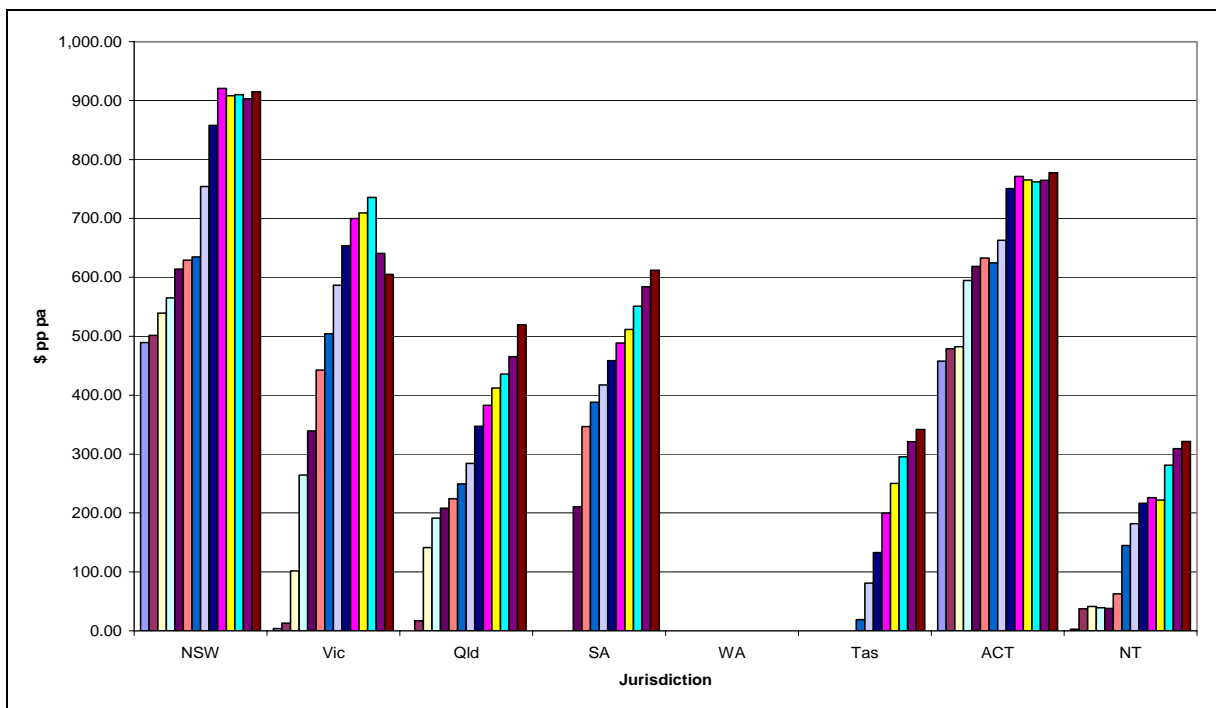
The strong growth in real aggregate EGM consumption is shown in Figure 3.7, and Figure 3.8 shows real per capita consumption of EGM gambling across Australian jurisdictions.

Figure 3.7 Real EGM gambling consumption, Australian jurisdictions, 1990-91 to 2003-04 (2003-04\$)



Source: OESR 2005

Figure 3.8 Real per capita EGM gambling consumption, Australian jurisdictions, 1990-91 to 2003-04 (2003-04\$)



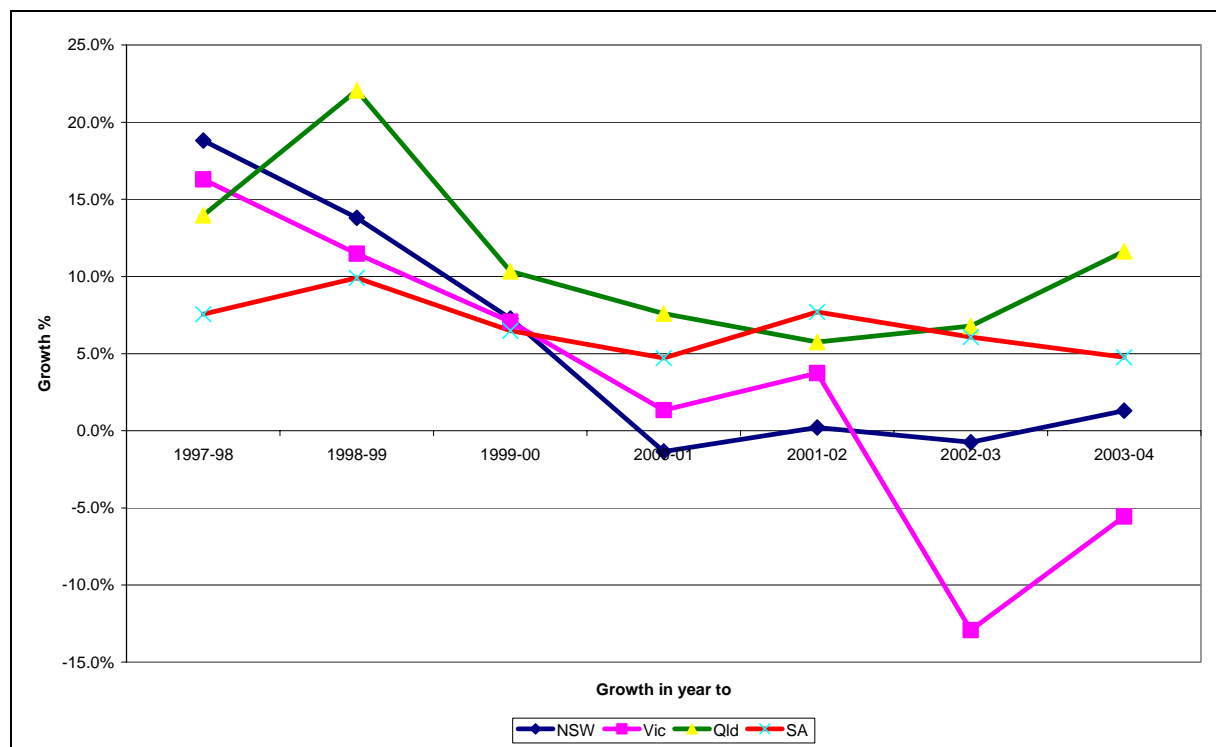
Source: OESR 2005.

By 2003-04, total annual EGM consumption in NSW was valued at about \$4.7 billion, \$2.3 billion in Victoria, \$1.5 billion in Queensland and \$723 million in South Australia. Real consumption increased continually in all jurisdictions save Victoria and WA over that period, in the case of the former showing real decline after 2001-02. In the case of WA, EGMs are not deployed other than in the casino. As Figure 3.8 shows, real per capita consumption was

highest in the well-established markets of NSW (\$915 per capita per annum) and the ACT (\$778), with South Australia demonstrating the next highest level of per capita consumption (\$612), marginally above the Victoria figure of \$605. It is noteworthy that EGM consumption in Victoria declined from a high point of over \$735 per person in 2001-02, almost certainly as a consequence of the introduction of a prohibition on smoking in gaming rooms in September 2002 (see Section 3.4.4). It should also be noted that the configuration of the EGM industry will almost certainly have a considerable impact on growth and levels of consumption. For example, in Victoria half of the total number of EGMs outside the casino (i.e., 13,750) must be located in clubs, where consumption per EGM is, on average, in the range of half that of EGMs located in hotels. In contrast, about 90% of EGMs in South Australia are located in hotels.

Figure 3.9 sets out the rates of real growth in per capita EGM consumption in Victoria, NSW, Queensland and SA between 1997-98 and 2003-04. Prior to 1997-98 growth rates in some jurisdictions were so high as to constitute outliers in the data set, and thus are likely to confuse the pattern demonstrated by the Figure.

Figure 3.9 Year on year growth rates, real per capita EGM gambling consumption, Vic, NSW, Qld & SA, 1997-98 to 2003-04 (linear scale)



Source: derived from OESR 2005.

As Figure 3.9 demonstrates, growth rates in NSW, Victoria and South Australia were broadly consistent in the earlier part of this series, probably reflecting the 'maturation' of the Victorian and South Australian markets and adaptation by the NSW market after its exposure to regulatory change. Prior to this period, growth in Victoria, Queensland and South Australia had in the early years of EGM operation been somewhat above these levels, whereas the very 'mature' NSW market (where poker machines have lawfully operated since 1956) demonstrated much more modest rates of growth. Subsequently, growth rates converged to some extent in 1999-2000, before again diverging. In South Australia, growth consistently hovered in the range between five and ten per cent in the period shown. In Victoria, the

introduction of the smoking prohibition in 2002 appears to have induced a sharp drop in real per capita expenditure with growth subsequent to the ban remaining negative up to 2003-4, although lesser in magnitude in the second year following the shock to revenue (see Section 3.4.4). In Queensland, growth declined after 1998-99 until 2001-02, after which it resumed an upward trajectory. In NSW growth declined into slightly negative territory by 2000-01 and oscillated around zero per cent subsequently.

Approximately one-quarter of eligible hotels and clubs in Victoria contain EGMs,²¹ compared to more than 90% in NSW (PC 1999: 13.14). Marshall (2004) observes this and also comments that the relative density of EGMs in New South Wales and Victoria is not mirrored in the per capita consumption of EGM gambling in those states. Despite having a much lower density of EGMs, Victorian per capita consumption has generally been only marginally lower than New South Wales, and higher than other states where EGM density is greater (for example Queensland). A number of factors are likely to contribute to this.

EGM gambling consumption is likely to be subject to the concept of diminishing returns just as some forms of agricultural production, for example. That is, if one were to commence farming a strip of land running from a river across a fertile plain, up a hill and culminating in the rocky foothills of a mountain range, one would rationally choose to farm the fertile plain first, because the proportional returns for one's investment of capital and labour are likely to be much higher than in the case of the rocky foothills. As one's capacity for additional activity increased, one would farm further and further up the hill until the point was reached where net returns were so low as to make additional activity pointless. We would hypothesise that this is exactly the case with EGM deployment and suggest that it is not just the number of EGMs or venues in play that contributes to the comparative consumption of gambling, but also the 'quality' of the EGMs and, more significantly, of the venues and their locations. It is possible that the revenue per EGM from the best performing venues in Victoria and New South Wales is similar but that the long venue 'tail' in New South Wales (that is, the proportion of less well 'performing' venues, games and machines), although it lifts the per capita consumption overall, lifts it by increasingly diminishing increments as venue and game 'quality' deteriorates. Victoria's venue 'tail' is probably much smaller than that in New South Wales, although it is likely that there is some 'oversupply' of EGMs in both markets.

It is also very likely that the traditional role of potential venues within different communities is distinct, given issues such as climate, cultural preferences and propensity to travel for entertainment or recreational purposes, which we hypothesise may vary considerably across Australian cities and states. We also note very distinct geographical differences between Victoria and other Australian states which may also contribute to the differing patterns of EGM density and consumption, as may population density and patterns of settlement. Australia, despite some appearances to the contrary, is probably not homogenous in culture, geography or patterns of human settlement and these issues must be carefully considered in any comparison of phenomena where such heterogeneity may well be significant, such as relative consumption of EGM gambling.²² We also must note the divergent regimes of

²¹ There are approximately 530 gaming venues in Victoria (June 2005), of which 349 are in metropolitan Melbourne. There are approximately 245 hotel gaming venues and 285 club gaming venues. See <http://www.justice.vic.gov.au/>

²² The researchers believe that this points to a further issue - the scale at which analysis of EGM consumption is best undertaken in relation to particular issues. Local level analysis and comparison is probably most fruitful for the majority of purposes and given issues associated with availability, categorisation and classification of data,

regulation across Australian jurisdictions, via which the pattern of deployment of EGMs differs quite markedly as does the potential for intensification. In NSW, the lion's share of EGMs is located in clubs, with many such venues resembling suburban casinos offering literally hundreds of EGMs. In Victoria, as already noted, half of the 27,500 non-casino EGMs are required to be located in hotels and half in clubs, with a ceiling of 105 EGMs in any one venue. In South Australia, about 90% of EGMs are located in hotels and about 80% of hotels have EGMs, with only about 80 of the 300 or so regularly operating clubs deploying EGMs²³, and generally deploying only modest numbers. The maximum permissible number of EGMs in South Australian venues is 40, although at the time of writing no venue operated more than 33 EGMs in the wake of the legislated EGM reduction program implemented in mid-2005.²⁴ In Queensland, EGMs are deployed in hotel and club venues as well as in smaller licensed premises in shopping strips. In the ACT only licensed clubs are permitted to deploy EGMs.

Between 2000 and 2002, growth rates for EGM consumption in both New South Wales and Victoria were much lower and this pattern may also be observed across Australia and in most jurisdictions. It thus seems clear that the 'maturing' of the Victorian market was associated with overall decline in revenue growth. We would therefore hypothesise that the pattern of development of a particular EGM market may be segmented into early growth, consolidation and mature phases, and that during each phase it is likely that the key drivers of growth will be distinct. In the early phase of the market growth is likely to be associated with the roll-out of EGMs and the absorption of 'latent' demand for EGM gambling opportunities. In the middle phase, we might hypothesise that the re-deployment of EGMs into more profitable locations and areas, accompanied by refinement in EGM features (bank note acceptors, diversity of games and platforms, 'fine-tuning' of the customer-machine match, etc) will provide the stimulus for growth via a consolidation of the market and by effectively growing the revenue per machine, an issue of less consequence to operators during the preliminary 'roll-out' phase. In the late stage, it appears that the global cap on machine numbers and the reduced capacity to effectively re-deploy machines, accompanied by a dearth of other than marginal innovations, may have led to a decline in growth rates. At this point it might be anticipated that further increases in revenue per machine become increasingly significant to the future EGM market and sophisticated marketing strategies which can further stimulate further demand (loyalty programs, etc.) become increasingly important. The phases and drivers of change in EGM consumption in Victoria are analysed in more detail in Section 3.4, below.

analysis at LGA level seems most likely to be meaningful for exploration of many of the issues we have raised in this report.

²³ The majority of SA clubs operate on a limited basis, i.e., they open only when the activity for which they were formed (sporting or recreational) is actually being conducted. This is quite distinct from NSW and to some extent Victoria, where licensed clubs are very likely to be operated on a seven day per week basis.

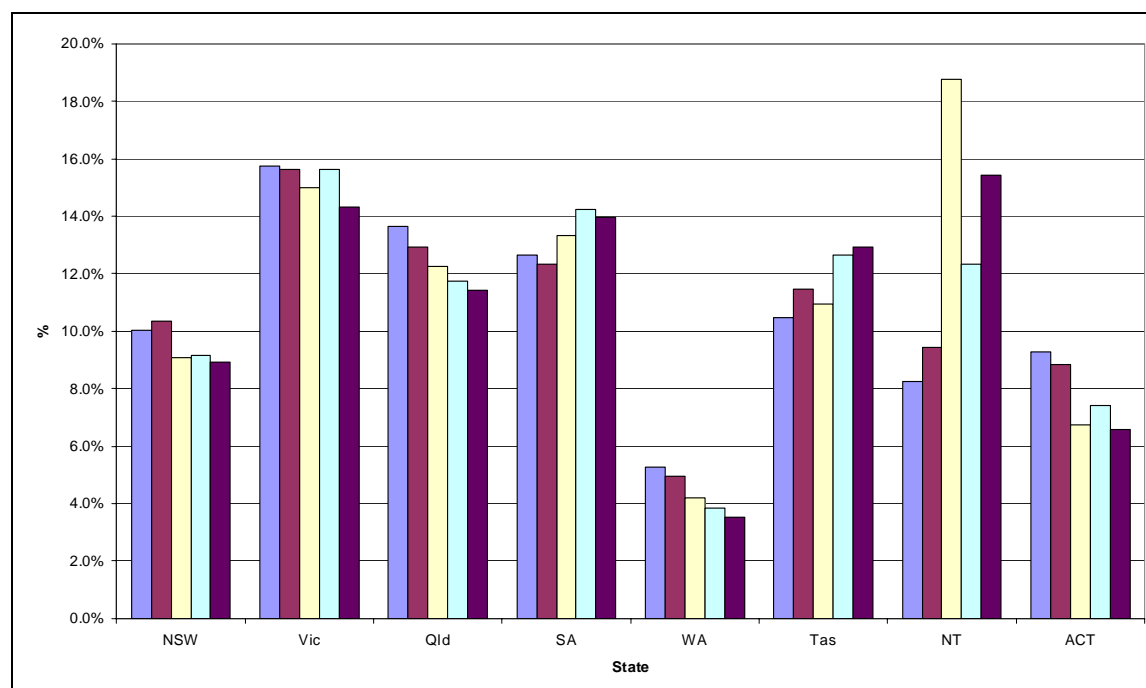
²⁴ Personal communication, Independent Gambling Authority 2005

3.3 State revenue implications of gambling taxation

Australian states have limited taxing powers, having surrendered their income tax powers to the Commonwealth during the Second World War. The revenue sharing arrangements between Commonwealth and states are the subject of endless debate and generate much antagonism between governments. As a consequence, state and territory governments are usually very open to new revenue possibilities and gambling has been seen as a major revenue source for some time, but particularly since the early 1990s. This has been compounded by competition between states to reduce taxes on business including payroll taxes, as well as taxes on property such as land tax. Thus, progressive taxes have declined in relative importance and more regressive taxes (including taxes on gambling and taxes on consumption generally) have become more significant in state budgets.

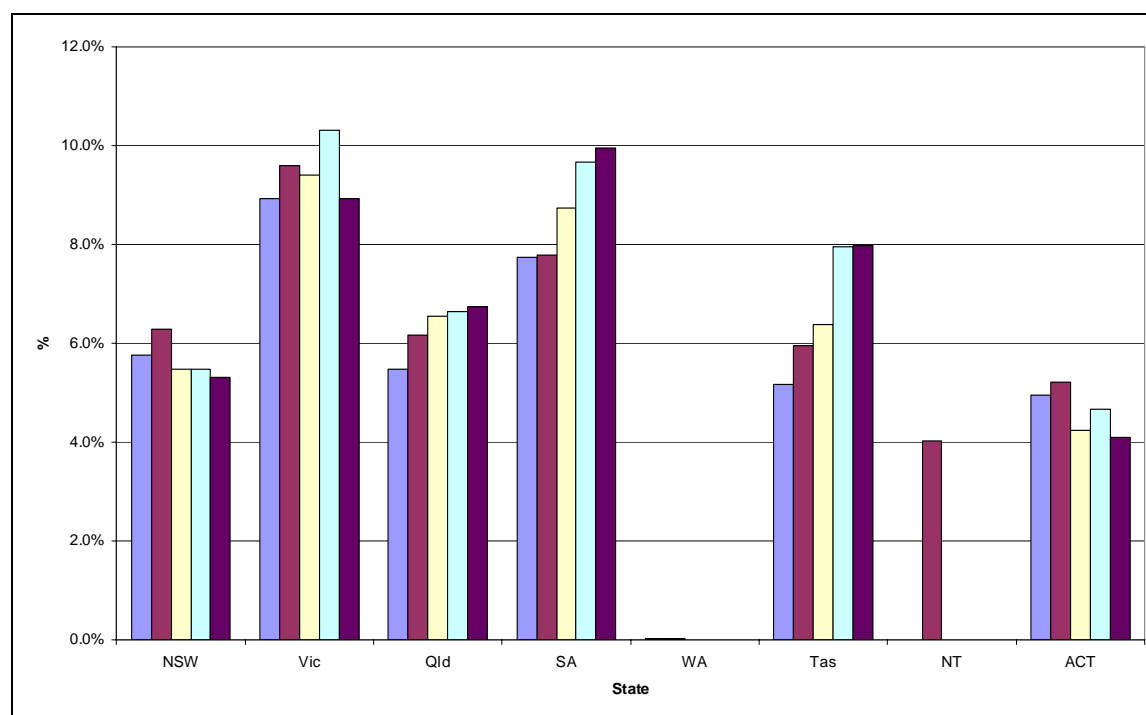
The introduction in July 2000 of the Goods and Services Tax (GST), a national ten per cent tax on consumption (other than some necessities such as fresh foodstuffs and medical expenses), was associated with an apparent decline in state revenue derived from gambling. This was because the arrangements accompanying the introduction of the GST allowed for a reduction in state gambling taxes so that the effect of the introduction of the GST was neutral – i.e., state taxes were reduced by an amount equivalent to the impact of the GST on gambling revenue. However, as the GST overall is returned to the states less the Federal government's administrative costs, overall the state revenue derived from gambling activities has not declined, even though the discontinuity in the state gambling tax series might indicate otherwise. This phenomenon also has an impact on other revenue series set out in charts in this section, although the effect of this is difficult to quantify. Figure 3.10, below, sets out the proportion of states' own tax revenue constituted by gambling revenues.

Figure 3.10 Gambling revenue as a percentage of states' own tax revenue, Australian states & territories, 1998-99 to 2002-03



Source: ABS 2004.

Figure 3.11 EGM tax as a percentage of states' own tax revenue, Australian states & territories, 1998-99 to 2002-03



Source: ABS 2004

Figure 3.11 shows the proportion of state own tax revenue derived from the consumption of EGM gambling, in the period 1998-99 to 2002-03. As Figures 3.10 and 3.11 illustrate, gambling revenues are an important component of state tax structures, providing as much as 18.8% of jurisdictional tax revenue (in the case of the Northern Territory) over the relevant period. It should be noted that the larger and more economically diverse south-eastern states of New South Wales, Victoria, Queensland and South Australia have divergent patterns of gambling tax dependency. New South Wales, where the EGM market is undoubtedly much more 'mature' than any other Australian jurisdiction, relies somewhat less on gambling taxes than do the other south-eastern states, with around nine per cent of state tax revenue drawn from gambling revenues overall and about 5.5% of state taxes drawn from the state's 100,000 EGMs (see Figure 3.6 above).²⁵ Victoria in contrast draws more than fourteen% of state taxes from gambling (as does South Australia) including about nine per cent drawn from EGMs (ten per cent in South Australia's case). Queensland relies on gambling for more than eleven per cent of its state taxes, 6.7% of state taxes coming from EGMs. In most states reliance on gambling taxes is falling overall, although there are exceptions to this. However, the reliance of state treasuries on EGM revenues has been largely maintained or grown over the relevant period.

This reliance is a highly relevant consideration in any description of the technical system for EGM gambling. For example, the budgeted expectations of state Treasuries that revenue from EGMs will increase over time may conflict with policy apparently focusing on the reduction of harm associated with EGM gambling, particularly when disproportionate amounts of EGM

²⁵ Historically, this has been due in part to the principle of 'mutuality' whereby NSW Registered Clubs are non-profit and retain earnings in exchange for funding localised infrastructure and other development. These arrangements were changed from September 2004, with a new tax on gaming revenue being phased in over the period to 2010. Annual revenue less than \$200,000 will attract no tax, rising to 40% for revenue over \$10 million in 2010. For detail see <http://www.treasury.nsw.gov.au>

revenue are generally acknowledged to be derived from those with gambling problems (PC 1999). In a climate where EGM numbers have been frozen, it is therefore implicit in state budget forecasts of increased revenue from EGM gambling that revenue per machine will continue to increase. This provides an illustration of the relationship between the 'purely' technical system, the system of regulation, and certain aspects of the social purpose of EGM gambling (in this case, the provision of revenue to government to fund the provision of general services to the community).

Table 3.2 State budget revenue predictions, Victoria, 1997-98 to 2005-06 (\$ millions)

Year	Gambling \$ mill.	EGM \$ mill.	Total Tax \$ mill.	Gambling % Total	EGM % Total
1997/1998	1,238.8	657.4	8,417.5	14.7%	7.8%
1998/1999	1,341.3	754.6	8,483.6	15.8%	8.9%
1999/2000	1,428.2	843.0	8,691.0	16.4%	9.7%
2000/2001	1,235.1	780.0	7,845.3	15.7%	9.9%
2001/2002	1,374.1	894.9	7,976.5	17.2%	11.2%
2002/2003	1,455.0	972.7	8,802.7	16.5%	11.1%
2003/2004	1,420.1	895.6	9,593.2	14.8%	9.3%
2004/2005	1,371.7	828.8	10,384.2	13.2%	8.0%
2005/2006	1,479.0	931.0	10,306.2	14.4%	9.0%

Source: Vic. State Budget Papers, Budget Paper No. 3 (or equivalent in earlier years), respective budget year.

Table 3.2 sets out the Victorian state budget predictions of gambling tax revenue for each year between 1997-98 and 2005-06, demonstrating that, in each year of this series until 2002/03, EGM taxes were predicted to rise as a proportion of total state tax revenue. Of course, the discontinuity associated with the introduction of the GST is also apparent in this series. From 2002-03 onwards, budget forecasts of the value of EGM and gambling taxation and their contribution to state tax revenue acknowledged the likelihood of decline, although EGM taxes continued to be forecast to account for more than nine per cent, and gambling taxes in general more than fourteen per cent, of taxes collected by the Victorian government. It could be argued from these estimates (which, it must be recalled, are the Government's best assessment of the likely revenue to be collected from revenue sources) that there was no expectation that harm minimisation measures would have any impact on growth in EGM consumption even though it is very likely that a disproportionate amount of gambling consumption, particularly EGM consumption, is attributable to individuals consuming problematically. Effective harm minimisation measures would be anticipated to have an impact, therefore, on EGM consumption and thus on revenue. Interestingly, after 2001-02, when the impact of the smoking prohibition was felt, estimates of tax revenue from gambling declined accordingly. The 2002-03 estimate of \$972.7 million in EGM revenue overstated actual revenue of \$826.4 million, and the 2003-04 estimate of \$895.6 million overstated actual revenue of \$798.2 million. This provides strong evidence that venue contexts are one aspect of the EGM gambling system can be modified in such a way as to greatly alter the pattern of consumption.

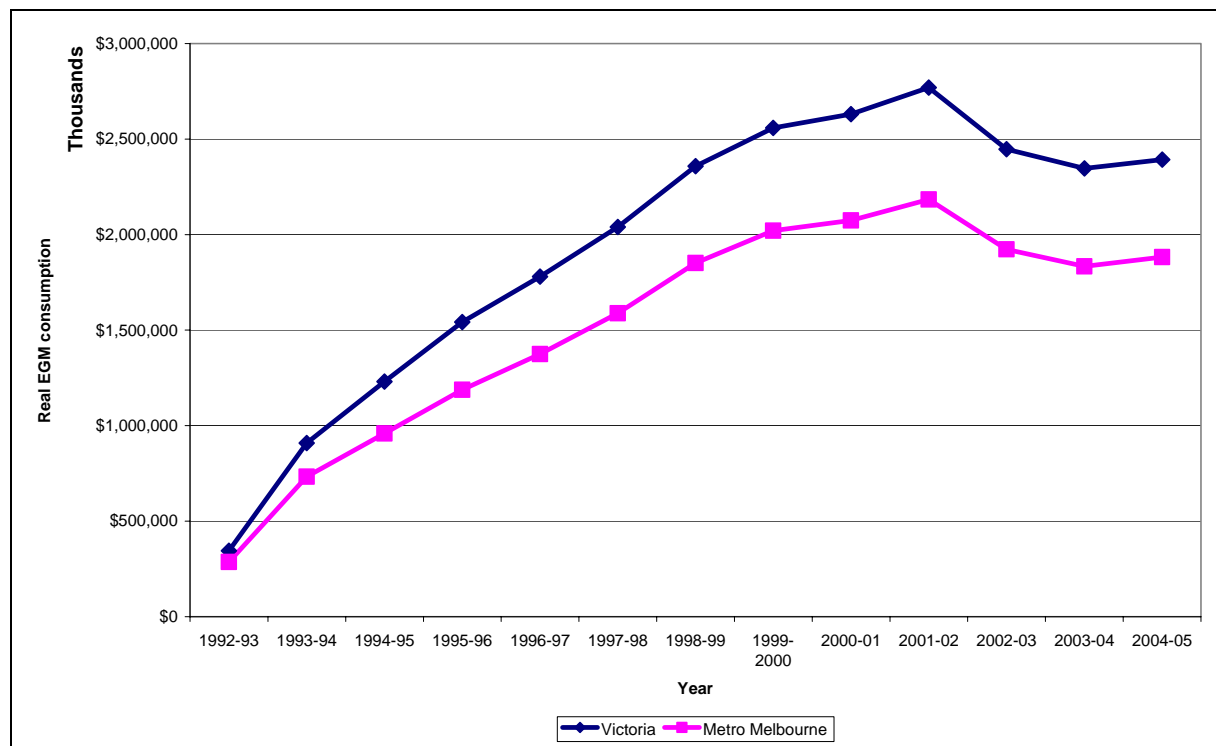
Clearly, governments in general rely heavily on taxation revenue sourced from gambling and it would be difficult to replace this revenue stream, particularly given the relative paucity of revenue opportunities available to state governments in Australia. In our opinion this factor is integral to both the definition of parameters of the technical system of EGM gambling and to their prescribed settings, and is hence a factor that must be considered in determining the way the system has evolved and is likely to develop in future.

3.4 EGM gambling consumption in Victoria

This section provides an overview of some key indicators of EGM gambling consumption in Victoria over time and looks at fluctuations in these trends. These fluctuations are correlated to changes in EGM technical system to highlight the apparent effect of some interventions in the EGM system on EGM gambling consumption. The focus is on Victoria but with some attention given to differences or changes in policy settings in other jurisdictions. In this respect we consider outcomes associated with changing the technical capabilities of the EGM system to provide an illustration of the argument that manipulation of the technical system correlates with changes in aggregate consumption. The late downturn in real EGM gambling consumption is discussed in the context of the smoking ban that significantly altered the gambling environment in clubs and hotels.

Figure 3.12, below, shows real expenditure on EGM gambling in Victoria and in metropolitan Melbourne from 1992-93 until 2004-05.

Figure 3.12 Real EGM gambling consumption, Victoria and metropolitan Melbourne, 1992-93 to 2004-05, (June 2005\$)



Source: OGR, 2005; VCGR,

<http://www.vcgr.vic.gov.au/CA256F800017E8D4/Statistics/7BEB6D4D35DE9201CA25702D00176631?Open>
accessed 19/8/05.

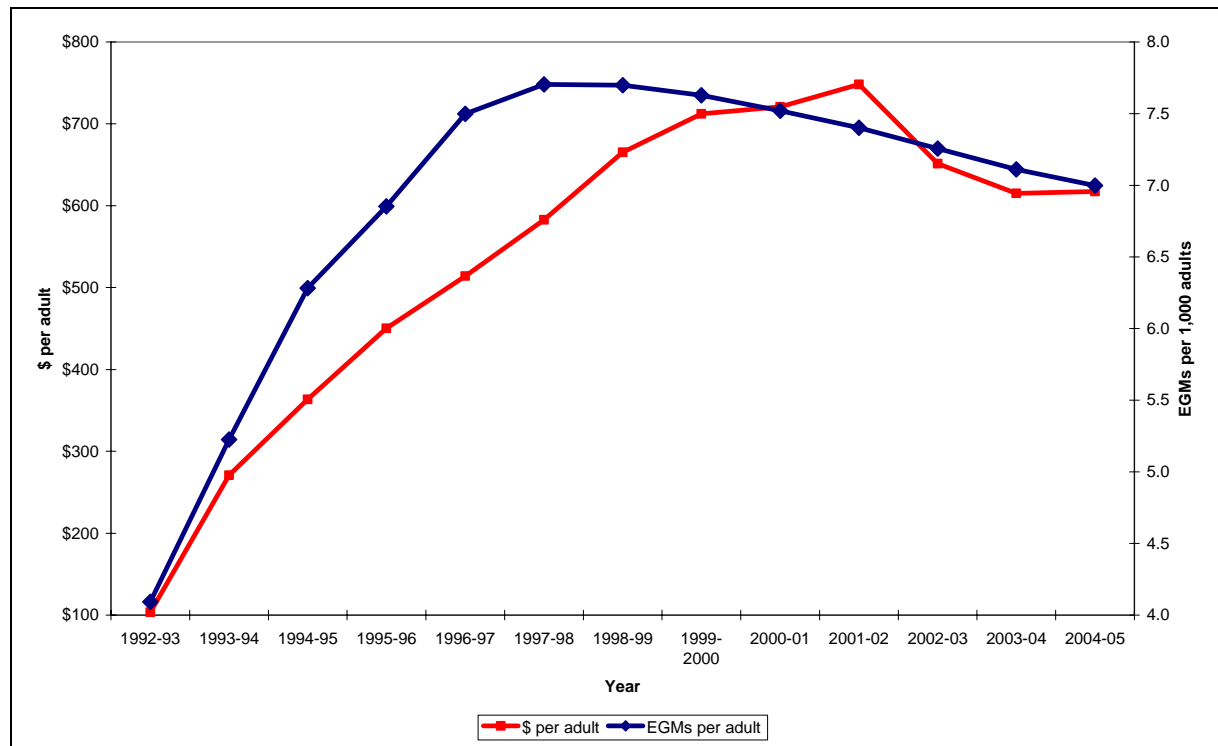
The common shape of the curves shown in Figure 3.12 is found across all measures of EGM gambling consumption. This curve can be broken down into three distinct phases. The first of these, up until 1996-97, was a period of rapid growth in consumption driven by the roll-out of EGMs to club and hotel venues. The second noticeable phase commences in 1996-97 and is a period of relative rapid growth that is associated with rising levels of real expenditure per EGM (see Figure 3.14, below), which we argue below was intensified by the introduction of banknote acceptors. This second growth phase slowed as it extended, until a third phase was reached, characterised by a decline in real EGM gambling consumption post-2001. It is

argued that this third phase can be linked to changes to regulations affecting smoking in gaming venues.

Overall, Figure 3.12 demonstrates that total real EGM consumption increased rapidly in Victoria, although at steadily declining rates of growth (see Figure 3.13), until it reached a peak in the year to June 2002. There was a significant decline in consumption in the year to June 2003, and a further less severe decline in the year to June 2004. There was some recovery in the year to June 2005, amounting to about 2.0% in real terms for Victoria and about 2.6% in real terms for metropolitan Melbourne.

There is a rapid growth in real EGM gambling consumption evident in the early years of the series shown in Figure 3.12. This rapid growth phase is associated with the roll-out of EGMs and the growth of expenditure from a zero base. As Figure 3.13 illustrates (below), the roll-out of EGMs in Victoria peaked in 1997-98 when the number of EGMs per 1,000 adults in the population reached a figure around 7.6. Since this point the density of machines has slowly declined as machine numbers have been capped and population has continued to grow.

Figure 3.13 Density of EGMs & real adult per capita EGM gambling consumption, Victoria 1993-2005 (\$June 2005)



Sources: http://www.ogr.vic.gov.au/domino/web_notes/ogr/ogrsite.nsf/pages/baseline_historical (1992-93 to 2003-04); <http://www.vcgr.vic.gov.au/CA256F800017E8D4/Statistics/7BEB6D4D35DE9201CA25702D00176631?Open> (2004-05); ABS CPI 6401.1, July 2005

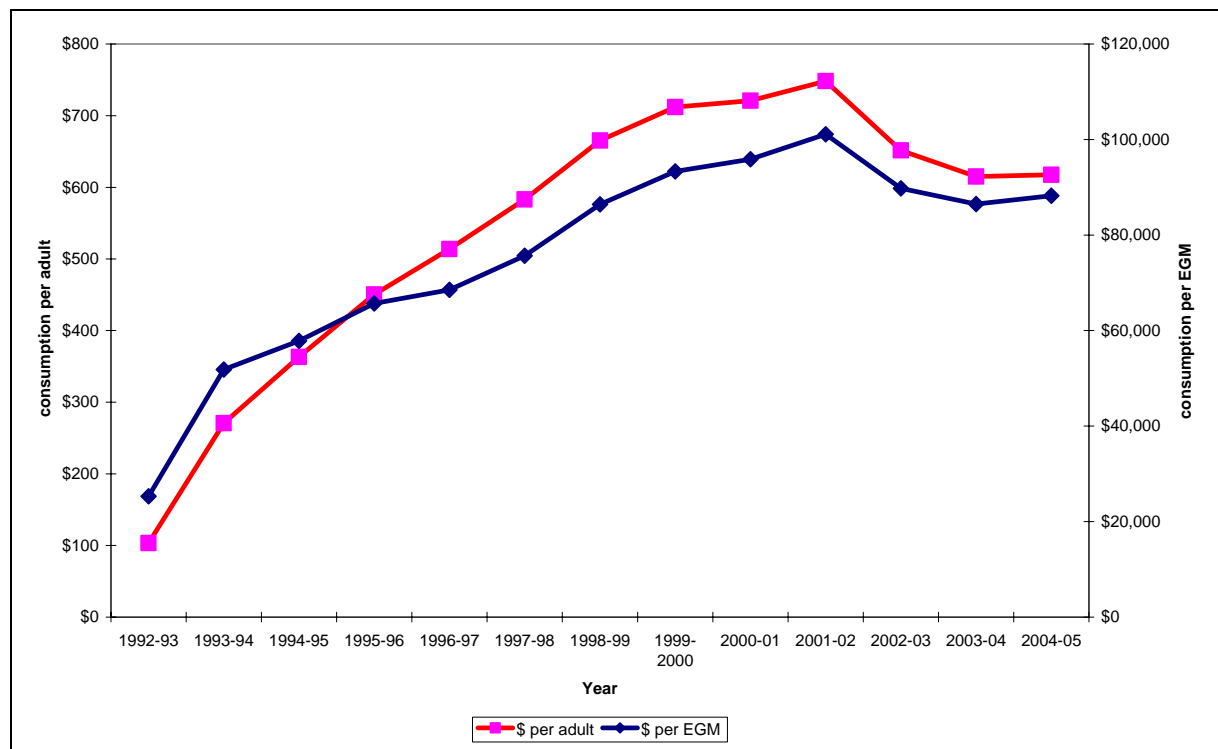
As might be expected, real per capita consumption of EGM gambling increased over the period largely in line with increases in EGM density (measured as EGMs per 1,000 adult). The Pearson product moment correlation coefficient for these data over the entire period shown is 0.92, demonstrating a robust relationship. Even more robust is the relationship in the period 1993-94 to 1997-98, when the density of EGMs peaked, subsequently declining because of the bi-partisan ceiling of 30,000 EGMs in total in Victoria, announced by both

major parties in the period leading up to the 1999 Victorian state election. This correlation coefficient is extremely high, with a value of about 0.99. What is more interesting is that in the period after 1997-98, when EGM density began to decline, real EGM consumption continued to grow. Thus, although much if not most of the growth in EGM consumption could be attributed to increasing availability of EGMs up to this point, after 1997-98 such growth must have been impelled by some other cause. This is not to say that other causes than increasing availability of EGMs were not responsible in part for earlier growth. However, after 1997-98 growth in EGM availability can be subtracted from the equation, as it were. To explain this second phase of stronger growth we looked at the chronology of regulatory changes and manipulations of the technical parameters of EGM gambling. This provided us with a hypothesis which sub-section 3.4.1 explores.

3.4.1 The second growth phase: BNAs and intensification of consumption

The level of consumption per EGM has changed, in some cases quite substantially, over the period since 1992-93. There are likely to be a number of factors involved in this change. Transformations in the level of real consumption per adult on EGM gambling and in the level of real consumption per EGM are shown in Figure 3.14.

Figure 3.14 Real EGM gambling consumption per person & real consumption per EGM, Victoria 1993-2004 (June 2004\$)



Source: OGR 2005, VCGR, 2005, <http://www.vcgr.vic.gov.au/CA256F800017E8D4/Statistics/7BEB6D4D35DE9201CA25702D00176631?Open> accessed 19/8/05.

It can be seen that increased per capita consumption of EGMs is accompanied by increases in real consumption per EGM. To some extent this is to be expected. However, it is clear that growth in per capita consumption of EGMs exceeds growth in EGM availability, in some cases by a considerable amount. Growth in real EGM consumption may be fuelled by growth in population, growth in the number of EGMs, and growth in the ‘intensity’ of use of EGMs, that is in the average real value of consumption per machine. In Victoria’s case, all three

factors appear to have contributed to total growth in consumption, but to varying degrees over time.

It is important to be clear what we mean by ‘intensification’ of EGM gambling consumption. What we refer to by this term is an increase in the real consumption per EGM, within a certain period. This does not distinguish between consumption expenditure diverted from other consumption or savings, and gambling consumption brought forward, in that the consumption would have occurred anyway at some point in the future. All other things being equal, intensification may be due to greater amounts being staked (bets and/or lines) than previously, or to EGMs being used more than in previous periods (or being played at a faster rate of consumption, where play approaches full-time use). These are changes to demand, that is to the pattern of behaviour of individual gamblers.

However, intensification may also result from changes to the form of supply of EGM gambling opportunities, in this case in the parameter values of the EGM gambling system. One highly relevant parameter value here is ‘BKNTLIM’ which limits the credit values that can be loaded on an EGM at any time. In effect, this parameter governs the number of coins or banknotes that can be inserted into an EGM. Looking at this side of the equation, the advent of banknote acceptors (BNAs) in Victoria greatly facilitated the more rapid and straightforward loading of money into EGMs, and hence ensured that the purchase of larger credit values became very easy. Were all EGMs limited to coin based purchase of credits some EGM gambling consumption may have been deferred until the next gambling session ($cs+1$). However, the ease of insertion associated with BNAs may bring forward such previously deferred consumption into the current session of play (cs).

The retro-fitting of BNAs to the stock of EGMs in Victorian venues occurred from 1995. The process involved bolting BNAs onto the side of older machines (venues being very keen to keep their successful EGMs) and hardwiring the BNA to the credit meter so notes were turned into credits as if they were coins. Due to these technical changes that had to be made to many thousands of EGMs the roll-out of BNAs took some time. Penetration of BNAs was very uneven, with an estimated 90% of metropolitan and popular regional venues fitted with BNAs by the time approximately ten per cent of country venues had been modified. The introduction of BNAs was very much supply driven as evidence from overseas was suggesting that BNAs increased turnover significantly. In addition, reduced costs in the handling of currency in the form of reduced volumes of coins could be anticipated.

There is certainly a correlation in terms of time period between the second phase of relatively strong growth in EGM gambling consumption and the introduction of BNAs. It is our hypothesis that the intensification that this second phase of relatively stronger growth represents was in fact driven by the alteration made to the EGM technical system to allow the retro-fitting of BNAs to older EGMs and the approval of new machines with BNAs. Although it is not possible to show definitively that this is the case we use two strategies to support this hypothesis. The first of these is to try and disentangle growth in EGM gambling consumption through intensification, from that fuelled by growth in either population or EGM numbers. The second strategy used to support the hypothesis is to look at evidence involving BNAs from other jurisdictions.

In relation to disentangling growth due to intensification from other factors, a simple approach to determining what part of total growth can be notionally attributed to each factor is set out in Table 3.3 (below). This table shows rates of population growth using ABS adult

population estimates, growth in the number of EGMs deployed, and growth in aggregate real EGM consumption. It will be clear that the first two of these do not amount to the third, and accordingly an estimate of that part of growth notionally due to ‘intensification’ (or in later years ‘de-intensification’) of EGM utilisation can be calculated on a simple arithmetic basis. This approach assumes, *ceteris paribus*, (i) that the proportion of people using EGMs will be maintained as a constant proportion of the eligible population and (ii) that the average consumption per EGM will be at least maintained as additional EGMs are deployed.

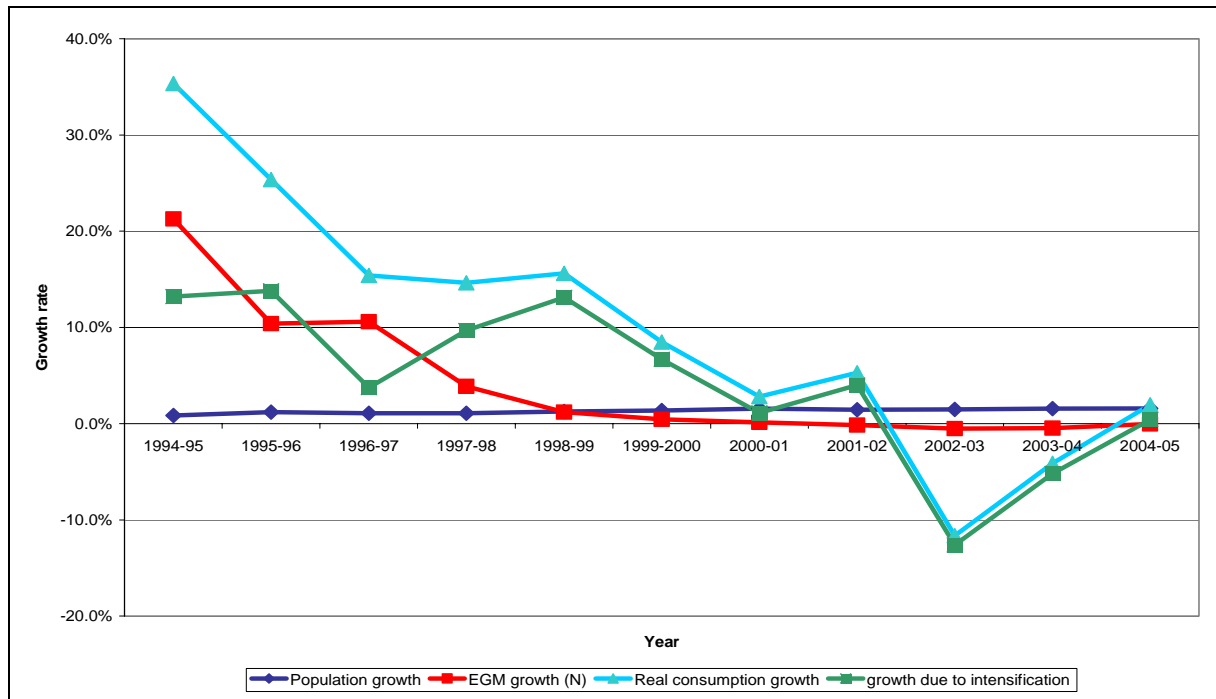
Table 3.3: Components of real growth in EGM consumption

Year	Adult Population	\$ real consumption	EGMs (N)	Pop'n growth	EGM growth	Real consump'n growth	Growth notionally due to intensification
1992-93	3,338,248	345,299,320	13,661	-	-	-	-
1993-94	3,356,801	908,896,021	17,537	0.6%	28.4%	163.2%	134.3%
1994-95	3,385,521	1,230,143,323	21,268	0.9%	21.3%	35.3%	13.2%
1995-96	3,425,734	1,542,281,178	23,478	1.2%	10.4%	25.4%	13.8%
1996-97	3,462,668	1,779,742,447	25,962	1.1%	10.6%	15.4%	3.7%
1997-98	3,500,237	2,040,200,564	26,965	1.1%	3.9%	14.6%	9.7%
1998-99	3,544,685	2,358,603,191	27,289	1.3%	1.2%	15.6%	13.1%
1999-2000	3,593,033	2,558,745,415	27,408	1.4%	0.4%	8.5%	6.7%
2000-01	3,649,313	2,630,895,899	27,444	1.6%	0.1%	2.8%	1.1%
2001-02	3,701,964	2,770,107,939	27,400	1.4%	-0.2%	5.3%	4.0%
2002-03	3,756,853	2,447,512,793	27,260	1.5%	-0.5%	-11.6%	-12.6%
2003-04	3,815,279	2,346,806,317	27,132	1.6%	-0.5%	-4.1%	-5.2%
2004-05	3,875,640	2,393,030,966	27,124	1.6%	0.0%	2.0%	0.4%

Source: OGR

These data are also set out in Figure 3.15, below.

Figure 3.15 Components of real growth, EGM gambling consumption, Victoria, 1994-95 to 2004-05

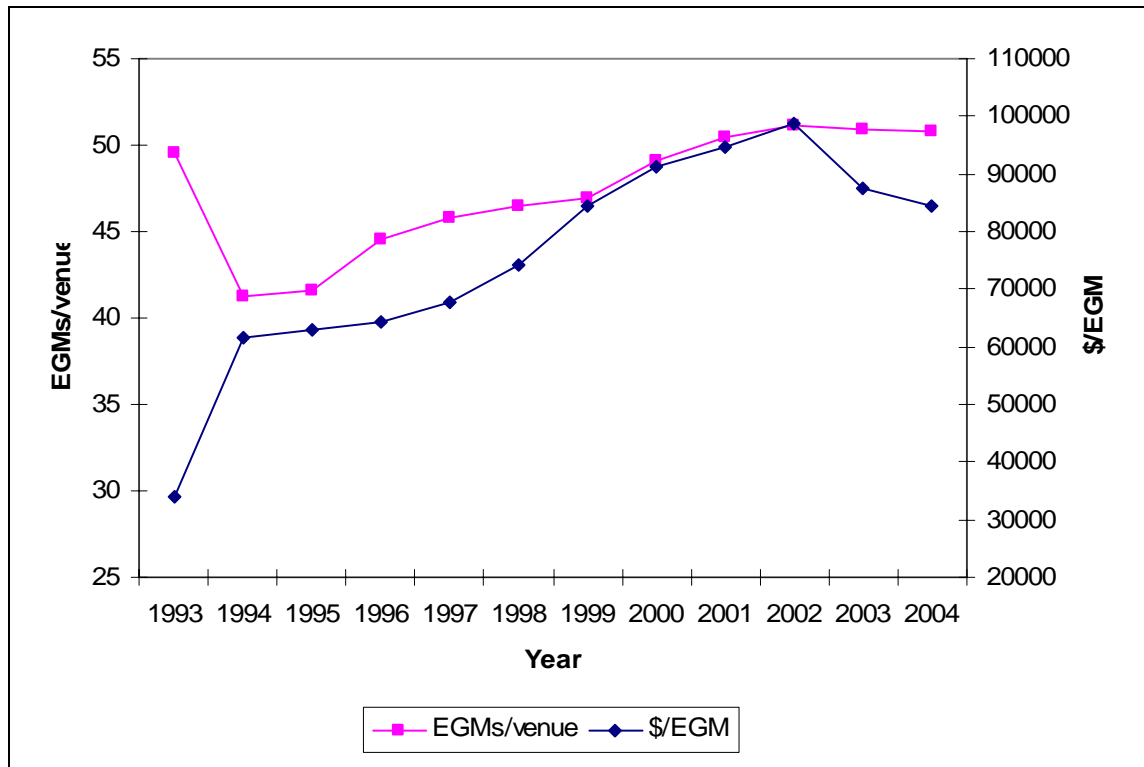


Sources: OGR, ABS 2004

It is of course possible that large increases in EGM availability may have ‘diluted’ consumption per EGM (in the early part of the series, higher than population growth). However, we can empirically observe that consumption per EGM increased throughout the period shown in Figure 3.15, in the first part of which the availability of EGMs grew, as did average venue size, measured by the number of EGMs per venue. It can be seen that a noticeable increase in the component of growth due to intensification occurs in the period correlating to the introduction of BNAs.

Growth in real EGM gambling consumption per EGM is displayed in Figure 3.16, as is growth in average venue size. What this demonstrates is the likelihood that increased consumption of EGM gambling is to some extent induced by the available supply of EGMs. However, the rapid growth in real expenditure per EGM in the three years following 1997 is also consistent with a rise in intensification attributable to the deployment of BNAs across the EGM system.

Figure 3.16 Real expenditure per EGM & average number of EGMs per venue, Victoria 1993-2004 (June 2004\$)



Source: ABS 2004; OGR 2005.

Actual growth in real consumption per EGM is in fact very close to the estimated rate of growth due to intensification shown in Table 3.3 and Figure 3.15. This is shown in Table 3.4.

Table 3.4: Comparison of estimates of growth due to ‘intensification’ of EGM use and growth in real consumption per EGM, Victoria, 1994-95 to 2004-05

Year	Growth notionally due to intensification	Growth in real \$ per EGM	% of growth attributable to intensification (see text)
1994-95	13.2%	11.6%	37.4%
1995-96	13.8%	13.6%	54.4%
1996-97	3.7%	4.4%	24.3%
1997-98	9.7%	10.4%	66.2%
1998-99	13.1%	14.2%	84.2%
1999-2000	6.7%	8.0%	78.8%
2000-01	1.1%	2.7%	39.8%
2001-02	4.0%	5.5%	75.8%
2002-03	-12.6%	-11.2%	108.3%
2003-04	-5.2%	-3.7%	126.4%
2004-05	0.4%	2.0%	21.2%

Source: OGR

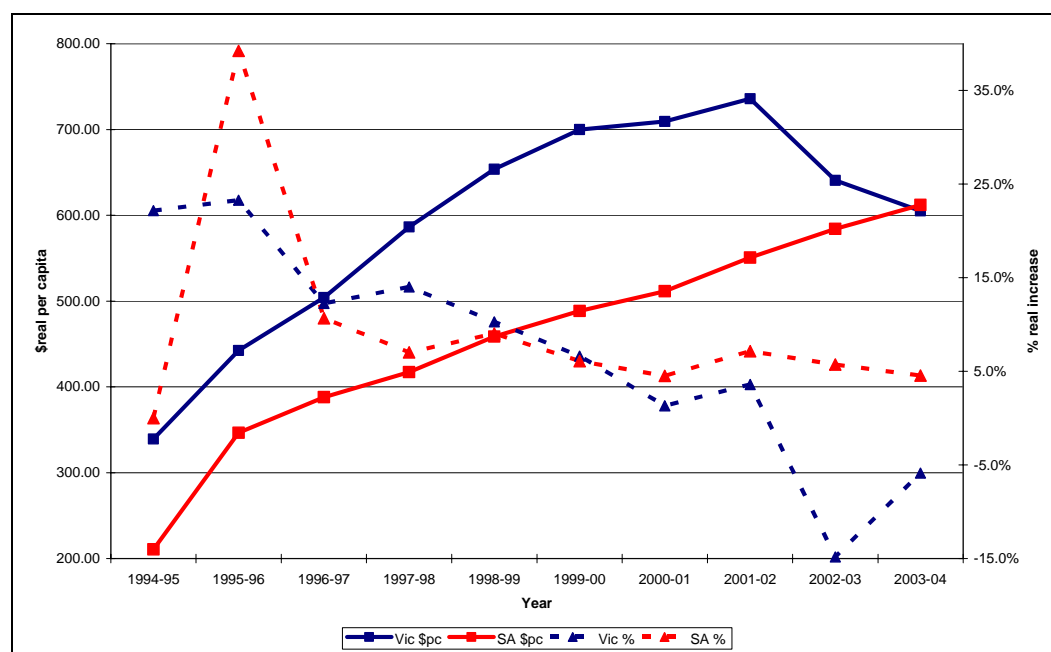
Thus, it may be concluded that our estimates of that part of growth attributable to ‘intensification’ of EGM gambling consumption, by whatever means, are reasonable, given that growth in real consumption per EGM will be related to changes in both EGM numbers and population. The third data column in Table 3.4 also shows that proportion of total growth in EGM consumption which we calculate as attributable to ‘intensification’, that is the extent to which ‘intensification’ of EGM use has contributed to increased consumption. This proportion has changed somewhat over all years shown, with a peak in 1995-96, a further peak in 1998-99 and a further peak in 2003-04, when ‘de-intensification’ more than accounted for total decline in real consumption – that is, growth in population, although combined with a modest decline in EGM numbers, was more than offset by the de-intensification of EGM use.

In summary, it appears that a substantial component of growth in real EGM gambling consumption since the inception of the EGM gambling industry can be attributed to what we have termed intensification. There also seems to be empirical support for the argument that a particular ‘boost’ to real EGM consumption which can be observed between 1997-98 and 1999-2000 was more strongly driven by intensification than by population growth or increase in the availability of EGMs. This adds weight to the argument that the introduction of BNAs was a key factor in this intensification, allowing as it did for larger volumes of money to be loaded more easily into EGMs, and therefore for higher credit values to be available for gambling consumption. It should be noted that anecdotal evidence from industry, government and community sectors, and from gamblers themselves, uniformly supports this conclusion.

3.4.2 Banknote acceptors: evidence from other jurisdictions

A second strategy used to support the hypothesis that the addition of BNAs in Victoria is linked to increased growth in EGM gambling consumption is to look at evidence from other jurisdictions. As mentioned above (see Section 2.9), banknote acceptors are prohibited on EGMs in club, hotel and casino venues in South Australia. It would seem likely that if EGM gambling consumption is facilitated (intensified) by BNAs, then there should be evidence of lower levels of consumption and rates of growth in consumption over time in that state in comparison to Victoria.

Figure 3.17 Real EGM gambling consumption per capita and real EGM gambling consumption growth per capita, Victoria and South Australia, 1994-95 to 2003-04.



Source: OESR 2005

This figure sets out real EGM gambling consumption per capita for Victoria and South Australia in the period following the introduction of EGMs into South Australian clubs and hotels. It will be noted that growth in real EGM consumption per capita in Victoria exceeded that in South Australia in 1996-97, 1997-98, and 1998-99, and was on par in 1999-2000. This is relatively remarkable, firstly because EGMs were in their preliminary phase in South Australia in those years, secondly because the density of EGMs in South Australia has been substantially greater than in Victoria for some time, and finally because around ninety per cent of South Australian EGMs are located in hotel venues, which in Victoria and elsewhere generate much higher average levels of consumption than EGMs located in clubs. Delfabbro & LeCouteur (2003: 106) note that, despite SA having many more EGMs per capita, average consumption per EGM was much lower in that state than in Victoria during the late 1990s. As at June 2005, the density of EGMs in South Australia was 11.7 EGMs per 1,000 adults substantially above that in Victoria (7.0 EGMs per 1,000 adults). However, consumption per EGM in June 2005 was very much lower in SA (\$4,381) compared to Victoria (\$7,344) and per capita consumption was on a par (\$51.55 in Victoria compared to \$51.46 in South Australia).²⁶ We would argue strongly that the much higher density of EGMs in South Australia, if combined with BNA equipped EGMs, would result in average consumption per EGM much closer to that in Victoria, and an accompanying much higher level of consumption per adult. Of course, some allowance must be made for system characteristics in Victoria which are distinct from those in South Australia, such as the duopoly arrangement in Victoria which permits more considered marketing and targeting of EGMs, and the substantially higher ceiling for the number of EGMs permitted in venues (105 in Victoria against 40 in South Australia). Nonetheless we would expect that this should be offset by the already noted preponderance of hotel venues in South Australia, as compared to Victoria where half of the available EGMs must be located in licensed clubs.

²⁶ Sources for these figures are regulators' websites: <http://www.olgc.sa.gov.au> and <http://www.vcgr.vic.gov.au>

With the exception of a sharp ‘spike’ in consumption levels in 1995-6 in South Australia, EGM growth in Victoria was higher over the period of the mid to late 1990s. EGMs had been deployed in Victoria for approximately three years at the time of their deployment in South Australia. It would be anticipated that growth in Victoria would therefore have declined relative to the anticipated early stage high growth rates in South Australia. Real per capita consumption of EGM gambling, also shown in Figure 3.17, demonstrates how Victorian consumption continued to diverge noticeably from that in South Australia until the introduction of the smoking ban appears to have brought about a real decline in per capita EGM gambling consumption and closed the ‘gap’ between per capita expenditure in the two states.

As noted, there are noticeable distinctions between the regulatory regimes applying in the two jurisdictions. The interruption to the growth series visible in the Victorian data for 1997-98 corresponds to the commencement of BNA retro-fitting to Victorian EGMs, and this phenomenon accounts disproportionately for Victorian per capita consumption continuing to exceed that in SA. It will also be noted that there is no such volatility evident in the per capita consumption of EGMs in South Australia over the relevant period, during which growth hovered between five and ten per cent. As we have already argued, growth in EGM consumption may be driven by population growth, intensification of EGM consumption or in growth in EGM numbers. Indications are that, prior to the smoking ban, BNAs were a key factor in driving per capita EGM gambling consumption in Victoria ahead of levels attained in SA. Indications are also that the relatively high density of EGMs in South Australia is the key driver of the steady growth in per capita consumption of EGM gambling in that state, which has now reached a level on a par with post-smoking ban levels in Victoria.

Turning to evidence from another jurisdiction, a dramatic revenue shock accompanied the introduction of limitations on the number and denomination of bank notes that could be inserted into EGMs in Queensland in December 2001. Initially, EGMs were adjusted so that bank note acceptors could accept only a maximum of one \$20 note initially and a further note after the available balance had dropped below \$20, permitting a maximum credit value of \$39.99 arising from the insertion of notes. The introduction of this measure (which was amended within one month of introduction to permit the insertion of up to five notes or a maximum credit value of \$100) was accompanied by a sharp decline in consumption growth. An evaluation of the modification of BNA parameters identified this as an outlier “suggesting a large irregular event occurred in December 2001”. The seasonally adjusted growth pattern series over this period would have suggested that modest (1%) growth in consumption could be anticipated. However, the actual result in this month was a decline of about 6% (Brodie, Honeyfield & Whitehead, 2003: 14-15). The authors of the evaluation report concluded that over time there had been no sustained reduction in consumption of EGM gambling outside the long-term trend. Of course, the modification of the original intervention means that an assessment of its long-term impacts is not possible. We would hypothesise that the initial shock was associated with the reduction in maximum credit obtainable from inserting currency (previously any denomination note up to \$100 could be inserted while the credit balance was less than \$100; thus the maximum credit limit obtainable from inserting currency was \$199.99) (Brodie, Honeyfield & Whitehead, 2003: 10). The short-term effect of the intervention was thus to limit the maximum credit available from the insertion of currency to \$39.99 (a reduction of \$160) and limit currency to \$20 notes or smaller. The modified longer-term result was to permit EGMs “to accept up to five \$20 notes at any break in play with no dependence on the value of credits already in the machine” (Brodie, Honeyfield & Whitehead, 2003: 10).

Thus the short and longer-term interventions were quite distinct and could be expected to have distinct consequences, which appears to have been the case. The initial intervention resulted in an immediate reduction in EGM consumption, which recovered to 'normal' levels as soon as the intervention was modified. This compares with a limitation on BNAs accepting notes of greater than \$20 denomination introduced into the ACT in late 2004, which was reported to have resulted in a five per cent decline in EGM consumption within a short period of time (personal communication, Club Care gambling counselling service, 2005). In contrast, the 2002 limitation of BNAs in Victoria to \$50 denomination notes and below,²⁷ but with no effective limit on maximum credit obtainable from the insertion of currency (see Table 2.7), appears to have had no appreciable effect on EGM consumption although this is somewhat hard to evaluate due to the confounding factor of the decline in EGM gambling expenditure flowing from the smoking ban in gaming rooms. It may be possible to better evaluate the impact of the 2002 BNA changes in further years, particularly as the shock to revenue apparently associated with the smoking ban plays itself out.

Overall the available evidence on BNAs from Australian jurisdictions supports the view that the availability of BNAs increases the level of aggregate EGM consumption. It follows that these indications also support the hypothesis that the fitting of BNAs to the stock of EGMs drove the second phase of growth in EGM gambling consumption in Victoria.

3.4.2 Restrictions on smoking in club and hotel gaming areas in Victoria

In the course of discussing the various phases in EGM gambling consumption in Victoria we have already noted that it is generally accepted that the decline in consumption in the year to June 2003 was attributable to the prohibition on smoking within gaming rooms which was introduced into Victoria from 1 September 2002. Figure 3.18, below, illustrates the fall in real EGM consumption growth rates that occurred at this time.

²⁷ It should be reiterated in this context that Australian ATMs do not dispense \$100 notes (they almost universally dispense \$20 and \$50 notes) making the value of this change somewhat debatable from the outset.

Figure 3.18 Real growth rates, EGM gambling consumption, Victoria and metropolitan Melbourne, 1993 to 2005

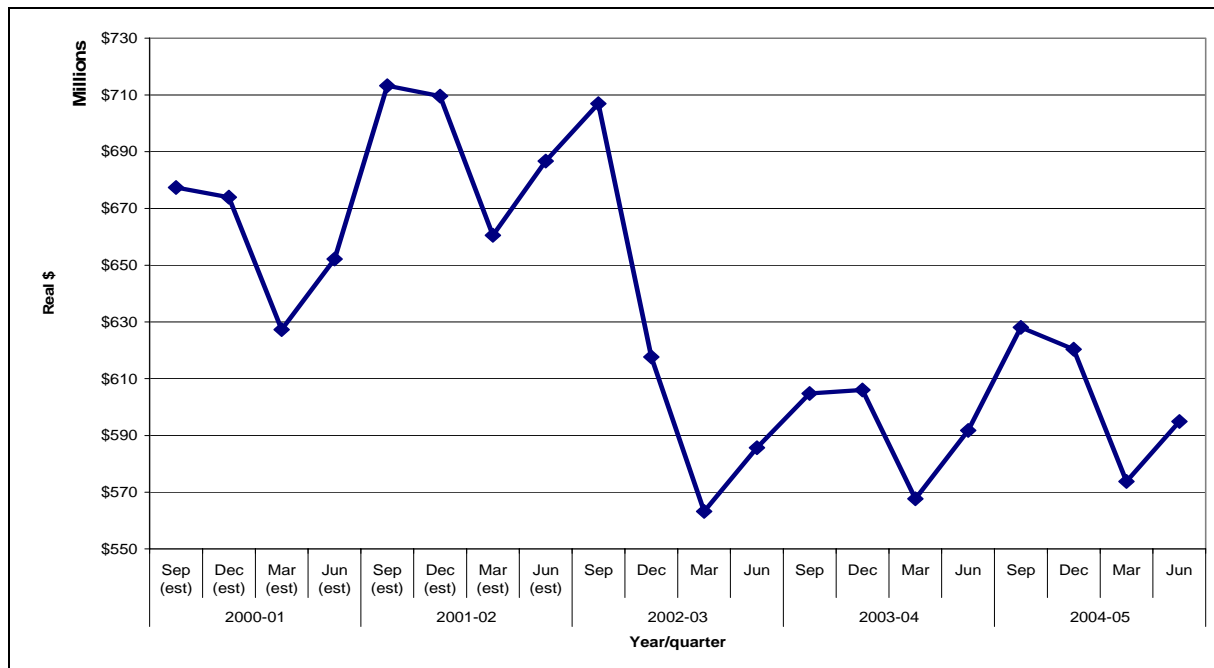


Source: OGR, 2005; VCGR, 2005,

<http://www.vcgr.vic.gov.au/CA256F800017E8D4/Statistics/7BEB6D4D35DE9201CA25702D00176631?Open> accessed 19/8/05.

As Figure 3.18 shows, real growth rates for EGM gambling consumption had been trending down overall, but with an increase around the time BNAs were fitted to the stock of EGMs and again in 2002. However, a strong shock to real growth rates subsequently occurred, and this has generally been hypothesised to be a consequence of the smoking ban. A more detailed examination of monthly EGM data supports this view, as shown in Figure 3.19 (below). The data set out in Figure 3.19 consist of seasonally adjusted quarterly estimates for 2000-01 and 2001-02, and actual quarterly totals for following years. These data have been adjusted for inflation using quarterly ABS CPI index values.

Figure 3.19 Real EGM gambling consumption, Victoria, September quarter 2000 to June quarter 2005 - \$June 2004-05*



Source: OGR, 2005; VCGR, 2005; ABS CPI Cat No 4601.0 released July 2005 *Note: data for 2000-01 and 2001-02 are seasonally adjusted estimates.

<http://www.vcgr.vic.gov.au/CA256F800017E8D4/Statistics/F57C8E1993956471CA25701C004BCCA7?OpenDocument>

What is clear from Figure 3.14 is that consumption dropped markedly after the September quarter 2001 and, in the absence of any other regulatory or other measure or intervention introduced at this time, this sudden decline can be sensibly attributed to no cause other than the introduction of the smoking prohibition. However, the fact that real per capita growth in EGM consumption resumed in the year to 2004-05 (see Figure 3.18) demonstrated the capability of the EGM industry to respond to the altered regulatory context. Field observations undertaken by the researchers and anecdotal evidence reported elsewhere²⁸ indicate that the decline in EGM consumption in Victoria attributed to the smoking ban has been and continues to be addressed by alterations to venue characteristics, specifically through the inclusion of 'smoking rooms' adjacent to, and with a view of, gaming rooms. Often, such areas are separated from gaming rooms only by a rope or waist high barrier, allowing EGM consumers to maintain visual and aural contact with EGMs whilst smoking.

One question that the decline in real EGM consumption raised was whether this can be correlated to any net benefit to social wellbeing, either through a reduction in problem gambling or a slowing of the progression of at-risk gamblers to problematic gambling behaviour. Marshall (2004) argues that the ban on smoking introduced in 2002 was not an effective harm minimisation measure in a 'problem gambling' context, concluding that

the ban on smoking, although recording a clearly identifiable drop in expenditure, can in no way be claimed as a successful harm minimisation strategy for gambling. There is no evidence whatsoever that the 10% - 20% decline in EGM expenditure is a result of changed behaviour by problem gamblers (Marshall 2004: 15).

²⁸ See for example ABC-TV *Four Corners*, 13 October 2003.

Marshall's central argument is that a smoking ban is not an effective (gambling) harm minimisation measure unless the decline in expenditure can be shown to have been due to a reduction in expenditure by problem gamblers.

New Focus (2004) found that 56% of their sample of 142 'problem gamblers' smoked, compared to the 2001 general adult population prevalence for all smokers of 24.8%, or 20.2% for those who smoke daily (males) and 20.3% of whom 16.5% smoke daily (females) (DHS 2004). McMillen et al. (2004: 69) found that around 23% of regular gamblers cited smoking as their reason for taking a break from gambling, and that 1.8% of regular gamblers nominated that they would spend money used for gambling on cigarettes if available, compared to 1.0% of non-regular gamblers (2004: 74). Research by Rodda, Brown and Phillips (2004), demonstrated a higher incidence of smoking amongst 'problem' gamblers than 'non-problem' gamblers, and concluded that

[t]his study provides evidence of a high smoking rate in a sample of untreated problem gamblers and a robust linear relationship between problem gambling and the likelihood of tobacco use and tobacco dependence in Electronic Gaming Machine players (Rodda, Brown & Phillips 2004: 78).

The most widely disseminated estimate of the disproportionate level of EGM gambling consumption by problem gamblers is that calculated by the Productivity Commission, which reported that 'problem gamblers' using EGMs made up just 4.7% of the population of all those who played EGMs but contributed 42% of EGM expenditure (PC 1999: 6.54 & 7.46). A Canadian study estimated that up to 60% of gaming machine revenues may derive from problem gamblers (Williams & Wood 2005). It can be safely argued that consumption by problem gamblers constitutes a disproportionately large component of EGM consumption.

It can therefore be hypothesised that if, at the very least, smoking prevalence rates are identical across all EGM gambling segments from casual 'recreational' to serious 'problem' gamblers, then up to 42% of any reduction in EGM expenditure attributable from a smoking ban could be expected to have come from reduced expenditure by 'problem gamblers'. Such a hypothesis is, of course, speculative and fails to take into account other factors, such as whether problem gamblers may be more likely to persist at EGM gambling in the face of their desire to smoke than would other gamblers. However, perhaps more significantly the discussion here points toward an underlying or 'structural' characteristic of the smoking prohibition or any explicit harm minimisation measure, namely that effective material measures to minimise harm and reduce 'problem' gambling will be likely to have an effect on EGM revenues, which may be dramatic.

Whether the decline was associated with a disproportionate reduction in EGM consumption by either 'problem' or 'recreational' gamblers is something of a moot point, as already discussed. However, evidence of discontinuities in EGM consumption data such as those associated with BNA modifications or smoking bans, provides substance to the argument derived from public health principles that material intervention measures can be effective in changing consumption behaviour.

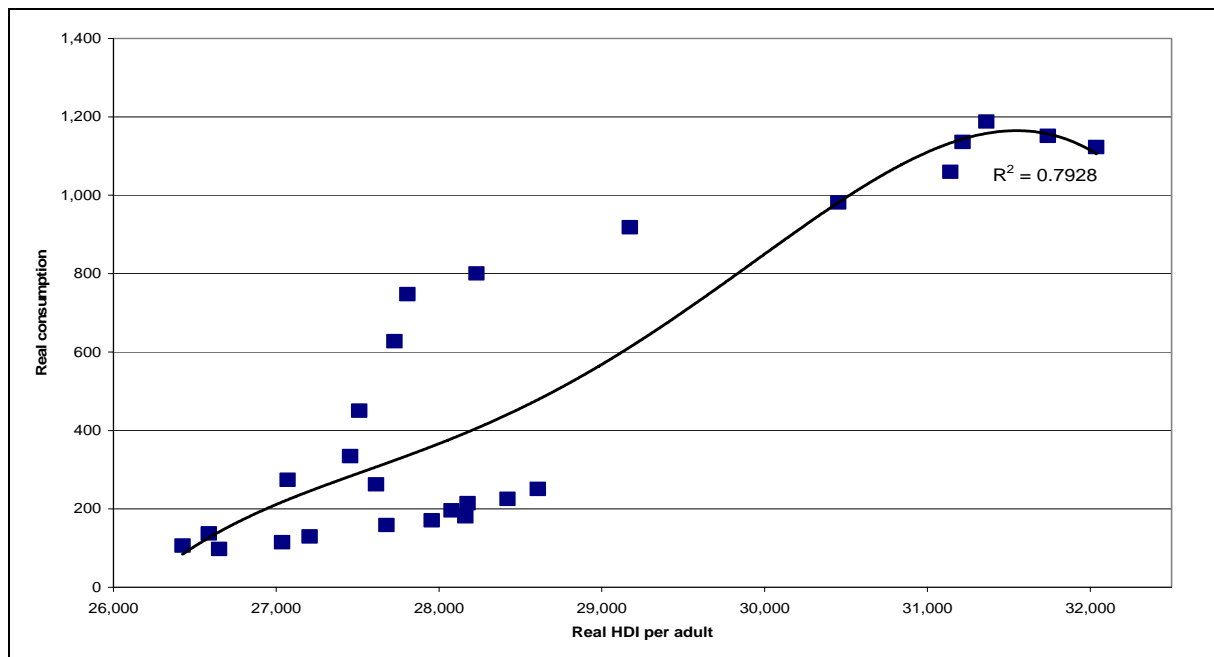
3.5 EGM gambling consumption and changes in household disposable income in Victoria (HDI)

In any consideration of the factors related to the intensification of EGM gambling consumption it is probably useful to have regard to the pattern of growth for EGM

consumption in Victoria and to compare that to growth in real household disposable income for Victoria. Intensification of EGM consumption may be associated with the current availability of more funds for that purpose, along with other causes. This may also further illuminate the apparent relationship at the national level, identified above.

As Figure 3.20 shows, there is an apparent relationship between the real level of HDI per adult and the real consumption of gambling in Victoria from 1978-79 to 2003-04. The R^2 value of the fourth order polynomial trendline is about 0.79.

Figure 3.20 Real consumption of gambling per adult and real HDI per adult, Victoria, 1978-79 to 2003-04 (Note: 90% of HDI assumed to be at disposal of adults).

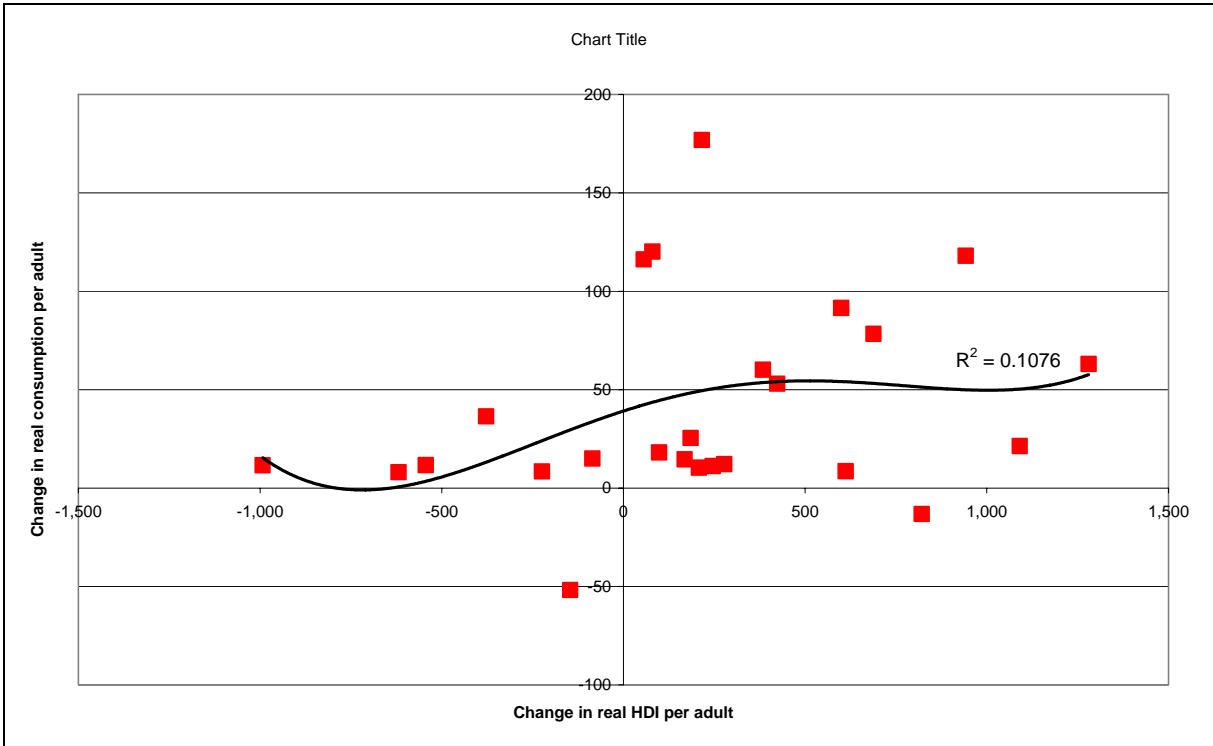


Source: OESR 2005

As with the national series set out in Figures 3.5 and 3.6, however, there is some discontinuity between the elements of the data set. For example, growth in gambling consumption between 1978-79 and 1990-91 was much more modest than in the subsequent period (see Figure 3A).

The relationship between changes in HDI per adult and changes in gambling consumption may also be interesting. If gambling expenditure were sensitive to availability of additional funds, it would be likely that increases in HDI would be accompanied systematically by increased gambling consumption. Figure 3.21 plots real changes in HDI per adult against real changes in gambling expenditure for Victoria over the period 1978-79 to 2003-04, and also shows a fourth order polynomial trendline ($R^2 = 0.1076$) for that plot.

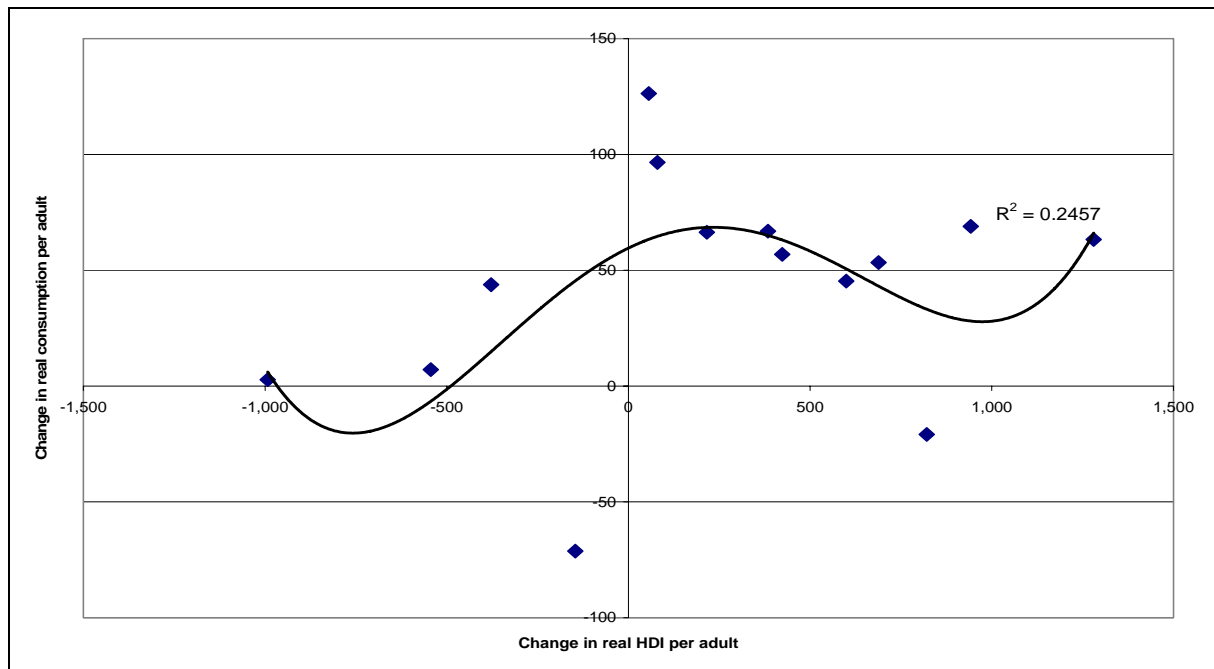
Figure 3.21: Change in real HDI per adult and change in real consumption of gambling per adult, Victoria, 1978-79 to 2003-04 (Note: 90% of HDI assumed to be at disposal of adults)



Source: OESR 2005

It will be clear that there is no consistent relationship between these data series. If gambling consumption were sensitive to movement in real HDI, one would expect to see concomitant increases during periods when HDI increased and concomitant declines in consumption during periods when HDI declined. In fact real HDI per adult declined on seven occasions during the period plotted in Figure 3.21 whereas real gambling consumption declined on two occasions. More importantly, on only one occasion did gambling consumption decline in the same period as real HDI declined, and that was in the year after the introduction of the smoking ban. What is evident from Figure 3.21 is that large changes in real HDI per adult are not systematically accompanied by large changes in real consumption of gambling, and in particular that large declines in real HDI per adult were not accompanied by declines in real consumption of gambling.

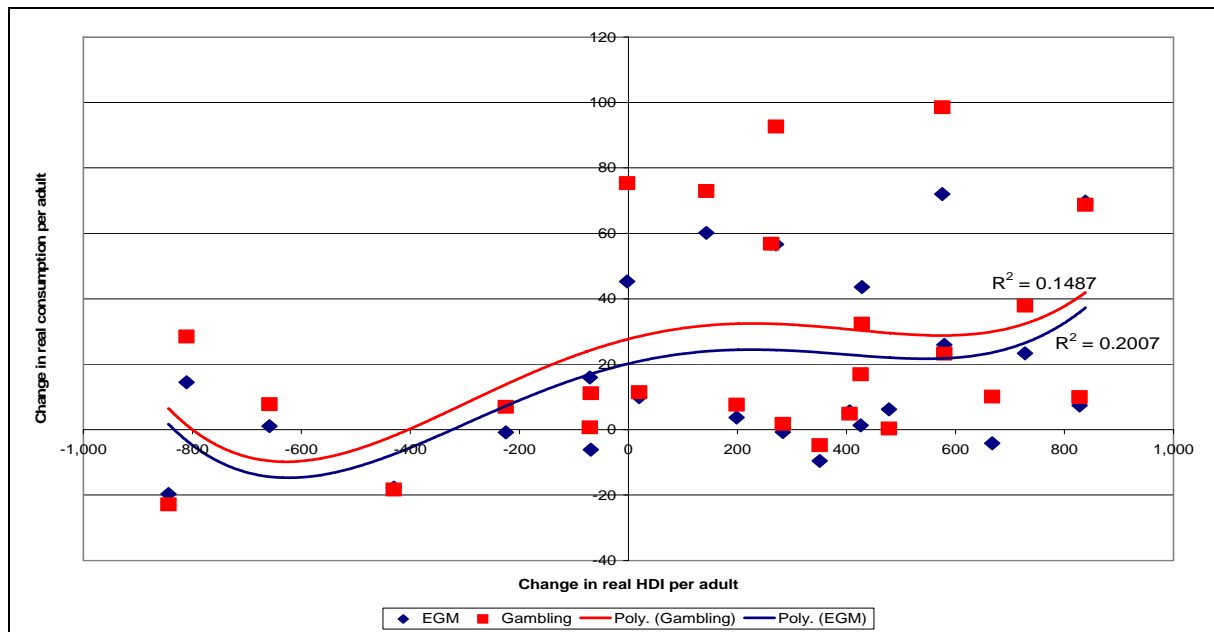
Figure 3.22 Change in real HDI per adult and change in real consumption of EGM gambling per adult, Victoria, 1990-91 to 2003-04*



Source: OESR 2005 * Note: 90% of HDI assumed to be at disposal of adults.

Figure 3.22 plots similar data comparing changes in real HDI per adult against changes in the real consumption of EGMs per adult for Victoria, together with a fourth order polynomial trend line ($R^2 = 0.2457$). The time period shown in Figure 3.22 is from 1991-92 until 2003-04 (noting that EGMs were not generally available in Victoria until after 1991). Again, it is difficult to discover a consistent relationship between movements in real HDI per adult and EGM consumption per adult. Although there is a stronger relationship in this plot as against Figure 3.21, the relationship is undoubtedly quite weak and displays little sensitivity between changes in real HDI per adult and real consumption of EGMs per adult. That is, large changes in real HDI are not accompanied by large changes in real consumption. In fact, the largest changes in real consumption occur at times of quite modest change in real HDI. The two occasions when real consumption declined are in the period following the introduction of the smoking prohibition. Similar data for Australia overall is plotted in Figure 3.23 (below) and this plot shows a similar lack of sensitive correlation.

Figure 3.23 Change in real HDI per adult and change in real consumption of gambling and EGM gambling per adult, Australia, 1978-79 to 2003-04*



Source: OESR 2005. * Note: 90% of HDI assumed to be at disposal of adults.

Thus, while we can conclude that although there is some evidence that increases in aggregate HDI appear to correlate relatively closely with changes in aggregate consumption of gambling, there is little evidence of any sensitive causality in this relationship.

Explanation of patterns of gambling consumption must draw on social, technical, regulatory and individual factors in building interpretations and explanations, rather than relying on the apparent convergence of macro- or micro-economic trends. For example, the composition of household budgets and relative allocations to different items as a share of the budget is a key factor not yet understood in the context of EGM gambling consumption. In the following second part of the analysis of EGM gambling consumption we look further at aggregate data and selected data on localised EGM gambling consumption to highlight further relationships between EGM gambling and components of the EGM socio-technical system.

4 Consumption of EGM gambling: Part 2

In this section we examine selected aggregate data that contribute to understanding the dynamism and varied nature of EGM gambling consumption, and the EGM system. We had hoped to be able to analyse individual machine data, including game type, credit values, bets and expenditure, for a sample of different venues and/or LGAs. Analysis of machine data would have enabled some insight into aggregate patterns of EGM gambling consumption and enabled the testing of the influence of different components of the system on consumption. Unfortunately these data could not be provided by the (then) Office of Gambling Regulation (OGR). The OGR did provide the most detailed data available at the time of the study, and, we understand, at considerable effort, for which the researchers are very grateful. Analysis of data provided was undertaken at the aggregate, local area and venue levels and according to various dimensions of the EGM system and characteristics of EGM consumption. The results of several of these analyses are reported here. Whilst the data indicate that the EGM system is uneven in its distribution and varied in its performance, a number of processes of rationalisation can be detected.

4.1 Distribution of EGM gambling in Victorian local areas and its relationship to socio-economic inequality

The spatial distribution of EGMs is a complex matter, although the Productivity Commission demonstrated that in New South Wales, South Australia and Victoria it was most probable that EGMs are distributed with a bias towards 'low income' areas of those states (PC 1999: 30). Although data for other jurisdictions are available at some level, the relevant Victorian data are more accessible than some other jurisdictions (certainly in contrast to New South Wales, for example). However, there is a lack of consistency across jurisdictions about what data are collected and processed, and about how those data are made available to researchers and the public. This inconsistency restricts the opportunity for comparative analysis. Perhaps based on the success of the collaboration on national technical standards, a standardised national approach to research data provision and management would greatly assist comparative analysis, and we believe this should be a priority of state and territory regulators. This would assist in the creation of an evidence base oriented to the achievement of the variety of legislated goals related to responsible gambling, harm minimisation and consumer protection.

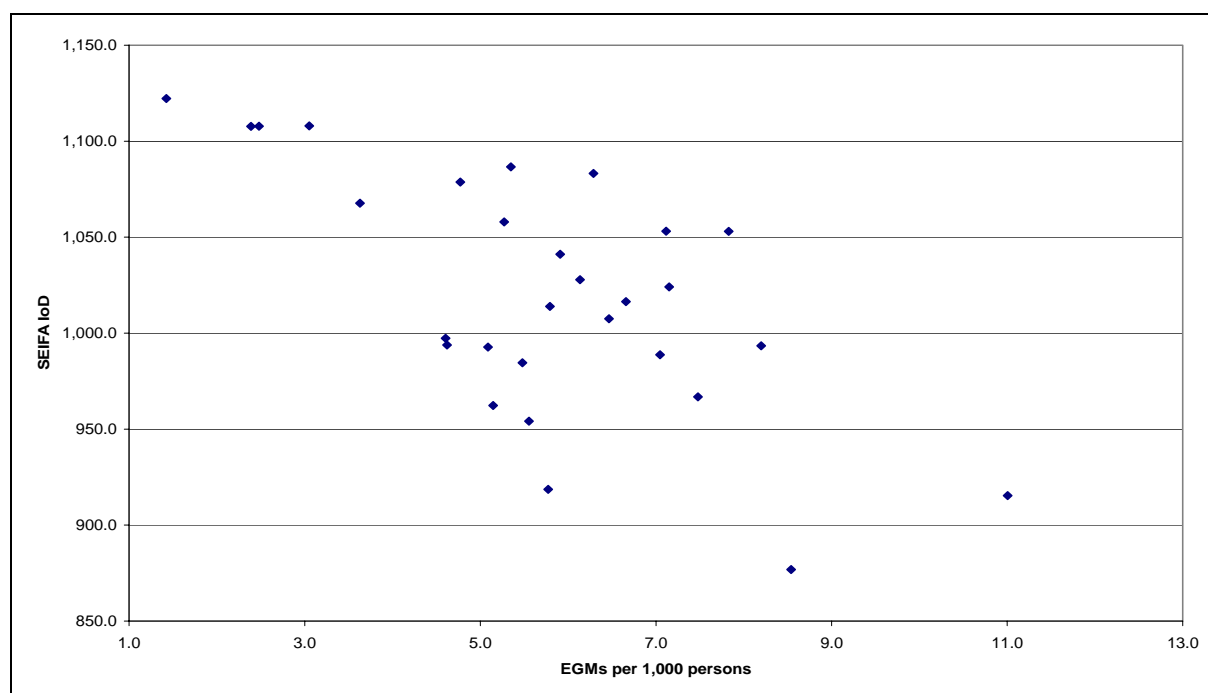
In Victoria, the EGM industry was established relatively recently and, unlike the situation in NSW, has been built around a networked centralised information technology system since its inception. The information available to the two gaming operators across their entire and substantial networks is comprehensive and real-time. Decisions relating to EGM deployment, performance and re-deployment of EGMs are thus strategic and commercially well informed. The distribution of EGMs in Victoria therefore can be understood as reflecting an accumulation of the entire network history of information-based commercial decisions allowable by regulation.

As discussed in the previous section, licensing a commercial product with an acknowledged level of potential consumer harm attached to it has allowed governments to extract extra revenues in the form of taxation, notionally to pay for externalities, i.e., socialised costs associated with its consumption. As was also discussed, arbitrary limits on the numbers of EGMs increase the risk of intensification of EGM use in the achievement of commercial revenue growth rates and hence budgeted taxation returns to government. However, as both an indirect beneficiary and the regulator of gaming, government sends ambiguous signals to

licensed operators about the extent to which potential revenue generating innovations are acceptable. In Victoria for example, the commercial decision-making of the operating duopoly in relation to the spatial distribution of their stock of EGMs was further restricted by the Government adoption of a regional caps policy limiting the number of EGMs that could be operated in five defined local areas. This policy was aimed at capping or ameliorating levels of EGM gambling consumption in the particular areas chosen, with a total of 406 machines to be withdrawn over the three years to February 2004 (SACES 2005b: 12).²⁹ Given the continued dependence of Government on EGM gambling industry revenues, such a policy should probably be viewed as representing emerging social and political limits of EGM gambling policy and regulation, rather than any financial limit, i.e. a view in relation to the aggregate level of EGM gambling consumption considered acceptable. That such emerging regulatory limits have clear spatial (and social) dimensions reflects the non-uniform nature of EGM gambling consumption and its effects, which are discussed below.

Figure 4.1, below, shows the density of EGMs (i.e., the number of EGMs per capita in local government areas) against the SEIFA Index of Disadvantage³⁰ score for that LGA, for all metropolitan Victorian LGAs in 2002-3.

Figure 4.1 EGM density vs. SEIFA Index of Disadvantage, metropolitan Melbourne LGAs, 2002-03*



Source: ABS 2001 SEIFA data; OGR. * Excludes City of Melbourne.

As this chart demonstrates there is a reasonably strong relationship (Pearson correlation coefficient, $r = -0.68$) between these data sets, and this is also true to a certain extent across non-metropolitan Victoria ($r = -0.51$), although this latter relationship is probably distorted by

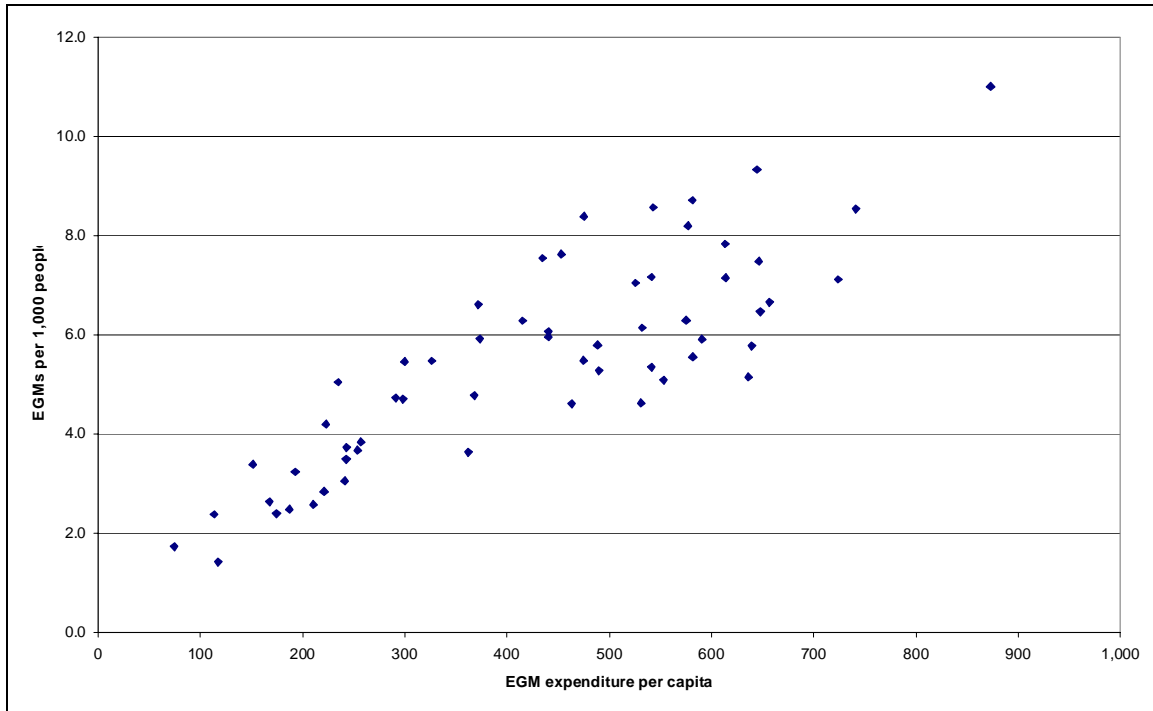
²⁹ This can be contrasted with the situation in NSW where increased flexibility in machine deployment was one trade-off in negotiations over increased taxation of poker machines.

³⁰ SEIFA (Socio Economic Index for Areas) is a set of indices developed and deployed by the Australian Bureau of Statistics for comparison of the relative socio-economic well-being of areas in Australia. The indices utilise census data to rank localities. A high score indicates relative well-being. The average score for Australia is 1,000.

the generally much greater concentration of non-metro areas in a single band of below average SEIFA scores (that is, comparatively disadvantaged).

The strongest available predictor of whether a particular LGA will have a high average consumption of EGM gambling is the density of EGMs. The Pearson product moment correlation between these data sets for all Victorian LGAs is about 0.9, and for metro Melbourne it is in excess of 0.95. That is, the more EGMs there are in a particular area the greater the consumption per person will be in that area. Figure 4.2, below, illustrates this phenomenon.

Figure 4.2 EGMs per capita vs. EGM expenditure per capita, Vic. LGAs 2002-03



Source: ABS; OGR.

The distributional pattern of EGMs in Victoria is thus demonstrably skewed towards disadvantaged areas, and this pattern has an impact on per capita consumption of EGMs. EGM consumption in Victorian clubs and hotels is almost certainly a predominantly local activity, and there is evidence that most consumers travel quite short distances to engage in the activity. KPMG (2000: 57) found that most EGM gamblers travelled less than 2.5 kilometres to the venue where they played. This finding was substantiated in large part by the 2003 Victorian Longitudinal Community Attitudes Survey, which found that more than 57% of EGM gamblers travelled less than 5km to the last venue where they played machines, 32.3% travelling less than 2.5 kilometres, which along with data relating to the point of origin of such journeys (i.e., work, home, etc.) lead the authors to conclude that “[t]he choice of EGM venue appears to be influenced by local accessibility...” (McMillen et al. 2004: 83). These findings are supported by research with problem gamblers conducted for this study, which emphasised the convenience of access to EGM gambling in the patterns of movement of everyday lives.

The ‘honey-pot’ effect, in which gamblers from outside particular local areas will travel in significant numbers to areas with abundant club and hotel EGM venues, should thus be largely discounted as far as metropolitan areas are concerned, as may the view that the limited

availability of potential hotel or club venues in some areas of suburban Melbourne tends to skew the distribution of EGMs away from those areas (Livingstone 2001: 53). In Melbourne as in other cities with a single casino, it is of course likely that EGM players may be expected to travel to play EGMs at the casino. There is also likely to be some ‘attractor’ effects for selected large EGM gambling venues that are located near other significant amenities with large customer volumes and access to parking, for example venues located adjacent to large shopping centres.

Table 4.1 EGMs per 1,000 people, selected Victorian LGAs, 1992-3 to 2002-3

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Ballarat	2.1	5.7	5.5	6.1	7.1	7.6	7.9	8.4	8.3	8.1	8.0	7.8	7.8
Banyule	1.4	3.4	3.8	4.5	4.9	5.0	5.3	5.2	5.1	5.3	5.3	5.3	5.3
Boroondara	0.4	0.4	1.3	1.7	1.8	1.8	1.7	1.6	1.5	1.4	1.4	1.5	1.5
Casey	0.0	2.1	2.6	3.5	4.0	4.3	4.5	4.3	4.5	3.9	4.5	4.2	4.2
East Gippsland	0.0	1.4	1.4	6.5	8.6	8.3	8.9	9.2	8.4	8.5	8.5	8.6	8.5
Dandenong	0.9	3.8	5.7	7.1	8.0	8.8	9.1	8.8	9.2	8.9	9.0	8.9	8.5
Shepparton	0.0	1.3	2.6	4.6	6.0	5.5	5.9	5.8	5.7	5.8	5.8	5.7	5.6
Hume	0.2	0.9	2.5	3.4	4.8	5.3	5.6	5.5	5.6	5.4	5.3	5.1	5.1
Maribyrnong	3.5	4.7	8.5	11.8	14.2	13.7	14.3	13.4	13.5	12.8	12.6	11.8	11.3
Monash	0.6	2.4	3.3	4.3	4.8	5.8	5.9	7.6	7.5	7.5	7.5	7.4	7.3

Source: OGR.

Table 4.1 (above) shows the wide disparity in the density of EGMs between Victorian LGAs. As Figure 4.1 (above) demonstrated, this is correlated to a significant extent with relative socio-economic advantage or disadvantage. Table 4.2 (below) sets out available venues and the proportion equipped with EGMs in 1999 for the six LGAs with greatest EGM density and the six with lowest EGM density, based on a search of the Liquor Licensing Commission database at that time. It is notable that Maribyrnong, an area of substantial socio-economic disadvantage has always had a much higher density of EGMs than Boroondara, Victoria’s most socio-economically advantaged LGA.

Table 4.2: Proportion of hotel and club venues with poker machines, selected Melbourne suburbs, July 1999

LGA	All Licensed premises*				Adult Pop'n**	EGMs per 1,000 adults	SEIFA**
	Total	W/EGMs	%	EGMs			
'Top' six							
Maribyrnong	37	14	37.8%	771	46540	16.6	888
Dandenong	28	15	53.6%	1154	94112	12.3	921
Hobsons Bay	38	12	31.6%	649	55934	11.6	980
Morn Penin	44	20	45.5%	855	80803	10.6	1011
Darebin	30	18	60.0%	1017	97482	10.4	944
Moonee V	42	16	38.1%	822	82475	10.0	1012
TOTALS	219	95	43.4%	5268	457346	11.5	
'Bottom' six							
Whitehorse	15	7	46.7%	541	106224	5.1	1073
Bayside	35	9	25.7%	284	62238	4.6	1108
Yarra Rnges	33	9	27.3%	393	90923	4.3	1047
Stonnington	52	7	13.5%	290	70149	4.1	1104
Nilumbik	7	4	57.1%	147	36843	4.0	1126
Boroondara	24	6	25.0%	246	112575	2.2	1134
TOTALS	166	42	25.3%	1901	478952	4.0	

*"licensed premises" = hotels and clubs holding full club licenses; **Population & SEIFA data 1996 census

Sources: VCGA website gaming venue data, 23/8/99; Liquor Licensing Victoria, licensed premises data, July 1999; ABS 1996 Census data

As the recent Victorian report on the implementation of regional EGM caps (SACES 2005b) commented, aggregate consumption data cannot tell the whole story of EGM gambling at the community or localised level. The particular class and cultural characteristics found in different areas influence consumption patterns and therefore the social and other effects of consumption behaviour. For a large class of Victorians, EGM gambling has been introduced into their preferred sites for socialising and alcohol consumption. In local areas where the cultural tastes of the population are predisposed to spending significant amounts of time in pubs and clubs it is more likely that available EGMs will be taken up (particularly in the context of alcohol-driven dis-inhibition). In this way EGM gambling eventually becomes more thoroughly integrated into the leisure pursuits of many who frequent these venues. Logically, increasing numbers of EGMs will then appear in such venues and areas. Undoubtedly EGM gambling revenues have been one important factor in the renewal of many metropolitan and regional venues (hotels in particular), which has broadened their appeal and the population base that feels comfortable visiting these premises. Conversely, for Australians with altogether different cultural tastes, limited amounts of time spent in club and hotel venues means they are far less likely to develop a taste for the consumption of EGM gambling, excluding possibly those who regularly frequent Crown Casino. The specific socio-cultural characteristics of particular local areas and/or regions are thus important in understanding the cultural practices that may contribute to the take up (or not) of the consumption of EGM gambling.

In summary, the data we have analysed suggest that the accumulation of commercial decisions made during the roll-out and consolidation phases of the EGM industry have resulted in a distribution of EGMs significantly correlated with indicators of social disadvantage. Comparatively high levels of EGM gambling consumption are similarly patterned. Another recent study concluded that it is not so much the number of EGMs in a

particular venue that is linked to social harm, but the “convenience of *where* they are available” (SACES 2005c: ix). It is therefore reasonable to conclude that the social harm from EGM gambling consumption, which has been foreseen by the Victorian Government at various moments throughout the introduction and consolidation phases of the EGM system, is likely to contribute to a net increase in social inequality. This appears intermittently to have been a matter considered when constructing the regulatory framework for the monitoring and control of the industry, for example via the insertion of legislative objects focused on the minimisation of harm. The introduction of the regional caps policy in ‘vulnerable’ areas, indeed the identification of ‘vulnerable’ areas as such, would also tend to support such a view.³¹

4.2 EGM gambling consumption, venue type and operator

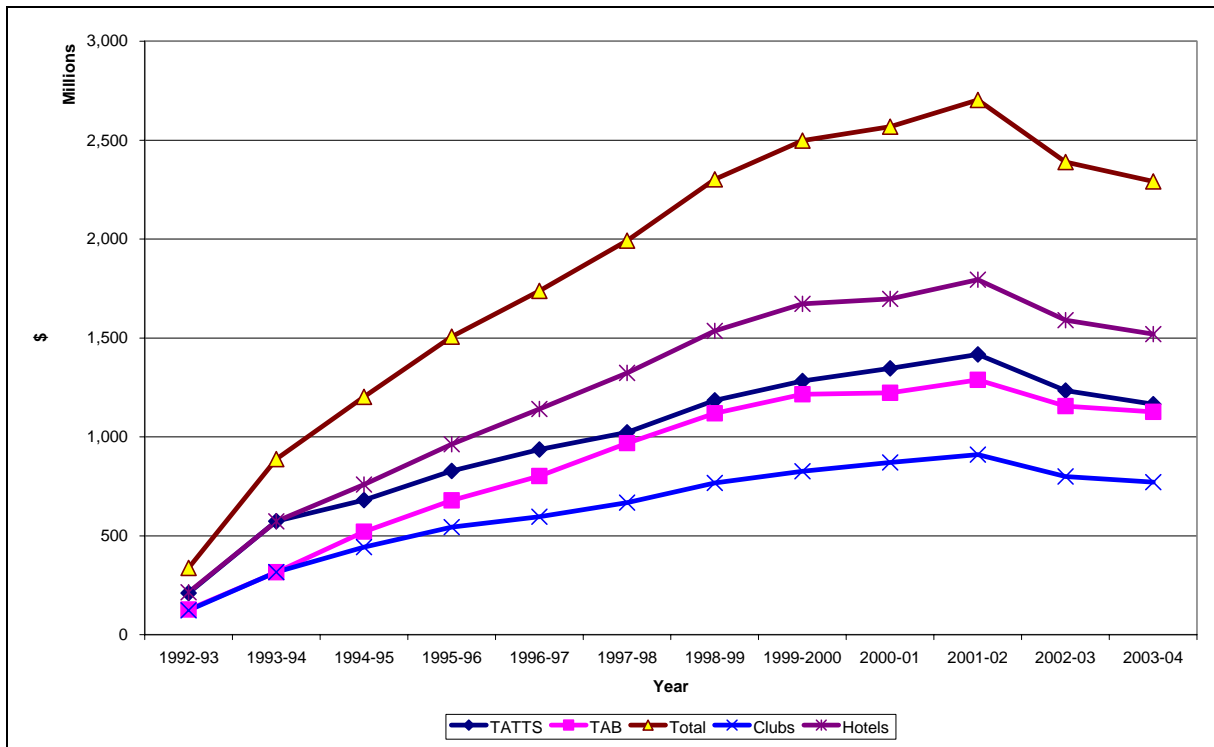
Australia-wide data indicate that hotels have captured an increased share of the EGM gaming market. ABS data show that between 1997-98 and 2000-01, the share of the national gambling market held by clubs remained stable (at 31.9%), whereas the share held by hotels and other commercial licensed premises (including taverns and bars) increased from 19% to 23.7%, despite substantial increases in the number of EGMs operated by clubs (from 91,905 to 112,127, an increase of 22%). The number of EGMs operated in hotels, taverns and bars increased from 52,751 to 55,662, an increase of 5.5% (ABS 2002a). On the basis of these data, it is clear that EGMs in hotels perform better on average than those in clubs. Indeed, whereas EGMs in hotels averaged 103.8% of the value of consumption per EGM in clubs (\$39,525 against \$38,065) in 1997-98, by 2000-01 EGMs in hotels averaged 149.8% of the value of consumption per EGM in clubs (\$58,920 against \$39,341).

The OGR provided the researchers with data relating to the performance of venues in a sample of Victorian LGAs for the purposes of this research, and this section undertakes some analysis of these data. In addition, we were provided with whole of network data at an aggregated level, allowing for some comparison of various parameters of the EGM system.

There are almost equal numbers of EGMs deployed in hotels and clubs, and between operators (Tattersalls’ and Tabcorp). However, consistent with national data, for the period up until June 2004, there were higher levels of EGM gambling consumption in hotels than in clubs. There was also higher EGM consumption in the venues managed by one operator in comparison with the other. Figure 4.3 summarises these data.

³¹ For a detailed analysis of the basis for selecting the capped regions and an evaluation of the impact of the caps see SACES (2005b), available from <http://www.justice.vic.gov.au>

Figure 4.3: Real EGM consumption by operator and venue type, Victoria, 1992-93 to 2003-04



Source: OGR 2005.

As Figure 4.3 demonstrates, annual EGM gambling consumption in hotels was consistently around twice that for club venues over this period. In all years annual EGM gambling consumption in Tattersalls’ venues was higher than Tabcorp venues, although the differential narrowed at various times during the period. Recent newspaper reports suggest that Tabcorp venues are now outperforming Tatts venues: “Analysts noted that Tabcorp had overtaken Tatts for the first time in the share of Victorian poker machine revenue” and was generating consumption levels of \$254 per EGM per day in August 2005, “approaching levels achieved before smoking bans were introduced at venues” (*The Age*, 6 September 2005).

Table 4.3 also shows these data by calendar year (the form in which the data were provided to the researchers by OGR).

Table 4.3: Real consumption of EGM gambling, Victoria, by operator and venue type, 1993 to 2004

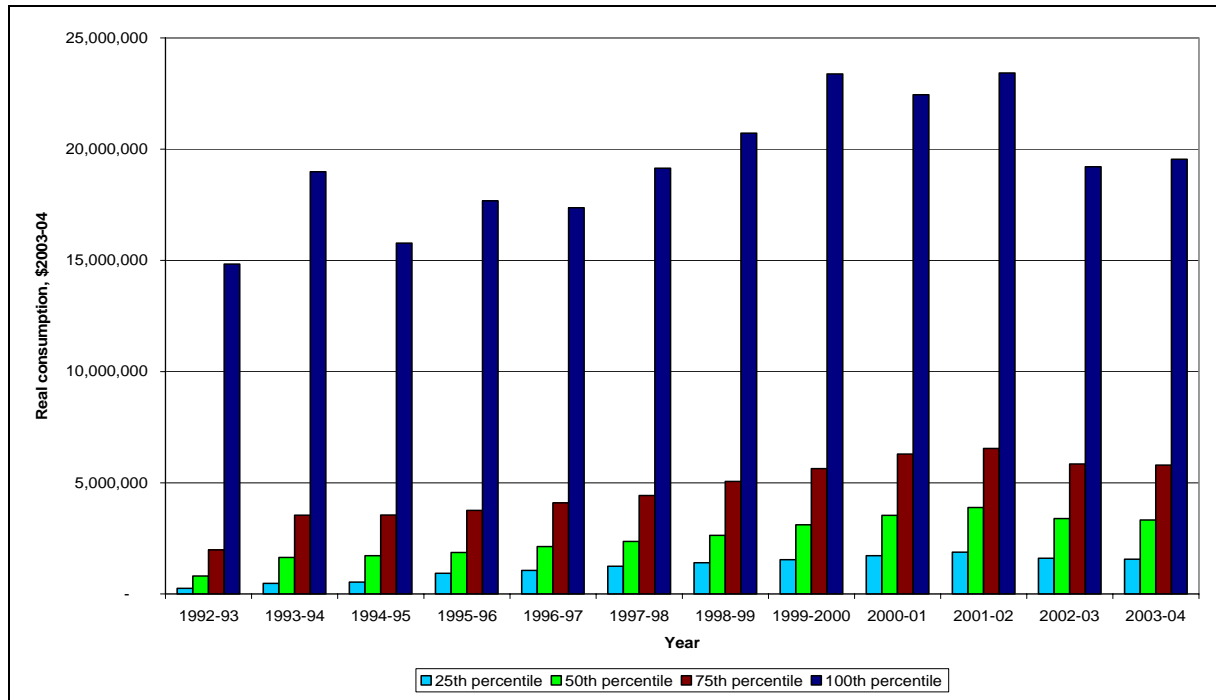
Real \$ (\$2004)					
	Operator		Venue type		
Year	Tattersalls'	Tabcorp	Clubs	Hotels	Total
1993	210,439,726	126,805,740	123,329,445	213,916,020	337,245,466
1994	573,357,599	314,924,566	315,965,629	572,316,536	888,282,165
1995	681,156,006	520,676,087	442,644,530	759,187,563	1,201,832,093
1996	827,615,233	679,037,279	543,504,320	963,148,192	1,506,652,512
1997	935,619,842	801,747,757	596,429,423	1,140,938,175	1,737,367,599
1998	1,023,512,935	968,111,445	667,924,181	1,323,700,199	1,991,624,380
1999	1,183,807,240	1,118,639,149	766,643,418	1,535,802,972	2,302,446,390
2000	1,282,155,808	1,215,667,096	825,594,691	1,672,228,214	2,497,822,905
2001	1,346,113,626	1,222,150,826	870,486,777	1,697,777,675	2,568,264,452
2002	1,416,020,258	1,288,172,541	909,843,994	1,794,348,804	2,704,192,799
2003	1,234,364,468	1,154,874,211	799,810,492	1,589,428,187	2,389,238,679
2004	1,164,792,949	1,126,137,028	770,977,882	1,519,952,094	2,290,929,976
Percentage of total					
	Operator		Venue type		
Year	Tattersalls'	Tabcorp	Clubs	Hotels	Total
1993	62.4%	37.6%	36.6%	63.4%	100.0%
1994	64.5%	35.5%	35.6%	64.4%	100.0%
1995	56.7%	43.3%	36.8%	63.2%	100.0%
1996	54.9%	45.1%	36.1%	63.9%	100.0%
1997	53.9%	46.1%	34.3%	65.7%	100.0%
1998	51.4%	48.6%	33.5%	66.5%	100.0%
1999	51.4%	48.6%	33.3%	66.7%	100.0%
2000	51.3%	48.7%	33.1%	66.9%	100.0%
2001	52.4%	47.6%	33.9%	66.1%	100.0%
2002	52.4%	47.6%	33.6%	66.4%	100.0%
2003	51.7%	48.3%	33.5%	66.5%	100.0%
2004	50.8%	49.2%	33.7%	66.3%	100.0%

Source: OGR 2005.

It can be seen that Tattersalls' venues established a lead over their only market competitor for club and hotel EGM gambling consumption, which gradually narrowed over the relevant period. Hotel venues however consolidated the advantage they displayed over club venues, and by the end of the series shown had consolidated their share of the EGM market at around two-thirds of total consumption. In addition, 87 of the top 100 performing venues in Victoria measured by aggregate levels of consumption were hotels in 2003-04.

Figure 4.4 shows the quartile values of EGM consumption at the venue level from 1992-93 to 2003-04 – i.e. the value of the venue at the 25th, 50th, 75th and 100th percentile, the 50th percentile representing the median and the 100th the maximum consumption at venue level. These data are in real terms at 2003-04 dollars.

Figure 4.4: Quartile distribution of real EGM gambling consumption per venue, Victoria, 1992-93 to 2003-04, \$2003-04



Source: OGR, ABS CPI

As Figure 4.4 demonstrates, the ‘best performing’ venues have generated real consumption in the range of \$20 million per annum since 1998-99, and have substantially exceeded the median value of consumption. Table 4.4 illustrates that the venues in the upper quartile have generated well over half the EGM consumption throughout the period 1992-93 to 2003-04, their average level of real consumption being between 7.5 and 3.7 times the average level of the remaining 75% of venues. Over time, the consumption share of the ‘top’ 25% has declined, which is probably an indication of increasingly standardised venue management and increasing average numbers of machines per venue, although this share of total consumption has remained consistently above 55% since 2000-01.

Table 4.4: EGM gambling consumption share top 25% of venues, real average EGM consumption per venue top 25% & remainder, Vic. 1992-93 to 2003-04, (\$2003-04)

	Consumption share of top 25%	Average real consumption, top 25% \$	Average real consumption, remainder, \$
1992-93	71.5%	4,820,009	641,634
1993-94	63.5%	6,405,507	1,238,922
1994-95	62.7%	6,554,477	1,302,521
1995-96	60.4%	6,899,641	1,508,607
1996-97	59.5%	7,335,205	1,666,123
1997-98	59.2%	8,128,354	1,877,628
1998-99	59.7%	9,410,488	2,129,622
1999-2000	58.1%	10,367,978	2,503,124
2000-01	56.3%	10,702,438	2,780,781
2001-02	55.4%	11,189,231	2,997,104
2002-03	56.1%	9,919,836	2,612,092
2003-04	55.7%	9,525,747	2,529,875

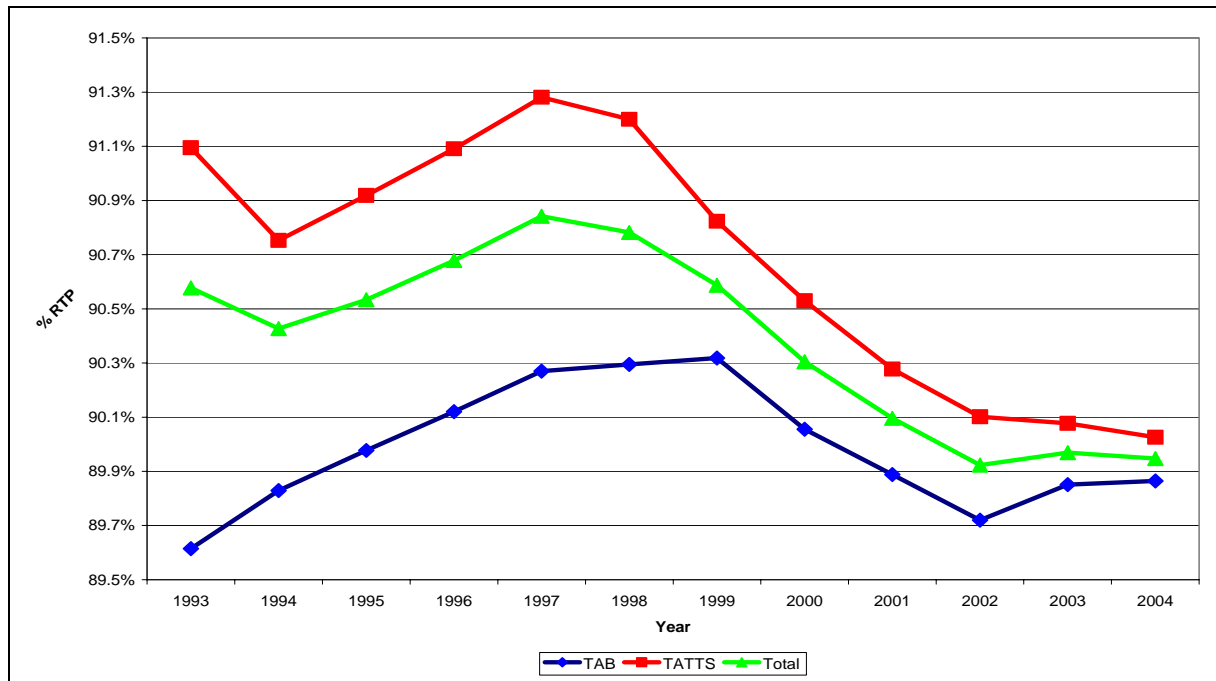
Source: OGR, ABS CPI

In summary, it is clear that there are significant differentiations within the aggregate EGM gambling consumption data. Hotels outstrip clubs by a 2:1 ratio. Tattersalls' venues have enjoyed a historically better performance than Tabcorp operated venues, although this has diminished to a point where the two operators are virtually even in terms of shares of aggregate EGM gambling consumption. The top quarter of venues contribute a disproportionate amount of aggregate EGM consumption that has stabilised in excess of the 55% over the last several years. These differentiations are produced in the context of the socio-economic patterns of EGM gambling consumption described in Section 4.1.

4.3 EGM gambling consumption and return to player (RTP)

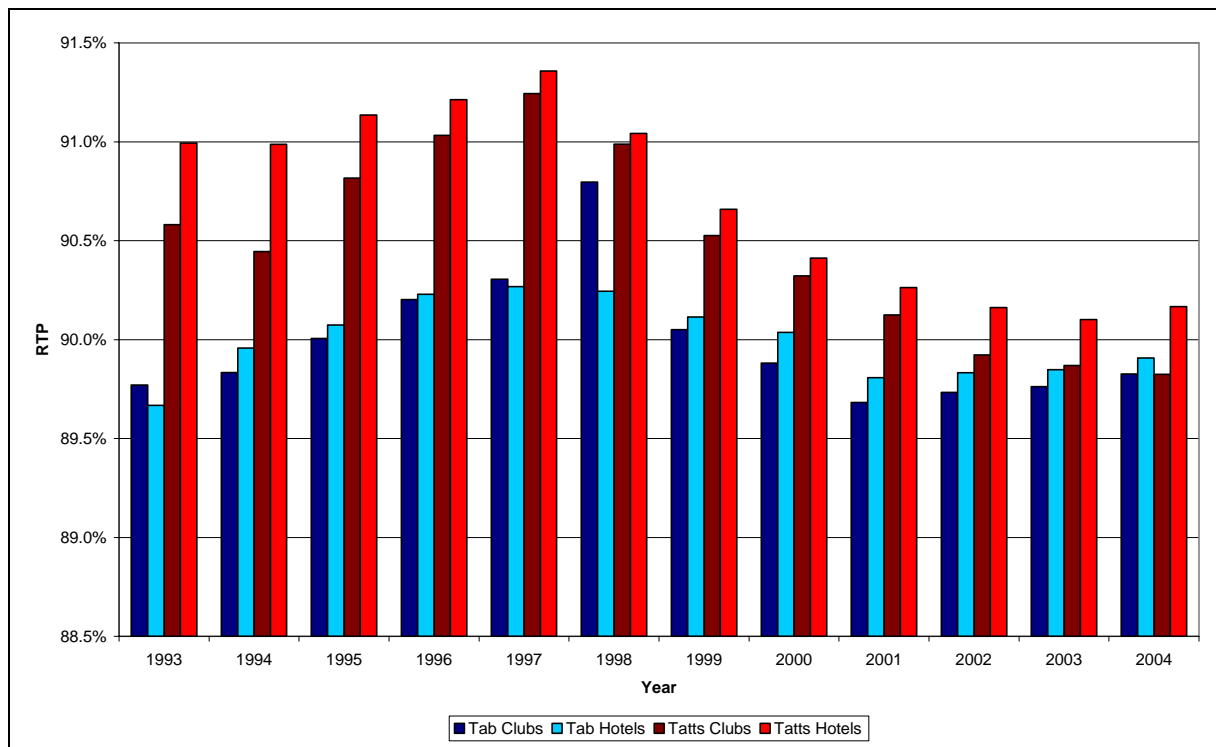
A key parameter of the EGM system that is worthy of attention is the average return to player (RTP). RTP is the proportion of total turnover that is returned to players via cash out (including contributions to jackpots, both local and wide area). The legislated minimum RTP is set at 87%, measured on a venue basis over a calendar year. Figure 4.5 illustrates different RTP levels for each of the operators over the period 1993 to 2004. On average, the RTP for EGMs operated by Tattersalls' has been higher for each year of the series, peaking at about 91.3% in 1997. The average RTP for EGMs operated by Tabcorp peaked at around 90.3% in 1999. Subsequently, the average RTP of both operators has converged and in 2004 both provided average RTP of around 90%.

Figure 4.5: Return to player ratios, EGMs, Tattersalls, Tabcorp and average, Victoria, 1993 to 2004



Source: OGR

Figure 4.6: Return to player by venue type and operator, Victoria, 1993 to 2004



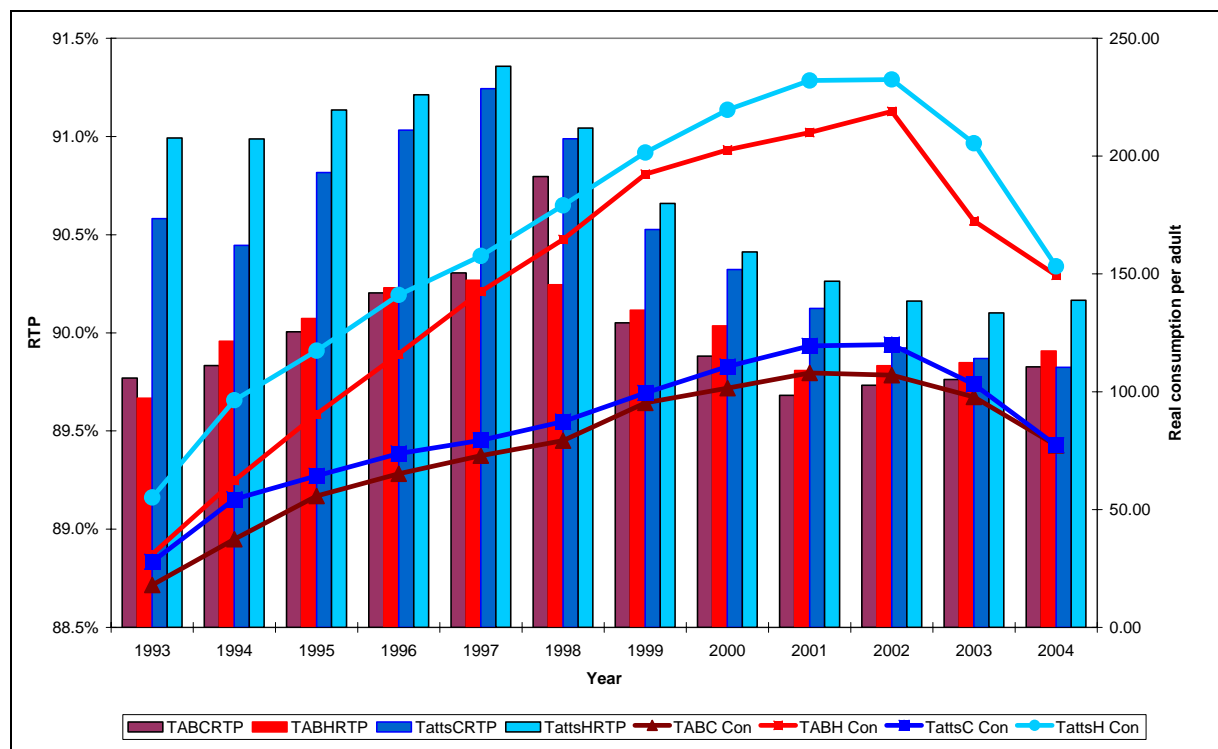
Source: OGR

Figure 4.6 sets out the RTP by venue type and operator for Victoria. As is clear from Figure 4.6, average RTP was higher in hotels than clubs in every year for Tattersalls' venues, and in

most years for Tabcorp venues. Tattersalls' venues have set higher average RTP than Tabcorp venues for both venue types in every year save for 2004, when Tabcorp and Tattersall's returned virtually identical RTP for club venues. Small differences in RTP equate to substantial differences in aggregate expenditure. Had both operators set their RTP at the maximum level reached for each venue type over the series (i.e. at 1997 levels for clubs and hotels in the case of Tattersalls', at 1998 levels for Tabcorp clubs and 1997 levels for Tabcorp hotels) EGM gamblers would have retained an additional \$1.3 billion (in 2004\$ values). This of course assumes that consumption of EGM gambling is relatively price inelastic, i.e. changes in price do not appear to affect consumption levels.

Given that the price of EGMs is in fact the value of RTP, it is possible to assess this elasticity and Figure 4.7 (below) illustrates this for each of the four categories of Tattersalls' and Tabcorp clubs and hotels. In fact EGM gambling appears to be price inelastic in that although in the early part of the series both RTP and real consumption per adult rose together, in the latter part of the series consumption continued to rise as RTP fell.

Figure 4.7: Return to player and real consumption per adult, by venue type and operator, Victoria 1993 to 2004



Source: OGR

Figure 4.7 serves to demonstrate that there is little apparent relationship between RTP levels and real consumption per adult. We calculated the Pearson product moment correlation for the data sets in each of the four categories. The strongest relationship we discovered via this process was in the case of Tattersalls' hotel venues, where the correlation coefficient was calculated at -0.644. That is, it appears that increased RTP levels were associated to some extent with lower levels of real consumption per adult. In fact, the highest RTP levels were available during the early period of EGM deployment when consumption levels were relatively low, and have declined subsequently as consumption as increased. The Pearson

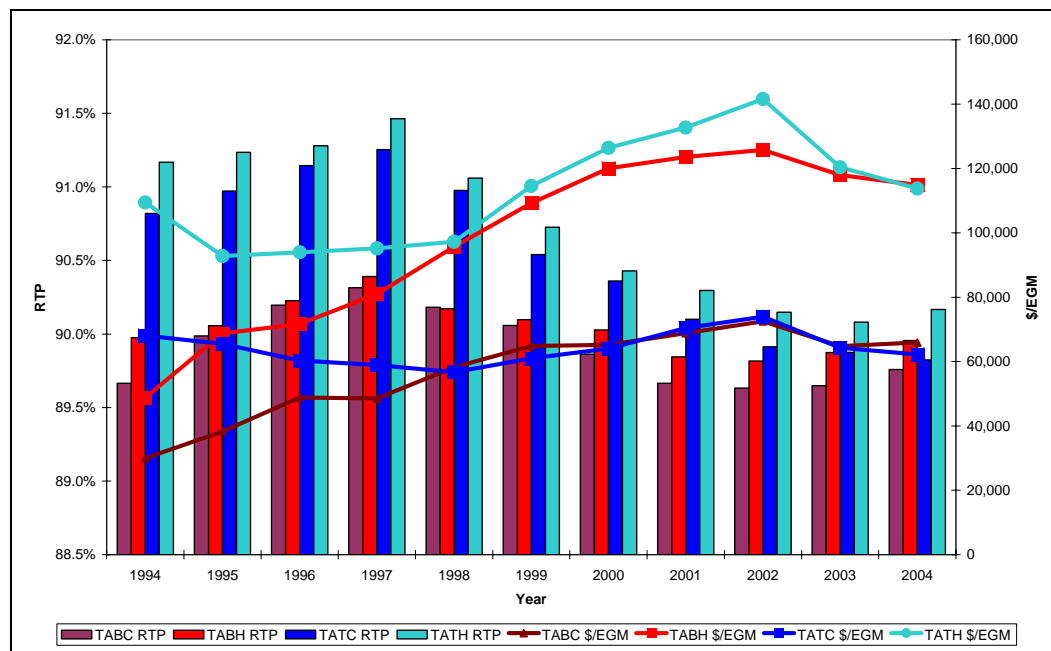
values for each of the other categories were: Tabcorp club venues, -0.067; Tabcorp hotel venues, 0.101; Tattersalls' club venues, -0.425.

The evidence suggests that EGM gamblers are unlikely to have a good understanding of the price of their consumption, and in the absence of such an understanding are in no position to make decisions about levels of consumption based on the price of particular games. Gamblers are thus also unlikely to consider relatively small differences in RTP to be a factor in their decision-making about choices between EGMs. We understand from industry sources that RTP levels for \$1 credit value EGMs are usually set at comparatively high levels because those who play such machines are thought to have a keener appreciation of the price they pay for the activity, probably based on perception of the relative duration of sessions of play. However, on balance we believe that RTP (construed as the price of EGM consumption) is not systematically related to the value of EGM consumption at the level of individual behaviour within gambling sessions. Research with problem gamblers undertaken for this project indicates that such players terminate their sessions of play on the basis of expenditure of all available funds, regardless of perceptions of price. That is, problem gamblers appear to play until all their money is gone.

4.3.1 Return to player and real consumption per EGM

It was not possible to look at per EGM consumption data or any information on actual gambling sessions for this research. However as Figure 4.8 (below) illustrates, it was possible to compare RTP with real expenditure per EGM for our selected LGAs.

Figure 4.8: Return to player and real expenditure per EGM, sample LGAs, 1994 to 2004



Source: VCGR

Figure 4.8 presents the return to player (RTP) percentage and average consumption per EGM for each of the categories of Tabcorp clubs and hotels and Tattersalls' clubs and hotels for the period 1994 to 2004. Figure 4.9 presents RTP and real turnover per EGM for each of the same four categories. The data presented in both figures describes the characteristics of EGMs deployed in all venues in the ten sample LGAs. Figure 4.8 demonstrates that RTP increased in all categories between 1994 and 1997, during which period average consumption per EGM

declined or was relatively static for both types of Tattersalls' venues, and increased for both types of Tabcorp venues. After 1997 RTP declined in both classes of venue for both operators and the relative disparity in RTP between Tattersalls' and Tabcorp was reduced by proportionately larger reduction in RTP in both classes of Tattersalls' venue.

Between 1998 and 2002 real consumption per EGM increased for both classes of venue for both operators, although the increase for hotels in the case of both operators was more substantial. After 2002, RTP stabilised or was slightly increased but real consumption per EGM declined. Table 4.5 sets out the Pearson product moment correlations for RTP and real consumption per EGM for each class of venue for the period 1994-2004 and for the period 1994-2002, (with a view to the fact that the decline in consumption after 2002 that is almost certainly attributable to the smoking ban may confound the results).

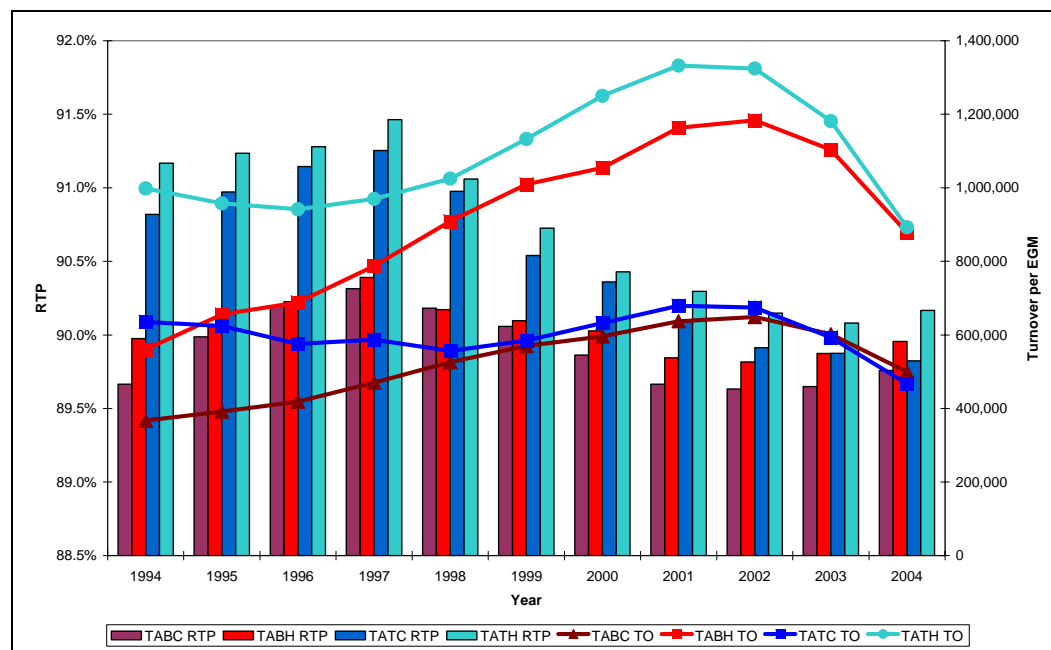
Table 4.5: Pearson product moment correlation, RTP vs. real \$/EGM, 1994-2004 and 1994-2002, Tabcorp and Tattersalls' venues, sample LGAs

	TAB Clubs	TAB Hotels	TATTs Clubs	TATTs Hotels
1994- 2004	-0.29	-0.52	-0.55	-0.86
1994- 2002	-0.20	-0.45	-0.78	-0.96

Source: VCGR

As Table 4.5 demonstrates there are very weak apparent relationships between the level of RTP and real consumption per EGM for Tabcorp club venues for both time periods. There are more robust apparent relationships for Tabcorp hotel venues and for Tattersalls' club venues, although these are weaker for the period 1994-2002 than between 1994-2004 for both classes of Tabcorp venue, yet *more* robust for both classes of Tattersalls' venue over the shorter timescale, which disregards the years of post smoking ban decline. It will also be noted that all relationships are negative – that is, as RTP declines, real consumption per EGM increases. Put another way, as the price of play increased, in all cases the value of consumption increased. This might be explained by the observation that, as price increases, the retained value of consumption also increases because the demand for EGM consumption is affected only marginally by price – it is price inelastic.

Figure 4.9: Return to player and real turnover per EGM, sample LGAs, 1994 to 2004



Source: VCGR

Figure 4.9 sets out both RTP and real turnover per EGM for each of the four classes. It will be noted that in the period between 1994 and 1997 real turnover for both classes of Tattersalls’ venue declined or stabilised as RTP increased, whereas for Tabcorp venues both RTP and real turnover increased. However in the period after 1997 real turnover increased for all classes of venue as RTP declined. The apparent effects of the smoking ban are again apparent after 2001. Table 4.6, below, sets out the Pearson product moment correlations for RTP and real turnover per EGM for each class of venue for the period 1994-2004 and for the period 1994-2002.

Table 4.6: Pearson product moment correlation, RTP vs. real turnover/EGM, 1994-2004 and 1994-2002, Tabcorp and Tattersalls’ venues, sample LGAs

	TAB Clubs	TAB Hotels	TATTs Clubs	TATTs Hotels
1994-2004	-0.39	-0.54	-0.03	-0.64
1994-2002	-0.36	-0.51	-0.79	-0.98

Again, there are weak to moderate apparent relationships between RTP and real turnover for Tabcorp clubs and hotels and Tattersalls’ hotels over the period 1994-2004, and somewhat more robust relationships over the shorter period for both classes of Tattersalls’ venue. Again, all relationships are negative – as RTP declined, real turnover generally increased, the notable exception being the period after 2001 when real turnover declined markedly despite stable or modestly increased RTP.

It should be noted that the range of RTP values for Tattersalls’ venues over the period of these data series has been greater than that for Tabcorp. Thus, apparent relationships appear more robust for Tattersalls’ venues simply because there has been more volatility in RTP. The very

modest increases or stabilisation in RTP at the end of the series may be a response by operators to the decline in turnover associated with the smoking ban, but this is a matter of surmise, and in any event given the operators' obvious acquaintance with the data not likely to influence player behaviour to the extent necessary to overcome the effects of the smoking ban.

A lower RTP is provided in club venues in comparison with hotel venues, and in venues operated by Tabcorp as against Tattersalls'. Both operators maintain RTP at similar levels for both venue types and yet all hotels have performed (on average) at comparable and converging levels as have all clubs. Over time RTP converged for both operators and both types of venue over the whole period of this series, and indeed at 2004 the difference in RTP across all four classes of venue was about 0.3 percentage points. At their peak (in 1993), the greatest differential across all four classes of venue was around 1.4 percentage points.

What is interesting is that, contrary to the general conclusion of the Productivity Commission (Banks 2002), RTP in the Victoria EGM industry to date has not tended to rise over time but to fall. That is, in Victoria as the initial roll-out phase of the EGM system passed and the number of machines was capped, RTP was lowered, as the primary driver of revenue growth became revenue per machine. As has been described above (see Section 3.4) this 'second phase' of consumption of EGM gambling in Victoria involved a component of overall growth that we have termed growth from 'intensification'. The advent of BNAs was shown to have correlated with this second growth phase from 1997 and the concomitant increase in consumption. Thus the intensification effect correlating with the advent of BNAs may also be related to RTP. The advent of BNAs may also help us understand the apparent continued growth in real EGM gambling consumption despite the drop in RTP.

An intensification effect associated with BNAs and RTP could occur in a number of ways – for example, the advent of BNAs themselves may have changed the average bet value for gamblers, causing them to lose money more quickly. A reduction in the number of 'spins' of the virtual reel also ensures that session outcomes are more likely to be highly volatile in relation to the operation of the random ratio schedule of an EGM. Alternatively, RTP may be altered systematically by the gaming operators leading to an increase in the price of EGM gambling consumption and hence a reduction in the time purchased in a typical session should gambling strategy remain the same.

What can be clearly seen is that this intensification effect was also correlated with a year-on-year lowering of RTP between 1997 and 2002. Broken down by operator and venue type it can be seen that RTP declined in each of the four operator/venue categories every year between 1997 and 2002. This suggests that the parameters of EGM gambling consumption were being systematically varied. This could occur at the machine level, if this phenomenon is the outcome of a longer run of EGM consumption. It could also occur if new product included in the system tended towards a lower set RTP, and thus 'diluted' RTP over time. Thirdly, this may be an outcome associated with the programming of EGMs. There is some evidence that as markets mature the structure of reinforcement provided by the random ratio (RR) schedule (size and frequency of wins) alters from frequent small wins toward less frequent but larger wins (Schellinck & Schrans 2002a). The parameters of EGM consumption could also be manipulated at the network level, with RTP being altered directly by gaming operators via the CMCS.

The downward trend in RTP continued, as described, until 2002. This is the threshold of what has been described as the third phase of the EGM gambling consumption in Victoria, marked by the introduction of the smoking ban in gaming venues and the concurrent decline in real EGM gambling consumption. At this juncture, it can be seen that RTP began to rise. In 2003, RTP rose in both Tabcorp clubs and hotels, whilst RTP continued to fall in Tattersalls' clubs and hotels. In 2004, RTP in Tabcorp venues rose for a second time, whilst RTP rose in Tattersalls' hotels but continued to fall in Tattersalls' clubs.

The change in the trend of RTP within aggregate EGM gambling consumption data thus reflects an inverse of consumption expenditure. That is, the decline in expenditure and turnover was accompanied by an increase in RTP, apart from the club venues operated by Tattersalls'. Once again this may reflect change in the parameters of the EGM gambling system, in that Tabcorp appears to have reacted quickly to the decline in real EGM gambling consumption by lowering the price of EGM gambling (raising RTP) in its venues via the CMCS. Tattersalls' moved more slowly but then quite decisively in terms of the lowering of the price of EGM gambling in its relatively high volume hotel venues (compared to club venues). This might be expected as a rational response to decline in real EGM gambling consumption using the parameter value tools available for manipulation. It might also imply that the direction of causality between the price of EGM gambling and demand is reversed or at any rate much less straightforward than in the consumption of other commodities.

In any event, the data we were provided with and have presented in relation to RTP cannot demonstrate whether EGM users are directly influenced by price, given that RTP equates on average to the price of play. However, there are a number of possible reasons as to why this may not be the case. Firstly, differences in RTP are not readily discernible during the course of a session of play due to the relative volatility of EGM outcomes across short intervals (see Section 2). Secondly, problem gamblers, who contribute disproportionate amounts of EGM gambling expenditure, are likely to terminate sessions of play because of a lack of funds with which to continue rather than for any other cause. Finally, there is likely to be little price induced elasticity of demand for 'problem' gamblers, given the likelihood that the choices such players make are not informed by rational considerations such as 'value for money'. It is almost certain that a very large and disproportionate component of EGM consumption is attributable to such players, and thus modest changes in price will have very little effect on player behaviour, even though such changes may have quite large impacts on the value of consumption overall and accumulated across the course of a year.

As in some other areas of EGM performance and the effect of various parameters, analysis of EGM level data, particularly in relation to individual sessions of play, would provide an invaluable and enhanced understanding of the relation between price and player behaviour. Unfortunately these data are not collected by the regulator and are certainly not utilised as the basis for analysis of EGM performance and relative risk. Based on industry sources we believe that operators utilise such data regularly and are thus able to fine tune their decisions accordingly.

4.3 Local level EGM gambling consumption patterns

The OGR provided relatively detailed data relating to EGM venues operated in selected local government areas (LGAs). These LGAs are shown in Table 4.7, below, which also sets out relevant data relating to these LGAs, including SEIFA index of disadvantage calculated from 1996 and 2001 census data, and estimated population.

Table 4.7: Selected characteristics, sample LGAs

LGA	SEIFA 1996	SEIFA 2001	Population 1993	Population 2004	Rural-metro status
Ballarat	988	993	79,204	86,963	Rural city
Shepparton	982	977	53,441	60,403	Rural city
East Gippsland	971	984	38,242	40,409	Rural shire
Boroondara	1,134	1,122	150,348	158,597	Metro inner
Banyule	1,059	1,058	118,190	118,490	Metro
Monash	1,056	1,053	163,293	162,834	Metro
Greater Dandenong	921	877	132,913	126,790	Metro
Casey	1,017	994	130,208	205,721	Metro outer
Hume	976	954	112,807	146,119	Metro outer
Maribyrnong	888	915	61,603	62,518	Metro inner

Source OGR

A relatively high score on the SEIFA index of disadvantage indicates relative socio-economic advantage. Thus, the most disadvantaged LGA in the sample in 1996 was Maribyrnong, and the most advantaged was Boroondara. In 2001, the most disadvantaged LGA was Greater Dandenong, Boroondara retaining its earlier position of relative advantage. Whilst most LGAs grew in population between 1993 and 2004, Monash and Greater Dandenong both recorded an estimated decline in population. Estimated population growth was highest in Casey, which recorded an increase of 58% over the period 1993 to 2004. Hume demonstrated estimated growth of 29.5% and Shepparton 13.0%.

The density of EGMs (measured as EGMs per 1,000 people) for the sample LGAs for each year from 1993 to 2004 is set out in Table 4.8, below. As the table shows, sample LGAs have a wide spread of EGM densities, with the lowest in the eastern suburbs of metropolitan Melbourne (Boroondara) and the highest in the metropolitan inner west (Maribyrnong). The City of Melbourne, which has the highest apparent EGM density in Victoria, is generally regarded as an outlier given its centrality and daily influx of workers and visitors.

Table 4.8: EGMs per 1,000 people, sample LGAs, 1993 to 2004

LGA	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Ballarat	5.7	5.5	6.1	7.1	7.6	7.9	8.4	8.3	8.1	8.0	7.8	7.8
Shepparton	1.3	2.6	4.6	6.0	5.5	5.9	5.8	5.7	5.8	5.8	5.7	5.6
East Gippsland	1.4	1.4	6.5	8.6	8.3	8.9	9.2	8.4	8.5	8.5	8.6	8.5
Boroondara	0.4	1.3	1.7	1.8	1.8	1.7	1.6	1.5	1.4	1.4	1.5	1.5
Banyule	3.4	3.8	4.5	4.9	5.0	5.3	5.2	5.1	5.3	5.3	5.3	5.3
Monash	2.4	3.3	4.3	4.8	5.8	5.9	7.6	7.5	7.5	7.5	7.4	7.3
Grt Dandenong	3.8	5.7	7.1	8.0	8.8	9.1	8.8	9.2	8.9	9.0	8.9	8.5
Casey	2.1	2.6	3.5	4.0	4.3	4.5	4.3	4.5	3.9	4.5	4.2	4.2
Hume	0.9	2.5	3.4	4.8	5.3	5.6	5.5	5.6	5.4	5.3	5.1	5.1
Maribyrnong	4.7	8.5	11.8	14.2	13.7	14.3	13.4	13.5	12.8	12.6	11.8	11.3

Source: OGR

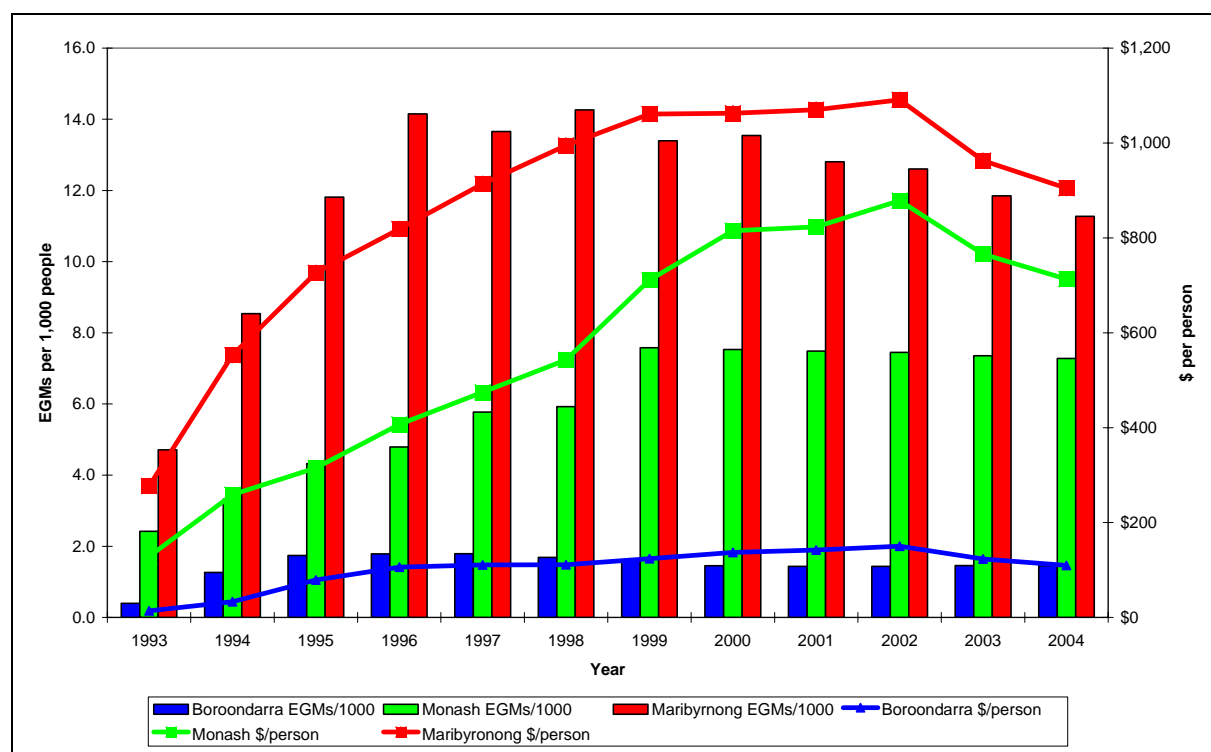
Table 4.9: EGM consumption per capita, sample LGAs, 1993 to 2004

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Ballarat	\$149	\$294	\$362	\$415	\$452	\$507	\$570	\$595	\$606	\$629	\$565	\$560
Shepparton	\$20	\$106	\$207	\$319	\$360	\$392	\$452	\$481	\$494	\$496	\$431	\$420
East Gippsland	\$12	\$146	\$257	\$373	\$401	\$449	\$478	\$528	\$537	\$551	\$499	\$514
Boroondara	\$14	\$33	\$79	\$106	\$111	\$111	\$124	\$137	\$142	\$150	\$123	\$110
Banyule	\$147	\$339	\$369	\$410	\$397	\$421	\$490	\$543	\$566	\$593	\$504	\$465
Monash	\$129	\$259	\$315	\$407	\$475	\$543	\$711	\$815	\$823	\$879	\$766	\$713
Dandenong	\$136	\$354	\$466	\$566	\$601	\$700	\$780	\$832	\$862	\$912	\$789	\$761
Casey	\$51	\$196	\$268	\$323	\$379	\$416	\$505	\$525	\$482	\$540	\$499	\$481
Hume	\$25	\$107	\$225	\$311	\$375	\$453	\$531	\$580	\$607	\$645	\$549	\$529
Maribyrnong	\$277	\$553	\$726	\$819	\$914	\$995	\$1,061	\$1,063	\$1,070	\$1,091	\$963	\$905

Source: OGR

Table 4.9 sets out the per capita value of EGM consumption for each of the sample LGAs over the period from 1993 to 2004, and Figure 4.10 displays real EGM consumption per person and EGMs per 1,000 people for selected LGAs over the same period.

Figure 4.10: Real consumption per person and EGMs per 1,000 people, selected LGAs, 1993 to 2004



Source: OGR

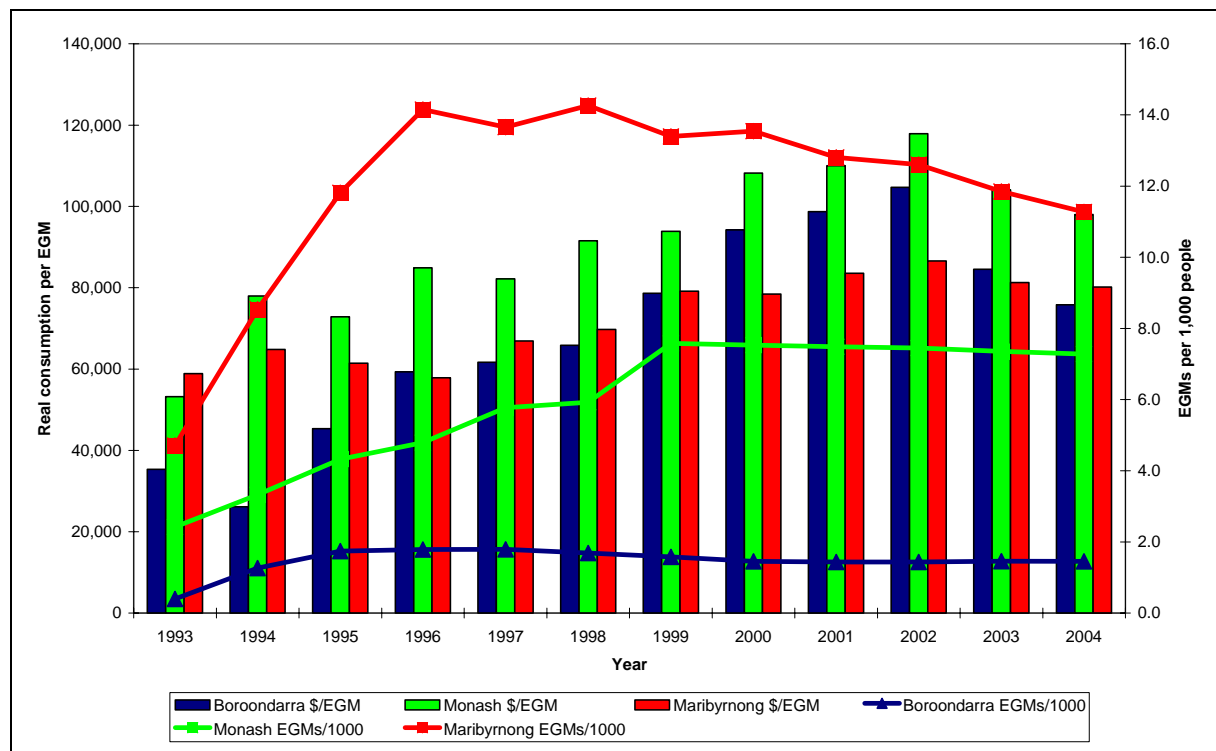
It will be apparent that there is some relationship between the density of EGMs and the value of real per capita consumption (in fact the Pearson product moment correlation coefficient for each of these data sets is generally in excess of 0.9, although the relevant value for Boroondara is about 0.62 and that for Maribyrnong and Banyule about 0.87). However the relationship between EGM density and consumption per EGM is less clear, with some LGAs demonstrating a strong positive correlation and others a much weaker apparent relationship. These values are set out in Table 4.10.

Table 4.10: Correlation coefficients, selected data, sample LGAs

LGA	Pearson product moment correlation:	
	\$/capita vs. EGMs/1,000	EGMs/1,000 vs. \$/EGM
Ballarat	0.927	0.790
Shepparton	0.915	0.868
East Gippsland	0.913	0.018
Boroondara	0.622	0.297
Banyule	0.877	0.715
Monash	0.977	0.913
Dandenong	0.933	0.863
Casey	0.912	0.818
Hume	0.900	0.836
Maribyrnong	0.874	0.354

Figure 4.11, below, sets out the relationship for selected LGAs.

Figure 4.11: Selected LGAs, 1993 to 2004, EGM density and real consumption per EGM



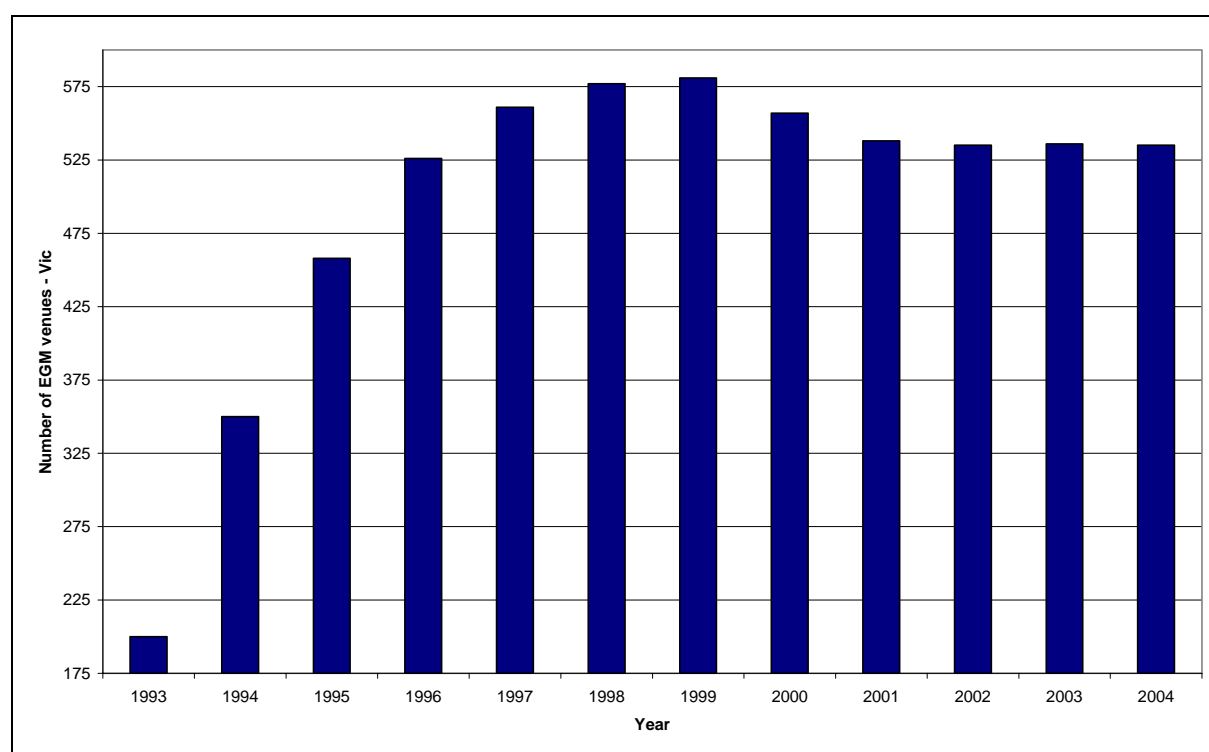
Source: OGR

These data demonstrate that high EGM densities are related to high per capita levels of EGM consumption. Within LGAs, as densities have changed so too have levels of per capita consumption. However, we note with some interest that, within the majority of sample LGAs, as EGM densities have changed so too has the real value of consumption per EGM. This is least apparent in Boroondara and East Gippsland, and less apparent in Maribyrnong. Again, we can conclude that a multiplicity of factors contribute to this apparent diversity, including demographics and the capacity of the industry to capitalise on the potential for demand. We note with particular interest the pattern in Maribyrnong, where a high density of EGMs appears to have produced high levels of per capita consumption but below average levels of consumption per EGM. It seems likely that the high density of EGMs erodes consumption per EGM, but at the same time may be related to high per capita levels of consumption. In Boroondara, low EGM density appears related to low per capita consumption but in some

years there has also been some additional consumption per EGM, as compared to Maribyrnong. In Monash, average to high density of EGMs is associated with mid-range levels of per capita EGM consumption but somewhat higher levels of consumption per EGM.

Of course, it is possible that the EGM operators have responded to perceived demand for EGMs and deployed machines accordingly. Thus, apparent demand induces the relative supply of EGMs and thus largely determines density over time. This is undoubtedly a part of the equation, but we also note that Maribyrnong has always had a comparatively high density of EGMs, and Boroondara has always had a comparatively low density. The tendency to maintain this disparity may be partially due to frictional factors - once arrangements have been entered into for the supply of EGMs with venue operators, there will be costs associated with their alteration. It is, however, clear that a number of venues have left the EGM system, particularly since 1999, as Figure 4.12 demonstrates.

Figure 4.12: Number of EGM venues, Victoria, 1993 to 2004



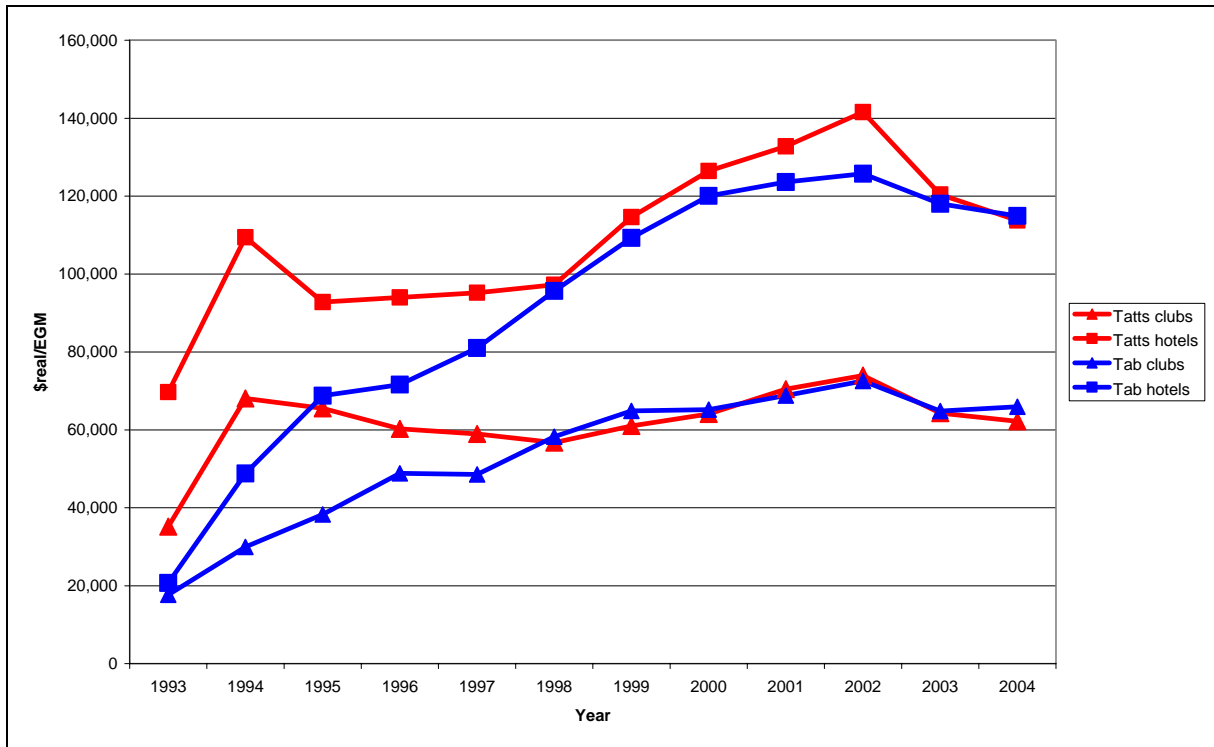
Source: OGR

It can be assumed that the gaming operators conduct research and develop quality internal information streams about their market and purchase external expertise regarding the contours of its various spatial and social segments. It can also be assumed that there is no straightforward demand curve for EGM consumption. This is supported by the fact that each LGA appears, within certain limits, to constitute a distinct market. The maximisation of aggregate EGM consumption within each such market appears to require a distinct approach – rather more EGMs in Maribyrnong cater to what appears to be relatively high per capita demand, rather fewer EGMs in Monash return relatively high levels of consumption activity per EGM.

4.3.1 Real EGM gambling consumption per EGM, selected LGAs

There are a number of distinctions between the gaming operators in relation to consumption per EGM by venue type across the sample LGAs. Figure 4.13 compares consumption per EGM for both venue types by operator over the period 1993-2004, demonstrating a substantial degree of convergence in EGM performance over that period.

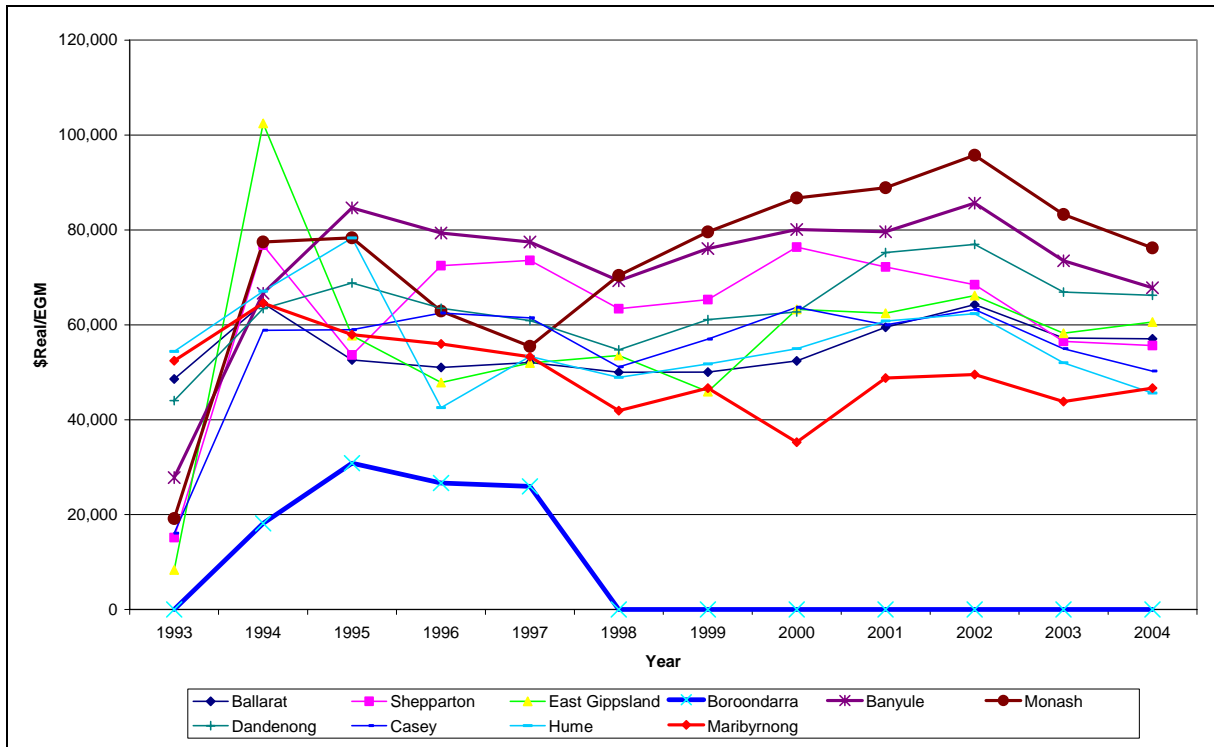
Figure 4.13: Real average consumption per EGM, sample LGAs, by venue type and operator, 1993 - 2004



Source: OGR

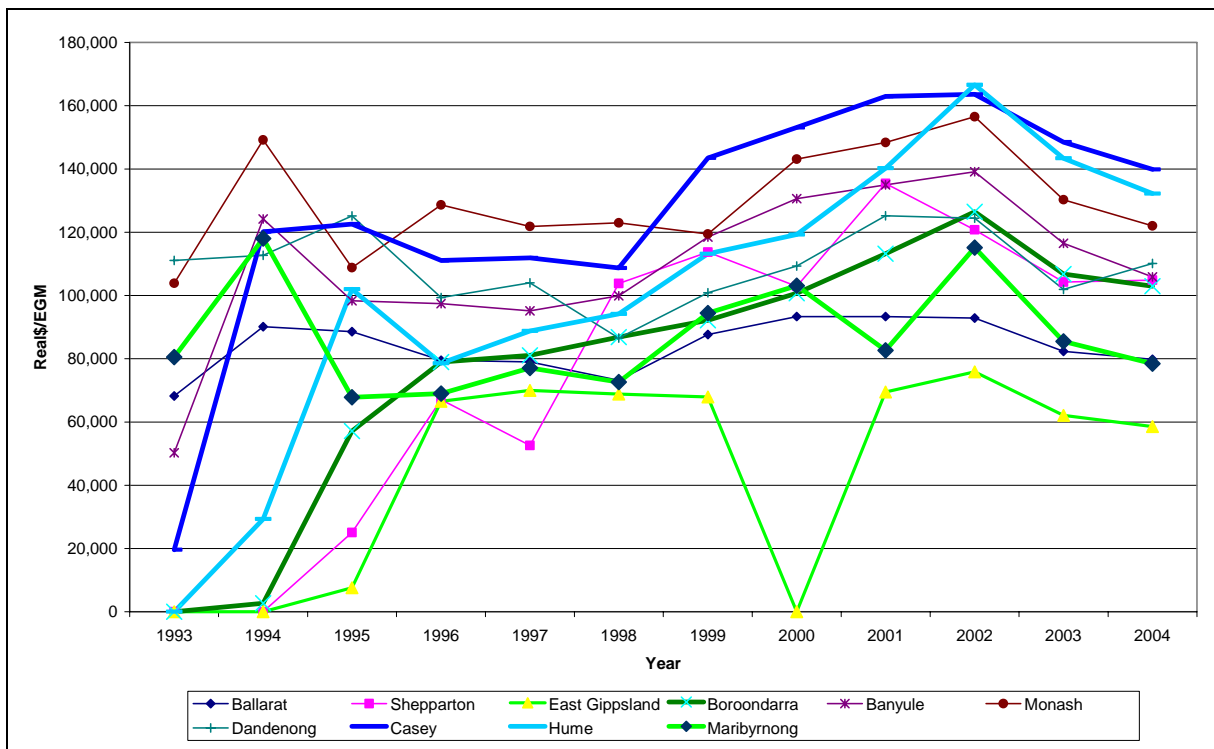
Of course, difference in relative performance between venue types is also compounded by relative performance between LGAs. The following four figures detail these differences across the four combinations of operator/venue type. Figure 4.14 displays real EGM gambling consumption per machine for Tattersalls’ club venues across the sample LGAs from 1993 to 2004. Figure 4.15 displays these data for Tattersalls’ hotels; Figure 4.16 does likewise for Tabcorp club venues; and Figure 4.17 completes the series by illustrating these data for Tabcorp hotel venues.

Figure 4.14: Real EGM consumption per EGM, Tattersall's club venues, sample LGAs, 1993 - 2004



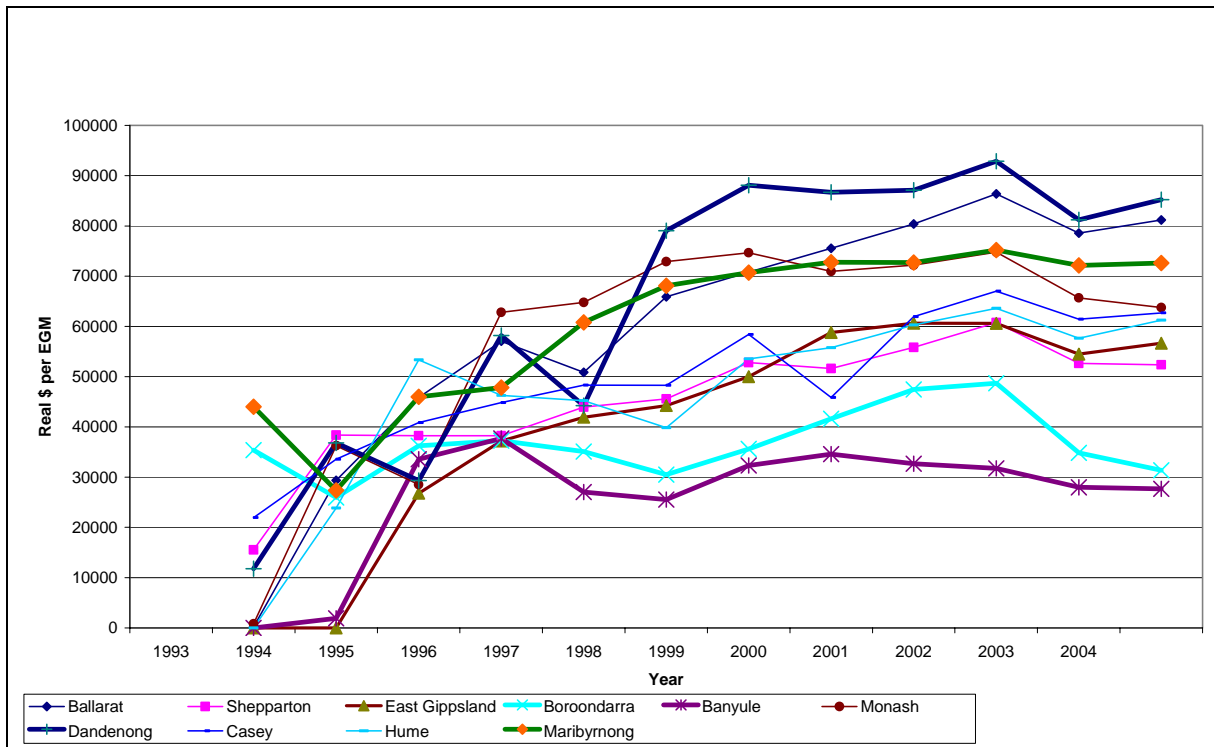
Source: OGR

Figure 4.15: Real EGM consumption per EGM, Tattersall's hotel venues, sample LGAs, 1993 - 2004



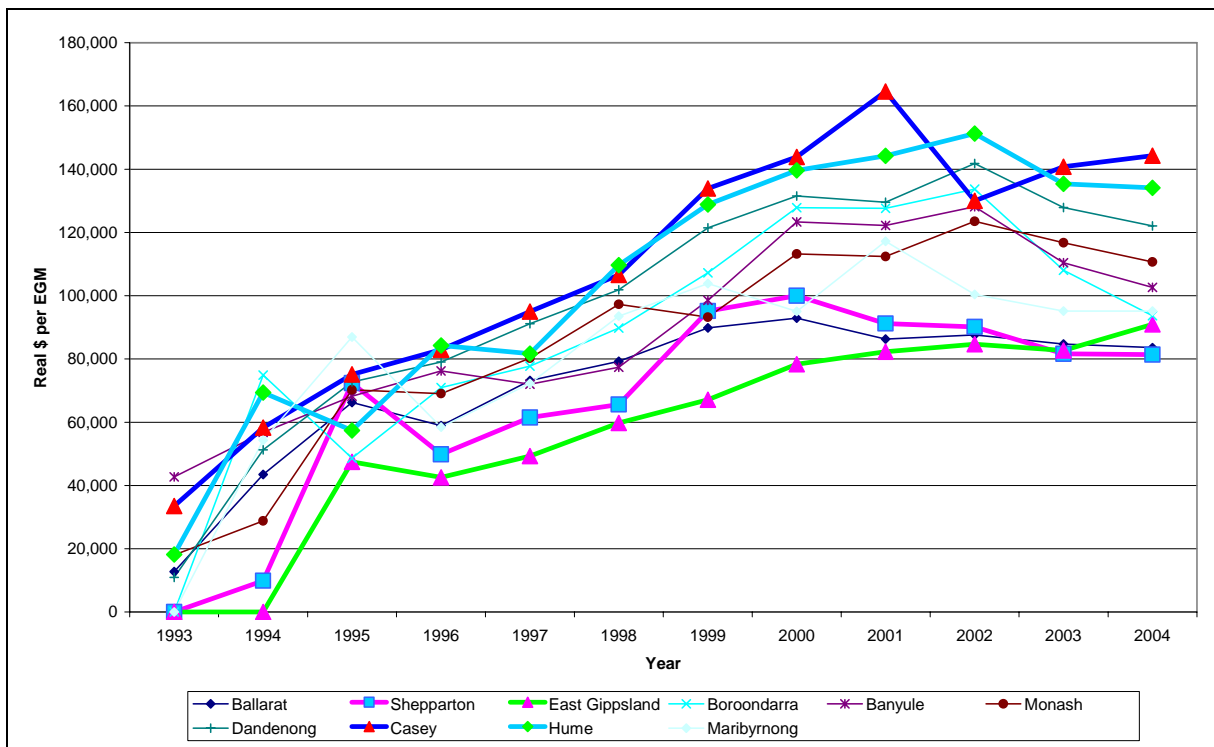
Source: OGR

Figure 4.16: Real EGM consumption per EGM, Tabcorp club venues, sample LGAs, 1993 - 2004



Source: OGR

Figure 4.17: Real EGM consumption per EGM, Tabcorp hotel venues, sample LGAs, 1993 - 2004



Source: OGR

It will be apparent from Figures 4.14 to 4.17 that rates of growth have been widely disparate between operators and venue types over the relevant period. However, it is also clear that rates of growth in hotel venues have been stronger in general than club venues, and that Tabcorp venues have experienced considerably stronger average growth in consumption per EGM than Tattersalls' venues, particularly over the periods shown in Table 4.11.

Table 4.11: Real growth in EGM gambling consumption per EGM by venue type and operator, sample LGAs, selected periods

	Hotels - 1995-2001		Clubs - 1995-2001		Hotels - 1995-2004		Clubs - 1995-2004	
	Tattersalls	Tabcorp	Tattersalls	Tabcorp	Tattersalls	Tabcorp	Tattersalls	Tabcorp
Ballarat	5.4%	30.2%	13.1%	75.2%	-9.9%	26.1%	8.5%	77.0%
Shepparton	440.6%	26.0%	34.6%	45.8%	318.5%	12.4%	3.8%	36.8%
East Gippsland	816.0%	73.3%	8.2%	126.3%	672.0%	91.6%	5.0%	111.5%
Boroondara	97.9%	162.5%	n/a	30.9%	80.0%	92.5%	n/a	-13.5%
Banyule	37.2%	79.1%	-5.9%	-2.7%	7.6%	50.4%	-19.9%	-17.7%
Monash	36.4%	60.0%	13.5%	152.8%	12.2%	57.6%	-2.7%	123.3%
Dandenong	0.0%	78.0%	9.3%	197.2%	-12.0%	67.8%	-3.8%	190.8%
Casey	32.9%	119.1%	1.7%	51.6%	14.1%	92.0%	-14.8%	53.5%
Hume	37.5%	151.3%	-22.3%	13.0%	29.7%	133.6%	-41.7%	14.8%
Maribyrnong	21.9%	34.8%	-15.8%	58.1%	15.7%	9.4%	-19.5%	57.9%
Average	43.1%	79.7%	7.5%	79.9%	22.6%	67.0%	-5.1%	72.3%

Source: OGR

4.3.2 Real EGM gambling consumption per capita, selected LGAs

Perhaps more significant measure is real per capita EGM consumption. Table 4.12 sets out growth rates by venue type and operator over selected periods.

Table 4.12: Real growth in EGM consumption per capita by venue type and operator, sample LGAs, selected periods

	Hotels - 1995-2001		Clubs - 1995-2001		Hotels - 1995-2004		Clubs - 1995-2004	
	Tattersalls	Tabcorp	Tattersalls	Tabcorp	Tattersalls	Tabcorp	Tattersalls	Tabcorp
Ballarat	0.7%	43.2%	93.9%	133.4%	-17.2%	33.4%	78.8%	126.6%
Shepparton	965.2%	39.7%	81.6%	52.3%	693.9%	19.9%	34.7%	37.5%
East Gippsland	766.0%	36.5%	26.4%	271.5%	642.0%	47.4%	19.7%	256.7%
Boroondara	58.6%	172.4%	-100.0%	-11.0%	43.0%	105.6%	-100.0%	-41.7%
Banyule	52.8%	69.9%	47.9%	9.1%	20.0%	42.8%	30.8%	-7.5%
Monash	84.9%	259.9%	257.5%	168.3%	52.4%	229.9%	200.2%	137.5%
Dandenong	22.3%	119.3%	36.5%	295.6%	7.3%	97.9%	15.6%	258.1%
Casey	152.9%	12.7%	10.8%	105.0%	94.8%	80.2%	-18.1%	83.1%
Hume	229.0%	293.0%	55.4%	27.2%	188.7%	240.0%	8.5%	20.2%
Maribyrnong	2.3%	174.3%	-9.0%	40.7%	-15.4%	104.9%	-25.5%	22.1%

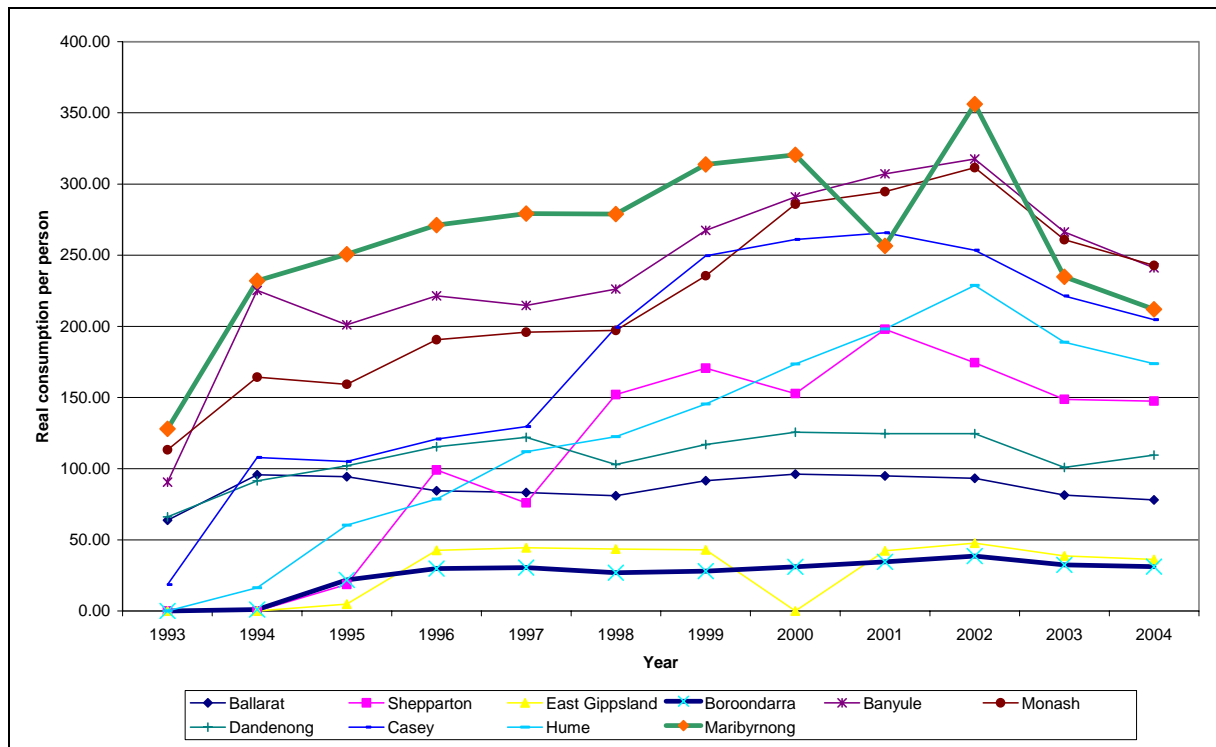
Source: OGR

Each LGA records a different market share for each venue type and operator – for example, Tabcorp had 59.2% of the Maribyrnong hotel venue market in 2004, and more than 65% of the club market in that LGA. It is also interesting to note that the strongest 'performing' hotel venues for both operators on a per capita basis have generally been those in Maribyrnong. Greater Dandenong has produced the highest per capita consumption figures for club venues for both operators. To some extent this may be a consequence of the venue mix (a little more than a third of the EGMs in Dandenong in 2004 were in hotel venues) but it may also relate to

effective operation of particular venues, noting that Maribyrnong had a 52:48 split of hotel to club EGMs, and that the mix in Dandenong was not unusual.

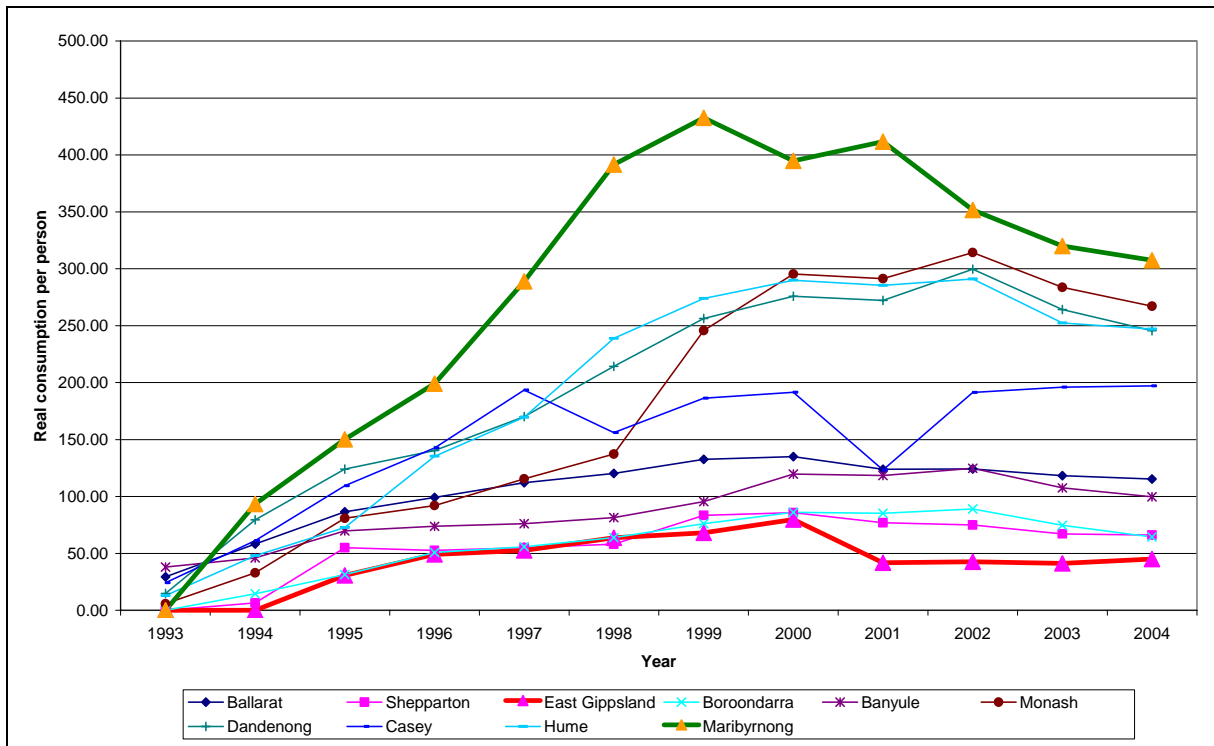
Figures 4.18 to 4.21 illustrate the real consumption per capita in the sample LGAs by venue type and operator. Figure 4.18 displays these data for Tattersalls' hotel venues; Figure 4.19 does likewise for Tabcorp hotels; Figure 4.20 shows these data for Tattersalls' hotel venues; and Figure 4.21 illustrates the same for Tabcorp clubs.

Figure 4.18: Real EGM consumption per person, sample LGAs, Tattersalls' hotel venues, 1993 to 2004



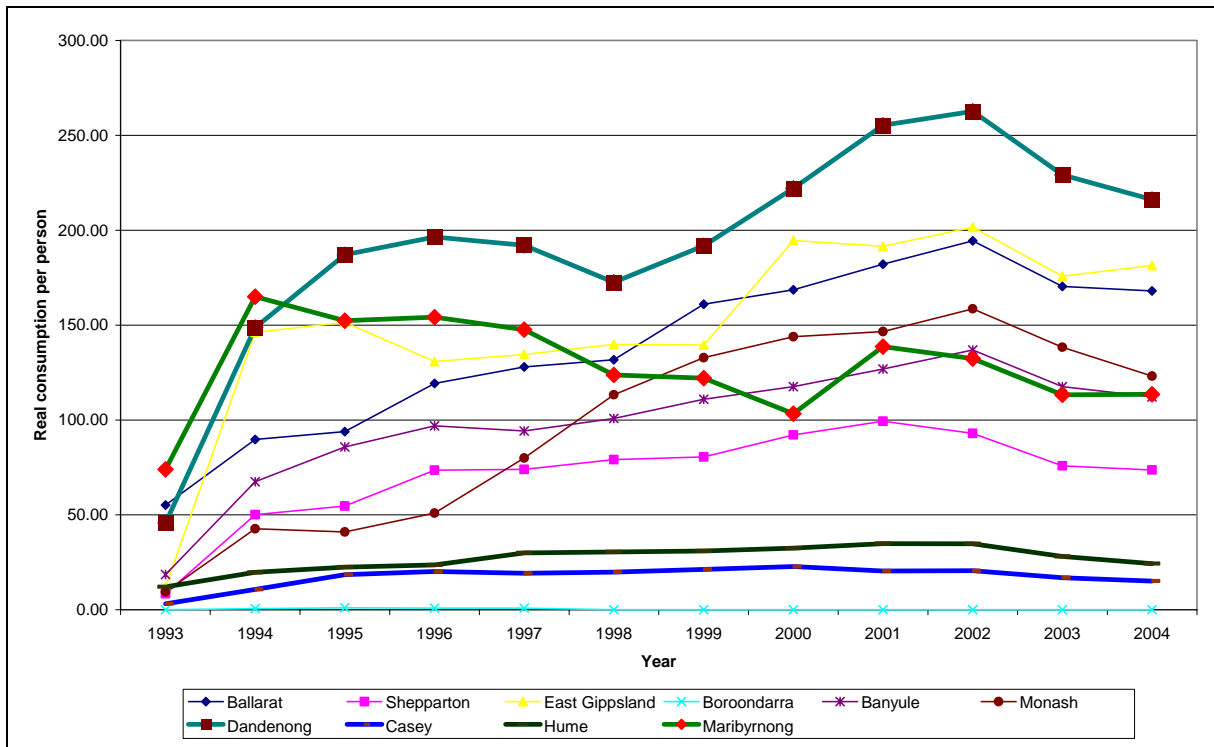
Source: OGR

Figure 4.19: Real EGM consumption per person, sample LGAs, Tabcorp hotel venues, 1993 to 2004



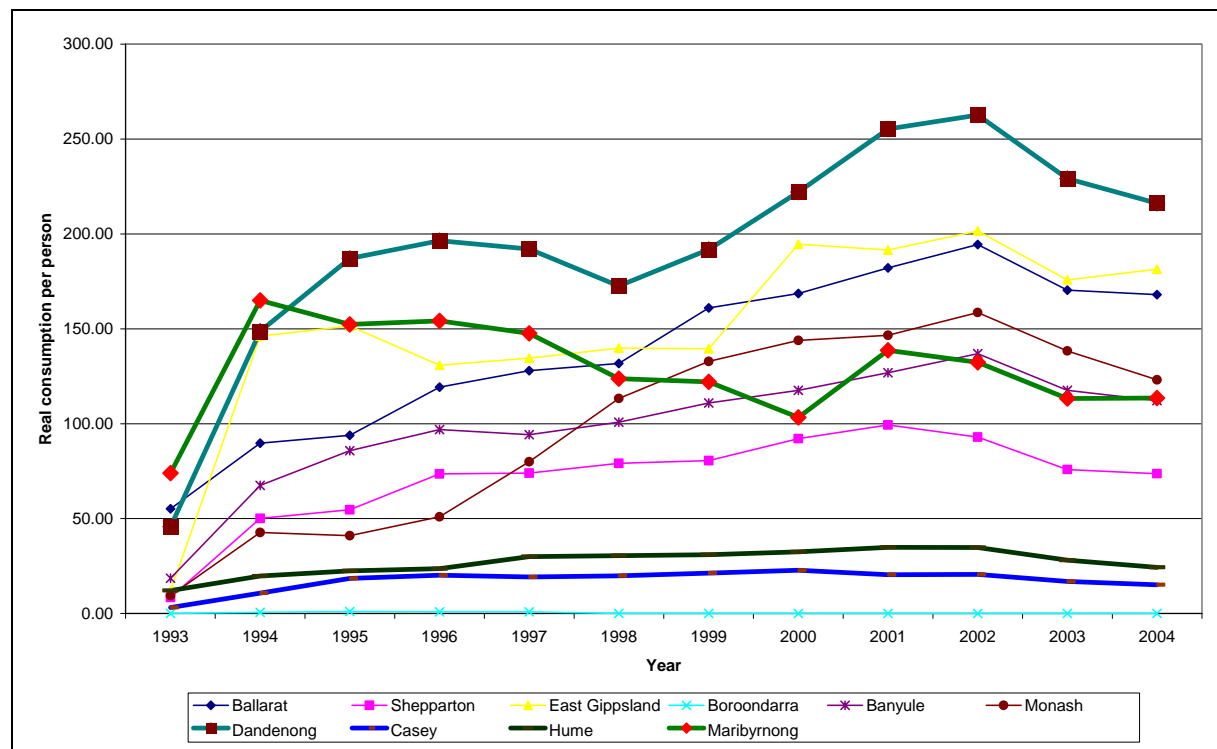
Source: OGR

Figure 4.20: Real EGM consumption per person, sample LGAs, Tattersalls' club venues, 1993 to 2004



Source: OGR

Figure 4.21: Real EGM consumption per person, sample LGAs, Tabcorp club venues, 1993 to 2004



Source: OGR

There is clearly a significant range of relative consumption illustrated in Figures 4.18 to 4.21. What is clear however is that there has been little ‘swapping’ of relative positions in the order of consumption value. That is, those LGAs where the value of consumption was high in the early years of the series have maintained that position throughout the series. This provides good evidence for the observation that EGM operators designed the EGM market in Victoria at an early stage of its development, rather than reacting to demand as information about EGM performance became available. Of course, this is not to say that operators ignore data as it becomes available. Rather, as we discuss elsewhere, the EGM market appears to be supply driven within a frame of socio-cultural characteristics which are well understood and utilised as marketing apparatuses by the industry, and are understood to at least some extent by government (as evidenced by the regional caps policy).

4.4 Selected venues – patterns of EGM gambling consumption

The OGR provided data relating to the performance of individual venues within the sample LGAs. This section presents some analysis of the performance of these venues, noting that we were unable to obtain data relating to the performance of individual EGMs, nor were we able to obtain data describing the features of EGMs or games and the date of their installation or upgrading. This would have provided very useful information related to important parameters of the system, for example, the popularity of specific games and particular credit denominations, the effect of the introduction of bank note acceptors, and the effect of game features on play. Whilst average machine data within a venue enables useful comparisons between venues, machine data would have enabled the drawing out of the range of machine performances within venues.

We selected 12 individual venues for analysis on the basis that such analysis at the individual level might illuminate some considerations that would be opaque at broader (i.e., LGA, metropolitan or statewide) levels. We selected the three highest ‘performing’ venues for both Tattersalls’ and Tabcorp from amongst sample LGAs measuring performance on the basis of the level of consumption per EGM at the venue in the year to June 2004. We also selected the three ‘lowest’ performing venues, assessed on the same basis, for each of Tattersalls’ and Tabcorp.

Venues are not identified by name, but basic information about the venues is provided in Table 4.13. Additional data relating to the performance of the ‘top six’ venues is provided in Table 4.14. Data relating to the ‘low six’ is provided in Table 4.15. It should be noted that all of the ‘top’ performing venues were hotels and all of those in the ‘low’ category were clubs.

Table 4.13: Sample venues, selected characteristics

Operator	LGA	Venue type	Venue ‘code’	Average real consumption pa, 1995-2004	Average EGMs, 1995-2004	Average real \$/EGM, 1995-2004
TAB	Hume	Hotel	TABH1	\$14,123,253	96	\$147,424
TAB	Hume	Hotel	TABH2	\$3,523,238	30	\$119,432
TAB	Casey	Hotel	TABH3	\$4,631,736	42	\$111,608
TAB	Banyule	Club	TABC1	\$817,346	24	\$33,915
TAB	Boroondara	Club	TABC2	\$1,053,103	42	\$25,134
TAB	Banyule	Club	TABC3	\$825,662	29	\$28,570
TATTS	Casey	Hotel	TATH1	\$7,570,161	53	\$142,029
TATTS	Casey	Hotel	TATH2	\$7,887,284	61	\$130,368
TATTS	Monash	Hotel	TATH3	\$19,200,344	105	\$182,860
TATTS	Ballarat	Club	TATC1	\$1,308,635	34	\$38,603
TATTS	Banyule	Club	TATC2	\$815,294	23	\$36,235
TATTS	Ballarat	Club	TATC3	\$1,325,031	33	\$40,645

Source: OGR

As Table 4.13 shows, the range of venue performance is substantial, with the best performing venue (TATH3) generating real average consumption per EGM of nearly \$183,000 per annum over the period from 1995 to 2004, whilst the lowest average real consumption per EGM was recorded by TABC2 where a much more modest \$25,000 was averaged during the same period.

Table 4.14: Data relating to ‘top six’ sample venues, 1993 to 2004, real consumption (\$2004)

	Venue	1993	1994	1995	1996	1997	1998
EGMs	TABH1	50	50	70	88	100	100
	TABH2	0	0	0	0	35	35
	TABH3	0	0	20	44	43	44
	TATH1	43	43	43	43	43	53
	TATH2	40	40	40	45	65	65
	TATH3	105	105	105	105	105	105
\$/EGM	TABH1	\$27,851	\$80,102	\$89,853	\$97,316	\$94,624	\$133,472
	TABH2	\$0	\$0	\$0	\$0	\$10,177	\$75,069
	TABH3	\$0	\$0	\$38,086	\$53,590	\$79,769	\$89,557
	TATH1	\$38,091	\$99,436	\$98,720	\$103,099	\$109,918	\$108,966
	TATH2	\$12,564	\$116,428	\$123,477	\$121,408	\$94,708	\$106,692
	TATH3	\$141,271	\$171,325	\$150,265	\$168,336	\$159,621	\$161,178
Total pa	TABH1	\$1,392,558	\$4,005,076	\$6,289,742	\$8,563,847	\$9,462,350	\$13,347,168
	TABH2	\$0	\$0	\$0	\$0	\$356,205	\$2,627,417
	TABH3	\$0	\$0	\$761,720	\$2,357,980	\$3,430,059	\$3,940,489
	TATH1	\$1,637,892	\$4,275,729	\$4,244,964	\$4,433,252	\$4,726,495	\$5,775,198
	TATH2	\$502,566	\$4,657,138	\$4,939,070	\$5,463,356	\$6,156,028	\$6,935,000
	TATH3	\$14,833,492	\$17,989,154	\$15,777,862	\$17,675,244	\$16,760,231	\$16,923,742
	Venue	1999	2000	2001	2002	2003	2004
EGMs	TABH1	100	100	100	100	100	100
	TABH2	35	38	38	38	38	38
	TABH3	44	44	44	44	44	44
	TATH1	51	58	58	58	63	63
	TATH2	65	65	65	65	65	65
	TATH3	105	105	105	105	105	105
\$/EGM	TABH1	\$163,918	\$178,137	\$177,495	\$184,262	\$165,904	\$165,978
	TABH2	\$106,838	\$144,794	\$149,790	\$159,267	\$144,829	\$151,569
	TABH3	\$107,497	\$119,750	\$109,071	\$135,009	\$160,735	\$182,191
	TATH1	\$131,107	\$151,051	\$195,630	\$183,334	\$157,756	\$145,329
	TATH2	\$122,660	\$131,246	\$143,339	\$150,905	\$148,153	\$155,687
	TATH3	\$193,647	\$211,005	\$213,794	\$223,090	\$182,996	\$164,671
Total pa	TABH1	\$16,391,796	\$17,813,708	\$17,749,532	\$18,426,170	\$16,590,445	\$16,597,770
	TABH2	\$3,739,331	\$5,502,164	\$5,692,005	\$6,052,153	\$5,503,489	\$5,759,617
	TABH3	\$4,729,880	\$5,268,990	\$4,799,124	\$5,940,389	\$7,072,333	\$8,016,395
	TATH1	\$6,686,478	\$8,760,980	\$11,346,533	\$10,633,378	\$9,938,605	\$9,155,729
	TATH2	\$7,972,894	\$8,531,006	\$9,317,065	\$9,808,809	\$9,629,950	\$10,119,664
	TATH3	\$20,332,984	\$22,155,503	\$22,448,415	\$23,424,414	\$19,214,601	\$17,290,443

Source: OGR

As Table 4.14 shows, the ‘best performing’ venues have steadily increased both total consumption and consumption per EGM over the whole period, and in most cases the number of EGMs in the venue has increased or stayed at least stable over the period. It should be noted that the venue TATH3 is one of the best performing venues in Victoria, generating total consumption of nearly \$23.5 million at its peak in 2002. Although the substantial decline in EGM consumption associated with the introduction of the smoking prohibition affected most venues, some defied this, notably venues TABH3 and TATH2. In the former case consumption actually rose over the relevant period, whereas in the latter, consumption declined in 2003 but recovered solidly in 2004. It is also notable that five of the six top

performing venues in the sample are located in the outer suburban growth corridors of Hume and Casey, with the sixth venue being a well-established hotel in Melbourne's sprawling and heavily populated south eastern suburbs.

Table 4.15: Data relating to 'low six' sample venues, 1993 to 2004, real consumption (\$2004)

	Venue	1993	1994	1995	1996	1997	1998
EGMs	TABC1	0	25	25	29	29	29
	TABC2	59	59	59	55	55	55
	TABC3	0	0	20	26	26	31
	TATC1	30	36	36	45	45	34
	TATC2	0	0	0	25	25	25
	TATC3	30	30	35	35	32	32
\$/EGM	TABC1	\$0	\$1,889	\$37,108	\$37,631	\$26,970	\$29,936
	TABC2	\$35,366	\$40,310	\$32,836	\$33,801	\$29,771	\$24,073
	TABC3	\$0	\$0	\$29,180	\$37,804	\$27,067	\$21,442
	TATC1	\$47,303	\$60,262	\$52,626	\$39,563	\$36,540	\$38,284
	TATC2	\$0	\$0	\$0	\$17,857	\$34,040	\$40,497
	TATC3	\$34,286	\$55,043	\$46,230	\$37,642	\$40,457	\$40,237
\$Total pa	TABC1	\$0	\$47,216	\$927,696	\$1,091,306	\$782,118	\$868,149
	TABC2	\$2,086,599	\$2,378,294	\$1,937,300	\$1,859,060	\$1,637,392	\$1,324,019
	TABC3	\$0	\$0	\$583,596	\$982,905	\$703,744	\$664,695
	TATC1	\$1,419,085	\$2,169,418	\$1,894,541	\$1,780,314	\$1,644,322	\$1,301,653
	TATC2	\$0	\$0	\$0	\$446,422	\$851,003	\$1,012,421
	TATC3	\$1,028,575	\$1,651,301	\$1,618,062	\$1,317,478	\$1,294,625	\$1,287,580
	Venue	1999	2000	2001	2002	2003	2004
EGMs	TABC1	29	20	20	20	20	20
	TABC2	45	30	30	30	30	30
	TABC3	31	31	31	31	31	31
	TATC1	34	29	29	29	29	29
	TATC2	25	25	25	25	25	25
	TATC3	32	32	32	32	32	32
\$/EGM	TABC1	\$35,915	\$40,300	\$35,522	\$34,215	\$32,410	\$30,685
	TABC2	\$25,438	\$30,094	\$21,961	\$16,179	\$10,413	\$8,973
	TABC3	\$28,943	\$30,935	\$30,832	\$30,169	\$25,096	\$25,691
	TATC1	\$37,259	\$42,856	\$36,116	\$38,012	\$33,202	\$29,080
	TATC2	\$34,076	\$39,326	\$43,017	\$46,423	\$36,959	\$33,922
	TATC3	\$43,242	\$45,973	\$46,304	\$39,956	\$32,598	\$33,569
\$Total pa	TABC1	\$1,041,532	\$806,005	\$710,437	\$684,305	\$648,204	\$613,708
	TABC2	\$1,144,690	\$902,807	\$658,833	\$485,366	\$312,384	\$269,182
	TABC3	\$897,228	\$958,981	\$955,807	\$935,252	\$777,983	\$796,432
	TATC1	\$1,266,796	\$1,242,833	\$1,047,350	\$1,102,355	\$962,863	\$843,327
	TATC2	\$851,899	\$983,160	\$1,075,420	\$1,160,568	\$923,982	\$848,060
	TATC3	\$1,383,740	\$1,471,137	\$1,481,718	\$1,278,600	\$1,043,148	\$1,074,219

Source: OGR

Table 4.15 sets out data describing aspects of the operations of the 'low six' selected venues, all of which are clubs located in a country centre (Ballarat) or in inner city areas (Banyule and Boroondara). Few of these venues recorded growth in EGM numbers over the whole period from 1993 to 2004, and three experienced a decline in EGM numbers in the latter part of the series. Five of the six experienced declines in real consumption per EGM prior to the introduction of the smoking ban, in some cases quite dramatically.

It is difficult to ascribe causality to this pattern other than to suggest that club environments are likely to lack appeal to those who consume EGM gambling heavily. This lack of appeal may be exacerbated by relatively small numbers of EGMs, which may make problem and other gamblers feel more noticeable and less able to 'blend' into a crowd. It may also be a function of local decision-making by club managements to discourage heavy emphasis on EGM revenue amongst club members and in some cases clubs may be focused primarily on the needs and interests of their members to the exclusion of visitors. Five of the six venues in this category were RSL, bowls or golf clubs which from our observations are less likely to emphasise the role of EGMs in the 'life' of the club. These venues retain some affinity for what we have described as the folk model of EGM gambling. Further, such venues are much more likely to have an air of friendly 'surveillance', given that most members are known to many other members, and heavy EGM consumption is likely to be remarked upon, or at least observed. At any rate, this may be the perception of those using EGMs. The sixth venue is a football club where such considerations may be less consequential and we are unclear as to the cause of the relatively 'low' performance of this venue, although attitudinal distinctions associated with social class may play a role in this.

In any event, our observations of venues and consultations with gamblers lead us to the strong view that small club venues are the most likely to have the characteristics of 'low-risk' venues – that is, relatively small numbers of EGMs, modest activity levels whether measured by the value of EGM consumption or the proportion of time EGMs are in use, the perception of 'surveillance' by friends and acquaintances, more limited operating hours, and some definite social or recreational purpose other than gambling (such as golf, bowls or regular social interaction with friends). Alternatively, it may be reasonable to postulate that large hotel venues may be more likely to exhibit characteristics which could be identified as 'high risk' – higher numbers of EGMs, high activity levels, a substantial degree of anonymity, gambling as a major or primary business focus, more limited social purposes and extended operating hours.

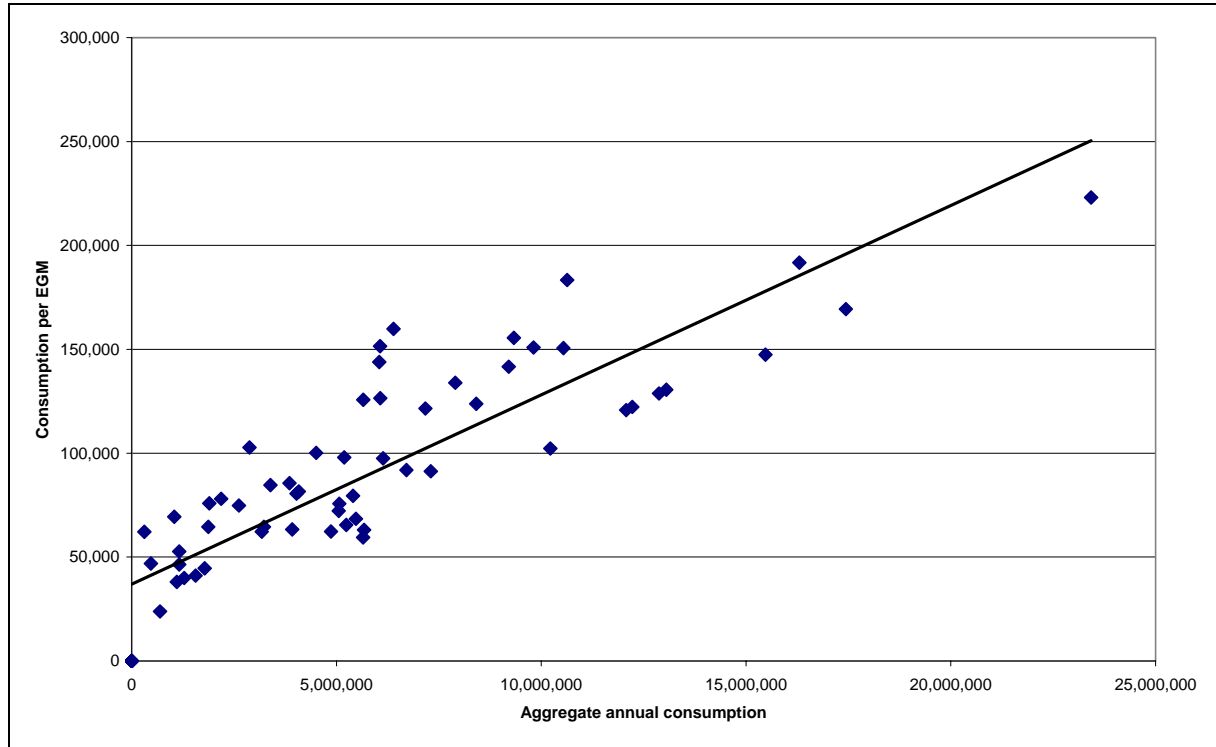
In order to quantify these ideas, it would have been very useful had the researchers been provided with access to EGM level data from within venues such as those described in Tables 4.13 to 4.15. However, the regulator advised that such data were not readily available. Further, we sought data relating to the characteristics of EGMs, including the date of fitting of bank note acceptors, the credit value of EGMs, game types, game upgrades, etc. We were advised that these data, although held by the regulator, are in a form where they cannot be readily (if at all) compared to the records of consumption held for individual EGMs.

This was a disappointing discovery, not the least because it indicates the extent to which the potential offered by the CMCS for modelling EGM gambling consumption and informing harm minimisation activities has not been utilised. Clearly, the ability to compare patterns of consumption for EGMs with modifications such as the fitting of BNAs and changes in credit values would produce very useful 'natural' data, enabling a better research base flowing into improved bases for decision-making in respect of harm minimisation measures. That this is not presently done, or at any rate is not done systematically, indicated that the harm minimisation object of the legislation currently falls between the stools of revenue protection and the guarantee of compliance with standards, probity and integrity in gambling (which are the uses to which data generated by the CMCS are mostly put).

A very strong and consistent relationship between the aggregate level of consumption in a venue and the average level of consumption per EGM can be observed amongst sample

venues, for both operators, regardless of the number of EGMs in the venue. Figure 4.22 illustrates the relationship between EGM consumption per EGM and aggregate consumption for Tattersalls' venues for 2002 as an example.

Figure 4.22: Consumption per EGM vs. aggregate consumption, sample Tattersalls' venues, 2002 (\$2004)

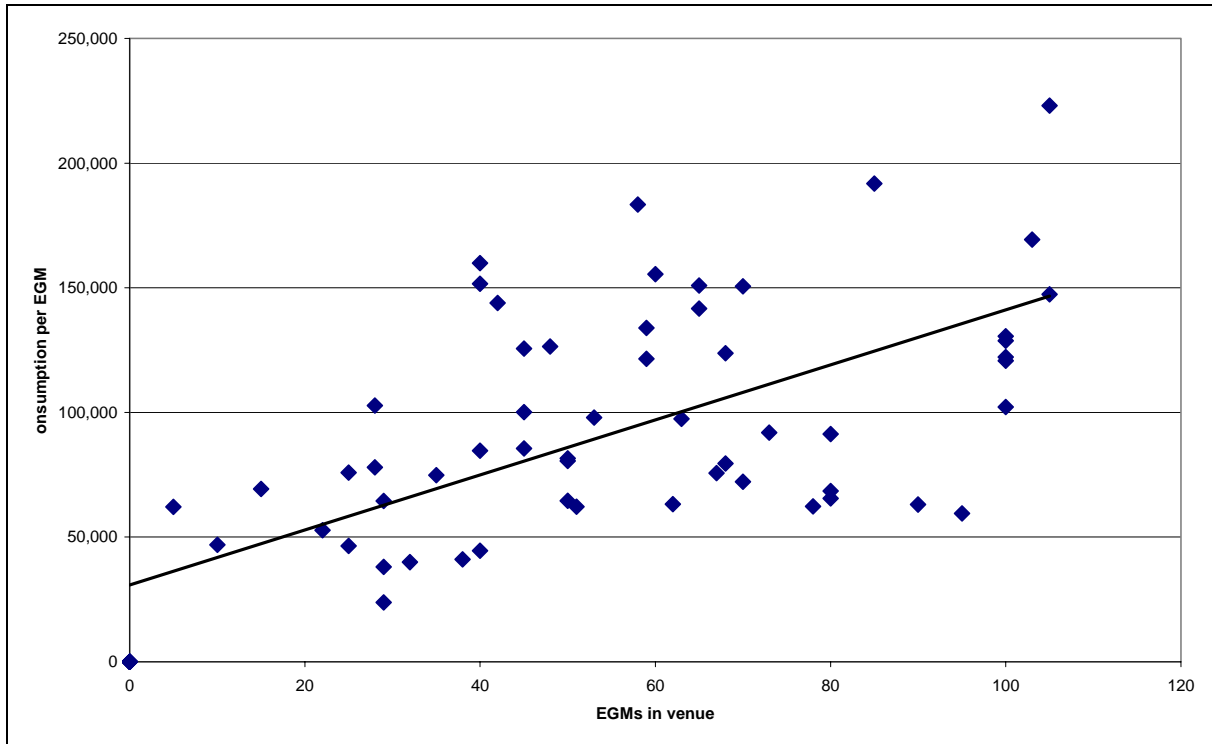


Source: OGR

As Figure 4.22 shows, venues with the highest aggregate consumption were very likely to exhibit high levels of consumption per EGM. This may appear self-evident but nonetheless emphasises the likelihood that busier venues induce higher levels of expenditure.

There is also a weaker but still reasonably strong positive relationship evident between the size of venues and the level of consumption per EGM for both operators. Figure 4.23 illustrates the relationship between venue size and consumption per EGM for Tattersalls' venues in 2002. As for Figure 4.22, a linear trendline has been inserted.

Figure 4.23: EGMs per venue vs. consumption per EGM, sample Tattersalls' venues, 2002 (\$2004)



Source: OGR

Between 1995 and 2004, the Pearson product correlation moment describing the relationship between aggregate consumption and consumption per EGM was about 0.8, for both operators amongst our sample venues. Over the same period, the Pearson product moment correlation describing the relationship between consumption per EGM and the number of EGMs in venues was generally between 0.6 and 0.7, although this was a little stronger in the case of Tattersalls' venues than Tabcorp venues. Thus, it would appear that there is a relationship between larger EGM gambling venues and higher levels of consumption per EGM. In addition, venues where high levels of aggregate consumption are evident also appear very likely to operate EGMs at high average consumption.

In concluding, we reiterate that data describing the effects of particular interventions or innovations in the EGM technical system were not available to us to assist in explaining this and other observable phenomena. Accordingly, in order to collect some relevant data about the effect of game features and EGM characteristics, we undertook qualitative research with the assistance of gamblers which described and analysed in the following section. However, Sections 3 and 4 provide a framework for describing a number of the distinctions within aggregate data on EGM consumption, which we believe provide an important context for better understanding the experiences and perceptions described by EGM gamblers.

The data described in this and the previous section allowed us to make several exploratory 'cuts' in the data available through the CMCS. As detailed above, differences and variations

were found on a number of dimensions, and trends could be seen to transform across time. This kind of analysis of evidence could allow for the systematic identification of sites and forms of risks associated with EGM gambling consumption. However, complementary and precise data on objective changes to the EGM technical system and/or technical parameters would be required and would need to be linked to machine, venue and aggregate level consumption data to facilitate the most meaningful analysis. Transformations in these data could then be used to monitor product innovations when new machines or games are introduced to the marketplace and other changes to the EGM technical system are made. Over time, risk profiles for consumer reaction to such transformations as new games or new game features, for example, would be developed. Data showing unexpected results, deviations from the norm or significant changes in consumption trends would provide a sound evidence base for investigating possible risks. It would then underpin targeted harm minimisation and/or consumer protection strategies and provide a reliable 'feedback loop' to regulators charged with the responsibility of administering aspects of the public interest in the innovation process.

5. Researching EGM technology with problem gamblers

5.1 Introduction

The broad task of the project to investigate the role of technology in the transformation of EGM gambling has two broad aspects. The first of these relates to mapping the contours of the EGM industry at aggregate level, as discussed in other sections of this report. The second relates to the relationship between EGM technology and consumers of EGM gambling. Obviously, comprehensive coverage of all issues involved in the relationship between EGM gamblers and EGM machine and network technologies is not possible in the context of this research project.³² However, one key issue of concern considered is the nature of the relationship between EGM problem gamblers (and to a lesser extent committed heavy gamblers) and machine technology. The nature of this relationship is important in relation to policy and practice in aiming to achieve the legislated goal of reducing the level of harm from consumption of EGM gambling.

A detailed review of the literature related to problem gambling, with particular reference to the characteristics of EGM technology and contexts of EGM gambling activity, was conducted and published as part of the major discussion paper for this project (Livingstone, Woolley and Borell 2005). Following this review, two strategies were put in place to collect primary qualitative data with problem gamblers as part of this research. The major data collection strategy was a series of focus groups and interviews conducted with self-identified problem gamblers who at the time of interview or discussion were or had been clients of Gamblers' Help services. A second data collection strategy was to integrate a series of questions about EGM use and beliefs about EGMs into an ongoing longitudinal research project with problem gamblers and their loved ones, being conducted at that time by New Focus Research for the Victorian Gambling Research Panel.³³ Individuals were asked a series of eight questions in the context of a longer questionnaire being conducted as part of the New Focus project.

5.1.1 Background: EGM problem gambling, gaming revenues and machine technology

A number of substantial prevalence studies have estimated that between two and three per cent of the Australian population are problem gamblers (Banks 2002). Problem gambling has been strongly associated with EGM gaming consumption (PC 1999). The Productivity Commission also established a link between problem gambling and disproportionate levels of EGM gambling expenditure. The PC estimated problem gamblers contributed 42.3% of EGM operators' profits and state taxation revenues from EGM gambling. This problem gambling-EGM revenue nexus lies at the heart of the policy dilemma confronting legislators and industry alike – programs and practices to minimise social costs from EGM gambling are unlikely to be 'revenue neutral'. In fact, policies which either stop problem gamblers or a proportion of problem gamblers from consuming EGM gaming or slow the rate of this consumption are likely to significantly impact on private and state revenues from EGM consumption. In addition, if such measures as a by-product were to also reduce the number of committed heavy gamblers escalating their gambling activity to harmful levels, then there

³² See the Discussion Paper, *Contexts, characteristics and impacts of EGM Technology* (2004) for further discussion of some of these issues and relevant literature.

³³ For published reports from this project to date visit <http://www.justice.vic.gov.au>, follow the links to 'Gaming and Racing', and then to 'Research'.

would also be a problem gambling prevention effect that would likely further reduce EGM revenue.

There are likely to be a range of social, economic and personal factors which contribute to the significant level of problematic EGM gambling consumption. This research takes a somewhat different approach to questions surrounding problem gambling than those focused on psychological or sociological approaches or (increasingly) on a combination of the two (see Griffiths & Delfabbro 2001, for example). EGM technology is placed at the centre of analysis and the material characteristics and technical capabilities of machines and networks and the contexts of their use (which we term the socio-technical), are considered to shape individual and aggregate EGM gambling consumption. This leads to a change of perspective on problem gambling as also constituted to some significant extent by the socio-technical. This means recognising that psychological explanations which understand problem gambling in terms of idealised models of individual free will and/or rational choice-making, or sociological explanations that rely on purely social determinations are insufficient, *should they ignore the irreducible influence of technology*. In this view the problem gambling-gaming revenue nexus needs to have a third term included – EGM technology – reflecting the fact that the specific characteristics and parameters of the EGM consumption opportunities available in Australia are the conditions of possibility of all gambling behaviour (along the continuum from recreational to problematic) and all potential and actual revenue receipts. Therefore, transformation in the technical basis of the conditions of possibility of EGM consumption will have an impact on gambling behaviour and revenue flows – the problem lies in knowing what changes will have what effects.

The potential of technological or technical interventions to have effects in relation to the reduction in social costs from gambling are already well recognised. Indeed, a number of harm minimisation measures put in place in Victoria³⁴ have specifically addressed aspects of EGM technology. These included:

- a ban on \$100 note acceptors on machines;
- prohibiting the increase of machine spin rates above current levels (2.14 seconds);
- a ban on autoplay facilities;
- setting a maximum bet limit of \$10; and
- displaying information about the odds of winning and the amount of time and money spent by the player.³⁵

Future plans for technology-based harm minimisation measures include the introduction of a limited number of machines (up to 10% of the total number of EGMs) to which access is restricted by use of a smart card or personal identification number (PIN).

However, in keeping with a key finding of this report generally, the researchers found that there was a surprisingly small evidence base for interventions in EGM technology in the interests of either harm minimisation or other regulatory goals. In addition much of this evidence was derived from either experimental or quasi-experimental research. Although counsellors have suggested lower levels of problem gambling in states without bank note

³⁴ Gaming Legislation (Amendment) Act 2002, for all EGMs introduced after 1 January 2003.

³⁵ Note that we are not discussing the displaying of warning message on machines in this context. However, we do consider the issue of on-screen messages designed to interrupt a specific gambling session in progress.

acceptors on machines (SACES 2005), there is little evidence of the impact of changed machine characteristics and/or technical parameters on *actual EGM gaming consumption*.

In relation to the reconfiguration of EGMs, a key study by Blaszczynski et al (2001) in response to recommendations from the New South Wales Liquor Administration Board³⁶ found that:

- a higher proportion of problem gamblers than recreational gamblers use high denomination notes inserted into BNAs;
- limiting BNAs to \$20 reduced EGM expenditure by 42%;
- a higher proportion of problem gamblers than recreational gamblers play EGMs at a rate faster than 5 seconds per spin;
- more than three times the proportion of problem gamblers (7.5%) in comparison to recreational gamblers (2.3%) placed maximum bets in excess of \$1; and
- the preference for relatively large bets per spin was a consistent predictor of gambling problems and of the severity of those problems.

The impact of these changes on gaming revenues would be substantial, cutting hotel gaming revenue by 39% and club gaming revenue by 17% according to one study (CIE 2001). This would tend to lend credence to our discussion of the key role of EGM technology in the nexus between problem gambling and gaming revenue. If, as seems likely, such a dramatic drop in expenditure would be due (at the very least) to a proportionate drop in expenditure by problem gamblers, then a net reduction in social harm would also seem likely to accompany the net reduction in gaming revenues flowing from this set of reconfigurations of EGMs.

However, in terms of our argument for evidence-based policy-making, it should be emphasised that these findings emerged from research conducted under ‘quasi-experimental’ conditions in club and hotel venues. This methodology and others used in studies of modifying machine parameters have been the subject of ongoing debate amongst researchers and peer reviewers (Blaszczynski et al 2003; CGS 2003; Delfabbro et al 2004).³⁷ The findings, and by extension the revenue predictions discussed, may not be replicated under actual EGM gaming consumption conditions.

In overseas jurisdictions such as Nova Scotia and Norway reconfigurations of gaming machines have been made in the interests of reducing the social costs from problem gambling. It is perhaps too early to draw strong conclusions from these interventions. Regardless, substantial differences in the characteristics of EGMs being used in these countries from ‘Australian-style’ video-based machines and in the contexts in which EGM gambling is consumed, mean that whilst these interventions can provide useful insights for policy makers, they do not in any way substitute for the cultivation of a significant local, regional and national evidence base. Recent research by the South Australian Centre for Economic Studies

³⁶ Consultation with the NSW LAB confirmed that the recommendations contained in their *Determinations* on modifying technical parameters of EGMs for harm minimisation purposes, which included the reduction of maximum bets from \$10 to \$1, were themselves not evidence based.

³⁷ See Livingstone et al (2004) for discussion of this research, its subsequent peer evaluation, and ongoing methodological and other debates.

(SACES 2005) into the impact of regional gaming machine caps in Victoria included a broad review of previous policies and results to minimise harm from gambling, and found that

[t]he most obvious gap in our view is that industry regulators and government are lagging well behind technological advances and growth strategies pursued by a highly sophisticated machinery design industry, and are failing to utilise the very same technologies to address the social and economic impact of problem gambling (SACES 2005, 51).

This finding clearly articulates the centrality of technology as both part of the problem and potentially a key aspect of future solutions. The ‘institutional lag’ identified was similarly evident in the case of the current research. Whilst not pretending to be in a position to provide comprehensive answers, the researchers have in the course of the project come to a view on some of the key steps needed in building an evidence base to address this lag. These steps are outlined elsewhere in this report.

5.1.2 Data collection – some methodological issues

Two data collection strategies were undertaken with the aim of obtaining insight into relationships between problem gamblers and EGM technology. The first was a series of focus groups and interviews with self-identified problem gamblers (n=62). The second was a short questionnaire collecting information on machine preferences and playing strategies in the course of ongoing research being conducted within the framework of the Gambling Research Panel research program (n=99).

There are a range of strategies researchers adopt in sample selection based on the outcomes desired and the kind of data being sought. Random selection avoids problems of sample bias, whilst stratified sampling techniques are designed to capture generalisable proportions of sub-groups within the sample. These techniques are common in research on gambling, particularly in problem gambling prevalence studies.

An information-oriented approach is the preferred strategy when seeking to maximise the value of the information captured from relatively small samples. This approach was taken in seeking a sample of self-identified problem gamblers to participate in focus groups. The assistance of the Gamblers Help network of Problem Gambling counselling and assistance programs was initially drawn on in making information about the research available to its client-base and helping the recruitment of respondents, who were offered the incentive of a \$25 voucher from a leading department store for their participation.

The data collected through the focus groups can be considered to have been drawn from a sample of paradigmatic cases. Paradigmatic cases refer to cases that highlight global characteristics of a particular population or sub-population, and even of the society in which they are contextualised. Such qualitative and small sample approaches are often criticised as not providing reliable enough data to form the basis of more general statements. However, provided researchers employ circumspection and a measured approach to the conclusions drawn and the implications argued to flow from small samples of paradigmatic cases this criticism is largely countered. For example, if most of the cases in our sample suggest that flashing lights on EGMs are attractive to them in choosing to play a particular machine, then these data have global significance, in that flashing lights are likely to be a factor in the marketability and attractiveness of poker machines. However, if were to try and extrapolate

from such qualitative data in arguing that a particular proportion of problem gamblers are attracted by flashing lights this would amount to an unreliable generalisation that should not be made. However, this limitation in no way diminishes the value and usefulness of interpretation from the data. The researchers believe that developing the kind of detailed description favoured by social anthropologists and integrated into a framework adapted from the emerging area of life-course research (Heinz & Kruger 2001) will be vital to the project of developing a well-founded understanding of the lived experience of gamblers. The current research can be viewed as a no more than a small step in this methodological development, in part due to the focus on the specific objectives of the project.

A total of 62 respondents were recruited for seven focus groups and six in-depth interviews. This is a relatively large number of respondents for such a qualitative data collection with self-identified problem gamblers, particularly in the context of a synchronic (snapshot) study. The focus groups and interviews were recorded and augmented with the researchers' notes. A thematic summary of the data were then compiled, with key quotes and striking comments included for purposes of illustration and example. The researchers have been mindful to only make interpretations and draw conclusions from the data based on those responses and themes that emerged clearly and strongly across a majority of groups and participants.

An information-oriented approach also guided the second data collection strategy. A questionnaire asking participants in a study of problem gambling services (New Focus Research 2004) about machine preferences and gambling strategies was completed by a total of 99 respondents. These data were processed at a basic level of frequencies and cross-tabs where sub-groups contained 30 observations or above. Once again the size of the sample meant that the data were not considered to provide conclusive or broadly generalisable results. However, the data generated provides insight into the complex question of the relationship between playing strategies, some beliefs, and problem gambling. This data collection instrument and the context of its deployment represent innovative methodological steps in researching the problematic consumption of EGM gambling.

More broadly, the researchers believe firmly that, along with the cultivation of a sound quantitative or statistical evidence base, methodological progress in researching with EGM gamblers (of all 'types') is a necessary condition of progress in understanding problematic EGM gambling consumption. Data generated from aspects of this project can be viewed as a small step in this direction. In the context of the current study, the researchers were satisfied that perspectives on some of the issues relevant to the complex relationship between EGM technology and problem gamblers did emerge, and that well-founded interpretations could be made on the basis of the data.

5.2 Focus groups and interviews with self-identified problem gamblers

A total of seven focus groups were conducted with 56 clients of Gamblers Help agencies, with a further six interviews with additional individuals who did not wish to participate in a focus group. Gamblers Help is funded by the Victorian Government from the Community Support Fund to provide counselling and other assistance to those experiencing difficulties with gambling. Five focus groups were conducted within metropolitan Melbourne and two in Ballarat, a major regional centre. Focus group size ranged between six and ten respondents, with an average of eight respondents per group. The duration of focus groups was between one and two hours. Six in-depth interviews were conducted with individual gamblers in metropolitan Melbourne, using the same schedule of questions and discussion topics utilised for focus groups. The duration of these interviews was up to one hour. Each participant was

offered and in almost all cases accepted a \$25 gift voucher from a major department store in compensation for their time.

5.2.1 Characteristics of the sample

A range of demographic and gambling activity data were collected from the focus group and interview respondents. These data are summarised in Table 5.1, below.

Table 5.1: Focus group and interview respondents

Gender	74.2% female; 25.8% male
Age (years)	21 youngest; 75 oldest 49 median; 48.4 average age
Country of birth	77.4% Australia; 4.8% Germany; 17.8% others
EGM gambling participation (years)	0.25 shortest; 30 longest 20 median; 9.5 average
EGM gambling problems (years)	0.25 shortest; 20 longest 5 median; 5.9 average
EGM gambling expenditure (\$/session)	\$30 low; \$9,000 high \$275 median; \$522.5 average
EGM gambling duration (hrs/session)	1 low; 24 high 3 median; 4.1 average
EGM gambling sessions (n/week)	1 low; 16 high 3.3 median; 3.6 average
Other gambling forms participation (n)	51.6% total. 24.2% TAB; 16.1% lotto
Other gambling forms problematic (n)	12.9% total. 8.1% TAB.
Occupation/ labour force status	21.0% office worker 17.7% home duties 14.5% labourer/ building & construction 14.5% professional/ semi-professional/ manager 14.5% pensioner 9.7% other blue collar 4.8% trades 3.2% unemployed

The sample of respondents was strongly biased toward females. More than three-quarters of all respondents were born in Australia. The average length of time the respondents had been consumers of EGM gambling was 9.5 years, with the average duration of problematic gambling activity being the equivalent of approximately two-thirds of this period. The average amount of money and time spent participating in EGM gambling was substantial. The wide range in expenditure per session reflects the fact that the level of losses that are sustainable vary widely between individuals depending on their income, assets and access to financial products (borrowings, credit cards, and in some cases misappropriation).

A total of 45% of the respondents reported average weekly losses of \$1,000 or more during their problematic gambling phases. Four respondents reported losing upwards of \$5,000 each week. In keeping with the narratives of ‘gambling careers’ that start to emerge in researching with self-identified problem gamblers, estimated weekly expenditures on EGM gambling come with histories and stories attached. Business profits, misappropriation and inheritance income were cited as sources of funds underpinning losses of greater magnitude. This contrasts with more modestly resourced respondents struggling to cope with everyday financial commitments due to average weekly EGM gambling losses in the range \$80-\$300.

5.2.2 *Summary of focus groups and interviews*

Venues

Two key themes emerged in relation to venues: the perceived qualities of a venue’s environment; and the proximity of a venue to the patterns of circulation of the respondents’ lives. The environment of the gambling venue was perceived to be important to respondents according to their personal preferences. Some respondents preferred the larger venues because they were more exciting, “colour and well-lit”, and there were “more people, more money”, and more jackpots. Others favoured the smaller venues as they were more quiet and comfortable. In particular the “seclusion” of a smaller venue meant that one could “hide away” and not be seen or remain “anonymous”. While many respondents preferred to be left alone “at the end of row or tucked away”, some respondents said they liked being recognised and interacting with staff. Most cited comfort as an important criterion in venue preferences. Venue attributes such as “comfy chairs”, good quality and free coffee, cheap drinks, and a “pleasant smoking room” were commonly identified. In addition, respondents nominated friendly venue staff as an important factor.

The majority of respondents regarded venue proximity as an important factor in venue choice – particularly in the early days of their EGM gambling. Most visited venues close to home, work, school or en route to these places because they could get there quickly – “once you make up your mind you want to get there” – and they also did not want to alter their normal routines. One respondent stated that the accessibility of gambling venues was the problem, that “when they’re right on your front doorstep they’re unavoidable; you can’t be 100% every day!” (meaning that it was impossible to resist the urge to visit the venue on every possible occasion of proximity to a venue). A “big win” was cited as being an incentive to visit a nearby venue again. Visiting several venues was also viewed as favourable where the strategy was to “hide their habit” or to “convince staff and patrons [I was] gambling half as much as I actually was”.

Individuals often revealed idiosyncratic or personal relationships to a venue or a small number of favoured venues. One female respondent, for example, liked to “find a niche” and had done so in four separate venues which she preferred to frequent for that reason. Many preferred the relative intimacy of club or hotel venues to the atmosphere of Crown Casino for this reason. However, this was balanced to some extent by those for whom Crown or other ‘big venues’ provided more variety, anonymity, and bigger jackpots.

Gaming machine characteristics

Three themes were prominent in discussion of the attractiveness of EGMs: visuals and sound; game features; and attachment to favourite machines. In relation to the attractiveness of gaming machines generally, the display of lights, colours and graphics (especially animations) were characteristics which excited some respondents – particularly the animated characters

that some described as a “lovable”. Others described presentation as important as “pokies present another world”. Some respondents found the sounds and music coming from the machine stimulating. One respondent reported dreaming of the “bleeps, bleeps” of the jackpot in her sleep, another said that the familiar sounds of the machines “stay with people for years”. However, a smaller number felt the sounds were annoying and “embarrassing” because it drew attention to them. Many spoke about their feelings of guilt about gambling and disliking “the music” and sounds because of the attention that it drew to their gambling activity.

Many respondents also nominated game features as an attractive characteristic of gaming machines generally. The “big money” was associated by a small number with those machine features which commonly involve a “doubling or tripling of prizes” during its operation – while others were impressed by the possibility of winning “a feature within a feature – it’s like your birthday!” Graphics and animations were described as adding to the “intensity” of the experience. By far the most important game feature nominated and discussed, across all the groups, was free spins. The free spins feature, (which when activated by the appearance of particular symbols ‘scattered’ across the screen, provides ‘free’ games) was perceived as very attractive by most respondents, for the key reason that “you don’t win without the free spins”. Crucially, the possibility of receiving a free spin was an incentive for gamblers to keep playing.

Favourite machines were described almost universally as crucial to gamblers’ experience. Individuals’ favourite machines were described as having a combination of characteristics that were “mesmerising”, sometimes in such a way that an “attachment” was formed, or it “almost became a part of your body”. Favourite EGM games nominated included: “Adonis”, “Sweethearts”, “Return of the Samurai”, “George’s Gold”, “Diamond Mine”, “Queen of the Nile”, “Gold Coins”, “Dolphins”, “Sunset”, “Hearts”, “Cash man”, “Coral Riches”, “Snow Cat”, “Lyrebird”, “Circus”, “Red Baron”, “Koala”, “Red Hot Chilli Peppers”, “Black Rhino”, “Aladdin”, “Devil”, “Incas”, “Indians” and “Phantom”. Some respondents said that they would leave a venue if their preferred machine was unavailable. Others said they would play another machine while waiting for their favourite machine to become available.

Structural characteristics of EGMs

The two key themes that emerged in relation to the structural characteristics of EGMs was an ambivalent attitude toward bank note acceptors (BNAs) and a preference for a mix of lower denomination (credit value) machines. Whilst it was broadly acknowledged that BNAs were convenient, many respondents also had a fairly strong negative response to BNAs. BNAs were perceived as a trap for problem gamblers because the notes became like “monopoly money”, as one respondent stated, “It’s like its not real money anymore”. Some respondents also mentioned that it was harder to keep track of how much you were spending with BNAs. Respondents acknowledged that by using BNAs, interaction with staff could be kept to a minimum (no need to get change) and one’s spending could be kept “private”. One respondent summarised this as “you don’t have to be embarrassed by the cashier knowing how much you’re putting in”. The fact that BNAs were silent was contrasted to the noise associated with coin-feeding, described by a couple of respondents as helping to ensure that nobody could keep track of your gambling habit.

The great majority of respondents preferred machines with low credit values, i.e., one cent, two cent and five cent EGMs. Some reported playing ten cent and twenty cent EGMs when they began poker machine gambling, but then migrating to lower value machines. The mix of

machines in a venue was seen as a positive thing, a couple of respondents advising that they would play a \$1 credit value EGM only when nothing else was available. The exception was one respondent who preferred \$1 machines, arguing “if you’re going to do it, do it properly”. Many others related experiences of playing \$1 credit value EGMs but linked this with the negative characteristic that money disappears quickly, reducing gambling time.

Gambling strategies used

In terms of practices, gambling strategies are a combination of bet size and number of lines gambled. However, these strategies are combined with other more subjective factors that are also part to the experience of EGM gambling consumption. It was clear from the focus groups that these factors are integral to individual experience and cannot be relegated to being of secondary or lesser importance in relation to decisions made about bet size or numbers of lines played.

In relation to bet sizes, about half of the respondents used ten cent and twenty cent bets initially and eventually changed to using one cent and two cent bets with multiple lines. Some respondents used five cent and ten cent bets, which they believed allowed more games for the dollar. Some believed that using the maximum credits (bet size) and maximum number of lines (maxi-maxi) would increase the chance of winning. Many preferred to play all lines, because playing fewer lines was frustrating as players would feel they were missing opportunities to win via the perception of ‘near misses’. Some said they would bet the minimum number of credits and up to the maximum number of lines (mini-max). Many respondents, regardless of initial strategy, stated that they would increase the value of their bets after a win.

A variety of beliefs about the responsiveness of machines were related by respondents. Many respondents believed that machines would only pay out when they were ‘willing’. Approximately half of the respondents believed that there were particular times of the day when a machine would pay out. These included: at lunchtime; late at night (because they were ‘filled up’); towards the end of the night (“they have to get rid of a certain amount”); around dinnertime (when more people are there); half an hour before closing time; or first thing in the morning (“they’ve been sitting there all night”). There was also some support for beliefs that machines paid out differently at various points in the calendar, for example paying more around special days – just before Christmas (to encourage people to gamble) – or paying less on pension days.

Various rituals and strategies were implemented by some respondents in order to try and generate a win or payout. Many of these involved personalising the machine. Some said they tried to coax a win from the machine using strategies based on perceived pleasurable stimuli such as “rubbing their tummy” or tapping the machine. Others tried negative or intimidatory tactics, glaring or swearing at the machine. A few respondents spoke about trying to “confuse” or “fool” the machine into thinking that another player had begun using it, based on the premise that a machine will only deliver winnings once per player, or that the machine was more likely to pay if the player wasn’t a problem gambler. All these measures were based on subjective elements of the respondents’ relationships with EGMs, which they believed would or could encourage a payout.

Advertising and promotional material

Advertising and promotion of EGM gambling consumption is designed to stimulate demand. Many respondents stated that advertising, promotional material and loyalty programs had not

contributed to their gambling practices. However, a few respondents acknowledged that promotional activities extended their gambling and acted as an “incentive” to go to venues. A few respondents said they had gotten “hooked” on raffles, competitions for free trips, lunches and drinks that could be won in their favourite venues. With regards to loyalty programs, a few made comments such as the “points system lead to more gambling”, and one male respondent said program mail-outs offering discounts and prizes were very inviting for him. Others considered promotional material delivered to their homes to be a challenge to their determination to cope with gambling problems. A couple of respondents claimed that they disliked advertisements as “they make you want to go”, particularly those that promoted the value of the jackpot.

Harm minimisation measures

Respondents were asked about a variety of current and prospective harm minimisation measures. Gambling warning signs were reported by many respondents as having little or no impact on their gambling habits. Some claimed they were not even aware of the warning signs. When asked what impact these signs had on gambling, a couple of respondents asked, “What warning signs?” Some respondents stated that the warnings intensified their feelings of guilt – “warning signs made me feel sad”.

In relation to clocks in gaming rooms, most respondents believed that observing the time of day had no impact on their gambling, even though they were conscious of time passing. Some respondents said knowing the time made them more determined to bet more money within the time available. However, a few respondents stated that clocks made them conscious of the time and reminded them that they had to be somewhere else.

There was a mixed reaction in relation to the prospect of smart cards and how they might affect gambling behaviour. A few respondents felt that it was a good idea as it could reduce the money spent (as long as the set limit wasn’t too high). One respondent stated that they would prefer to use a card rather than use cash in a machine, another respondent believed that they would ‘max-out’ the card quicker. Other respondents mentioned potential privacy issues if the smart card were introduced, particularly in relation to a “big brother” watching over you, and the potential for information to be “used against a person’s gambling habit”.

The ban on smoking in gaming rooms provoked a mixed reaction among respondents. The ban frustrated some intensely, but most respondents said the ban caused little or no behavioural change. Many stated that the smoking ban made gambling less enjoyable, a typical statement being “[I] loved smoking in front of the machine”. For some the smoking ban had helped them to reduce or stop their smoking, but claimed it had little impact on their gambling. The smoking ban was positive for others as they hated smoking and preferred to enjoy a smoke-free environment. In one case a woman reported that it had helped disguise her gambling habit from her family, by eradicating the smell of tobacco smoke that had previously lingered on her hair and clothes.

Gambling as a social experience

Many respondents stated that they did not socialise whilst at gambling venues, and most were unhappy talking to people while they were gambling, one respondent reporting that she “got angry when people talk to you in venues”, and another said they “hate[d] talking to people”. Respondents remarked that gambling was “very anti-social” and that it ruined their social life because of its secretiveness. One respondent said that “initially everyone goes for company; but then the socialising is less important – you’re socialising with the machine”. Some

respondents said that they didn't like attention when gambling and preferred to play machines that were out of sight.

However, a few respondents said that they did not mind talking to staff and to people they knew. A small number said they would only gamble if people were around (strangers or friends). Many liked the attention from staff when they first started EGM gambling, enjoying the free coffee, familiarity of local venues, friendly service and the attention of receiving rewards or incentives. However, this situation changed over time, with attention from gaming staff later becoming very stressful for some gamblers.

'The zone'

Most of the respondents were familiar with a state of deep involvement in EGM gambling that was commonly referred to as "the zone". Many had experienced 'the zone' as a dissociation or escape from life/reality, "just me and the machine", a focused and absorbed state that is "euphoric" and where nothing else mattered, "nothing can go wrong there". One respondent described 'the zone' as being a "technique" which provided relief: "you're no longer in the life that I live". Similarly, many respondents spoke about the value of money being lost or being irrelevant when in the 'zone'. Respondents also articulated the transitory nature of 'the zone' "which evaporates". What follows is a "feeling of wretchedness" about the money and time spent, and a sense of deception when "there's no money left and reality hits". The secretiveness of concealing problematic gambling behaviour was also described as "part of it – being away from people, living a double life". According to many respondents, at first this is part of the whole experience of gambling but after a while it becomes tiring and leads to strong feelings of guilt and shame.

Most respondents said it was easy to spot a problem gambler, and referred to many of the signs and/or characteristics that they had identified in themselves as problem gamblers. The following traits were nominated as typical of problem gamblers: they are intense, they don't smile, they rub machines, they are hunched up and stressed, have frustrated expressions, are "spaced out", do not want to talk (anti-social), won't look at you, have a fixed stare, "they look different", are quick button pressers and have glazed eyes. The readiness of respondents to identify a specific EGM problem gambling 'persona' was consistent across the groups, with descriptions conjuring images of haunted, troubled and isolated individuals who stand out from others who "aren't serious" about gambling.

Many respondents were able to describe their EGM gambling 'career'. Most could describe how gambling started for them. Frequently they started in their local club or hotel, "close to home", "where I didn't have to drive", where they could be involved in a venue "incentive program to assist in delusion of fun and games". As gambling moved from a situation of gambling for amusement to "trying to recoup losses" many described the way their behaviour started to become more bizarre. Respondents reported "starting to lie", packing bulky clothing in the car to easily disguise their appearance, and moving frequently between venues and to venues where they were not known. By this time 'the zone' had become the only truly satisfying experience of gambling, and outside interference or conversation from strangers was to be avoided. What many respondents found hard to understand at the point of the interview or focus group discussion (i.e., in retrospect) was that they did not realise they had a problem at the time, and did not self-exclude or seek help at this stage.

Other key factors shaping EGM gambling consumption

The range of other topics featured across the focus groups and interviews is too broad to be described in suitable detail here. However, two relevant topics emerging in relation to the shaping of EGM gambling consumption practices were the seductive influence of ‘big wins’, and concern about easy access to Automatic Teller Machines (ATMs). Many respondents recounted a story such as “had a \$500 win early on which made it attractive”. Each story had a specific social context and subjective meaningfulness, which in all cases lead toward greater expenditure of time and money in the consumption of EGM gambling. No respondent reported taking a step back from EGM gambling consumption on the back of a big win. A number linked a change from ‘social’ to ‘serious’ gambling to the perceived impact a big win had on them. The false expectation created by this apparently exceptional luck was regarded as a ‘lure’ which drew individuals back to gamble, or to gamble more. Respondents thus uniformly associated ‘big’ wins with an experience of escalating EGM gambling activity.

Along with the availability of venues, almost all respondents considered ready access to ATMs – “they’re the worst thing” – dangerous. While one respondent remarked, “maybe leaving the venue would make you think more”, others thought it would just mean changing venues. There was an apparent ambivalence in relation to ATMs, with the convenience they provide contrasting with the potential for extension of gambling sessions and escalation of losses in the minds of respondents. A majority of respondents stated that they make one or repeated trips to in-venue ATMs to obtain further funds for gambling in the course of a gambling session. The \$200 limit on each ATM withdrawal³⁸ was described as “making you walk a bit more”. Most respondents viewed ATM withdrawals as being part of a single gambling session, rather than as breaking their gambling session up into multiple sessions. The ‘finalisation’ of a gambling session may, for many problem gamblers, be best defined by the exhaustion of the total amount of money to which they had access by all means rather than by the money they carried to a venue. In relation to this, several respondents reported strategies of attending venues without their bank debit cards, ensuring that they could not access further funds from ATMs to extend their EGM gambling sessions. This revealed a specific intention to limit losses.

5.3 EGM questionnaire with self-identified problem gamblers

A series of questions prepared by the researchers for this project were incorporated in a broader questionnaire to a sample of problem gamblers as part of a separate longitudinal study funded by the Gambling Research Panel and conducted by New Focus Research³⁹. These questions were included in “Section A: Factors Contributing to the Development of Problem Gambling” of the New Focus questionnaire, which was conducted by telephone interview in October 2004. The researchers do not have access to the entire dataset from this questionnaire, although New Focus kindly provided the responses to the questions included at the researchers’ request, as well as data describing the gender of respondents. Only a limited number of cross-tabulations could thus be undertaken using these data.

The reader is advised to treat these results with caution. This was not a methodologically stringent data collection exercise with a random sample of respondents. The results are heavily biased towards women, for example. The data shown should therefore be viewed as

³⁸ The \$200 limit to ATM withdrawals in EGM venues relates to each individual transaction. However multiple transactions are permitted, up to the limit of available funds and/or the daily withdrawal limit applicable to the account. Credit withdrawals are not permitted at ATMs located in EGM venues in Victoria.

³⁹ The New Focus research report is available from <http://www.justice.vic.gov.au> and includes information on the recruitment of participants for the survey etc.

descriptive and indicative only. The figures for means provided are not a valid indicator of central tendency in a statistical sense, rather they are used to provide simple comparisons between respondents' answers to different questions (Tables 5.9 and 5.10). The very limited number of questions included in the survey focused on basic questions regarding problem gamblers' strategies and cognitions. Unfortunately, the New Focus research occurred prior to the researchers formulating more specific questions related to game technology (for example, perceptions of links between winning and bet size). Despite these limitations, the results for the questions asked are included to provide a further comparison and counterpoint to the data gathered through the qualitative aspects of researching with self-identified problem gamblers described above.

5.3.1 EGM questionnaire results

The questions focused on six aspects of EGM gambling activity: parameters of EGM gambling consumption; machine preferences; venue preferences; playing strategies; beliefs about EGM gambling; and other factors affecting EGM gambling behaviour. Women (61.6%) were over-represented in the sample (n=99). Fifteen respondents only answered questions on the parameters of their EGM gambling consumption in the dataset supplied to the researchers. All of these respondents were male. Those who provided responses to the full questionnaire thus made up a smaller group (n=84), which was even more predominantly female (72.6%). The results shown for all questions subsequent to the section on parameters of EGM consumption, following, are for this smaller group of 84 respondents.

Parameters of EGM gambling consumption

Respondents were asked to estimate the extent of their EGM gambling consumption by two measures: hours per month spent EGM gambling; and money per session spent EGM gambling.

Table 5.2: Hours per month spent EGM gambling

	n	%
0-5 hours	13	13
6-10 hours	22	22
11-15 hours	13	13
16-20 hours	9	9
21-30 hours	9	9
More than 30 hours	33	33
Total	99	100

The respondents reported a wide range of hours spent EGM gambling. Slightly more than one third (35%) reported spending 10 hours or less EGM gambling, whilst one-third of the respondents reported spending more than 30 hours per month. Similarly respondents reported a wide range of expenditures per session on EGM gambling consumption.

Table 5.3: Money per session spent EGM gambling (\$AU)

	n	%
0-\$20	9	9
\$21-\$50	15	15
\$51-\$100	20	20
\$101-\$150	8	8
\$151-\$200	15	15
\$201-\$300	12	12
More than \$300 per session	20	20
Total	99	100

A total of 24 respondents (24%) reported spending \$50 or less per EGM session, whilst almost one-third of respondents (32%) reported spending \$201 or more per EGM session. These two results are consistent with the data from the focus groups and interviews and again reflects the different scales of involvement in EGM gambling that constitute problem gambling for individuals. A combination of the two results indicates that there appears to be a strong relationship between these two dimensions of EGM gambling consumption. Of those who spent more than 30 hours per month EGM gambling, 42.4% reported spending more than \$300 per session. More than half (51.5%) of those who reported spending more than 30 hours per month EGM gambling reported spending \$201 or more. Of those who reported spending more than \$300 per EGM gambling session, the vast majority (70.0%) reported that they gambled on EGMs for more than 30 hours per month.

A further question was asked about the way in which a particular session of EGM gambling consumption is ‘finalised’. This question is relevant also to EGM gambling strategy and whether there are eventualities within sessions that may reduce their duration.

Table 5.4: Finalising an EGM gambling session

		n	%
Which of the following best describes how you play electronic gaming machines?	I always spend all of the money I have available	44	52
	I often spend all the money I have available	25	30
	I leave the venue before all of my money is gone	5	6
	I often take my winnings and leave	9	11
	I always take my winnings and leave	1	1
Total		84	100

An overwhelming proportion of respondents (82%) reported spending all of their available money in a particular EGM gambling session at least ‘often’. An absolute majority (52%) said they always spend all of the money they had available. A much smaller proportion (12%) reported leaving the venue with their winnings, with just one respondent stating they always did this. There is a clear implication here that the respondents will extend their EGM gambling consumption session for the longest duration possible. This may involve spending specific amounts taken to a venue, including comparatively large, periodically available amounts such as wages. Whether it includes visiting ATMs, either inside or outside venues, to replenish funds is unknown. The permutations of money taken to venues, subsequently won and lost, and/or obtained from other sources (ATMs, loans etc) thus emerges as a key research question. This information would enable a better understanding of EGM gamblers’ calculations of the money ‘available’ for a particular session. This key question appears to the researchers as requiring a specific research intervention, utilising qualitative techniques in particular.

Gaming machine preferences

Respondents were asked three questions about their EGM preferences: preferred credit value; favourite machines; and why they liked their favourite machine.

Table 5.5: EGM preferences – favourite credit value

	n	%
1 cent	16	19
2 cents	21	25
5 cents	32	38
10 cents	5	6
20 cents	3	4
50 cents	4	5
\$1	3	4
Total	84	100

Respondents reported a clear preference for smaller denomination machines. This supported the views expressed in focus groups and interviews. More than four-fifths of the respondents preferred machines with a credit value of five cents or less. Of female gamblers, none reported a preference for one dollar credit value machines and just 6.6% nominated fifty cent credit values as their favourite.

When credit value preferences and amount spent per EGM gambling per session were cross-tabulated some interesting results appeared. Those who gamble the smallest amounts per session were clustered on the lowest credit value machines, with 66.7% nominating one cent machines as their favourite, and the remainder evenly divided between two and five cent EGMs. No gamblers who reported spending up to \$20 per EGM gambling session preferred EGMs with credit values of 10 cents or more. Those who reported losing \$201-300 or \$301 or more per EGM session were most likely to prefer five cent credit value machines (63.6% and 64.3% respectively). These two relatively high spending groups were very similarly distributed in terms of their credit value preferences, with approximately two-thirds of the remaining gamblers in both groups preferring EGMs with credit values of ten cents and above. However, it must be noted that the sub-groups of respondents on which these results are based are too small (<30) to be considered reliable and require repeated validation in larger sample studies. Interestingly, when credit value preferences and time spent EGM per month were cross-tabbed no such strong clustering appeared.

Respondents were asked the name of their favourite EGM. The largest single response was 'no favourite' (13.1%) which when added to those who 'didn't know' (5.1%) meant that approximately one in five respondents did not nominate a favourite EGM. Of those respondents who did nominate a favourite machine the most popular were 'Hearts/Sweethearts' (11.9%), 'Dolphin treasure/chest' (7.1%), 'Adonis/gold chains' (7.1%), and 'Queen of the Nile/Cleopatra' (6.0%). A total of 30 different machines or machine themes were nominated by respondents, reflecting a wide range of difference in machine preferences.

Respondents were also asked what they liked about their favourite EGM and could nominate up to three factors, although only 7.0% of those who nominated at least one 'like' nominated three factors and 40.8% nominated just a single factor. The responses to this question were more strongly patterned around dominant themes. A total of 46.5% of those who nominated a 'like' were attracted by their perception that their favourite machines provided bigger and more frequent payouts. Free games/spins (40.8%), machine presentation including colours, sounds and graphics (33.8%) and special game features (12.7%) were the other factors that respondents reported were attractive to them.

Venue preferences

The specific social contexts of gambling determine to some extent the patterns of EGM gambling consumption across the network. Spatial analyses have shown that the integration of gambling into primary sites for the social lives of a sizeable proportion of the Victorian population (hotels and clubs) has statistically significant class and socio-economic patterns of difference (Livingstone 2001, Marshall & Baker 2002). There is also a consensus in the literature that EGM gambling consumption takes place largely in local venues and/or those that are situated in convenient locations between key sites of individuals' lives such as home and work etc. This again emerged quite clearly in the focus groups and interviews.

The respondents were asked if they had a favourite pokie venue and if they preferred gambling on EGMs in hotel or club venues. A total of 56% agreed they had a favourite EGM gambling venue (7% strongly agreed, 49% agreed). Of those who did have a favourite EGM gambling venue, 53.2% also agreed that they preferred gambling on EGMs in club venues, whilst 40.5% agreed they preferred gambling on EGMs in hotel venues. Of those that did not have a favourite EGM gambling venue 40.5% agreed they preferred gambling on EGMs in club venues whilst 29.7% agreed they preferred gambling on EGMs in hotel venues.

Club venues were nominated as the preferred venue type for both those who had a favourite EGM gambling venue and those that did not. However, 19.7% of those who did not have a favourite venue disagreed that they preferred EGM gambling in *both* hotels and clubs. This may indicate a preference for Crown Casino as an EGM gambling venue. It may also be an expression of a lack of affinity with EGM gambling venues *per se*, in the experience of some problem gamblers. It may be that for a small group the consumption of EGM gambling in and of itself is so predominant in experiential terms that it even tends to push the immediate contexts of that gambling activity well into the background. This suggests a possible continuum of 'intensity' in the gamblers relation to the EGM technology in itself, which is constitutive of a range of *gestalts* of foreground/background relations in the context of consuming EGM gambling. Experience could potentially vary markedly along such a continuum, as might be interpreted from the testimonies from focus group and interview respondents who were clearly able to articulate an experience of 'the zone' – of a direct and intense communion with the machine itself – but also able to describe the importance of contextual venue-based factors to the overall EGM consumption experience, for example refreshments and personable staff.

A key research question arising in relation to problematic EGM gambling consumption and gambling venues is one of individual recognition. In the context of this project the researchers framed a scale question asking respondents if they agreed with the statement: 'I like to play machines in a venue where I am well known'. The results for this question are shown in Table 5.6, below.

Table 5.6: Venue preferences – personal recognition

		n	%
I like to play machines in a venue where I am well known.	Strongly disagree	16	19
	Disagree	48	57
	Neither agree nor disagree	2	2
	Agree	17	20
	Strongly agree	1	1
Total		84	100

A total of 76 % of respondents disagreed that they like to play machines in a venue where they are well known, compared to 21% who agreed (mean score 2.3). This is a relatively strong result in the context of the questions asked in this study. It is a result consistent with the themes of concealment and anonymity which emerged in the focus groups and interviews.

A question about the validity of this result can be raised when this result is juxtaposed to that discussed above that 56% of respondent do have a favourite pokie venue. It may be asked how a majority of respondents can have a favourite EGM gambling venue, intuiting that this may be the venue in which they are most likely to be well known, and a vast majority also prefers to gamble in venues where they are not well known. There are two basic interpretations of these data that can counter this argument. First, from a logical perspective, there is no mutual incompatibility between having a favourite EGM venue and not being well known in that same venue. In fact, the reason for a venue being a ‘favourite’ may be precisely the fact that you are not recognised there. It must be observed that large venues are very densely populated for much of the time, offering metropolitan-like possibilities for relative anonymity. This may well account for some of the seeming incongruity in these two data, although the researchers tend toward an understanding of problem gambler lived experience (and hence research responses) that would not anticipate the separation of ‘favourite venue’ and ‘personal in-venue recognition’ in quite such a deliberate manner. However, the necessity to de-contextualise gambling activity from social bonds could indeed be a key characteristic of late-stage ‘gambling careers’, although further research is needed on this point – as is further development of the conceptualisation of gambling careers. Developing a deeper understanding of the articulation of in-venue social relationships, venue preferences and EGM gambling consumption practices may be a key element in developing just such a conceptualisation of gambling careers.

Secondly, and once again this interpretation is informed by the focus groups and interviews, these data may reflect the ambivalent, even ‘torn’, position in which many problem gamblers may find themselves, in which deceit or dissembling becomes an intermittent or constant mode of inhabiting EGM gambling venues. The perception that others who know you have realised that your gambling has become ‘more than just fun’ becomes a source of discomfort which stands in conflict with the desire to consume EGM gambling in often ever-increasing volumes. As the qualitative data collection highlights, (sometimes bizarre) strategising to avoid recognition or even ‘attention’ in EGM gambling venues may become a key part of the EGM gambling experience precisely because of this ambivalent position in which the social contexts of EGM gambling place problem gamblers. Contextualised in a framework of

structured ‘gambling careers’ this second interpretation is provisionally favoured by the researchers.

EGM gambling strategies

Respondents were asked about two basic dimensions of EGM gambling consumption: their strategy in terms of bet size and number of lines selected for each spin of the reels; and their use of the ‘gamble’ feature. It should be noted that EGM credit values could also be interpreted as a key part of EGM gambling strategies. However, in this report we have chosen to include this factor within the analytic domain of EGM machine preferences (see above). In reality, EGM credit values may also be viewed as part of the ensemble of ‘choices’ and orientations integral to gambling strategy.

Table 5.7: EGM gambling strategy – combination of bet size and number of lines

		n	%
When playing gaming machines what is your favourite playing strategy:	Minimum bet, minimum lines	5	6
	Minimum bet, maximum lines	50	60
	Maximum bet, maximum lines	11	13
	None of these	18	21
Total		84	100

A majority of the respondents reported that a combination of minimum bet size and maximum number of lines was their favourite EGM gambling strategy. This is consistent with focus group and interview data and with previous research on this question (Walker 2001). The strength of this result is emphasised by the fact that the next largest sub-group of respondents did not have a favourite combination of bet size and number of lines. No respondents nominated using the maximum bet on a single line as their preferred EGM gambling strategy.

The tendency toward using a ‘mini-maxi’ strategy among self-identified EGM problem gamblers has been reported previously (Walker 2001). The focus groups and interviews suggested a linkage between the use of multiple lines and ‘near misses’. The propensity of EGMs to regularly provide reinforcement for the erroneous cognition that a win is ‘close’ is highly likely to be linked to the regular appearance of a winning symbol or symbols somewhere on the screen. As discussed elsewhere in this report, the structure of EGM virtual ‘reels’ allows this to occur regularly by situating several winning symbols on shorter reels but only one such symbol on longer reels. Thus, although symbols associated with high value wins may regularly appear on the screen, the probability of achieving a winning combination is predictably very remote. The desire to capitalise on the apparent regular appearance of winning symbols, and thus to avoid the ‘horror’ of a big win on a line that has not been gambled is, in the researchers’ view, a highly valid quasi-rational (if erroneous) explanation for the ‘maxi’ element of this EGM gambling strategy.

In relation to minimum bet sizes, the vast majority of focus group and interview respondents reported a gradual diminishing in nominal bet value as their involvement in EGM gambling became more regular and ‘serious’. Respondents also largely preferred the smaller credit value EGMs. Both these factors are likely to be linked to the desire to extend the duration of EGM gambling consumption sessions, by limiting the rate of expenditure on lost spins. This

would have the effect of lengthening the period in the desired ‘zone’. The tendency to gravitate toward a mini-maxi strategy may thus also be linked to the duration and, perhaps more particularly, the ‘stage’ of an individual’s ‘gambling career’.

Table 5.8: EGM gambling strategy – use of the ‘gamble’ feature

		n	%
How often do you play the 'double up' or 'gamble' feature on electronic gambling machines:	Always	4	5
	Often	5	6
	Sometimes	7	8
	Occasionally	17	20
	Never	51	61
Total		84	100

Use of the gamble feature was low amongst respondents, with three-fifths not ‘doubling-up’ and gambling their wins at all. Only a very small proportion (11%) of the respondents could be described as consistent users of this feature. This result was also consistent with focus group and interview discussion. Whilst there may be several reasons for this, one that emerged in qualitative data collection was the preferred use of winnings to extend the duration of EGM gambling consumption. Another reason may be that gamblers prefer to take their winnings rather than risk them further. However, this hypothesis is not supported by responses to the separate question on ‘spending money-taking winnings’, where a vast majority reported ‘often’ or ‘always’ spending all the money they had available to them in a particular EGM gambling session (see *Parameters of EGM gambling consumption* above).

Beliefs about EGM gambling

Respondents were asked to agree or disagree with a series of four statements related to beliefs about EGM gambling technology. All four statements were in the positive and were restatements by the researchers of beliefs reported by gamblers arising from previous research in the field, and also from consultation with problem gambling counselling service providers for this study.

The respondents were asked a series of four questions inquiring into their beliefs about EGM gambling. Three of these questions asked about the relation between the gambler and the machine, particularly the capacity of the gambler to affect the outcomes produced by the machine/network technology. The first two of these questions are broad and ask in different ways a general question about whether the EGM technology can be manipulated by gambling strategy. The third question moves from this general level to asking about one particular strategy, that is continuous and sustained gambling on a single machine. This question was designed after preliminary investigation suggested that gamblers’ rational beliefs about EGM technology were being cut across by other (also rational) cognitions relating to ‘the law of averages’. The comparative results for questions 1-3 (Tables 5.9 and 5.10) support the researchers’ hypothesis that this cognition affects beliefs about the ‘random’ nature of EGM outcomes.

Table 5.9: Beliefs about EGMs

		n	%
Skillful play will make gaming machines pay out more often	Strongly disagree	34	41
	Disagree	38	46
	Neither agree nor disagree	4	5
	Agree	7	8
Total		83	100
It is possible to effect the amount the machine will pay out	Strongly disagree	30	36
	Disagree	46	55
	Agree	7	8
Total		83	100
Machines will pay out if you keep playing them	Strongly disagree	17	20
	Disagree	35	42
	Agree	30	36
	Strongly Agree	2	2
Total		84	100
The machines pay out more at different times of day	Strongly disagree	9	11
	Disagree	26	32
	Neither agree nor disagree	4	5
	Agree	38	46
	Strongly Agree	5	6
Total		82	100

The fourth question asked whether respondents thought EGMs performed differently at different times. This question is oriented to beliefs about the manipulation of EGMs and about 'fairness', which had also appearing in the preliminary phases of the research. However, the question remains at a very general level of belief or otherwise about manipulation *per se*. It does not discern between belief in a variability in EGM payout rates that is cybernetic, that is, internal to the 'black box' of the EGM technology and independent of external (human) intervention or an external variability, that is, one resulting from intentional human intervention at the machine, venue or network level.

Respondents generally disagreed with both of the general statements about the capacity of EGM gamblers to influence the performance of EGM technology. Both these results were decisive, with only a small proportion (8%) holding a view that the gambler could influence machine performance. The response to this question does not, however, necessarily correspond to the proportion of the respondents who had ever held such a view. Rather, the strong result could possibly be better understood as those who *retained* a view that gamblers could influence EGM performance, reflecting the process of (re-)education many of the respondents had undertaken about EGM gambling since attending a counselling service.

The hypothesis that significantly more of the respondents may have at one time believed they could influence EGM performance is supported by results for the third question. This is the question that moved to ask about a specific 'erroneous cognition' about EGM gambling,

specifically about the ‘law of averages’ influencing the odds of a win over time. There was a large shift in the result for this question in comparison to the previous more general questions, with more than one-third of respondents (38%) agreeing that EGMs ‘will pay out if you keep playing them’, although only a very small proportion of the respondents (2%) strongly agreed with this statement.

The result for this question supported the researchers’ view that a substantial proportion of gamblers may be under the illusion that sustained play on a particular EGM influences the odds of a payout from that machine. In terms of harm minimisation the result is alarming, as it goes to the heart of EGM gambling consumption practices, including the basic principle that every single spin of an EGM is an isolated event, completely unrelated to any other spin or sequence of spins. What this result suggests is that a sizeable proportion of ‘problem’ EGM gamblers may adhere to conflicting ‘rational’ beliefs that influence their consumption practices. A belief in the completely random nature of results generated by EGM technology and a belief in a general ‘law of averages’ (noting that the period over which a particular EGM will conform to its theoretical ‘return to player’ or RTP ratio will far exceed the capacity of any individual to maintain play on the machine) are not mutually exclusive and could be held concurrently by any individual. This appears likely to be the case for a sizeable proportion of self-identified problem gamblers at least, even where a process of (re-)education about the operation of EGM technology has been undertaken in the counselling process. From this it might be hypothesised that trying to ‘out-think’ an EGM may not be the only danger embedded in cognitions underlying EGM consumption practices, but that conflict between (rational-logical) beliefs may influence EGM gambling consumption outcomes. It is also important to reiterate that ‘erroneous cognitions’ are not necessarily non-rational or ‘illogical’.

Table 5.10: Beliefs about EGMs – average rating

1=Strongly disagree and 5=Strongly agree

	Mean
Skillful play will make gaming machines pay out more often	1.8
It is possible to effect the amount the machine will pay out	1.8
Machines will pay out if you keep playing them	2.6
The machines pay out more at different times of the day	3.0

Respondents were more strongly agreed that EGMs pay out differently at different times of the day, with an absolute majority (52%) believing this to be the case. In a general sense this belief once again displays a lack of understanding of the random operation of EGM technology. However, there is also to a certain extent a reality underlying this belief. This could be based in the extensive experience of many respondents. For example, large EGM jackpots are programmed and triggered to occur under certain conditions known to EGM gamblers, such as when the jackpot prize pool is within certain predetermined limits. This information is advertised widely within venues. Gambling operators can, and do, bias the possibilities of where these jackpots will occur by venue type. The operations of so-called ‘pokie gangs’ have sought to exploit this increased likelihood of a win. Participation in the scheduled ‘going off’ of a jackpot is thus an experience of the EGM network operating differently in a particular (temporally defined) context. Such engineered results are likely to undermine perceptions that, overall, the EGM network operates within ‘constant’ and completely unpredictable parameters.

A second related perception that emerged in focus groups was that payout rates or RTP could be adjusted to more strongly favour EGM operators during certain periods of greater demand, such as lunchtime. It was not clear if this variation was perceived as cybernetic, or as manipulation by venue or gaming operators. No questions were asked about this specific issue in the questionnaire, however this view appears to be reinforced by the overall agreement by respondents with the statement that machines pay out differently at different times of the day.

Other factors influencing EGM gambling consumption

A total ban on smoking in gaming rooms in hotel and club venues in Victoria and the unrestricted gaming floor in Crown Casino came into effect on September 1 2002. As described elsewhere in this report, the ban correlates with a significant decline in real expenditure per gaming machine. As early as December 2002, Tabcorp Ltd notified the Australian Stock Exchange of expected lower profits due to falling EGM revenue (SACER 2005: 1). The extent to which the smoking ban has contributed to this decline in the rate of growth in EGM gaming expenditure cannot be entirely dissociated from other gambling sector factors such as the regional caps policy, the gradual implementation of restrictions on 24 hour gaming and externalities such as variations in household disposable income diverted to gambling expenditure (SACER 2005), consultations with venue operators confirmed an observable change in EGM gambling consumption practices dating from the inception of the

smoking ban and the new strictures it imposed on individual behaviour within venues. In this context the respondents were asked whether the introduction of the smoking ban and altered the time they spent EGM gambling.

Table 5.11: Other factors influencing EGM gambling consumption – smoking ban

		n	%
Has the introduction of the smoking ban in gaming rooms:	Reduced the time you play electronic gaming machines a lot	5	6
	Reduce the time you play electronic gaming machines a little	8	10
	Increased the time you spend playing machines a little	4	5
	Increased the time you spend playing machines a lot	1	1
	Had no impact	66	79
Total		84	100

A large majority of respondents (79%) stated that the smoking ban in gaming rooms had no impact on the time they spent EGM gambling. Only a small proportion (16%) said the smoking ban had reduced the time spent EGM gambling, which was counterbalanced by a smaller group (6%) who said the smoking ban had led to an increase in the amount of time they spent EGM gambling. Thus, only a small net proportion of respondents (10%) reported decreasing the time they spent gambling as a result of the smoking ban. This does not necessarily equate to a ten per cent decrease in the overall time or money spent by the respondent group on EGM gambling, noting that ‘finalisation’ of gambling sessions (as discussed above) is largely related to the availability of funds with which to gamble, subject to a limited range of time constraints reported by focus group and interview respondents including picking up children from school, etc.

There are also several reasons why the responses to this question may possibly understate the impact of the smoking ban on EGM gambling consumption amongst problem gamblers. These include whether the smoking ban had occurred subsequent to the respondents seeking help for their problematic consumption of EGM gambling. In this case the smoking ban may have had little or no direct influence on respondents’ gambling for the reason that they were already taking conscious measures to reduce their gambling. For those respondents who are smokers, the need to go outside to smoke may have interrupted ‘the zone’ and disrupted heavy or chronic gambling sessions. However, interview data suggests that interruptions to gambling sessions to withdraw money from ATMs were not sufficient to constitute a ‘break’ in a gambling session. However, should additional interruptions (to smoke) have occurred the duration of an EGM gambling session would have to be extended for there to be no reduction in the overall time spent gambling. Read in conjunction with the data presented above on the finalisation of gambling sessions, it seems that this may be the case for many gamblers, as a large proportion of the respondents reported finalising the EGM gambling session only once they had used up all available funds including winnings and money available to be withdrawn from ATMs.

A further reason the result may be understated is if the respondent group does not include a representative proportion of smokers in comparison to the general population or to the population of problem gamblers, or given the small sample size, a sample of smokers representative of smokers generally. The result from this question should therefore be considered inconclusive. However, given the fact that problem gamblers contribute a disproportionate amount to EGM gambling expenditures and the apparent strong link between the decline in the rate of growth of EGM expenditure and the introduction of the smoking ban, the result suggests to the researchers that the way in which a particular gambling session is brought to a close is at least as important a variable as the amount of time spent gambling. The concept of 'finalisation', empirically tested and read alongside data on 'duration' of sessions of EGM gambling consumption and visits to ATMs, may be important in constructing a better model of a typical or 'ideal-type' of a problematic EGM gambling session.

5.4 Conclusion

The process of researching EGM technology with self-identified problem gamblers was found by the researchers to be very useful and informative. The accent on the basic material elements of the EGM system, machines and venues, provided a space for focus group discussions and interview that did not make problem gamblers themselves the 'object' for discussion and questioning. Asking specific questions about these elements allowed insight into the practices which structure EGM gambling sessions. This research approach has offered interesting insights into the relationship between problem gamblers and the EGM network, which go to the heart of questions about EGM revenues and issues of social and governmental responsibility expressed in legislated harm minimisation and responsible gambling goals.

The convenient location of venues and the quality of service provided was found to be very important. However, the emphasis on local, friendly venues where an individual felt welcome as a regular patron was seen to devolve into something different across the course of individuals' 'gambling careers'. Recognition and interaction were supplanted as desirable qualities of venues by the opportunity for anonymity and isolation from interruptions to the direct relationship with EGMs in themselves. The context of EGM gambling receded, as an experience of 'the zone' became fore-grounded as the desired mode of EGM gambling consumption.

The integration of EGM gambling opportunities into the circulation patterns of everyday life can be understood as a key aspect of the success of EGM gambling as a consumption item. Venues were described by respondents as convenient with the routines of their daily home, work and social lives. On one hand, the fact that hotels and clubs pre-dated the introduction of EGMs as key sites for social gatherings, as mediating venues between work days and domestic evenings, etc. meant that EGM gambling consumption did not have to recruit a 'clientele' from scratch, but rather could become one element of the consumption practices of patrons of the venues. On the other hand, EGM gambling opportunities have also attracted new patrons to club and venues. For both these groups the ease of access and availability of EGM gambling consumption opportunities is paramount. It is the onset of relatively harmful consumption practices that appears likely to cause a 'break' with the convenience of (local) venues, as the desire for anonymity and the avoidance of experiences of shame and embarrassment start to become prominent aspects of EGM gambling consumption.

In terms of the subjective experience of EGM gambling, a number of features of the machines and games themselves are important in shaping consumption practices. These include: the credit value (most prefer values of five cents or less); the game design (graphics, lights, sounds), interesting game features and free spins. The availability of bank note acceptors were noted for their convenience and for the ability to conceal the amount of money being gambled compared to coin-fed machines. It was noticeable, however, that relationships with EGMs went beyond merely technical elements or cosmetic appearances. Respondents also tended to personalise (or even sexualise) their relationship with EGMs. Some described a variety of practices of touching, rubbing, coaxing and cajoling machines. Some also cited perceived negative aspects of these personalised relations, including berating and abusing machines. Some clearly attributed human characteristics or capacities, such as the capacity to reward or encourage particular behaviour, or the capacity to be 'tricked' into paying out.

The research with problem gamblers also led to the perhaps obvious (but nonetheless important) conclusion that it costs large amounts of money to consume large amounts of EGM gambling. Those who played the most also spent the most per session. The key factor is that the finalisation of gambling sessions was overwhelmingly due to the exhaustion of available funds. This finalisation occurred, in the majority of cases, subsequent to one or more occasions of accessing further funds via ATMs. The data clearly indicate that EGM gamblers leave the vast majority of gambling sessions empty-handed. There are clearly some major implications of this finding, particularly where the amount being lost has grown in concert with the development of a problematic gambling career, and where chasing after losses already accrued inevitably only exacerbates the financial, emotional and social harm suffered.

At times it is difficult to understand why particular gamblers persevere with gambling careers that are causing them to suffer harm. There is a developing literature on the 'erroneous cognitions' that may underpin such perseverance. In this research process with self-identified problem gamblers, the researchers were particularly struck by the way the desire to gamble for as long a period of time as possible in order to maintain a connection with the state known as 'the zone' could push to the background concerns about the amount of money being lost. However, this could only be maintained until the moment that the session was finalised. These sessions were also clearly structured emotionally, with the experience of being in 'the zone' immediately overwhelmed by feelings of shame and guilt once no money remained. On the evidence gathered here, there are no residual feelings of wellbeing extending from a losing EGM gambling session (which is far and away the most common experience). Gratification from EGM gambling consumption is entirely located within the act and the moment itself.

The predominant tendency of respondents to use a strategy of minimum bets was viewed as complementary to the desire to extend the duration of inhabiting 'the zone'. The strategy of gambling these minimum bets on a maximum number of lines was interpreted as reflecting the importance of winning, particularly the avoidance of seeing a 'big win' occur on a line not being gambled. The researchers formed the view that this 'mini-maxi' gambling strategy is thus also strongly conditioned by the capacity of EGM technology to produce a seemingly endless sequence of 'near misses' due to the repeated appearance of winning symbols on the video screen. As discussed elsewhere, technical aspects of EGMs, including differing virtual reel lengths and numbers of particular symbols per virtual reel, enable the constant appearance of desired symbols despite the extraordinarily long odds of a top-prize win.

In keeping with the general tone of the research with problem gamblers, the mini-maxi strategy can be interpreted as a relatively logical and rational approach to EGM gambling

given the stimuli confronting individual gamblers. This appears a reasonable argument even despite the presence of gambler information and machine warnings in various forms that are designed to alert individuals to the fact that *nothing* they do can influence their chance of winning on an EGM. Similarly, the researchers found that respondents' understanding of the randomness of EGM outcomes was confounded by the presence of other folk-principles such as 'the law of averages', which underpinned belief in the transformation across time of the probabilities of a particular machine paying out. Further, the researchers came to conclude that, at base, most EGM gamblers believe that all gaming machines will pay out their top prize(s) at least once during their 'lifetime' (or 'cycle'). Disabusing gamblers of the illusions entailed in such well-founded fictions may be of paramount importance in reconfiguring the relationship between EGM gamblers and EGM technology toward less dangerous consumption practices.

6. Discussion

The task of this project has been to investigate the transformation in the EGM gambling industry, with an emphasis on the role of technology in the process of change. The EGM industry in Victoria has been the focus of this investigation, however events and processes that occurred historically prior to the establishment of the Victorian industry proper in 1991 and geographically removed from Victoria itself are also important for understanding the contemporary situation. Viewed in historical perspective, the Victorian EGM industry underwent a process of rapid growth and consolidation and has emerged as a wholly commercialised and rapidly maturing sector that is (at the time of writing) only now in its fourteenth year of operation. This is very distinct from the numerous differentiated phases of development which characterised the EGM industry in NSW, for example. The specific manner of its development has conferred both advantages and disadvantages on the industry in Victoria.

6.1 The changing EGM industry

It is advantageous to understand transformation in the EGM industry by considering broad aspects of its development, including national, interstate and other dynamics, via a longer view. Processes of policy learning and other collaborations between jurisdictions have been and continue to be important in the transformation of regulation and administration of the industry, but are often to some extent informal and therefore not well documented. Crucially, we believe that in some respects the administration of the EGM industry has not kept pace with the transformation of the sector at either technical or systematic levels, and that the incorporation into regulatory processes of adequate responses to legislated goals in relation to responsible gambling and harm minimisation are some distance away. We also found that key aspects of emerging national strategies and the standardisation of industry practices are not well understood publicly. However, we tend to accept the view put by regulators that change in relation to specifically technical issues is relatively hard won, due in no small part to the complexity of many of the problems involved.

In the context of this Report, the historical transformation of EGM gambling in Australia is summarised by contrasting what we term a ‘folk model’ and a ‘commercial model’ of EGM gambling. Whilst this transformation has, in our view, been predominantly supply-driven, that is, motivated by government and industry objectives, it has had conspicuous social, cultural and economic consequences. We conceptualise this transformation as change from a folk model to a commercial model of EGM gambling.

The folk model of the EGM gambling industry refers to a sector in which small-scale clubs operate a small number of EGMs for the purpose of generating modest revenue for the purposes of the club. A typical example would be a lawn bowls or football club with purpose built clubhouse facilities that are open on competition days or weekends, which earns small amounts of additional income from a handful of EGMs. Many local sporting and RSL Clubs that regularly operate seven days per week, and provide food, beverage and other services, can also be thought of in this way to some extent, particularly where a mutuality agreement meant that revenues had to be reinvested in the club and its purpose and related activities. The folk model therefore involves a direct link between a club, its members or visitors and the purposes of that club, with the primary purpose of EGM gambling being the generation of modest gaming revenues typically used to keep the club operating or to subsidise other costs such as equipment, sporting insurance, or relevant community infrastructure. Large parts of

the NSW Clubs sector between 1956 and the mid 1960s can be thought of in this way. Although the folk model may be thought of as increasingly representing the industry's past, there are many small venues (notably in South Australia but also in Victoria and in some regional areas) that still fit this model to a significant extent. Transposed to the hotels sector, the folk model would be a useful way of categorising a small regional or rural venue with a handful of machines that return very modest revenues on the back of almost exclusively local custom.

The commercial model of the EGM gambling industry is in sharp contrast to the folk model in a number of major ways. The first is that the purpose of EGM gambling sits within a business model emphasising the maximisation of gross revenues, private profits and government taxation receipts. A second change is the scale of the industry – commercialisation has entailed rapid growth in the number of machines and gambling venues, and has driven rapid and sustained consumption growth in most jurisdictions. A third related change is that many hotel or club venues become primarily or substantially gambling venues, altering their purpose, management practices and character substantially.

The folk and commercial models are not necessarily mutually exclusive. However, under the specific industry model in Victoria, where the gaming operator duopoly makes management agreements with key accounts, venue management companies or individual clubs and hotels, the two EGM networks are professionally managed as commercial assets incorporating substantial data analysis and other reflexive (i.e., feedback based) management techniques typical of contemporary business practice. This accentuates the fact that, unlike NSW or the ACT, there is no historical basis in a folk model EGM sector in Victoria. Under this model, venues that most tend toward a small-scale style of operation are likely to be viewed as under-performing. Indeed, during one phase of the EGM industry's development in Victoria the operators were subjected to criticism because of their tendency to withdraw EGMs from such venues.⁴⁰ Further evidence for this includes the trend across the life of the industry in Victoria toward increased numbers of machines per venue, increasing the average size of gaming venues within the allowable range. On the other hand, the top 25% of venues contribute around 55% of total EGM consumption, so there is a 'tail' of less highly performed (in commercial terms) gaming venues where something approaching a folk model of EGM gambling may still be found to exist.

All EGMs in Victoria are unquestionably significant commercial assets, the performance of which is linked to corporate share prices, remuneration and rewards systems, and shareholder value. The twin imperatives of industry profits/share prices and maintenance of Government taxation revenues underpin the logic of market expansion for EGM gambling. In a sector with specific legislated constraints on expansion (caps on machine numbers in particular), revenue growth per operating unit is vital. Although the commercial model does not necessarily overwrite the folk model entirely, as mentioned, the commercial model clearly continues to drive change in the Victorian EGM industry today, possibly to the greatest extent of all Australian jurisdictions. We believe this can be attributed to the concatenation of the ownership and operation model and the monitoring systems that characterise Victorian EGM operations. The operators have the capacity, capability and the incentive to drive continual reflexively based change in the large EGM systems they operate. What is understood about management practices in this regard remains somewhat limited, and constrained by

⁴⁰ For example, see *The Age* 19 April 1999 "Ceiling on pokies may be changed" by Sandra McKay; *Herald Sun* 30 June 1998 "Swoop on RSL pokies" by Mike Edmonds; *Herald Sun* 23 January 1998 "Profits push threat to pokies" by Greg Thom; *Herald Sun* 23 February 1998 "Pub gamblers biggest losers" by Greg Thom

limitations on the extent to which corporate management practices are publicly discussed. However, the researchers formed the view over the course of the research that there remains significant scope for further rationalisation in the management practices of the two Victorian gaming operations on a number of levels, particularly through technical innovation (but which are not discussed in this Report).

At a general level, innovation in the gambling industry in Australia has moved through phases in which it has become increasingly fully governable, and subsequently into a phase of commercial and technical innovation and expansion. Regulatory innovation has struggled to keep pace with the rate of change. Computer and information technology has played a central role in the development of both gaming and wagering markets. It can be argued that in the case of commercial EGM gaming networks, gambling has become particularly intensified or, as this phenomenon was termed in the project Discussion Paper, 'hyper-commodified'. The idea of intensification relates to specific qualities of the nature of the commodity in question. The first such quality is the heightened intensity of the rate of change, that is, the increasingly rapid re-development and diversification of commodities in the light of perceived consumer preference, technical advancements, and market research. Thus, the innovation process must be capable of rapid re-development and deployment, and for this reason information-based products, being relatively de-materialised forms of consumption, are particularly suited to hyper-commodification. The second quality of intensification is the rapidity of consumption that is made possible by the structure of a particular commodity, for example, the speedy repetition and continuity of EGM gambling. A further quality is the generalisation of the processes of circulation themselves. Most EGMs in Australia are nodes in webs of networked machines, creating gambling pools in the form of linked jackpots that increase the value of particular markets. Networked EGMs are thus an example of an innovation process allowing the almost 'perfect' integration of a particular commodity into a sophisticated network. This network facilitates two-way communication, permitting very large numbers of almost effortless commercial transactions as well as management monitoring and manipulation and regulator surveillance. Such hyper-commodification thus has enormous potential to generate substantially increased business volumes with very low 'friction' in the form of transaction costs, particularly at the expanding margins of the business. We would argue that the contemporary EGM industry in Victoria has many of these characteristics.

As an added element of the matrix within which EGM gambling is located, and which forms the conditions of possibility for the technical system of EGM gambling, we must refer again to the legislation regulating gambling activity in Victoria. There are multiple imperatives required by the Gambling Regulation Act 2003, but the objects of this legislation are particularly clear (see Section 2.7).

6.2 Technical innovation as a driver of change

The research has highlighted the significant constitutive role played by technical development in the transformation of the EGM gambling sector. This is part of the commercial innovation cycle that defines successful businesses and industries. The leading Australian gaming machine manufacturer, Aristocrat Leisure, is also one of the nation's leading investors in research and development (R&D). The most recent edition of the Melbourne University R&D scoreboard valued Aristocrat's R&D expenditure at \$63.4 million for 2003-04, placing it fourth behind Holden, CSL and Ford amongst Australian companies. Analysts have linked R&D expenditure levels to greater shareholder returns (Roberts 2005). These are investments in knowledge and technology that also earn significant export revenues. Innovation by manufacturers is perhaps the key driver of change in the industry (see Section 2.10).

At a fundamental level, the incorporation of information and communication technology (ICT) changed the structure of EGMs dramatically and shaped the commercial EGM industry we have today. ICT has made possible the complex linking of jackpots and bonus games between machines and/or between venues. ICT has enabled the instantaneous division of gambling expenditures into operator and venue revenues and government taxation receipts. A reliable centralised form of real time data collection has become available to gaming operators, providing a virtually faultless management information system of extremely high quality.

The scale of investment in the development of EGM technology is a key driver of the industry. However, the social and regulatory contexts of EGM gambling consumption are also crucial. These contexts constrain the way in which the EGM industry can innovate and develop, but are themselves changed by technological innovation. The social contexts of Victorian club and hotel venues have been changed dramatically by the introduction of poker machines. These changes have included substantial material re-development of venues, changes in the nature of products and services offered and a shift in the culture and in some cases demographics of clientele.⁴¹ There is today wide variation between venues, with a key difference lying in the extent to which a particular venue has adopted EGM gambling as its core operational focus. There is a wide range of choice for hotel and club patrons, between venues that are primarily gambling venues with the feel of ‘mini-casinos’ in which large numbers of gamblers can be found at most hours of the day, or more traditional hotel bars with gaming rooms that are sparingly used for much of the business day. However, diversity amongst venues in a particular LGA is variable.

As was found through observation visits to gaming venues, those that are strongly focussed on sustained gaming activity appear consistently to feature the latest games, the most innovative displays and the greatest variety of games and jackpots. Such venues also more often feature other in-venue promotions, such as daily giveaways of electrical goods, which provide incentives for gamblers to continue to gamble. These venues also feature well-appointed viewing and smoking areas and coffee, tea and bar services that allow patrons to effectively remain inside the gaming room for extended periods of time. The gaming floor in such venues does replicate the feeling and energy more associated with casinos. A kind of critical mass of gamblers seems to be able to generate a ‘buzz’ around gambling that the increasingly dynamic contemporary EGMs both enhance and reflect.

The venues where large aggregate sums are gambled are quite distinct in atmosphere from those with more modest levels of consumption, and in our view this forms an important parameter of the technical system of EGM gambling. That is, large venues are likely to induce greater gambling expenditure not only in the aggregate but in terms of consumption per EGM, as the consumption data analysis presented in Section 4 highlights. A sophisticated understanding of consumption patterns based on detailed analysis of real-time venue and machine data would thus form a key dimension of an appropriate risk strategy for managing EGM gambling consumption as a population health issue. The linking of a risk strategy to the social forms of gambling venues has a precedent in the tripartite system of EGMs introduced into Great Britain. The British system was designed with the aim of “deliberately avoiding the mistakes made in other jurisdictions, like Australia, where high stakes gaming machines in particular have been allowed to invade normal social spaces” (DCMS 2004: 16, see Table

⁴¹ See the published research outputs of the VCGA and the GRP for more details on these changes.

A.9). A combination of a systematic evidence base, technical re-skilling and some ‘reverse’ policy learning would contribute to Australian regulators regaining their standing as leaders in the administration of the gaming industry.

The regulatory context shapes and constrains the development of the EGM industry in Victoria in a number of ways. At an aggregate market level this includes measures such as the legislated caps on number of machines, the proportion of total machines that can be run by each operator, the numbers of machines that can be operated in metropolitan or regional venues as well as restrictions on particular capped regions. The regulatory context also shapes the technical parameters of EGM and EGM network operations and all aspects of the appearance and functioning of EGMs. The regulatory context thus restricts innovation in some areas of EGM technology, but provides opportunities and incentives in others. We found that the process of technical innovation is a relatively cooperative and bi-directional one in which manufacturers and regulators participate, although the extent of this appears to vary between jurisdictions. Innovative manufacturers seek to ‘push the envelope’ in new ways that can enhance the performance of their products and satisfy the warranties attached to the sale of EGMs to operators. Regulators are responsible for ensuring that the process of innovation conforms to legislative and administrative requirements. Ideally such a bi-directional process can reduce the possibility of industry investment in innovations being subsequently disallowed or regulators being placed in the position of having to make ‘million dollar’ decisions related to innovation investment.

However, the research process revealed evidence of a significant gap between the regulator’s technical capabilities and competences, and the innovation processes currently involved in the manufacture of EGMs. Game software in particular is an area in which regulators almost entirely rely on advice from accredited testing facilities as to the conformity of new products to required standards. This is not a black and white area, and it appears that in many cases an element of judgment is required in formulating a decision. Consultation with regulators in a number of jurisdictions confirmed that there are risks associated with the reduction of in-house testing and other technical appraisal capabilities. These risks were felt to be negligible in relation to the corruption of what is a multi-faceted approvals process. However, a risk was identified in relation to unforeseen consequences of the approval of innovative games or elements of games due both to the technical complexity of the software, and to the broad range of responsibilities, including game fairness, that fall to the regulator. The ongoing nature of technical innovation therefore means that this gap between the technical knowledge and competences of state and territory regulators and new game software and hardware is also at risk of widening further. This is compounded in our view by the failure of the regulator to make full, systematic and effective use of EGM data for purposes of ascertaining the actual effects of innovation.

6.3 Electronic Gaming Machines and the possibility of safe consumption

In the Discussion Paper for this project we defined ‘commodification’ as the processes by which social relations, and (in this case) leisure pursuits are transformed or ‘reduced’ to a commercial transaction, one which can be packaged for sale and consumption. The EGM itself simply represents the way in which the EGM ‘bet’ is packaged and sold for a price through the medium of a random number generator. Each transaction is settled and metered by the individual EGM and communicated via the CMCS. The ingenuity and inventiveness of the process of innovation thus focuses on ways to add value to the product and/or make better use of its networked capabilities, in such a way as to increase consumption levels.

We found that innovation in game software has undoubtedly made EGMs more attractive to consumers. 'Free' spins and similar game features (including features within features and 'metamorphic' game stages) are very popular and make certain machines more interesting and entertaining. Competition between national and international manufacturers has contributed to wider circles of influence on design (notably from Japan) and hence vastly improved themes in artwork and intensified graphics, animation, lighting and sound components. Collectively these elements have made EGMs a more stimulating experience for many gamblers. It is also clearly possible to make good (successful) gaming machines and poor (unsuccessful) alternatives using particular combinations of all these elements. The contemporary form of 'Australian-style' gaming machines can be understood as the sum of all the commercial research and information systems and industrial innovations applied to their design and manufacture to date. However, we know this is not all 'science', but also a largely intuitive process.⁴²

One of the key objectives of the research was to consider the relationship between the material form and technical characteristics of EGMs and problem gambling issues. A number of technical factors appeared to be linked to questions of consumer safety. The number of theoretical combinations a particular EGM can produce on the screen has grown to a very high level. The scale of these possibilities and their relationship to the chances of winning become very difficult if not impossible for the average consumer to fully understand. This is particularly the case when there are very wide variations between EGMs in this respect. The researchers observed machines operating in Victorian venues with up to 130 million theoretical combinations, with 80 million theoretical combinations being a common number. In such circumstances it is not difficult to understand the prevalence of 'erroneous cognitions' about the chances of winning amongst gamblers, as is well documented in the research literature.

The technical capacity to generate such a huge number of theoretical combinations relies on the use of one or more very long virtual reels, with a large number of stops, within a machine. The variation in virtual reel lengths can play a role in the way symbols present themselves to the consumer. For example, one long virtual reel may hold only one winning symbol, reducing the chance of winning the major prize. Other shorter reels may carry several of the winning symbols increasing the frequency of the appearance of these desired symbols. Should a gambler decide to play multiple lines different virtual reels may be activated and the base algorithm may change, altering the pay-table. The repeated appearance of the desired symbols associated with winning then creates a frequent 'near miss' effect. This is exacerbated by the operant conditioning effects associated with the random ratio schedules of EGM reinforcement (size and frequency of wins) (see Sections 1.6 & 2.9).

An analogy may be drawn here with scratch cards, highlighting the ambiguous nature of this process. It can be argued that if, on scratching the first five panels of a six panel 'scratchie', two maximum prize symbols (eg. \$100,000) are revealed then the consumer has a more 'exciting' and 'satisfying' experience for their \$2 outlay than if they had only the opportunity to win a lesser prize (\$5) when scratching the last panel. In fact this experience is also a function of the order in which the panels are revealed, for example, in that the random nature of scratchie play will produce different psychosomatic correlates ('adrenalin rush', or disappointment). The chance of winning does not vary from the moment of purchase to the

⁴² For an interesting discussion of this see an interview with Len Ainsworth reported in 'Head of the game Australia's poker machine king still has big dreams', by Roy Masters. Sydney Morning Herald 15/01/2005

final settlement of the transaction. However, the way in which the consumption is experienced varies considerably. The regular appearance of desired winning symbols on EGMs can be argued to both enhance the consumption experience in terms of feeling 'close to a win' or 'in the game' and to stimulate further play and inevitably over time extend losses. In researching EGM technology with problem gamblers we found near misses to be prominent in their discourse.

A further factor in relation to safe consumption practices is the requirement to use particular betting options to access certain prize categories including in some cases playing multiple lines. Some of these require gamblers to increase the number of credits being staked. A requirement for bigger bets is in some instances required to access interesting and attractive features of EGMs and particular categories of prizes. Increased stakes are also often required to activate the next level of metamorphic games, a key aim of playing EGMs of this type. Whilst RTP is adjusted automatically by the algorithm in such circumstances to ensure that game fairness requirements are satisfied, there remains an incentive for gamblers to bet bigger than they may have initially intended if they are to take advantage of all the features of many contemporary EGMs.

The number of times the 'gamble' option can be played following a win is limited to five. There is a paradox attached to the gamble option on EGMs, in that gamble feature is the bet with the best odds per transaction that EGM gambling consumers encounter. However, there was a tendency discussed by some problem gamblers to gamble small wins seeking to double up the maximum allowable five (5) times at the risk of losing the entire stake. The paradox of the gamble feature is that whilst it has the best odds per transaction, it also appears to be the mechanism by which a proportion of small wins are instantaneously erased through a 'one-shot' expenditure of credits that otherwise would be dissipated through regular play. Some problem gamblers reported eventually avoiding the use of the gamble feature for this reason. In effect EGM gamblers are once again being enticed to gamble larger stakes (bigger bets) than they intend by the option to immediately re-invest wins (gamble is available only on win meter credits and can be hedged by selecting half-double up). The effect of this ability to win more quickly using the gamble feature on base staking behaviour is unknown. The researchers formed the view that, regardless of any impact on base play strategies, enabling a maximum of five successive gambles on a win is in all likelihood excessive and should be reduced to a smaller number. In effect the net outcome of the gamble feature appears to be strongly negative for EGM consumers, although some industry sources consulted believed that an evidence base may disprove this interpretation. At least one researcher has argued that the gamble feature has a negative effect on gambler outcomes by increasing the volatility of the game (Toneguzzo1996).

The consumption of EGM gambling is continuous, repetitious and can be sustained for long periods of time. The triggering of the internal operation of the RNG is accompanied by the operation of graphics, sounds and lighting externally in a classic stimulus-response relationship. Extended periods of EGM consumption can thus have a significant operant conditioning effect. Enhanced machine effects are produced for winning bets, producing a learning effect that can elicit further gambling. The bodily, emotional and learning effects that are built into the practice of EGM gambling constitute a kind of template for a variety of mood states and attachments observed amongst gamblers. A number of such states are well documented in the research literature, as is their variation in relation to individual differences. We would argue that the basic operant conditioning effect that underpins the practice of EGM gambling consumption is a key component of the success of EGMs. However, this is also a

risk factor for an ‘unthinking’ mode of EGM gambling consumption which becomes unsafe if excessively extended. Evidence for this risk factor emerged in researching with problem gamblers through descriptions of ‘the zone’. The use of warning messages, notices and information in venues was dismissed by problem gamblers as irrelevant and invisible. Such measures, which follow a type of primitive health promotion model, are inadequate on their own in the construction of an effective harm minimisation model. Moves to promote the in-venue observation and interruption of problem gamblers by staff members that are now being implemented in New Zealand are broadly supported by the researchers. We understand that this measure is being further assessed in research currently underway as part of the National Research Agenda for Problem Gambling.

The development of such measures with their emphasis on individuals is likely to lead to aggregate positive outcomes for EGM gamblers’ wellbeing. We view this as a welcome continuation and enhancement of the health promotion model of interventionist harm minimisation strategies. Research attention that has been focussing on the use of cashless systems such as swipe or stored value cards, or other systems that may separate point of purchase from point of play fall into the same category if they are optional or available only in particular ‘high intensity’ sites for EGM gambling consumption. However, we believe that it is the effectiveness of the operant conditioning, ‘near miss’ and other effects within EGM consumption that open the door to *unsafe* consumption. This is the level at which safeguards on consumption, developed at a population health level, can potentially engage with the question of how an attractive but *safe* commodity can be offered for consumption. We argue that there is sufficient evidence to suggest that modifications in the operating configuration of EGMs or the technical parameters of EGM networks may offer, from a population health strategy perspective, highly effective mechanisms for increasing consumer safety. The aim of such a population health strategy would be more direction over time of the process of innovation and development of the EGM gambling commodity to achieve this objective. However, what is currently lacking is a comprehensive evidence base on which to found such a strategy, although we believe that the technical capacities of the EGM network in Victoria can provide this evidence base.

It is worthwhile at this point noting the range of information already compiled by the metering systems of EGMs that would form the basis of such an evidence base (see Section 3.3 of the National Standards 8.0 for greater detail). This includes: games played; turnover; cancelled credits; cashbox; coins in and out; banknotes in; cashless in and out; money in and out. Further meters compile data on progressive games and multi-game. Importantly, the options for additional metering (NS 8.0 sub-section 3.3.24) includes description of a gamble metering system that would enable the development of an evidence base related to the gamble feature.⁴³

6.4 Significant changes in the configuration of EGMs

In relation to the configuring of EGMs, a major characteristic that has increased and intensified consumption of EGM gambling is undoubtedly the introduction of bank note acceptors (BNAs). Combined with a largely unfettered access to automatic teller machines, this has had the effect of making the insertion of large amounts of money a much more straightforward proposition. BNAs have also largely obviated the need for EGM users to

⁴³ The Australian New Zealand Gaming Machine Technical Standards Rev 8.0 and the Victorian Appendix 7.0 took effect on the 28 October 2005. These standards and the CMCS technical document are available by going to <http://www.vcgr.vic.gov.au> and following the link to Legislation & Standards.

reveal to anyone how much they wish to gamble, something which problem gamblers we interviewed regarded as likely to lead to excessive consumption because of the perceived lack of inhibition involved. The growth in EGM consumption per EGM in the period post-1997 was almost certainly attributable in substantial part to the deployment of BNAs across the system, and we also note that modifications to BNA parameters in some jurisdictions resulted in important changes to consumption patterns. BNAs actually provide an interesting example of the combination of technical innovation and socio-cultural circumstances, leading to growth in levels of average consumption per EGM.

Research conducted in NSW found evidence that reducing the denomination of bank notes accepted by BNAs to a maximum of \$20 cut gaming expenditure substantially. This research also found that a higher proportion of problem gamblers used maximum denomination notes in BNAs than did recreational gamblers (IPART 2005). Clearly regulators in Victoria also believe there is some merit in these kinds of changes. All EGMs approved since January 1 2003 have been prohibited from including \$100 BNA facilities. The question, which was also raised in relation to the experimental research conducted in NSW, is whether eliminating \$100 note acceptors is effective when ATMs are stocked with \$50 and \$20 denomination banknotes.

Other system technical features include the introduction of linked jackpots and the configuration of credit values across networks. Both of these have been managed over the life of the system in order to maximise returns, and we note that operator policy regarding the mix of credit values is an important component of the management of venues and of the system as a whole. A further example of this relates to the level established for the return to player (RTP) as a proportion of turnover. This has strongly converged between operators over recent years, after having been to some extent quite divergent. Operators have apparently both discovered that driving down RTP has little effect on consumption growth, and have managed their networks accordingly in order to maximise returns.

6.5 EGM technical parameters

Parameters are the limiting values that define a variety of dimensions of the EGM technical system. They are also contained in the National Standards document that deals with configuration issues such as game fairness, BNAs and reel spin speeds. In consultation with manufacturers, the National Standards Working Party has been working toward the standardisation of requirements for the evaluation of gaming machines since 1994, within the limitations imposed by differing industry structures and technological capabilities between the participating jurisdictions. In general, the parameter values that apply across Australia and New Zealand are varied and in some respects uneven. This is due to the fact that current values represent continuations of historical arrangements and, once again, reflect the absence of an evidence base to inform decisions about the appropriateness of parameters and their future trajectory.

The technical parameters are fundamental to the aim of safe consumption of EGM gambling, setting the limits on bet size, win size and the number of credits that can be loaded into a particular machine at a given time. The tendency for the relatively recently legislated goal of responsible gambling to fall between the two historical stools of regulation, probity and revenue protection, is highlighted in the National Standards document statement of intent (Section 1.3), which states:

The intent of this document is to ensure that gaming occurs on gaming machines in a manner that is:

- a) fair;
 - b) secure; and
 - c) auditable;
- and that gaming machines are reliable in terms of these issues (NS 2004, 13).

However, regulators have increasingly commenced incorporating the third goal of regulation into the technical standards. In respect of Victoria, relevant sections in the Appendix contain explicit legislated responsible gambling provisions expressly relating to the presentation, operations and other aspects of EGM technology.

In relation to parameter limits, the values that we find are most obviously worthy of concentrated attention are the maximum bet allowed (MAXWAGER) and the maximum credit balance that may exist on an EGM (BKNTLIM). The NSW research for the IPART review found that problem gamblers were approximately three times as likely as recreational gamblers to bet more than \$1 per spin. Preference for large bets was also found to be a consistent predictor of gambling problems and their severity. In Victoria the maximum bet on EGMs is \$10 unless operating in a 'specified area' (currently only in Crown Casino). In contrast, in Queensland clubs and hotels the maximum bet is \$5 and in New Zealand community venues it is \$2.50. Clearly the level of maximum bet allows different levels of the famously 'voracious' Australian-style machine. In the context of EGM gambling for leisure purposes there seems little requirement for such a high maximum bet in Victoria, particularly as unrestricted EGM gambling is available at Crown Casino. This limit may indeed contribute to unsafe EGM gambling consumption. However, once again, there is no evidence base to support or disprove this interpretation or on which to base recommendations for change to this level.

A wide variation between jurisdictions also exists in relation to maximum credit balance. In Victoria an EGM in a club or hotel can hold credits worth \$9,949, whereas in Queensland the corresponding value is \$100 although high values can be set in Queensland casinos. Once again it seems hard to understand that there is a need to allow individuals to insert almost \$10,000 into an EGM for the purposes of safe enjoyment of a leisure activity. On the other hand there is clearly a risk to consumer safety in allowing this possibility, given the well-documented links in consumer research between depression or other negative moods and binge or impulse purchasing behaviour. To the best of our knowledge no such high banknote limits exist for EGMs in social venues comparable to Australian pubs and hotels anywhere else in the world, but rather such high levels are restricted to purpose built gambling venues such as casinos. Consultation with current and former regulators and informal discussions with law enforcement officers confirmed the seemingly obvious risk of such high banknote limits in relation to the crime of money laundering. A successful prosecution for money laundering using poker machines in a casino has been obtained in New Zealand and can be relatively closely controlled in Australian casinos with on-site police facilities. However, it is questionable that the capacity to monitor suspected money laundering activity exists on the floor of club and hotel gaming venues. Once again we could find no evidence base for the setting of this high level in Victoria despite these two apparent risks.

Overall, in relation to technical standards, the researchers have formed the view that the consultative processes of the annual revisions of the standards document and of the Working Group will be an increasingly key element in the future fulfilment of regulators' responsible gaming obligations. It also appears that the strategic goal of standardisation and consultation presents a potential win-win for regulators and equipment manufacturers. The management of the innovative process should be the location of an increasing level of activity in relation to

responsible gambling provisions. The refinement of the National Standards and the strategic goal of technical standardisation are compromised where state-based measures have to be taken to deal with unsafe consumption outcomes *after the fact*. The goals of the National Standards to cut the costs of EGM approvals and deployment are obviated where expensive and time consuming measures (including research programmes) continue to be viewed as necessary due to significant levels of harm related to EGM gambling. Rather, consumer safety should be an integral part of the innovation process undertaken by manufacturers and overseen on a case-by-case basis by regulators. This would demand attention to unforeseen consequences from particular innovations be an aspect of the innovation process itself, necessitating trials of new innovations. This kind of institutional reflexivity is an increasingly prevalent and successful strategy for dealing with uncertainty and risk of moving forward in complex markets.

6.6 Social distribution of consumption and risk

Our analysis of data provided by the regulator has reinforced the view that EGMs have been concentrated in areas of relative socio-economic disadvantage, for whatever reason (i.e., because this is where the market is to be found, or where it has been produced). This concentration does appear to have resulted in stronger per capita consumption in such areas, despite sometimes unpredictable levels of average consumption per EGM. This may be associated with the distinction between peak levels of demand and average levels of demand – in the sense that an area with a concentration of EGMs will be better able to meet peak demand (which may be as little as four to five hours per week) and thus generate higher per capita levels of consumption. We also note the apparent tendency for high performing venues to be located in outer suburban growth corridors. As measured by consumption per EGM, hotel venues consistently outperform club venues by a considerable margin and larger venues appear to consistently outperform smaller venues. The relative performance of EGM operators has now converged, but for most of the history of the EGM industry in Victoria Tattersalls' venues performed at higher levels on consumption measures than Tabcorp's. This is significant because it highlights the importance of management practices to the overall performance of the EGM system, a phenomenon which is also illuminated by considering the distinctions between club and hotel venues and larger and smaller venues, for example. The continued rationalisation of club and hotel EGM operations is likely to be driven by the requirement to grow the market through growth in revenue per machine. Management practices are likely to converge particularly as large venues and chains of venues increasingly purchase venue management services with track records in stimulating growth. The recent purchase of the Taverners group by Woolworths, in a venture with a venue management company run by Bruce Mathieson, is a pointer to an industry increasingly dominated at the top end by corporate management strategies designed to extract further value from their EGM assets.

Distinct phases have been observed in the intensification of EGM consumption and average consumption has increased because of changes to management practices, particularly at the level of venue management, but also because of specific technical innovations including in particular the introduction of bank note acceptors (BNAs). It is clear from industry comments and from observation of data that the installation of BNAs provided a fillip to the industry in the period after about 1997. It is also clear to us that their installation has resulted in an intensification of EGM use – in many cases to the detriment of the interests of gamblers. We note the finding from research data that most problem gamblers in the telephone sample (for instance) report that sessions end when all available funds are exhausted. Qualitative data reported in this study also demonstrates the extent to which the ease of access to funds

provided by ATMs combines with the ease of insertion of bank notes via the BNA to exacerbate this situation for many gamblers. The effect of BNA configuration on gambling consumption should be a matter of further sustained inquiry.

We also noted the concentration of EGMs into larger venues where much higher levels of consumption per EGM are likely, producing higher levels of aggregate consumption. This represents a utilisation of available data to inform management decisions and is to be anticipated. However, we believe that it may be advisable to give some consideration, in the context of a review of EGM licenses, which is to commence shortly, to the reconsideration of limits in venue size (as measured by EGM numbers) and the ratio of EGMs in hotels and clubs.

It is clear that enforcement of the harm minimisation object of the current legislation is generally not been as well undertaken or implemented as the regulation of revenue protection or probity in gambling, both of which functions appear to be well performed by the regulator. This is due in part to the relatively recent emergence of this third stool of regulator responsibility. We note in particular that the potential for evidence generation provided by the regulator's access to the CMCS of each operator has yet to be realised. It is a well-established principle of public health (where harm minimisation as a philosophy has its origins) that the development and implementation of interventions or activities intended to reduce harm should be based on evidence. Available evidence should be utilised at the levels of understanding the problem, understanding the extent to which specific interventions are likely to address the problem, and understanding the extent to which specific interventions in fact did address the problem. Despite the availability of a good source of data to generate an evidence base (the data generated by the operator's CMCS) it is a concern that there is an apparent lack of an evidence base to inform decision-making around the impact of various technical and associated interventions. Again, the obvious example is that provided by the introduction of BNAs. A simple natural experiment would have been provided by the analysis of data around the installation of BNAs to examine the extent to which BNAs increased the level of consumption of EGM gambling to which they were fitted. This would have yielded valuable insights and informed decision-making around relevant parameters. It was not done, as far as can be ascertained. Similarly, although the regulator advised us that periodic examination of EGM data may be undertaken, there is no attempt to establish an evidence base to inform decisions around harm minimisation or consumer safety. This is a serious omission that can and should be urgently addressed – at little cost to the regulator. A review of the data currently readily available and consideration of desirable dimensions of data that ought to be captured needs to be undertaken. This review would need to consider technical changes that may facilitate an ideal dataset and not limit itself to enumerating what is currently possible.

On this general theme, it was found that there has been little systematic thinking about the desirable scale and/or scope of the EGM industry in each jurisdiction in which it has been introduced. In this the industry throughout Australia appears to have developed along idiosyncratic historical and socio-political lines. Later industry sectors have apparently derived such essential decisions as the total number of machines deployed from very simple calculations in relation to an industry model (NSW) with such particular social and historical characteristics that it is difficult to see how it might have been viewed as providing a suitable basis, other than the fact that it was close by. Today technical parameters continue to differ (sometimes markedly) between jurisdictions, there is no clear commitment to harm minimisation across jurisdictions, and responsibility for consumer safety and/or harm minimisation falls between the twin stools of revenue protection and protection of probity in

gambling activities. There are some technical factors in some jurisdictions that cannot be overcome without significant capital investment. In this regard Victoria has the opportunity to be a leader in the realm of regulation as technical practice, due in no small part to the quality of its network infrastructure. This could provide significant policy learning opportunities for other jurisdictions at different points in the technical cycle.

However, we believe that there is a pressing need for a coherent national strategy that provides a level of strategic steerage within which individual jurisdictions can accommodate their particular issues. In our view the National Standards Working Group has been operating very well in this respect. However, the role of the Working Group needs to be more transparent and its strategic direction more coherent across the three goals of regulation. The operations of the Working Group do not necessarily need to be overly formalised. The innovation process requires a degree of freedom in pursuing competitive advantage. Manufacturers and regulators do need to be able to discuss and negotiate, both in relation to specific cases of innovation and to general philosophies for the future of the industry. Technical requirements that take account of emerging responsible gambling and consumer safety issues can be incorporated into this process in the same way as probity requirements, for example. This would have as its goal a nationally consistent and coherent strategic direction for the EGM technical system that includes an explicit commitment to harm minimisation. This must be backed by the development of evidence bases to inform technical requirements, policies and regulations. Of course, it may be that in some jurisdictions this commitment is lacking. If so, it is necessary for this also to be made explicit.

EGMs certainly provide some people with pleasant experiences, although for some other people they can produce catastrophic personal consequences. If this latter is genuinely regarded as a matter of importance (and the Victorian legislation explicitly recognises that it is) then it is necessary to act accordingly and the most effective way of doing this is to utilise available evidence to systematically inform policy and regulatory decisions. It is also important for technical capacity to be retained in government and it is likely that some such capacity has been lost in recent years via outsourcing of compliance testing. We believe this needs to be addressed if regulators are to remain as well informed as possible about the rapidly developing innovation process which is associated with EGMs and other gambling development. This may be particularly important in a changing economic environment where the attractiveness of gambling and its consequences may become more marked.

We are therefore concerned at the lack of a risk management framework for harm minimisation purposes. Such a framework could involve the development of risk profiles at machine, venue, regional and operator levels, utilising a risk analysis or similar tool to identify relatively high risks, and require a management plan to address risks accordingly. We believe that a number of relevant parameters are identifiable (as suggested in the recommendations set out in this report) and that although we are unable at this stage to produce a tool in a climate where evidence gathering is pursued for harm minimisation purposes we suggest that this could become a more straightforward task which the regulator could achieve readily. In any event, experience in such an activity would likely improve regulatory efficacy and efficiency rapidly.

6.7 Opportunities to address regulatory gaps and risks

We have identified the following specific opportunities for regulatory and other innovation, arising from the research.

Data monitoring and risk management

The Central Monitoring and Control Systems (CMCS) utilised by EGM operators provide a substantial amount of data which has the potential to greatly improve risk management practices and reduce harm associated with EGM use. This potential is not currently realised and this represents a major defect in the arrangements for minimisation of harm. The regulator could address this gap by:

1. establishing a capacity for monitoring data derived from the CMCS systems operated by EGM providers for the purpose of meeting the harm minimisation objective of the Act;
2. developing risk management profiles at the game/platform, venue and operator levels in order to provide benchmarks against which to undertake harm minimisation monitoring activities;
3. ensuring that innovations in EGM game and platform design are not fully approved and deployed until they have been subject to harm minimisation scrutiny via limited initial deployment and the use of actual EGM data and a risk management profile;
4. continually monitoring actual EGM platform and game performance against risk management profiles established at the game/platform level and venue level;

The following factors are able to be measured systematically and as such are likely to form the basis of a risk profile system:

- Expenditure per specific EGM game/platform per annum,
- Numbers of EGMs per venue,
- Use rate of EGM game/platform,
- 'Free' spins won,
- Use rate of gamble feature,
- Credit values of EGMs,
- Geographic and social significance of location, for example, in or near a shopping centre or within an area of relative socio-economic disadvantage,
- Hours of availability of EGMs,
- Average expenditure per EGM,
- Values of banknotes inserted within sessions of play,
- Bet values,
- Aggregate expenditure at venue,
- Expenditure rates for high credit value EGMs (particularly \$1 credit values),

Risks identified include risks relating to harm incurred to individual EGM users and risks associated with money laundering by criminals using high credit value EGMs. The risk profile would aid in the efficient use of resources in relation to the targeting consumers at risk of suffering harm from EGM gambling. In venues this would include:

- Observation of a high rate of 'regulars' who visit frequently and for prolonged periods,
- Observation of high rate of patrons exhibiting apparent preoccupation with particular EGM games/platforms,

This would also aid in the identification of EGM activity that would fit the profile of possible money laundering.

The regulator has the opportunity to utilise available technical capacity to:

5. Undertake development of a risk profiling tool for application at the EGM game/platform, venue and operator levels, including identification of acceptable/unacceptable risk parameters;
6. Develop a strategy to address issues in relation to any venues and/or particular EGM games/platforms identified as 'high risk', in conjunction with venue and gaming operators, including requiring operators to develop risk management plans for specific venues;
7. Review the operation of risk management strategies periodically and be empowered to require amendments to risk management plans where this is believed to be necessary to address risks associated with particular EGM games/platforms or venues.

Technical development and approval systems

Current practice for development of technical standards and approval of gaming equipment is largely non-transparent and appears not to explicitly address harm minimisation principles to the same extent and depth as probity and revenue issues. In large part this may be a function of the state based jurisdictional issues associated with the regulation of gambling, but from a consumer safety perspective there appears to be no justification for a plethora of differing parameter settings and standards between states and territories. Issues of consumer safety and harm minimisation should be part of a coherent national strategy in relation to the technical features of EGM games/platforms and their approval. We do not believe this is presently the case.

There is currently no definitive proof of causal relationships between specific characteristics of EGM games/platforms and a high incidence of problematic gambling. Problem gamblers identified a number of characteristics as important in the development of problematic behaviour, suggesting a multi-faceted approach is required. Clear goals and a coherent strategy in relation to EGM technology and consumer safety/harm minimisation must be set. By definition, the development of EGMs that are innovative, successful, secure, fair, *and safe* for consumers should be the aim. This aim should apply to ongoing revision of technical standards, including EGM configuration and technical parameter values. Consistency and appropriateness should be goals of a process to evaluate and set parameter values accordingly so as to best balance all the responsibilities of the regulator. However, this process must utilise actually available data and continue to monitor and evaluate the impacts of actual technical innovation on EGM consumption. This is essentially a continuation of the opportunity for an evidence-based approach described above and needs to be a priority medium-term strategy.

Regulators have the current opportunity to:

8. Establish a national evidence-based approach to the incorporation of consumer safety into the innovation stage of processes of technological development. The long-term goal of this process will be to retain the attractive features of gaming machines for safe recreational or leisure gambling but to ameliorate the aspects or extents of design features of Australian-style machines that are unsafe for consumers, seeking to shape but not stymie the imperative of manufacturers to pursue innovation;
9. Re-establish a technical capacity (e.g., for at least some testing of EGMs whether randomly or as a matter of course) within the regulator, noting that outsourcing of testing may have lead to a deterioration in technical sophistication and understanding within the regulator, and that reacquisition of such a capacity may assist in identifying

EGM games/platforms which require more regular/systematic monitoring for risk management purposes;

10. Develop transparent and coherent strategies at a national technical working group level to clarify the purposes of the technical standards, including processes for agreement on and implementation of harm minimisation strategies and specific measures, again drawing on the available evidence base of specific jurisdictions (we note that some jurisdictions do not have access to data of the quality available in Victoria, for example). The strategy should include as a matter of priority a process to evaluate the basis for, and continuing appropriateness of, parameter value settings, including their appropriateness in relation to distinctions between gambling specific venues (such as casinos) and social venues which provide gaming opportunities (such as clubs and hotels). We note that some jurisdictions already set some parameter values at different levels in venues of different types.

Further research and continuing monitoring

On the available evidence the two most likely EGM level characteristics contributing to the development of problem gambling are bank note acceptors (BKNTLIM) and the ‘free game’ features incorporated into many EGM games. In the case of the former, the ready availability of ATM facilities appears to assist problem gamblers to expend all available cash reserves during sessions of play without experiencing the inhibiting factor of contact with a cashier or other person. We also note the ‘near miss’ effect and direct inducements to increase bet size in the course of gambling as factors particularly worthy of further attention. We were unable to pursue these (and some other) issues as fully as we wished because of the unavailability of EGM level data. The extremely high credit limits available on EGMs in Victoria and in some other jurisdictions (particularly those where BNAs are allowed) pose a clear risk of money laundering, particularly on high credit value EGMs (which appear to be less favoured by problem gamblers). This requires immediate attention by the regulator.

In this context, the regulator has the opportunity to:

11. As a priority, conduct further studies utilising EGM level data drawn from the CMCS, as well as other quantitative and qualitative data, to develop a better understanding of:
 - (i) the relationship between problem gambling behaviour (including incidents of expenditure of all available cash assets during sessions of play) and BNA availability and parameter limits. This may involve cross jurisdictional studies involving jurisdictions where BNAs are not universally fitted;
 - (ii) the effect of ‘free spin’ features on player behaviour, in particular the extent to which players increase bets in anticipation of achievement of ‘free spin’ features;
 - (iii) the structure of reinforcement schedules (size and frequency of wins); and
 - (iv) the relationship between player behaviour, and venue size (measured by the number of EGMs) and type.

A suitably qualified and experienced expert independent of Government should be contracted to also conduct CMCS data analysis.

Harm minimisation as underpinning philosophy

Harm minimisation in the context of EGM gambling consumption has multiple and varied meanings across Australian jurisdictions and appears presently to be largely based on impressionistic conceptions and ideas, and in particular on concepts revolving around

consumer information and attitude change.⁴⁴ Harm minimisation in other fields of public risk has evolved in multiple directions, which although they incorporate information provision and attitude change also utilise material change to assist in the management of risk. Examples include road safety, drug misuse and abuse, and the incidence of smoking-related disease. In each of these areas attitude change has been utilised, but as an adjunct to material changes in certain parameters around the risk. Modifying attitudes is not necessarily always possible, or effective. Evidence from water consumption modelling for example suggests that attitudes are intransigent and changes in practices limited – eventually the technical system must be modified. Similarly we believe that the philosophical commitment to harm minimisation must be clarified and either explicitly withdrawn as an object of the legislation or implemented with the necessary conviction to bring about a serious attempt at understanding the nature of harm, the relative risk of particular EGM venues and games/platforms, and the consistency of management practices at all levels with the goals of consumer safety and harm minimisation.

Clarification of harm minimisation as underpinning philosophy requires:

12. Explicit endorsement by the Victorian and other Australian governments of a commitment to harm minimisation as the underpinning principle of gambling regulation, on at least the same footing as revenue protection and probity issues are presently addressed;
13. Development of an agreed national framework for developing risk management strategies with a focus on consumer safety and harm minimisation, including in the areas of technology innovation and regulation as a technical practice;
14. Sharing of risk profile tools for mandatory application to EGM and other gambling activities on a national basis if possible;
15. Development of harm minimisation goals in relation to EGM gambling and gambling more generally, including explicit commitments to information sharing, development of a national evidence base derived from actual gambling system data sources, and agreement on explicit independent evaluation of all harm minimisation measures using all available data. If possible this should be undertaken on a consistent national basis.

⁴⁴ This is not altogether surprising given the different histories of gambling industries and regulation in each state and territory. We note that the national gambling research program has published as an initial offering a report entitled *Problem Gambling and Harm: Towards a National Definition*. See <http://www.gamblingresearch.org.au>

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Appendix A: EGM technology, gambling problems & harm minimisation

This review looks at the relationship between EGM technology and gambling outcomes. The major focus is on literature that can assist in interrogating the nexus between EGM technology, gambling problems and harm minimisation measures. It addresses literature to do with the aetiology of gambling problems in general, but more specifically the aetiology of EGM-related gambling problems. This literature is reviewed with particular attention to aspects of the EGM technical system, but does not look closely at available profiles of EGM participation or revisit the research on problem gambling prevalence rates.⁴⁵

This Appendix includes:

- a summary of selected recent approaches to problem gambling;
- reviews of problem gambling literature based on behaviourist, need-state or cognitive theoretical perspectives;
- a review of studies directly concerned with EGM design and gambling behaviour; and
- a review of literature on EGM technology and harm minimisation measures.

It is widely held that gaming machines are more likely to lead to problem gambling than other forms of gambling (PC 1999: Ch. 8; SACES 2003: 11-14. The disproportionate amount of EGM expenditure calculated to come from problem gamblers was estimated as 42.3% by the Productivity Commission (PC 1999: 7.46).⁴⁶ It has been argued that the particular qualities of gaming machines accentuate the potential for excessive gambling and that “more attention needs to go to understanding how their design and working play on human psychology to control and seduce” (New Focus 2003: 42). It has also been argued that machine gamblers who develop gambling problems do so much quicker than those ‘traditional’ gamblers who develop problems (Breen 2003: 31). It has also been suggested that intra-personal variables such as gender and the presence of co-morbid disorders do not generally affect the speed with which people develop gambling problems, but rather that the “social, environmental and stimulus features of mechanised gambling are implicated” (Breen 2003: 31).

Research into gaming machines and problem gambling is wide-ranging and fraught with complexities relating to the differences in types of machine gambling, and the varying social, cultural, economic and political contexts within which both machine gaming and research take place. As described earlier, gaming machines vary widely across national jurisdictions. However, research tends to take it as a given that gaming machines are fairly generic in their key features, even in circumstances where the readership audience can be assumed to be international.

Until relatively recently, few research reports have specifically described the technological characteristics of particular machines in relation to their impact on (problem) gambler behaviour. Emerging predominantly from the discipline of psychology, recent research has focused on behaviourist/learning, cognitive and need-state theories. These have been argued to have a special application to EGM gambling (even while the current trend in policy and practice could be argued to be toward more broadly encompassing psycho-social explanations

⁴⁵ For a discussion of these topics see SACES (2003), particularly Chapter 2.

⁴⁶ Proportions of gambling expenditure contributed by problem gamblers for other gambling forms: wagering 33.1%; scratchies 19.1%; casino table games 10.7%; lotteries 5.7%. Adjusted total for all: 33.0% (PC 1999: 7.46).

for excessive or problematic gambling). Key studies that examine the nexus between gaming machine technology and problem gambling aetiology are briefly described below. These studies are categorised in terms of their sub-disciplinary approach. However, the grouping of studies together does not necessarily indicate a close commonality in the rationale or approach underpinning the study. Many psychological studies of gambling behaviour could be considered hybrid in nature, in that they utilise a number of ideas and understandings drawn from this very broad discipline. However, we firstly provide a brief summary of recent approaches to the study of problem gambling.

A.1 Recent approaches to the study of problem gambling

There is a growing international literature on gambling in general and problem gambling in particular, including several recent approaches to the question of problem gambling that can be described as somewhat multi-dimensional in character. These approaches advocate research into problem gambling that integrates both a range of theoretical perspectives and variety of levels of analysis (social, cultural, local, personal).

In an article advocating a ‘biopsychosocial’ approach to the study of gambling behaviour, Griffiths (2001) describes the strengths and weaknesses of various analytical approaches and documents some useful findings about problem gambling aetiology to date. He concludes by recommending a constructive and integrative utilisation of existing theory and knowledge about problem gambling.

Gambling is...a complex, multidimensional activity that is unlikely to be explained by any single theory. Instead, this research is best served by a biopsychosocial model that stresses the individual and idiosyncratic nature of the development of gambling problems and emphasises the role of contextual factors internal and external to the process of gambling itself (2001: online version, no pagination).

Griffiths argues that theories may be complementary rather than mutually exclusive and that limitations of individual studies might be overcome through the combination of ideas from different perspectives (2001). Though sociological theories are invariably overlooked by experimental psychologists examining the issue of problem gambling (at least in the English-speaking world), Griffiths is of the view that sociological theories also appear to be critical in understanding the acquisition of gambling behaviour.

Griffith also makes the point that there is no clear-cut distinction between problem gambling and normal gambling, “rather there is a continuum from social gambling to ‘regular’ gambling to problem gambling” (2001). This has fundamental implications for both theory and research methodology – in particular, many experimental studies are based on the idea that there are two separate groups ‘problem or pathological gamblers’ and non-problem gamblers.

Blaszczynski (2000) has developed a useful theoretical model describing various pathways that people might take toward the acquisition of gambling problems. This research is based on experience with a clinical population (where people are seeking help or are compelled to seek help) and, as such, particular social groups are likely to be more predominant in the research sample as compared to the broader population. According to Blaszczynski (2000), all treatment models assume that gamblers are a homogenous population and that theoretically derived treatments can be effectively applied equally to all problem gamblers. Instead, he proposes that problem gamblers form a heterogeneous population, which varies in significant ways - the end result of a complex interaction of genetic, biological, psychological and

environmental factors. Hence, he describes a differentiated model that identifies three main subgroups.

1. *Normal*. These gamblers lose transient control over their behaviour because of irrational cognitions and thought patterns, which lead to a series of poor judgments. Following this, they become temporarily over-involved in gambling. These gamblers 'require minimal interventions, counselling and support strategies and may resume controlled gambling post intervention. Self-help groups such as Gamblers Anonymous are effective, as are self-control, self-help educational materials.'

2. *Emotionally vulnerable*. These are gamblers who participate for emotional reasons – to dissociate ('cut off') as a means of escaping painful life stresses, to reduce boredom, or to deal with unresolved psychological conflicts or childhood traumas. They require more extensive therapeutic interventions, which might include the development of stress management and problem solving skill or therapies aimed at resolving psychological conflicts and improving self-esteem.

3. *Biologically based impulsive pathological gamblers*. This subgroup is defined by the presence of neurological or neurochemical dysfunction. These gamblers suffer a medical and/or psychiatric condition that is characterised by impulsivity and features of 'attention deficit disorder'. For members of this group clinicians must attend to problems related to attention and organisational deficits, stress intolerance and poor problem solving and coping skills. These gamblers may require intensive cognitive behavioural interventions aimed at impulse control over longer periods of time. Medications for reducing impulsivity may be considered.

Furthermore, it is proposed that there are three elements relevant to all gamblers regardless of subgroup membership (Blaszczynski 2000).

1. *Conditioning/reinforcement through 'rewards' from gambling*. Various studies have shown that gambling produces a state of subjective excitement and increased heart rate. Wins, delivered at variable ratios (reward interval schedules) produce states of excitement. Repeated pairings condition this arousal to stimuli associated with the gambling environment. Through second order conditioning, gambling cues elicit an urge to gamble, which results in a habitual pattern of gambling. Thus excitement can be experienced in anticipation, during or in response to exposure to gambling situations or cues. This process of conditioning can be used to explain gambling as an addiction produced by the effects of positive and negative conditioning, tolerance and withdrawal (Blaszczynski 2000).

2. *Development of cognitive schemas (patterns of thinking)*. This is superimposed on the conditioning framework and irrespective of whether or not an addiction type model is adopted. Early and repeated wins result in irrational belief structures that promote gambling as an effective source of income. These schemas shape illusions of having control, biased evaluations and judgments, erroneous perceptions, superstitious thinking and faulty understandings of probability (Blaszczynski 2000).

The reinforcing properties of gambling and the irrational cognitive schemas combine to consolidate and strengthen habitual gambling practices. At this point, the downward spiral of gambling...takes its toll. When gamblers lose they attempt to recoup losses through further chasing, which results in accumulating financial debts. Despite acknowledging the reality that gambling led them into financial problems, they irrationally believe that gambling will solve their problems (Blaszczynski 2000).

3. *Ecological determinants*. These revolve around public policy issues that promote availability and access to gambling facilities. ‘Substantive data clearly demonstrates that the incidence of pathological gambling is inextricably tied to the to the number of available gambling outlets’ (Abbott and Volberg 1996; Volberg 1996; PC 1999; cited in Blaszczynski 2000: np).

The ‘pathways’ model is put forward primarily as a framework for clinicians, as a “conceptual framework that attempts to integrate research data and clinical observation to assist clinicians in the identification of distinct subgroups of gamblers requiring different treatment strategies” (Blaszczynski 2000: np). However, the model provides a summary of major strands of thinking about problem gambling emerging from the clinical or treatment setting.

A more recent approach proposed by Zangeneh and Haydon (2004) is a ‘psycho-structural cybernetics model’, a theoretical approach which seeks to address the complex interactions between individuals and structure that lead to problem gambling and its maintenance. Within this model it is proposed that both negative and positive feedback to the individual can lead to gambling problems. In the case of negative feedback, faulty or irrelevant incoming information held by individuals may produce erroneous (gambling) behavioural output (2004: 3). On the structural level, the offers and inducements portrayed in advertising may also be influential, particularly when operating as contexts for individuals who already hold erroneous cognitions. In the case of positive feedback, early or relatively large wins on the individual level may combine with structural contexts emphasising wealth creation, risk and chance ideology (Zangeneh & Haydon, 2004: 5). The interrelationships between individuals and structure and the ‘feedback’ of information processing are thus argued to provide a way of thinking about problem gambling that integrates relatively micro- and macro-social factors.

These recent theoretical perspectives on problem gambling tend toward broad analytic and explanatory frames. Nevertheless, it is possible to see connections between these broad conceptualisations of problematic gambling and the narrower concern of the researchers with harm associated with EGM gambling and its particular technological platform. For example, it appears that two of the major determinants that are argued by Blaszczynski to confront all gamblers, namely processes of conditioning through the offer or receipt of rewards and the development of cognitive schemas, are likely to have direct relevance to the nexus between gaming machine technology and gambling participation. The third determinant, which Blaszczynski terms ecological, can be broadly interpreted as the contexts of all machine gaming, including in particular those elements and their parameters described in this Report as comprising the EGM technical system.

In the following sections, selected studies are compiled which are of specific relevance in relation to the question of problem gambling, EGM gambling and technology.

A.2 Behaviourist or learning theories

Behaviourist theories conceptualise persistent gambling as a conditioned process. This theoretical orientation is described by Griffiths and Delfabbro (2001):

... both classical and operant conditioning principles have been applied to the study of gambling. In operant explanations for problem gambling ... persistent gambling is seen as a conditioned behaviour maintained by intermittent schedules of reinforcement, most likely a variable-ratio schedule. This involves the provision of infrequent rewards after varying numbers of responses. On the other hand,

proponents of classical conditioning models...argue that people continue to gamble as a result of becoming conditioned to the excitement of arousal associated with gambling, so that they feel bored, unstimulated and restless when they are not gambling ...

In particular, the combination of event (or stake), the result of win or loss and the time-gap between each gamble win is said to contribute to the 'addictiveness' of gaming machines (Griffiths & Parke, 2003). EGMs may be readily conceptualised as devices utilising highly developed concepts of reinforcement in order to maintain desired behaviour.

Table A.1, below, summarises selected relevant literature on EGM gambling participation and EGM technology from a broadly behavioural or learning approach.

Table A.1 Gaming machine features and gambling behaviour, behavioural/learning approaches

Salient dimensions of gaming machine design in the acquisition of gambling habits and gambling problems	Method	Source
<p>Intermittent reinforcement</p> <p>Pathological gambling results from partial schedules of reinforcement whereby the ‘operant is assumed to be the behaviour that places coin or property at risk (e.g. putting chips onto the roulette table, passing cash across a counter in an off-course betting agency or pulling the handle of a gaming machine) and is intermittently rewarded by cash winnings.’</p>		<p>Skinner, 1953; as cited by Hinchy, Legg England & Fabre, 1992 and Delfabbro, Falzon & Ingram, 2004</p>
<p>Reinforcement schedule, small wins</p> <p>Wins affect play rate for up to three minutes, while effects of other variables were inconsistent. Wins smaller than 50 credits tend to elevate play rate while larger wins cause a breakdown in the otherwise very regular rate of play. ‘The results provide strong evidence that the gambling of high-frequency poker machine players is a highly disciplined and stereotyped behaviour sensitive to the reinforcement schedule inherent in the machine characteristics...’</p>	<p>Persistent gambling was studied as a function of the reinforcement of arousal and winning during normal poker machine playing sessions. Play rate, heart rate, winnings, subjective excitement and expectations of winning were recorded for 5 male and 5 female high frequency players.</p>	<p>Dickerson, Hinchy, Legg England & Fabre, 1992</p> <p>Australian, based on EGM technology</p>
<p>Near wins</p> <p>Players in the near win condition played 33% more games than did the control group, suggesting that near wins can be added to the list of factors that may motivate people to gamble despite the probability of monetary loss.</p>	<p>In a 3 reel game, near wins were operationally defined as 2 identical symbols followed by a third different symbol. Players in the experimental condition were exposed to 27% near wins in a series of continuous losses, whereas players in a control group were exposed to none.</p>	<p>Cote, Caron, Aubert, Desrouchers & Ladouceur, 2003</p> <p>Canadian, based on VLT technology</p>
<p>Modality of symbol presentation</p> <p>The effect of modality of symbol presentation on Video Lottery Terminals (VLTs) (sequential vs. simultaneous) on gambling behaviour was investigated. Sequential presentation incited players to prolong session.</p>	<p>28 adult occasional VLT players were initially given \$10 for participation and told that they could win an additional \$15 by increasing their number of credits while playing ‘Swinging Bells’ (being assured that they would leave with \$10 independent of results).</p>	<p>Ladouceur & Sevigny, 2002</p> <p>Canadian, based on VLT technology</p>
<p>Relationship between bet size and numbers of lines bet</p> <p>Experienced EGM gamblers tend to converge towards a pattern of gambling that features minimum bets on maximum lines (mini-maxi) rather than vice versa despite similar levels of reinforcement for both.</p>	<p>Review of selected literature on gambling behaviour from a learning theory perspective.</p>	<p>Walker, 2001</p> <p>Australian, based on EGM technology</p>

Table A.1 Gaming machine features and gambling behaviour, behavioural/learning approaches (continued)

<p>Speed and sound</p> <p>The purpose was to ‘identify game parameters that would reduce the risk of abuse of VLTs by pathological gamblers, while exerting minimal effects on the behaviour of non-pathological gamblers.’ Slow speed and no sound (contrasting with fast speed with sound) decreased enjoyment, excitement and tension-reduction for pathological gamblers relative to non-pathological gamblers. Pathological gamblers (but not non-PGs) found it easier to stop playing when the counter was displayed to when the counter was not displayed. It was speculated that noise and sound might increase the attractiveness of the play or, alternatively, that arousal is maintained and reinforced by narrowed attention and intense concentration providing the gambler with an ‘escape’. Robust differences between the two groups were not found for the presence of a running display of money spent or for a game that could not be stopped through touching the screen. Speed and sound were manipulated together so cannot disentangle impact of each.</p>	<p>60 regular VLT players were exposed to 3 machine manipulations: a counter which displayed a running total of money spent, a VLT spinning reels game where participants could no longer ‘stop’ the reels by touching the screen and sensory feature manipulations.</p>	<p>Loba, Stewart, Klein & Blackburn, 2001</p> <p>Canada, based on VLT technology</p>
<p>Near misses</p> <p>The <i>near miss</i> leads to persistence of play on slot machines. The 30% near miss condition led to the greatest persistence, as compared to the 45% and 15% near miss conditions.</p>	<p>180 undergraduates played a 4-wheel computerised slot machine. The dependent variable, persistence was defined by the number of trials in the extinction phase.</p>	<p>Kassinove & Schare, 2001</p>
<p>Smells</p> <p>A specific odorant led to increased in the amount of money gambled by patrons on slot machines. The amount of money gambled in the slot machines surrounding ‘Odorant 1’ during the experimental weekend was greater than the weekends before and after. The increase appeared greater when the odorant was higher. In contrast, the amounts of money gambled in the slot machines surrounding ‘Odorant 2’ and in the control area did not change significantly.</p>	<p>The effect of ambient odour on gambling behaviour was tested in a Las Vegas casino, with 2 slot machine areas odorised with pleasant but distinct aromas. An unodorised area acted as a control for comparison purposes. The 3 areas were compared for money spent on machines – for the weekends before, during and after the odorisation.</p>	<p>Hirsch, 1995</p>
<p>Continuous staking (<i>facility for continuous placing of bets</i>)</p> <p>VLT gambling is characterised by continuous staking whereby the time between wager and payout is short. ‘This characteristic is thought to be involved in the maintenance of problem gambling behaviour.</p>		<p>Dickerson, 1990; as cited by Loba, Stewart, Klein and Blackburn, 2001</p>

Table A.1 Gaming machine features and gambling behaviour, behavioural/learning approaches (continued)

<p>Payout interval and rapid event frequency</p> <p>Griffiths found that these (UK fruit) machines features have the potential to induce excessive gambling.</p>		<p>Griffiths, 1993; as cited by Loba, Stewart, Klein and Blackburn, 2001</p>
<p>Near wins</p> <p>Near wins prolong VLT gambling sessions. When 2 winning symbols precede a losing symbol in a sequence on a VLT, gamblers will play longer than if there were no near wins at all. It was theorised that near wins act as a momentary increase in winning expectancy (hopes), which might be a key factor related to gambling duration.</p>		<p>Cote, Caron, Aubert, Desrochers & Ladouceur, 2001; as cited by Ladouceur, & Sevigny, 2002</p>
<p>Near wins</p> <p>Near wins may be encouraging signs for future success.</p>		<p>Reid, 1986: as cited by Ladouceur, & Sevigny, 2002</p>
<p>Near wins</p> <p>Near wins could produce some of the excitement of a win and therefore encourage future play.</p>		<p>Griffiths, 1999; as cited by Ladouceur, & Sevigny, 2002</p>
<p>Rapid action and stimulation</p> <p>Video Lottery Terminals “have been termed the ‘crack control of gambling’ for the very reason of their rapid action and stimulating subjective arousal.”</p>		<p>Korn and Shaffer, 1999; as cited by Blaszczynski et al, 2001</p>
<p>Colours and lights</p> <p>Primary colours and flashing lights are common features of machines, aimed to increase the impression of fun and excitement.</p>		<p>White, 1989; Caldwell, 1974; Griffiths & Swift, 1992; as cited by Blaszczynski et al, 2001</p>

Studies based on behavioural/learning theories make up one of the largest bodies of sustained experimental work in relation to the influence of the properties of gaming machines on the behaviour of gamblers. The offers and attractions of rewards can be seen as crucially important in this group of studies. Wins and near misses appear to affect both the rate of gambling and the longevity of gambling sessions. The ability to continuously stake on gaming machines encourages the flow of the gambling session. Physical features of the machines, such as lights, sounds and the rapidity of the action are also likely to maintain arousal and excitement, potentially inducing excessive gambling. There is clearly a considered body of work that places the characteristics of the key element of the EGM technical system, the machine unit itself, at the centre of questions about the nexus between EGM gambling and problem gambling. This suggests that an avenue of further enquiry for the researchers could be to seek information or data on transformations in the appearance and performance of EGMs and any perceived or documented link with changed patterns of gambling behaviour.

A.3 Need-state models and theories of addiction

Need-state models conceptualise gambling as a form of psychological or physiological dependence, with the associated assumption that people gamble to escape unpleasant feeling states such as anxiety, depression or boredom (Griffiths & Delfabbro, 2001).

Table A.2 Gaming machine features and gambling behaviour, need/state approaches

Salient dimensions of gaming machine design in the acquisition of gambling habits and gambling problems	Method	Source
<p>Narrowing of attention (dissociation)</p> <p>Pathological gamblers may experience a greater narrowing of attention than occasional gamblers when engaged in VLT play. Pathological gamblers were slower than occasional gamblers in reacting to irrelevant light stimuli while playing on a demonstration VLT. They were significantly more likely to report more symptoms of general dissociation as measured by the Dissociative Experiences Scale.</p>	<p>12 problem VLT gamblers (as identified through the South Oaks Gambling Screen) were compared to a group of 11 occasional VLT gamblers.</p>	<p>Diskin & Hodgins, 1999</p>

Diskin and Hodgins (1999) suggest that for those with gambling problems attention may become relatively intensely focused on the gaming machine. This can mean that it is more difficult for other elements of the context in which the gambling is taking place to distract the gambler from the machine.

A.4 Cognitive theories

Cognitive theories, broadly speaking, attribute excessive gambling to erroneous beliefs and thought patterns regarding the likely profitability of gambling. For example, “irrational thinking may be related to problematic gambling behaviour ... with persistent behaviour thought to be the result of people’s overconfidence in their ability to win money and associated misconceptions” (Griffiths & Delfabbro, 2001). These misconceptions are frequently said to include an overestimation of control over the gambling process and of the gambler’s own skill level. As with the psychological theories described above, Griffiths and Delfabbro (2001) argue that the evidence for this theory as a unitary explanation for the aetiology of gambling problems is inconclusive.

Table A.3 Gaming machine features and gambling behaviour, cognitive approaches

Salient dimensions of gaming machine design in the acquisition of gambling habits and gambling problems	Method	Source
Misconceptions about the games and the likelihood of winning play a major role in the acquisition and maintenance of problems.	Slot Tutorial Treatment Guide	Horbay, 2004
<p>Relationship of cognitions to machine design</p> <p>There are important differences between standards and gambling reinforcement schedules as modern poker machines enable the gambler to vary the amount wagered on each response and to bet on more than one payout line at a time [whereas the research by Dickerson et al (1992) involved earlier mechanical models]. Thus poker machine players are able to vary the potential magnitude of reinforcement, the potential amount lost and the frequency of reinforcement. As a result Walker (1992) argues that cognitive theories should be considered, eg. ‘gambler’s fallacy’ whereby gamblers believe short-run sequences reflect characteristics of long-run sequences.</p>		Walker, 1992; as cited by Delfabbro & Winefield, 1999
<p>Winning expectancies and arousal</p> <p>Regardless of the level of risk-taking, expectancy of winning is a cognitive factor influencing levels of arousal. When playing for fun, gambling becomes significantly less stimulating than when playing for money. It is probable that expectations are a predominant factor explaining the mechanism underlying the maintenance of gambling habits.</p>	34 occasional or regular VLT players were assigned randomly into 2 groups. A ‘low-expectancy’ group played for fun (expecting to win worthless credits) while the high expectancy group played for real money.	Ladouceur, Sevigny, Blaszczynski, O’Connor & Lavoie, 2003
<p>Irrational cognitions</p> <p>As previous research has suggested that irrational thinking may play a central role in the maintenance of behaviour in slot machine gambling, this study examined the validity and predictors of irrational thinking. 75% of gambling-related cognitions were found to be irrational. Irrationality was unrelated to the amount of money lost or won during sessions but was positively related to risk taking. The most common irrational cognitions included false beliefs concerning the extent to which outcomes could be controlled or predicted and the attribution of human qualities to gambling devices. Although women did not produce more irrational statements than men they were significantly more likely to personalise the machine i.e. treat it as an ‘electronic friend.’</p>	12 women and 8 men were told to play as naturally as possible in a gaming venue in South Australia and they were asked to speak aloud whatever thoughts occurred to them while gambling.	Delfabbro & Winefield, 2000 Australian, based on EGM technology

Table A.3 Gaming machine features and gambling behaviour, cognitive approaches (continued)

<p>Irrational cognitions</p> <p>Irrational thinking may be related to problematic gambling behaviour with persistent gambling thought to be the result of an overestimation of the extent to which gambling outcomes can be influenced or predicted.</p>		<p>Ladouceur & Walker, 1996; Wagenaar, 1988; Griffiths, 1994; Toneatto, Blitz-Miller, Calderwood, Dragonetti & Tsanos, 1997; as cited by Delfabbro & Winefield, 2000</p>
<p>Irrational cognitions</p> <p>When a person has been gambling for an extended period of time, he or she is no longer able to recall the original reasons for gambling. Although cognitive factors may be important in the development of gambling, such factors may become less important as the gambling habit develops.</p>		<p>Griffiths, 1994; as cited by Delfabbro & Winefield, 2000</p>

Studies of gambling and problem gambling behaviour that are based in cognitive theories focus on the relationship between gamblers understandings and expectations of gambling and their 'objective' chances. These theories posit a kind of 'gap' between gamblers cognitions and 'reality'. These theories inevitably suggest that gamblers 'misrecognise' the rules and/or chances that are embedded in the structure of gambling. The 'gap' between gamblers' cognitions and the objective structure of gambling (gambler's fallacies) may also be stimulated and reinforced by particular characteristics of the various gambling forms. In the case of EGM gambling, Walker (1992) points out that many gamblers continue to believe that each spin of the reels is not an independent event, but rather part of a sequence.

Although EGMs are random in their operation and each event is independent of all events preceding it, the gambler's fallacy remains that an internal logic to the sequence of events (bets) exists (SACES 2004b: 10). This is represented in colloquial language which may refer to gaming machines as 'hungry' (not going to pay out soon) or 'hot' (about to pay). A laymen's version of the 'law of averages' suggests that playing for longer increases the chances of a big win. Whilst the erroneous cognitions that underlie gambler's fallacies are no doubt important, the researchers consider that the consumption of gambling is also related to broader socio-cultural factors, such as pursuit of consumption in the guise of an opportunity to apparently engage in a windfall financial system analogous to that portrayed in business and other media and popular culture. The logics of 'calculated risk-taking' in an 'enterprise culture', or of having to 'be in it to win it' or 'nothing ventured, nothing gained' are colloquialisms that capture essential components of the apparently requisite value system of self-reliant individuals in contemporary capitalist societies.

Given this broader context, the most persuasive feature of gambling in relation to cognitions is likely to be the expectation of winning. 'Irrational' thinking, such as the inevitability of winning if enough time and money is 'invested,' can lead individuals to continue to gamble beyond what they can afford, in search of the win that will 'change their life'. This can have potentially harmful consequences when combined with behavioural reinforcements such as near wins, which may reinforce the thinking that a win is 'just around the corner'. The capacity of EGMs to provide relatively frequent rewards (small wins) and evidence of proximity to a big win (near misses) can thus be understood as particularly effective in relation to both learning and cognition approaches. A number of studies have combined elements of these (behavioural and cognitive) theories in experiments with gambling behaviour (Table A.4 below).

We have also noted that a number of problem gamblers interviewed for this project have reported that 'free spin' features of some EGM games is an extremely attractive element of the cycle of play. Generally, a particular combination of symbols appearing on the screen or some part of it will initiate a period during which a number of 'free spins' occur, during which prize values are often increased by as much as 100%. Players interviewed for this research have identified this as very influential in their playing behaviour, and many report that they select machines for play on the basis that this feature is provided by the selected game. Walker (2001) has also reported on this element and noted its importance to and influence on the behaviour of regular and problem gamblers

Table A.4 Gaming machine features and gambling behaviour, cognitive/behavioural approaches

Salient dimensions of gaming machine design in the acquisition of gambling habits and gambling problems	Method	Source
<p>Reinforcement schedule, small wins and beliefs about machines</p> <p>Gambling responses are sensitive to machine events. Larger wins disrupted response rates giving rise to large post-reinforcement pauses, whereas response rates were maintained by small rewards. Both post-reinforcement pauses (PRPs) and response rates independent of pauses were studied and while it was found that PRPs were positively related to the magnitude of reinforcement there was no systematic relationship between reinforcement size and running response rate. Behaviour and beliefs of regular players were more consistent than occasional players and these players tended to increase their stakes when winning and decrease them when losing. Poker machine gambling may be influenced by the beliefs which players hold about the nature of the reinforcement schedule.</p>	<p>18 regular and 21 occasional poker-machine players were observed, using a methodology that allowed simultaneous recording of machine events, behaviour and cognitions</p>	<p>Delfabbro & Winefield, 1999</p> <p>Australian, based on EGM technology</p>
<p>Near big losses and perceptions of luck</p> <p>Differences in self-perceived luck influenced future gambling behaviour. The person who nearly loses everything feels relatively lucky and subsequently loses more. Participants who experienced a near big <i>loss</i> on a wheel-of-fortune wagered significantly more on the outcome of a subsequent game of roulette than did those participants who experienced a near big <i>win</i>.</p>	<p>30 male and female undergraduates gambled on a computer that displayed a slot machine style wheel-of-fortune game which included conditions of near win and near loss.</p>	<p>Wohl & Enzle, 2003</p>
<p>Autonomic arousal and cognitions</p> <p>Autonomic arousal is associated with gambling-related stimuli, even in the absence of gambling activity. Arousal is cognitively mediated in cases of problem gambling (thus cognitions may be important in mediating arousal in cases of problem gambling). The results 'would suggest that an optimal treatment for problem gamblers must address not only the arousal component of problem gambling behaviour, but also the attributions and cognitions which gamblers make in relation to their gambling environment.'</p>	<p>38 subjects/ 3 groups: problem gamblers and high and low frequency social gamblers. All problem gamblers played exclusive on poker machines. 5 different conditions were employed in order to determine under which conditions gambling related cues were related to increased autonomic arousal as measured by skin conductance level, heart rate and frontalis electromyography. The 5 conditions were: a neutral task, a videotaped poker machine gambling scenario presented with and without distraction, a personally relevant 'win' situation and a videotaped horse race.</p>	<p>Sharpe, Tarrier, Schotte & Spence, 1995</p>

The three studies summarised in Table A.4 highlight various aspects of machine gaming that can be understood as related to both learned responses and cognitions about the nature of EGM gambling. Delfabbro and Winefield (1999) make an explicit link between 'machine events' and the response rate (rapidity) of gambling behaviour. However, they link these together both through behavioural patterns embedded in the operation of machines and through the cognitions that structure gamblers' reasoning about their gambling behaviour. Sharpe et al. (1995) further widened the behavioural component of gambling to also encompass the stimulus provided by the gambling environment, not just by the gaming machine itself. This would suggest that modifications and transformations in the layout and presentation of EGM venues should not be discounted in terms of its affect on patterns of gambling behaviour and potentially the development of gambling problems.

The studies reviewed support the view that the distinctive properties of machine-based gambling may embody certain characteristics that make this form of gambling a special case in relation to problem gambling. This body of research, predominantly utilising learning and cognitive theories, suggests that the facility of machines for intermittent reinforcement, rapid play, constant reward (however conceptualised), various cognitive illusions, excitement and arousal through sensory stimulation, and the narrowing of psychological attention may be crucial factors in understanding any nexus between gaming machines and problem gambling. These factors appear to be relevant even when broader social and cultural factors are also seen to be of crucial importance.

A.5 Aspects of EGM design and gambling behaviour

There are a smaller number of studies that place the characteristics of gaming machine technology at the centre of analysis of machine gamblers' behaviour. These studies are diverse in rationale and intention, but what they have in common is a focus on gaming machines as key to the acquisition or production of particular patterns of gambling behaviour, including the potential for such patterns to be problematic or harmful. A summary of these studies is provided in Table 5.5, below.

Table A.5 Gaming machine features and gambling behaviour, selected other studies

Salient dimensions of gaming machine design in the acquisition of gambling habits and gambling problems	Method	Source
<p>A range of characteristics (as applied to gambling in general)</p> <ul style="list-style-type: none"> • Event frequency (time gap between each bet) • Stake size (including issues around affordability, perceived value for money) • Amount of money lost in a given time period (important to chasing) • Prize structures (number and value of prizes) • Probability of winning • Size of jackpot • Skill and pseudo skill elements • ‘Near miss’ opportunities • Light and colour effects (eg red) • Sound effects • Accessibility (opening times, membership rules, number of outlets, location of venue) • Type of gambling • Advertising • Rules of the game • In general, structural characteristics that promote interactivity and to some extent define alternative realities and allow feelings of anonymity. • Social or asocial nature of the game.. ‘One of the major influences of technology appears to be the shift from social to asocial forms of gambling. From this it could be speculated that as gambling becomes more technological, gambling problems will increase due to its asocial nature’ (273). ‘...technology is essentially turning gambling from a social pastime to an asocial one’ (279). • Situational characteristics impact most on acquisition and structural characteristics impact most on development and maintenance most important accessibility and event frequency (280). • Theories about why people gamble need to take account of the needs and motivations of the gambler and their interaction with environmental stimuli. 	<p>Critical review</p>	<p>Griffiths, 1999b</p> <p>UK, based on fruit machine technology.</p>
<p>Colours</p> <p>It was noted that black, red and purple are the most common colour scheme in arcades. Novice gamblers placed more bets and lost more money with red lighting in the venue as compared .to blue lighting.</p>	<p>Research as part of proposed harm minimisation measures in NSW. See section 5.5.</p>	<p>Popkin, 1994; Stark, Saunders & Woo key, 1982, cited by Blaszczynski et al 2001</p>

Table A.5 Gaming machine features and gambling behaviour, selected other studies (continued)

<p>‘Addiction’ to gaming machines results from an integrated mix of situational and structural characteristics of machines, biological, psychosocial or genetic predispositions and the interaction between the player and machine</p> <p>Characteristics of EGMs which contribute to problematic gambling include:</p> <ul style="list-style-type: none"> • Hidden odds whereby people often have no idea about their chance of winning a large prize. • The mapping or weighting of the virtual reel to the physical reel (for slot line games) means that the visual reel that the player interacts with gives a false impression about the true odds making wins seem more plausible than they are. • Apparently low stakes of each bet. • Prize structure – small & medium prizes help establish and maintain the behaviour through positive reinforcement. Also the possibility of a larger win sets up the expectation of a big pay-off and encouraging hope, despite substantial losses. 	<p>Discussion of the role of knowledge & information: how machines work; common myths; various machine features and the relationship of features to addictiveness potential.</p>	<p>Turner & Horbay, 2004</p> <p>Canadian, based on VLT technology.</p>
<p>Machine structural characteristics</p> <p>The authors describe the importance of a number of machine characteristics:</p> <ul style="list-style-type: none"> • Development of ‘features’ & their relation to types of win, bettor involvement, skill & choice. ‘Winning through features’ refers to winning money via the machine’s play rather than simple reel order. • Near miss (& its changing role with new technology, including increased use of ‘features’, ‘repeat chances’ & ‘credit teasing’) <i>‘The gaming industry appears to have adapted and strengthened the near miss by connecting it to the ‘feature’ play (rather than ‘reel order’)</i>. • Payout interval/event frequency • Familiarity characteristics (naming, appeal and persuasion – such as when a popular show like The Simpson’s is used) • Sound effects (music and verbal interaction) • Light & colour effects (suggestion that people may gamble more under red lighting and with red decor) • Features that facilitate the suspension of judgement such as in the use of tokens rather than real money. • Features that stimulate the illusion of control through personal involvement, perception of skill and familiarity with a particular machine. • Win probability 	<p>Analytical piece including literature review and findings from research. The review changes in structural characteristics of the UK fruit machine over the last decade.</p>	<p>Parke & Griffiths, 2004</p> <p>UK, based on fruit machine technology.</p>
<p>Novelty</p> <p>“It is a well known phenomenon that players enjoy new machines, presumably because they offer novel visual and sound effects that increase the enjoyment of the machines and presumably result in increased profits”</p>	<p>Research as part of proposed harm minimisation measures in NSW. See section 5.5.</p>	<p>Blaszczynski, Sharpe & Walker, 2001</p> <p>Australian, based on EGM technology</p>

Table A.5 Gaming machine features and gambling behaviour, selected other studies (continued)

<p>The psychology of familiarity</p> <p>Other innovations in fruit machine design tap into the psychology of familiarity. Three areas that appear to have relevance are familiarity and its relationship to naming, appeal, and persuasion. When tied in with more recent research on the psychology of familiarity, the names of machines do seem to be critically important – particularly in terms of gambling acquisition. It is now quite often the case that fruit machines are named after a person, place, event, television show or film. Not only is this something that is familiar to the fruit machine player but may also be something that the potential players might like or affiliate themselves with.</p>	<p>Analytical review</p>	<p>Parke & Griffiths, 2004</p> <p>UK, based on fruit machine technology but with wider applicability.</p>
<p>Various: commercial modification of gambling behaviour</p> <p><i>Machine interactions</i></p> <ul style="list-style-type: none"> • Flash up signs ‘you’re too good for me’, ‘you’re a legend’ • Make pay out intervals shorter • Increase ‘multiplier potential’ • Increase ‘near misses’ (Frustration Theory) – failing to fulfil a goal produces frustration which energises behaviour, therefore provides a role for staff to be verbally encouraging and the opportunity to provide more incentives to stay • Skill level encourages player to be more active in the game thereby focusing on the relationship between the machine and the player. The individual believes they are skilful even though the machine is stimulating the illusion of control through the players personal involvement. Perception of skill is linked to familiarity with the machine. <p><i>Light & sound</i></p> <ul style="list-style-type: none"> • Research indicates red lights in the venues had a less inhibitory effect than blue lights • UK arcade interiors are usually decorated in the red end of the colour spectrum, lighting is dim to increase the focus on the flashing lights of the machine. Even when not many people are present in the venue this lighting gives the effect of a party atmosphere with lots of noise and flashing lights. UK research found that dim lighting increased verbal latency and reduced eye contact which led to more gambling and less social interaction • Dark background, no natural light (windows to have dark drapes), dim lights, rooms to be warm and cosy, ‘Muzak’ style music that does not provide any competition to gambling. <p><i>Venue layout</i></p> <ul style="list-style-type: none"> • Position ATM and smoking facility within view of poker machines • Replicate surroundings of gaming room in smoking facility • Consider provision of facilities in smoking room (for example, TAB, Sky Channel, Keno, Chocolate Wheels, raffles, large TV screen, comfortable seating) 	<p>A summary of much of the literature, but oriented to pragmatic solutions to a particular commercial problem: How to encourage people who are smokers to continue gambling in non-smoking environments?</p>	<p>Barrington Centre Pty Ltd, 2002</p> <p>Australian, proposals for Victorian EGM market, based on Australian and UK research.</p>

Table A.5 Gaming machine features and gambling behaviour, selected other studies (continued)

<p>Computerization</p> <p>The involvement of gamblers with computerized technology was found to influence the rate of onset of problem gambling behaviour. Gambling on video slots or video poker associated with a significantly faster rate of onset of problem gambling behaviour for both men and women.</p> <p>Characteristics of computerised gambling said to influence the rate of onset of problem gambling:</p> <ul style="list-style-type: none"> • Rapidity of play • Continuity of play • Repetitiveness of play 	<p>Three sources of data studied for a sample of 180 gamblers seeking treatment for a variety of gambling problems.</p>	<p>Breen, 2004</p> <p>USA, based on slot technology</p>
<p>Machine parameter modifications</p> <p>A series of six machines were used which varied in play-speed, illumination levels, sound, form of outcomes and the availability of betting lines and other game features. Variation in such parameters varies factors such as reinforcement schedules etc. Player preferences were found to be most strongly influenced by play-speed, number of lines available and sound. Players preferred gambling on machines that were faster, provided more betting lines and sound. Little evidence that modification to machine ‘aesthetic characteristics’ changes player interest with the exception of sound. Frequency & magnitude of reinforcement both important but frequency more so.</p> <p>EGM gambling behaviour is argued to be closely related to a random ratio schedule of reinforcement, known to be capable of maintaining very rapid response rates and behaviour highly resistant to extinction. “This schedule is thought to explain why gamblers lose money so quickly, as well as persist even after having sustained prolonged periods without reward” (2005, 8). Changing the schedule of rewards should influence behaviour (speed, duration, resistance to extinction or all three), “it is very possible that by varying machine characteristic it may be possible to influence behaviour and therefore expenditure” (2005, 8). “There may be ‘optimal’ or threshold schedule parameters that can be used to identify the points where gaming machine schedules are no longer able to maintain player interest and behaviours, and these may differ between problem and non-regular gamblers” (2005, 22).</p> <p>“[P]layer behaviour and preferences were consistently related to factors influencing the rate and frequency of reinforcement...effects are in the same direction as those observed in Blaszczynski et al.’s (2001) field studies” (2005, 20). Future research recommendation: gradual variation of parameters during play with dependent variable being the decision-point for moving to another machine.</p>	<p>Laboratory study of behavioural and subjective effects on the gambling preferences of regular EGM gamblers, of various machine parameter modifications.</p>	<p>Delfabbro, Falzon & Ingram, 2005</p> <p>Australia, based on EGM technology</p>

The studies summarised in Table A.5, above, place aspects of gaming machine design at the centre of understandings of patterns of gambling behaviour. They are based on a variety of forms of gaming machine technology, including fruit machines (UK), VLTs (Canada), slots (US) and EGMs (Australia). Many of the aspects of machines discussed can be considered 'generic' to all gaming machines, for example naming, lighting and sound. However, none of the research reviewed to date provides critical comparison of the various forms of gaming machines. In particular, differences and commonalities in the actual game features of various forms of gaming machines remain undocumented and unexamined in the literature. As a consequence there appears to be, as yet, no systematic consideration of the role of different features and formats of the games themselves in the production of patterns of consumption of EGM gambling, and their potential relationship to harmful gambling behaviour.

A range of characteristics of gaming machines is cited in the literature reviewed as contributing to the nexus between gaming machine technology (and its context) and gambling behaviour. It is interesting to note the interpretations of the literature made in the interests of solving a 'commercial' problem (Barrington Centre 2002). Manipulation of machines and their contexts, in the interests of modifying the gambling behaviour of a particular group (smokers) in the context of a ban on smoking in EGM gambling areas, is described as a coordinated and holistic strategy. Such a strategy involves the technical system (machine performance, lighting, venue modifications), service factors (staff encouragement of wins, awareness of body language alerting need for refreshments), incentives and promotions, and other factors (Barrington Centre 2002). As an intentionally commercial strategy, which is designed to encourage unbroken or continuous gambling (Barrington Centre 2002), it incorporates a variety of the psychological triggers and social and contextual elements that are discussed and described in the research literature. This would add support to Griffiths (2001) claim that no single theoretical perspective within the literature on gambling and problem gambling should be seen as sufficient to provide a 'unitary' explanation for either patterns of gambling behaviour or the tendency for some gamblers to experience harm from gambling.

A.6 Gaming machine technology and harm minimisation

One of the key objectives of the project, as described in research tasks specified by the GRP, is to consider current developments related to the nexus between EGM technology, public policy initiatives and problem gambling. This section reviews recent initiatives in this respect.

A.6.1 New South Wales

At the request of the Minister for Gaming and Racing for New South Wales, the Independent Pricing and Regulatory Tribunal (IPART) has been conducting a review of harm minimisation measures in that state since 29 July 2003. The Terms of Reference for this review were determined in part by the Liquor Administration Board (LAB) review of gaming machines and related technical equipment (LAB 2001).⁴⁷ As part of this review the LAB considered a range of harm minimisation measures, a number of which are technologically based. These are contained in the LAB's as yet unimplemented *First Determination* (2001).⁴⁸ Three technical harm minimisation items identified in the *First Determination* were the subject of research, but were not implemented until the gaming industry had time to conduct its own research (LAB 2003, 24). The Gaming Industry Operators Group (GIOG) NSW was subsequently formed and commissioned this research (LAB 2003, 25).

⁴⁷ The LAB is the licensing authority for gaming machines in NSW clubs and hotels.

⁴⁸ Available from http://www.dgr.nsw.gov.au/HTML/LAB/technical_standards_2.html

IPART (2003: 6), in turn, divided the prospective harm minimisation measures, some of which are currently in place in NSW, into six groups:⁴⁹

- circuit-breakers;
- information for gamblers;
- liquidity controls;
- restricted promotion of gambling;
- community/counselling services; and
- technical measures.

Measures that are, at least in part, technologically based can be found across most of these categories. For example, the shutting down of machines is a ‘circuit-breaker’ and the elimination of ‘double up’ game features is grouped under ‘restricted promotion of gambling’. The measures classified together as specifically ‘technical’ (IPART 2003: 6) included:

- slower reel speeds;
- removal of visual and sound stimuli;
- requirement for human intervention in large payouts; (Current)
- requirement for natural light in gambling venues;
- requirement for gambling patrons to be visible to people outside the gambling venue; and
- the impact of music being played and display of lights when a win takes place.

As part of the IPART review, submissions on the efficacy of harm minimisation measures were called for and additional comments were invited on a range of research commissioned by the Casino Community Benefit Fund.⁵⁰ A further key study into the efficacy of technically based harm minimisation measures was prepared by the University of Sydney Gambling Research Unit (USGRU) for the GIOG. This study (Blaszczynski, Sharpe & Walker 2001) and evaluated the efficacy of three such technical measures – reduced maximum bet, reconfigured note acceptors, and modified reel spin – and became a central document in the IPART review process. An associated assessment of the potential revenue impacts of these technical modifications was also produced (CIE 2002), foreshadowing a possible loss of revenue of 20% in clubs and up to 40% in hotels in NSW if all three measures were put in place together (CIE 2002: x-xii). This would tend to support the researchers’ contention (see Section 2) that the disproportionate consumption of EGM gambling by ‘problem gamblers’ means effective harm minimisation measures would likely have a relatively dramatic impact on EGM revenues. The IPART review process was due to report in May 2004, but had not done so at the time that this Discussion Paper was in preparation. Key studies related to the nexus between gaming machine technology, harm minimisation and public policy processes in NSW, and elsewhere, are summarised in Table A.6, below.

⁴⁹ See <http://www.ipart.nsw.gov.au/pdf/DP67.pdf> for full listing and groupings.

⁵⁰ See http://www.ipart.nsw.gov.au/papers/call_comments_gaming2003.pdf for the list of research. The research can be accessed at <http://www.dgr.nsw.gov.au>

Table A.6 Gaming machine features and gambling behaviour, harm minimisation measures

Salient dimensions of gaming machine design in the acquisition of gambling habits and gambling problems	Method	Source
<p>Modification of technical parameters of machines</p> <p>The use of bill acceptors did not appear to be reliably associated with problem gambling status, severity of problem gambling, amount of money lost or persistence of play.</p> <p>Reduction in reel spin would be unlikely to reduce problems with EGM gambling and could lead to an increase in indirect social/family harm for a small proportion of problem gamblers.</p> <p>Reducing the maximum bet size from \$10 to \$1 led to players gambling for shorter periods, making fewer bets and losing less money. It was considered reasonable to assume that problem gamblers were affected more than recreational gamblers.</p>	<p>Three conditions were tested for among recruits in a field study in participating clubs and hotels:</p> <ul style="list-style-type: none"> - reconfiguring bill acceptors so that they do not accept \$100 or \$50 bills; - slowing reel spin speed; and - reducing the maximum bet from \$10 to \$1. <p>The three measures subjected to study were part of a set of gaming machine operating parameters being considered by the Liquor Administration Board as the administrative body for approving gaming machines in NSW.</p>	<p>Blasczynski, Sharpe & Walker, 2001</p> <p>Australian, based on EGM technology</p>
<p>Harm minimisation messages</p> <p>Three messages were evaluated as the most effective:</p> <ul style="list-style-type: none"> • Have you spent more on gambling than you intended? • Are you gambling longer than planned? • Have you felt bad or guilty about your gambling? 	<p>Qualitative study in which respondents trialled EGMs with ten harm minimisation messages running consecutively on one machine and randomly on another. Respondents answered a questionnaire and participated in a focus group followed this.</p>	<p>Consumer Contact, 2003</p> <p>Australian, based on EGM technology</p>
<p>Modification of technical parameters of machines</p> <p>Findings on recommendations of Blasczynski et al (2001):</p> <ul style="list-style-type: none"> - reconfiguration of bill acceptors a potentially effective harm minimisation only when implemented with other strategies, eg. in relation to proximity of ATMs; - reel spin modification does not appear, at this stage, to be an effective harm minimisation strategy; and - reduction in maximum bet size shows strong potential as a machine-based harm minimisation measure. 	<p>Review of Blasczynski, Sharpe & Walker (2001) and CIE (2001) for NSW Department of Gaming and Racing.</p> <p>Raised questions about the reliability of results from a field study where ‘naturalness’ of setting is disrupted by presence of researchers.</p>	<p>Centre for Gambling Studies, University of Auckland (Tse, Brown & Adams), 2003</p>

Table A.6 Gaming machine features and gambling behaviour, harm minimisation measures (continued)

<p>Responsible gambling features</p> <p>On average, the percent of times players reported losing track of time and money, or playing beyond desired time limits declined for all players, but most strongly among those taking up regular play on the new terminals (Adopters); Adopters experienced a significant decline in the average percent of time they reported spending more money than they wanted; There was a significant decline in session length associated with play on the new terminals over the course of the study.</p> <p>Despite a reduction in the amount of time spent playing on the new terminals, there were no significant changes in the average amount of money spent each time played, within any of the player groups or at a total level.</p> <p>On a machine basis there was an increase in the rate of expenditure and, consequently, an overall increase in revenue associated with the introduction of new machines might be expected.</p> <p>The new terminals tended to attract those players who were already more involved in VLT play prior to the introduction of the new machines, but were equally likely to be adopted by players at Low, Moderate or High risk for problem gambling. Only those at no risk were less likely to have taken up play on the new machine. It may be that simply introducing new terminals will attract those who are most likely to derive benefits from any measures intended to assist players in managing their gambling.</p> <p>Exposure to the 60-minute pop-up reminder was associated with a small yet significant reduction in session length and a decrease in expenditure among higher risk players.</p> <p>Use of the on-screen clock was associated with improvements in keeping track of time and playing within desired time limits, although (as yet) it had no measurable effect in reducing session length or expenditure.</p> <p>There are other play behaviours and machine characteristics that had a significant effect for changes in session length and expenditure on the new terminals and in some cases influence or override the effectiveness of the features.</p>	<p>In 2000, the Nova Scotia Gaming Corporation announced that it would be replacing 3,200 VLTs with new or modified machines with ‘responsible gambling features’ designed to discourage excessive play. Introduction of these machines began in 2001. The changes introduced to the machines included new games and improved graphics, the addition of a bill acceptor and four features to support players in managing the amount of time and money spent.</p> <p>Specifically the features comprised of:</p> <ul style="list-style-type: none"> - a permanent on-screen clock denoting the time of day; - a display of betting activity in cash amounts rather than credits; - pop up reminders of time spent playing after 60, 90 and 120 minutes of continuous play; and - a five minute cash out warning at 145 minutes of continuous play and mandatory cash out at 150 minutes. <p>A questionnaire and 3 follow-up surveys were conducted with gamblers recruited in gambling venues. The quantitative study was preceded by qualitative focus groups, interviews and observation of VLT gambling with RGFs in place.</p>	<p>Schellinck & Schrans, 2002</p> <p>Canadian, based on VLT technology</p>
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Table A.6 Gaming machine features and gambling behaviour, harm minimisation measures (continued)

<p>Responsible gambling features</p> <p>Varied the parameters of a spinning reels and a video poker game:</p> <ul style="list-style-type: none"> • Speed of play • Sounds • Display running counter • Disabled touch screen <p>Slower speeds and muting sound decreased enjoyment levels, and ‘pathological’ gamblers found it easier to stop gambling with the running counter in view.</p>	<p>See Table 5.1 for details</p>	<p>Loba, Stewart, Klein & Blackburn, 2001</p> <p>Canada, based on VLT technology</p>
<p>Pre-determination counteracting effects of ‘impaired control’</p> <p>To prevent gamblers who have regular EGM gambling involvement being vulnerable to the effects of impaired control a set of technical measures may be available to enable the pre-determination of the scale of gambling activity, to enhance the effectiveness strategies used by ‘in control’ gamblers such as setting strict time limits, setting strict monetary limits or avoiding venues. Pre-determined gambling parameters might be carried on a identity card readable at the central gaming network server level through card readers at the venue level.</p> <p>“In the context of the current trend toward cashless gambling/gaming there is now both the knowledge base and the technology to enable governments to develop a consumer protection environment that balances the individual freedom of the player with the opportunity for the community to prevent problem gambling and underage gambling ‘at a stroke’...(could be applied to all new gambling products as they emerge) and could be fully automated and web based (2003: 25).</p>	<p>A broad study involving using quantitative and qualitative methods into the psychological factors involved in the “impaired control” that places gamblers at risk of becoming problem gamblers. Gamblers who have regular and sustained EGM gambling sessions, find this emotionally stimulating and/or a distraction from life pressures are liable at some time liable to suffer impaired control over the parameters of their gambling activity (time or money in particular).</p>	<p>Dickerson, Haw & Shepherd, 2003</p> <p>Australia, based on EGM technology</p>
<p>Awareness and perceptions of effectiveness of responsible gambling measures</p> <p>Specific measures evaluated include: signage and information; gambling environment (clocks, lighting etc.); restriction of access to cash; self-exclusion; responsible advertising and promotion. Approximately two-fifths of respondents had changed their gambling behaviour in some way due to responsible gambling measures. Specific measures and different population segments results are clearly tabulated and discussed. Almost one-fifth of respondents scored as ‘problem gamblers’.</p>	<p>A mail survey (n=706) and an in-venue survey (n=248) were conducted with NSW Club patrons looking at: EGM gambling participation; awareness of, and opinions of adequacy and effectiveness of, Club responsible gambling measures; screening for problem gambling using VGS screen.</p>	<p>Hing, 2003</p> <p>Australia, based on EGM technology</p>

Harm minimisation measures in NSW that are already in place are shown in Table A.7 below.

Table A.7 NSW harm minimisation measures in relation to EGM gambling

Type	Harm minimisation measure
Circuit-breakers	Compulsory shut-down of gambling venues
Information for gamblers	Requirements to display certain signage Display of clocks in gaming machine areas Information on brochures required in gambling venues Information on betting tickets, lottery and keno entry forms Role of community services, including gambling counselling services General advertisements highlighting problem gambling
Liquidity controls	Requirement for large payouts not to be in cash Prohibition on providing credit for gambling Requirements to locate ATMs away from gambling areas
Restricted promotion of gambling	Controls on advertising Controls over player reward schemes Restrictions on promotions and other inducements to gamble
Community/counselling services	Requirement for gambling operators to enter into agreement with counselling services Training of staff in gaming machine venues
Technical measures	Requirement for human intervention in large payouts

Source: IPART 2003: 6.

Only one harm minimisation measure classified by IPART as a ‘technical measure’ is currently operative in NSW. However, several other measures listed in Table A.7, above, appear to be of direct relevance to the idea of the EGM technical system. In particular, the compulsory shut-down of venue restricts access to the EGM system, whilst provision of information, signage and clocks in gaming venues modifies the context of gambling activity. In addition, controls on advertising and player reward schemes potentially modify gamblers’ perceptions and expectations of participating in the EGM system.

Another paper emerging from the NSW process examining the nexus between EGM technology, harm minimisation measures and public policy is Dickerson et al. (2003) who suggest the exploitation of technical capabilities to allow gamblers to ‘pre-determine’ the extent of their gambling activity (see PC 1999: 16.71 for a discussion of pre-determination). Parameters delimiting spending, and duration and location of gambling activity could be carried on an electronic card able to be read at the EGM network server level. This would set limits on gambling when an individual ‘logged on’ to gamble. This could prevent gamblers becoming at-risk where control became impaired due to gambling for too long, for example. It would appear that for this to be effective gaming machines would have to be modified with smart-card readers, and all gamblers would require such a card to gain access to and continue to play any EGM linked to the network. EGMs would also have to be cashless (i.e., the smart card would be loaded with credits) or the EGM would be inoperable without a smart card in place, so that no credits could be purchased or games conducted unless that condition was met.

Privacy concerns and the potential for gamblers to utilise a number of card ‘identities’ (and the potential trade in cards) appear to require careful consideration. It is also important to carefully consider the regulatory environment within which any such smart-card system might

operate. For example, in the Victorian context the operators could introduce a network wide smart-card system which provided them with very good quality data about the demographic and gaming characteristics of their customers, providing an excellent marketing tool which may to some degree confound the perceived harm-minimisation characteristics of the intervention. Alternatively, a third party might be contracted by the regulator to manage the smart-card system, and privacy concerns might be addressed by avoiding any electronic linkage between the data contained on the card and the identity of the card holder. Further, if the system were to avoid generating a wholesale 'trade', the integrity of the system would have to be high (i.e., of the same standard of that pertaining to driver licences) thus incurring not inconsiderable costs.

However, integrating gambling consumption more fully into a system of checks and balances common to everyday electronically-based commercial transactions, such as those that accompany credit card use, would appear to provide a framework for some potential solutions to these problems. Support for the technical feasibility of such a system at the machine level has been voiced by at least one major gaming machine manufacturer (Aristocrat 2003).

A study by the Centre for Gambling Education and Research (CGER) examined gamblers' attitude towards cashless gaming technologies in NSW (Nisbet 2004), estimating the number of cashless gaming machines operating in NSW to be 695 (0.7% of the EGMs in the state), all of which are situated in four venues (Nisbet 2004: 3).⁵¹ The study asked respondents about a number of aspects of the card-based cashless gaming system including its usefulness in aiding spending management, and the availability of a player activity statement (PAS), detailing gambling transactions.⁵² Nisbet found that "consumers do not believe that card based technologies would help them manage their spending", but that they "believe that the player activity statement is a useful feature" (2004: 18). Nisbet (2004: 18) concludes that there "is no evidence to suggest that a voluntary, card based gambling scheme offers any significant protection to gambling consumers relative to that offered by other responsible gambling measures".

The strength of Nisbet's conclusion may be qualified somewhat, however, by the ambivalence of the study's findings. It is not difficult to imagine that should the PAS prove to be a 'useful feature' then its usefulness may well be in the area of managing expenditure. Further, 70.5% of respondents to the study had never used a cashless card, with Nisbet's analysis showing a "significant correlation" between those who have used or continue to use a cashless gaming card and those who *do* believe the card helps expenditure management (Nisbet 2004: 13). This ambiguity in understanding the potential and actual adoption of technology may present a significant domain of risk in this area. In preliminary venue consultations undertaken by the researchers in Victoria, concerns have been voiced about the practicality of card technologies. For example, in one small club gaming venue with a relatively aged member/client base, management considered the introduction of cashless cards would definitely require significant adjustments on the part of gamblers and a level of assistance from venue staff. At the same time, members of this club had successfully adapted to a card-reader system for club entry and access to member benefits in recent times, following considerable effort in training and assistance from club staff. Distinguishing perceptions about, and actual experiences of,

⁵¹ "Approximately 20 venues in NSW are approved to operate cashless card based systems...the number of additional machines for which card based functionality is planned...is estimated at 3000" (Nisbet 2004: 3 fn 1).

⁵² Under the NSW *Gaming Machine Regulations* 2002 all EGM card and account holders may request monthly player activity statements and/or transaction records (Nisbet 2004: 4).

technologically-based harm minimisation measures thus appears to require careful consideration by interested parties and policy-makers alike.

The *Final Report* (2004) of the IPART inquiry made 108 recommendations designed to foster a 'responsible gambling culture' in NSW, 45 of which related to "measures to protect gamblers" (2004: 164). Many of these recommendations were not advocating new protective measures, however, but rather the retention of current measures or the further investigation or rejection of new or further restrictions. Key technical measures that were recommended for introduction were the inclusion of permanent on-screen clocks on all gaming machines (2004: 55-6), and the use of 'pop-up' messages on EGM screens warning gamblers they had been gambling continuously for 60 minutes (2004: 58-60). The technical implementation of clocks appears relatively straightforward if incorporated into all EGMs approved in the future. However, the definition of what constitutes a 'continuous' gambling session that would trigger a pop-up warning message appears a little more complex in execution.

The IPART report took the view that more sustained and systematic research was required in relation to slowing reel spin speeds, modifying bank note acceptor or lowering the maximum bet. There is currently no restriction on reel spin speed in the NSW appendix to the National Standard, although the LAB *First Determination* (2003) had recommended a 3.5 second spin and 1.5 second idle as a reasonable standard. In the USGRU research on reel spin a fast reel spin was set at 3.5 seconds and a slow reel spin was 5 seconds (Blaszczynski, Sharpe & Walker 2001). Whilst noting that slowing reel spin speeds may help a small proportion of problem gamblers, IPART recommended that in the absence of "clear evidence" reel spins should not be slowed "at least in the short to medium term" (2004: 114).

Similarly, IPART did not recommend lowering the level of maximum bets primarily because there is no evidence available as to what the optimum level maximum bets should be fixed at in the interests of both problem gamblers and industry stakeholders (IPART 2004: 88-93). Instead it was recommended that research be undertaken to ascertain the optimal bet level for *stand-alone* gaming machines, taking into account the impact of a range of possible maximum on "problem and 'at risk' gamblers", recreational gambling, the "economics of the gaming industry" and "unintended consequences" (2004: 93).

In relation to the modification of banknote acceptors, this measure fell into the category of those IPART proposed should be 'prioritised for evaluation', along with 'pre-commitment mechanisms, and cash limits for ATMs in gaming venues (2004: 98-104). IPART took the view that restrictions on note acceptors, the placement of ATMs and limits on ATMs need to be considered as a suite of harm minimisation measures. A key recommendation is that "linked research" should be conducted on these three "liquidity controls" (2004: 171). Other measures considered that were not recommended for restriction included: limits on EGM sound features; maximum wins on stand alone machines; the number of double-ups, further restrictions on EGM artwork, enforced payout levels, natural light in gaming areas, and gamblers being visible to those outside gaming areas; and the maximum number of carded games per reel (IPART 2004: 107-120).

A.6.2 Nova Scotia

Nova Scotia remains the only jurisdiction in the world that has embarked on a systematic process to develop and test responsible gaming features on EGMs, or VLTs as they are called in Canada. After research in 1998 showed that more than half of the revenue from VLTs was derived from problem gamblers, the Nova Scotia Government owned agency, the Nova Scotia Gaming Corporation (NSGC) announced the retirement of the current VLT machines and their replacement with VLTs designed to appeal more to the social gambler and less to the problem gambler, via the provision of responsible gaming features. In December 2000, NSGC announced a three phase plan over two years to replace the 3200 existing VLTs with the new or modified machines.

The new machines would have features designed to make the machine more entertaining such as improved graphics, an ability to set the speed of the games, and a greater selection of new games. As well, the machines incorporated a bank note acceptor (BNA). The new games still provided a 95% payout, and a maximum prize in the \$500 range, and the maximum bet is \$2.50 per spin. The new VLTs also had four new responsible gaming features: A permanent on-screen clock displaying time-of-day; the display of betting activity in cash amounts versus credits; pop-up reminders of time spent playing after 60, 90 and 120 minutes of continuous play; a 5 minute warning at 145 minutes of continuous play and mandatory cash out at 150 minutes.

These RGFs were designed to provide reality checks, interruptions or breaks in play, and to alert players to the amount of time and money being spent during a specific play session. As part of the plan, the effectiveness of the RGFs were assessed in the field. Specifically the research was designed to assess awareness of and exposure to the features, determine the effect of the RGFs on player behaviours, perceptions and attitudes, and identify improvements to enhance the effectiveness of the features in mitigating excessive play. The phased approach adopted allowed the NSGC to evaluate the RGFs and then modify these features or add others in the machines to be rolled out in the two remaining phases.

There were some weaknesses in the first phase RGF study as new terminals began to be placed in venues during the pre-measures survey, which meant that some respondents had already tried the new machines prior to completing the survey. Also, the new machines had been updated in terms of “entertainment value” as well as having BNAs and being designed to play faster, all of which would be expected to influence the two primary effects being measured, length of play and expenditure per session.

The study, described in Table 5.6, found that there was strong anecdotal support for the clock and the cash display helping gamblers, though because of their nature it was difficult to isolate any impact using statistical analysis. Analysis found the 60 minute pop-up reduced both expenditure and session length, though the effect was not strong.

Based on these results the NSGC made several changes to the specifications of the phase two VLTs. One completely new RGF was added, and four of the original RGFs were modified. The new RGF allowed the gambler the option to set 15, 30, 45, or 60 minute time limits for play. At the end of the specified period the gambler could pay attention to the message by stopping play, or could chose to continue. The pop-up features were modified by adding a 30-minute pop-up message which meant that a message popped up after 30 minutes of continuous play. The permanent on-screen clock was modified to make the time of day more prominent. All wagers and references were displayed in cash amounts. Finally, the time between the warning message and the mandatory cashout was extended from 5 to 10 minutes.

A second study was undertaken in June 2004 with the machines introduced into a test market. A control market was also used to help isolate the possible effects of the new RGFs. This time no new games or other modifications were made to the test machines during the study. A before and after survey examining behaviours and attitudes was conducted to measure the effects. The results of the study will be released October 4, 2004.

These studies show that some of the RGFs do have some impact and that they probably contribute to harm minimization. However, their effects are not particularly strong, for example when compared to a ban on smoking. More radical modifications to the way the games are played will almost certainly be required before there is a substantial effect on problem gambling using RGF based approaches.

A number of comments were directed to the Nova Scotia RGF evaluation (which is reported in Schellinck & Schrans, 2002) by Blaszczyński *et al* in an IPART submission, and by the Centre for Gambling Studies, University of Auckland (2003). The comments of Blaszczyński *et al* are focused on methodological issues, in particular the reliance on repeated telephone interviews of gamblers to seek a self-assessment of player behaviour in relation to the use of machines with RGFs. This was at odds with the comments of the University of Auckland team who assessed the Schellinck & Schrans approach as “promising” as it seeks to provide an assessment of modifications to EGMs (or similar) in naturalistic settings (Centre for Gambling Studies, University of Auckland, 2003, p.14). This almost directly contradicts the comments of Blaszczyński *et al* who argue that “By comparison, the Sydney University research and the Quebec research measured actual machine play” (p.20), although it is understood that these studies were undertaken in an environment where play was observed and thus may have been subject to modification by reason of that observation.

A.6.3 Victoria

The nexus between EGM technology, harm minimisation measures and public policy has undergone recent modification in Victoria. These modifications are carried in changes to gambling legislation and technical standards. The Ministerial Directions that took effect on 1 January 2003 pursuant to the *Gaming Machine Control Act 1991* (GMCA) directed the VCGA that EGMs in Victoria can only be played in an ‘unrestricted’ mode if located within an approved gaming ‘area’ within a gaming venue, and if accessed via card or PIN number technology. This technology requires gamblers to pre-determine limits on time spent and net monetary loss, prior to gambling (paragraph (i)). This direction sets the stage for the kind of use of technology as a ‘tool’ to minimise harm from gambling as recommended by Dickerson (2003).

The effect of the Ministerial Directions on approved gaming areas and on access to EGMs played in ‘unrestricted’ mode is to create two tiers of EGM participation. In effect, the Directions provide a kind of trade-off whereby restrictions on access incorporating technologically-based harm minimisation measures access to gaming machines operating at virtually ‘full capacity’. EGM gambling in ‘specified areas’ will be potentially faster, more continuous and involve larger outlays and more rapid expenditure. Characteristics of the new tier of EGM participation to be conducted within ‘specified areas’ are summarised in Table A.8 below.

Table A.8 EGM gambling in Victoria, criteria for approved ‘gaming areas’ within gaming venues

Criteria	Specification
Location	Must not be: Outside Melbourne Statistical Division; or In a region determined pursuant to 12AA of the GMCA
Proportion of venue EGMs	Must not exceed 20% of venue total
Gaming Operator limits	Must not exceed 1000 in all areas Maximum 50% in hotels Maximum 50% in clubs
Casino limit	Must not exceed 1000 in all areas
EGM parameters/limits	Unrestricted
EGM access	Card, personal identification number (PIN) or similar technology Gambler sets of pre-determined limits on time spent and net monetary loss

Source: Victoria Government Gazette, S. 168, 19 September 2002 (Ministerial Directions)

The only 'specified area' currently operating in Victoria is within the Crown Casino. The implementation of specified areas within club and hotel gaming venues is at the planning stage, and appears likely to provide significant challenges for gaming operators on a number of logistical and operational levels. The introduction of 'specified areas' within club and hotel venues would also impose further demands on the gaming regulator (OGR). The researchers' will seek information on the processes of implementation and operation of 'specified areas' in the discovery phase of the research.

There are a variety of other criteria, which currently shape the EGM technical system or will do so if implemented. The Ministerial Directions restrict the maximum bet on all machines licensed on or after 1 January 2003 to \$10. Design requirements for new EGMs also ban autoplay facilities, and ban machines from accepting \$100 notes (OGR 2004: 6). Other current regulations in relation to lighting and views, loyalty schemes, clocks and advertising also shape the system. In addition, changes to the GMCA, which came into effect on 16 June 2002, allow the VCGA to refuse approval to a gaming machine or a specific game on the grounds of responsible gambling standards. The *Victorian Appendix* (2003) to the national gaming machine standards (v6.0) includes specific requirements with regard to responsible gambling (see Section 4.4 of this paper). These requirements are supplementary to those under the GMCA and Casino Control Act 1991 and relate to the presentation, spin rate, maximum bet limit and time display of EGMs (section V9).

Documenting changes in the EGM technical system does not necessarily allow these changes to be 'mapped' onto transformations in gambling behaviour. This is particularly the case where comprehensive trend data on gambling participation is not available. In this respect Victoria offers a potentially useful archive of gambling participation data compiled over a series of community surveys.⁵³ The development of 'gambling segments' classifies gamblers into a number of categories that provide insight into the patterns of gambling behaviour of those who are considered by standard measures to have gambling problems, those who may at-risk of developing problems, etc. Changes in the profile and participation patterns of EGM gambling segments in Victoria will be considered in relation to transformations in the EGM technical system. This will be possible once detailed data on aspects of the system such as

⁵³ See <http://www.grp.vic.gov.au> for access to the community survey series conducted by the Gambling Research Panel and formerly by the Victorian Casino and Gaming Authority.

machine credit values, bank note acceptors and gambling expenditure, amongst others, have been analysed. It is a general principle of the discovery process of the project to look for evidence of the impact of all regulations, technical specifications and other arrangements that shape the EGM technical system on gambling behaviour. These will be considered in relation to the specific harm minimisation measures currently operating, and in prospect, in Victoria.

A.6.4 United Kingdom

The British government is in the process of modernising its gambling legislation. The Draft Gambling Bill 2004 contains provision for a new national gambling regulator, The UK Gambling Commission. The Gambling Commission will have broad responsibility for licensing and regulating all aspects of the gambling industry in Britain, with responsibility to protect the vulnerable. The Joint Committee on the Draft Gambling Bill has recommended a national problem gambling prevalence study to be conducted prior to the implementation of the Gambling Bill and at five-year intervals after that. The Joint Committee has been guided by the Productivity Commission Report (1999) in its expectations of the increase in problem gambling as a result of the liberalisation of gambling.

However, there are distinct differences in the structure of the UK gambling industry to that found in Australia. In relation to gaming machines, the Draft Gambling Bill 2004 classifies machines in to four categories, which determine where these machines can be located and limitations on their operation. These classifications are summarised in Table A.9, below.

Table A.9 Categories of gaming machines, UK Draft Gambling Bill

Category	Location	Limits
A	Casinos only	Unlimited stakes and prizes – may be linked within the casino to create potential large jackpots
B	Bingo premises, betting offices, adult gaming centres (up to four each), or registered club (up to three each)	Maximum stake £1; Maximum prize £500, or £250 in a registered club
C	Bingo premises, betting offices, adult gaming centres, adult-only areas of family entertainment centres, pubs and other premises with an alcohol on-licence	Maximum stake 50p; Maximum prize £25
D	Family entertainment centre (including seaside arcades, bowling alleys, motorway services and theme parks) and other non-gambling outlets such as cafes, fish and chip shops, takeaways, cab offices, etc.	Maximum stake 10p; Maximum prize £5 (Where machine pays out non-money, non-exchangeable prizes the maximum stake will be 30p)

More precise dimensions of the expanded UK EGM gambling market emerged in the British Government response to the Draft Gambling Bill in June 2004 (DCMS 2004). The number of machines is to be restricted to 150 for large casinos and 80 for small casinos. Large ‘regional’ casinos, which are intended to ‘regenerate’ specific locations within the UK (DCMS 2004: 51), will be entitled to 1,250 machines. Machines in regional casinos will be able to offer unlimited prizes (Category A machines) whereas small and large casinos will be restricted to a limit of £500 (Category B machines) (DCMS 2004: 3). The Government response has also determined that small and large casinos will be entitled to two EGMs for each table game, a reduction from the ratio of 3:1 nominated by the Joint Committee (DCMS 2004: 26).

From the point of view of a comparison with the EGM technical system in Victoria, and in other states and territories in Australia, there appear to be two main differences. First, different grades of machines are to be deployed according to different venue types, with the overall range of venues in which machines can be located being much broader than in Australia. Second, there is no provision for wider area networks linking machines and providing for very large-scale jackpots and pools. Rather, small and large casinos will be entitled to link at least ten machines to venue level jackpots as part of their Category B machine entitlement (DCMS 2004:26). Access to unlimited prizes on the types of gaming machines found commonly in Australian clubs and hotels will be restricted to large regional casinos in the UK. Questions about the types of venue that can be considered ‘regional casinos’ and are licensed as such thus appear likely to determine the future number and spatial density of unrestricted machines deployed in the UK (see DCMS 2004: Annex). The Joint Committee had noted that Category A machines pose particular risks and, as new features, should be introduced gradually and not permitted in unlimited numbers,⁵⁴ and the Government agreed in its response.

The UK Government proposed specific safeguards in relation to EGM technology, to be incorporated in “statutory instruments, license conditions and codes of practice” (DCMS 2004: 16), which “may include powers:”

- To control speed of play

⁵⁴ See http://www.parliament.uk/parliamentary_committees/jcdgb.cfm

- To control game design features such as “near misses” and progressive tiers, which may reinforce incentives to repeat play
- To require information about odds and actual wins and losses in the play session to be displayed on screen
- To require “reality checks” or the need to confirm continuing play
- To implement loss limits set by players before starting through use of smart card technology
- To vary stake and prize limits (DCMS 2004: 16-7).

The rationale for these intended safeguards is stated clearly in the Government response and tied to learning from the Australian approach to the expansion of commercialised gaming.

We are deliberately avoiding the mistakes made in other jurisdictions, like Australia, where high stakes gaming machines in particular have been allowed to invade normal social spaces. Unfortunately the rate of problem gambling there is now over two per cent, over twice the rate in Great Britain. On the contrary, our proposals will lead to a significant reduction in the number of premises where gaming machines are available (DCMS 2004: 16).

The UK approach thus combines restrictions on access and availability of gaming machines with a gradient of relatively more or less ‘high stakes’ machines. Restriction of Category A machines to regional casinos at the upper end of the scale will be matched at the lower end of the scale by the withdrawal of the small prize gaming machines commonly found in unlicensed premises such as fish and chip shops and mini-cab offices (DCMS 2004: 3). The Government’s preferred table game to EGM ratio of 2:1 for small and large casinos (defined by amount of gaming floor space) will also mean reduced numbers of gaming machines than had been anticipated. In addition, all gambling operators will be required to “comply with Gambling Commission codes of practice on social responsibility” (DCMS 2004: 3).

A.7 Discussion

In summary, a variety of interventions have emerged in relation to the identified nexus between EGM technology, harm minimisation measures and public policy. What is clear is that rigorous research into, and evaluation of, particular technical interventions, is becoming central to the process of public policy formation in relation to EGM (and other gambling) harm minimisation measures. There appears to be a developing interest in the EGM technical system as a potential ‘tool’ that can be deployed in the interests of those with gambling problems, or those who may be at-risk of developing problems.

The research reviewed provides ample evidence that reflection on the interface between the EGM technical system and gamblers is proceeding on a variety of fronts and from a variety of theoretical perspectives. A number of dimensions are being explored, incorporating much of the panoply of cognitive and emotional expectations and responses that are embedded in gamblers’ relation to EGMs, although current research is far from exhaustive in this respect. However, recent approaches appear to be acknowledging the complexity of the EGM-gambler relation, and are now seeking to contextualise specialised research findings within a broader socio-structural understanding. Studies of social capital, leisure preferences and social networks have emerged, for example, which offer insight into they ways commercialised

gambling can be understood as integrated into the social worlds of particular groups (Warde & Trampunolon 2002).

Research devoted to investigating and evaluating the development of EGM technology-based harm minimisation tools has emerged relatively recently. This research assumes that EGM technology has the potential for modifications or that new design principles could be introduced that could minimise the harm experienced by problem gamblers and importantly, could act in a preventative capacity in relation to 'at-risk' gamblers.

There appear to be clear difficulties in the conduct of this kind of complex research, which are already being debated by some researchers (notably Blaszczynski et al., Dickerson et al., Delfabbro et al. and Griffiths). A key methodological difficulty appears to lie in the particular limitations of field studies or laboratory studies. Field studies which purport to be conducted in a 'naturalistic' setting are unable to account for the extent to which the gambling behaviour of participants, whilst 'under the microscope' of the researchers, replicates their usual gambling. The presence of the researchers and the special setting of this particular gambling session may influence individual gamblers, to a greater or lesser extent. In addition, no discussion has emerged about whether a proportion of problem or other gamblers actually have quite erratic patterns of gambling participation, such that even if the gambling displayed is relatively 'natural' it is not necessarily 'typical' of that particular gambler. Dickerson et al. (2003) certainly point in the direction of this problem in relation to the idea of control becoming 'impaired' during gambling sessions. However, whether this process of impairment whilst gambling is rapid, sudden, gradual or varied, is triggered by specific events or as a process of fatigue for example, remains uncertain.

The limitation of laboratory studies lies in the extent to which the gambling behaviour observed clinically would be replicated in a commercial gambling context. This is particularly relevant given research that suggests cues such as sound, smell and lighting in gambling venues can play a role in arousal. The context of gambling is a key to understanding the EGM technical system, so in this respect laboratory studies must also be treated with due circumspection (as Delfabbro et al. 2004, for example indeed do).

In relation to the question of EGM technology and harm minimisation measures, a number of 'commonsense' questions also arise in reviewing the studies which make up what is essentially the vanguard of work in this area. For example, in the testing of restrictions on bank note acceptors in the major study done to date (Blaszczynski et al. 2001), the parameter of the test was the elimination of \$100 notes. However, the most common denominations of notes in circulation and use in Australia are \$10 and \$20 values, and for the majority of gamblers are likely to be used more frequently than \$100 notes. Further 'commonsense' speculation might suggest that 'problem gamblers' would be *more* likely to feed incremental amounts, for example five times \$20, into a machine than one amount of \$100, than would recreational gamblers. This kind of practice (for example) could be one deployed by problem gamblers to give an illusion of control, or indeed could be a sensible 'tactic' deployed by someone who is perhaps 'at-risk' of gambling too much. Even recreational gamblers are likely to stagger their input of money into the machine as part of their own negotiations about how much they intend to spend gambling, which is clearly not always (and perhaps rarely) a 'fixed' amount at the outset of gambling but more likely to depend on 'how my luck is going'.

There are thus likely to be continued significant methodological questions arising from research that attempts to assess the effects of varying the technical parameters of EGMs on

gambling behaviour. It should be emphasised that this is crucial research and that, in part, the only way these questions will be clarified will be through analysing the disparities in results achieved in laboratory and field settings. At the moment this research appears to be in the early stages of developing both methodological grounds and testable hypotheses. This is a crucial stage in the development of a systematic and rigorous body of research that can explore the questions which some of the studies described have opened up in relation to EGM technology, gambling behaviour and harm minimisation. Such research on this nexus as has been done to date is, in the view of the researchers, potentially path-breaking in terms of gambling research and public policy, and should not be considered an attempt by researchers to establish the 'last word' on such questions or be criticised unfairly on such a basis. At this point in the process, the first steps have been taken in what will likely be an increasingly methodologically and technically sophisticated field of research endeavour and substantial and longitudinal studies should be vigorously promoted.

Analysis of the precise configurations of machines, credit values and other technical parameters that structure the EGM system would offer the opportunity to draw a more meaningful quantitative picture of the consumption of EGM gambling. The configuration of the EGM technical system appears likely to shape and condition the consumption patterns and experiences of gamblers to an as yet unclear extent. At the same time gambling behaviour is likely to feedback into the configuration of the technical system, in the shape of gambling expenditures, preferences, risks and harm that lead to changes in design, operating parameters or regulation. This is characteristic of systems implementation under conditions of reflexive modernity (Beck et al. 1994), in which potential and actual consequences of that implementation process increasingly become incorporated into the ongoing refinement and re-production of the system itself.

Appendix B: Glossary of acronyms

ABS: Australian Bureau of Statistics
ATF: Approved testing facility
ATM: Automatic teller machine
BNA: Bank note acceptor
CIT: Computerised information technology
CMCS: Central monitoring and control system
EGM: Electronic Gaming Machine
GRA: Gambling Regulation Act (Vic)
GRP: Gambling Research Panel
GST: Goods and services tax
IoD: SEIFA Index of comparative disadvantage
IPART: Independent Pricing and Regulatory Tribunal (NSW)
LGA: Local Government Authority
OGR: Office of Gambling Regulation
RGF: Responsible gambling feature
RNG: Random number generator
RR: Random ratio
RTP: Return to player
SEIFA: Socio-economic index for areas
WAN: Wide area network

Appendix C: Basic information sheet and discussion schedule, qualitative research

Basic information:

1. Gender Male

Female

2. Age

3. Occupation

4. Country of birth

5. Number of years you have used EGMs

6. Number of years that EGM use has been or was a problem

During this time of problem EGM use, please estimate:

7. Average amount you would spend per EGM session

8. Average time you would spend in each EGM session

9. Average number of EGM sessions per week

10. Do you gamble in any way other than EGMs?

11. If so, what other forms of gambling do you use?

12. Is this/are these a problem for you?

Discussion schedule – Gamblers' Help clients

1. Are there differences between individual venues, or between types of venues (e.g., hotels, clubs, venues where you are known/unknown, large/small) that make some more attractive than others?
2. What is it about a venue that makes it attractive?
3. Do/did you participate in venue/operator loyalty programs?
4. Did advertising or promotional activities by venues or operators play a part in the development of your gambling practices?
5. Do/did you generally use venues near, or on the route to/from, your home/work? How far do/did you travel to visit a venue?
6. Do/did you have favourite machines?
7. Which machines do/did you like the most?
8. Do/did you have favourite denominations for machines? What are they?
9. What is it about a particular machine that makes it attractive?
10. Do machine features play a part in attractiveness of machines?
11. Do you think that machines will pay out when they're ready to?
12. Do you think that machines are programmed to pay out more/less than average at particular times of day? If so, what times are relevant?
13. Do you think that there are ways of getting more or better payouts with EGMs? What are these?
14. What features or characteristics of machines are most likely to make/have made you want to keep playing?
15. Do/did clocks on machines make you conscious of the time you spend/spent playing machines? Did this have any impact on your gambling?
16. Do/did warning signs in venues or on machines have any impact on your gambling? If so, what was/is this?
17. Does/did the ban on smoking in venues have any impact on your gambling? If so, what was/is this?