

# **THE ECONOMIC IMPACT OF GAMBLING**

## **Project Report**

**March 2000**

*- Prepared for -*

**Victorian Casino and Gaming Authority**  
Level 5/35 Spring Street  
Melbourne Victoria 3000

*- Prepared by -*

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*The Economic Impact of Gambling*

*Consultant - National Institute of Economic and Industry Research*

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# **The economic impact of gambling**

**A report for the  
Victorian Casino and Gaming Authority**

**Prepared by the  
National Institute of Economic and Industry Research,  
trading as National Economics**

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**March 2000**

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## Executive summary

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Since NIEIR completed its studies of the impact to 1995-96 of new gaming facilities (the casino and electronic gaming machines) on the Victorian economy, a number of research studies into the issue have been completed. The most important is the recent report of the Productivity Commission.

NIEIR's analysis concluded that, up to 1995-96, new gaming expenditures had a significant positive impact on the Victorian economy because of:

- (i) the high level of financing of new gaming expenditure by reductions in household savings; and
- (ii) the level of unemployed resources in the Victorian economy (which meant that the increased expenditure generated increased employment).

As a consequence of the finance of gambling expenditure from savings, the Institute found that retail expenditure was not significantly affected.

The Productivity Commission report:

- (i) reinforces NIEIR's conclusion that retail trade was not significantly affected by new gaming expenditures;
- (ii) reinforces NIEIR's conclusion that new gaming expenditures have a strong positive impact on the economy when modelling allows for unutilised resources;
- (iii) challenges, but does not refute, NIEIR's saving hypothesis (that is, up to 1995-96 at least) household savings decline largely financed new gaming expenditure growth; and
- (iv) greatly expands the role of social costs in economic evaluation.

The most cogent reason for doubting NIEIR's conclusion that, in the 1990s, the increase in gambling in Victoria was financed largely from reductions in savings, derives from doubt as to the accuracy of the Australian Bureau of Statistics' Household Expenditure Survey, which NIEIR used to validate the conclusions. Accordingly a substantial part of the work effort for the present study takes the form of reworking, validating and re-analysing the HES data base. The strong conclusion from the study is that the HES is still the most suitable data base to draw macroeconomic conclusions from microeconomic data. Moreover, NIEIR's original hypotheses are confirmed, namely that:

- up to the mid to late 1990s, declines in saving have financed new gaming expenditures, especially in Victoria; and
- new gaming expenditures have a strong impact in stimulating other complementary expenditures, particularly eating out, alcohol and tobacco.

These conclusions, as before, are verified by macroeconomic trends.

This study makes clear, however, that the extent to which households can finance gambling from savings depends on:

- (i) monetary policy in general, and interest rates in particular;
- (ii) trends in other elements in the household income/expenditure balance; and
- (iii) trends in the household debt service ratio.

Low interest rate regimes over the past few years have encouraged households to build up debt, reduce savings and spend at high levels. With savings now historically low, and debt levels now historically high, the current situation cannot continue. As the current trend unwinds the strength of the savings hypothesis will decline.

This study undertakes sophisticated regional modelling analysis which suggests that in Victoria the strength of the savings hypothesis declined by 10 per cent to 1997-98 and with rising interest rates is expected to decline by 30 per cent in 2000-01. By 2004-05 the level of gambling financed out of savings is expected to be reduced by half compared to the 1995-96 level.

Nevertheless, in the immediate past the report finds that new gaming expenditures have increased their positive stimulus to the Victorian economy by at least 25 per cent above that estimated for 1995-96 if temporary casino construction effects are ignored. The immediate past contribution has been \$1.4 billion to net state product and around 24,000 to employment. These are still the net benefits even if the costs of problem gamblers are included. The contribution to gross state product is estimated at \$1.9 billion.

Over the next few years the contribution to economic activity from new gaming expenditure is expected to decline slightly from current levels as growth in new gaming expenditures is limited by the decreasing ability of households to dip further into savings. By 2005 it is expected that contribution to employment will be about the same as in 1995-96 based on the 1995-96 assumptions.

However, by 2005 the 1995-96 assumptions will not all be justified. In particular with Victorian Government debt levels now down to relatively low levels and the triple A rating restored, it is unlikely that the 50 per cent Victorian government debt reduction allocation from gaming taxation revenue will be sustained. This assumption underpins the state-wide economic analysis.

By 2005 a more plausible assumption is that all the gaming taxation revenue will be (or could be) fully spent. In this case by 2005 the increase in net state product will be \$1.8 billion with an additional 31,000 employment positions. Thus, over the next five years, despite the savings financing of gaming expenditures falling to less than 50 per cent:

- (i) the growth in export of gaming services (estimated to be 25 per cent of the total by 2005); and
- (ii) the removal of the constraint on the use of taxation revenue for government expenditure,

will produce further increases in the contribution of new gaming activities to Victorian economic activity.

This study also calculates the impact of electronic gaming machine gambling at a Local Government Area level. It finds that currently all LGAs are benefiting, either directly or indirectly, from the net benefits of new gaming in terms of enhancement to gross regional product. Nevertheless, the net benefits are unequally distributed. Boroondara has a net regional product gain per household of \$1,000 per annum compared to Strathbogie of \$134.

A recent regional study, the Victoria University study into low income LGAs, is fatally flawed in that the feedback from the state-wide positive effects on local areas is ignored.

Further, the long run benefits from new gaming at the regional level are also unevenly distributed. Melbourne City households gain \$22 per week, while some country LGAs gain by around \$2 per week.

The LGAs which have high social costs from gambling activity (that is, greater than \$2.6 million annually) are:

- Monash;
- Greater Geelong;
- Greater Dandenong;
- Kingston;
- Darebin;
- Casey;
- Moreland;
- Whitehorse; and
- Boroondara.

In the longer term, as the benefits from the finance of gambling from savings weaken, the net benefit for low income LGAs will decline and, under certain long run assumptions, turn significantly negative. The areas at high risk in this regard are:

- Greater Dandenong;
- Darebin;
- Mornington Peninsula;
- Moreland;
- Maribyrnong;
- La Trobe;
- East Gippsland;
- Bass Coast; and
- Central Goldfields.

Finally, the study reveals a fundamental flaw in the Productivity Commission study. The Commission compares long run gross benefits from gambling (which are significantly lower than the current short run benefits) with the current, that is 1997-98, social costs of gambling. As the level of gross benefits and costs of gambling are linked the Productivity Commission under-estimates net benefits.

Moreover, this report shows that few of the Productivity Commission's calculations of both the benefits and costs of gambling are useful in policy formulation.

In relation to gambling patron profiles the report makes the following points.

- Most gamblers, even heavy gamblers, can afford to do so. The reason for this is that gambling expenditures increase with income (up to around \$80,000 gross income per year) and because most gambling households have asset reserves.
- Heavy gambling induces significant increases in expenditures on alcohol, tobacco, restaurant and take-away food and smaller increases in other entertainment expenditures. Even for average gamblers these expenditures are markedly higher.
- Gambling induces only relatively small reductions in other expenditures. These reductions appear to be widely spread over the expenditure categories.

- On balance, increased gambling expenditures lead to increased total expenditures. Given that incomes are largely constant, by necessity savings reduce.
- High gambling expenditures interfere with asset accumulation and for many households lead to a reduction in assets over time. For a significant number of households, assets can be reduced to nil or debts can arise.
- Given the enormous household asset base of over \$1,200 billion in Australia for 1994, gambling at current levels has only a relatively small impact on total asset levels. Typically gambling is financed to a similar extent by increasing debts and by reducing assets.
- It appears that, at least under the current easy money policy, debts are increased before assets are sold to finance negative savings.
- Some socio-demographic groups tend to spend more on gambling or have a higher incidence of being a big spender. Different data sources and analytical approaches give different results for these effects because of unreliable data, high standard errors, large differences between states, changes over time and complex spending patterns. Overall it would appear that:
  - gambling expenditures are strongly driven by supply – socio-demographic patterns in mature gambling states (New South Wales/Australian Capital Territory) differ markedly from other states;
  - in mature gambling markets, the people who can least afford to gamble tend to do so, e.g. low/medium income earners, the aged, blue collar workers; and
  - persons with dependent children and high status occupations tend to spend relatively less on gambling.
- Gambling expenditures are concentrated among a subset of the population, more than most other expenditures. Frequent gamblers spend more each time they gamble than infrequent gamblers. Socio-demographic factors can explain only a very small fraction of the expenditure difference between small and big gamblers. Despite marked socio-demographic differences in the propensity to gamble, it must be acknowledged that both gambling and frequent gambling are widely spread over the population.
- Complication of the analysis by introducing a socio-demographic segmentation of gamblers does not greatly improve the calculation of benefits and costs at the macroeconomic level. A segmentation of gamblers by expenditure group (e.g. small, average, top – highest 10 per cent of spenders) and assets is suggested, resulting in a classification which determines whether the gambler can afford the expenditures in the long run or not.

The most clear cut result of this study is that the increase in gambling in Victoria has so far been financed largely out of net cash savings. It has therefore impacted on asset formation. This contradicts the results from the Victorian Casino and Gaming Authority and Productivity Commission surveys where respondents state that pocket money, a gambling budget or other sources were used. These survey results reflect the perception or intention of the respondents and not the actual outcomes. By analysing data reflecting the actual outcomes on a micro and macro level, the present study shows that gambling has so far been largely financed out of savings.

---

# 1. Introduction

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During the 1990s, government restriction on gaming in Victoria was substantially relaxed, the number and variety of gambling outlets increased, and household expenditure on gambling (alternatively known as gambling losses) increased. Several impacts of this increase are undisputed, including an increase in employment in gambling and gambling-related activities, an increase in the proportion of household budgets devoted to gambling, and an increase in the incidence of problem gambling.

A number of studies have been completed of the social impact of the increase in gambling, including the increase in the number of problem gamblers. The present study was commissioned:

- to complement social impact studies; and
- to investigate further the economic impact of the increase in gambling.

In Chapter 2 the general approach taken in the study is described, and in Chapter 3 this is compared with other recent studies. The bulk of the analysis is covered in Chapter 4. In the interests of readability, many of the more technical questions concerning data quality and analysis have been relegated to appendices, which form an integral part of the report.

Chapter 5 covers the state-wide impact of the new gaming facilities, while Chapter 6 reports the regional impact of electronic gaming machines. Chapter 7 lists the conclusions of the study in relation to the terms of reference.

## 1.1 Methodological outline

The study was undertaken for the Victorian Casino and Gambling Authority in response to a tender brief issued in August 1998. This chapter lists the terms of reference; describes the proposal and the extent to which it was fulfilled, then provides an account of the methodological difficulties of assessing the impact of the increase in the availability of gambling facilities in the particular circumstances of Victoria during the 1990s.

### 1.1.1 Terms of reference

This research study was separated into two sections.

The first section required the evaluation of existing data collection and profiling techniques, with the aim of putting in place a standard for data collection amenable to an ongoing analysis of the microeconomic impacts of gaming.

Specifically this involved:

1. liaison with the consultants appointed to undertake the following projects to ensure that the individual data collected for these projects could be adapted to the microsimulation calculations necessary to determine individual expenditure patterns:
  - *The Evaluation and Further Use of Existing Data Sets;*
  - *Community Gambling Patterns and Perceptions 1998 and 1999;*

- *The Impact on Specific Cultural Groups;*
  - *Longitudinal Community Impact Study;* and
2. an evaluation of the adaptability of the data collected from these projects and the capacity to undertake economic evaluations based on geographic areas using both or either econometric modelling and microsimulation techniques.

These tasks were completed and the results provided to the Authority. They are not the subject of the present report.

The second section of the study required the collection, analysis and interpretation of relevant data from various sources including the following.

1. An assessment of the economic impacts of gaming based on the following levels:
  - state;
  - regional or geographical area;
  - community or local government area; and
  - household/individual.
2. For the economic impacts at the aggregated levels specified above, consideration of the income, expenditure and employment aspects of the gaming industry in relation to other industries.
3. An assessment of the linkages between each level as detailed in 1.
4. An examination of the historical relationship of gambling expenditure in comparison to overall expenditure and how this relationship has altered since the introduction of electronic gaming machines and the opening of the casino.
5. An examination of the level of expenditure on gambling comparative to that in other Australian states and territories (taking the differences in industry structure into account).
6. The identification of significant changes in the nature of expenditure patterns, both gambling expenditures and non-gambling expenditures at the individual/household level and the investigation of the relationship of these changes to such variables as employment, income, education, household composition and other demographic characteristics.
7. An overview of the econometric modelling and microsimulation techniques used in the economic assessment, specifically:
  - econometric modelling:
    - the selection of the appropriate model;
    - the selection of the data required for utilisation of the model; and
    - the use of sensitivity analysis to test the model results;



- microsimulation:
    - variables used and the combination of variables used, e.g. income, employment type and status, and education; and
    - elasticity of variables analysed.
8. Comparison with the finding of other economic impact studies undertaken by the Authority, including the *Impact of the Expansion in Gaming on the Victorian Retail Sector*, the *Effect of Gambling on Employment in Victoria* and other relevant studies.

### 1.1.2 Methodology originally proposed

The original research proposal for the second half of the project included the following.

A useful addition dimensions to previous studies would be an investigation of closer linkage between the recent Victorian changes in gaming services availability and the patterns of gaming activities in New South Wales households. This would be useful not only to generate a basis for comparison, but also to put the changes in the Victorian environment in a better context. That is, although Victorian gaming expenditures have grown rapidly the overall outcome may be to place the Victorian experience in line with what has happened in New South Wales over the past few decades.

Secondly, the microsimulation modelling in the previous studies was a static analysis, or cross-sectional for a fixed time period. This was necessary to obtain practical results at the aggregate level. However, missing from the previous studies was a dynamic analysis of how the same household, or household groups, changed their pattern of behaviour through 1993 to 1996 as gaming activities in Victoria expanded. This would have been useful to show how the mix of households change in order to sustain an overall gaming expenditure. It would also show how, in some households, there may have been an unsustainable commitment to gaming in earlier stages which, over a period of time, would have forced correction in behaviour.

Thirdly, the microsimulation data base used for the previous study, by necessity, was limited to the standard data of Census and household expenditure data prepared by the Australian Bureau of Statistics. Additional data sets are now available through other Authority consultancies and other work which can be used to complement NIEIR's microsimulation data base and can be used to improve the quality of the results, both at the household level and at the regional level.

#### **Task 1 – Improve the microsimulation data base**

The first task was to improve the microsimulation data base. All data currently in the public domain was reviewed and the data bases interrogated for integration into the microsimulation data base. However, most recent surveys, including data collected by the Authority, were drafted with largely social and psychometric aims, and after investigation it was found that they were of limited usefulness as microsimulation data bases for the economic purposes of the present project. Accordingly attention was concentrated on interpretation of the Household Expenditure Survey, which, with all its faults, had a large sample and rich information on household characteristics and general expenditure patterns. It was found that the deficiencies of this survey could be to large degree overcome.

### ***Task 2 – The application of dynamic microsimulation modelling***

The brief promised the development of a dynamic microsimulation approach to the introduction of increased gambling facilities. This was done on the basis of the HES data set. Dynamic household responses were incorporated in modelling in the economic impact analysis at the state and regional level.

### ***Task 3 – Microsimulation analysis: a Victorian and New South Wales comparison***

NIEIR's microsimulation data bases extend back to 1986 and are segmented by state. Task 3 involved comparing New South Wales household income and expenditure structures, both currently and in the early part of the decade with those for Victoria. The objective was to test the hypothesis that the Victorian household structural changes in response to gaming have converged with the New South Wales outcomes.

### ***Task 4 – Macroeconomic indicators***

Task 4 involved updating the macroeconomic indicator analysis of the previous NIEIR studies in terms of relative Victorian performance in relation to retail expenditures, savings, employment, etc.

### ***Task 5 – Update of venue survey***

The previous survey of gaming venues into the impact of gaming in terms of investments, revenue, patronage, etc. was repeated. The objective was to achieve as large a survey response as possible so that the inputs into the regional econometric modelling analysis of Task 6 was of a high quality.

This task was subcontracted to Market Solutions and separately published.

### ***Task 6 – Regional econometric modelling***

The previous studies did not use NIEIR's considerable standard econometric modelling infrastructure at the regional level, that is Statistical Local Area for Metropolitan Melbourne and Statistical Sub-divisions in the country, to assess the full effects of gaming at the sub-state level. A regional econometric analysis would enable the full effects of gaming to be assessed by estimating the total changes in regional industry, output, employment, household incomes, and gross regional product. The previous studies stopped at the microsimulation analysis stage.

This time, the results from the microsimulation analysis from Tasks 1 to 3 at the regional level were fed into the regional econometric models to obtain the full flow-on effects. This approach enabled a cross-check with the state-wide modelling outcomes.

The econometric analysis was conducted for the years 1996, 1998 and 1999. This enabled changing patterns in the response to gaming to be captured at the regional macroeconomic level.

### ***Task 7 – The state-wide economic impact***

The previous approach to estimating the state based analysis was adopted. This used a top-down approach given the microsimulation results, venue survey and statistical indicator analysis. As for the regional analysis the state impact was evaluated for 1996, 1998 and 1999.

The updated top-down approach was contrasted with the bottom-up approach from the microsimulation and regional econometric analysis from Task 6, with discrepancies reconciled. Considered, overall, quantitative conclusions were developed.

The impact of changes to the Victorian gambling regime since 1992 were also evaluated at the national level.

### ***Task 8 – Economic evaluations***

Task 8 was to bring together all of the preceding tasks. This included the analysis in terms of a rich variety of household structures, for example single pensioner to high income no children households, both at the state and regional levels. The expenditure pattern changes were to be across 400 consumption categories.

The regional full flow-on analysis was at the Statistical Local Area for Melbourne and the Statistical Sub-division Area level in the country. At the regional level outputs from the macroeconomic model were expressed in terms of industry output employment changes at the 2-digit industry level and 44 retail consumption expenditure categories.

At the state level similar indicators were assessed together with the impact on State Government revenue categories.



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## 2. General issues in gambling policy and research

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There are now several studies in the public domain which deal with the economic and social impacts of gambling expenditures. In order to be able to compare and assess the value of these studies it is necessary to develop criteria for the assessment of public policy and research into gambling activities. These criteria will be discussed under the following headings:

- gambling activity and public policy issues;
- positive and normative economic research; and
- the factors determining the appropriate research methodology.

### 2.1 Gambling activity and public policy issues

Gambling is a highly regulated activity. In particular, the agencies regulating the availability of poker machines (governments and their delegated regulatory authorities) can significantly alter:

- the extent of gambling in the community (measured by gambling expenditures per capita or as a percentage of disposable income);
- the structure of gambling activity (for example electronic gaming machines versus horse racing); and
- the profitability of gambling services (by altering gambling taxes and/or the supply of different types of gambling).

In order to make satisfactory policy decisions (that is, to maximise the community's net benefit from gambling) policy makers want to know the answers to the following questions:

1. Does the general economy benefit from gambling?
2. Is the distribution of economic benefits and disbenefits from gambling inequitable at the regional level?
3. What are the social costs from gambling and, as far as comparisons can be made, do they significantly offset the gross economic benefit from gambling?

#### ***General economic benefit***

The general economic benefit issue refers to the economy as a whole and requires an answer to the question of whether or not total economy-wide activity and employment is higher than what would be the case either in the absence of gambling or with a more restricted supply of gambling services. As gambling is a state issue the economy-wide dimension refers to the state economy.

### ***The regional perspective***

The supply of gambling services can involve a strong regional dimension. The regulatory regime is regional (that is, sub-state) in its licensing and other controls. For example, it has been decided there will be only one casino in Victoria, and that it should be in the capital city. A cap has also been placed on the number of electronic gaming machines which can be allocated to metropolitan areas.

The answer to the question of whether or not some regions gain significantly from gambling while other regions lose (with potential for a large winner-loser differential) implies an answer to the question of whether or not changes to the regional dimension of gambling policy can alter the state-wide benefit. The core issue here is the regional distribution of gambling services.

### ***Social costs***

Almost all elements of economic activity involve social cost. Work stress generates family breakdowns, suicides and destructive personal behaviour. Travel to and from work or recreational pursuits involves risk of death or injury.

The question here is not whether gambling involves a social cost but whether or not the social cost is high relative to the economic benefits. *Prima facie*, gambling falls into a class of goods and services where supply is regulated by the state because of a propensity to cause social costs deriving from loss of player control.

An example of other goods and services for which regulation is imposed are various drugs; the judgement is that the supply of these drugs is harmful in the community, not because there is no economic benefit, but because the social costs associated with the economic benefit are judged high relative to the economic benefit.

Possible regulatory regimes for commodities that impose a social cost range from outright prohibition (such as currently applied to opiates) to complete de-regulation. Outright prohibition works best where there is strong and universal community disapprobation of the good or service. Where some members of the community, or indeed of significant sub-communities, are willing to tolerate the good or service, or regard it as harmless in moderation, outright prohibition can be difficult to enforce and result in serious social costs in the form of criminal provision of the good or service. At the other extreme, complete de-regulation can result in high levels of loss of user control of the good or service, with attendant social costs. In most cases of addictive goods and services which are regarded as harmless in moderation by many or most in the community, Victoria has settled for regulated provision, which tries to avoid the high social costs at either end of the spectrum.

## **2.2 Positive and normative economic policy research**

University economics courses up to the 1960s taught the difference between positive and normative economics. More recently this distinction appears to have been forgotten to the detriment, in particular, of gambling research.

Positive economic research is basically concerned with what is the case. Disagreements over what is the case should be settled by appeal to the facts as they currently exist.

Normative research is focused on what ought to be. The facts are not relevant in normative economic research. Normative economic research derives from ethical values and judgements, derived variously from ideology, religion or philosophy. Differences between individuals over normative conclusions cannot be settled by an appeal to the facts. They can only be settled by debate and in a democratic society by appeal to the political process.

Economics is often brought into the service of normative arguments. For example, interest groups which consider that they will be disadvantaged by a proposed policy change will marshal economic arguments against it, perhaps seeking to create a coalition in opposition by showing that other groups will also be adversely affected. Such manoeuvres have become such a normal part of political debate that they can be handled within positive economics on the conventional assumptions that higher incomes are preferable to lower and employment is preferable to unemployment. Greater difficulty is often experienced with reference to environmental issues (with the conflict of interest between the current and future generations) and even more in considering habit-forming goods and services.

The outstanding methodological problem in coming to a balanced assessment of the expansion of gambling facilities is that of problem gambling. Though problem gambling is a matter of degree, serious problem gamblers are a small minority of the population who suffer greatly as a result of their lack of control, and who also inflict some of that suffering on others, most severely their immediate families but also the community at large (e.g. through work absenteeism, crime and the cost of social work responses). An increase in the availability of legal gambling facilities, and a diversification of the types of gambling offered, will increase the rate of serious loss of player control, if only because more people are introduced to the possibility, and also because some people may be susceptible to specific forms of gambling. For example, those who cannot abide horse racing or two-up may still become problem gamblers as a result of playing electronic gaming machines (EGMs).

By contrast with the intensity of despair suffered by problem gamblers, the benefits of gambling are fairly mild but much more widespread: they include a certain level of employment generation, some investment income, taxes willingly paid and a certain level of entertainment. Like the incidence of problem gambling, these benefits increase with the extension of legal gambling outlets.

A third factor should also be taken into account: the extension of legal gambling probably reduces illegal gambling. An important reason for the introduction of TAB betting in Victoria was to reduce the number of illegal SP bookmakers. However, displacement of illegal gambling was not an important stated motive for the expansion of gaming facilities in the 1990s. By their nature illegal casinos and EGMs have to be fairly covert operations, and cannot approach the scale or match the publicity of the new gambling facilities introduced during the decade. There was probably some reduction in illegal activity, but it is likely that it was minor compared to the increase in legal gambling.

Despite the importance of problem and illegal gambling for gambling policy, they should not be allowed to obscure the more mundane effects of the increase in gambling availability. Normative concern over these aspects can easily lead to neglect of a complete account of the positive economics of the change. The skill in economic argument lies in the realisation of its positive and normative components. It is good and normal for economic researchers to have normative motivations. The perversion arises when normative values drive the argument to the extent that they are presented as positive economics. This has happened time and time again in the history of the subject. Researchers have ignored inconvenient facts in the interests of their normative argument.

The ability of some to subvert positive economic research to normative ends is due to the complexity of the economic policy process. In some instances good economic policy can be fairly simply derived from positive economic research. Indeed, this will be the case in the overwhelming majority of cases, where there is reasonable community agreement as to the ends being pursued. For example, monetary policy decisions cannot be made without reference to the actual state of the economy in terms of unemployment, resource utilisation, and balance of payment process, and to the underlying values that unemployment is bad and income is good.

In other areas good policy will be more self-consciously normative. In these situations benefits and costs cannot be fully identified, let alone valued, without explicit reference to normative considerations. It is in this area that economic policy research of high integrity can become controversial and politically partisan. Gambling research is in this category.

One of the objectives of this study is to clarify the distinction between positive and normative issues in relation to gambling research. Indeed, unless this is done it is not possible to make sense of the current status of research into gambling.

### ***The difference between the short and long run***

The comparison between normative and positive research is complicated by the difference between short and long run research.

By necessity short and long run research refers to time periods. The increase in the availability of gambling in Victoria during the 1990s is likely to have both short-run and long-run effects. For example, as of 1990 many Victorians had never been to a casino. They then had their opportunity; many went, and of these some were not impressed and may never return; others became regular patrons and some became problem gamblers. The short-run and long-run impacts are different. The economic issue here is the long run sustainability of the pattern of financing of gambling expenditures which developed during the period 1995-96 to 1998-99. The danger is that normative argument will seize on short-run responses and present them as long-run, or indeed selectively confuse the two periods.

In summary, the ultimate motivation for research on gambling is necessarily normative, but normative anxieties should not be allowed to control the positive analysis of change over time.

## **2.3 Positive economic gambling research methodology**

The total gross benefit to the economy will be the sum of:

- (i) the resource expansion effect; and
- (ii) the resource reallocation effect.

The value of the resource expansion effect depends critically on the actual environment in which the economy is operating at the time of the introduction/expansion of gambling services.

Successful positive economic research into gambling, therefore, requires that the research methodology be designed to capture those features of the general economic and social environment which are core determinants of the benefits and costs of gambling. In turn this implies that positive gambling research be time specific. Reference to the case of gambling in the context of the Victorian economy will clarify this point.



### ***The resource expansion effect***

In the early 1990s the Victorian economy was in deep recession with double digit unemployment and strong negative medium to long term expectations. Victoria was described by those more fortunate as the rust bucket state. The poor public sector financial position at the time meant that the state was unable to use traditional fiscal policies to kick-start economic growth. The government of the day was therefore anxious to exploit any initiatives that would induce an increased private sector contribution to growth.

Expansion of gaming (casino and gaming machines) services was judged to be a suitable initiative. Positive economic stimulus would come from:

- (i) investment in the supply of gambling services;
- (ii) retention in Victoria of gambling expenditures by Victorian residents that were previously applied in other states (New South Wales for electronic gaming machines and the other states for casinos);
- (iii) increased expenditures in Victoria of visitors; and
- (iv) increased household consumption expenditures triggered by the availability of new gambling services.

In the early 1990s the Victorian household savings ratio was high in comparison with the national average. Prima facie, this was due in part to the more restricted availability of gambling services in Victoria.

In this context, and given the general economic environment over the 1990s, the appropriate positive research study for assessing the gross benefits from the expansion in gambling services in Victoria would be one which:

- (i) allowed for the possibility that the household savings ratio would decline as gambling services expanded;
- (ii) allowed for the possibility that, given the under-utilised capital and labour resources in the general Victorian and national economies, gambling service expansion could lead to a sustained increase in general economic activity and employment; and
- (iii) allowed for the possibility that the expansionary monetary policy pursued by the federal government from 1992 to 2000 (at least) assisted in increasing the gross economic benefit from gambling.

In this case the appropriate research methodology would be one which involved the following:

- (i) determination of whether or not the expansion of gambling services reduced the household savings ratio;
- (ii) determination of the direct expenditure stimulus to economic activity from:
  - increased indirect expenditures retained within the state;
  - increased tourist expenditures;
  - increased investment expenditures;
  - increased government services; and
- (iii) the use of appropriate econometric models to quantify the follow-on benefits (or multipliers) from the direct expenditure stimulus.

Given the economic environment starting with the 1992 recession, the appropriate econometric model would be one which:

- did not assume full employment;
- allowed the total capital stock of the economy to increase; and
- assumed an accommodating monetary policy. (A non-accommodating monetary policy would be one where interest rates are raised to choke off the positive economic stimulus from gambling.)

### ***The resource reallocation effect***

If it were reasonable to assume that, in the absence of the increase in gambling and the accommodating monetary policy, the Victorian and national economies would have experienced full employment of capital and labour resources over the 1990s, the resource expansion effect would be assumed to be zero. In this context all the gross benefit would come from the resource reallocation effects of increased gambling expenditures. The traditional research tool for doing this is the calculation of changes in consumer and producer surplus associated with the resource reallocation effects of increased gambling expenditures.

If it is thought that, within the foreseeable future, the general economic environment will change so that capital and labour are fully employed, even in the absence of the stimulus provided by gambling, it would be appropriate to regard the sum of the resource expansion and resource reallocation effects as representing the short term benefit of gambling expansion while the long run outcome would be represented by the resource reallocation effect only. The short run gross benefits would be less than the long run gross benefits and it would flag to policy makers that the interactions of gambling and the general economy may change in the future.

What can be said with certainty is that for the years from 1992 to 1998 positive economic research requires the adoption of a non-zero resource expansion research methodology if the gross benefits of increased gambling services to the economy are to be accurately assessed.

The appropriateness of the resource expansion research methodology can be underlined by further consideration of the 1990s consumer boom.

## **2.4 Gambling and the consumer boom**

As already pointed out, in Victoria the increase in gambling was an aspect of a more general consumer boom which grew out of a deep recession. Economic modelling is required to disentangle the effects of increased gambling from the other aspects of the boom.

The boom built up from the recession of 1991-92 to a peak expected around 1999-00 (though, as usual during booms, voices are heard claiming that the good times can go on for ever). The boom extended to the rest of Australia, and was in many ways similar to contemporary experience in the United States. Though an increase in gambling due to increased availability of facilities was a feature of the boom in Victoria, this was less noticeable in New South Wales, largely because that state had increased availability several decades before.

The 1990s consumer boom was different in many ways from its predecessors. From a macroeconomic point of view, it was notable by comparison with all booms since the Second World War for low inflation and continuing high unemployment; for an increase in inequality (particularly of private incomes), and for the low savings ratios achieved not only by households but by governments and the corporate sector. The consequence of these low savings ratios was the rapid accumulation of consumer and international debt. The low inflation rate was achieved largely by allowing unrestricted competition of overseas products in Australian markets. The poor competitiveness of most Australian import-competing production kept the unemployment rate high, which undercut the bargaining power of labour and further assisted in controlling inflation.

Against the background of uncompetitive Australian production, how did a boom develop? The basic reason was that the low inflation rate encouraged the government to pursue an easy-money policy, accompanied by a lax fiscal policy (low interest rates, tax cuts and low government savings). Normally low-tax easy-money policies would be expected to encourage capital investment by business, but in most industries the outlook was poor due to the high level of international competition, and not much was spent on new factories or product development. However, despite the increased level of job insecurity which accompanied the government's approach to inflation control, households responded to the tax cuts and took advantage of the easy money. A consumer boom resulted.

This boom was felt across the whole range of consumer industries. Some of the increased consumer expenditure was spent on imports, and created jobs overseas, but much of it generated economic activity within Australia, notably in home building and in tourism, restaurants, entertainment and recreation. In Victoria the increase in gambling fitted neatly into the general prosperity of the entertainment and related industries. However, a comparison with New South Wales helps to place the impact in perspective. In that state, which already had electronic gaming machines (EGMs), expenditure on gambling rose with the boom from 2.7 per cent of household expenditure to 3.7 per cent, compared with the Victorian increase from 1.5 per cent to 3.9 per cent.<sup>1</sup> New South Wales also experienced a consumer boom, despite the smaller increase in gambling expenditures.

## 2.5 The role of reduced savings in the consumer boom

The role of reduced household savings rates in the consumer boom should be emphasised, since it is crucial to the assessment of that part of the boom which was due, in Victoria, to the increase in gambling.

At the household level, conventional middle-class morality values saving highly. This morality is supported by lessons bitterly learnt during such events as the depressions of the 1890s and 1930s, and reinforced during the current period of high job insecurity. A household with a cushion of savings is better placed than one without to weather downturns, be they due to personal misfortune or economic recession or restructuring. Given current circumstances, the incentive for households to save is strong; why then, a reduction in the savings rate? Two factors have contributed.

- The current level of job insecurity (which is an aspect of the government's anti-inflationary strategy) means that many households, affected by unemployment or reduced hours, are receiving less-than-expected incomes, and are dipping into their savings to help make up the difference.

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<sup>1</sup> Australian National Accounts.

- The easy-money policy has made borrowing much easier. Despite misgivings about their economic prospects, households have thus been encouraged to go into debt rather than save.

At the national level, there is deep ambivalence. On the one hand it is Federal Government policy to encourage households to save. On the other, as soon as households raise their savings rates the consumer boom will end, tarnishing the government's reputation as an economic manager. The contradiction at the heart of government policy was first analysed by Keynes.

At the national level, the desirability of a high savings rate depends on there being good uses to which the savings can be put. Currently in Australia there is a plethora of potential good uses, including the development of new products competitive on international markets, and the rectification of past environmental mistakes. The problem is that few of these good uses are potentially profitable to private investors, due in no small measure to the government's policy of inflation control through international competition, and its failure to compensate in any way for the effect of this policy on the potential for profitable investment in Australia.

Given the shortage of realisable good uses for savings, the consequence of an increase in the savings rate would be a recession brought about from lack of demand. Neither private business, nor governments, nor the household sector would be coming forward to buy what could be produced, and unemployment of both people and equipment would rise. In these circumstances, a consumption boom brought about by low savings rates is at least preferable to an outright slump, even though (especially from the point of view of future generations) it is arguably inferior to boom with less consumption and a higher level of capital accumulation.

The following analysis assumes the conditions prevailing during the consumer boom: that is, that increases in household expenditure, financed from reduced savings, did indeed create jobs, rather than merely crowd jobs out of other areas such as the production of capital goods and the rectification of environmental problems. As applied to the economic assessment of the increase in gambling in Victoria, this means that the increase, in so far as it was financed from a reduction in household savings, did indeed generate jobs, a result that was desirable, but only in a second-best fashion; that is, it was only desirable given the failure to increase the accumulation of real capital.

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### 3. Recent studies into the benefits and costs of gambling: a critique

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In 1997 the Authority released two reports by the National Institute of Economic and Industry Research (NIEIR) into the economic impact of gambling in Victoria. The two reports were *"The Impact of the Expansion in Gaming on the Victorian Retail Sector"* and *"The Effect of Gambling on Employment in Victoria"*. The retail study was co-authored with Spiller, Gibbons, Swan. In late 1999 the Productivity Commission released its final report into *"Australia's Gambling Industries"*. In October 1999 the Workplace Study Centre of Victoria University released *"Preliminary Local Area Gambling Research: Economic Effects"*. There have also been other studies into various aspects of gambling. These have been summarised in the Productivity Commission's report. The Workplace Study Centre (WSC) report is important because it contains a regional analysis of the impact of EGMs on four Melbourne regions. This is a prime focus of the present study.

The studies are over-viewed in Table 3.1.

#### 3.1 The NIEIR studies and their critics

The 1997 studies for the Authority were not the first time NIEIR had undertaken a detailed analysis of the impact of gambling on the urban economy in general, and household savings in particular. A large scale study for the Victorian Treasury was completed in 1994, namely *"Costs and benefits of the operation of electronic gaming machines in Victoria"*<sup>2</sup>.

The 1994 NIEIR study used data from the 1989 ABS Household Expenditure Survey (HES) data base and regression modelling found that with the introduction of poker machines:

- expenditures on food, alcohol, tobacco, travel, clothing and rent increased;
- expenditures on other entertainment, household durables, fuel, health, other goods, overseas expenditures and, in particular, capital housing costs decreased; and
- in total, an increase of poker machine expenditures by \$10 was estimated to lead to another \$11.80 in additional expenditures, to a reduction of \$6.40 in other expenditures, a reduction in household investment (expenditures on capital housing costs) of \$6.00 and to a decrease in savings of \$9.40.

It should be noted that the results depended heavily on the modelling of "latent poker machine players", that is, persons who were potential poker machine players but did not play because there were no EGMs in their state. The regression model then simulated the expenditures of the latent players after the introduction of poker machines. That is, the model did not simulate the effects of an increase in gambling, but the effects of the introduction of poker machines.

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<sup>2</sup> This study was published as an appendix to the 1994 Shillings Report titled "Review of Electronic Gaming Machines in Victoria".

**Table 3.1 Studies into the impact of gambling: an overview**

Status	Economic dimension			Social dimension	Overall
	Geographical and short run/long run focus	Conclusions	Reasons		
NIEIR (two studies)	<ol style="list-style-type: none"> <li>1. State – Victoria</li> <li>2. Current or short term focus. That is, how gambling influenced economic activity in Victoria, 1994 to 1996, through household savings reductions and unutilised factors of production.</li> </ol>	<p>To 1996 the expansion of gaming services from the early 1990s exerted a strong positive influence over the Victorian (and national) economy.</p> <p>GDP expands by \$0.76 million per \$ million expansion in gambling revenue. 13.5 jobs were created per \$ million expansion in gambling expenditure.</p>	Additional tourism expenditures, construction activity and declines in the household savings ratio.	Ignored	No conclusions
Productivity Commission	<ol style="list-style-type: none"> <li>1. National</li> <li>2. Long term focus. Assumed full employment. Assumed that consumers have no ability to reduce savings (that is, to increase consumption relative to income).</li> </ol>	Consumer surplus benefit of between \$4.4 billion and \$6.1 billion annually.	Benefits to consumers who can now access a preferred form of entertainment.	Losses from, lower productivity, earnings loss, crime, emotional distress of family, relationship break-up, depression and suicide are placed at between \$1.8 billion and \$5.6 billion annually. The social costs are for 1997-98.	Net annual benefit of between -\$1.2 billion and \$4.3 billion.
Workplace Study Centre Victorian University	<ol style="list-style-type: none"> <li>1. Regional (Victorian) low income Local Government Areas.</li> <li>2. Mixes short and long run assumptions to minimise gross benefits from gambling.</li> </ol>	The expansion in gambling has had a net negative impact on low income regions.	Model assumptions (no reduced savings effect, no disbursement of state-wide benefits to the regions) guarantee the results obtained.	Some discussion.	A net negative for low income regions.

The 1997 NIEIR/SGS retail study focused on national sales in particular, and household savings ratios in general. The methodology was divided into two parts, namely:

- (i) time series analysis; and
- (ii) microsimulation analysis.

The time series analysis examined trends in consumer expenditures (relative to income) between Australian states between 1991-92 and 1995-96. The study concluded that there was no evidence to suggest that the strong expansion in gambling expenditures in Victoria (relative to other states) had depressed retail expenditures, or indeed, consumer expenditures generally in Victoria. The corollary of this was that the increase in gambling expenditures had:

- been financed out of past and present savings; and/or
- had triggered complementary expenditures which offset the expenditure substitution effect.

This is designated as the household savings hypothesis.

As was recognised in the retail study, the broad brush approach of time series analysis required complementary research strategies to verify any hypothesis suggested by time series analysis. This was done with:

- (i) microsimulation analysis using the 1994 Household Expenditure Survey (HES) data; and
- (ii) Establishment Survey analysis.

With the publication of a new round of the HES relating to 1994 it was no longer necessary to rely heavily on the “latent poker machine player” model. However, the results using the 1994 HES were broadly the same as those which had used 1989 data, with the study finding that the increase in EGM gambling expenditure was likely to have been financed out of a reduction in savings. This study repeated the analysis from first principles, using new data, yet the conclusions remained the same.

The establishment survey analysis also revealed strong positive spill-over effects from gambling expenditures to general retail activity.

The Productivity Commission in its study examines the NIEIR/Spiller, Gibbons, Swan national study. It does not undertake any original research to verify or reject the findings of the study. Indeed, the Productivity Commission cites two studies using market sector macroeconomic models of the type used by NIEIR to look at the impact of gambling on retail expenditure. One study was by Econtech and the other by the Centre for International Economics (CIE). Both studies verified NIEIR’s original conclusion that expansion in gambling expenditures had a negligible impact on retail expenditures.

As noted in Table 3.1, however, the Productivity Commission’s preferred assumption is that household savings ratios do not decline. That is, in its calculations of the gross benefits of the increase in gambling the Productivity Commission assumes that expansion was not in whole, or in part, financed by reductions in household savings. The implicit assumption is that it is financed by foregone entertainment and recreational expenditures.

How does the Productivity Commission justify this assumption? It does not duplicate the retail study analysis in order to verify or reject its conclusions. Instead, the Productivity Commission's defence of its position is argued along the following lines.

Firstly, its summary of surveys of gambling patrons indicates that, on average, respondents interviewed over the phone claimed that 20 per cent of their gambling expenditure was financed from reductions in savings and the rest by expenditure substitution. As is pointed out in the current study, this is a common finding from these types of sources. However, these sources cannot be used to interpret macroeconomic impacts.

The second approach is to quote two submissions from Access Economics, acting on behalf of Tattersalls, to the Productivity Commission inquiry. Access note that although household savings rates have declined over the 1990s they conclude that there is "no reason to single out changes in gambling as having in any way a 'special' impact on savings" (Productivity Commission Vol. 1, p. 5.33). This is not correct. As is outlined in Section 4 of this report, a state based analysis of the performance of the aggregate savings ratio clearly shows for the Victorian experience (relative to other states) a strong *a priori* link between the expansion in gambling expenditure and a decline in aggregate household savings.

In addition the point is added that "as much gambling expenditure is undertaken by people with low incomes and little discretionary savings it is hard to see how the increase in gambling expenditure could be funded by a fall in savings" (Productivity Commission report, Volume 1, p. 5.33). The logic here is that household units cannot have a negative savings ratio. This is incorrect, since, unfortunately though it may be, they can and do. Currently the aggregate household savings ratio (net, after depreciation) is near zero. Given the substantial positive savings ratio by high income households the zero aggregate rate implies that a significant proportion of low income households currently have negative savings ratios.

Households can sustain negative savings ratios by:

- (i) increasing debt levels;
- (ii) running down financial assets;
- (iii) selling non-financial assets; and
- (iv) intra-family asset transfers.

The Productivity Commission recognises this when discussing the financing of problem gambling. Much of Australia's economic growth over the past few years has been driven by running down the savings of low-income households.

The NIEIR retail study did not argue that the savings hypothesis was likely to be sustainable for ever and a day. Indeed, it expected that the savings reduction financing of gambling expenditures would decline over the period to 2005. However, in the environment of the mid to late 1990s, not only was a substantial portion of the increase in gambling financed from savings, but the rundown in the household savings rate, in the absence of alternative sources of demand, increased the level of economic activity.

This conclusion is valid only for the particular circumstances of Victoria at that time. These special circumstances revolved around the relation of the high household savings ratio in Victoria relative to other states in the early 1990s. Nevertheless, the Victorian conclusions have strong national implications because of the importance of Victorian expenditures in driving the growth in national gambling expenditures over the decade.



The last line of attack on the savings hypothesis as put forward in the retail study is to question the use of the HES. This theme is also strongly taken up by the Workplace Study Centre study. The main line of attack is to point to the under-representation of gambling expenditures in the raw HES survey results. It is argued that if gambling expenditures are so under-represented, any analysis using the HES must be extremely suspect.

The answer to this is twofold:

- there is no better source; and
- the HES produces an entirely believable pattern of gambling expenditures, particularly once its records are adjusted for under-statement (see Sections 4.4 and 4.5 and Appendix 2).

Most of Australia's macroeconomic indicators are now based on survey results. The raw data from these surveys are often under-representative of the population as a whole and require adjustment and refinement before conclusions can be drawn. In this context the HES is little different from any other data source. The present study spends considerable effort in reconciling the HES to other sources, and adjusting and validating the use of HES data as a policy analysis tool in relation to gambling expenditures.

Given the demonstration of the savings hypothesis, the second NIEIR study for the Authority was the employment study which was simply an economy-wide (that is, state-wide) assessment of the gross benefit of gambling using an appropriate econometric model for positive economic research. The methodology for this assessment followed the steps outlined in the previous section.

The Productivity Commission report (Volume 1, p. 5.30), lists other model-based studies which, along with the NIEIR study, showed the impact of gambling expenditures on the macro economy. Among these, the CIE study adopts similar positive economic research assumptions as NIEIR (for example, under-utilisation of labour resources) and obtains very similar conclusions as to the quantitative stimulus which the expansion in gambling expenditures imposed on the economy.

By contrast, the ACIL and Econtech studies assumed an economic environment that did not exist in the mid to late 1990s. They assumed full employment. At best these studies describe how the economy may have adjusted to the expansion of gambling expenditures in the 1950s and 1960s, or what may be the case sometime over the next decade or two. Therefore, they cannot be used as insights into the current gross benefits of gambling activities.

### **3.2 The Productivity Commission study**

The Productivity Commission's study in relation to the assessment of the gross benefits of gambling is in the same category as the ACIL and Econtech results. That is, it is at best a long run analysis that may be of positive research relevance at some point in the future. The Productivity Commission assumes:

- (i) a zero net savings response to increased gambling expenditures; and
- (ii) full employment of resources.

This allows the Commission to adopt its preferred research methodology of assessing the gross benefits of gambling via calculation of producer and consumer surpluses. Given the lack of justification for this procedure, it would appear that the preferred research methodology has determined what assumptions are to be made. This is normative, not positive, economic research.

### ***The fundamental flaw in the Productivity Commission study***

The Productivity Commission's approach in terms of its assessment of the gross benefits of gambling in conjunction with its approach to calculating the social costs of gambling, leads to a fundamental flaw in its research methodology.

The gross benefits which it calculates from gambling are what may or may not arise at some point in the future when the Australian economy can effortlessly maintain full employment. The costs of gambling are calculated as of 1997-98. The Productivity Commission is comparing short run costs with long run benefits in circumstances where, given the assumptions employed, the long run benefits are significantly less than the short run benefits. This is because, given the unconstrained economy of the mid to late 1990 decade, the gross benefits of gambling will be the sum of the resource expansion effect (as calculated by NIEIR) and the resource reallocation effect identified for the long run by the Productivity Commission. This balancing of short run costs against long run benefits is simply unacceptable.

Given that the current gross benefits from gambling are likely to be higher than long run benefits, a reasonable hypothesis is that the current short run costs of gambling may also exceed long run costs. The situation with gambling is similar to the assessment of financial deregulation. The consensus in this case (including the Productivity Commission's position) is that the introduction of financial deregulation in the early 1980s had high short term benefits but also high short term costs, as financial and non-financial enterprises took the opportunities available from deregulation to excess. This led to the severe balance sheet recession in the early 1990s. As a result of this experience non-financial enterprises have learnt how to manage debt more conservatively. There has been a decline in both the gross benefits and gross costs (from the corporate perspective) of financial deregulation.

It will be similar with gambling. As households pass from the current regime of unsustainable financing of gambling to a more constrained environment, their more conservative approach will reduce the costs of gambling.

By comparing the level at which gross benefits may settle in the long run with the current costs of gambling the Productivity Commission has under-estimated net benefits. Because of this the Productivity Commission study is not a valid study of the overall net benefits from gambling. This conclusion is reinforced by the inconsistency between the Commission's calculations of the social costs of gambling (which imply heavy dissaving) and its rejection of the savings hypothesis.

### ***The Productivity Commission's incompatible calculations of gross benefits and gross costs***

Simple arithmetic is all that is necessary to show that the Productivity Commission estimate of the costs of gambling imply a high savings reduction to finance gambling expenditures.

The Productivity Commission estimates that problem gamblers account for one third of gambling expenditures. They lose an average of \$12,000 per year. Problem gamblers finance their expenditures by:

- running down savings to the point where all income is spent;
- foregoing basic expenditures (e.g. food);
- running down financial assets;
- increasing debt;
- selling tangible assets; and
- resorting to crime.

The present study (Section 4.5 below, also Appendix 2) estimates that high debt/no asset gamblers (representative of problem gamblers) have a high propensity to undertake net complementary expenditure (eating away from the home, alcohol, tobacco, other entertainment) as a result of the gambling activity. Expenditures complementary to gambling increase; they are not reduced in order to finance gambling. The multiplier found is \$0.85 per dollar of gambling expenditure. This suggests that problem gamblers not only finance expenditures out of current and past savings, but generate a dissaving rate relative to gambling expenditure which is greater than one.

To be conservative it will be assumed that this dissaving rate is not 1.85 but 1.2.

The Productivity Commission study also identifies a significant proportion of high gamblers who are not problem gamblers, that is, gamblers who are rich enough to afford a high level of gambling activity. It is known, for example, that “high rollers” constitute approximately one fifth to one quarter of casino revenue. It will be assumed that 15 per cent of gamblers constitute this category with 100 per cent financing of gambling expenditure out of savings. For this group expenditure increases on complementary goods and services will be assumed at 30 cents in the gambling dollar. This is the rate identified in this study for the top 0.5 per cent of EGM spenders.

For the remaining gamblers, the Productivity Commission and Authority survey finding of a 20 per cent savings draw-down will be adopted.

These estimates imply a weighted average savings draw-down ratio of:

$$(1.2 * 0.33 + 1.3 * 0.15 + 0.20 * 0.52) = 0.70; \text{ or}$$

$$\text{dissaving rate} * \text{problem gamblers} + \text{dissaving rate} * \text{high gamblers} + \text{dissaving rate} * \text{remaining gamblers}$$

This simple arithmetic indicates the inconsistency between the Productivity Commission’s estimates of gross benefits and gross costs. The Commission’s gross benefit assumption of a zero savings deterioration implies a very much smaller problem gambler component. This disconnect invalidates the Productivity Commission’s overall conclusions in relation to the cost-benefit ratio of gambling at the national level.

Alternatively, if the Productivity Commission reconciled their gross benefits with their estimates of gross costs by assuming that increased gambling results in a decline in the household savings ratio, they would have to adopt a methodological framework closer to that used by NIEIR. In this case the gross benefits would be considerably higher.

### ***Consumer surplus and the resource allocation effect***

The Productivity Commission results assume zero resource expansion effect, and derive the whole of the benefit from consumers' and producers' surpluses. By contrast, NIEIR captures the resource expansion effect and in addition models any increase in producer surplus through the impacts of gambling on the structure of industry activity. The NIEIR results do not, however, add in the consumer surplus dimension.

NIEIR had always had difficulties of applying the concept of consumer surplus to gambling, as conventionally measured estimates of consumer surplus depend critically on the price elasticity of demand. To calculate a price elasticity it is necessary to observe consumer purchases of the given commodity at a variety of prices; but what is the price of gambling? For example, attempts to define price series based on the proportion of each bet retained by the gambling service (e.g. EGM) are far from satisfactory, since different types of gambling differ in ways other than the payout rate.

A more clear cut, meaningful and straight-forward approach would be to calculate the long run gross benefits from gambling on the assumption that the household funding of gambling from savings is somewhere between the current level of approximately 70 per cent and the 20 per cent level obtained from patron surveys. This is the approach adopted in the regional modelling results given in Chapter 6 of the present study.

Despite the very great methodological difference between long-run estimates based on this methodology and the Productivity Commission's consumer surplus calculations, NIEIR's estimates of long-run national benefits is of the same magnitude as the Commission's estimate. In the context of the mid to late 1990s, NIEIR's estimate of the expansion in private consumption expenditure in Victoria per \$ million expansion additional gambling expenditure may be adjusted as follows:

- (i) converted to Australia-wide gambling levels;
- (ii) adjusted for economic feedback efforts between the states; and
- (iii) adjusted for temporary factors such as major construction projects.

With these adjustments the total increase in national consumption expenditure is \$8.0 billion. This is comparable with the Productivity Commission's resource allocation estimates once the Commission's treatment for problem gamblers is taken into account.

However, over the next few years NIEIR would expect this estimate to decline as the savings/borrowers financing of gambling declines. This issue further considered in Chapter 5 of this study.

### ***Social costs***

The inconsistency between the calculation of the gross costs and the gross benefits of gambling is but one problem with the Productivity Commission's study. Another problem is the components which it has included in its total social cost calculation. The components and their associated high and low cost estimates are reproduced in Table 3.2. Given a Productivity Commission estimate of 290,000 (moderate or severe) problem gamblers, the 1997-98 annual cost per problem gambler is between \$6,000 and \$19,000.

Policy makers need quantitative estimates of costs and benefits which can be compared with estimates for a whole range of alternative resource allocation and social policy initiatives being simultaneously implemented across the policy portfolios. Given the quantitative framework adopted to assess general decisions most of the cost estimates included in Table 3.2 are useless as contributions to good policy making.

An example will illustrate this point. The Productivity Commission has led the way in opening up the Australian economy over the past two decades and thereby increasing the pressures of globalisation on the Australian workforce. Although the consensus is that this has resulted in increased national productivity, there has also been an increase in social costs associated with the general reduction of commercial, social and institutional protection of Australian households. These increased social costs have come from:

- increases in the inequality of the distribution of non-social security incomes;
- a greater proportion of the workforce in part time, casual or limited duration employment;
- longer working hours for most of those wishing to maintain growth in their real employment incomes;
- increased married female participation rates;
- few employment prospects for those over 45 who have lost full time employment as a result of structural change; and
- diminishing income and employment prospects for people with low to moderate skills.

All these changes have played their part in increasing personal and family stress, depression, attempted and realised suicides, personal destructive behaviour, crime, etc. Before the full results in Table 3.2 can be useful for policy makers, additional information must be provided which will allow policy makers to compare like with like. To do this the Productivity Commission would have to recalculate all its past cost-benefit estimates using the same methodology as employed in Table 3.2. In terms of general commercial policy, NIEIR has little doubt that the Productivity Commission would find that gross social costs of trade and industry policy changes over the last 15 years would, at the very least, be high in relation to the estimates of gross benefits now current. Indeed, it is very likely that, given the creation/destruction dynamics of the market system, any attempt to generalise the approach in Table 3.2 would quickly bring the methodology into disrepute as virtually all changes would become too costly to implement.

If the broad approach which the Productivity Commission has adopted for gambling were adopted for all studies of the economic system, the high social costs associated with general market activity would significantly reduce Australia's net GDP. If the general benefits of market activity are thus discounted, the Productivity Commission estimates of the net benefit from gambling could be interpreted as high in relation to costs. Alternatively, the methodology could be generalised to a revolutionary approach justifying a whole new plethora of market restrictions.

Until the Productivity Commission, other policy makers and the Australian Bureau of Statistics carry out the work to estimate the whole of this extended range of costs, all that can be done currently, in relation to gambling, is to reduce the eligible categories of costs where policy makers can compare like with like. This implies reducing the cost categories to those traditionally included in standard cost-benefit policy calculations. In this case the eligible cost categories for problem gamblers would include:

- bankruptcy;
- productivity loss at work;

- job change costs;
- crime and legal costs;
- costs of violence; and
- gambling counselling services.

Taking the average of the Productivity Commission high/low costs for these categories, the eligible cost total becomes \$186 million, or approximately \$650 per problem gambler. To this should be added the financial costs of divorce, medical treatment and the costs of unemployment. In this context the estimate in a recent New South Wales study<sup>3</sup> of \$1,300 per problem gambler seems reasonable if one wishes to err on the high side of useable estimates of the costs of problem gambling.

	Low	High
<b>Financial</b>		
Bankruptcy	1.3	1.3
<b>Productivity and employment</b>		
Productivity loss at work	21.0	150.0
Productivity loss outside work	7.2	50.0
Job change earnings loss	24.0	24.0
Job change employee job search	13.0	13.0
Job change employer staff replacement cost	22.0	22.0
<b>Crime and legal</b>		
Cost of police incidents	3.2	3.2
Court cases	5.6	5.6
Jail costs	5.1	5.1
<b>Personal and family</b>		
Emotional distress of immediate family		
Moderate problem gamblers	n.e.	n.e.
Severe problem gamblers	756.0	2 267.0
Emotional distress of parents		
Moderate problem gamblers	n.e.	n.e.
Severe problem gamblers	0.0	666.0
Break-up of a relationship <sup>(a)</sup>	288.0	864.0
Financial cost of divorce	2.8	2.8
Emotional cost of divorce	126	253
Cost of violence	2.8	8.3
Depression <sup>(b)</sup>	231.0	692.0
Thought of suicide <sup>(c)</sup>	120.0	239.0
Attempted suicide	70.0	117.0
Impact on immediate family	81.0	161.0
Impact on parents	0.0	21.0
<b>Treatment costs</b>		
Gambling counselling services	20.0	20.0
<b>TOTAL</b>	<b>1 800.0</b>	<b>5 586.0</b>

Notes: n.e. Not estimated  
 (a) Excluding those that lead to divorce or separation.  
 (b) Excluding those reporting thoughts of suicide.  
 (c) Excluding estimated attempted suicides.

Source: Productivity Commission Study.

<sup>3</sup> Dickerson, M., Allcock, C., Blaszczyński, A., Nicholls, B., Williams, R. and Maddern, R. 1998, *An Examination of the Socio-economic Effects of Gambling on Individuals, Families and the Community Including Research into the Costs of Problem Gambling in New South Wales: The 1997 Study 2 Update*, report prepared for the Casino Community Benefit Fund, NSW Government, 1998.

### **3.3 Report by the Workplace Study Centre of Victoria University**

The Workplace Study Centre focuses on the likely impact of gambling on four low income Melbourne Local Government Areas, Brimbank, Greater Dandenong, Maribyrnong and Moreland.

The authors of the study seem to think that it is necessary to attack NIEIR's state-wide findings in order to justify an assumption which will lead to a negative impact of EGM expansion in low income regions. This is not the case. With regard to the savings hypothesis it has never been suggested that the poorest regions could predominantly finance gaming through a reduction in savings. Without being able to appropriately reduce savings (which are potentially non-existent) the ability to increase long run discretionary gambling expenditure is constrained. Due to this, it was explicitly pointed out in the retail study that low income regions would not receive the same gross benefit as suggested by the state average results.

In terms of the regional modelling the Workplace Study Centre study is deficient. In particular:

- (i) only local residents are assumed to use local venues; and
- (ii) there is no spillover benefit from regions which benefit from gambling into the four regions under study.

Other quantitative assumptions made by the authors of the study are at best questionable. Chapter 5 of this NIEIR study calculates the impact of gambling on all LGAs, including the four LGAs specified by the Workplace Study Centre, using NIEIR's general methodology. Without resort to the extreme assumptions adopted by the Workplace Study Centre, NIEIR confirms that the increase in gambling has been to the relative disadvantage of low-income areas, and may eventually be to their absolute disadvantage.





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## 4. Analysis

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Data on the increase in gambling which were collected at the industry level are detailed and believed to be accurate, at least with regard to legal gambling. By contrast, the available data on household response have been much criticised. The methodology attempted to make the best possible use of these mixed sources.

### 4.1 Introduction

In this chapter a number of different methodologies will be developed. This diverse set of analyses rigorously tackles the set of assumptions that underpin our economic analysis at the household, regional and macroeconomic levels.

The role of savings in financing gaming expenditures is analysed using both macro expenditure trends (Section 4.2) and micro economic data (Sections 4.4, 4.5). The use of both types of analysis is important in making a clear distinction between economy-wide average behaviour and the economic consequences for particular individuals (Section 4.1). The chapter specifically deals with the long run consequences that gambling will have on asset formation for a household (Section 4.6).

Important analyses are also conducted into the role of complementary and substitute goods. Understanding the impact on expenditure patterns across expenditure classes is crucial in determining the long run impacts of this new form of expenditure.

In addition this chapter outlines the structure and detail of the regional modelling used to assess the impact of electronic gaming machines.

### 4.2 Arguments about gambling and saving

As discussed in Chapter 3, the question of the effect of gambling on savings rates has aroused much controversy. The *a priori* arguments in favour of a reduction in the savings rate include the following.

- Savings are a residual, and easily squeezed if a new, exciting and vigorously advertised expenditure opportunity arises; particularly if spending is at venues where it is fairly easy to become excited and temporarily lose control of the purse.
- For some people at least, gambling may be a problem, and the introduction of new opportunities will cause them to squander their savings as well as trim other expenditures.
- Gambling may also directly substitute for some forms of saving, such as investment in speculative stocks, which from the investor's point of view yield thrills not entirely different from gambling.

Contrary *a priori* arguments include the following.

- In abstract economic theory, the savings rate is determined by rational choice between present and future consumption, adjudicated by interest rates. Increased pressure to consume is not among these traditional determinants. Belief in this form of economic theory seems to underlie the Productivity Commission's disinclination to believe that gambling has been financed to a significant extent from a reduction in savings rates. (It

may be noted that belief in this form of theory also precludes any Keynesian benefits from reduced savings rates, since by definition demand is never deficient and demand-deficiency recessions are logically impossible.)

- Gambling is a current expenditure, and therefore, unlike purchases of houses or cars it could be morally argued that it should not be financed from borrowing. There may be a suspicion that some of those who argue that gambling has not impacted on saving have been distracted by their normative concerns, and converted this moral imperative into actual behaviour (despite the fact that the financial sector, through personal loans and credit cards, has for several decades been vigorously encouraging households to borrow to finance current consumption).
- How can problem gamblers dissave when they are already broke? This question seems to underlie the arguments of those who are concerned that gambling has reduced retail turnover in poor areas.

To some extent, these perceptions relate to differences in timing. Consider, first, the argument that people may, almost accidentally, dip into savings in response to the availability of a new consumption opportunity, versus the Productivity Commission's predictions. Households whose initial reaction to the availability of enhanced gambling opportunities is to reduce savings may, when they realise that this is happening, either cut back on gambling or cut back on other expenditures. This is particularly likely for those who, having sampled the new opportunities, decide that gambling is "a mug's game". In other words, savings may fall in the initial excitement, but subsequently return to normal as the Productivity Commission believes. Even so, NIEIR's original hypothesis that the extension of gambling in Victoria would lead to a reduction in the household savings rate was based, in part, on evidence that the household savings rate in New South Wales was lower than in Victoria when there were poker machines north but not south of the Murray<sup>4</sup>; and also on evidence that heavy-gambling households have lower savings rates than non-gambling households.

The habit forming properties of gambling are a matter of degree, ranging from not at all (people who are put off by both gambling itself and the surroundings where it is practised) to very severe (people who engage in all manner of social deception and crime in order to finance their gambling habit). The introduction of new forms of gambling is likely to create new players who lose control (people who were not at risk from horse racing, TABs or lotteries may be caught by EGMs or Casino games), including a burst of new players losing control when the temptations are first introduced. In that it takes some time for players to develop a lack of control, there will be a sequence of household budget adjustments, including:

- reduced savings (such as reduced rates of paying off house mortgages, increased personal debt, rundown of assets especially those which are readily cashed);
- reduced expenditures on other consumption goods and services;
- efforts to increase income, either legally (working more) or illegally, and finally; and
- complete social malfunction; inability to hold down a job, even suicide.

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<sup>4</sup> Australian National Accounts.

If the household starts off rich, it may be able to afford a high level of gambling indefinitely. If it starts off poor, it will not be long before losses begin to bite. At the aggregate level, this means that an increase in the availability of gambling facilities is likely to be followed by:

- a period during which the household savings rate falls as problem gamblers emerge and dissipate their assets, followed, some time after the increase in availability of facilities has stopped, by
- stabilisation of the household savings rate, possibly at a lower level than before (the new batch of problem gamblers has dissipated its assets, and the rate of new players losing control has fallen).

In other words, both the novelty effects of new gambling outlets, and the creation of a new batch of problem gamblers (some of whom may start off with considerable assets which they can dissipate) points to a fall in the household savings rate, at least in the years immediately following the expansion of facilities. Add to these considerations the fact that Victoria's new gambling outlets were established during a consumer boom when dissaving was in fashion and it would be surprising if the initial impact did not include a fall in the aggregate savings rate. The longer-term impact may include rather less dissaving, but it is still possible that the household savings rate will stabilise at levels lower than would be the case if legal gambling were more restricted.

So much for the *a priori* arguments. There are two important sources of positive evidence:

- the time sequence of events and
- cross-section data at the household level.

We begin analysis by examining the time sequence.

### **4.3 Historical trends**

Recent historical trends in gambling expenditures can be documented from the National Accounts. These estimates are based on industry returns, and should therefore be reasonably accurate. The National Accounts place expenditures in the context of the overall economy of each state.

#### **4.3.1 Trends in gambling as a proportion of total household expenditure**

The priority which consumers give to expenditures on gambling (i.e. net gambling losses) may be assessed from the proportion of such expenditures in total household spending.

The rather surprising result, see Figures 4.1 to 4.8, is that gambling expenditures, as a per cent of total household expenditures, in the past two to three years have:

- stagnated in four states, in some cases after increases earlier in the decade (Queensland, South Australia, Tasmania and the Northern Territory);
- decreased from a peak in the early 1990s in two states (Western Australia and the Australian Capital Territory); and
- increased significantly in two states (New South Wales and even more Victoria).

The data also gives precedents for falls in gambling as a proportion of total expenditures:

- in New South Wales the gambling expenditure share declined from 1983 to mid 1987; and
- in Tasmania the gambling expenditure share also declined from 1983 to 1986.

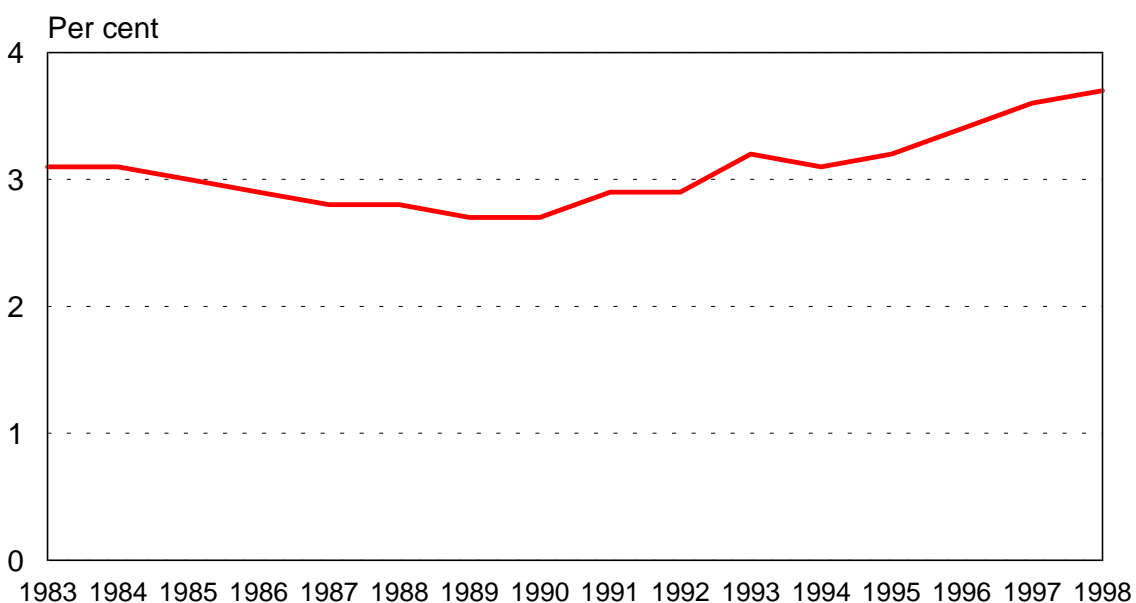
Victoria has an unusual gambling profile: the gambling expenditure share was constant at a low level from 1983 to the end of 1992 and then exploded from 1.5 to 3.2 per cent within only two and a half years. This is the strongest increase of any state since 1983. The second strongest increase occurred in South Australia from early 1994 to mid 1996, from 1.7 to 2.8 per cent.

The Northern Territory showed a somewhat similar development: from 1983 to early 1992 the gambling expenditure share was constant, then increased strongly until early 1996, and stabilised at that level. The Victorian gambling expenditures, however, did not stabilise, but continue to rise, although at a slower rate: steadily from 3.2 per cent in 1995 to 4.0 per cent at the end of 1998.

This means that in early 1997 Victoria took New South Wales' place as the top Australian gambling state and now leads New South Wales by approximately 0.4 percentage points. The Victorian gambling share by 1998 was 10 per cent higher than the share in New South Wales. The New South Wales figures however, are likely to rise significantly with the introduction of EGMs into hotels.<sup>5</sup>

**Figure 4.1: Share of gambling expenditures of total household expenditures**

**New South Wales**

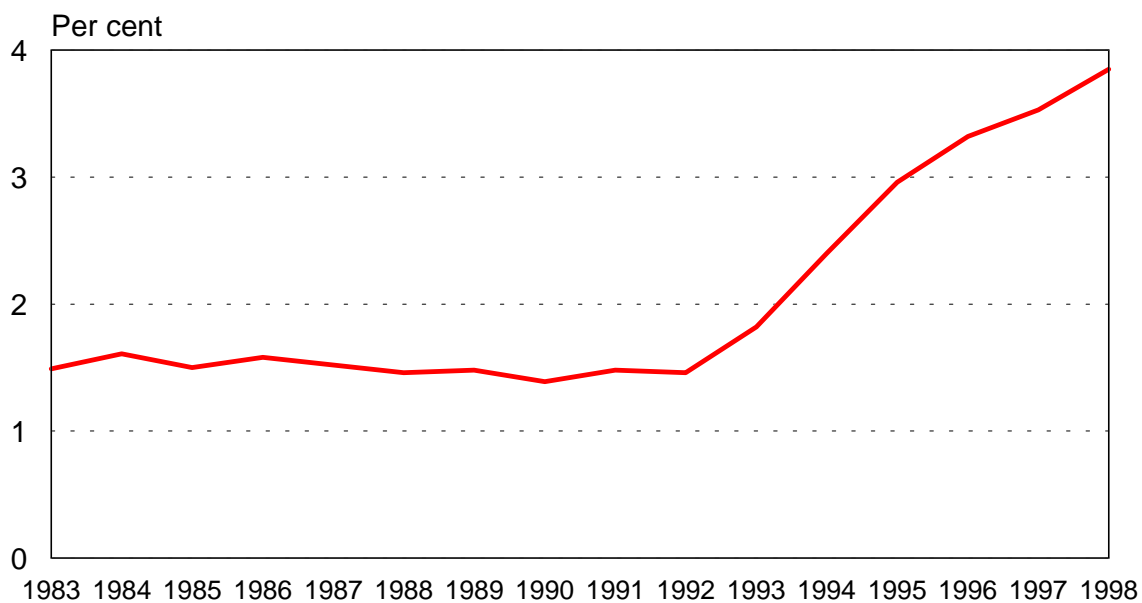


Source: Australian National Accounts.

<sup>5</sup> Prior to 1999 hotels were only permitted Approved Amusement Devices – Draw Poker Machines. For further discussion on the recent history of gaming expansion see “Australian Gambling Comparative History and Analysis” recently published by the VCGA.

**Figure 4.2: Share of gambling expenditures of total household expenditures**

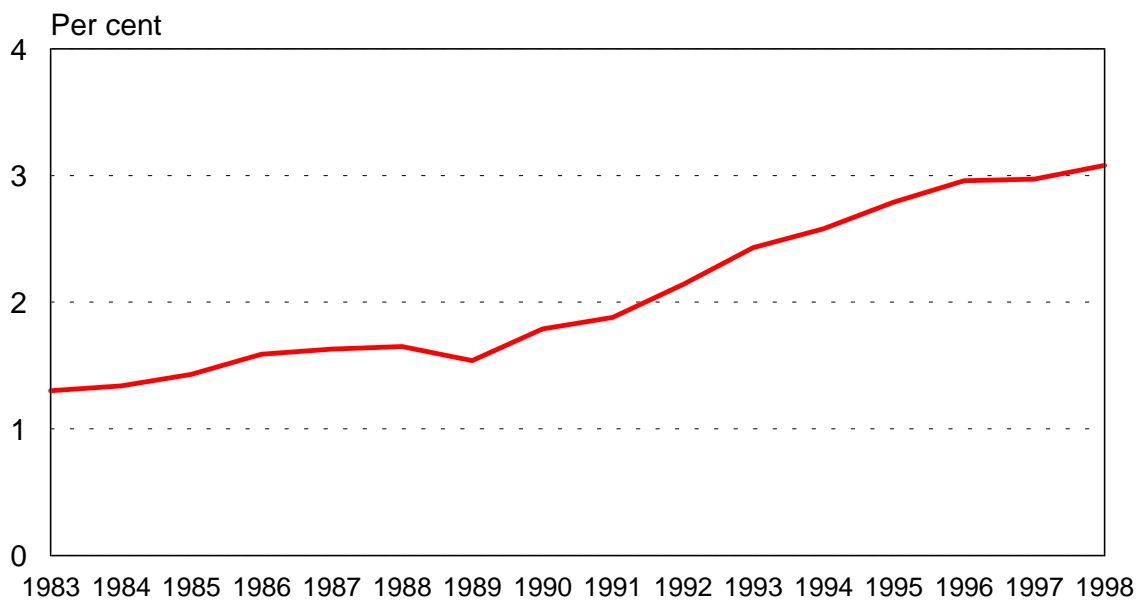
**Victoria**



Source: Australian National Accounts.

**Figure 4.3: Share of gambling expenditures of total household expenditures**

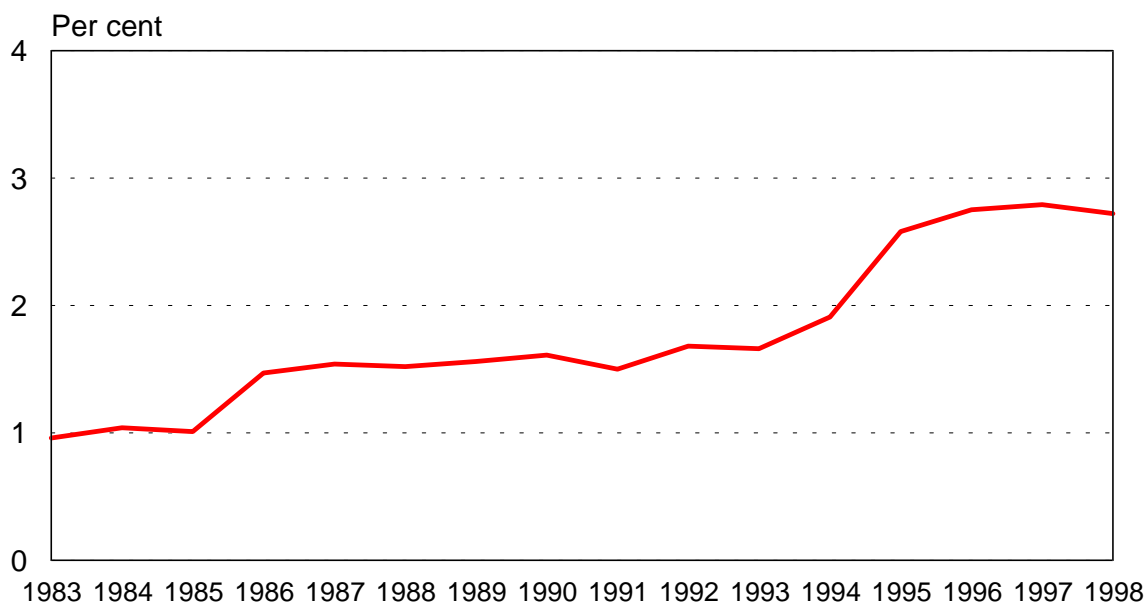
**Queensland**



Source: Australian National Accounts.

**Figure 4.4: Share of gambling expenditures of total household expenditures**

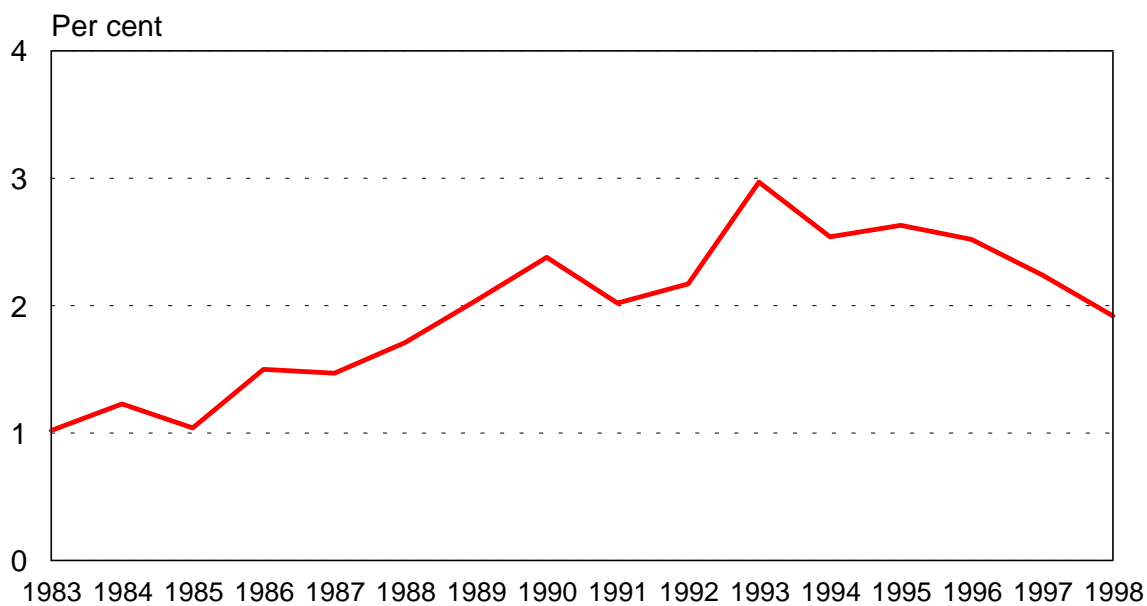
**South Australia**



Source: Australian National Accounts.

**Figure 4.5: Share of gambling expenditures of total household expenditures**

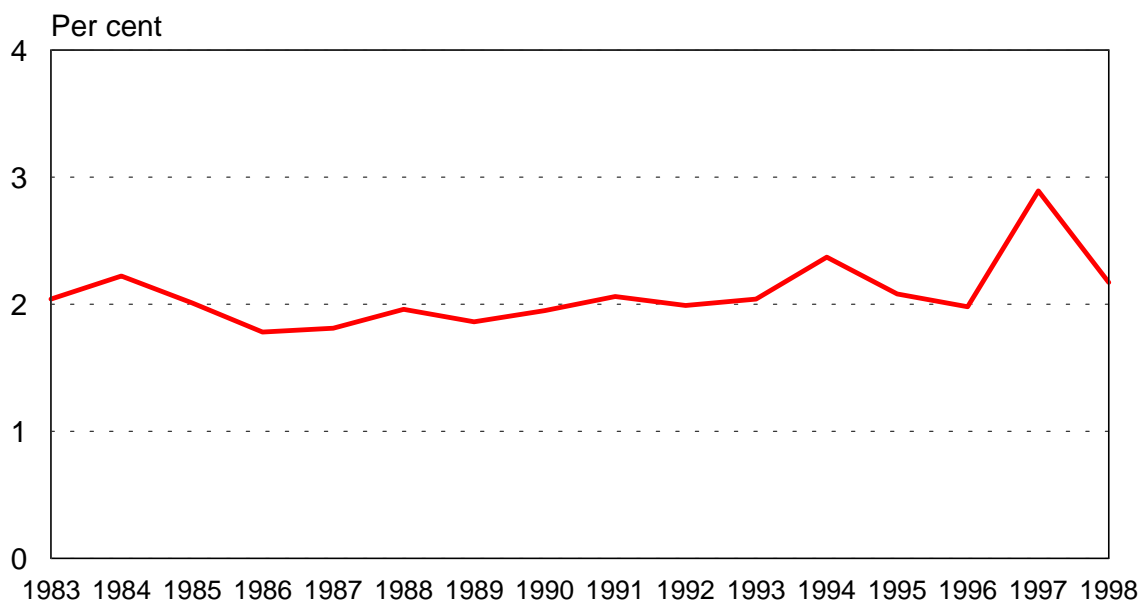
**Western Australia**



Source: Australian National Accounts.

**Figure 4.6: Share of gambling expenditures of total household expenditures**

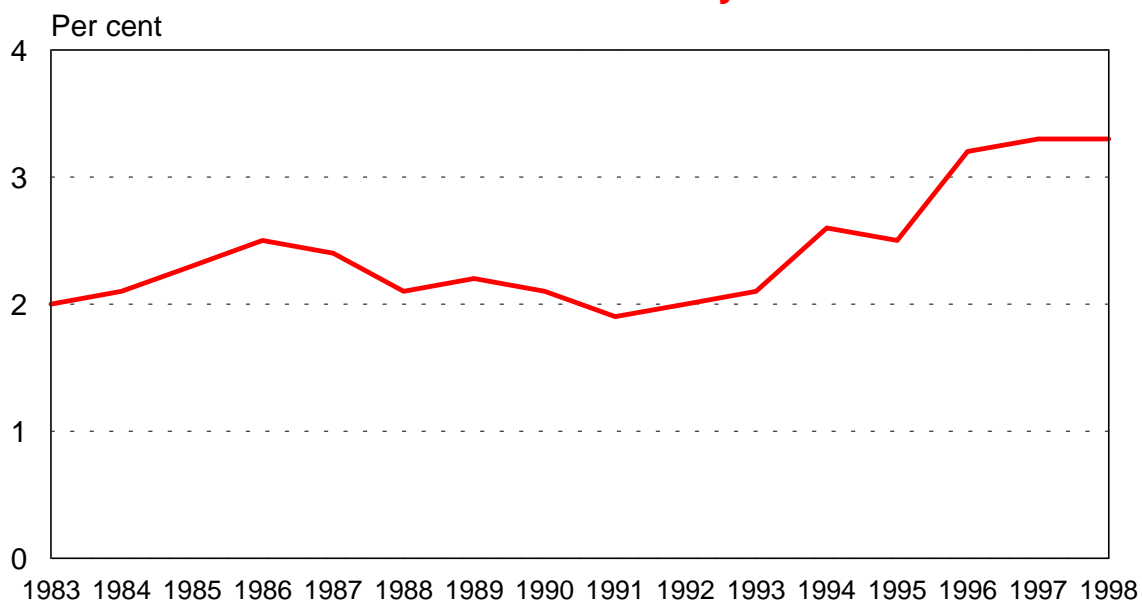
**Tasmania**



Source: Australian National Accounts.

**Figure 4.7: Share of gambling expenditures of total household expenditures**

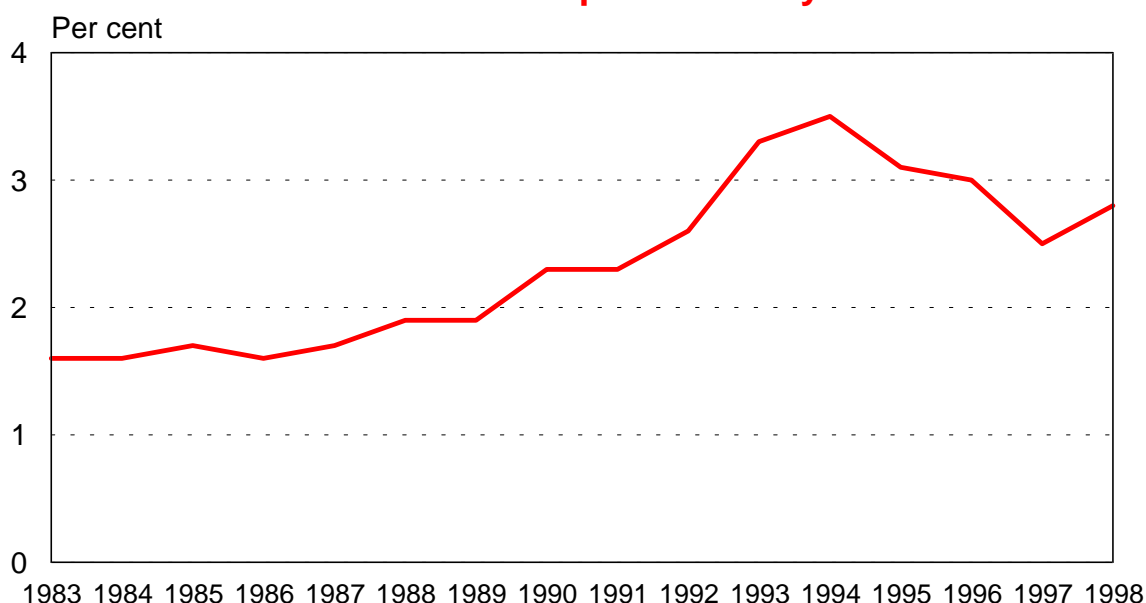
**Northern Territory**



Source: Australian National Accounts.

**Figure 4.8: Share of gambling expenditures of total household expenditures**

**Australian Capital Territory**



Source: Australian National Accounts.

The absolute expenditures per adult are also higher in Victoria than in New South Wales, see Table 4.1. This contradicts the per capita expenditures from the Australian Gambling Statistics, which state that for 1997-98 New South Wales had a per capita gambling expenditure of \$963 and for Victoria only \$921. However, the Australian Statistics contain expenditures of interstate and overseas tourists, which the ANA exclude. For example, the ABS estimates spending in the ANA private final consumption expenditures on gambling for 1997-98 for New South Wales as \$4,311 million, but the Australian Gambling Statistics state \$4,527 million. That is, 4.8 per cent of total gambling expenditures in New South Wales was not done by New South Wales residents (net difference taking account of import and export). For Victoria, the ANA estimates are only 1.3 per cent lower than the Australian Gambling Statistics. As a result, gambling expenditures in New South Wales are higher than in Victoria if divided by the number of adults, however, the expenditures of New South Wales residents on gambling per adult is less than the expenditures of Victorian residents.

**Table 4.1a Total gambling expenditures in New South Wales and Victoria**

	Sep. 1997	Dec. 1997	Mar. 1998	Jun. 1998	Sep. 1998	Dec. 1998
New South Wales (\$ million)	1 058	1 087	1 102	1 064	1 075	1 108
Victoria (\$ million)	770	835	763	786	851	941
New South Wales/Victoria ratio (%)	1.37	1.30	1.44	1.35	1.26	1.18
New South Wales (\$/adult per week)	17.4	17.8	18.0	17.3	17.4	17.9
Victoria (\$/adult per week)	17.2	18.5	16.9	17.3	18.7	20.6

Source: Australian National Accounts.



The expenditures on EGMs are still higher in New South Wales than in Victoria. The ABS does not publish EGM expenditures by state, so only the Australian Gambling Statistics provides data for this comparison. If the ANA corrections for total gambling in 1997-98 are applied to EGMs for both years the following picture emerges for EGM expenditures.

	1996-97 (\$)	1997-98 (\$)	Growth (per cent)
New South Wales	9.80	11.60	19
Victoria	8.07	9.36	16

Source: Australian Gambling Statistics, Australian National Accounts and own assumptions.

Until 1996-97 the EGM growth per adult was significantly stronger in Victoria than in New South Wales. Only in 1997-98 was the growth in New South Wales stronger than in Victoria. However, it is quite likely that Victorian EGM growth in 1998-99 will again be larger than the New South Wales' EGM growth, as the Victorian growth rate of total gambling is significantly higher than that for New South Wales, and the EGM expenditures make up around half of total gambling expenditures. Victorian per adult expenditures for the September 1998 and December 1998 quarters are 10 per cent higher than for the same period in the previous year, see Table 4.1a. The growth rate is the same for New South Wales of only 0.3 per cent, see Table 4.1a.

#### **4.3.2 Trends in gambling expenditures and household savings rates**

A crucial question which may be addressed using time-series data is: To what extent were the reduction in the aggregate household savings rate, and the resulting increase in household debt, related to the increase in gambling, and to what extent relate to other factors such as the easy money policy? At first sight interstate comparison should allow firm conclusions, at least in some areas. For example, from the bottom of the recession in 1991-92 to 1998-99 the rate of growth of Gross State Product was similar in New South Wales and Victoria, but patterns were different. In particular, the growth of output of recreation, personal and other services was greater in Victoria. Since gambling is included among such services, it is likely that increased output of gambling services contributed more to the boom in Victoria than in New South Wales. However, the difference might simply reflect the nature of the boom in the two states: in Victoria the boom was based squarely on increased household consumption, with increases in other consumer-oriented outputs also noticeable, and high in relation to New South Wales in retail trade and transport and communications. In New South Wales the boom, while still consumer-based, emphasised increased output of financial, property and business services.

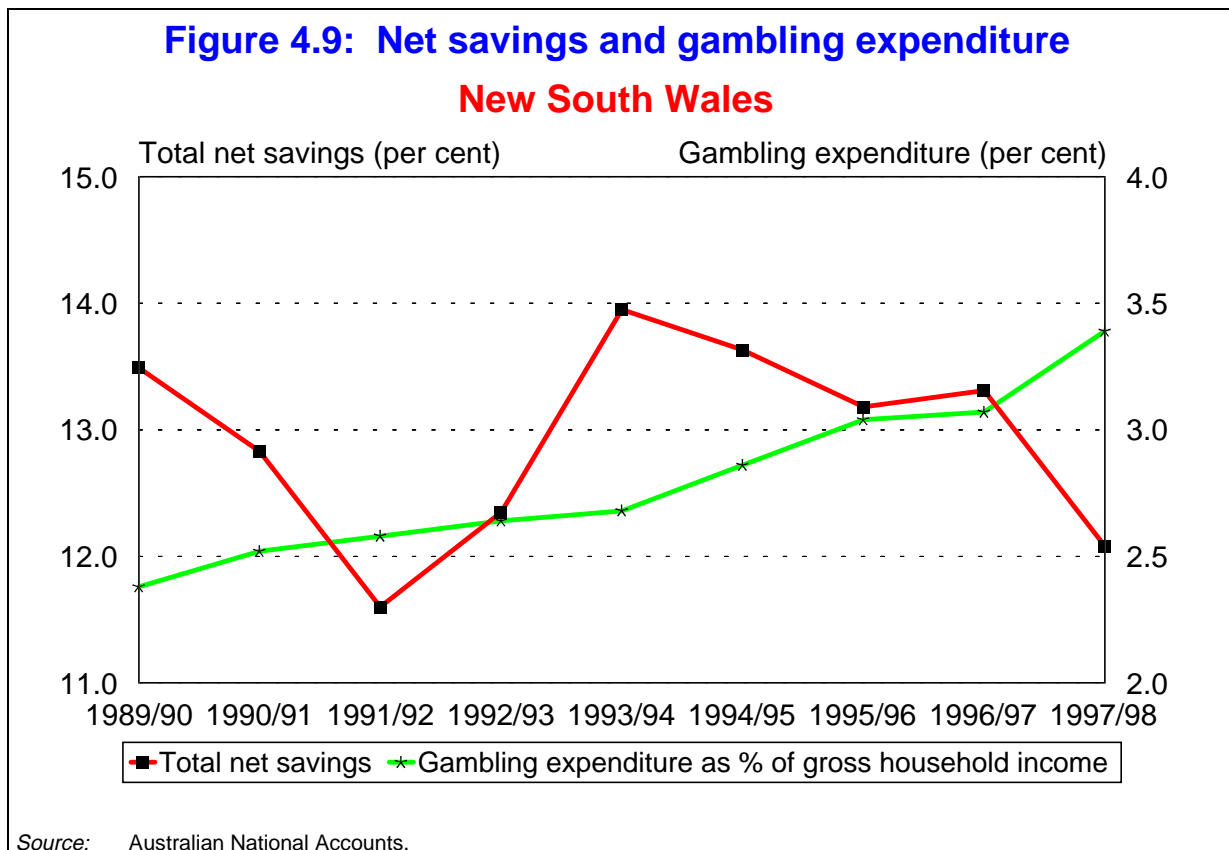
The National Accounts not only confirm that gambling has increased its share of household expenditures; they make possible a set of interstate comparisons of direct relevance to the hypothesis that one of the benefits of the increase in gambling has been a fall in the household savings rate. As stated several times before, this may only be counted as a benefit to the extent that the alternative was the underemployment of capital and labour. It has been argued that this was the case in Australia during the 1990s, and particularly so in Victoria.

For this purpose, the relevant comparison is between the household savings ratio (savings as a percentage of gross household disposable income) and gambling expenditures as a percentage of gross household disposable income. (Gross in these definitions means before calculation of depreciation; disposable means after payment of income tax and excluding incomes over which households have no control, such as interest on superannuation funds.) Figures 4.9 to 4.14 show the history of these household gambling and savings ratios by state for the 1990s.

In Victoria the aggregate household savings ratio fell every year in the decade, and the gambling ratio rose every year. In both cases the cumulative change was significant; gambling up from 1 per cent to 3.5; household savings down from 20 per cent to 10 per cent.

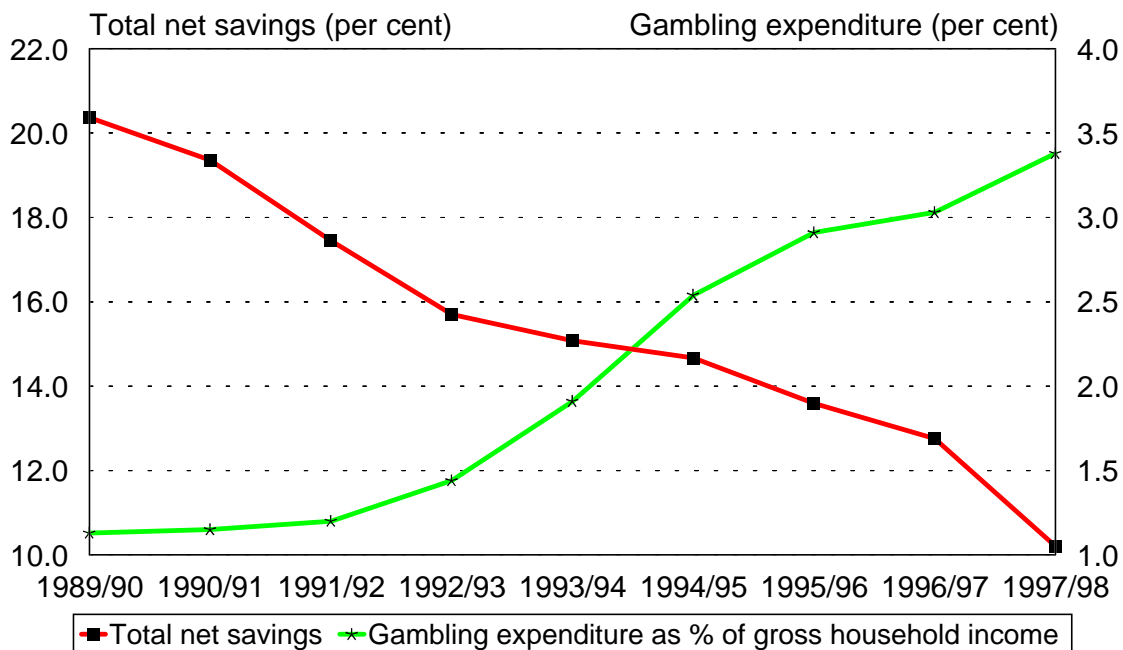
In NSW there was a smaller increase in the gambling ratio, from 2.5 to 3.5 per cent, accompanied by a fluctuating household savings ratio which started much lower than the Victorian ratio and ended higher. Patterns in Western Australia and Queensland were fairly similar to this, while in Tasmania they were closer to the Victorian pattern. In South Australia the household savings ratio collapsed with the recession in 1990-91, well before gambling expenditure began to increase. In that state, the increase in gambling expenditure from 1993-94 on cannot be readily correlated with movements in the household savings ratio, which did not fall below its recession level till 1997-98.

The history of the household savings ratio in Victoria, where Australia's largest rise in the gambling ratio correlates neatly with its largest fall in the household savings ratio, provides prima facie evidence that the increase in gambling was at least in part financed from falling savings. However, patterns in the other states caution against assuming that gambling alone controls the household savings rate. Indeed, this is true for Victoria: a rise of 2.5 percentage points in the ratio of gambling to household disposable income does not fully account for a fall of 10 percentage points in the ratio of savings to household disposable income. During the consumer boom, gambling was not the only expenditure to be financed out of a fall in the savings rate.



**Figure 4.10: Net savings and gambling expenditure**

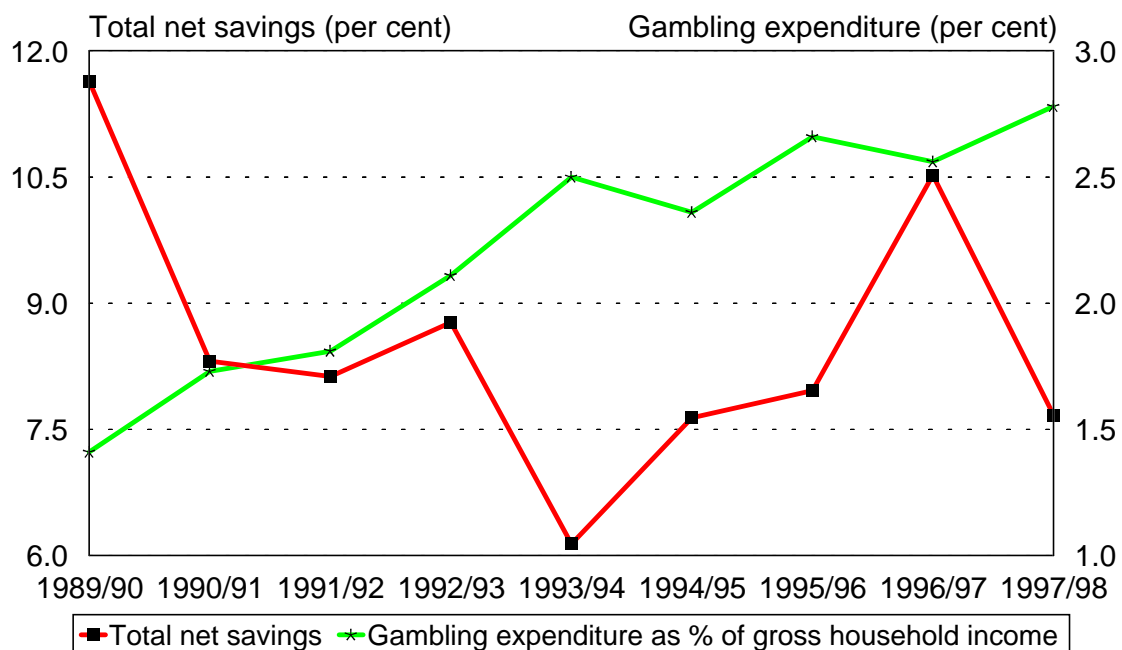
**Victoria**



Source: Australian National Accounts.

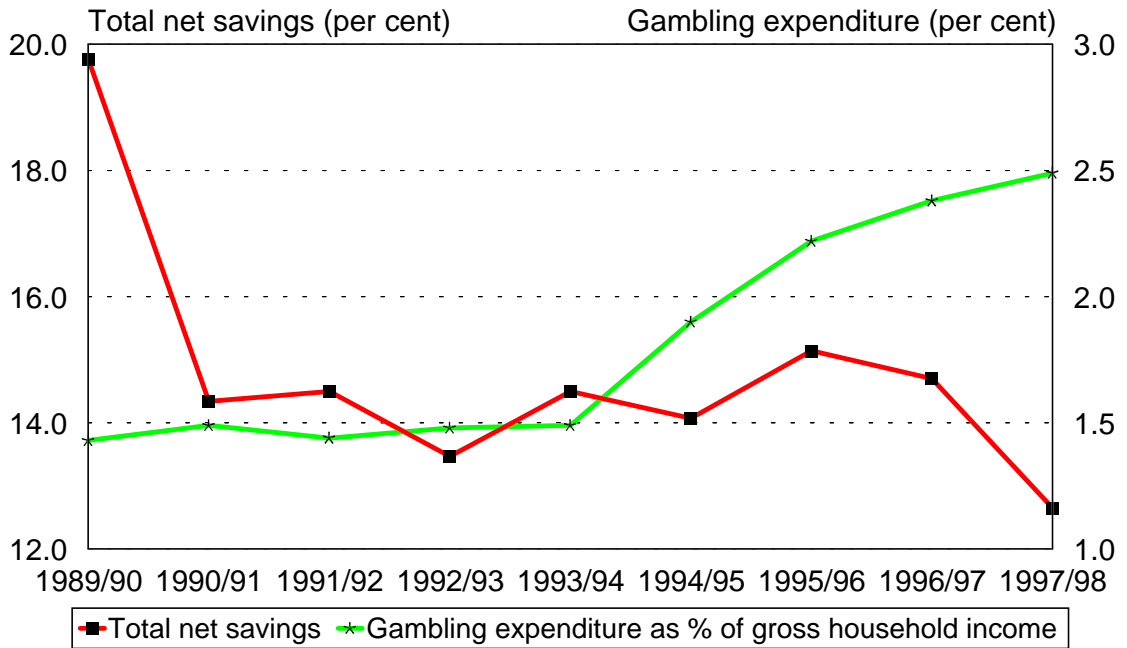
**Figure 4.11: Net savings and gambling expenditure**

**Queensland**



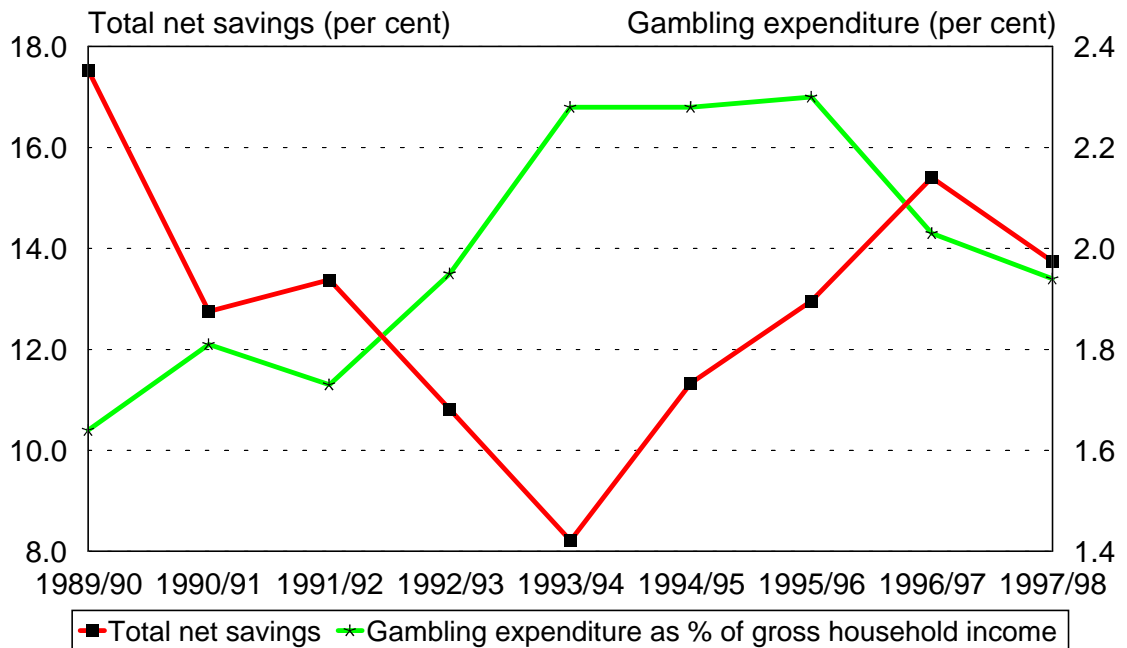
Source: Australian National Accounts.

**Figure 4.12: Net savings and gambling expenditure**  
**South Australia**

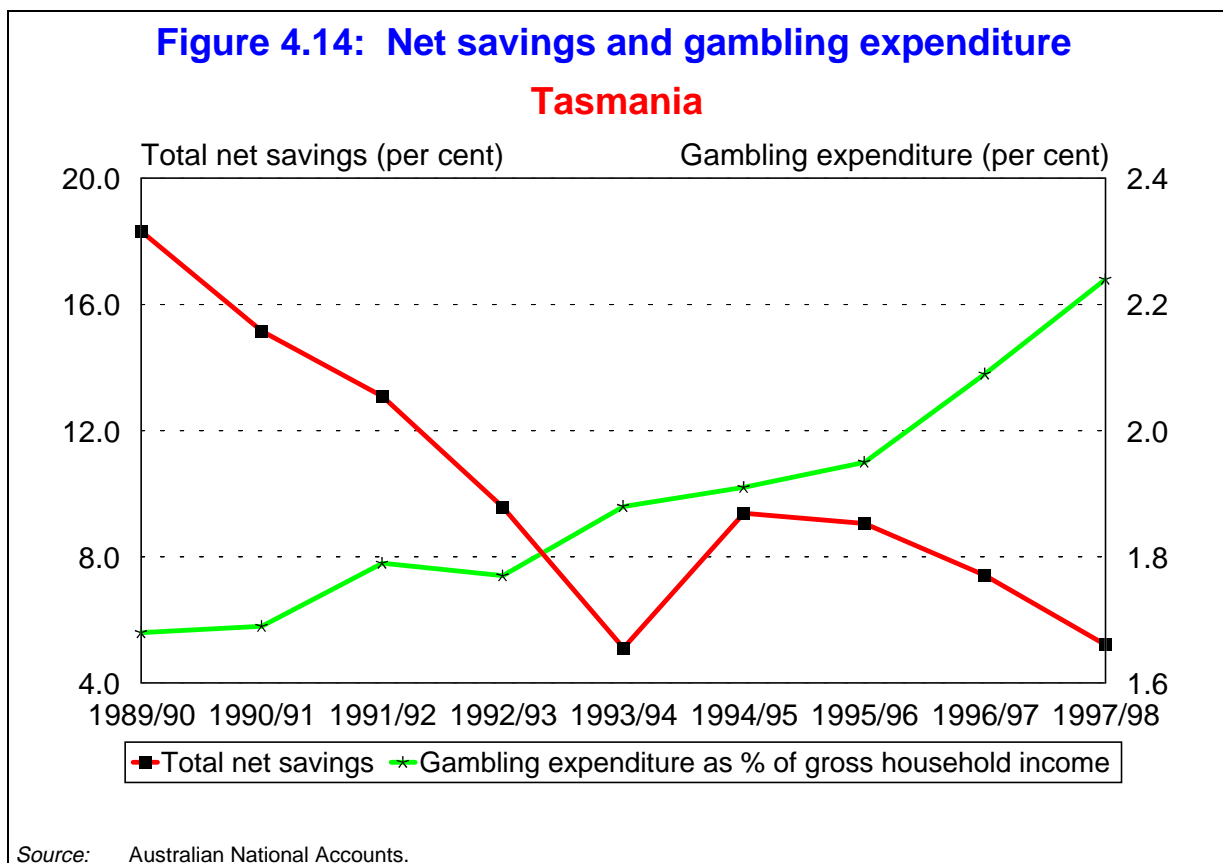


Source: Australian National Accounts.

**Figure 4.13: Net savings and gambling expenditure**  
**Western Australia**



Source: Australian National Accounts.



### 4.3.3 A more detailed time series analysis

Encouraged by the prima facie relationships between gambling expenditures and the household savings rate at the state level, NIEIR subjected the data to a more detailed econometric investigation.

The first step in this time series approach was to estimate a function based on the gambling expenditure share for New South Wales, Victoria and Queensland. The result was:

$$SR_i = 121.923 - 0.20735 \cdot GS_i + 2329.59 D$$

(14.20)      (3.47)                      (2.20)

$R^2 = 0.54$  (indicating moderate association, 54 per cent of all the movement in savings rate could be explained by the model as presented). The numbers in parentheses are t-stats indicating that all coefficients are significant at the 90 per cent confidence level.

Where:

- $SR_i$  = State savings ratio.
- $GS_i$  = State gambling expenditure share in household disposable income.
- $D$  = Dummy variable for Queensland in 1996-97, due to an unexplained once-off jump in savings rate that appears erroneous.

All data was indexed to 100 in 1992-93. The equation was estimated over the 1992-93 to 1997-98 period. The result is statistically significant.

The coefficient on the  $GS_i$  variable implies that a percentage point rise in the gambling expenditure share of state household disposable income resulted, during the estimation period, in at least an equal percentage point decline in the household savings ratio. This is an important item of evidence for the hypothesis that the increase in gambling was financed from savings.

Beyond this point, the research question was broadened in an attempt to identify the complements and substitutes of gambling; the types of expenditure which may have been encouraged or crowded out as a result of the increase in gambling. To address these questions, NIEIR investigated quarterly expenditure data by state from September 1983 to December 1998 from the ABS State Accounts data. The data covered 62 quarters. Additional degrees of freedom for the regression model were won by pooling the data from the eight states, generating 488 data points. Typically the larger the data set the more accurate the representation of reality and a sample of 488 is more than adequate.

The ANA data were nominal original (not seasonally adjusted) private final consumption expenditures for September 1983 to December 1998. On request, the ABS provided separated gambling expenditure data for the expenditure category "recreational and cultural services".

Several simple linear regression models were formulated to estimate the impact of gambling expenditures on other expenditures, the first being a model which explained the growth of the expenditure shares of various expenditure categories by the growth of the share of gambling. All expenditures were divided by total household expenditures and the growth of each share was calculated and correlated in the regression model. The results of this model are recorded in Table 4.2 under "Growth model, raw data". The same model was re-estimated after correcting the expenditure data for seasonality effects. This assumed a linear trend and separate season factors for each state and expenditure category. The results of this model are recorded in Table 4.2 under "Growth model, seasonalised data".

A second regression model related the shares of the expenditures to the growth in the gambling shares. Again, the model was estimated for raw data and for seasonalised data, see columns 3 and 4 in Table 4.2.

Because these regression models use expenditure shares, they have a tendency to produce negative regression coefficients, because by definition if the share of gambling expenditures increases the share of the other expenditures must decrease as all shares always add up to 100 per cent. However, the share of gambling is relatively small and the growth relatively large so that this intrinsic effect should not be too strong, which is confirmed when studying the results of Table 4.2.

Table 4.2 gives those regression coefficients which are significant at the 95 per cent confidence level. Selected coefficients which are not significant are included in brackets for the purpose of comparison. The coefficients for the first two columns are multiplied by 100, while the share model results (columns 3 and 4) are multiplied by 1,000. This is done to aid the reader in their interpretation of the results.

An example of how to interpret results is as follows; A rise in gambling expenditure of \$100 is associated with a rise in food expenditure of \$6 and a decline of \$57 in clothing and footwear expenditure under the Growth Model using raw data (first column in 4.2). Using the share model an increase in gambling expenditure of \$100 would reduce the share of clothing and footwear, in the household budget, by 1.6 per cent.

Table 4.2 does not show a clear picture. For most expenditures no impacts were found. For almost all other expenditures the various models contradict each other. For example, the first model detected a positive impact of gambling on housing costs, while the second model estimated a small negative impact and the share models could not detect any significant relationship. The only exception to this general lack of pattern is the category furnishing and household equipment for which all models derive some sort of negative impact. However, as about 30 expenditure categories were examined, this could still be a random effect, even if a reduction in furnishing expenditures appears quite plausible.

The failure of the time-series models to identify consistent complements for gambling may be borne in mind when interpreting cross-sectional data, analysed later in this chapter, which identifies strong complements for gambling. The time-series result might be interpreted as indicating that people who already smoked, drank and ate out simply added gambling to their entertainment regimen, and that gambling was not attractive to the abstemious; hence the cross-section relationship but the lack of time-series relationship. However, the time-series results are econometrically unsatisfactory, and their failure to identify either substitutes or complements is judged to reflect these problems.

The most obvious of these problems is that the results show extreme sensitivities to the model and the data transformations undertaken. It therefore appears extremely difficult, if not impossible, to estimate expenditure changes induced by increased gambling through time series data. Data or model problems cannot be ruled out and there may be strong impacts. However, various models have been estimated, including several model runs not reported here, for example lagged regression models, and no clear picture emerged. At this stage it appears more likely that there are no strong impacts of gambling on other expenditures, except possibly other entertainment.

If no significant expenditure changes are induced by increased gambling, except some reduction in other recreational expenditures, by definition gambling must be largely financed out of a reduction in savings. This confirms the result given in the first equation reported in this section.

Originally, NIEIR intended to compare expenditure patterns in states with higher gambling expenditures and with lower savings ratios with expenditure patterns in states with lower gambling expenditures. These differences could indicate the impacts of further increases in gambling or deteriorations of the financial situation (decrease of the savings ratio). However, this intention was dropped given the unclear relations between the various expenditure categories and expenditures. Interpretation was in any case bound to be difficult, due to the effects of state characteristics such as weather, supply and taste of the population which impact independently of incomes and other economic factors on expenditures.

The major result of the analysis presented in this section is that, beyond the savings/gambling substitution, aggregated data could not throw light on adjustment processes to gambling expenditures. The main underlying problem hindering estimation was that the data are highly collinear over time. Typically one would treat this problem by analysing growth data. However, this did not help in this case as in the 1990s many expenditures grew strongly at the expense of a declining savings ratio. Since in this period gambling expenditures increased more rapidly than any others, the regression models show a positive impact of gambling on most other expenditures. This is a statistical artefact.

**Table 4.2 Impact of the growth of the share of gambling on other expenditures**

		Growth model		Share model	
		Raw data	Seasonalised data	Raw data	Seasonalised data
1	Food	6	-2	–	–
2	Cigarettes and tobacco	–	–	–	–
3	Alcoholic beverages	–	–	–	–
4	Clothing and footwear	-57	–	-16	–
5	Housing, electricity gas and other fuels	20	-2	–	–
6	Furnishings and household equipment	-45	-5	-12	(-1)
7	Health	7	-7	–	–
8	Transport	6	–	–	–
9	Purchase of vehicles	–	–	-5	–
10	Operation of personal transport equipment	11	-4	–	–
11	Transport services	–	–	–	–
12	Communications	–	–	–	–
13	Recreational and cultural	–	16	–	10
14	Audio visual equipment	-50	–	-5	–
15	Other major durables for recreational and cultural	-58	–	–	–
16	Other recreational items and equipment	-46	-5	(-2)	–
19	Newspapers, books and artists' goods	-14	-6	–	–
20	Educational services	61	–	5	–
21	Hotels, cafes and restaurants	–	–	–	–
22	Catering with service components	–	–	–	–
23	Accommodation services	–	–	–	–
24	Miscellaneous goods and services	7	-4	–	–
25	Personal care	-25	-6	–	–
26	Personal effects	-24	–	–	–
27	Insurance with premium supplements	–	-15	–	–
28	Financial services	20	–	–	–
29	Other services	15	–	–	–
<b>31</b>	<b>Retail (1 to 4 + 6 + 14 to 16 + 19)</b>	<b>-23</b>	<b>-3</b>	<b>-31</b>	<b>(-15)</b>
<b>33</b>	<b>Total recreational and cultural excluding gambling</b>	<b>-22</b>	<b>-3</b>	<b>(-5)</b>	<b>–</b>

*Note:* The data has been checked for outliers and six observations have been omitted because of extreme growth of gambling expenditures. Three of these observations relate to the Northern Territory, one to Western Australia and South Australia (both for 1986) and Tasmania (1990).



NIEIR tried to solve the problem by calculating the share of expenditures in total expenditures. However, as explained above, this approach has the tendency to produce negative coefficients because the expenditure shares always add up to 100 per cent. This effect is particularly strong when analysing large expenditure categories, such as total retail. For this reason the coefficients for large expenditure groups are to be treated with extreme care. This effect is not so strong with smaller expenditure categories. However, if an increase in gambling expenditures is financed by a small relative reduction in a number of small expenditure categories, this may be difficult to identify with the data at hand because it is difficult to identify small effects in noisy data, especially when various trends are present.

Any attempt to proceed further using aggregate time-series data would need to address the following issues:

- the data generation process of the National Accounts and the derivation of the gambling data. Much of the ANA is more estimated than observed data;
- regression models should be tried which also incorporate incomes and savings. It should be noted that ANA data needs to be corrected for this purpose as the ANA income concept is not a household cash income concept and is not really relevant for expenditure estimation. For example, ANA household incomes include superannuation savings. In addition, ANA expenditures include expenditures not made by households but by other parties on behalf of households, e.g. health expenditures; and
- check for structural breaks in the regression model.

Clearly, such an analysis would be a major undertaking and there is a considerable chance that despite all efforts, the results will be inconclusive or show that gambling expenditures do not have a major impact on other expenditures.

An alternative way of analysing the issues at hand is to use microdata. While past analysis of microdata showed significant and plausible results, the problem with microdata is the extrapolation of cross-section data (the validity of which is confirmed only for a certain point in time) into dynamic changes. For example, if households with a lower income spend less on gambling, does this mean that if the income of households decreases over time (e.g. in a recession) that they will spend less on gambling? Despite this problem, it is expected that useful insights can be won by analysing microdata.

#### **4.4 Economic consequences of an expansion in legal gambling: the need for modelling at the household level**

Given the difficulties inherent in time series analysis, NIEIR resorted to the analysis of microdata as a means of identifying the substitutes and complements of gambling. From the point of view of overall state and regional economic impacts, this is a very important question. To take two extreme cases, the state and regional impact is likely to be very different if (apart from savings effects) gambling is financed from reduced expenditure outside the state/region (for example, reduced spending on overseas travel) than if gambling is financed from reductions in expenditure which generates incomes within the state/region (for example, spending on massage parlours). In the former case, the region has captured expenditure which would otherwise have gone elsewhere; in the latter a form of purely local expenditure has been replaced by one with only moderate local content. In practice, an increase in gambling expenditure is likely to cause a wholesale re-arrangement of household budgets, and the local effect will depend on the details of this re-arrangement.

As with all re-arrangements of household budgets, it is likely that there will be both complementary and substitute expenditures. For example, when a household buys a car, it commits to substantial expenditures on petrol (which are therefore complementary) but is likely to reduce other expenditures, particularly public transport fares (which are therefore substitutes). It may also go into debt, in which case its purchase is initially balanced by a reduction in savings.

What goods and services are complementary with gambling? The likely candidates are those which are readily available at gambling venues: alcoholic drinks, tobacco and restaurant meals. And substitutes? If people are spending time at venues and buying their meals there, it is likely that commercial production of food will displace domestic production, with well-known effects on the value of production as calculated in the national accounts. (When commercial production is substituted for domestic, the reported value increases, even though no actual increase occurs. When this happens, the national accounts provide an upwardly-biased assessment of the benefits of the change.) Apart from this, there is no *a priori* list of substitutes, and it is likely that most expenditures are mild substitutes for gambling.

#### **4.5 Evidence on complementarity, substitutes and savings at the household level**

These considerations highlight the importance of the Authority's requirement, in the brief for the present project, that the household incidence of gambling should be investigated, as well as the regional and state economic impacts.

As pointed out in Chapter 3, it has been argued that such investigation is prevented by poor data at the household level. It is true that gambling expenditures reported in expenditure surveys fall short of expenditures reported by the industry.

These discrepancies, which are large, have caused the ABS to caution against accepting the HES estimates of gambling expenditure. Doughney and Kelleher have taken the ABS' warnings to heart, and argue strongly against any use of the HES in studies of gambling. However, there is unfortunately no substitute for the HES in the crucial question of identifying the complements and substitutes of gambling. No other survey:

- covers the whole population; and
- enumerates gambling and non-gambling expenditures in detail.

In the absence of HES data, the only possibility is crude assumption; for example, the crude assumption that gambling has no complements and crowds out local retail expenditure.

#### ***Gamblers and non-gamblers***

Though people consistently underestimate their gambling losses, the shame of gambling is probably not so severe that they are unwilling to report attendance at gambling venues. (The likely exception is problem gamblers who are so guilty that they underestimate the frequency of attendance.) The HES can be partitioned into those households which admitted gambling and those which did not. Since the increase in gambling venues in Victoria was mainly due to the introduction of EGMs, analysis concentrated on attendance at this type of venue. It was found that 6 per cent of adults played EGMs Australia-wide in the two weeks covered by the 1994 HES.

This figure is subject to two main caveats.

- When the survey was taken (it is the most recent HES) EGMs were well established in New South Wales but only being introduced elsewhere. Thus the New South Wales estimate of 9 per cent attendance is more likely to represent current Victorian attendance than the HES estimate of 5.6 per cent for Victoria in 1994.
- The survey relates to attendance during a two-week period during which an expenditure diary was kept. It therefore excludes occasional gamblers who did not happen to patronise an EGM during the nominated fortnight. (Indeed, some may have been too self-conscious to go during their HES fortnight.) However, the estimate of 9 per cent participation over a fortnight is consistent with the Authority participation survey results, which show participation of around 6 per cent for playing within the last week, and around 14.5 per cent for playing within the last month.

Despite these caveats, it is probable that the households which recorded EGM use in the HES comprise a fair proportion of households which regularly use EGMs, and the households which did not record such use contain a majority of households which rarely or never use EGMs. A simple partitioning of the HES into EGM-playing and non-playing households can thus assist in identifying complements and substitutes.

This simple partitioning for New South Wales, the Australian Capital Territory and Victoria produced estimates of average expenditure by type of purchase for EGM players and non-players. These results established that EGM players spent more on restaurant meals, alcohol, tobacco, motoring and various other entertainments than non-players (see Appendix 1). This looks like a reasonable list of complements for gambling. However, the results were unsatisfactory, for two reasons.

- They took no account of expenditure drivers other than gambling participation. For example, the total expenditure of gamblers on non-gambling items was higher than of non-gamblers, particularly in Victoria. This would indicate that gamblers' incomes were, on average, higher, which would have had effects on their expenditure patterns.
- Though the analysis identified a likely pattern of complements, substitutes were not so clearly identified. This pointed to a need for a more refined analysis, taking other cost-drivers and household characteristics into account.

NIEIR therefore proceeded to the identification of substitutes and complements using a household expenditure model derived by adjustment of the HES. For a full account of this process see Appendix 2.

### ***Econometric estimation at the household level***

Two steps were taken to adjust the crude comparison of gamblers and non-gamblers:

- expenditure drivers other than gambling participation (such as incomes and household composition) were taken into account; and
- in order to give greater weight to the expenditure adjustments of committed gamblers, reported gambling expenditures were taken into account.

The second of these adjustments involved assuming, not that the amounts of gambling expenditures reported in the HES are accurate (which they patently are not) but that relative amounts are reasonably accurate (i.e. that people who reported relatively high expenditures are heavier gamblers than those who reported relatively small expenditures). This involved a working hypothesis that HES respondents fairly systematically understated losses and overstated wins, so that they fairly accurately reported the pattern of gambling expenditure despite the over- and under-statements. Applying this hypothesis required two steps:

- conversion of wins to losses (it is not possible to win on EGMs in the long run, and people who reported wins were probably long-run losers); and
- increasing all reported losses so that total expenditure across the whole HES was equal to EGM expenditure from industry returns.

These assumptions were applied to the HES unit-records. A number of other standard NIEIR adjustments were also applied, for example, re-weighting to correct for the under-representation of high income and young adult households. The resulting revised set of unit records was analysed, and the following were identified as expenditures complementary to EGM gambling:

- alcohol;
- tobacco;
- restaurant meals; and
- take-away food.

By the same token, the following were identified as substitutes:

- other expenditures in general; and
- savings (this last because total expenditure reductions as a result of substitution were less than total expenditure increases as a result of gambling expenditures and expenditures on gambling-complements).

This pattern reflects what might be called a gambler's approach to life.

These associations, existing in cross-section data collected at a given time, do not necessarily apply in time sequence. Perhaps today's gamblers are merely yesterday's heavy smokers and drinkers; perhaps they have never been savers. However, the strong complementarities and the lack of strong substitutes other than savings reductions make a prima facie case that people who develop a taste for gambling are likely to increase their expenditures on its complements, and to dip into their savings so long as they have any.

#### **4.6 Further explorations using the HES – identification of problem gamblers**

These impacts on complementary expenditures, substitute expenditures and savings are crucial for estimating the overall economic impact of the increase in gambling. But what of the problem gambler? Our confidence in the HES estimates would be considerably enhanced if we could identify problem gamblers in the survey. (For a full analysis see Appendix 2.)

The search for problem gamblers began by identifying those who spent large amounts on gambling, using the adjusted gambling estimates. It was found that, during the reporting fortnight, most of these households spent well beyond their incomes on gambling. However, these households did not appear to be hard-core problem gamblers, since their asset position (as estimated from asset incomes and loan payments) was in general sufficient to support an occasional gambling spree of the reported magnitude, though definitely not to support its continuance fortnight after fortnight. In other words, the heavy gamblers identified in the HES could have been:

- spree gamblers; or
- incipient problem gamblers just starting on the slippery slope.

The probability is that the group contained a number of genuine spree gamblers, whose gambling occurred in bursts which were sufficient to strain their finances and to depress their savings rates, but which were sustainable provided sprees did not occur more than a few times a year. At least during the survey fortnight, these households were big spenders, and their gambling was (as usual) complementary with alcohol, tobacco and restaurant food, but also with other expenditures in general. To balance all this spending, gambling exerted a strong negative influence on savings, at least during the fortnight of the spree. The impression is of high-income people imitating high profile gamblers. This group may be significant contributors to reductions in the household savings rate, but appear to be able to afford their gambling.

Further investigation identified another group whose gambling losses were not as heavy as the spree gamblers, either in total or in relation to income. However, for this group the losses were more obviously serious, since they were accompanied by a poor asset position, and were obviously unsustainable even on a spree basis. These households were, as usual for gamblers, enthusiastic drinkers and (particularly) smokers, but they economised on other expenditures and were running down their already small assets. While possibly not full-blown problem gamblers, these households were in severe financial trouble. They comprised roughly 0.5 per cent of total households, which is approximately the percentage that would be expected for 1994.

The fact that such gamblers can be identified in the HES returns greatly increases confidence in this source, at least for the purpose of identifying complements and substitutes as required for the further economic analysis. The patterns reported in the HES include patterns reported by both spree gamblers and problem gamblers, as well as by the general run of the gambling population.

#### **4.7 Projections of gambling expenditures and simulation of resulting financial adjustments of households**

A task of this study was to simulate the economic adjustments which households make to gambling expenditures. Given the previously witnessed increase in gambling expenditures, the impacts of an increase of gaming expenditures need to be simulated over time.

For the purposes of this study a relatively simple microsimulation model was developed to account for households' financial situation over time. Ageing<sup>6</sup> of the households and inflation<sup>7</sup> were ignored but in other respects each household of the HES was tracked, over time, as to how its gambling expenditures affected other expenditures, savings, debts and assets. For this purpose assets and debts were updated annually by attributing the cash saving reduction which was required to finance gambling (after taking into account the expenditure reductions) to the various asset and debt categories.

The microsimulation methodology is based upon the idea that a comprehensive survey of individuals or households can be used to mimic an entire or subsection of a population's behaviour. Suppose a survey of a thousand households is taken (for instance dealing with expenditure behaviour as in the HES). The survey would collect information on the behaviour patterns or perceptions of interest as well as socio-economic information of the respondents. Assume that in the survey there are four households whose household head is a doctor.

Subsequently we may be required to simulate the behaviour of another thousand households, for which we do not have any direct data on their behaviour, but may know some demographic features (for instance from the ABS Census). What we need to do is mould the original data set so as it best replicates the nature of the new households. If this new set of households contained eight households whose household heads are doctors, we would have to weight the importance of the doctors in the original survey twice as high.

Now imagine that we not only know the occupation of the household head but literally a hundred demographic features of the original thousand households. We could subsequently massage the weightings of the original households by accounting for all of these factors, thus mimicking very closely the nature of the new households. This process is known as microsimulation and when applied through time with assumptions about the way the households respond it is known as dynamic micro simulation.

When using the HES as a database, for microsimulation analysing gaming expenditures, two major problems occur:

- A large proportion of respondents who record gaming expenditures recorded very high gambling expenditures. These households did not have the reported financial capacity for these to be medium to long term averages. Hence such expenditures should not continuously be applied to that household. For example a recorded expenditure on gaming of four hundred dollars over the two week reporting period does not necessarily translate into an annual expenditure of ten thousand four hundred dollars; and
- the distribution of gambling expenditures in the HES appears to be heavily biased, partly for the same reason which caused the first problem listed.<sup>8</sup>

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<sup>6</sup> Ageing – in more complicated micro-simulation models the effects of ageing are included in the decision-making process. In these models we would model households (members of) dying and/or new households forming. This is especially important in modelling small populations, however in this study maintaining the same stock of households is satisfactory to simulate state-wide results.

<sup>7</sup> Inflation – the effects of inflation are felt by households as movements in purchasing power. In complicated models changes to real purchasing power of households can be modelled. In times of high inflation lower skilled households often face falling real wages and this can promote changes in spending patterns across consumption items. In periods of high inflation this effect should be included, however it is not required for the state-wide analysis in period of low inflation.

<sup>8</sup> For a detailed discussion concerning the distribution of reported gaming expenditures see Appendix A4.2.3

It would appear that the distributions among gamblers which were derived from the Authority survey for 1998 are more realistic estimates of gambling expenditures, even for 1993-94. For these reasons it was decided to replace household expenditures on gambling by their estimated value, using the multiple regression model described in Appendix 4.4.2.

The question arose as to whether to make further adjustments in the expenditure distribution of the HES. This has not been done for the following reasons:

- the economic impact model of gambling expenditures is largely linear in gambling expenditures. The model parameters differ only if a household moves from one net asset class into another net asset class; and
- the Authority study relates to Victoria in 1998, while the 1994 HES is used as the basis for the model and simulation. It would be better if the 1994 HES gambling distribution could be corrected towards the June 1994 gambling distribution. This, however, is not possible.

These arguments against general adjustment do not nullify the benefits in adjusting the 1994 HES gambling expenditure distribution to the Authority distribution. In particular the assumption of a constant correction factor for gambling expenditures, irrespective of household type, requires further detailed analysis because this factor is between 0.7 and 4.7 for the various gambling categories. For example, do retirees with smaller gambling expenditures under-report with the same degree (factor) as young blue collar workers? It may well be that under-reporting varies less by socio-demographic group than by (reported) gambling amount. That is, it can be expected that frequent gamblers under-report more than infrequent gamblers (even if a significant amount is spent this does not cause a problem). Given that the Authority survey was not specifically designed for microsimulation purposes and the fact that the HES does not contain information on the frequency of sprees or on long term gambling expenditures, any correction will require a considerable amount of very careful analysis, as well as a significant dose of assumptions. For these reasons such work was not undertaken in this study but is recommended for future studies.

After undertaking the preparatory steps listed above, the impacts of increased gambling on household finances were simulated as follows:

1. select growth factor of gambling, mimicking past growths and small forecasted growth rates;
2. apply the multipliers from Appendix Table A2.7 to determine the gambling induced expenditures;
3. add the changes of expenditures and savings to the observed values which relate to the base gambling expenditures, thus deriving new expenditures;
4. derive cash savings as gross income – simulated expenditures – simulated savings;
5. distribute any derived cash savings into the six assets and two debts categories, as per transition shares outlined in Appendix Two Tables A2.8 and A2.9; and
6. update assets and debts with the changes from 5.

The following examples explain the general approach taken by the asset model.

A household has interest bearing assets of \$10,000 and a house valued at \$110,000 and a mortgage of \$40,000. This household has a net cash savings of \$1,000+ in 1994. Net cash savings is a measure of savings which can be positive or negative depending on the levels of debt. With net assets of \$80,000 ( $\$10,000 + \$110,000 - \$40,000$ ) the household belongs to net asset class \$40,000 to \$100,000. Then the net cash savings are distributed into the following increases of assets:

Interest bearing assets	\$122	(12.2 per cent of \$1,000)
Dividend bearing assets	\$20	
Superannuation	\$18	
Business	\$40	
Property	\$18	
House value	\$422	
Personal loan	-\$47	
Mortgage	-\$313	

Because this household has no personal loan, the \$47 reserved to pay back the personal loan is distributed pro rata to the other asset classes. This method generates assets in asset categories even if they are still zero, for example this household had no property assets. In reality it would be assumed that households invest largely in existing asset categories and only after these have reached a certain level will households reallocate and/or diversify their assets.

Estimating such transition probabilities was quite a task and as the example shows, the asset changes in the new asset categories are quite small. In addition, the effects of such modelling errors are reduced, though not eliminated, by analysing not the model results, but the difference of model results, for two scenarios of gambling expenditures.

Now let us consider the same hypothetical household as described above, and assume that the net cash savings are -\$1,000. In this case we only subtract from existing asset categories. As the parameters were estimated for a shift from net asset class \$40,001 – \$100,000 to \$100,001 – \$200,000, but as the household is now regressing towards the net asset class \$0 to \$40,000, the parameters of the latter net asset class are used to splice the -\$1,000 net cash savings. The direction of the movement is the key determinant in this example, as the transition probabilities deal with the class that the household is heading towards.

This household has only three asset/debt categories: interest bearing assets, house and mortgage. Personal loans are also added to the list as it is assumed that both debt forms (mortgage and personal loans) are potentially used to finance negative savings, even if current debts of the household are zero. Thus, the -\$1,000 is spliced into these four asset/debt categories with the shares 3.9 per cent (interest), 5.9 per cent (house), 3.9 per cent (personal loans) and 82.3 per cent (mortgage). These shares do not add up to 100 per cent because business and property assets were not included. Hence, the four shares are pro-rated to 100 per cent before being applied. Then the household has interest bearing assets of \$9,960 (-\$40), the house value is \$79,939 (-\$61), mortgage increased to \$80,857 (+\$857) and personal loans to \$42.

It should be noted that the household pays a monthly mortgage, which is recorded in the HES and assumed to stay constant. The asset model subtracts the capital component of the mortgage paid from the mortgage debt in a pre-step. If the mortgage has been paid off, the mortgage payment is added to the net cash savings.



A reduction in the house value can be interpreted as running down the housing stock in the short term and the switch to another house in the long term.

The asset model can generate negative assets, if a household has net cash savings which are negative and no, or very small, assets. Such cases are corrected by increasing mortgages or personal loans. For example, if a household has \$400 in interest bearing assets, no other assets and a negative net cash savings of -\$600, it is assumed that interest bearing assets are reduced to zero and debts are increased by \$200. The \$200 is spliced into mortgages and personal loans. More generally, if an asset category becomes negative, it is set to zero and the undistributed amount is distributed among the existing asset categories. If insufficient assets are available to cover the negative net cash savings, debts are increased.

The asset model can also generate positive debts if the pay back amount for a debt category from positive net cash savings exceeds the debts. This does not happen frequently and the amounts are relatively small. In these cases the amount left after balancing the debts account is added to the interest bearing assets.

Superannuation assets do not include entitlements but are estimated based on the actual income from superannuation as recorded in the HES. A reduction in superannuation means that the household draws on these assets. Increasing superannuation means that the household increases this asset form, which is quite unlikely. The estimated parameters for superannuation are more likely to reflect differences between household cohorts and groups which should not be interpolated, in particular not for an increase in superannuation. As superannuation is a relatively small asset category this model weakness appears to be acceptable, at least for the scope and precision of the simulations undertaken for this study.

The results of this analysis can be summarised as follows.

- The long term asset formation effect of the increase in gaming since 1994 depends primarily on whether or not the household owned a home in 1994, and its level of net assets.
- The large effect of a households' starting position on its behaviour should come as no surprise. The existence of specific types of gambler based upon their asset-debt position is discussed thoroughly in Appendix A2.4.
- For home owners with very low levels of net assets (i.e. net indebtedness greater than \$20,000) the impact of increased gaming expenditures is more likely to involve increasing levels of personal loans. Very quickly the majority of these households face constraints imposed by lending institutions. Based on reported expenditures in the HES, and verified in studies by the Authority, the length of time this level of gaming can continue is quite short.
- Other households that have a poor net asset position, which can presumably continue gaming longer, are those with highly leveraged mortgages. These households along with others who have paid off substantial portions of their mortgages are crucial in the time period 1994-2000. As these households have seen the required payments fall on their mortgages, they have been able to access significant funds by adapting their payments or redrawing on their equity. The microsimulation results are consistent with financing extra expenditure (both gaming and gaming induced expenditure) in this manner.

- Only the highest asset classes (net assets over one hundred thousand) would begin to display significant diversion of funds away from interest earning deposits. This may be an important point in addressing the response obtained from surveys such as the Authority's Community perceptions survey. Due to the high level of induced expenditure that gambling appears to be related to (Section 4.4), the total of all consumption rises significantly. This microsimulation approach suggests that most of those gamblers surveyed (all except the wealthiest) would not have had changes to behaviour consistent with reducing savings in the form of money in the bank.
- After the effect on housing the next largest effect is that which occurs to the stock of business assets. For the asset-wealthier categories there appears to be a significant long run impact on the value of business assets held. Presumably this could only be measured in the economy by a reduction in overall levels of investment.
- The only other group for whom a large effect of gaming expenditures would be felt in terms of savings deposited is the non home-owning net asset poor (net assets between zero and fifteen thousand). This group primarily includes the young and the very old. Microsimulation suggests a portion of these would experience a reduction in the funds available for investment purposes.
- The high asset class also displays a movement of funds away from superannuation in the face of increase gaming. This is quite strong when compared with other asset classes. This is a result consistent with economic theory which suggests that gaming in the long run requires strong discounting of future events in favour of current utility (pleasure). The future event in this case is retirement and the requirement for an adequate level of funds to support retirement. Those who discount the future the greatest would move assets away from superannuation.

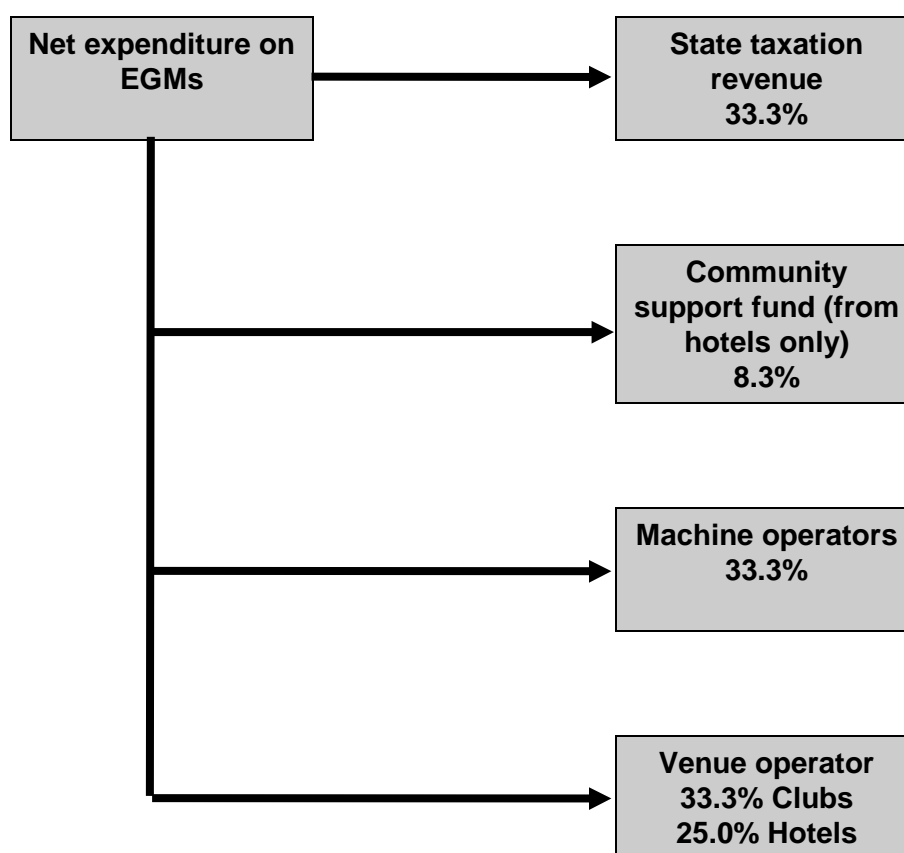
#### **4.8 Tracing the economic impact of the provision of EGMs**

The net expenditure by patrons on the EGMs in a region has to be distributed across various stakeholders. The model distributes the funds in the following manner:

- state taxation – 33.3 per cent of expenditure goes directly to government revenue and an additional 8.3 per cent of expenditure at hotels go towards the community support fund (CSF);
- machine operators – 33.3 per cent of expenditure goes to the two gaming operators, Tabcorp and Tattersalls; and
- venue operator – 33.3 per cent goes to club venues and 25 per cent goes to hotels.

Figure 4.15 provides an illustration of these distributive impacts.

**Figure 4.15**  
**First round distributive impacts – for each region**



These are the first round distributive effects from the actual net EGM revenue. The most obvious distribution back to the region comes in the form of wages and salaries to venue employees. From the cost structure of gaming venues the actual dollar value is known or estimated and assigned to the workers according to where they live. In order to do this we assume that for most venues, apart from the casino, workers live within the region they work, (or that movements net out in suburban areas). For the casino ABS records provide very good estimates as to where these workers reside.

Importantly some of the other costs that we capture include those attributable to building and maintaining venues and Federal Government taxation. These benefits are spread across the Victorian economy by weighting the output levels in LGAs. For instance, other costs such as accounting and business services are distributed to where these activities take place. Once other venue costs are accounted for the venue is left with a gross operating surplus (GOS) to distribute.

Distribution of the gross operating surplus (profits) is important and in this model it is assumed that club-type venues distribute their surplus to the local community in the form of better services to members, or in some cases subsidised food and beverages. The remaining surplus to venues is distributed to shareholders whose place of residence is determined by general share ownership patterns. This method is used due to the large number of hotels owned by large chains or breweries, whose shareholders are the ultimate recipients of any profits.

Figure 4.16 shows the route of distribution for venue income.

Income provided to Tabcorp and Tattersalls as machine operators is split up between wages and salaries, taxes, other costs and profits. Wages and salaries are distributed to where the workers live using the ABS journey to work by ANZIC data. The other value added is distributed on a 48\52 split to Victoria and the rest of Australia. This factor is necessary because some of the shareholders reside outside Victoria, some gaming machines are sourced from interstate or overseas and not all federal taxation revenue returns to Victoria.

The remaining money is assumed to go straight to their bottom line. Such an assumption is reasonable considering that the major cost involved in supplying the machines would be payment to the EGM manufacturer, who would distribute any surplus in the same manner as Tabcorp and Tattersalls. The GOS is distributed to shareholders in the same manner as the hotel GOS.

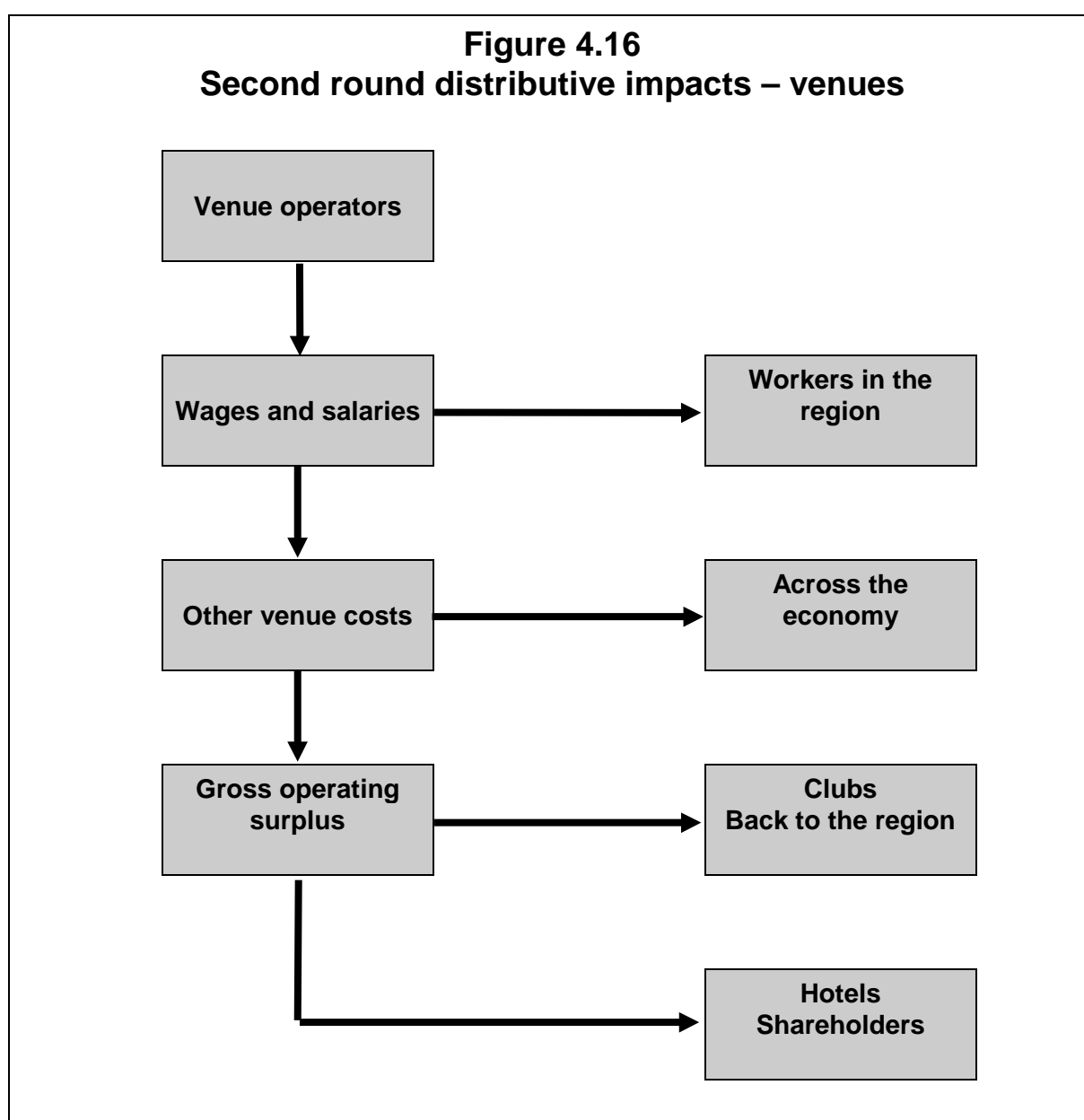
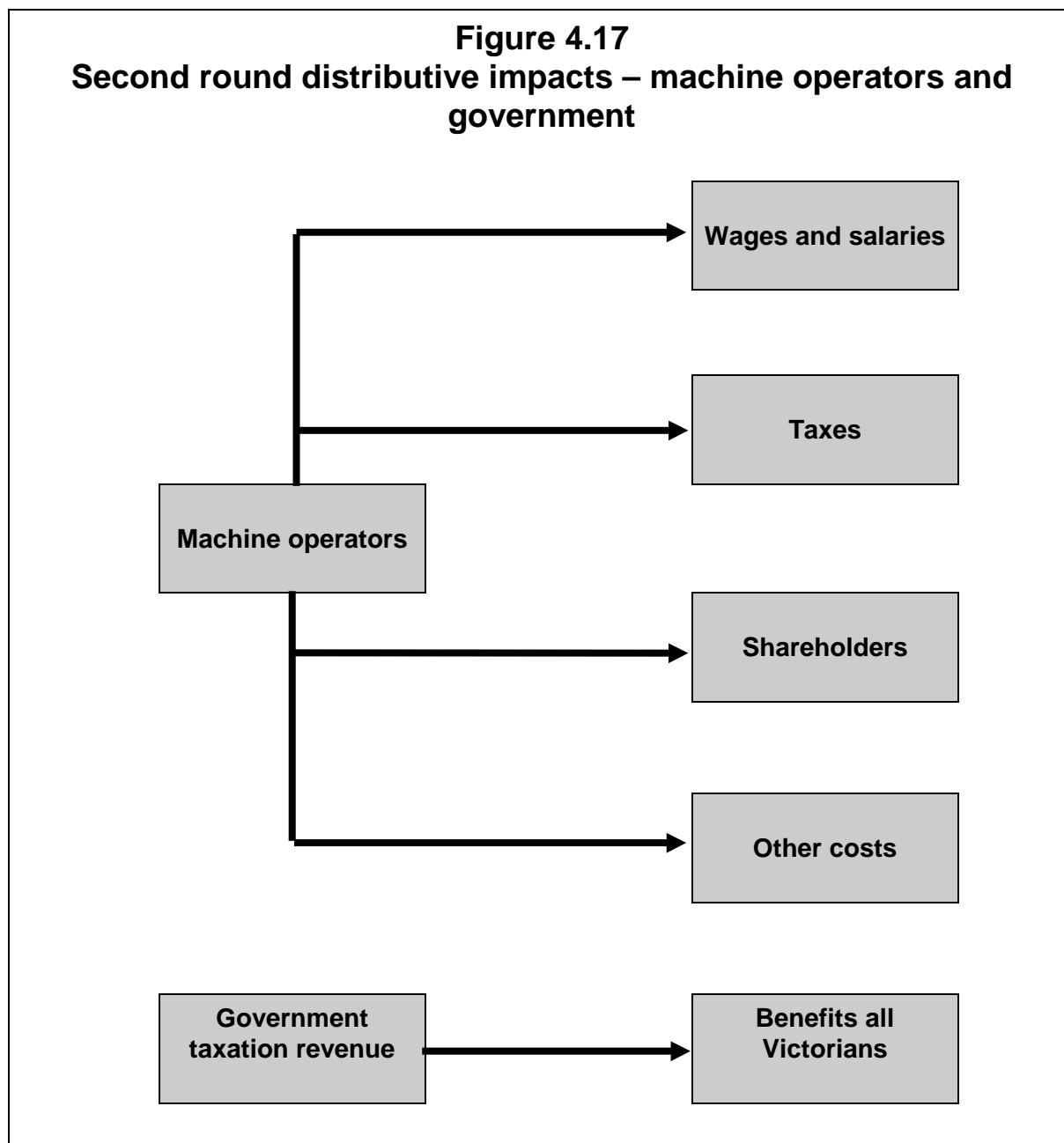


Figure 4.17 shows how this distribution works.



Using this methodology it makes no difference if profits are distributed through a manufacturer such as Aristocrat Leisure or through Tabcorp. In reality if the individual addresses on the share registers of each company were used some difference would exist. However the assumption that profits to shareholders are distributed based on the residential location of general share owners makes little difference to the outcome of the modelling.

Government taxation receipts are the remaining first round effects of gaming. Taxes are assumed to be collected at zero cost and distributed to all Victorian regions on the basis of population shares. Taxation receipts include that revenue collected under the banner of the Community Support Fund (a very small proportion of total taxes collected). More detailed information on the distribution of such funds could be used, however it can be reasonably argued that the monies distributed are designed to help all Victorians equally.

In modelling the effect of government spending on the economy it is assumed that 100 per cent of EGM revenue goes towards current expenditure. This assumption allows us to distribute the benefits of this expenditure across the state, at the same time as applying the multiplier effect to today's expenditure.

#### **4.9 Sourcing EGM expenditure – geographically**

The other side of the equation is the source of the EGM expenditures. EGM expenditure, like all other expenditures, comes at the cost of an alternative use of the funds. In determining the regional impact of gaming it is important to know where, geographically the funds have been derived from and where they may have otherwise been spent.

The raw data detailing the expenditure at each venue is used to find a total amount wagered in each region. However, not all expenditure in the region is sourced from the region's residents. We argue that the key determinants of the amount of revenue generated from patrons who live outside the region are the level of employment in the region and the level of tourism the region attracts.

This thesis is supported by information in the Survey of Community Gambling Patterns and Perceptions. From both the fifth and sixth Authority surveys two questions are relevant. The first is on the distance travelled to get to the last EGM venue visited and the second is on where the respondent travelled from to get to the EGM venue. Both questions explicitly exclude visits to the casino.

For the first question the findings were that in 1998 most (63 per cent) gamblers travelled less than 5 kilometres to get to the EGM venue. This was a slight increase on the 1997 figure of 59 per cent. This means approximately 40 per cent of patrons travel more than 5 kilometres to get to an EGM venue. That sort of distance is large enough to place most residents outside of their local government area.

This is why attributing EGM expenditure in a particular region to the region's inhabitants is misleading. Of the 40 per cent of gamblers who travel outside their region some would cancel out. For instance, if 100 people from town A travel to town B and 100 people from town B travel to town A and expend similar sums of money, the net effect is zero. This effect is not likely to be great.

A further caveat on this number is the number of respondents from the country who travelled more than 20 kilometres to get to an EGM venue. In rural areas this distance is likely to be within the boundaries of the region so these people should be excluded. They represent approximately 7.5 per cent of gamblers who travel greater than five kilometres. Taking both these effects into account we are left with a conservative estimate that 25 to 30 per cent of gamblers gamble other than in the same region as they live.

The problem now becomes how to develop a good methodology to find out where this proportion of gamblers resides. Our starting point is the second question from the survey on where patrons travelled from to get to the EGM venue. In 1998 the number of patrons travelling from home to play EGMs was 84 per cent, this is compared to the 1997 result of 75 per cent. In 1998 6 per cent travelled from work compared to 7 per cent in 1997. Responses of the remaining people included 2 per cent who travelled from a friend's or relative's house, 2 per cent who were on holiday and 1 per cent who travelled from a restaurant.

It must be noted that the information provided from the Community Patterns Survey on visits to EGM venues from work, might be underestimating the number of people who actually visit venues near their place of employment. The question asks “where did you travel from to get to the EGM venue?”. The question is only concerned with where the patron comes from, not on where they are going. Consequently the question doesn't capture people who gamble before they start work, i.e. they are recorded as coming from home with no reference made to work. It is possible that people are just as likely to gamble before work as they are after, especially when considering the case of workers who work outside the standard 9 to 5 regime. Therefore a substantial proportion of gamblers who gamble outside their residential locality could be doing so in the vicinity of their work.

The level of employment will give us an idea of the number of people travelling to and from an area during the day. For some regions that have a disproportionately large number of workers their gaming market is inflated far above the resident population, because of the opportunity to gamble before, during and after working hours.

An additional reason to use the level of employment is that it will often capture regional shopping and entertainment centres. The influence of these centres is to capture the tendency of residents of other regions to travel to these centres for activities such as shopping, going to the movies, eating out etc. The propensity to travel to pursue these activities should be related to similar decisions to travel to gaming venues. Alternatively the relationship could be as simple as gaming accompanying such activities. Taking account of these factors is known as the journey to work correction.

The level of tourism is very important for a number of regions in Victoria. Regions such as the City of Melbourne and the Shire of Bass Coast (Phillip Island) have large numbers of domestic and overseas travellers. It is important to appreciate that not all gaming undertaken in such areas emanates from residents or workers. Tourists in the City of Melbourne are assumed to account for 10 per cent of expenditure on EGMs. This is reasonable when taking the “draw card” status of the Casino into account.

From the 1994 Household Expenditure Survey we have derived estimates of the relative propensity of different regions to gamble. It is important that when we are noting the information about the journey to work that we maintain the correct inference when allocating the influence of non-resident gamblers, by assigning the correct propensity factor to workers carried over from their place of residence. By taking this into account the relative propensity to gamble is maintained after the journey to work and tourism corrections have been applied.

#### **4.10 Sourcing EGM expenditure – household budget**

Once a reasonable estimate of the average expenditure per household have been obtained for each region, it is important to understand the extent to which that money comes from debt financing, savings or from the diversion of other expenditures. Average expenditure is derived using venue expenditure data and household figures for each LGA.

Each funding alternative has vastly different economic outcomes. Debt financing has long term implications for future expenditure, which is modelled. Financing gambling through reducing savings rates has an immediate positive impact as it releases extra money into the local economy. The diversion of money away from other expenditures has differing effects on different regions. Enterprises (within the same region or elsewhere), that would have otherwise attracted the money suffer, to the benefit of the gaming venues.

To determine the share of total expenditure attributable to any of the three financing options we make use of two key variables. Firstly the assumption that the savings substitution rate has a state-wide average of 20 per cent and that different regions, depending on their disposable income, vary around that rate. This differing rate is known as the impulse to substitute and was first used in the Authority Retail study. This is an important concept because it removes a key constraint that a state-wide rate implies, the implication that the poorest people are using savings when they have no capacity to do so.

More affluent regions will have a higher impulse to substitute ratio due to the fact they have surplus money to save. It must be noted that the 20 per cent savings substitution rate includes expenditure on complementary goods consumed whilst gambling, not just EGM expenditure itself.

The second assumption is that gaming is just another expenditure in a basket of goods that must be paid for out of disposable income. This is an important assumption for regions that have a negative savings rate (regional savings rates are used and are supplied by NIEIR's household debt model). By way of illustration it would be easy to say that when a region had a average net savings of negative \$20 dollars per week and a gambling expenditure of \$30 dollars per week that \$10 dollars of the gaming expenditure came from savings and \$20 dollars came from debt. This is unlikely to represent that actual impact of gaming on the typical household budget of the region.

From this the following expenditure profile is more likely. If the total amount spent per week was \$200 dollars including the gaming expenditure, then some could have been saved without the gaming expenditure (depending on the impulse) but that the entire basket contributed to the negative savings of which gaming is only partly responsible. The net result may be (if the region was income-poor) that \$4 would have been saved (or not borrowed), \$23 came from other expenditures and \$3 was debt-financed. This assumption is important because it does not place undue value judgements on the behaviour in the regions and people's decision to gamble given their economic circumstances.

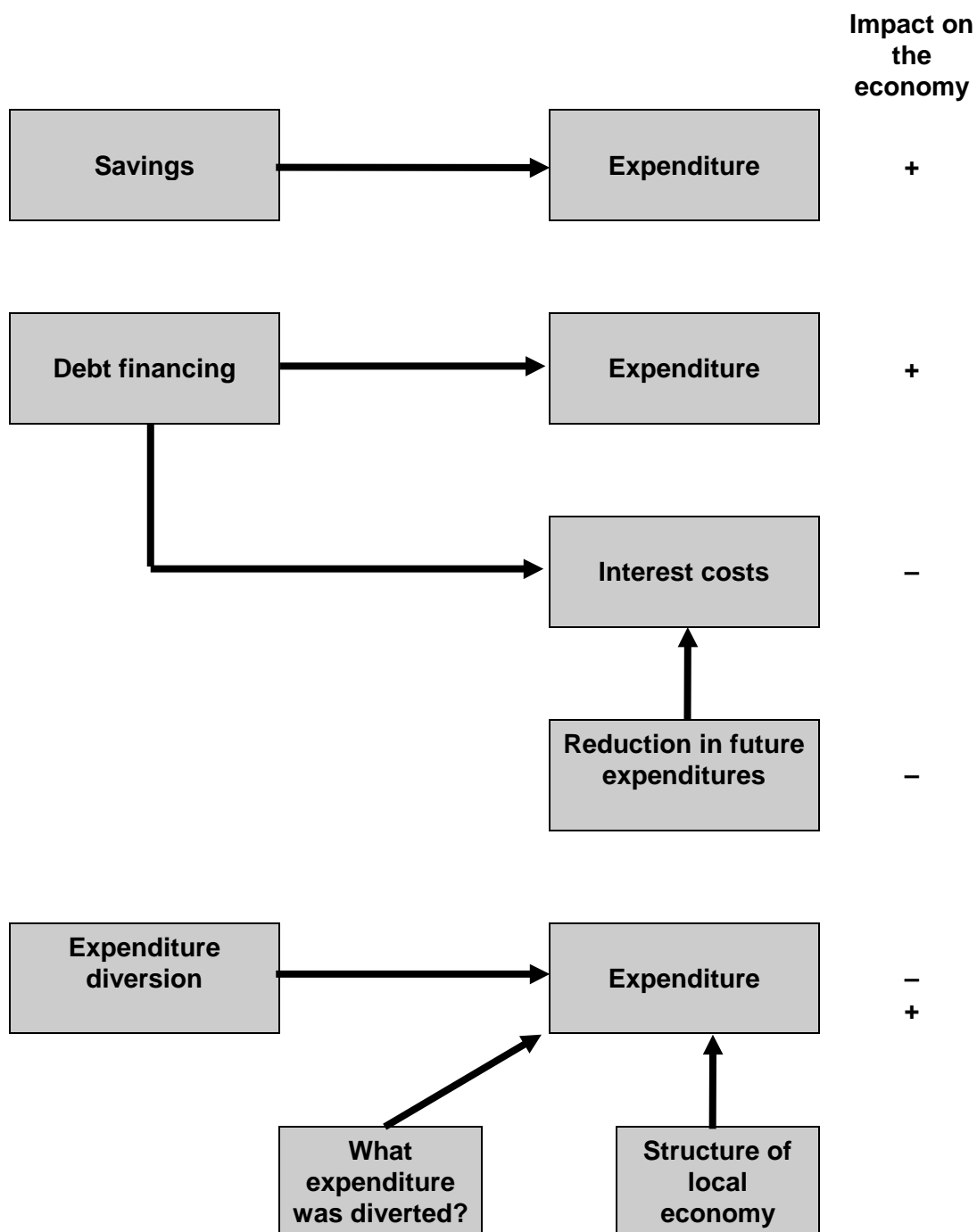
Once we have understood the source of the gaming expenditure we need only address one other issue. What is the opportunity cost of the switch in expenditure, or alternatively what would be the impact had it been otherwise spent? The importance of this question can be illustrated with the use of the following two scenarios.

The first scenario is a community that is very small, creates little wealth and has a small retail base. The switch by its residents into spending on gaming in the local area has two impacts. The first is the direct effect of gaming as discussed in the supply-side section. For this small community the benefits would be large, as there would be an increase in employment and activity in the region. The direct economic cost would be negligible, as the residents only spend minimal amounts on retail locally, choosing to go outside the community for the majority of their retail expenditure.

The second extreme is a large region with a wide industry base and a large retail centre that captures its entire local spending capacities. The switch of one dollar from the local economy to gaming will have a large impact. This is because that dollar fed around the community to all ends of the local economy. Its multiplier or net impact was a lot larger than the single dollar it started as. When retail expenditure is replaced by gaming expenditure a proportion automatically goes to the government, some to the venue, some to Tabcorp and Tattersalls and some goes back through the local economy. It is unlikely that the small share that comes back in the form of wages and salaries and smaller secondary flow-ons will work as hard as the original dollar would have.



**Figure 4.18**  
**Sources of household EGM expenditure**



The regional modelling captures these effects by looking at the sizes and scope of regions and their ability to create wealth and employment (multipliers). The methodology takes into account the retail base of a region and the extent to which it relies on retail expenditures from outside its boundaries. An example of the doubly harsh impacts a region can suffer is evidenced by the City of Geelong, which not only fits second scenario well, but also relies on retail expenditure from residents of the surrounding regions, which will have fallen due to the introduction of gaming.

## 4.11 Other costs - problem gambling

The issue of problem gambling and its associated costs are not assessed in the regional model. These costs can be grouped under the following categories:

- health and welfare service costs borne by the community and state;
- employment dimension cost covering productivity loss and absenteeism;
- legal and criminal costs covering increased crime and costs associated with the criminal justice system; and
- household dimension cost covering bankruptcy and the increased prevalence of debt.

Following the Productivity Commission methodology there are various ways of calculating the number of problem gamblers at the regional level. These are:

- (i) 2.1 per cent of the adult population;
- (ii) 2.1 per cent of the adult population multiplied by a scale factor between 0.6 and 1.4. The 1.4 factor applies to the poorest region and 0.6 to the richest (income terms) region. In Victoria where machine supply is closely related to venue income, this method has the advantage of incorporating the Productivity Commission's methodology of modelling the number of new problem gamblers as a function of availability;
- (iii) 0.33 of total regional gambling expenditure divided by \$12,000. This method used the Productivity Commission's assertion that approximately one third of all gambling revenue comes from problem gamblers and that their losses are approximately \$12,000 per annum. This method has the advantage of imputing a larger proportion of problem gamblers in areas which reported higher than average expenditure; and
- (iv) the average of (ii) and (iii).

Where an estimate was required for economic impact at the regional level, NIEIR used the average of the first three measures outlined above. Based on the \$1,300 per annum costs for problem gamblers the annual Victorian cost in 1997-98 came to \$88 million.

In Section 6.8 below a sensitivity study is reported in which costs per problem gambler are increased to \$6,000 per annum, approximately in line with the Productivity Commission's estimates reported in Table 3.2 above. NIEIR does not believe this to be a realistic estimate, but reports it to give an upper-bound estimate of the geographic distribution of costs.

## 4.12 Summary

The discussion in this chapter lays the foundations for the economic analysis in the coming chapters. The three areas covered were:

1. household budgets for gambling expenditure and savings;
2. sources of gambling expenditure including complements, substitutes and savings; and
3. an economic impact model to analyse the effect of EGM expenditure.

Section 4.2 began with a general discussion on savings and gambling expenditure. This was followed by Section 4.3 which covered historical trends in gambling expenditure and savings, expressed as a percentage of household disposable income. The general finding across Australia in the 1990s was that savings have fallen whilst gambling expenditure have risen. A model was developed to investigate the relationship between the two.

Given the difficulties inherent in the time series data presented in Section 4.3, NIEIR resorted to microeconomic data as a means of identifying substitute and complementary expenditure items to gambling. This culminated in development of a model using adjusted HES data to identify complements and substitutes. The results were presented in Section 4.5.

To further enhance the accuracy of the model NIEIR included problem gamblers and their impact on reported expenditures in the HES. The key finding of Section 4.6 was the identification of a number of households in the HES that may be experiencing long term problem gambling difficulties. As the HES is only a snapshot the section points out the difficulty in determining whether these were long term behaviours or otherwise.

Once the model for household expenditures was developed in Sections 4.3 to 4.6, Section 4.7 tried to identify the resultant adjustment in the household's assets. It linked the section on savings financed gambling and presented results based on different asset categories. Evidence pertaining to the role of substitute and complimentary expenditure was also used. The result of Section 4.7 highlighted how the impact of increased gaming expenditures will vary across household types depending on the household's level of assets (or wealth). The section showed how different households shift expenditure and subsequently funds for asset accumulation or debt reduction away from varying asset or debt types. As each type of asset/debt has different long run consequences the overall results vary markedly.

On the basis of the analysis reported in this Chapter and in Appendices 1-5 NIEIR was able to estimate the economic impact of the increase in gambling at the state and regional levels.

The nature of the flow of economic activity was outlined in Sections 4.8 to 4.10. Section 4.8 showed how funds from gaming are distributed according to regulation (venues, operators and government). It also outlined how the activity (wages and profit and taxes) that is generated within the venue is distributed to the local, state and national economy.

Section 4.9 analysed the source of the expenditure on a geographical basis, asking from what regions the expenditure was derived.

Section 4.10 tackled the implications for the economy of the different ways that the expenditure can be financed from within the household.



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## 5. The current and future Victorian benefit from new gaming services

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The 1997 NIEIR report “The Effect of Gambling on Employment in Victoria” produces estimates of the contribution of new gaming services (casino plus electronic gaming machines) to the Victorian economy. The report found that in 1995-96 net new gaming revenue (that is, after adjusting for the substitution effect between new and traditional gambling products) was estimated at \$1,500 million in 1996 prices.<sup>9</sup>

Given the trends in casino and EGM expenditures over the two subsequent years, this estimate becomes, in 1996 prices:

	<b>\$ million</b>
1996-97	1,740
1997-98	2,071

To facilitate comparison with earlier estimates the 1996 price base was retained.

A critical factor in determining the current contribution of new gambling products to the Victorian economy is whether or not the saving hypothesis (that is, in Victoria new gaming expenditures on a state-wide basis were financed largely out of savings) still holds. Much of analysis in Chapter 4 focused on defending the original hypothesis. However, the inference from the analysis is that the strength of the savings substitution is likely to weaken over time. To examine this matter this weakening effect must be quantified.

### 5.1 The regional dimension: the key to the solution of the gambling financing issue

Ultimately the ability of households to finance gambling expenditures (that is, without significantly reducing other forms of expenditures) depends on:

- (i) the ability of the household to save as measured by the savings ratio – which is the percentage of savings to income; and
- (ii) the households debt-service ratios – which is debt repayment and interest as a percentage of income.

In general, households with high incomes save a higher proportion of income. Also the debt service ratio will vary systematically with household net worth or wealth.

The strength of savings substitution will vary positively with the savings ratio and negatively with the debt service ratio. The higher the household’s level of savings the more likely it is to finance gambling out of savings. Conversely, the higher the household’s debt service ratio, the less likely it is that gambling expenditure will come from savings.

Evidence as to how the financing of gambling from savings will change at the state level may be sought at the regional (that is, sub-state) level. Different regions (defined by Victorian Local Government Areas) will have different gambling propensities and different savings and debt service characteristics.

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<sup>9</sup> NIEIR “The Effect of Gambling on Employment in Victoria”, 1997, p. 86.

The finding that, state-wide, new gaming expenditures have been financed from savings implies that regions with high incomes (hence high savings ratios) and low debt service ratios will fund new gaming expenditures from savings. Other regions with low incomes and high debt service ratios could be funding only part of their new gaming expenditures from savings. The probability of such regional variations is increased by the complementarity of various other expenditures with gambling, which means that these expenditures will also increase.

It follows that as the income, savings and debt characteristics of regions change, their ability to finance new gaming expenditures out of savings will also change. The sum of regional changes will determine the overall state-wide change.

In order to quantify this aspect, part of the regional modelling framework outlined more fully in Chapter 6 will be used. What will be required from the regional modelling is historical data and projections (to 2001) of:

- savings ratios by region;
- debt-service ratio by regions; and
- household disposable income.

Table 5.1 shows the estimates and projections of the savings adjusted debt service ratio by region from 1993 to 2001. This ratio measures the difference between a region's debt service ratio and its estimated savings ratio. This is a much more useful measure than either the debt service ratio or the savings ratio because it combines the best elements from both into one number.

*Savings adjusted debt service ratio = debt service ratio (principal plus interest) – savings ratio*

For clarity this concept will be explained with the use of an example. A prosperous region may have a debt service ratio of 25 per cent of income and a current savings ratio of 7 per cent of income. In effect the 7 per cent savings could be offset against debt servicing, producing a figure of 18 per cent. This savings-adjusted debt service ratio is a more accurate measure of the region's finances. The higher this ratio the less the region's discretionary income and hence the less its ability to add to its debt service costs.

The ratio varies considerably across regions. For example Stonnington, an unusually high income region, had an estimated savings adjusted debt service ratio of 14.7 per cent in 1995-96 while Casey (with its high mortgages) had a savings adjusted debt service ratio of 32.2 per cent. Much of the difference is explained by the fact that Casey had an estimated net savings ratio of -6.0 per cent in 1995-96, meaning that on average the households in the region spent more than they brought in. This tightens the financial constraint represented by Casey's 26.2 per cent unadjusted debt service ratio.

The general deterioration in regional savings adjusted debt service ratios since 1995-96 is due to:

- (i) declines in the savings ratio following the Victorian trends; and
- (ii) increases in the debt service ratio because of the overall expansion in debt.

Post 1999 it is projected that the deterioration in the savings adjusted debt service ratio will be accelerated by a rise in interest rates. This is assumed to be approximately 2.0 percentage points (total of rises from January 2000 onwards).

**Table 5.1 Victorian regions: debt service ratio minus savings ratio – 1993-2001 (ratio)**

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Alpine (S)	0.15	0.14	0.14	0.16	0.17	0.18	0.20	0.23	0.27
Ararat (RC)	0.18	0.16	0.15	0.17	0.19	0.21	0.23	0.26	0.31
Ballarat (C)	0.19	0.16	0.16	0.18	0.19	0.20	0.21	0.24	0.28
Banyule (C)	0.18	0.16	0.16	0.18	0.19	0.20	0.21	0.24	0.28
Bass Coast (S)	0.10	0.08	0.09	0.12	0.14	0.15	0.17	0.21	0.25
Baw Baw (S)	0.25	0.21	0.21	0.23	0.24	0.25	0.26	0.30	0.34
Bayside (C)	0.18	0.16	0.16	0.19	0.21	0.23	0.25	0.29	0.33
Boroondara (C)	0.05	0.04	0.04	0.07	0.09	0.11	0.14	0.18	0.22
Brimbank (C)	0.07	0.05	0.05	0.09	0.11	0.12	0.14	0.18	0.22
Buloke (S)	0.16	0.14	0.14	0.17	0.20	0.23	0.25	0.31	0.37
Campaspe (S)	0.21	0.17	0.16	0.19	0.22	0.25	0.27	0.31	0.36
Cardinia (S)	0.26	0.24	0.24	0.28	0.30	0.30	0.32	0.36	0.41
Casey (C)	0.24	0.25	0.26	0.32	0.34	0.34	0.36	0.41	0.45
Central Goldfields (S)	0.14	0.14	0.16	0.22	0.24	0.25	0.27	0.31	0.35
Colac-Otway (S)	0.23	0.20	0.20	0.21	0.22	0.23	0.24	0.27	0.31
Corangamite (S)	0.19	0.17	0.16	0.19	0.21	0.24	0.26	0.31	0.37
Darebin (C)	0.15	0.12	0.12	0.15	0.17	0.19	0.21	0.25	0.28
Delatite (S)	0.16	0.13	0.13	0.14	0.16	0.17	0.18	0.21	0.26
East Gippsland (S)	0.19	0.16	0.16	0.18	0.20	0.21	0.23	0.26	0.30
Frankston (C)	0.26	0.23	0.23	0.25	0.26	0.26	0.27	0.30	0.34
Gannawarra (S)	0.16	0.15	0.15	0.20	0.22	0.24	0.27	0.31	0.37
Glen Eira (C)	0.19	0.16	0.16	0.18	0.21	0.23	0.24	0.28	0.32
Glenelg (S)	0.11	0.09	0.09	0.11	0.13	0.14	0.16	0.20	0.24
Golden Plains (S)	0.23	0.20	0.20	0.24	0.26	0.26	0.28	0.32	0.37
Greater Bendigo (C)	0.22	0.22	0.22	0.26	0.28	0.29	0.31	0.34	0.38
Greater Dandenong (C)	0.19	0.17	0.17	0.19	0.20	0.21	0.22	0.25	0.29
Greater Geelong (C)	0.18	0.16	0.16	0.18	0.19	0.19	0.20	0.23	0.27
Greater Shepparton (C)	0.18	0.16	0.16	0.18	0.20	0.21	0.22	0.26	0.30
Hepburn (S)	0.21	0.18	0.18	0.21	0.23	0.23	0.25	0.28	0.32
Hindmarsh (S)	0.20	0.17	0.17	0.18	0.20	0.22	0.24	0.28	0.33
Hobsons Bay (C)	0.17	0.14	0.13	0.15	0.17	0.18	0.20	0.23	0.27
Horsham (RC)	0.13	0.11	0.11	0.14	0.16	0.17	0.19	0.23	0.28
Hume (C)	0.23	0.21	0.21	0.24	0.26	0.26	0.27	0.31	0.35
Indigo (S)	0.18	0.18	0.19	0.24	0.26	0.27	0.29	0.33	0.38
Kingston (C)	0.19	0.17	0.17	0.21	0.22	0.23	0.25	0.29	0.33
Knox (C)	0.18	0.17	0.17	0.21	0.23	0.23	0.24	0.28	0.32
La Trobe (S)	0.12	0.12	0.13	0.17	0.20	0.21	0.23	0.26	0.30
Loddon (S)	0.18	0.15	0.15	0.17	0.19	0.21	0.23	0.28	0.34
Macedon Ranges (S)	0.28	0.25	0.25	0.28	0.30	0.31	0.33	0.37	0.41
Manningham (C)	0.15	0.14	0.15	0.20	0.22	0.23	0.26	0.30	0.34
Maribyrnong (C)	0.07	0.06	0.06	0.09	0.11	0.13	0.14	0.18	0.21
Maroondah (C)	0.19	0.16	0.16	0.18	0.19	0.18	0.19	0.22	0.25
Melbourne (C)	0.08	0.07	0.08	0.12	0.14	0.16	0.19	0.23	0.28
Melton (S)	0.17	0.14	0.13	0.17	0.18	0.19	0.21	0.24	0.28
Mildura (RC)	0.17	0.17	0.18	0.24	0.26	0.27	0.30	0.34	0.39

**Table 5.1 Victorian regions: debt service ratio minus savings ratio – 1993-2001 (ratio) – continued**

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Mitchell (S)	0.25	0.23	0.22	0.25	0.27	0.27	0.29	0.32	0.36
Moira (S)	0.20	0.19	0.20	0.24	0.26	0.28	0.30	0.34	0.40
Monash (C)	0.19	0.17	0.16	0.19	0.21	0.23	0.24	0.28	0.31
Moonee Valley (C)	0.09	0.08	0.08	0.10	0.12	0.13	0.15	0.18	0.22
Moorabool (S)	0.16	0.14	0.14	0.18	0.19	0.19	0.21	0.25	0.29
Moreland (C)	0.16	0.15	0.16	0.19	0.21	0.22	0.24	0.27	0.31
Mornington Peninsula (S)	0.17	0.14	0.14	0.16	0.17	0.17	0.18	0.21	0.24
Mount Alexander (S)	0.18	0.16	0.16	0.19	0.21	0.21	0.22	0.26	0.29
Moyne (S)	0.24	0.21	0.21	0.23	0.25	0.27	0.29	0.34	0.40
Murrindindi (S)	0.23	0.21	0.21	0.25	0.28	0.30	0.33	0.37	0.42
Nillumbik (S)	0.25	0.24	0.24	0.29	0.31	0.31	0.33	0.37	0.42
Northern Grampians (S)	0.09	0.10	0.11	0.17	0.20	0.22	0.25	0.30	0.36
Port Phillip (C)	0.16	0.14	0.13	0.16	0.17	0.19	0.21	0.24	0.28
Pyrenees (S)	0.11	0.08	0.07	0.10	0.12	0.14	0.16	0.20	0.25
Queenscliffe (B)	0.20	0.17	0.17	0.18	0.20	0.22	0.24	0.27	0.30
South Gippsland (S)	0.17	0.14	0.13	0.14	0.16	0.17	0.19	0.22	0.27
Southern Grampians (S)	0.19	0.17	0.17	0.20	0.23	0.25	0.28	0.32	0.38
Stonnington (C)	0.16	0.13	0.13	0.15	0.17	0.19	0.21	0.25	0.30
Strathbogie (S)	0.06	0.03	0.03	0.06	0.08	0.10	0.13	0.17	0.21
Surf Coast (S)	0.24	0.21	0.21	0.23	0.25	0.25	0.27	0.30	0.34
Swan Hill (RC)	0.19	0.17	0.17	0.20	0.22	0.24	0.26	0.30	0.35
Towong (S)	0.21	0.18	0.17	0.20	0.22	0.25	0.27	0.32	0.37
Unincorporated Vic	0.20	0.16	0.15	0.17	0.20	0.24	0.26	0.31	0.36
Wangaratta (RC)	0.20	0.18	0.17	0.20	0.22	0.25	0.27	0.31	0.35
Warrnambool (C)	0.18	0.16	0.15	0.18	0.19	0.20	0.22	0.25	0.29
Wellington (S)	0.19	0.16	0.16	0.18	0.20	0.21	0.22	0.26	0.30
West Wimmera (S)	0.18	0.15	0.15	0.17	0.20	0.24	0.27	0.33	0.41
Whitehorse (C)	0.20	0.16	0.15	0.18	0.21	0.25	0.27	0.31	0.35
Whittlesea (C)	0.14	0.12	0.12	0.16	0.18	0.18	0.20	0.24	0.28
Wodonga (RC)	0.18	0.17	0.18	0.22	0.24	0.25	0.27	0.30	0.35
Wyndham (C)	0.22	0.20	0.21	0.25	0.26	0.26	0.27	0.31	0.35
Yarra (C)	0.10	0.11	0.12	0.16	0.19	0.20	0.22	0.26	0.30
Yarra Ranges (S)	0.16	0.14	0.13	0.17	0.18	0.18	0.19	0.23	0.27
Yarriambiack (S)	0.13	0.12	0.13	0.17	0.20	0.24	0.27	0.32	0.38
<b>Total Victoria (simple average)</b>	<b>0.18</b>	<b>0.16</b>	<b>0.15</b>	<b>0.19</b>	<b>0.21</b>	<b>0.22</b>	<b>0.24</b>	<b>0.28</b>	<b>0.32</b>

The final step was to use the model to estimate how, for each region, the proportion of new gambling expenditure financed from savings would change as the savings-adjusted debt service ratio changes.

The model results indicate that for high savings-adjusted debt service ratio regions a 1.0 percentage point change in the savings-adjusted debt service ratio leads to a 4.0 percentage point change in the proportion of gambling expenditure financed from savings.



The resulting state-wide estimates for the savings financing of new gaming expenditures are given in Table 5.2. The key result is that in 1997-98 savings financing of new gaming expenditure is estimated to have dropped to 87 per cent. In the immediate future, that is 2000, a financing-from-savings ratio of around 70 per cent is expected. High interest rates and the grind-down effect of high levels of household debt will further reduce the savings finance ratio to 54 per cent in 2001.

After 2001 interest rates can be expected to fall, which will generate the potential for a rebound (albeit temporary) in the household savings financing of gaming expenditures. On current trends a realistic assessment would be that the Victorian savings financing of new gaming expenditures will be in the vicinity of 45 to 50 per cent by the middle of the current decade.

1995-96	100
1996-97	93
1997-98	87
1998-99	82
1999-00	70
2000-05	45-50

Source: NIEIR.

## **5.2 New gaming activities: macroeconomic modelling evaluation methodology**

There are a number of alternative methodologies to be employed in estimating the impact of new gaming expenditures on the economy. One methodology which has already been discussed is the consumer surplus approach. This is appropriate for a resource constrained economy.

Victoria, over the 1990 decade, has not been a resource constrained economy. Therefore, alternative methodologies need to be employed. The general alternative methodologies are econometric model based with the research sequence outlined in Figure 5.1.

Within the econometric model approach there are two approaches. One is the demand side and the other is the production (or more accurately) the income side.

Under the demand side approach the focus is on estimating the direct expenditure impact of new gaming activities, including:

- (i) visitor expenditure in Victoria that is made because of non-gaming availability;
- (ii) retained Victorian resident expenditures that would otherwise have been applied interstate on gaming activities; and
- (iii) net new gaming expenditures applied by Victorian residents in Victoria.

In the Victorian Casino and Gaming Authority's study "*The Effects of Gambling on Employment in Victoria*", August 1997, NIEIR adopted a production/income approach. This involved the estimation of net direct income allocation from new gaming activities.

**Figure 5.1: Gambling and employment – the methodological phases**

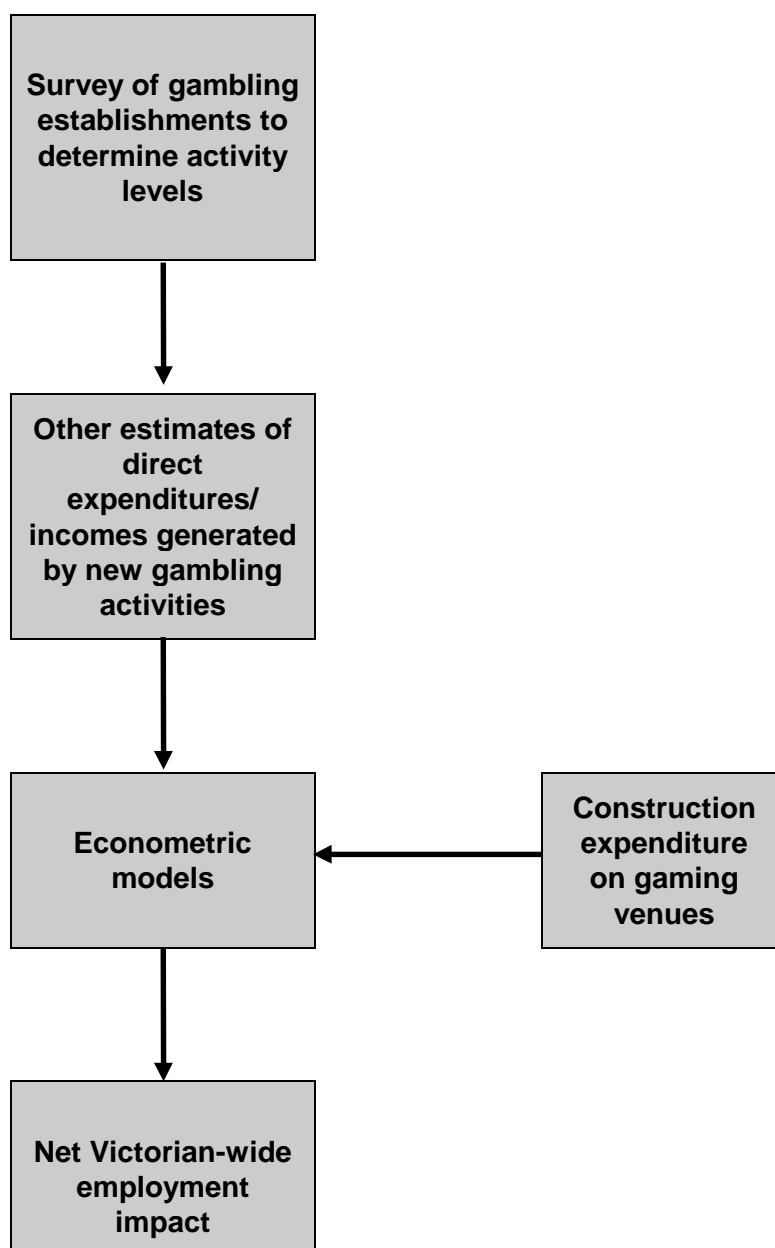


Table 5.3 defines the four categories under which revenue from gambling activities is distributed to direct beneficiaries. As the table covers the gaming industry as a whole, the distributions between gaming enterprises, such as between venue operators and EGM machine owners, are netted out.

**Table 5.3 Distribution structure of new gambling activity revenue**

1.	Direct “on-site” employment	Wage and salary payments.
2.	Purchases of goods and services (or inter-industry demand)	Payments to contractors, consultants, and other service providers, payments for goods purchases.
3.	Taxes	Casino taxes, gaming taxes, payroll taxes, etc.
4.	Gross operating surplus	Interest payments, company taxes, dividend payments, proprietor income, depreciation allowances, profit retained.
5.	Displacement expenditure effect	Loss of value added in non-gambling industries due to gambling expenditure crowding out effects.

The first category includes the direct on-site employment beneficiaries with the gambling revenue distributed to these people as wage and salary income. By on-site gambling industry employment is meant the employment in establishments which are classified as providing gambling activities. Therefore the new gambling activity revenue distributed to the on-site employment beneficiaries is the wage and salary component of the industry.

Gambling venues and other gambling industry enterprises also purchase goods and services from non-gambling industry personnel and enterprises. Security, cleaning and maintenance services are generally purchased from contractors along with replacement parts and other goods required to maintain venues and gaming appliances. Purchases of goods and services from outside the industry are referred to as net inter-industry purchases which will create employment in the same way as on-site employment. In this instance, however, the employment increase is classified to other industries in the economy such as business services, financial services, fabricated metal products, etc.

Casino taxes and gaming taxes constitute a significant proportion of new gambling activity revenue. What the government decides to do with this additional revenue will be important in determining the employment effect of gambling.

Gross operating surplus is simply the residual after deducting wages and salaries, inter-industry demands and taxes from total new gaming activity revenue. Gross operating surplus can be distributed to the gambling industry as retained profits and depreciation allowances, or it can be distributed to other sectors of the economy as:

- interest payments;
- dividend payments;
- proprietor income; and
- other direct taxes (company taxes), etc.

The scope of the direct effect is completed when the employment created by the construction of gaming venues is taken into account.

The direct loss of value added in non-gaming industries involves the estimation of the industry substitution or industry crowding-out effect. The crowding-out effect involves both non-gaming gambling industries and non-gambling industries. The savings financing ratio outcome is central to the calculation of the industry crowding-out effect.

The production/income side approach is preferred by NIEIR because more accurate estimates can be made of direct income leakages compared to the direct expenditure leakages.

As previously detailed, the macro econometric model-based evaluation of gaming expenditures uses NIEIR's macro econometric models of the Australian and Victorian economies.

### ***Gross and net state product***

Although the employment study used the designation gross state product, conceptually the estimate was net state product. The difference between gross and net national product is the net flow of income (interest, dividends, wages, etc.) accruing to foreign residents. It is the same at the state level in that the difference between gross and net state product is the direct leakage of income out of the state or into unspent government balances. All the data necessary to determine both gross and net state product was explicitly included in the Employment Study. This study clears up the unnecessary confusion that arose from the previous inappropriate descriptions. State multiplier analysis should only be applied to the net state product concept.

## **5.3 The gambling services export share**

The greater the share of gaming expenditures generated by expenditures of non-Victorian residents, the less the impact of the decline in the savings financing of gaming expenditures in terms of the economy-wide benefits.

The question is, therefore, what is a reasonable estimation of the exports of gaming expenditures? NIEIR, in a study for the Melbourne City Council published in December 1998, estimated the interstate and international share of Casino expenditure at 48 per cent. This was based on direct surveying of casino patrons and VIP expenditure estimates provided by Crown Casino. The export share of Casino non-VIP expenditures was estimated at 23 per cent.

The 1996 Tourism Victoria report "Victorian Regional Travel and Tourism Survey: Main Overnight Report" estimated the average gaming expenditure per night of interstate and international visitors at \$3. It can safely be assumed that this estimate does not capture the VIP or high roller expenditure effect.

Inflating the \$3 estimate by:

- (i) the growth in international and interstate tourism;
- (ii) the growth in the number of EGM machines since 1995;
- (iii) inflation;
- (iv) the impact of interstate daily visitors, that is mainly business visitors; and
- (v) deducting the export expenditures of the non-VIP casino visitors,

gives a figure that the current export gain of non-casino EGM expenditures is approximately 6 per cent. The overall weighted average result for gaming expenditures is, therefore, 20 per cent.

Given the recovery in VIP expenditures with the Asian economic recovery, and the expected outcome that visitor expenditures will grow twice as fast as Victorian resident expenditures, a reasonable working benchmark for the export share of gaming expenditures will be of the order of 25 per cent by the middle of this decade (that is, by 2005).

## 5.4 The impact of new gaming

Table 5.4 updates the 1995-96 estimates of the impact of new gaming expenditures on the Victorian economy.

The first row in Table 5.4 is taken directly from the 1995-96(e) estimates in Table 7.9 from VCGA *"The Effect of Gambling on Employment in Victoria"*, August 1997. Using the same modelling methodology as employed in that study Table 5.4 updates the 1995-96 previous estimates for 1997-98 and 1998-99 given the actual levels of new gaming expenditures.

It should be noted that new gaming expenditure is not the same as gaming expenditure. In 1998-99 gaming expenditure (casino plus EGM) in Victoria was \$2.6 billion. In Table 5.4 new gaming expenditure for 1998-99 is \$2.2 billion. The difference is due to the estimated \$0.4 billion that comes from the substitution of gaming expenditures for other forms of gambling expenditures. The methodology for calculating this is given in the Employment Study.

The 1999-00 and 2004-05 estimates of new gaming expenditures are projections. For the macro modelling the savings financing profile of Victorian resident expenditures is taken from the profile given in Table 5.2, under which 82 per cent savings financing from 1998-99 falls to 70 per cent by 1999-00. For 2004-05 the proportion of new gaming expenditures financed from Victorian domestic savings is set at 47.5 per cent.

Despite the estimated fall in the household savings financing ratio by 11 percentage points between 1995-96 and 1997-98, the contribution of new gaming expenditures to Victorian net state product increased by \$277 million to \$1 420 million in 1996 prices. The contribution to employment was 24,400, an increase of 21 per cent over the 1996 levels. The opening of the permanent casino in May 1997 made a significant contribution to this outcome.

Despite the growth in new gaming expenditures over the period from 1998 to 2000 the contribution to Victorian economic activity falls due to the falls in the savings financing ratio.

By 2004-05, given the 1997 Employment Study modelling methodology, the contribution of new gaming expenditure to Victorian net state product will be \$1.3 billion with a total employment contribution of 20,200.

The gross state product estimates are larger than the net estimates because they include the direct estimate of private and public sector income flows out of the state.

### **Government expenditure**

In the 1997 Employment Study it was assumed that 50 per cent of Victorian government revenue was allocated to increased expenditure and 50 per cent to debt reduction. This assumption has been retained here to 1999-00 and the (a) estimate for 2004-05.

However, it is not realistic to maintain this assumption to 2004-05. Victorian debt has now fallen to low levels and Victoria has regained its triple A credit rating. In these circumstances it is more plausible to assume that all the additional government revenue from new gaming will be spent. It is this assumption which underpins the (b) estimate for 2004-05 in Table 5.4.

As government expenditure financing from new gaming revenue expands over the next few years, the total net state product from new gaming expenditure will expand to \$1,822 million in 1996 prices, while the employment contribution will expand to 30,700.

Thus, the substantial fall in the household savings financing of new gaming expenditure over the next few years will be more than offset by:

- the growth in exports of gaming services; and
- the increased funding of government expenditures from gaming revenue,

with the result that the contribution of new gaming expenditures to the Victorian economy will increase.

Under the 2004-05(b) case gross and net state product are closer because income flows out of the state from government taxation revenue cease.

**Table 5.4 New gaming activities: impact on Victorian macroeconomic aggregates (excluding construction and problem gambler effect) – 1996 \$ million**

	New gaming expenditure	Private consumption expenditure	Government expenditure	Private equipment investment	Non-dwelling construction	Net state product	Gross state product	Total employment ('000)
1993-94	568	184	126	32	25	263	474	4.2
1994-95	1 127	438	200	80	69	669	998	10.7
1995-96	1 500	829	279	160	120	1 143	1 584	20.2
1997-98	2 070	1 033	331	197	146	1 420	1 893	24.4
1998-99	2 214	1 045	338	199	148	1 437	1 896	23.6
1999-00	2 401	1 009	343	194	143	1 289	1 753	22.8
2004-05 <sup>a</sup>	2 920	967	328	186	138	1 331	1791	20.2
2004-05 <sup>b</sup>	2 920	1 276	618	239	167	1 822	2 070	30.7

*Source:* NIEIR. Data to 1995-96 from Tables 7.7 and 7.9 of the VCGA Employment study. Net state product is what was designated gross state product in Table 7.9. Gross state product here is net state product plus residual GOS plus government debt reduction from Table 7.10 in the 1997 Employment Study.

## 5.5 The construction effect and problem gamblers

The results in Table 5.4 for 1995-96 did not take into account the construction effect. In the Employment Study the cumulative increase in net state product from the construction effect over the period 1993-94 to 1995-96 was \$1.4 billion which, in turn, was largely due to the construction of the permanent casino.

Replacement, alteration and addition, and refurbishment expenditures on the permanent casino are not captured in the results in Table 5.4. It is reasonable, therefore, to assume that the long term average of these expenditures will be around 6 per cent, representing an average of building and equipment depreciation, an annual expenditure in the vicinity of \$80 million.

However, as noted in Section 4.10, problem gambler costs come to approximately the same amount. These costs are best treated as a tax on the community and, therefore, would have the same, though negative, incidence as construction expenditures. Therefore, it is reasonable to regard the impacts in Table 5.4 as also representing the case where the benefits are net of both problem gambler costs and additional construction expenditure benefits.

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## **6. Victorian regional impact analysis: electronic gaming machines**

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One objective of this study is to undertake a bottom-up approach to assessing the state-wide net benefits of new gaming expenditures. A second objective is to assess the long run impact of gambling on regions. The bottom-up approach is based on summing the net benefit from Local Government Areas. These objectives are pursued in this chapter, which uses a full regional model framework to analyse the regional impact of electronic gaming machines.

The links in this section to other sections of this study is as follows. The regional modelling framework uses microsimulation of household characteristics in each region (as described in Sections 4.4 to 4.6, regionally dimensioned by census results), complemented by regional modelling on the supply side (Section 4.7). Expenditures generated by the microsimulation model are dimensioned to household savings ratios (as described in Section 4.9 and Chapter 5) and allowance is made for expenditure flows between regions (Section 4.8).

### **6.1 Reported EGM expenditures**

In the beginning of March 2000 the Authority released a detailed table of total gaming expenditure (net cash balances) for most local government areas in Victoria. This table is duplicated in Appendix 6.

The regional modelling in this report does not explicitly use data in this table due to the following reasons.

1. A number of local government area totals are not reported individually, as the total number of venues within the area is small.
2. NIEIR required information relating to the split between Tabcorp and Tattersalls machines and between club and non-club venues. This necessarily involved using only a sample time period for which NIEIR obtained revenues for all venues.

Care was taken to limit seasonal variation that some venues may experience. Totals were appropriately cross-checked against 1997-98 regional relativities. Estimated totals for all regions are comparable to total year expenditures detailed in Appendix 6.

The EGM expenditure level on which the regional analysis of this section is based is \$2.2 billion. This is the Victorian total expenditure level for 1998-99. It includes expenditure on EGM machines in the Casino. Non-EGM Casino expenditure for 1998-99 was \$0.5 billion.

### **6.2 Short and long run regional models and assumptions**

A distinction has to be drawn between short and long run models and assumptions. The distinction between short and long run regional models assessing the impact of new gaming activities focuses on how new gaming expenditures are treated in the household expenditure decision process.

If gaming expenditures are treated as a mature expenditure item then households, in considering adjustments to total income, expenditure, savings and debt formation, will adjust gaming expenditures proportionately to their share in total household expenditures. That is, when gaming expenditures are a mature expenditure item, they will be adjusted more or less in proportion to the overall expenditure adjustment.

When gaming expenditures are a new expenditure item then it is appropriate to consider the financing of new gaming expenditures in themselves as a focus of households. In the macro-econometric analysis of Section 5, new gaming expenditures were treated as a new or "immature" expenditure category.

When the savings financing of gaming expenditures is high, it is clearly appropriate to treat new gaming expenditures as new or "immature" expenditure items. However, once the savings financing of new gaming expenditures falls to around 20 per cent, then it is appropriate to treat gaming expenditure as a mature household expenditure item. From the analysis of Section 5.1, new gaming expenditure will not become a fully mature expenditure item until the 2005-2010 period.

The long run regional modelling structural features and the long run savings financing assumptions are linked. The long run regional modelling structure contains the assumption that the savings financing of gaming expenditure is 20 per cent (along with a range of other expenditure items), while the household expenditure decision behavioural structure assumes gaming expenditures are a mature item.

The reverse is true for the short run regional modelling structure, under which gaming expenditures are considered a new/immature item with a 70 per cent household savings financing.

### **6.3 The regional case studies**

In the main the regional case studies of this section are long run studies. Based on 1998-99 EGM expenditure levels they indicate what the regional net benefit will be once gaming becomes a mature expenditure item. Thus the analysis applies to what is likely to be the outcome by 2005 to 2010. The results do not apply to the current situation.

There is one and only one case, the short run case, which does apply to the current situation. This is given in Table 6.5.

The focus of this section, on likely long run outcomes, is based on the premise that it is the long run outcomes that are the most important for structural policy formulation.

### **6.4 The operation of the regional model: an example**

In order to describe the operations of the regional model an example is taken of the calculation of the results presented in Table 6.1. This will be the City of Unknown. The actual results for the City of Unknown in Table 6.1 have been altered in this example to avoid identification. The methodology behind this model was described in Sections 4.8 to 4.11.



The City of Unknown, in Melbourne, currently has 414 EGMs. The total amount retained by machines (the Net Cash Balance), is \$463,000 per week.

The venues receive	\$126,000 (\$39,000 clubs + \$86,000 hotels)
Government tax including GST	\$183,000
Machine operators	\$154,000
<b>Total</b>	<b>\$463,000</b>

The region receives \$13,000 from wages earned by residents who work at Crown Casino. An additional \$40,000 goes to the LGA in wages and salaries to residents from working at venues inside or outside the area. Other costs or value-adding incurred in operating these gaming machines are distributed in the following manner.

- \$25,000 or 20 per cent of venue income stays within the local area in the form of wages and salaries for providing venue inputs (cleaning, accounting etc) and specific construction work.
- \$13,000 or another 10 per cent goes to the state and is distributed across the state based on the level of output in each LGA. This is designed to capture the type of activity that is provided by state or nation-wide enterprises whose direct benefit is hard to capture on a regional basis. The result of this redistribution via the state is a total return to the City of \$45,000, due to the fact that its regional product is large.
- We assume that the gross operating surplus (GOS) of the venues operated as clubs goes back to the community. For the City of Unknown this equals \$15,000 or 38 per cent of club revenue.
- We assume that six per cent of hotels' GOS (\$5000) goes back to the community reflecting local ownership patterns of publicans. The remaining 32 per cent for hotels, or \$28,000, is distributed state-wide according to the general ledger of shareholder residence.
- \$108,000 of economic activity comes back to the City. This income includes: dividends for shareholders of Tabcorp and Tattersalls, wages and salaries paid by these organisations and other value added, such as payments for venue maintenance. The City's wealthier-than-average socio-economic base attracts a high level of dividends. The regions high level of local output attracts other value-added (wages and operating surplus from activities associated with the provision of gaming), and its proximity to the main offices of Tabcorp and Tattersalls attracts wage incomes from these sources.
- The proportion that comes back to the City in the form of government expenditure financed from taxes is \$238,000. This is based on the assumption that government revenue is distributed equally by population across the state.

On the expenditure side the City of Unknown residents are estimated to spend \$16.60 per household per week on EGMs. This is 74 per cent of State-wide median expenditure per household, which is \$19.96 according to SpendInfo<sup>10</sup>. Dividing EGM revenue in the City of Unknown by the number of households derives the \$16.60 figure.

The journey to work (JTW) correction factor is 1.16 (developed in Section 4.9), meaning that the total market of players is boosted by 16 per cent due to the influx of workers and the

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<sup>10</sup> SpendInfo is a registered NIEIR product which details household expenditure levels for over 400 consumption categories. It is based on the HES and provides both actual and forecast data by post code.

level of entertainment infrastructure. After applying the JTW correction, residential expenditure per household drops to \$14.28.

Because the relative propensity to gamble of the workers and other people visiting the area is higher than the resident population, a correction factor is applied which further reduces estimated residential EGM expenditure per household to \$12.77.

Asking the question of how this expenditure is financed we note that the estimated average household savings ratio is 6.7 per cent which equates to \$57 per week. Therefore, the amount gambled can on average, comfortably be met without being debt financed.

The unadjusted household-model savings reduction response to increased new gambling for the City of Unknown is 127 per cent. This is due to the higher-than-average level of income and implies that residents are slightly more likely to be savings-financing gaming expenditure than the average Victorian.

The Victorian state-wide percentage of expenditure that comes from savings is 17.6 per cent, the weighted average implied by the assumption that the figure is 20 per cent for all Victorian households (long run rate consistent with mature product, as described in Section 6.2). By multiplying the model estimate by the state-wide factor, Unknown has a savings-financing rate of 22.4 per cent, therefore of the \$12.77 spent we find that \$2.86 is savings-financed leaving \$9.9 to be expenditure-diversion financed.

The net present value (NPV) of this savings financed behaviour over five years is \$681 per household. This is derived by multiplying the \$2.86 of weekly savings financed expenditure by 52 weeks by 5 years, then discounting the future values so a figure can be expressed in today's dollars.

This is a positive impact for the local economy. The total NPV of the diverted expenditure is \$2,360 per household over the five years of the projection. We must now trace the areas from which this diverted expenditure will be lost.

The example becomes complicated here because the retail equation involves spending by residents of the City of Unknown in other suburbs and in their own region and also spending by all residents over Melbourne in the City of Unknown.

For the \$2,360 per household from 29,000 households, once the multiplier effects have been included a total value of \$52 million would have been lost due to local area effects as well as \$36 million which would have gone into the broader economy. Once all regions have included their amounts going to the broader economy and all of the flows are determined, we find that the City of Unknown would lose \$41 million from economic activity owing to this diverted expenditure.

The net impact offsets a NPV of \$19 million in saving gained against a cost of \$93 million in other economic activity foregone. Therefore the LGA loses \$74 million. Or put it another way, if gaming expenditure went down a black hole (i.e. it provided no local benefits in the form of wages, profits, tax, etc.) then the area would be \$74 million worse off in NPV over five years.

However the black hole scenario is not the case and we must therefore add back the NPV over five years from:

- wages and salaries;
- profits;
- other value added; and
- government expenditure (EGM financed).

This amount is equal to \$108 million. The money the residents saved has no current economic benefit (i.e. 6 per cent of \$108 million because of the City of Unknown savings rate). Therefore the spent income effect is \$101 million. Using the same multipliers or model for the local economy, as used in the retail diversion effect, gives a net income effect of \$151 million over five years.

This \$151 million net income effect minus \$74 million, the value of expenditure foregone, gives \$77 million as the net impact of EGM expenditures on the area expressed as an NPV over five years.

The example above is designed to assist the reader to understand the complex nature of the approach used and in this instance, it is the understanding of the process, not the final fictitious regional impact, that is important.

## 6.5 Measuring regional impacts

Section 6.4 worked through a regional example of the processes modelled and arrived at a net impact measured in terms of \$ million. The net impact for a region, as was shown in the example, is defined as the net income effect minus the value of expenditures foregone. The actual estimate for each region using this technique is shown in Table 6.1. Also included in the fourth column of Table 6.1 is the annual undiscounted costs of problem gambling as explained in Section 4.11.

To measure the effect on households of the net impact we report two additional measures. The first is simply the results from Table 6.1 expressed in a per household per week dollar impact. This highlights the effect on everyday incomes and is shown in Table 6.2, column 1.

The second measure addresses the long term consequences for asset formation of the effect on regional incomes and savings (Table 6.2, column 2). This is expressed as a lump sum over five years, discounted to today's dollars. In the research outlined in Appendix 2, the differences in long run outcomes for heavy gamblers depended largely upon their asset base and their ability to save. In simple terms the poorer the assets and income of a region the greater the long run implications of a small diversion of savings. Conversely, the research also found that for high asset/high income areas the long run impact on asset formation appeared quite small. To develop a measure of these effects, it was accordingly important to obtain an effective measure of the region's ability to save and grow its financial base. The appropriate tool is NIEIR's household debt model, which uses microsimulation techniques to build a complete financial portfolio for all regions of Australia. From this source we obtain a per week dollar measure of financial security. Financial security in this sense deals with a region's ability to withstand changes in interest rates and incomes.

According to this measure of financial security, there are considerable differences between Victorian regions. Although much of metropolitan Melbourne has experienced significant asset growth, due to housing price and stock market increases, the same cannot be said for most of country Victoria. By including such measures as the value of house prices increase, as well as ordinary incomes and government payments, we obtain a detailed financial view

of the geography of economic advantage and disadvantage. NIEIR believes this measure to be inclusive of all the financial elements of the ABS socioeconomic disadvantage measure. It does not, however, include the full breadth of social measures, preferring to leave these questions to broader policy.

The measure referred to as “change in financial security” (Table 6.2, column 3) is the per household per week dollar impact of new gambling as a percentage of the previous level of financial security as assessed by the household debt model (NIEIR). As a percentage it highlights some significant social issues. For example, in Stonnington the impact is as expected positive, but is quite small at 1.6 per cent, even though Stonnington receives a large positive impact per household per week. This is due to the relatively large amount of financial assets already at the region’s disposal. By contrast, the benefit to Melton is about 3 times smaller than the household benefit in Stonnington, but the change in financial security is over twice as high with a change of 4.7 per cent. This is due to a lower level of household financial assets in Melton.

## **6.6 The pattern of regional impacts: long run zero problem gambler costs**

The results in the tables are in the form of cumulative discounted sums over five years. The discount rate used is 3.2 per cent, which corresponds to NIEIR inflation forecast over the period. Table 6.1 presents the regional impact of electronic gaming machines by local government area for the long run case (that is, using a 20 per cent saving finance rate), with no problem gambler costs. From the table the areas with a high net impact are:

- Monash (\$172 million), Whitehorse (\$189 million), Stonnington (\$163 million), Port Phillip (\$138 million), Yarra Ranges (\$175 million) and Boroondara (\$362 million)

Area which have a high negative net impact are:

- Darebin (-\$83 million), Mornington Peninsula (-\$34 million), Maribyrnong (-\$35 million) and LaTrobe (-\$2.3 million).

To put these figures into perspective Table 6.2 presents the outcome on a per household basis over the five years and per week. Expressing the results in such a way aids comparisons between LGAs and shows result at the household level. Also included is the impact of the outcomes on financial security (or wealth), a measure which includes net assets and income.

From Table 6.2 the following regions gain the most on a per household basis:

- Boroondarra, Stonnington and Port Phillip, with gains of \$24.80, \$16.60 and \$14.80 per week. The main factors accounting for this are the residents’ low level of EGM expenditures, a high propensity to dip into savings to finance gambling expenditures and the high level of share ownership in the two LGAs (hence reaping benefits from the disbursement of profits from the machine operators). These benefits improve the residents’ level of financial security by 2.3, 1.6 and 2.3 per cent respectively; and
- Whitehorse has a gain of \$14.10 per week. This is due to the LGA's large population, thus capturing per capita disbursements such as government expenditure. The high level of production captures further benefits. A low level of EGM expenditure coupled with a strong income and asset base also benefit the region. The change in financial security is 2.4 per cent.

**Table 6.1 The regional impact of EGM expenditures – net present value over five years selected regional indicators – long run savings assumption and zero problem gambler costs**

	Value of expenditures foregone (1998-99 \$m)	Net income effect (1998-99 \$m)	Net impact* (1998-99 \$m)	Annual undiscounted cost of problem gamblers (1998-99 \$m)
ALPINE	-4.3	12.7	8.5	0.4
ARARAT	-10.0	11.8	1.9	0.2
BALLARAT	-173.4	201.3	27.9	1.5
BANYULE	-218.7	344.8	126.1	2.3
BASS COAST	-44.1	31.4	-1.4	0.4
BAW BAW	-25.6	46.8	21.2	0.6
BAYSIDE	-101.3	237.3	136.0	1.7
BOROONDARA	-164.8	526.9	362.1	3.1
BRIMBANK	-388.6	425.3	36.7	3.0
CAMPASPE	-28.7	49.2	20.5	0.7
CARDINIA	-31.7	65.0	33.3	0.8
CASEY	-389.3	457.7	68.4	2.7
CENTRAL GOLDFIELDS	-14.7	13.0	-1.7	0.3
COLAC-OTWAY	-19.4	22.8	3.4	0.4
CORANGAMITE	-6.4	13.6	7.2	0.3
DAREBIN	-397.1	314.4	-82.7	2.7
DELATITE	-19.6	25.4	5.8	0.4
EAST GIPPSLAND	-65.2	61.5	-3.6	0.8
FRANKSTON	-266.3	292.3	26.1	2.1
GLEN EIRA	-308.6	389.8	81.2	2.5
GLENELG	-15.2	21.8	6.6	0.4
GREATER BENDIGO	-181.7	220.3	38.6	1.6
GREATER DANDENONG	-359.6	365.3	5.7	2.6
GREATER GEELONG	-625.8	684.4	58.6	3.6
GREATER SHEPPARTON	-105.1	126.7	21.6	1.0
HEPBURN	-8.1	11.3	3.3	0.3
HOBSONS BAY	-114.9	160.3	45.4	1.5
HORSHAM	-27.2	37.0	9.9	0.3
HUME	-218.7	307.0	88.2	2.2
KINGSTON	-320.9	403.2	82.3	2.6
KNOX	-358.2	489.2	131.0	2.6
LA TROBE	-160.5	158.2	-2.3	1.3
MACEDON RANGES	-16.0	46.8	30.7	0.6
MANNINGHAM	-230.1	375.3	145.2	2.2
MARIBYRNONG	-152.7	117.7	-35.0	1.3
MAROONDAH	-185.6	289.5	103.8	1.8
MELBOURNE	-139.2	230.9	91.7	1.2
MELTON	-42.6	68.0	25.4	0.7
MILDURA	-80.6	91.4	10.8	0.9
MITCHELL	-21.3	33.5	12.2	0.5

**Table 6.1 The regional impact of EGM expenditures – net present value over five years selected regional indicators – long run savings assumption and zero problem gambler costs (continued)**

	Value of expenditures foregone (1998-99 \$m)	Net income effect (1998-99 \$m)	Net impact* (1998-99 \$m)	Annual undiscounted cost of problem gamblers (1998-99 \$m)
MOIRA	-10.2	25.5	15.3	0.5
MONASH	-443.1	614.7	171.6	3.4
MOONEE VALLEY	-289.7	343.3	53.6	2.3
MOORABOOL	-9.4	26.6	17.2	0.4
MORELAND	-318.9	343.1	24.2	2.8
MORNINGTON PENINSULA	-323.4	289.2	-34.2	2.2
MOUNT ALEXANDER	-9.4	14.6	5.2	0.3
MURRINDINDI	-4.0	10.0	6.1	0.2
NILLUMBIK	-60.5	134.9	74.3	1.0
NORTHERN GRAMPIANS	-11.5	14.6	3.1	0.3
PORT PHILLIP	-108.3	246.2	137.9	1.8
QUEENSCLIFFE	-1.7	2.7	1.0	0.1
SOUTH GIPPSLAND	-18.7	26.1	7.4	0.5
SOUTHERN GRAMPIANS	-14.8	19.9	5.1	0.3
STONNINGTON	-143.5	306.9	163.4	2.0
STRATHBOGIE	-2.0	4.7	2.7	0.2
SURF COAST	-20.8	32.7	11.9	0.3
SWAN HILL	-21.5	27.4	5.9	0.4
TOWONG	-1.1	3.6	2.5	0.1
WANGARATTA	-30.4	41.9	11.4	0.5
WARRNAMBOOL	-59.3	72.1	12.8	0.5
WELLINGTON	-52.1	66.7	14.6	0.8
WHITEHORSE	-304.7	493.9	189.2	2.9
WHITTLESEA	-228.3	273.7	45.4	2.0
WODONGA	-33.6	53.2	19.6	0.6
WYNDHAM	-126.7	179.3	52.6	1.4
YARRA	-75.3	157.1	81.8	1.5
YARRA RANGES	-182.8	358.0	175.2	2.5
<b>Total Victoria</b>	<b>-8 947.5</b>	<b>11 963.8</b>	<b>3 027.7</b>	<b>88.0</b>

Note: \* Net income effect less value of expenditure foregone.

**Table 6.2 The regional impact of EGM expenditures – net present value over five years selected household regional indicators – long run savings assumption and zero problem gambler costs**

	Per household per week impact (\$1998-99)	NPV per household over five years (\$1998-99)	Change in financial security (per cent)
ALPINE	7.5	1948.5	3.1
ARARAT	1.7	446.0	0.6
BALLARAT	3.8	987.8	1.5
BANYULE	12.2	3164.4	2.9
BASS COAST	-0.6	-162.2	-0.3
BAW BAW	6.9	1781.8	3.0
BAYSIDE	16.4	4270.9	1.7
BOROONDARA	24.8	6460.1	2.3
BRIMBANK	3.1	795.2	1.4
CAMPASPE	6.4	1665.4	2.7
CARDINIA	9.2	2400.5	3.2
CASEY	5.6	1466.9	1.7
CENTRAL GOLDFIELDS	-1.3	-347.4	-0.6
COLAC-OTWAY	1.8	461.6	0.7
CORANGAMITE	4.4	1150.1	1.7
DAREBIN	-6.7	-1748.3	-2.3
DELATITE	3.0	784.0	1.3
EAST GIPPSLAND	-1.0	-247.3	-0.4
FRANKSTON	2.6	678.9	1.1
GLEN EIRA	6.6	1723.3	0.9
GLENELG	3.4	871.9	1.3
GREATER BENDIGO	4.9	1278.2	2.1
GREATER DANDENONG	0.5	134.0	0.2
GREATER GEELONG	3.4	888.6	1.2
GREATER SHEPPARTON	4.4	1156.7	1.9
HEPBURN	2.5	640.6	1.2
HOBSONS BAY	6.3	1642.6	1.9
HORSHAM	5.8	1503.7	2.2
HUME	9.5	2474.9	5.5
KINGSTON	6.7	1752.8	1.5
KNOX	11.7	3032.9	2.6
LA TROBE	-0.3	-90.0	-0.1
MACEDON RANGES	10.8	2797.8	3.1
MANNINGHAM	16.2	4217.5	1.9
MARIBYRNONG	-5.9	-1529.0	-2.2
MAROONDAH	12.1	3144.0	2.8
MELBOURNE	21.9	5704.3	3.2
MELTON	7.9	2058.5	4.7
MILDURA	2.5	640.0	1.1

**Table 6.2 The regional impact of EGM expenditures – net present value over five years selected household regional indicators – long run savings assumption and zero problem gambler costs (continued)**

	Per household per week impact (\$1998-99)	NPV per household over five years (\$1998-99)	Change in financial security (per cent)
MITCHELL	5.7	1469.3	3.2
MOIRA	6.4	1668.6	2.9
MONASH	12.2	3180.8	2.1
MOONEE VALLEY	5.1	1329.4	1.1
MOORABOOL	8.8	2291.5	4.8
MORELAND	1.8	480.7	0.6
MORNINGTON PENINSULA	-3.1	-811.4	-1.1
MOUNT ALEXANDER	3.3	851.5	1.5
MURRINDINDI	5.0	1311.8	2.7
NILLUMBIK	16.9	4395.9	2.6
NORTHERN GRAMPIANS	2.5	641.1	1.0
PORT PHILLIP	14.8	3848.6	2.3
QUEENSCLIFFE	3.0	788.3	0.7
SOUTH GIPPSLAND	3.2	828.4	1.4
SOUTHERN GRAMPIANS	3.0	778.0	1.1
STONNINGTON	16.6	4317.6	1.6
STRATHBOGIE	3.0	775.1	1.3
SURF COAST	7.2	1876.7	2.9
SWAN HILL	3.1	804.2	1.3
TOWONG	4.1	1076.9	1.6
WANGARATTA	4.7	1212.6	1.9
WARRNAMBOOL	5.0	1288.2	1.9
WELLINGTON	3.9	1004.6	1.5
WHITEHORSE	14.1	3672.9	2.4
WHITTLESEA	5.6	1465.2	1.5
WODONGA	7.3	1899.9	3.2
WYNDHAM	8.7	2251.6	2.7
YARRA	11.3	2931.9	2.1
YARRA RANGES	15.2	3946.4	5.3
<b>Average Victoria</b>	<b>7.48</b>	<b>1945.9</b>	<b>1.78</b>



The regions who perform relatively poorly on a per household basis are:

- Darebin makes a loss of \$6.70 per week. On the expenditure side this is due to the large number of machines and low average income in the area. On the supply side the relatively low level of production in the area hampers the region's ability to capture other value-adding activities associated with gaming. In terms of financial security the residents are 2.3 per cent worse off.
- Mornington Peninsula loses \$3.10 per week. A number of factors account for this including low average income, savings and population and a low production base. The region's distance from the CBD and the resulting low levels of casino and Tabcorp/Tattersalls workers compounds the result.
- Maribyrnong loses \$5.90 per week. This results from the region's low level of saving financed EGM expenditure, relatively high EGM usage and low average incomes. Also the region's output multipliers to capture flow-on effects from gaming are low. The change in financial security is -2.2 per cent, more than double the change for Mornington. This is because Mornington has a higher level of average income and assets, so the relative impact is not as great.

All other regions fell somewhere in-between those that performed relatively well and those that performed relatively poorly.

## 6.7 Reconciliation with the macro econometric analysis

The sum of column three in Table 6.1 is \$3.0 billion which, when the undiscounted sum is calculated and divided by five, the annual total of \$0.7 billion is derived. This will approximate the gain in net state product.

If the macroeconomic model used to generate the results in Table 5.4 is re-run on the assumption of:

- (i) a marginal savings financing assumption of gaming expenditures of 20 per cent; and
- (ii) full government expenditure of gaming taxation revenue,

the increase in net state product is \$1.2 billion for the 1998-99 new gaming expenditure levels. The increase in government expenditure (a higher state product multiplier) significantly offsets the decline in household savings financing of new gaming expenditures to the determination of Victorian gross product.

The \$1.2 billion net state product increase includes the effect of Casino non-EGM expenditures. These are \$0.5 billion. A large part of this benefit is offset by commissions to secure the VIP gamblers. The estimate is that approximately \$100 million of these commissions flow out of the state. Then the contribution to net state product for the VIP gambler is approximately \$0.6 billion. It follows, therefore, that the annual net macro-econometric outcome (excluding non-EGM Casino expenditures) is a net state product gain of \$0.6 billion. This is close to the regional sum. The two approaches (macro and regional) are, therefore, reconciled with some differences expected given the slightly different modelling methodologies.

## **6.8 Adjustment for the social costs of gambling**

The annual undiscounted costs of problem gambling are shown in the last column of Table 6.1. The costs are calculated as explained in Section 4.11. The sum of the annual regional cost is \$88 million. This estimate is for 1997-98 gambling expenditure levels.

To obtain the results in the tables that follow, the costs of problem gambling are deducted from the gross results where indicated. Future costs of problem gambling are discounted at 8 per cent. The justification for this is the Productivity Commission's implicit finding that the costs of gambling unleashed by the introduction of new gaming services in the mid-1990s are probably peaking at the current time. The results are shown in Table 6.3.

To give a further indication of the sensitivity of the results to problem gambling, in Table 6.4 the costs of problem gambling are further enhanced in line with the Productivity Commission's estimate of \$6000 per problem gambler per annum.

The rise in the estimated cost of problem gambling from \$1,300 to \$6,000 has a detrimental effect on each LGA. For example, the NPV per household over five years in the relatively well off LGA of Bayside goes from \$4,048 under the NIEIR estimate, to \$3,243 under the Productivity Commissions estimate. This is a reduction of \$805 over five years.

Another example is provided by Frankston. The NPV per household over five years goes from \$457 under the NIEIR estimate, to negative \$346 under the Productivity Commissions estimate. This is a reduction of \$803 over five years.

The magnitude of these changes indicates that the impact of gaming on households is quite sensitive to the assumption made about the costs associated with problem gaming. A comparison using any other LGA in Tables 6.3 and 6.4 highlights this.

## **6.9 The pattern of region impacts: short run impacts**

The regional model was re-run in short run mode with the short run savings financing assumption (70 per cent) and the assumption that one half of Victoria's EGM revenue is allocated to increased government expenditure.

Table 6.5 shows the outcome for net regional product and net regional product per capita. The total estimated increase in state net product is \$923 million.

From Table 5.4 the deduction of \$0.6 billion (the estimated contribution to Victorian net product from non-EGM Casino expenditures) from the 1998-99 outcome of \$1.4 billion gives a total of \$0.8 billion. The two estimates are, therefore, as close as could reasonably be expected.

The distribution of benefits across regions on a per household basis is also given in Table 6.5. The distribution is not uniform.

**Table 6.3 The regional impact of EGM expenditures – net present value over five years selected household regional indicators – long run savings assumption and NIEIR problem gambler costs**

	Per household per week impact (\$1998-99)	NPV per household over five years (\$1998-99)	Change in financial security (per cent)
ALPINE	6.1	1589.9	2.5
ARARAT	0.9	226.9	0.3
BALLARAT	2.9	762.6	1.1
BANYULE	11.2	2924.1	2.7
BASS COAST	-1.4	-363.1	-0.6
BAW BAW	6.0	1563.2	2.7
BAYSIDE	15.6	4048.2	1.6
BOROONDARA	24.0	6229.2	2.3
BRIMBANK	2.0	530.7	0.9
CAMPASPE	5.6	1444.9	2.3
CARDINIA	8.4	2174.7	2.9
CASEY	4.7	1233.0	1.4
CENTRAL GOLDFIELDS	-2.1	-556.3	-0.9
COLAC-OTWAY	0.9	246.0	0.4
CORANGAMITE	3.6	931.8	1.4
DAREBIN	-7.6	-1981.6	-2.6
DELATITE	2.1	535.3	0.9
EAST GIPPSLAND	-1.8	-458.7	-0.7
FRANKSTON	1.8	456.8	0.7
GLEN EIRA	5.8	1506.1	0.8
GLENELG	2.5	658.7	1.0
GREATER BENDIGO	4.1	1057.4	1.7
GREATER DANDENONG	-0.5	-119.6	-0.2
GREATER GEELONG	2.6	664.2	0.9
GREATER SHEPPARTON	3.6	932.2	1.6
HEPBURN	1.6	424.8	0.8
HOBSONS BAY	5.4	1413.4	1.6
HORSHAM	4.9	1284.4	1.9
HUME	8.6	2223.4	4.9
KINGSTON	5.9	1524.6	1.3
KNOX	10.7	2789.9	2.4
LA TROBE	-1.2	-305.1	-0.4
MACEDON RANGES	9.9	2570.2	2.9
MANNINGHAM	15.2	3951.4	1.8
MARIBYRNONG	-6.8	-1758.8	-2.6
MAROONDAH	11.2	2913.8	2.6
MELBOURNE	20.8	5401.0	3.0
MELTON	7.0	1819.3	4.1
MILDURA	1.6	420.7	0.7

**Table 6.3 The regional impact of EGM expenditures – net present value over five years selected household regional indicators – long run savings assumption and NIEIR problem gambler costs (continued)**

	Per household per week impact (\$1998-99)	NPV per household over five years (\$1998-99)	Change in financial security (per cent)
MITCHELL	4.8	1239.4	2.7
MOIRA	5.6	1449.1	2.5
MONASH	11.2	2923.4	1.9
MOONEE VALLEY	4.2	1097.1	0.9
MOORABOOL	7.9	2066.6	4.4
MORELAND	1.0	248.1	0.3
MORNINGTON PENINSULA	-4.0	-1029.3	-1.3
MOUNT ALEXANDER	2.5	638.6	1.1
MURRINDINDI	4.2	1096.2	2.3
NILLUMBIK	15.9	4146.6	2.4
NORTHERN GRAMPIANS	1.6	422.4	0.6
PORT PHILLIP	14.0	3647.2	2.2
QUEENSCLIFFE	2.2	575.9	0.5
SOUTH GIPPSLAND	2.4	612.8	1.0
SOUTHERN GRAMPIANS	2.1	558.7	0.8
STONNINGTON	15.8	4105.6	1.6
STRATHBOGIE	2.2	566.4	0.9
SURF COAST	6.4	1665.6	2.5
SWAN HILL	2.2	584.9	1.0
TOWONG	3.3	860.7	1.3
WANGARATTA	3.8	993.8	1.5
WARRNAMBOOL	4.1	1065.5	1.6
WELLINGTON	3.0	788.9	1.2
WHITEHORSE	13.2	3437.9	2.2
WHITTLESEA	4.6	1200.1	1.2
WODONGA	6.4	1675.7	2.8
WYNDHAM	7.7	2009.6	2.4
YARRA	10.4	2709.1	1.9
YARRA RANGES	14.3	3713.1	4.9
<b>Average Victoria</b>	<b>6.59</b>	<b>1713.5</b>	<b>1.56</b>

**Table 6.4 The regional impact of EGM expenditures – net present value over five years selected household regional indicators – long run savings assumption and Productivity Commission problem gambler costs**

	Per household per week impact (\$1998-99)	NPV per household over five years (\$1998-99)	Change in financial security (per cent)
ALPINE	1.1	293.2	0.5
ARARAT	-2.2	-565.2	-0.8
BALLARAT	-0.2	-51.7	-0.1
BANYULE	7.9	2055.4	1.9
BASS COAST	-4.2	-1089.6	-1.8
BAW BAW	3.0	772.9	1.3
BAYSIDE	12.5	3243.0	1.3
BOROONDARA	20.7	5394.7	2.0
BRIMBANK	-1.6	-425.3	-0.7
CAMPASPE	2.5	647.8	1.0
CARDINIA	5.2	1358.0	1.8
CASEY	1.5	387.1	0.4
CENTRAL GOLDFIELDS	-5.0	-1311.2	-2.2
COLAC-OTWAY	-2.1	-533.4	-0.8
CORANGAMITE	0.5	142.5	0.2
DAREBIN	-10.9	-2825.3	-3.7
DELATITE	-1.4	-363.8	-0.6
EAST GIPPSLAND	-4.7	-1223.0	-2.0
FRANKSTON	-1.3	-346.0	-0.5
GLEN EIRA	2.8	721.0	0.4
GLENELG	-0.4	-112.1	-0.2
GREATER BENDIGO	1.0	259.2	0.4
GREATER DANDENONG	-4.0	-1036.4	-1.7
GREATER GEELONG	-0.6	-147.2	-0.2
GREATER SHEPPARTON	0.5	120.5	0.2
HEPBURN	-1.4	-355.6	-0.7
HOBSONS BAY	2.2	584.7	0.7
HORSHAM	1.9	491.8	0.7
HUME	5.1	1314.4	2.9
KINGSTON	2.7	699.6	0.6
KNOX	7.4	1911.3	1.6
LA TROBE	-4.2	-1082.8	-1.6
MACEDON RANGES	6.7	1747.2	2.0
MANNINGHAM	11.5	2989.2	1.3
MARIBYRNONG	-10.0	-2589.5	-3.8
MAROONDAH	8.0	2081.6	1.9
MELBOURNE	16.6	4304.5	2.4
MELTON	3.7	954.8	2.2
MILDURA	-1.4	-372.2	-0.6

**Table 6.4 The regional impact of EGM expenditures – net present value over five years selected household regional indicators – long run savings assumption and Productivity Commission problem gambler costs (continued)**

	Per household per week impact (\$1998-99)	NPV per household over five years (\$1998-99)	Change in financial security (per cent)
MITCHELL	1.6	408.3	0.9
MOIRA	2.5	655.5	1.1
MONASH	7.7	1992.8	1.3
MOONEE VALLEY	1.0	257.1	0.2
MOORABOOL	4.8	1253.6	2.6
MORELAND	-2.3	-593.1	-0.7
MORNINGTON PENINSULA	-7.0	-1817.4	-2.4
MOUNT ALEXANDER	-0.5	-130.9	-0.2
MURRINDINDI	1.2	316.4	0.7
NILLUMBIK	12.5	3245.3	1.9
NORTHERN GRAMPIANS	-1.4	-368.7	-0.6
PORT PHILLIP	11.2	2919.1	1.8
QUEENSCLIFFE	-0.7	-191.9	-0.2
SOUTH GIPPSLAND	-0.6	-166.7	-0.3
SOUTHERN GRAMPIANS	-0.9	-234.1	-0.3
STONNINGTON	12.8	3338.9	1.3
STRATHBOGIE	-0.7	-188.2	-0.3
SURF COAST	3.5	902.6	1.4
SWAN HILL	-0.8	-207.8	-0.3
TOWONG	0.3	79.1	0.1
WANGARATTA	0.8	202.6	0.3
WARRNAMBOOL	1.0	260.1	0.4
WELLINGTON	0.0	9.2	0.0
WHITEHORSE	10.0	2588.2	1.7
WHITTLESEA	0.9	241.6	0.2
WODONGA	3.3	865.4	1.5
WYNDHAM	4.4	1134.7	1.4
YARRA	7.3	1903.5	1.4
YARRA RANGES	11.0	2869.8	3.8
<b>Average Victoria</b>	<b>3.36</b>	<b>872.9</b>	<b>0.80</b>

**Table 6.5 The regional impact of EGM expenditures –total regional and per household basis– short run assumptions - \$million 1998-99**

	Increase in net regional product	Increase in net regional product per household
ALPINE	1.4	314.4
ARARAT	1.0	237.0
BALLARAT	14.6	518.5
BANYULE	30.5	766.8
BASS COAST	2.9	346.0
BAW BAW	4.4	374.3
BAYSIDE	23.7	745.0
BOROONDARA	56.4	1006.0
BRIMBANK	26.1	564.5
CAMPASPE	4.4	356.3
CARDINIA	6.5	469.9
CASEY	31.1	667.6
CENTRAL GOLDFIELDS	0.8	168.4
COLAC-OTWAY	1.6	218.6
CORANGAMITE	1.4	216.7
DAREBIN	9.2	193.9
DELATITE	2.0	274.4
EAST GIPPSLAND	3.5	240.6
FRANKSTON	17.8	464.2
GLEN EIRA	28.8	610.7
GLENELG	2.0	264.1
GREATER BENDIGO	14.8	490.1
GREATER DANDENONG	20.2	473.4
GREATER GEELONG	39.8	602.9
GREATER SHEPPARTON	9.0	484.8
HEPBURN	0.9	178.7
HOBSONS BAY	13.6	493.6
HORSHAM	3.0	464.7
HUME	25.1	703.5
KINGSTON	29.2	621.6
KNOX	38.9	899.9
LA TROBE	9.6	384.3
MACEDON RANGES	5.3	484.7
MANNINGHAM	33.8	981.9
MARIBYRNONG	4.3	185.7
MAROONDAH	25.0	758.1
MELBOURNE	20.8	1295.1
MELTON	7.5	603.2
MILDURA	6.1	361.0
MITCHELL	3.5	417.5
MOIRA	2.4	259.4
MONASH	49.4	914.9

**Table 6.5 The regional impact of EGM expenditures – the increase in net regional product – short run \$ million assumptions 1998-99 (continued)**

	Increase in net regional product	Increase in net regional product per household
MOONEE VALLEY	25.2	626.0
MOORABOOL	3.0	397.0
MORELAND	19.3	383.1
MORNINGTON PENINSULA	12.5	297.3
MOUNT ALEXANDER	1.2	192.8
MURRINDINDI	1.0	216.8
NILLUMBIK	13.2	781.2
NORTHERN GRAMPIANS	1.3	256.2
PORT PHILLIP	25.1	700.8
QUEENSCLIFFE	0.4	284.8
SOUTH GIPPSLAND	2.2	241.1
SOUTHERN GRAMPIANS	1.6	251.2
STONNINGTON	30.5	806.3
STRATHBOGIE	0.5	134.5
SURF COAST	2.9	461.9
SWAN HILL	2.1	285.2
TOWONG	0.4	153.6
WANGARATTA	3.3	354.4
WARRNAMBOOL	5.8	577.5
WELLINGTON	5.4	372.6
WHITEHORSE	42.8	831.0
WHITTLESEA	21.3	687.5
WODONGA	4.6	444.8
WYNDHAM	16.7	714.8
YARRA	15.5	557.3
YARRA RANGES	32.8	738.8
<b>Total Victoria</b>	<b>923.0</b>	<b>593.3</b>

## 6.10 The long term and problem gambler costs

A comparison of Tables 6.2, 6.3 and 6.4 indicate the impact of problem gambler costs. For example Ballarat has a weekly impact from EGM expenditures per household of \$3.80 (Table 6.2, column 1). This impact is without the costs associated with problem gaming included. Using the NIEIR estimate of problem gaming the impact falls to \$2.90 (Table 6.3, column 1). With the Productivity Commission's estimate the impact falls considerably to minus \$0.20 per week (Table 6.4, column 1).

The Productivity Commission's social distress calculations in Table 6.4, at \$6,000 per annum cost per problem gambler, represent a worst case scenario. In this case additional regions are added to the list including Greater Dandenong, Moreland, La Trobe, East Gippsland and Central Goldfields. Even in the case of Table 6.4, the high income, wealthy regions still generate large gains in incomes.



## 6.11 Comparisons with other regional modelling

In their paper "The Impact of Poker Machine Gambling on Low-Income Municipalities, 1999" Doughney and Kelleher develop a regional impact model.<sup>11</sup> It is not the aim here to produce a thorough review of their paper but to list some key assumptions and highlight the differences between the NIEIR and the Doughney and Kelleher models. To be fair to the authors it must be stated that their model was developed for use in Maribyrnong. As such they may wish to change some of the assumptions if applying the model to other regions across the state.

As a result of their modelling assumptions:

- the impact on the region excludes the effects of new investment expenditure by venues, even though this is still at relatively high levels historically (estimated at \$230 million over 1997 and 1998, in the 1997 Survey of Gaming Venues);
- the impact also excludes the impact of sums derived from government spending out of the income from gaming machines through tax and the community support fund or through revenue derived from the gaming operators Tabcorp and Tattersalls;
- in effect they treat the region as isolated with respect to spending and gambling. "Marginal spending and gambling will balance out between neighbouring areas". (page 40);
- complementary expenditure at gaming venues is said to displace other expenditure in the region (a meal and drink at the pub will displace dinner and drink somewhere else);
- the savings hypothesis is assumed away and the debt alternative receives little mention, so expenditure therefore comes directly from diverted consumption expenditure, though this assumption however is relaxed to "20 per cent comes from savings";
- leakages from first round distribution, State tax 33.3 per cent, CSF 8.33 per cent (hotels only), and venue operators 33.3 per cent are disbursed as follows; profits from the hotel and clubs are not treated as a leakage, the rest is not distributed back to the region;
- retail leakages from the area, or escape spending, is assumed to be between 20 and 50 per cent of retail expenditure by residents;
- losses at venues from non-residents are zero (as much is gambled out as is gambled in);
- for employee compensation at venues they assume 20 per cent live locally;
- as regards production of goods and services that are complementary to venue activity e.g. EGM manufacturing, they assume 20 per cent comes from the region;

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<sup>11</sup> The Impact of Poker Machine Gambling on Low-Income Municipalities, 1999. James Doughney and Tony Kelleher, Victoria University.

- multiplier effects from wages and salaries are incorporated, however, multipliers are not applied to the lost retail consumption (from diverted expenditure); and
- they assume 100 per cent of gaming expenditure in a region comes from local residents.

The main differences between the two methodologies lie in the treatment of EGM expenditures by residents and the redistribution of gaming derived government expenditure and Tabcorp and Tattersalls profits.

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## 7. Conclusions

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The conclusions of the study may be set out in relation to the terms of reference.

### 1. The economic impact of gambling

- *at the state level*

In the circumstances of the mid to late 1990s, the expansion of gambling contributed to an increase in employment and economic activity in Victoria. Gambling was partly responsible for the increase in consumer demand brought about by a fall in the household savings rate during the 1990s, and this in turn was responsible for the increase in economic activity.

The increase in gambling also brought social costs, especially an increase in problem gambling. Without detracting from the seriousness of this increase, it should be remembered that to some extent it was a once-only event representing a response to the increase in availability. As the growth in gambling opportunities tapers off, so should the rate of generation of new problem gamblers.

However, even with generous allowances for the costs of problem gambling, in the circumstances of Victoria in the years 1992-1998 the expansion of gambling brought substantial net economic benefits.

- *at the household level*

The impact of the increase in gambling facilities for most households was fairly mild. However, some small groups benefited considerably, especially those who would not otherwise have obtained employment, and those who obtained higher returns for their capital investments than would otherwise have been the case. At the other extreme, some households suffered considerably, particularly those of new problem gamblers.

Though heavy gamblers can be found at all household income levels, wealthy households can afford high levels of gambling (or occasional exceedingly expensive gambling sprees) in the sense that their continuance as households is not placed at risk. The same is not true for low income households, and those with few assets; here even quite low levels of gambling can set up the financial stresses identified as problem gambling. However, such households are a small minority.

- *at the regional, community and LGA levels*

The economic impact of the increase in gambling facilities varied considerably across the state. The differential effects can be predicted from the pattern of incidence at the household level. Given that employees of gambling establishments tend to live locally, the chief differential distribution of benefits was from asset incomes, and hence wealthy areas tended to benefit. By contrast, given the relationship between problem gambling and low incomes and wealth, low income areas tended to suffer net disbenefits.

## **2. Income, expenditure and employment aspects in relation to other industries**

The expansion of gambling contributed to the consumer boom of the 1990s in Victoria because demand for other locally-produced goods and services was slack. Capital accumulation was low as a result of globalisation, which reduced the prospective profitability of investments in tradeable goods. Similarly consumer demand for many types of goods and services was increasingly satisfied from overseas. In these circumstances, the diversion of demand towards a service which by necessity was satisfied from sources within the state increased expenditure, income and employment, and took up some of the slack due to the decline of agriculture and manufacturing.

## **3. Linkages between levels**

The positive aspects of the increase at the state level were only possible because of the household response in reducing savings rates. This is an average measure as some households obviously increased their savings through the 1990s. What we do know is that the households that contributed to the reduction in savings, which occurred since 1993, by increasing gambling inevitably ended up with less assets than they would otherwise have had. Even if they did not become problem gamblers they were worse off than before.

By contrast in the same period, some households which spent little or nothing on gambling were able to benefit, directly or indirectly, from the increase in employment and economic activity associated with gaming.

The appropriate regional linkage was shown to be a function of the type of households within the region, i.e. how many of the former and latter scenarios. The extra effects included as a regional linkage are those linked to the nature of the economy in the area.

An interesting timing issue evolved through the level of savings reductions an individual household can cope with. Obviously poorer households that had lower savings rates and higher debt servicing ratios in 1993 (Section 5.1) have had less scope to reduce savings and/or increase debt service costs. As explained in Table 5.2, this results in a grinding down of the average savings financing assumption.

The regional linkage of this effect was seen when we considered that the poorest regions will, on average, already have households with the lowest savings and the highest debt service costs. Hence, their scope, on average, to use savings to finance new gaming expenditure could be as low as zero for the poorest region.

## **4. Gambling and overall expenditure**

There is not sufficient evidence to decide whether the relationship between gambling and other expenditures has changed over the past decade: the complementarity of gambling and expenditures on tobacco, alcohol, restaurant meals and take-away food is as expected and is likely to be stable. The tendency to finance gambling out of savings is also to be expected, but no household can sustain it indefinitely. Once Victorian households have adjusted to the increased gambling opportunities it is likely that, in aggregate, the household savings rate will be lower than it was in the 1980s, and gambling will be substituted for some of the other household expenditures usual in that decade.

## **5. Gambling in Victoria and the other states and territories**

In 1990 Victoria was a low-gambling state, well below the state where households spent most heavily on gambling, New South Wales. By 1998 Victoria's households spent more heavily on gambling than those in New South Wales, though with the introduction of EGMs into hotels in NSW gaming expenditure may now be on the rise. Only time will tell as new statistics become available.

## **6. Significant changes in expenditure patterns**

Given that much of the increase in gambling was financed from savings, the main resulting changes in expenditure patterns so far identified have been increases in complementary expenditures on alcohol, tobacco and meals away from home. However, when households turn to rebuilding their savings following the present consumer boom, it is unlikely that they will return to the expenditure patterns of the 1980s. The expenditures which will be sacrificed in order to accommodate increased gambling have yet to be identified, because the sacrifices have not yet been made in the majority of gambling households.

## **7. Econometric and microsimulation techniques**

Given the problems of the Victorian economy during the 1990s, the model appropriate for assessment of the impact of the increase in gambling in Victoria must be able to cope with benefits from the utilisation of resources which would otherwise have been unemployed. The NIEIR model has this attribute. The Productivity Commission, by contrast, simply assumes these benefits away: an approach which might be appropriate in other times and places, but not Victoria during the 1990s.

Important household reactions to the increase in the availability of gambling included:

- increased expenditure on complements; and
- reduced savings, hence reduced asset formation.

The latter, in turn, means that a household which spends more now will have less to spend in the future. A microsimulation methodology was devised which took this into account. As with consumer booms in general, the contribution of gambling to the current boom yields economic activity benefits if the alternative is unemployment, but punishes future generations if it crowds out the accumulation of capital. NIEIR's judgement is that the current boom is of the former type.

## **8. Comparison with other studies**

The study broadly confirms previous NIEIR studies, and independent studies which have adopted a similar approach to the generation of increased employment and income. On the benefit side, it disagrees with the Productivity Commission on two major counts:

- the Commission's assumption that Victoria in the 1990s was at full employment, so that gambling could not be responsible for any increase in economic activity; and
- the Commission's use of consumers' surplus to value benefits,

while on the cost side, it suggests the Commission should include the broad range of costs specified in its gambling study in all its other work, including that on microeconomic reform.

## 9. Summary of results

**Table 7.1 Net impacts on the Victorian economy excluding construction benefits and problem gambling costs**

Scope	Savings effect (per cent)	Government expenditure (per cent)	\$ billion per annum
<b>State modelling framework</b>			
New gambling <sup>1</sup> - short run (current)	70	50	1.3
New gambling - medium term (to 2005)	50	100	1.8
EGMs only - short run (current)	70	50	0.8
EGMs only - long run (after 2005)	20	100	0.6
<b>Regional modelling framework (state total)<sup>2</sup></b>			
EGMs only - short run (current)	70	50	0.9
EGMs only - long run (post 2005)	20	100	0.7

Note: 1. Gaming introduced since 1993, including Casino and electronic gaming machines (EGMs).

2. Derived from the aggregate of all regional impacts as detailed in Section 6. Also see Section 6.7 for a reconciliation of the two approaches (state based versus regional modelling) used

As outlined in Section 1.1.2 this study aims to provide both a statewide macro-economic (top-down) and regionally based (bottom-up) analysis. The aggregate results are summarised in Table 7.1. The table also outlines the assumptions that each scenarios reported impact is based upon.

The effect of the expansion of new types of gambling since 1993 is detailed under the state-wide modelling framework scenarios labelled 'New gambling'. The new gambling - short run scenario details a positive short run impact of \$1.3 billion dollars per annum. This figure is based upon the assumptions that one half of all government gambling derived taxation is required for debt repayments and that gambling is an immature product which is 70 per cent financed out of household savings.

When government funds are no longer required for debt repayment as state government debt levels fall in the medium term, 100 per cent of gambling derived taxation revenue can be dedicated to current expenditure. This scenario is detailed as New gambling - medium term, and also assumes that in the medium term gambling is maturing as a product and therefore financing gambling from savings falls to a rate of 50 per cent. The positive impact of this scenario is \$1.8 billion per year.

The fall in the rate of savings financing is modelled to continue to decline to 20 per cent in the long run (post 2005) when gambling becomes a mature product. The EGM only - long run scenarios are based upon this assumption. The state based modelling framework scenario presents a positive economic impact of \$0.8 billion per year for the EGM only - long run scenario. As it is a long run assessment the government is assumed to no longer require debt repayments to be funded out of gambling tax revenues.

The EGM only - short run scenario uses the high savings financing assumption (70 per cent) and the 50 per cent government debt repayment assumption. The net impact for this current year scenario is reported to be \$0.9 billion per year.

The differences between the EGM only impacts using the state modelling framework and the regional modelling framework are due only to methodological differences rather than the assumptions used.

## **Appendix 1**

### **Relationship between EGM gambling and expenditures on tobacco and alcohol**

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## Appendix 1: Relationship between EGM gambling and expenditures on tobacco and alcohol

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While there has been a significant amount of research on the socio-demographic characteristics of gamblers, little research has been done in Australia on psychographic factors and on the relationship of gambling with potentially habit forming activities such as smoking and drinking. The 1993-94 HES provides information on 436 types of expenditures, including tobacco and alcohol to undertake such an analysis.

Table A1.1 shows the following.

- The incidence of purchasing tobacco or alcohol is about twice as high for persons which spent on EGMs than for other persons. Table A1.2 shows that this effect is not based on higher incomes of EGM players or related factors as the ratio for most other expenditures is less than 1.2. For this reason, it must be assumed that EGM expenditures increase tobacco and alcohol expenditures. If consumption of alcohol, tobacco and EGM playing very often go hand in hand, increased EGM playing would be adverse to the players' health. It is also possible that an increased incidence of EGM playing could nourish latent desires or even addictions to smoking and drinking. However, from this analysis it is not clear whether persons who drink and smoke more also like to gamble or whether gambling induces additional drinking and smoking.
- Expenditures for tobacco and alcohol of non-EGM players in New South Wales/Australian Capital Territory and Victoria are almost identical, but the expenditures of EGM players in New South Wales/Australian Capital Territory are higher than of EGM players in Victoria. This most likely reason is based on longer EGM playing times in New South Wales/Australian Capital Territory than in Victoria. The EGM expenditures of persons which played EGMs within the last two weeks in New South Wales/Australian Capital Territory are about 25 per cent less than in Victoria, however, the under-reporting in the HES differs between the states. Average EGM expenditures per adult in New South Wales are more than double the expenditures in Victoria, as reported by the Australian Gambling Statistics.
- The incidence of all other gambling forms (lottery, lotto, TAB, racing, casino, informal betting, etc.) for EGM players is double the incidence for non-EGM players. Interestingly, the gambling expenditures of non-EGM players in Victoria are considerably higher than in New South Wales/Australian Capital Territory, as are the gambling expenditure of EGM players. This may indicate that the latent demand for gambling in Victoria is larger than in New South Wales/Australian Capital Territory.

Table A1.2 divides the population into two groups, EGM-players and others, and records the average expenditure pattern of each group. It shows that EGM players spend more than non-EGM players on almost all expenditure categories. This demonstrates that the two groups have different socio-demographic profiles and incomes, and it is very difficult to draw any conclusions from the table for this reason.



**Table A1.1 Impact of EGM gambling on other expenditures, by state, 1993-94**

	NSW and ACT			Victoria		
	EGM not played	EGM played	Ratio	EGM not played	EGM played	Ratio
Incidence of tobacco expenditures (%)	22	41	1.9	22	38	1.7
Tobacco expenditures (\$/week/person)	4.30	9.50	2.2	4.20	8.40	2.0
Incidence of alcohol expenditures (%)	42	79	1.9	41	69	1.7
Alcohol expenditures (\$/week/person)	7.90	21.90	2.8	7.90	17.70	2.2
Incidence of other gambling (%)	33	66	2.0	36	67	1.9
Other gambling expenditures (\$/week/person)	3.90 (3.00)	9.80 (9.00)	2.5 (3.0)	4.80 (3.90)	21.20 (11.10)	4.4 (2.9)

Notes: 1. "EGM not played" means that no expenditures or gains have been recorded in the diary for the past two weeks.  
2. The "Other gambling expenditures" given in brackets omit outliers by setting any gain/loss exceeding 100 to \$100.

Source: 1993-94 HES.

**Table A1.2 Expenditure profiles of EGM and non-EGM players, NSW/ACT and Victoria, 1993-94 (\$/week/person)**

Expenditures (only non-dependents)	NSW and ACT		Victoria	
	Non-EGM players	EGM players	Non-EGM players	EGM players
Food	50.42	43.20	46.94	52.64
Restaurants	10.12	14.50	8.66	13.85
Beer	3.89	13.93	3.97	10.05
Wine	2.11	2.69	1.78	3.19
Spirits	1.24	3.45	1.52	2.87
Tobacco	4.30	9.50	4.17	8.43
Men's clothing	2.58	2.92	2.89	2.59
Women's clothing	4.91	3.25	6.45	8.38
Other clothing and footwear	10.57	8.66	8.94	11.63
Furnishings	8.87	6.39	7.40	8.13
Household operation	9.05	6.59	7.77	9.35
Health expenditures	3.27	3.03	3.16	3.88
Other costs for car	20.43	24.09	20.76	29.92
Public transport	2.87	3.18	3.02	1.97
TV, PC, etc.	2.07	1.93	1.73	1.91
Books, newspapers	3.79	3.66	3.94	3.79
Recreational equipment	4.03	2.57	3.14	6.11
Gambling	3.86	24.47	4.84	42.41
Hire video, etc.	1.14	1.51	0.96	1.34
Fitness studio	0.19	0.17	0.18	0.40
Sport fees and admissions	2.22	3.43	2.46	4.39
Cinema	0.53	0.74	0.57	0.89
Other admissions	0.87	1.13	0.78	2.09
Other recreational	0.95	2.29	1.50	1.01
Animal costs	2.82	2.79	2.72	3.41
Airfares Australia	0.44	1.11	1.36	0.45
Holidays Australia	1.16	1.22	1.07	2.59
Toiletries	3.59	3.38	3.38	4.72
Hair services – male	0.28	0.44	0.40	0.29
Hair services – female	0.77	0.79	1.02	1.90
Other personal care	1.10	1.37	0.63	1.19
Miscellaneous goods	5.87	5.61	4.69	5.07
Miscellaneous services	5.73	5.82	6.03	5.96

*Note:* This table only contains person related expenditures, some expenditure categories also have household related components which can not be attributed to an individual person.

*Source:* 1993-94 HES.

## **Appendix 2**

### **Analysis of the HES**

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## Appendix 2: Analysis of the HES

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### A2.1 Adjusting the HES data

The HES data has been benchmarked to control totals where reliable aggregate data sources were available and the HES is considered to understate.

- All gambling expenditures were adjusted with a factor to match the 1994 expenditures of the Australian Gambling Statistics. Alcohol and tobacco expenditures were adjusted using National Accounts data and NIEIR corrections to account for differences of scope, e.g. expenditures of overseas tourists.
- Incomes from assets were benchmarked to the 1994 Australian National Accounts incomes, again after some adjustments. Most notably, incomes from interest in the Australian National Accounts include a 38.4 per cent component of deemed interest, which was not actually paid to households. As the Australian National Accounts are an accounting system which tries to show the flows between the major economic sectors, it often does not represent the physical flows. For this reason corrections of the Australian National Accounts data are often required before the data can be used in a model of household economic transactions. It is not claimed that all necessary corrections were undertaken in this study. In fact many more corrections for scope could be made. However, given the complexity of the Australian National Accounts and the scarcity of reference data this would be a formidable task. It is believed, however, that with or without benchmarking the HES similar result patterns would emerge for the analysis undertaken in this study (but not necessarily for any other analysis).
- Assets have been imputed using rates of return which are partly based on the Australian National Accounts analysis and partly on NIEIR estimates, or have been benchmarked to Australian National Accounts asset estimates.

### A2.2 Regression analysis of the impact of gambling on expenditures, savings, assets and debts

A multiple linear regression model was developed to analyse the economic impacts of gambling expenditures. The same regression model was used for each of the expenditure categories analysed, as well as savings, etc. To illicit the marginal effects of gaming expenditure only we remove the socio-demographic influences, such as income and household structure. All models, therefore, include an extensive array of such variables as a base or starting point model. This list of variables is detailed in the notes to Table A2.1. As an alternative additional driver (variable), total gambling expenditure was included to determine whether knowing how much a household spends on gaming helps explain the levels of spending on other items. An additional alternative model is also presented in which added each of the six gambling categories in the HES (lottery tickets, lotto type games and Tattslotto, EGM, TAB and on-course betting, casino games and other gambling) as drivers.

Table A2.1 details the adjusted  $R^2$  for a series of multiple regression models.  $R^2$  is a statistical measure which illustrates the level of variation in reported expenditure that is explained by the model in question. A score of 100 indicates complete explanation, 0 no explanation at all. The adjusted  $R^2$  measure takes into account the number of variables used, so that when we add one variable to Column 2 (in addition to model used in Column

3), and six variables in Column 1 (in addition to model used in Column 3) we can still compare the columns.

In Table A2.1, Column 3 is the model without any extra gaming information. Column 2 includes one additional driver, total gaming expenditure and Column 1 includes six additional drivers detailing different types of gaming expenditures.

Table A2.1 includes two important pieces of information. One, the degree to which socio-demographic features influence household spending on various expenditure items, and two, the extra influence that gambling expenditure has on explaining differences in spending. A cursory examination of Table 2.1 shows that an item like car servicing is not explained well by socio-demographic features (Column 3, 0.70 out of 100). This is due to the fact that most households require cars and the level of servicing (in terms of total cost) required for most cars is similar.

Not surprisingly, knowing whether or not the household is a high gambling expenditure household does not provide any extra information about this servicing cost, so Column 2 remains 0.70 out of 100. In Column 1 the effect of using the adjusted  $R^2$  measure is seen as the further detail of six separate gaming expenditures actually reduces the total explanation (0.66 out of 100), i.e. superfluous information actually reduces the adjusted  $R^2$  value.

On the other hand, an item such as total savings is obviously related to socio-demographic and economic features such as age, income and housing status. This is confirmed by Table A2.1 indicating an adjusted  $R^2$  value of 53.27 out of 100 for Column 3 (no extra gaming information). Knowing whether or not the household spends money on gaming should improve our understanding of total savings and hence we see the rise in the adjusted  $R^2$  value in Column 1 to 53.39 out of 100. This indicates that the levels of spending of households on gambling actually does influence the level of total savings.

The same analysis can be done for all items in Table A2.1, however, it should be noted that small changes in  $R^2$  scores reported should be treated carefully.

Probably the most compelling expenditure item is that of tobacco which, despite being explained quite poorly by socio-demographic features at 5.67 out of 100, increased significantly to 7.15 out of 100 with the inclusion of gambling information.

A similar result is obtained for alcohol. Looking at the effects measured in dollars and cents an increase of \$1 in EGM expenditure is shown to increase alcohol expenditure by 4.3 cents. Table A2.2 outlines various other impacts.

Table A2.2 shows that the net effect of gambling is a slight additional expenditure of 1.1 cents. That is, one additional dollar spent on gambling results in a total expenditure of \$1.01 by the household. For EGM expenditures the total expenditure change caused by EGM spending is higher at \$1.14.

Correspondingly, cash savings must reduce by \$1.01 for every \$1 spent on gambling. This has been confirmed by the regression model for cash savings, where cash savings are calculated after the spending on gambling.

The regression model of cash savings before gambling expenditure shows that savings (excluding the additional dollar spent) reduce by 1.2 cents for each dollar spent on gambling. The estimated coefficient is not significant and the model is therefore also consistent with the hypothesis that gambling does not induce any savings activity to finance the gambling. At any rate, one additional dollar spent on gambling results in approximately \$1 less in cash savings.

**Table A2.1 Impact of gambling on household expenditures, savings and debts, R<sup>2</sup> of multiple regression model**

	Six gambling categories	Total gambling	Gambling excluded
Health insurances	24.69	24.51	24.49
Car insurance	21.21	21.04	21.09
Superannuation contribution	14.05	14.05	14.05
Life insurance	7.25	7.15	7.13
Holidays	6.39	6.39	6.39
Furniture, TV, etc.	7.24	7.18	7.18
Clothing	10.50	10.47	10.47
Restaurant	17.25	17.09	16.67
Take-away	21.72	21.22	20.85
Entertainment – gambling	10.28	10.16	10.17
Car purchase	2.86	2.85	2.85
Car servicing	0.66	0.70	0.70
Car parts	0.53	0.57	0.58
House maintenance	3.71	3.75	3.74
Capital housing	2.80	2.74	2.74
Mortgage interest	44.05	44.05	44.05
Recreation – gambling	14.31	14.23	14.23
Gifts, donations, etc.	1.32	1.33	1.34
Alcohol	11.65	10.18	9.07
Tobacco	7.15	6.27	5.67
Other expenditures	48.93	48.90	48.89
Interest load	5.41	5.49	5.45
Interest credit card	5.00	4.80	4.79
Total savings	53.39	53.28	53.27
Saving cash	21.48	21.40	21.41
Saving property	4.22	4.16	4.16
Saving superannuation	14.05	14.05	14.05
Debts total	64.69	64.69	64.69
Debts house	67.96	67.92	67.91
Debts loan	9.19	9.09	9.10
Debts card	41.09	41.07	40.82
Asset all	55.68	55.64	55.64
Asset accounts	10.68	10.63	10.64
Asset shares	20.30	20.12	20.13
Asset business	50.67	50.64	50.63
Asset property	50.67	50.64	50.63
Asset superannuation	6.15	6.19	6.19

Notes: 1. The multiplier regression model takes into account:

- six age groups of the household head;
- income, including non-linear transformation;
- labour force status head (full time, part time, self-employed, unemployed, not in labour force);
- country of birth (Australia, Asia, other);
- marital status of head of household (married, single, other);
- occupation of head (eight categories);
- housing status (owning, pay mortgage, renting); and
- state of residence.

2. Other expenditures are all expenditures excluding gambling, recreation, alcohol and tobacco, take-away and restaurants.

Source: 1994 HES, adjusted as described above.

**Table A2.2 Major impacts of total gambling and EGM expenditures on other expenditures**

	Change of expenditures in cents for each additional dollar spent	
	Total gambling	EGMs
Restaurant	1.6	2.9
Take-away	0.7	1.6
Alcohol	4.3	13.4
Tobacco	1.6	5.1
Other entertainment	-0.4	–
Other recreation	-0.7	-2.4
Other expenditures	-7.8	-6.8
Total induced expenditures	8.9	23.0
Total reduced expenditures	7.8	9.2
Net expenditure change	1.1	13.8
Total expenditure change	101.1	113.8

The regression model did not show any significant impact of gambling expenditures on interest paid for personal loans and only a statistically insignificant increase in interest paid for credit cards of 5.4 cents. If one assumes an interest rate of 15 per cent, debts on the credit card would increase by 36 cents per dollar spent on gambling. This result is, however, significant only with a 20 per cent error level. In addition, only expenditures on lottery tickets and lotto type games showed any significant impact, while one would expect that the more substantial expenditures on EGMs, TAB and casinos would lead to an over-drawing of credit cards. In summary, the regression model used does not provide strong evidence that credit cards are over-drawn to finance gambling.

The regression model estimated that savings in property reduce by 3.8 cents per dollar spent on gambling. However, the coefficient is not significant with a *t* value of only -1.05 (error level 30 per cent). Savings in superannuation and life insurances are estimated to decrease by 0.7 cents per dollar, again the coefficient is statistically not significant.

The regression model could not find any significant impacts for the debts level. Total debts are even estimated to decrease by \$3.40 for every dollar spent on gambling and once again the estimated coefficient is statistically not significant. The model estimates that debts on loans and credit cards increase (not significantly) with gambling expenditures, while debts for housing (mortgages) decrease (not significantly) with gambling. It would appear that the latter result is based on model imperfections. It may well be that households with a higher mortgage gamble less. As mortgage paid is not a driver in the regression model, this would translate into decreasing mortgages when gambling increases, all other factors held constant. Nevertheless, the regression model could not detect any significant impacts of gambling expenditures on the debt level of households.

Very similar results were obtained for asset levels. Assets in interest bearing accounts and shares and superannuation decline insignificantly with gambling, while assets in business and property increase insignificantly with gambling. Again the latter results most likely reflect that households with business and property assets tend to spend less on gambling.

In summary one can say that the regression model could not establish significant increases in debts or asset reductions due to gambling. While the model provides some indications that these effects happen, the data available did not allow the effects to be estimated with any acceptable degree of certainty. Given these results and the previous results on savings the 1994 HES and the regression models strongly indicate that gambling is largely financed out of savings.

On the other hand, the Authority surveys (and the Productivity Commission's draft study on gambling) document that a significant number of problem gamblers exist who finance gambling expenditures by running down their savings and assets and taking up debts. It would appear that an insufficient number of such households is included in the HES to allow results to be estimated with any precision. The number of problem gamblers in 1993-94 was certainly less than today. For example, the Authority survey suggests that in 1998 1 per cent of adults ran into financial trouble due to gambling. If this share was 0.5 per cent in 1993-94, 42 such households should have been in the HES.

Given the large under-reporting of gambling in the HES, it must be concluded that households with financial difficulties due to gambling are severely under-represented in the HES and/or their gambling expenditures are highly unreliable. Thus, the effective sample size of such households in the HES is expected to be not more than 42 and quite possibly only a fraction of this number. Clearly this is not sufficient to use linear regression models to estimate any significant impacts concerning the group of households with financial difficulties due to gambling. Consequently, the results obtained must relate largely to "non-problem gamblers". "Non-problem gamblers" here are defined as households which did not run into serious financial problems due to gambling.

### **A2.3 Identifying households in the HES which are under financial stress due to gambling expenditures**

The method of using regression models for all households of the HES to identify financial impacts of gambling, as described in the previous section, revealed only marginal impacts. As discussed in the previous section, it is known that for a considerable number of households gambling causes financial stress, however, it is not clear whether such households are actually contained in the HES. It was argued that, if any, only a very small number of households (approximately 42) could be expected in the HES. External estimates of problem gamblers were used for this estimate. The task now is to identify the unknown but probably small number of households which spent much more than they could afford in the HES.

One problem which is caused by the small number of affected households is that the sub-sample of affected households is likely to have socio-demographic characteristics which are quite different from the general HES population. In order to eliminate this effect, the multiplier regression model (described earlier in this section) was used to estimate all variables to be analysed, e.g. expenditures, savings, debts, etc. Then the estimated value was subtracted from the observed value, thus eliminating the impact of the socio-demographic variables on the variables to be analysed. In other words, instead of the observed expenditures etc., the estimated residual was analysed.

Various approaches were used to identify high spending gamblers, see Table A2.3:

- the households were sorted according to their EGM expenditures and the 42 highest spending households were selected (data column 1 in Table A2.3);
- the households were sorted according to their EGM expenditures and the highest 10 per cent of spenders, 69 households, were selected (data column 2);



- the households were sorted according to the share of gambling of gross income and the 42 households with the highest shares were selected (data column 3); and
- as above, but the top 149 households were selected to produce a reasonable sample size.

Table A2.3 shows that the top spenders on EGMs spent \$15 more on restaurants than other households with the same socio-demographic profile. Also take-away, alcohol and tobacco expenditures are considerably higher, in total these households spent \$101 more than other households. As the average household spends approximately \$75 on these four expenditure categories, the top gambling households spend 2.3 times as much as the average household. This is considerably more than the average impact of gambling expenditures on other expenditures, see Table A2.2.

**Table A2.3 Expenditures, savings, debts and assets of top gambling households**

	EGM expenditures		Gambling/income	
	Top 0.5% of households N = 42	Top 10% of spenders N = 69	Top 0.5% of households N = 42	Top 3.3% of gamblers N = 149
Δ Restaurants	15	10	16	10
Δ Take-away	9	7	4	4
Δ Alcohol	48	57	31	37
Δ Tobacco	29	28	14	11
Δ Other entertainment	-2	-4	-2	1
Δ Other recreation	-11	-11	-	1
Δ Other expenditures	65	17	7	-12
Total expenditure changes	154	104	70	52
Income	1 091	1 117	567	715
Gambling	609	467	794	419
EGM expenditures	549	415	244	199
Total expenditures	1 755	1 587	1 438	1 146
Cash savings	-664	-470	-871	-431
Δ Interest paid on loans	1	3	-3	-
Δ Interest paid on credit cards	-0.50	0.20	0.86	0.24
Δ Savings – property	48	-10	19	-13
Δ Savings – superannuation	-0.30	-7	-3	-2
Δ Total debts	-9 840	-8 358	4 221	-3 902
Δ Debts – house	-16 134	-12 199	3 277	-4 212
Δ Debts – loans	6 222	3 799	788	282
Δ Total assets	46 117	1 987	25 425	7 136

Notes: Δ Indicates that the expenditures were corrected for the socio-demographic characteristics.

The top 0.5 per cent of households includes 42 households.

The top 10 per cent of spenders on EGMs includes 69 households.

The top 3.3 per cent of spenders on gambling per income includes all households which spent more than 25 per cent of their gross income on gambling. Households with incomes of less than \$7,000 per annum (less than social security payments, these could be transitional households with a temporary very low income) and self-employed households (for which income data are less reliable) are excluded from this analysis.

These households also spend \$65 more on other expenditures. Their incomes average \$1,091 gross per week, compared to \$861 for the average households. These 42

households spent \$609 per week on gambling in the two week period of the HES diary. Most of this (i.e. \$549) was on EGMs. Except for gambling, these households are roughly financially balanced as total expenditures except gambling amount to \$1,146, while incomes are \$1,091.

However, the high gambling expenditures lead to a negative balance of \$664 per week. Therefore the effect on savings and other financial parameters of these households was analysed.

- Interest paid on loans was higher than expected and savings in superannuation funds lower. However, the amounts are marginal, about \$1, and could not finance the gambling.
- More importantly, the top gambling households have higher assets than other households with the same income and lower debts. These households also invest strongly in property (\$48).

It would appear that these households could well afford a gambling spree, or in fact quite a few gambling sprees. It is not clear whether the higher personal loan (\$6,222) has been used to finance gambling. This amount would pay for only ten fortnightly gambling periods as the one recorded in the HES. Possibly the personal loans were used to finance other assets. Whatever the cause of the personal loans, these households could afford some gambling sprees and the loans. If these households had spent similar amounts on gambling more often, they would need to have either smaller assets or higher debts. These households, however, have both higher assets and smaller debts. The conclusion must be that the households are not regularly spending excessively on gambling. The other possibilities, that normally the households spend less on other expenditures or that the financial data reported in the HES are completely wrong, are discounted.

When the sample size is increased to 69 households the results are very similar, even though average gambling amounts reduce from \$609 to \$467.

Apparently the selection method for top gamblers has identified households which could afford it. However, we are looking for households which cannot afford to gamble. For this reason the ratio of gambling expenditures to incomes was used, see column 3 in the table.

In fact, the selected 42 households spent \$794 on gambling but earn only \$567 on average. Again, these households have greater assets than their income would suggest. However, these households also have:

- greater debts;
- spend less on superannuation;
- spend more on credit card interest; and
- pay a lesser interest on loans despite higher debts which indicates that they pay back the loan slower.

On the other hand, these households manage to:

- invest more in property; and
- have higher assets and higher net assets.

If not for gambling (\$794) and gambling induced expenditures (\$70), total expenditures would be \$574, which can be financed out of the incomes of \$567. It would appear that while these households have larger assets than expected, they occasionally gamble and this is financed with personal loans and higher mortgages, slower repayment of personal loans, less superannuation contributions and increased use of their credit cards. However, one could also argue that the higher assets could only be financed with a higher mortgage given the low incomes and the higher personal loans which could be used to finance other purchases. After all, the loans would finance only one fortnightly gambling spree. If the later argument is followed, it can be concluded that these households are not regular high spending gamblers. However, incomes have been taken into account when calculating debts, assets and savings. Thus it would appear that while the households do not gamble themselves into bankruptcy, they occasionally gamble. While they can afford to do so, this still produces financial strains which result in higher loans, credit card usage, etc.

When the sub-sample is increased to include the top 149 spending households these effects disappear and the households boast higher assets as well as lower debts. This finding is consistent with the hypothesis that almost all gamblers in the HES can afford to do so and only a very small number of households are included in the HES who can less afford to do so.

An effort was made to identify households in the HES who are under more financial strain due to gambling expenditures than the households previously identified. If most top gamblers have considerable assets, then households which have small assets and a high gambling to income ratio should be analysed. In addition, partly to prevent under-reporting of incomes from some household types from biasing the analysis, the following households were excluded:

- all self-employed households;
- all households with less than \$7,000 per annum;
- the analysis was restricted to the 4,380 households who reported some gambling expenditures;
- as a more stable (even if biased) estimate of income the average of income and expenditures minus gambling was used, but only for the purpose of ranking households by their gambling expenditures to income ratio; and
- only households with no assets and a house value of less than \$150,000 and debts exceeding \$5,000 (excluding mortgage) were included (low asset – high debt households), or households with assets less than \$5,000 and a house value of less than \$180,000 (low asset households).

Table A2.4 shows that the top 42 gambling households of the two sub-populations have lower loan debts than the other households of the respective sub-population of 294 and 937 households: \$3,000 and \$100 less respectively. Also total debts and total assets are lower, as are all forms of savings. Within the highly pressured no asset – high debts households (data column 1) the top gambling households have net assets of \$11,000 less than the group average. This is entirely due to the smaller house value.

The top gambling households reduce savings in property and in superannuation by \$22 per week and have higher credit card debts. Clearly these savings cannot finance the \$205 per week reported spending on gambling. Also a continuous spending of \$205 per week of gambling would amount to \$11,000 within one year which the top gambling households showed in reduced assets. Thus the top gambling households cannot be assumed to regularly spend such large amounts on gambling. However, it does not appear that the gambling expenditures of \$205 were “one-offs”, because:

- savings on properties and superannuation are less than for the total sub-group of households despite having lower debts; and
- total expenditure excluding gambling is \$952, while incomes are \$1,049. With such a high potential cash savings of \$97 per week the reduced savings on property and superannuation and the higher credit card interest would be hard to explain.

**Table A2.4 Expenditures, savings, debts and assets for 42 top gambling households out of selected low asset households**

	No assets other than house Debts > \$5,000 House value < \$150,000	Assets <\$500 House value <\$180,000
Income	1 049	692
Gambling	205	246
Total expenditure	1 157	895
Cash savings	-108	-203
Δ Interest paid on loans	-2	0.1
Δ Interest paid on credit cards	0.4	0.6
Δ Savings – property	-16	-52
Δ Savings – superannuation	-6	-0.4
Δ Total debts	-11 000	-200
Δ Debts – house	-7 500	-150
Δ Debts – loans	-3 000	-100
Δ Total assets	-22 000	-500
Number of households	42	42
Total number of households with no assets – high debts (column 1) or low assets (column 2)	294	937

Note: Δ Indicates that the expenditures were corrected for the socio-demographic characteristics.

The top 42 spending households of the no asset – high debts sub-group reduced other expenditures by \$52 per week to compensate for the \$205 spent on gambling and the gambling induced additional \$76 on alcohol, etc. In total these households spent \$210 per week on alcohol, tobacco, restaurants, take-away and other entertainment, a total of \$415 per week on gambling and entertainment. The reduction in other expenditures for these households is considerably more than for the average gambling household, see Table A2.2.

Approximately 18 per cent of gambling and gambling induced expenditures are saved elsewhere. This is an indication of the significant financial strain on these households, who have an average debt of \$25,000, plus an average mortgage of \$25,600, as normally other expenditures are inelastic against gambling expenditures.

Furthermore, and more importantly, the -\$22,000 in assets is relative to all gamblers within the no asset – high debts sub-group. That is, we have not only to explain the -\$22,000 in assets of the top gamblers, but also the dire asset situation of the total sub-group, i.e. is the no asset – high debt situation of the total sub-group caused by gambling?

To throw further light on the question of how the negative asset situation was caused, the whole sub-group of no asset – high debts households was analysed. Table A2.5 compares no asset – high debts households with and without gambling expenditures.

It would appear that the top 42 gambling households have a long term savings ratio of zero at best. With an income of \$1,049 and ex-gambling expenditures of \$952, they could afford \$97 as average weekly gambling expenditures. Thus, the top gambling households identified are likely to be high spenders on gambling which in the fortnight of the 1993-94 HES survey spent more than the average amount on gambling. This is explained by the fact that the households were sorted according to gambling expenditures per income.

The assumption of the top 42 households spending \$5,000 per year on gambling does not explain the high negative asset situation as the \$97 per week would be sustainable as derived above.

The results of Table A2.5 show that the non-gambling households (second data column) have similar net assets as the gambling households (first data column) with net assets being around minus \$17,000. The gambling households feature a higher income, higher assets, higher debts and comparable net assets.

When income and other socio-demographic characteristics are taken into account (marked with  $\Delta$  in Table A2.5), the gambling households have net assets which are \$48,500 (= 72,500 – 24,000) less than the non-gambling households. The main reason for this large difference is that the gambling households, given their income and socio-demographic profiles, should have considerable total assets (of approximately \$98,000), but assets are only \$44,000. For non-gamblers the expected total assets are \$37,700 and observed assets of \$39,600. Apparently non-gamblers have dramatically different socio-demographics than gamblers within the no asset – high debts sub-group:

- 55 per cent of gamblers are renters, but 72 per cent of non-gamblers are renters;
- 39 per cent of gamblers are below 34, but 57 per cent of non-gamblers are below 34;
- 10 per cent of gamblers are older than 54, but only 3.2 per cent of non-gamblers;
- 34 per cent of gamblers are blue collar workers, but only 25 per cent of non-gamblers; and
- 16 per cent of gamblers do not work and 25 per cent of non-gamblers do not work.

That is, the low total assets of the non-gamblers are explained by their high renting incidence, young age and high share of non-workers.

Besides significant lower than expected net assets, the gambling households have:

- slightly higher mortgages (even though the higher share of mortgage payers in the gambling group were taken into account);
- less savings in superannuation, higher interest paid for credit card debts;
- savings in property higher than expected, but lower than for the non-gambling group; and
- the only positive aspect for the gambling households is that they pay off their loans faster (\$1,350 per annum versus \$1,240).

**Table A2.5 Expenditures, savings and debts of no asset – high debts households**

	Gambling expenditures	No gambling expenditures	All households
Income	884	750	861
Gambling	42.80	0	20.70
Total expenditures	908	740	847
Alcohol and tobacco	74.70	40.20	45.20
Restaurants and take-away	30.30	21.40	29.20
Cash savings	-24	10	14
Interest paid on loans	24.40	22.50	8.00
Interest paid on credit cards	2.70	1.50	1.55
Savings – property	36.70	32.00	50.20
Savings – superannuation	20.90	16.10	27.00
Total debts	60 296	48 291	35 060
Debts – house	33 300	21 720	27 600
Debts – loans	26 700	26 700	7 200
Total assets	44 000	29 600	245 600
Net assets	-16 300	-18 691	210 540
Number of households	294	229	8 389
Δ Alcohol and tobacco	20.3	-10.50	
Δ Restaurants and take-away	-0.6	-5.60	
Δ Other entertainment	1.30	-9.40	
Δ Interest paid on loans	1 350	1 240	
Δ Interest paid on credit cards	1	0	
Δ Savings – property	6.7	10.7	
Δ Savings – superannuation	-3.6	-0.3	
Δ Total debts	19 300	15 900	
Δ Debts – house	2 931	-921	
Δ Debts – loans	16 300	16 800	
Δ Total assets	-53 200	-8 100	
Δ Net assets	-72 500	-24 000	

It is worthwhile noting that other expenditures (other than gambling, alcohol, tobacco and other recreation) are higher in the no asset – high debts households group than expected, given their socio-demographic profiles. The gambling group spends \$15.30 per week more than expected and the non-gambling group \$25.10 per week more. This also means that the gamblers do not significantly reduce other expenditures in order to finance gambling and gambling induced costs.

The gambling households spend \$2,226 per annum on gambling plus \$1,092 per annum as additional expenditures on alcohol, tobacco, restaurant and take-away and saved nothing in other expenditures to compensate.

The non-gambling households spend \$1,326 less than expected on alcohol, tobacco and other entertainment. The total expenditure difference between gambling and non-gambling households (corrected for socio-demographics) is \$4,644 per year. After 10 years the gambling households would have lost the \$48,500 observed asset difference between the two groups. The assumption of an **average** length of gambling of 10 years appears to be on the high side. In addition, gambling expenditures were, on average, much lower in previous years, though not necessarily for gamblers. However, it can be assumed that the gamblers in the no asset – high debts sub-group have spent more on gambling in the past and have been forced to reduce gambling because of their high debts. The much higher gambling expenditures of the top 42 households of all households \$609 to \$794, see Table A2.5, compared to \$205 here, strongly supports this view. On balance, it appears justified to accept that a considerable part of the asset loss of the gamblers is caused by gambling.

In addition, it may be that the poor asset situation of the non-gambling group (which actually may be gamblers who did not report gambling expenditures within the fortnight of the HES survey) was partly caused by gambling. It may also be that some of the non-gambling households gambled in the past and therefore have reduced assets, even though they have stopped gambling by the time of the HES. In fact, predicted gambling expenditures are higher for the non-gambling group than for the gambling group. This would support the hypothesis that the non-gambling household group is in fact a mixture of households which gamble, but not in the fortnight of the HES survey, and households which really do not gamble other than marginally. However, the data fit of the regression model for gambling was extremely poor with an  $R^2$  of only around 1 per cent, which seriously limits the empirical support for the above hypothesis. Given the short survey period of two weeks, it is quite clear that some gamblers are in the non-gambling group, the (unanswered) question is, what is their share?

The analysis undertaken therefore highlights the importance of having information on medium to long term average expenditures instead of expenditures for a short period of time, because no information on the auto-correlation of the expenditures is available. In other words, do many households spend, from time to time, a large amount on gambling, but never too much over a year, or is it always the same households who spend large amounts?

## A2.4 Segmenting gambling households

Gambling expenditures show some very particular features.

- Gambling is widely spread over the population, but very high expenditures are concentrated in only a small number of households. It is true that most expenditure distributions are highly skewed, that is there are very few who spend a great deal. However, the skewness of gambling expenditures is particularly high and expenditures are unusually evenly distributed over many household types.
- Gambling contains several forms which attract different types of people, probably for different reasons.
- Gambling expenditures trigger alcohol and tobacco expenditures and, to a lesser extent, expenditures on restaurants, take-away and other entertainment.
- Gambling only affects other expenditures mildly. The reductions in other expenditures just balance the additional expenditures (e.g. alcohol). For top spending gamblers additional expenditures far outweigh the moderate savings in other expenditures.

- Most households finance gambling through a reduction in cash savings. Larger gambling expenditures are financed through reductions in savings in property and superannuation, personal loans and (in 1994) to a very small extent, through credit cards.
- Very high gambling expenditures lead to a reduction of assets, such as property, business, dividends and accounts and to an increase in mortgages and loans.

For these reasons socio-demographic factors are not very suitable for the segmentation of gamblers. Because gambling is largely financed out of cash savings and cash savings lead to asset accumulation, assets and cash savings are of critical importance. Because cash savings are rather small and in many cases so small that assets/debts are used to finance gambling, the net asset position of a household should be the key variable for segmenting gambling households.

It appears that hardly any “real problem gamblers” which spend large amounts of money consistently on gambling without being able to afford it are included in the HES. This is not really surprising as such problem gamblers try to hide their behaviour even from their families; hence, such persons would not agree to participate in the HES survey or simply not state any gambling expenditures.

However, other types of gamblers can be identified in the HES which show light to extremely serious impacts from gambling expenditures. It is not clear to what extent such household types are under-represented in the HES. Based on the results described in Section A2.3, the following economic classification of gamblers was developed.

### **1. Fully affordable**

For the vast majority of gamblers gambling is fully affordable. Gambling is financed out of a reduction in cash savings. Induced expenditures are approximately balanced by reduction in other expenditures. These gambling types heavily determine the results of the regression model, see Table A2.2. Because most of these households do not constantly gamble, many of them still retain positive or zero cash savings. A significant number of households exist, however, with a moderately negative cash balance. These can be compensated by a reduction in property savings (slowly running down the dwelling stock) and superannuation savings (reduced own contributions).

### **2. Asset rich top gamblers**

These households gamble large amounts more irregularly and finance this through zero cash savings, credit cards, reduction in superannuation, personal loans. However, they still invest in property and suffer neither significant asset reductions nor debts, but their asset accumulation is reduced. Most of these households have a high to medium income.

### **3. High debts gamblers**

These are many of the no asset – high debts households described in the previous section. Despite average incomes and not excessive gambling amounts (average of \$42.80 per week), these households have debts caused by longer term gambling. Total gambling and entertainment expenditures of around \$10,000 per year, of which around \$4,644 are gambling induced, over several years lead to a net debt situation. These households have average incomes and their members are middle aged and largely blue collar workers and clerks. Most of these households own a home.



#### **4. *Asset poor gamblers***

This is the group of households with an asset position between the “asset rich top gamblers” and the “high debts gamblers”.

### **A2.5 Estimating the impact of gambling household financial patterns**

In Section A2.3 sub-groups of households were identified which suffered severe financial stress due to gambling expenditures. The identified households showed assets, debts and savings patterns quite different to other households and the data presented in that section can be used to estimate the impacts of gambling.

The question is, however, whether the financial patterns of households who are under particular stress (no asset – high debts households) are representative for the financial reaction of all households who gamble. Various alternative sub-groups have been analysed in addition to the ones described in Section A2.3, however, the financial reaction to gambling expenditures was not clear. Given the many problems associated with the analysis undertaken and which result in bias and statistical noise, rather strong effects are required in order to be able to estimate the financial impacts of gambling using the HES. For this reason, at this stage, the no asset – high debts households have to be used to estimate financial adaptation of households. Clearly it would be one of the first tasks of future work to tune the market segmentation of Section A2.4 in such a way that separate estimation for the market segments becomes possible. To what extent this is possible when using the 1993-94 HES is unclear.

Two household groups could be used for the estimation:

- a comparison of the top 42 gambling households of the no asset – high debts sub-group with the gambling households of the no asset – high debts sub-group; and
- a comparison of all gamblers of the no asset – high debts sub-group with the non-gamblers of the no asset – high debts sub-group.

Because of large sample sizes and stronger effects, the second option was chosen. The results are presented in Table A2.6.

**Table A2.6 Estimated impacts of gambling on household finances**

Impacted variable	\$ per week		Impact as ratio to gambling expenditures (per cent)
Gambling expenditures	42.80		100
Gambling including induced expenditures	87.80		205
Gambling induced expenditure cuts	6.60		-23.4
Reduced savings – property	(2.50)		–
Reduced savings – superannuation	(-3.40)	-1.10	-2.6
Net cash savings	-80.10		

Impacted variable	\$		Impact as share of total asset change (per cent)
Increase credit card debts	(6)		–
Increase loans	0	(-500)	0
Increase mortgage	335	(3 850)	6.9
Asset reduction – house	-16 200		33.3
Asset reduction – superannuation	-2 800		5.8
Asset reduction – property	-3 500		7.2
Asset reduction – business	-8 000		16.4
Asset reduction – shares	-6 800		14.0
Asset reduction – accounts	-8 000		16.4
	<b>48 650</b>		<b>100</b>

*Note:* Values in brackets are results which have the incorrect sign and which are therefore aggregated with other similar variables. This problem occurred only with variables of minor amounts.

## A2.6 Estimating the impact of gambling on the asset formation

In the previous Sections A2.2 and A2.3 the impacts of gambling expenditures on other expenditures and savings were analysed for various household groups. The results are summarised in Table A2.7 and show that:

- for all household groups expenditures on restaurants, take-away, alcohol and tobacco increase with gambling expenditures;
- for top spenders on EGM and gamblers of the no assets – high debts group, these multiplier effects are much stronger than for the general population;
- the impact on other entertainment is not clear; and
- other expenditures decline, but not sufficiently to compensate the induced additional expenditures. This leaves a positive net multiplier effect of gambling, that is gambling leads to a larger reduction in savings than the original gambling expenditures.

**Table A2.7 Estimated multiplier effects of gambling expenditures on EGM expenditures for various household groups**

	All households, total gambling expenditures (Table A2.4)	All households, EGM expenditures (Table A2.4)	Top 0.5% of EGM spenders (Table A2.5)	No assets – high debts households (Table A2.8)
Restaurants	1.6	2.9	2.7	–
Take-away	0.7	1.6	1.6	11.7
Alcohol	4.3	13.4	8.7	–
Tobacco	1.6	5.1	5.3	72.0
Other entertainment	-0.4	–	0.3	25.0
Other expenditures	-7.8	-6.8	11.8	-23.4

Source: 1994 HES and NIEIR expenditure model.

The question arises, which multiplier effect of gambling expenditures should be used for the simulation of the impacts of gambling expenditures? This increase is largely based on an increase of EGM expenditures. Furthermore, it may be assumed that through the increase of gambling the concentration of gambling expenditures increases. Interestingly, the multipliers for EGM expenditures are similar for all EGM players and for the top 0.5 per cent of EGM players. Therefore, the multipliers for all EGM players are used in the simulation study.

After simulating the expenditure effects of gambling expenditures the model needs to simulate the impact of changed savings on assets. For example, if savings are negative over a year will asset stocks be run down, and which asset stocks? Or are debts increased, and if yes, which form of debts? A considerable amount of analysis using the HES was undertaken to derive the following asset formation model:

- asset formation and running down the asset stocks are very different for home owners/mortgage payers and for renters;
- asset formation differs greatly between wealth, average, asset poor and asset negative households. Thus total net asset is a major determinant of which asset or debt category a household will use if it needs to invest cash savings, or to finance negative cash savings; and
- correspondingly, separately for renters and owners/mortgage payers, the asset and debts profiles were assembled from the HES for various total net asset classes. From these asset and debts profiles transition coefficients from one total net asset class to another were calculated, see Tables A2.8 and A2.9.

**Table A2.8 Changes in assets/debts structures for asset changes for house owners.**  
**Percentage of funds allocated to asset/debt type for net asset category household is moving towards**

Net asset category		Deposit	Invest- ments	Super.	Bus- iness	Property	House value	Personal loans	Mort- gages
≤ - \$20,000	%	2.5	0	0	0	0	0	25.0	72.5
-\$20,000 to -\$1	%	0	0	0	6.5	0	0	3.2	90.3
\$0 to \$40000	%	3.9	0	0	2.0	2.0	5.9	3.9	82.3
\$40001 – \$100000	%	12.2	2.0	1.8	4.0	1.8	42.2	4.7	31.3
\$100001 – \$200000	%	18.8	5.3	5.6	25.6	7.5	36.2	1.0	0
\$200001 –	%	15.0	15.5	10.7	35.9	14.3	8.6	0	0

**Table A2.9 Changes in assets/debts structures for asset changes for non-house owners.**  
**Percentage of funds allocated to asset/debt type for net asset category household is moving towards**

Net asset category		Deposit	Invest- ments	Super.	Bus- iness	Property	Personal loans	Mort-gages
< \$0	%	0	0	0	0	0	78.2	21.8
\$0 – \$15,000	%	45.6	6.1	4.3	36.2	17.4	-8.5	-1.7
\$15,001 – \$200,000	%	4.0	7.6	2.8	76.3	10.8	-1.1	-0.4
\$200,001+	%							

*Note:* It is not quite clear how mortgages of households who do not own a home should be interpreted. Apparently this includes households who have lost their home and still have a net mortgage to pay. However, this should be classified as personal loan and not as mortgage. Mortgages for high asset households without home ownership indicate that mortgages of other property have been misclassified by reporting households. Alternatively, other assets than a private dwelling could be mortgaged, including vacant land.

*Source:* 1994 HES and NIEIR modelling.

## **Appendix 3**

### **Further HES analysis**

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## Appendix 3: Further HES analysis

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This appendix completes the analysis of the Australian Bureau of Statistics Household Expenditure Survey of 1993-94.

### A3.1 Analysis of the HES

This section presents comparisons between states, namely New South Wales, the Australian Capital Territory and Victoria. This is to highlight similarities and differences between the states with different levels of maturity in their gaming markets.

The analysis develops from a socio-demographic profile of gamblers in the HES and continues with the differences in patterns of expenditures between gamblers and non-gamblers. It uses data from VCGA surveys to supplement the HES.

### A3.2 Household Expenditure Survey

The HES provides a breakdown by state while the Authority studies are only available for Victoria. The HES is a richer and established survey which only relates to 1994, while major changes in gambling have occurred since then. The Authority studies can be used to update information derived by the HES.

The HES suffers a number of problems:

- the expenditure on gambling was recorded over a two week period in the respondents' personal diary. The short period increases standard errors;
- self-reporting under-estimates expenditures in case of all stigmatised expenditure categories, in particular gambling, tobacco and alcohol; and
- the HES is not completely representative, for example high income households and young households are under-represented. It may well be that households which gamble above average are under-represented.

Despite these problems, the HES is a very useful data base with a good sample size of 8,389 households. The ABS uses the HES primarily to weight the CPI figures. Also, the HES has been used for a number of major studies of gambling patterns. NIEIR alone has undertaken several such studies using the HES since 1992 and also uses the HES to derive regional estimates of potential gambling expenditures in its SpendInfo product. SpendInfo data on gambling have been used with good success by several of NIEIR's clients and by NIEIR in undertaking market research for its clients.

This experience assures us that despite its many shortcomings, and in particular the severe under-reporting of gambling, the HES contains valuable structural information on who are the small, average and big gamblers. However, from this work it is not clear to which extent the HES contains information on long time excessive or pathological gamblers.

In its past work and in SpendInfo, NIEIR has treated the gambling raw data from the HES in the following way:

- converted negative expenditures to expenditures. That is, a reported win from gambling is used as an indicator for significant gambling activity of that household, which we know results in significant expenditures in the medium to long run, even if the reported wins were correct; and
- benchmarked the expenditures on gambling derived from the HES as described above to the expenditure totals from the Australian Gambling Statistics.

### A3.3 Socio-demographic analysis

While the HES is a relatively old survey (the data relates to 1993-94) its breakdown by state allows the differences in gambling patterns for states with a different maturity of the EGM market to be analysed. New South Wales and the Australian Capital Territory are considered to be mature markets because poker machines have been available in these states/territories since the 1950s. (The data does not cover the recent introduction of poker machines into New South Wales hotels.) Victoria had just introduced EGMs in 1992. A comparison of emerging and mature areas may allow the development for Victoria to be projected.

Incidence of playing poker machines has been chosen as the major variable for the analysis for a number of reasons:

- incidence and expenditures show fairly similar patterns in the HES;
- incidence is a robust measure which cannot be biased by a few outliers as expenditures can; and
- incidence data appears to be a better comparator across surveys and more surveys report data on incidence than expenditures.

Table A3.1 shows the incidence of playing poker machines over a recent two week period, measured by whether the respondent reported any expenditure or any gain from playing poker machines or ticket machines (beer ticket, beer lottery ticket).

State	Male	Female	Total
New South Wales	11.0	7.1	9.0
Victoria	5.8	5.3	5.6
Queensland	6.9	6.1	6.5
South Australia	0.8	1.2	1.0
Western Australia	1.0	0.4	0.7
Tasmania	1.6	2.2	1.9
Northern Territory	4.2	3.1	3.7
Australian Capital Territory	11.1	4.8	7.8
<b>Total</b>	<b>6.8</b>	<b>5.2</b>	<b>6.0</b>

Source: 1993-94 HES.

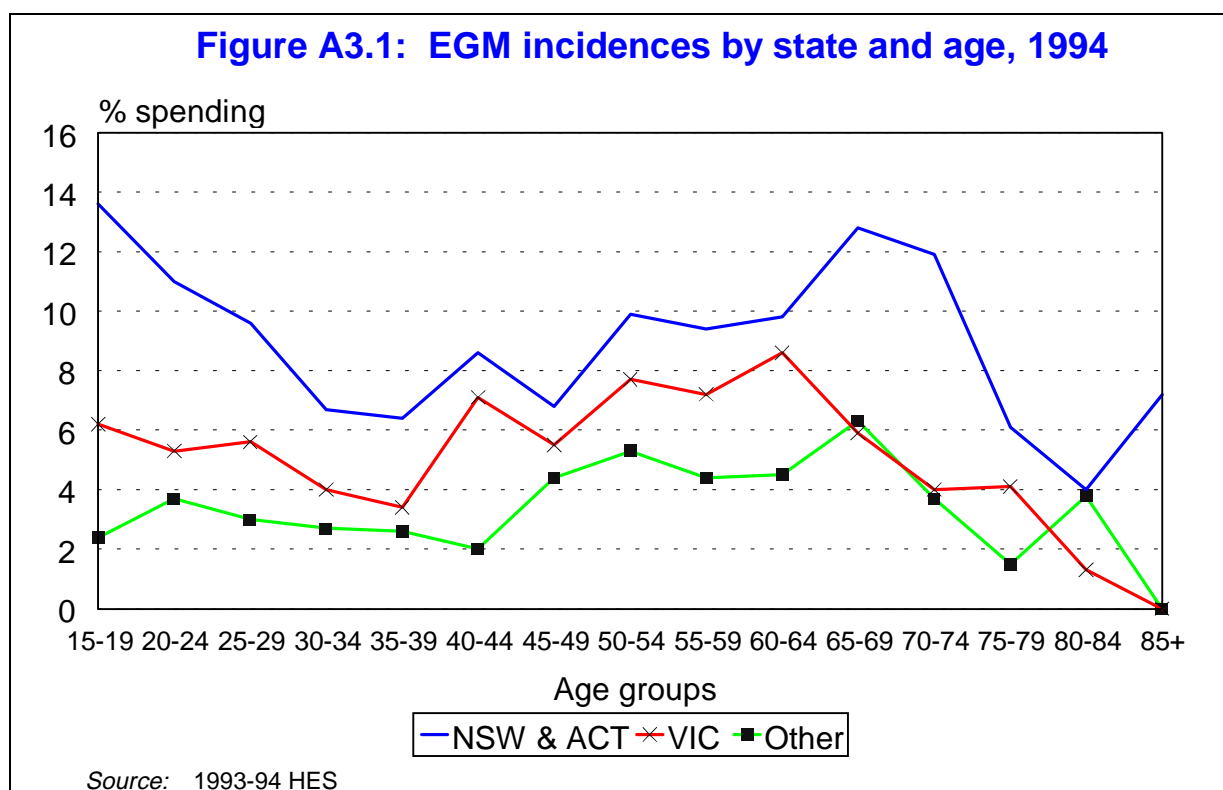
The results show that:

- New South Wales and the Australian Capital Territory had the highest incidences (7.8 and 9.0 per cent respectively). This may be, at least partially, the result of an established market and a high supply of around 1 EGM per 55 people;
- Queensland, Victoria and the Northern Territory had average incidences of between 3.7 and 6.5 per cent;
- the other states showed very small incidences of 1 to 2 per cent; and
- in the states with low and average incidence, the incidences for men and women were quite similar, but in New South Wales and the Australian Capital Territory men had a much higher incidence of playing EGMs.

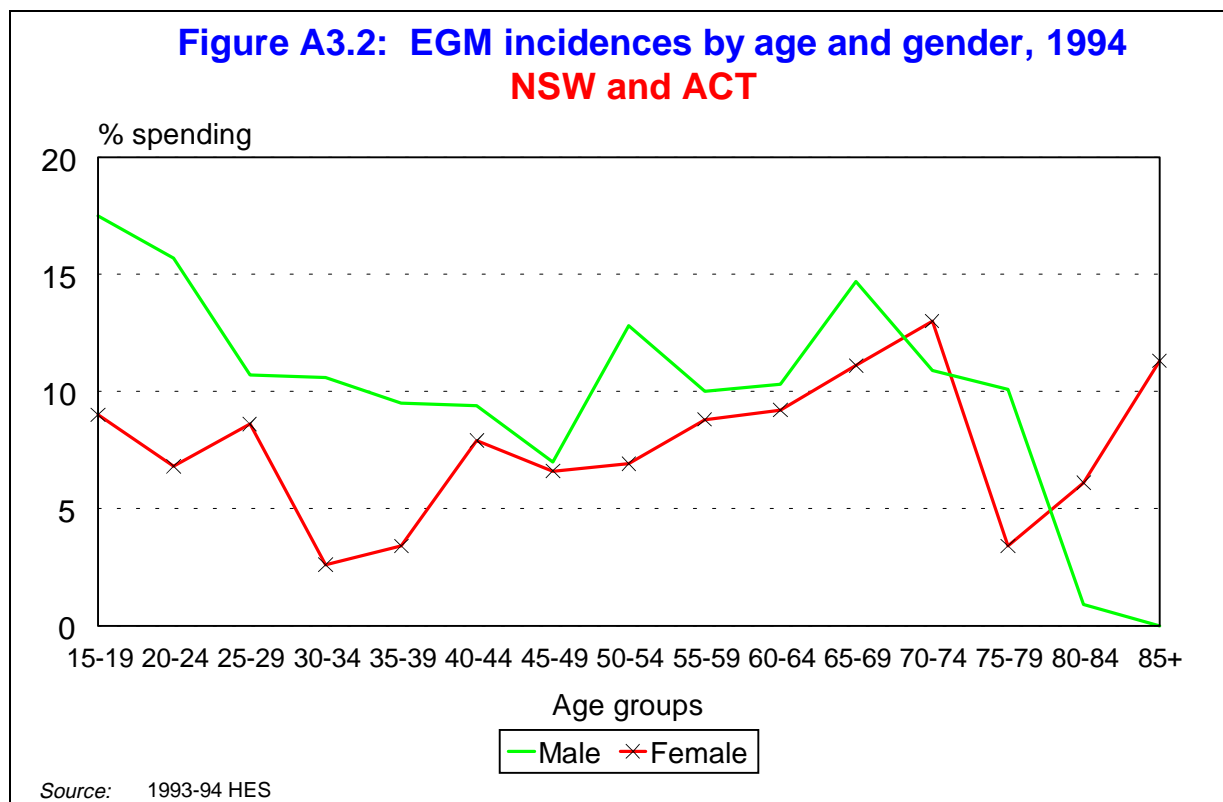
EGMs were introduced between 1990 and 1992 in Victoria and Queensland and these states are thus considered to be emerging markets. In Queensland licensed pubs as well as casinos had EGMs, while in Victoria the casino opened only after the HES had been completed. Northern Territory may also be considered an emerging market because it had two casinos operating which provide EGM gambling facilities and drawcard machines (giving wins in the form of vouchers, not in cash) were operating for many years. EGMs in hotels and clubs in the Northern Territory were only introduced after 1995.

Figure A3.1 shows that in states with a high incidence of EGM gambling it is especially the young (15 to 24) and the older (65 to 74) who play EGMs, while in the other states the incidences are similar for the different age groups.

Figure A3.2 shows that in the mature EGM states for older women the incidence of playing EGMs is converging towards the male incidence. For the other states there is only a small difference in the incidence by gender (4.1 per cent for women and 4.5 per cent for men) and no differences in the age profiles could be detected between men and women.







Tables A3.2(a) and A3.2(b) shows how household income impacts on the incidences and the expenditures for EGM gambling:

- the incidence of playing EGMs is largely independent from household income for New South Wales/Australian Capital Territory. Expenditures only rise moderately with income and the lowest income group (<\$15,000 per annum) spend as much as the middle income group \$30,000 to \$50,000. As a per cent of income the lowest income group spends in excess of ten times more than the top income group;
- in Victoria and the other states the incidence increases with income but declines with very high incomes. It appears that in these states more of those who can more easily afford to gamble do so than in the mature EGM states; and
- expenditures for Victoria show that the low income range spends most on gambling, followed by the high income range, while the middle income ranges spend least. The expenditures reported in Table A3.2(b) are affected by outliers but an outlier analysis showed that the reported patterns are basically correct, that is, the expenditure relativities are largely unaffected by the expenditure outliers.

**Table A3.2(a) EGM incidences by income and state, 1993-94 (per cent spending)**

	NSW and ACT	Victoria	Other	Total
<\$15,000	8.5	2.7	2.4	4.6
\$15,000 – \$30,000	9.9	5.5	3.7	6.2
\$30,000 – \$50,000	8.1	4.8	3.7	5.5
\$50,000 – \$100,000	9.2	6.9	3.7	6.5
>\$100,000	8.5	6.5	3.1	6.4
<b>Total</b>	<b>9.0</b>	<b>5.6</b>	<b>3.5</b>	<b>6.0</b>

Source: 1993-94 HES.

**Table A3.2(b) EGM expenditures in \$/week and person by income and state**

	NSW and ACT	Victoria	Other	Total
<\$15,000	1.28	1.69	0.36	0.99
\$15,000 – \$30,000	1.10	1.03	0.51	0.84
\$30,000 – \$50,000	1.33	0.64	0.44	0.80
\$50,000 – \$100,000	1.40	1.54	0.65	1.14
>\$100,000	1.49	1.13	0.47	1.10
<b>Total</b>	<b>1.31</b>	<b>1.18</b>	<b>0.52</b>	<b>0.97</b>

Source: 1993-94 HES.

Household gross incomes were used in the analysis instead of personal incomes. Personal incomes can be very misleading, for example a spouse or a member of a rich household may have no own income but typically still has considerable resources available. The incomes have been converted from 1994 dollars to 1997 dollars in order to allow a comparison with the income groups reported in the 1997 and 1998 Authority survey.

As incomes have only a limited impact on EGM incidence, one could also assume that highly correlated variables such as occupation have little impact. Table A3.3 shows that this is not the case. In fact, occupation is a major factor determining incidence of EGM gambling.

- In the mature New South Wales/Australian Capital Territory market, blue collar workers have the highest incidences, followed by grey collar workers (clerks, sales and service workers), while the higher occupations (managers and professionals) have the lowest incidences. Self-employed and employers show the lowest incidences of all groups.
- The patterns for Victoria are similar but much flatter. A notable difference is the low incidence of gambling by tradesmen in Victoria.

**Table A3.3 EGM incidence by occupation and state, 1993-94 (per cent spending)**

	NSW and ACT	Victoria	Other	Total
Self-employed	4.4	5.0	2.3	3.5
Managers	8.4	5.3	3.8	6.0
Professionals	5.0	3.5	2.8	3.8
Paraprofessionals	8.7	6.9	1.1	5.4
Tradesmen	12.8	5.0	4.1	7.4
Clerks	9.2	7.8	5.2	7.3
Sales/services	11.7	8.1	5.6	8.3
Operators	14.4	8.5	2.8	8.3
Labourers	9.6	7.0	3.8	6.6
Unemployed	8.9	4.6	3.3	5.6
<b>Total</b>	<b>9.0</b>	<b>5.6</b>	<b>3.5</b>	<b>6.0</b>

Source: 1993-94 HES.

Table A3.4 reveals that:

- grey collar workers in New South Wales/Australian Capital Territory gamble more often when they have a lower income, while in Victoria the incidence is independent of income;
- persons without occupations gamble independent of household income in New South Wales/Australian Capital Territory, while in Victoria gambling incidence increases with income;
- blue collar workers have a strong income elasticity. For example in New South Wales/Australian Capital Territory high income blue collar workers have double the incidence of low income blue collar workers. In Victoria the incidence is increased slightly with income; and
- in New South Wales/Australian Capital Territory managers/professionals have a higher incidence when their household income is higher, with the exception of young managers/professionals which are at least partly responsible for the high incidences in the \$15,000 to \$30,000 group. Also in Victoria the incidence of managers/professionals increases with income, but the increased incidence for younger managers/professionals is less pronounced.

In summary, EGM patterns in the mature states appears to be less rational than in Victoria in 1993-94. This effect appears to be strongest in the grey collar and the no occupation groups. Blue collar workers have the highest incidences in New South Wales/Australian Capital Territory but more so for blue collar workers with a high income. It appears that increased supply of EGMs stimulates different population groups differently. Unfortunately it appears that this stimulation affects low income persons more than others and the stimulation appears to induce less rational gambling patterns.

**Table A3.4 EGM incidence by income and occupation, NSW/ACT and Victoria, 1993-94  
(per cent spending)**

	Managers/ professionals	Blue collar workers	Grey collar workers	Unemployed	Total
<b>NSW and ACT</b>					
<\$15,000	0.7	8.0	11.7	9.2	8.5
\$15,000 – \$30,000	12.2	7.2	14.3	9.6	9.9
\$30,000 – \$50,000	3.1	11.1	9.0	7.6	8.1
\$50,000 – \$100,000	6.9	12.0	9.6	8.2	9.2
>\$100,000	6.0	16.0	8.6	9.1	8.5
<b>Total</b>	<b>6.0</b>	<b>11.2</b>	<b>9.9</b>	<b>8.9</b>	<b>9.0</b>
<b>Victoria</b>					
<\$15,000	4.0	5.3	2.4	2.3	2.7
\$15,000 – \$30,000	1.3	5.7	8.0	5.6	5.5
\$30,000 – \$50,000	6.7	4.6	8.1	2.5	4.8
\$50,000 – \$100,000	5.1	8.3	7.6	7.5	6.9
>\$100,000	5.6	6.7	7.4	8.8	6.5
<b>Total</b>	<b>5.0</b>	<b>6.4</b>	<b>7.5</b>	<b>4.6</b>	<b>5.6</b>

Source: 1993-94 HES.

Further evidence that gambling patterns in mature EGM states are less rational than in emerging markets comes from Table A3.5.

- Public renters have the highest incidences in New South Wales/Australian Capital Territory but only the second highest incidence in Victoria.
- Owners have the highest incidence in Victoria, but only the second highest incidence in New South Wales/Australian Capital Territory. In fact, in New South Wales/Australian Capital Territory the incidence for public renters is 73 per cent higher than in Victoria but the New South Wales/Australian Capital Territory incidence of owners is only 40 per cent higher than in Victoria.
- In Victoria income had some impact on incidence for each of the housing status groups, while in New South Wales/Australian Capital Territory the impact of income was less pronounced.

**Table A3.5 EGM incidence by income and housing status, NSW/ACT and Victoria, 1993-94  
(per cent spending)**

	Owners	Purchasers	Renters private	Renters public	Total
<b>NSW and ACT</b>					
<\$15,000	7.8	10.2	6.7	13.7	8.5
\$15,000 – \$30,000	11.5	7.9	8.6	8.0	9.9
\$30,000 – \$50,000	7.6	7.3	10.3	5.0	8.1
\$50,000 – \$100,000	8.4	9.3	9.0	17.0	9.2
>\$100,000	9.3	7.9	8.2	0.0	8.5
<b>Total</b>	<b>9.1</b>	<b>8.5</b>	<b>8.9</b>	<b>10.2</b>	<b>9.0</b>
<b>Victoria</b>					
<\$15,000	3.4	3.9	0.9	0.0	2.7
\$15,000 – \$30,000	6.7	4.4	3.6	5.3	5.5
\$30,000 – \$50,000	4.9	5.7	2.1	16.5	4.8
\$50,000 – \$100,000	7.5	6.6	6.7	0.0	6.9
>\$100,000	12.7	1.2	0.0	0.0	6.5
<b>Total</b>	<b>6.5</b>	<b>5.4</b>	<b>3.7</b>	<b>5.9</b>	<b>5.6</b>

Source: 1993-94 HES.



## **Appendix 4**

### **The Authority surveys**

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## Appendix 4: The Authority surveys

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This appendix:

- (i) overviews the findings of the Authority surveys;
- (ii) compares the Authority survey results with the HES results; and
- (iii) explores the issue of the financing of gambling expenditures using the Authority results.

### A4.1 Survey of community gambling patterns and perceptions

The Authority surveys of community gambling patterns and perceptions have been undertaken each year since 1992 (except in 1993). The sample size has been around 1,700 to 2,000 persons over the last three surveys. Key variables from the Authority surveys of 1996, 1997 and 1998 were made available to the consultant by the Authority. In addition, the report "*Sixth Survey of Community Gambling Patterns and Perceptions*", April 1999 by Roy Morgan Research for the Authority contains data tables including data from the earlier Authority surveys.

An analysis of the three latest Authority surveys identified considerable problems from the point of view of possible incorporation of Authority data into the microsimulation analysis. These are not surprising since the Authority surveys were commissioned to assess social practices and perceptions of gambling rather than its economic effects.

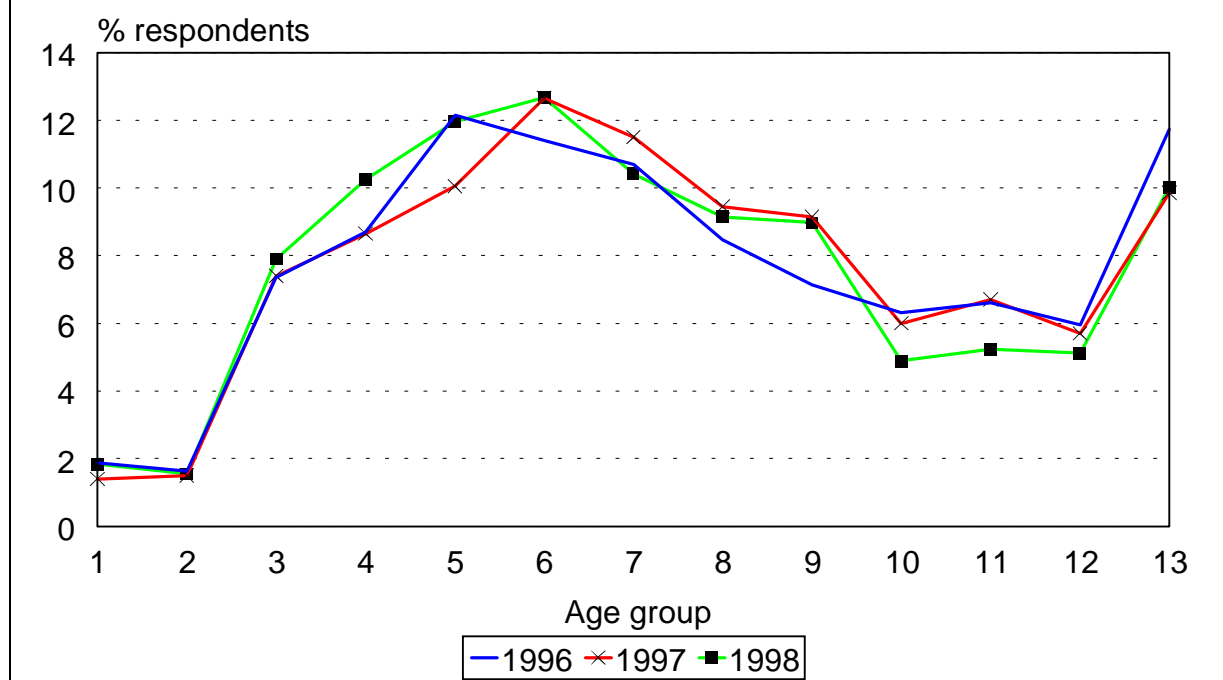
- The age structure of the respondents and the metro/other distribution have significantly changed, see Figure A4.1. For example, the share of persons aged 20 to 39 was 39.6 per cent in 1996 and 38.7 per cent in 1997, but 42.8 per cent in 1998. In 1996 and 1997 33 per cent of respondents were from non-metro areas but only 27 per cent in 1998. The 1996 and 1997 surveys were undertaken by Market Solutions and the 1998 survey was undertaken by Roy Morgan Research.

This shift in respondent characteristics poses a problem for the comparability of the survey results over time. For example, when finding a change of some results from 1997 to 1998 one would not know whether this change has been caused by the change of the survey population from 1997 to 1998 or whether the observed trend really occurred.

- Coding of responses appears to have changed in several cases, e.g. for religion and occupation, resulting in unexplainable changes from one survey to the next (see Table A4.1). This is of particular concern as many questions were not prompted using predefined answer categories, but the respondent's reply was coded by the interviewer. In the absence of very detailed coding handbooks such procedure is likely to be highly sensitive to changes of staff.



**Figure A4.1: Age distribution of respondents of VCGA survey 1996, 1997 and 1998**



**Table A4.1 Distribution (per cent) of respondents' religion in the Authority surveys 1996, 1997 and 1998**

	1996	1997	1998
Anglican	13.0	12.0	<b>20.0</b>
Catholic	25.8	26.1	25.5
Baptist	5.0	2.3	1.9
Presb./Methodist/Uniting Church	<b>15.5</b>	<b>12.8</b>	<b>9.7</b>
Salvation Army	0.4	0.5	0.5
Lutheran	0.6	0.9	1.5
Other Christian	7.5	<b>3.5</b>	6.9
Jewish	0.5	0.6	0.5
Buddhism	1.1	0.9	1.4
Other non-Christian	1.9	2.5	0.6
Other	0.6	0.3	1.1
No religion/don't know	23.3	24.3	<b>30.4</b>
Church of England/Protestant	3.5	3.0	<b>12.5</b>
Greek Orthodox	1.4	2.3	2.7

Note: Doubtful results are shaded.

Despite the problems discussed above, it may still be possible to undertake structural (static) analysis of the surveys. For example, a finding that blue collar workers and young males have a higher incidence of gambling is fairly robust against such survey problems. Firstly, this is because the relative incidences for these socio-demographic groups are quite high compared with the potential survey bias and, secondly, because such analysis compares different groups which may suffer a similar degree of bias (e.g. too many non-metro respondents).

Fortunately many gambling characteristics are spread fairly evenly over the population and are thus relatively insensitive against changes in the socio-demographic characteristics of the respondents. To the extent that this is true, even a trend analysis may be feasible. However, this is not always the case and without proper analysis any comparison of results from the past years may lead to false conclusions.

In addition, it appears that the problems described relate not only to socio-demographic background variables, but also to some of the target variables. For example, in 1997 53 per cent of respondents reported pension/wage/job as the source for the gambling outlay, and in 1998 this share was 38 per cent.

A change in sample plan and the resulting change in the representation of the Victorian population could be corrected by reweighting the samples. However, important variables to be benchmarked, such as income or occupation, have additional problems and therefore this approach appears unfeasible.

Another option would be a geo-demographic approach to estimate changes from 1996 to 1998. The geo-demographic approach uses the socio-demographic distribution of 1996 of the postcode of the respondent instead of the socio-demographics of the respondent. Then a regression model which takes into account the socio-demographics and includes trend dummy variables for the years 1996, 1997 and 1998 is estimated. The trend dummy variables are net of:

- any change in the representation of the surveys; and
- any change in the recording of socio-demographic characteristics in the survey.

They therefore represent an estimate of the real change of gambling participation and attitudes subject to the assumptions:

- that changes in the running of the surveys have not changed the results significantly; and
- that the truthfulness of responses has not changed significantly, which may be impacted by changes of public perception and judgement of gambling related issues.

Another problem in deriving trend estimates is that the gambling market is still rapidly developing. Some changes in gambling behaviour may be triggered by changes in supply, such as location, new games and changes in the operation and offerings of clubs. Extrapolation of such changes in gambling behaviour may produce erroneous results.

From the discussions above it appears unlikely that precise estimates of trends of gambling behaviour can be derived from the Authority surveys. However, it appears that it is possible to develop plausible scenarios of trends in gambling behaviour by using careful analysis of the Authority surveys in conjunction with the HES and the Australian Gambling Statistics.

## A4.2 Analysis of the Authority survey and comparison with the HES

Selected variables from the Authority unit record data from 1996, 1997 and 1998 have been made available to the consultant by the Authority. The variables have been recoded by the Authority in order to make them as compatible over time as possible.

### A4.2.1 Conceptual differences between HES and Authority surveys

The expenditure concepts used in the HES and in the Authority surveys differ.

The HES contains average weekly expenditures derived from the diaries which each adult household member kept for 14 days. The HES was undertaken throughout 1993-94 on a rotation basis in order to eliminate seasonal impacts on expenditures. Expenditures are recorded separately for seven gambling categories, including EGM, casino, etc.

The HES is thus a cross-section over time and the weekly expenditures may be multiplied by 52 to get annual expenditures.

However, the expenditure distribution is biased because households who play more often are more likely to have recorded some expenditures within the fortnight of the diary. For example, all respondents which play at least once every two weeks would record at least one expenditure in the HES. However, only 3.8 per cent of respondents who play only once a year would record an expenditure in the HES.

The limited time period of the diary, together with the lack of information on frequency of purchase in the HES, do not allow the HES to identify very small average spendings. For example, if one person spends on average once a year \$5 and recorded a spending of \$5 in the HES, the HES implicitly assumes that the person spends \$2.50 each week. However, the true average weekly spending of this person is  $(1/52) * \$5 = \$0.10$ .

The expenditure for frequent players should be correct, to the extent that the expenditures within a two week period describe their long term average expenditures.

However, if frequent players spend more each time they play than non-frequent players (a finding derived from the Authority surveys), the HES would contain too many higher expenditures and too few small expenditures.

Despite the fact that the expenditure distribution in the HES is biased as described above, average expenditures are unbiased, except for under-reporting. This is because the probability of infrequent gamblers recording expenditures in the HES is low. For example, the person who spends \$5 once a year has only a probability of  $2/52$  of recording these \$5 in the HES. The average weekly spending of the described type of persons is  $(2/52) * \$2.50 = \$0.10$  which is correct ( $\$5/52 = \$0.10$ ).

The discussed capture of gambling expenditures in the HES can be summarised as follows:

- the HES should report the correct average expenditures, but for under-reporting;
- the HES contains too few small (infrequent) gamblers and too high a share of frequent gamblers; and
- the fact that the respondent writes the expenditures in a diary may well induce the respondent not to report additional expenditures on gambling if he/she has already

reported several expenditures so as not to admit the high frequency and high expenditures on gambling. That is, it is quite likely that very high gambling expenditures of frequent gamblers are more under-represented than other gambling expenditures, e.g. from persons who gamble rarely.

The Authority surveys contain various expenditure data:

- the last EGM expenditures (not in casino). The point in time to which this expenditure refers is not known, except whether it was within the last week;
- whether the person played EGM (not in casino) within the last week;
- average expected outlay on EGMs (separate for casino and non-casino) each time the respondent gambles;
- average expected frequency of playing EGMs (separately for casino and non-casino);
- amount spent/won on all gambling activities in last week;
- average expected outlay for all other gambling categories, e.g. for casino; and
- average expected frequency of playing for all other gambling categories, e.g. for casino.

Annual expenditures could be estimated from the Authority surveys in various ways.

### ***Method 1: using respondents' expectations***

Multiply the average expected frequency of playing EGMs (outside casino) x average expected outlays (outside casino) plus average expected frequency of playing EGMs (casino) x average expected outlays (casino). This approach is available for all gambling categories.

### ***Method 2: using reported expenditures within last week***

For total gambling expenditures, the amount spent/won on all gaming activities in the past seven days.

### ***Method 3: use reported last expenditures and expected frequency***

Multiply the last expenditures with the expected average frequency of gaming. This approach is only available for EGMs and assumes that the average spending on EGMs in casinos is as high as the average spending on EGMs not in casinos. A comparison of the expected average outlay on EGMs in and outside of casinos from the Authority surveys from 1997 and 1998 supports this assumption.

Method 1 gives poor results, method 2 is acceptable and method 3 gives the best results, that is the results correspond closest to the total gambling expenditures as recorded by the Australian Gambling Statistics.

It should be noted that the average last expenditures cannot be interpreted as the average spent by the survey population, because the last expenditures do not relate to a fixed time period. For example, if one person spends \$10 in a week and another person \$5 in a year, average expenditures per week are not \$7.50, but approximately \$5.10.

The capture of gambling expenditures in the Authority survey can be summarised as follows.

- In order to estimate average expenditures various variables in the Authority surveys have to be combined. For EGM expenditures good data is available, quite good data for total gambling, while for the other gambling categories the data for estimating average expenditures are relatively poor.
- Method 3 to estimate EGM expenditures can provide annual expenditures and the correct distribution of the annual expenditures (correct but for understating). The HES by its nature produces only a biased EGM expenditure distribution.
- Expenditures on EGMs estimated using method 3 above may understate expenditures of less frequent gamblers because expenditures made a longer while ago (e.g. three or more months) may well be under-estimated by the respondent.
- The Authority expenditures on total gambling relate to the last week and are reasonably comparable with HES expenditures on total gambling which relate to the last two weeks. The expenditure distributions are biased.
- The Authority expenditures for other gambling forms are likely to be inferior compared to the HES because they are based on expected average behaviour instead of actual behaviour. Theoretically, the Authority surveys can produce correct distributions for these expenditures. However, due to the strong response bias these expenditure data are not likely to be very good.

## A4.2.2 Key expenditure characteristics in the Authority surveys and the HES

Table A4.2 below gives an overview of participation rates and expenditures on EGMs from the Authority survey. The main findings from these tables are as follows.

- The expected participation rate for EGM playing (using respondents' data on average frequency of playing) is much lower than reported past participation rates from the Authority survey and from the HES. It appears that the estimated participation rates are only about a third to half the reported participation. Respondents' perception of their average gambling behaviour appears to grossly understate actual behaviour.
- Reported participation for EGM machines in the past one week and one month are roughly comparable with the participation rate reported in the HES. This may indicate that 1993-94 HES gambling data for New South Wales/Australian Capital Territory may be used (after adjustments) to simulate Victorian gambling patterns in 1997 and 1998.

The HES expenditures for New South Wales/Australian Capital Territory were analysed instead of the HES expenditures in Victoria because New South Wales/Australian Capital Territory were already mature EGM markets in 1993-94, while Victoria was only an emerging EGM market.

**Table A4.2 Summary of gambling participation and expenditures on EGMs in the Authority surveys**

Variable	1995	1997	1998	<u>1998</u> <u>1997</u>
Expected participation rate EGM for 2 weeks	4.5%	3.3%	3.6%	(+9%)
Played EGM within the last week (not in casino)	–	6.6%	5.8%	(-12%)
Played EGM within last month (not in casino)	–	15.6%	13.5%	(-13%)
Participation rate EGM for last 2 weeks in 1993-94 HES	VIC: 5.6%	NSW/ACT: 9%		
Expected average expenditures on EGMs per week (method 1)	\$4.50	\$4.00	\$3.70	
Estimated average expenditures on EGMs per week (method 3)	–	\$4.50	\$8.30	
Lost/won last time played EGM (not in casino)	–	\$9.10	\$11.50	
Actual EGM expenditures/week in financial year	\$7.10	\$8.20	\$9.50	
Estimated EGM expenditure for September/October when the Authority survey was run	–	\$9.15	\$10.70	

*Notes:* The impacts of just a few outliers for reported losses/gains may make any comparison of the raw data meaningless. For this reason the following maximum expenditures were defined after analysis of the expenditure distributions and larger expenditures were reset to the maximum expenditures: Average expenditure on EGMs (non-casino) PNCOUT\$: \$800, average expenditure on EGMs (casino) PACOUT\$: \$500.

*Source:* Authority community gambling patterns and perceptions surveys.

The comparability of HES data for New South Wales and the Authority data for Victoria can be seen as follows. Victorian average EGM expenditures per adult in September 1997 (based on the Australian Gambling Statistics and estimated assuming a linear growth rate in 1997 and 1998 derived from the growth rate from 1996-97 to 1997-98 from the Australian Gambling Statistics of \$8.20/adult to \$9.50/adult) were 9 per cent above the level of New South Wales per adult expenditures in 1993-94 (\$9.15 versus \$8.40, again from the Australian Gambling Statistics). For this reason, very roughly one would expect a participation rate for Victoria of 9 per cent \* 1.09 = 9.8 per cent for 1997 (using the HES definition for the past two weeks and the 9 per cent participation rate for New South Wales in the HES for 1993-94 and assuming that the 9 per cent higher expenditures are caused by a 9 per cent increase in participation rate).

Through interpolation of the reported participation rates from the 1997 Authority survey for one week and one month (6.6 per cent and 15.6 per cent) the participation rate for two weeks is estimated at around 10 per cent which is very close to the 9 per cent participation rate for New South Wales in the HES, or the 9.8 per cent adjusted participation rate based on the HES.

Table A4.2 shows:

- EGM expenditures estimated using method 1 decreased from \$4.50 (1996) to \$4.00 (1997) to \$3.70 (1998) in the Authority surveys, while actual EGM expenditures increased strongly from \$9.15 (1997) to \$10.70 (1998) (actual expenditures as estimated as described above). The incorrect trends and the strong under-reporting show that method 1 is not very good; and
- the estimated EGM expenditures in 1997 were 44 per cent of the actual expenditures and in 1998 the ratio increased to 71 per cent. By way of comparison, the EGM expenditures in the 1993-94 HES were 33 per cent of the actual expenditures for Victoria and only 16 per cent for New South Wales. It is likely that a non-negligible share of the gambling of Victorian households actually occurred in other states, e.g. New South Wales. This would increase the representation ratio for Victoria.

One of the main reasons why the Authority surveys have much higher representation ratios may be the fact that they are phone surveys. Phone surveys should have a lower refusal rate than very comprehensive and time consuming surveys such as the HES.

#### **A4.2.3 Expenditure distributions in the Authority surveys and the HES**

Table A4.3 contains characteristics of the expenditure distributions for EGMs in the Authority surveys and the HES. The HES does not contain as much very small expenditures as there are only 8.5 per cent of adults who report EGM expenditures in the HES, whereas in the Authority surveys this share is between 31 and 38 per cent. The median expenditures in the Authority surveys are only a fraction of the median expenditures of the HES. Average spending is similar in the surveys. Maximum spending is much higher in the Authority surveys, probably because they are surveys conducted by telephone.

**Table A4.3 Distribution of EGM expenditures in the 1993-94 HES for NSW/ACT and the Authority surveys 1997 and 1998**

	HES 1993-94 NSW/ACT	Authority 1997	Authority 1998
Number of observations with expenditures	443	737	528
Per cent adult spending	8.5%	37.7%	30.8%
Median spent (of spender)	\$7.50	\$1.15	\$2.30
Average spent (of spender)	\$15.60	\$12.10	\$27.00
Average spent (all adults)	\$1.31	\$4.55	\$8.30
Maximum spent	\$207.50	\$462	\$1 600
Actual spent (Australian Gambling Stats.)	\$8.40	\$8.20	\$9.50

*Notes:* The HES expenditures relate to the weekly average spent within the two weeks of the expenditure diary of each adult in the respondent households. The Authority expenditures are estimated on an annual basis and then converted to weekly expenditures.

*Source:* 1993-94 HES and 1997 and 1998 Authority surveys.

Table A4.4 compares the expenditure distributions of the three surveys. Expenditures for the first four quintiles are higher in the HES than in the Authority surveys. This shows how serious the impact of a short surveying period can be for the distribution of expenditures which may occur only rarely. However, the expenditures in the fifth quintile are much higher in the Authority surveys and this effect is even stronger in the top expenditure decile where the Authority expenditures are much higher than the HES expenditures.

The differences between the 1997 and 1998 Authority surveys are profound, e.g. the median of the 1998 survey is double the median expenditure of the 1997 survey and expenditures in the top decile are 2.5 times higher in the 1998 survey than in the 1997 survey. Even after an outlier analysis the 1998 top decile is more than double the 1997 top decile.

For the first four quintiles, expenditures in 1998 were approximately 1.6 times the expenditures in 1997. This indicates that no changes in the sample plan are responsible for this difference, but in the operation of the survey. The extreme change in high expenditures from 1997 to 1998 may at least partly be caused by a change in the sample plan where in 1998 more suburbs with a higher share of very large spenders were selected. The differences between the 1997 and 1998 surveys are so profound that they make the surveys practically incomparable for trend analysis.

**Table A4.4 Distribution of EGM expenditures (\$/player/week) in the 1993-94 HES for NSW/ACT and the Authority 1997 and 1998 surveys (decile of weekly expenditures)**

	1 & 2	3 & 4	5 & 6	7 & 8	9 & 10	9	10
1993-94 HES	1.80	4.50	8.00	14.60	49.00	27.80	70.60
Authority 1997	0.13	0.50	1.40	4.20	54.50	15.20	93.20
Authority 1998	0.20	0.80	2.20	7.00	124.30	18.40	230.00
Authority 1998/1994 HES	0.11	0.18	0.28	0.50	2.50	0.66	3.30
Authority 1997/1994 HES	0.07	0.11	0.18	0.29	1.10	0.55	1.30
Authority 1998/Authority 1997	1.50	1.60	1.60	1.70	2.30	1.20	2.50

*Source:* 1993-94 HES and 1997 and 1998 Authority surveys.

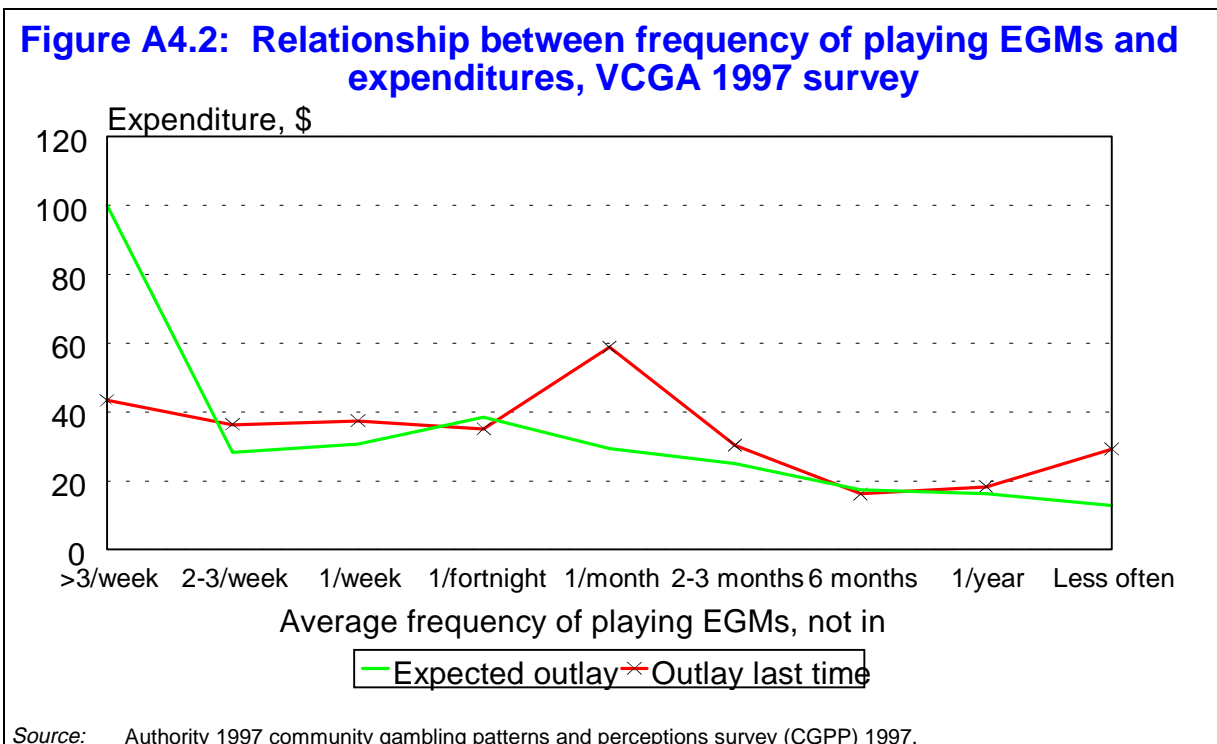


#### A4.2.4 Relationship between frequency of playing EGMs and amount spent each time

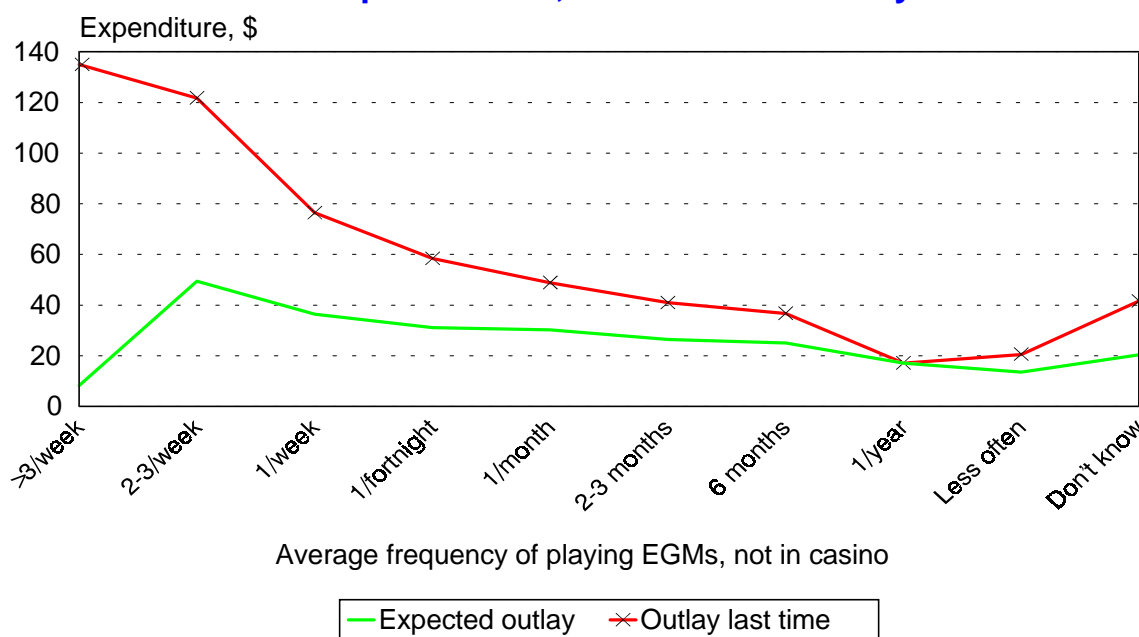
Figures A4.2 and A4.3 show the relationship between the frequency of playing EGMs not in casinos and the amount spent each time playing EGMs. In 1997 only three respondents stated an average frequency of “more than three times a week” and hence the corresponding values in Figure A4.2 should be ignored. Average expected expenditures for respondents who stated that they play two to three times a week are \$28, which is 1.75 times the average expected expenditure of respondents who stated that they play only once a year.

The outlay for EGMs at the last play is even more strongly affected by frequency. Very frequent players spend twice as much each time they play than infrequent players. The ratio in the number of games played is approximately 150 between frequent and infrequent players, as frequent players play three times a week and hence 156 times a year, while infrequent players play once a year.

In the 1998 Authority survey similar results are observed, however, the differentials between frequent and infrequent players are even larger, approximately double the differentials in 1997, see Figure A4.4. These large differences again indicate that significant changes occurred in taking the survey between 1997 and 1998.



**Figure A4.3: Relationship between frequency of playing EGMs and expenditures, VCGA 1998 survey**



Source: Authority CGPP survey 1997.

#### A4.2.5 Socio-demographic patterns of EGM expenditures in the Authority surveys and comparison with the HES

Figures A4.4a and A4.4b compare the incidence of playing EGMs by age and gender in the 1997 Authority survey, the 1998 Authority survey and the 1994 HES. Only New South Wales and Australian Capital Territory households have been selected from the 1994 HES as only these states were mature EGM markets in 1994. Age has been aggregated to minimise the impact of standard error. The incidence for playing EGMs in the Authority was estimated using the expected frequency to play EGMs to derive the probability that the respondent would play within any interval of two weeks. This way of calculating the incidence is compatible with the two weekly diary method of the HES.

Because expected gambling behaviour deviates from observed gambling behaviour, a second method of calculating the incidences has been devised. All respondents were included who stated that they played EGMs outside of casinos within the past week and 50 per cent of respondents who stated that they had done so in the past month. The first and second method are compared in Figures A4.4c and A4.4d. The estimated incidences by age differ considerably, but the patterns against age are fairly similar. The largest differences between the methods was observed for 1998. Method 1 was preferred because it theoretically matches the HES better and is used in Figures A4.4a and A4.4b.

Figures A4.4a and A4.4b show large differences between the 1997 and 1998 Authority surveys. It cannot be imagined that such changes occurred in Victoria within one year. Even considerable differences in running the surveys should not produce such differences and one wonders whether coding or processing errors are responsible for the results.

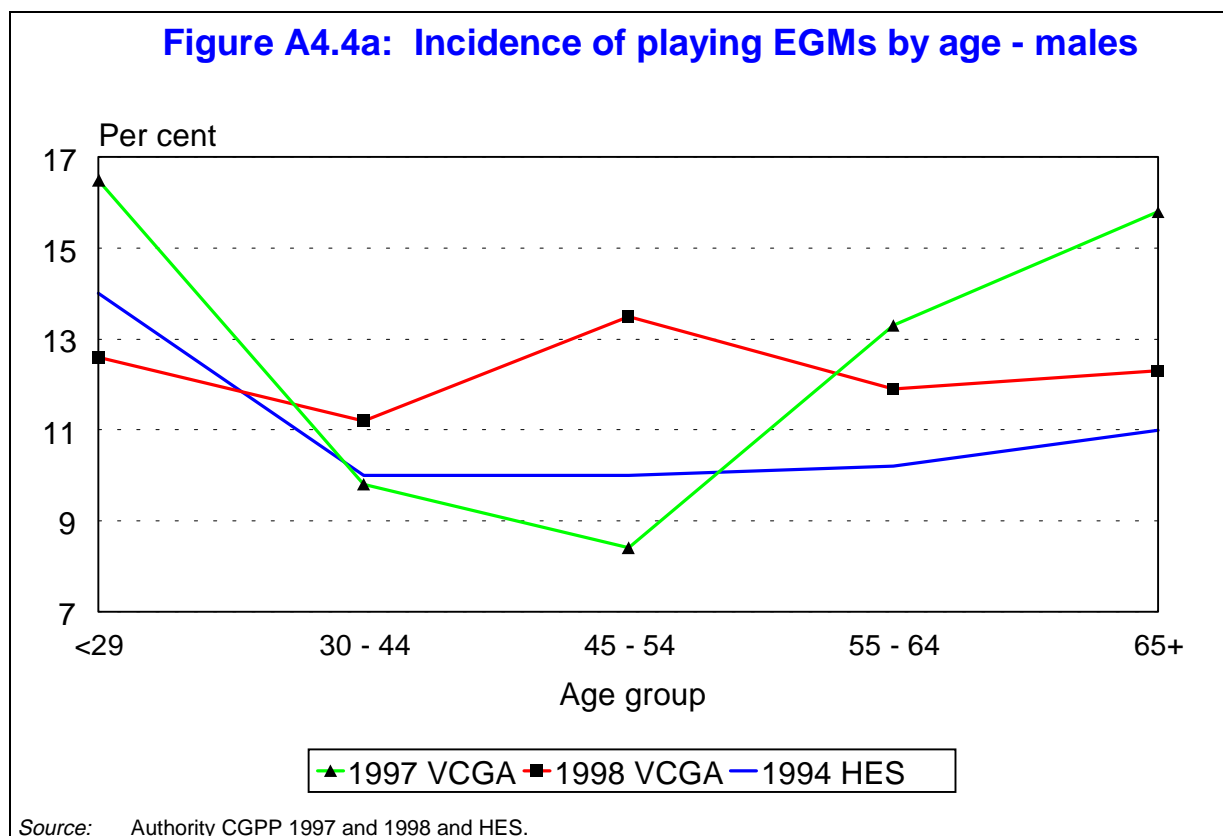
The 1997 age profiles fit the HES profiles better than the Authority profiles from 1998. The Authority profiles from 1998 are much flatter than the 1997 age profiles. The age profiles from medium and large gamblers are typically quite flat. This may lead to the hypothesis that in 1998 EGM playing was much more concentrated in the big gambler group. However, the relative incidences of weekly and monthly players have hardly changed from 1997 to 1998.

The major differences between the 1997 Authority survey and the 1994 HES are higher incidences for males aged 55+ in the Authority survey and generally higher incidences for females in the Authority survey.

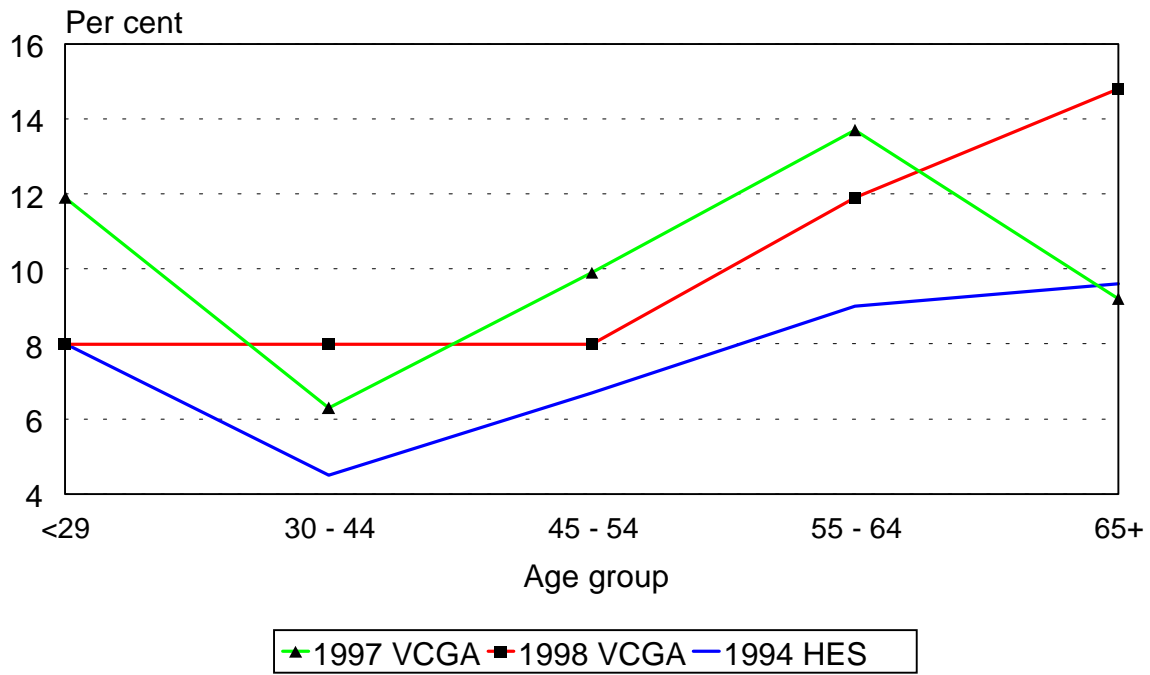
In addition to age, the incidence profiles by income and by occupation group have been analysed. They are not reproduced here because the same qualitative conclusions were drawn from these tables as from the age patterns of Figure A4.4.

It is highly disturbing that the differences between the 1997 and 1998 Authority surveys for Victoria (excluding rural areas) are larger than the differences between the 1993-94 HES for New South Wales and the Australian Capital Territory (including rural areas) and the 1997 Authority survey. On the other hand, the similarities between the 1997 Authority survey and the 1994 HES are comforting. This would support the hypothesis that the 1996 and 1997 Authority surveys were more accurate than the 1998 Authority survey. However, the 1998 Authority survey is much better than any other survey in estimating total EGM expenditures which gives the 1998 survey a higher credibility.

Without further research it is not possible to determine which Authority survey is the better one. Because of this uncertainty and as the 1996 and 1997 Authority surveys appear to match the HES better than the 1998 Authority survey, and because the HES has more expenditure data, it has been decided to use the HES as a starting point for the modelling of the adaptation processes to gambling.

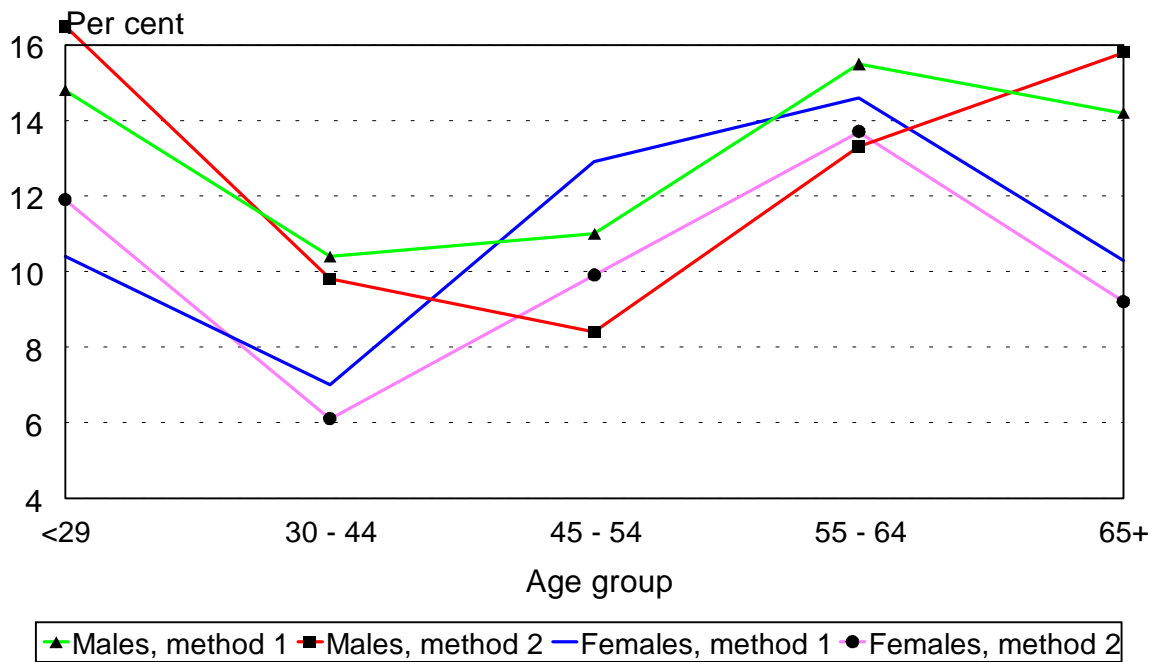


**Figure A4.4b: Incidence of playing EGMs by age - females**



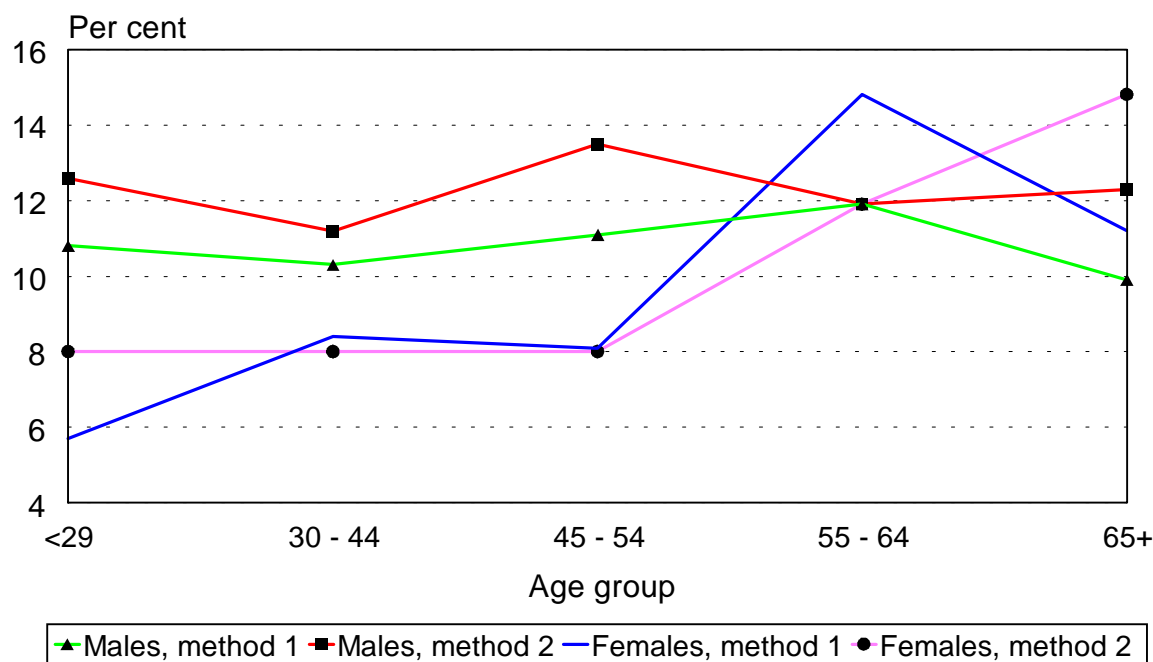
Source: Authority CGPP 1997 and 1998 and HES.

**Figure A4.4c: Incidence of playing EGMs by age for alternative incidence definitions - 1997**



Source: Authority CGPP survey 1997.

**Figure A4.4d: Incidence of playing EGMs by age for alternative incidence definitions - 1998**



Source: Authority CGPP survey 1998.

#### **A4.2.6 Socio-demographic profiles of small, average and large EGM spenders in the Authority surveys and the HES**

Table A4.5 compares the socio-demographic profiles of respondents by estimated EGM expenditures (method 3) in 1998. Only 53 respondents belong to the top 10 per cent spender group and consequently the results have a considerable standard error for this group. Table A4.5 was also produced for 1996 and 1997, but the results are not reproduced here. However, if the results from 1996 and 1997 led to different conclusions, this has been reported in the following text.

Table A4.5 shows that the top 10 per cent of gamblers are more likely to be male, single or married without children, to work as tradespersons or to be grey collar workers (clerks, salespersons, etc.). Small gamblers (those in the bottom 60 per cent by spending) have more or less the average socioeconomic profiles and the average gamblers lie typically between the small and top gamblers. The following observations can be made based on Table A4.5.

- The tendency to spend on EGMs is largely independent of age. The age profiles for the various gambling groups are remarkably similar.
- Males and females have roughly the same incidence of not playing EGMs. Females are more likely to be small gamblers while men are more likely to be average or top spenders.
- Singles tend to be either non-gamblers or top gamblers.
- Dependent children are reported for only 30 per cent of top gamblers, while 41 per cent of all respondents have dependent children.

- Seventy-five per cent of top gamblers and 63 per cent of average gamblers work, compared to 59 per cent for all respondents. Also the share of unemployed is much smaller for average or big gamblers than for all respondents.
- Very few households with less than \$20,000 per year are top gamblers, however, this group is hardly under-represented in the average gambling group. The middle income group (\$20,000 to \$50,000) especially, has a higher incidence of belonging to the top gamblers, followed by the top income group. When the data for 1996 to 1998 are pooled, the income distributions of the various gambling groups become more similar, that is the gambling patterns become more independent from income.
- Managers and professionals (including paraprofessionals) have a much smaller likelihood of being big or average gamblers than other occupation groups. Tradespersons and grey collar workers have an above average likelihood of belonging to the top spenders. However, for 1996 and 1997 the results differ, probably at least partly caused by different occupation codes as no perfect concordance exists. The results for 1996 and 1997 are reproduced at the bottom of Table A4.5. Here managers/professionals have almost the average incidence of being a top spender, but a below average incidence of being an average spender. Tradespersons tend to be average gamblers. Grey collar workers have a below average incidence of being a top spender on EGMs, but an above average incidence of being an average spender and blue collar workers have an above average probability of being a top gambler.

**Table A4.5 Socioeconomic profile by gambling group, Authority surveys for 1998**

Socioeconomic characteristics	Estimated spending on EGMs (percentile)				
	None	Bottom 60%	30%	Top 10%	All
<29	21	24	20	23	22
(<29, 1997)	(15)	(25)	(26)	(27)	(19)
30 – 44	35	35	34	36	35
45 – 59	22	25	25	21	23
60+	21	17	21	21	20
Male	43	35	47	55	42
Single	21	13	16	25	19
Dependent children	41	43	38	30	41
Employed	59	57	63	75	59
Unemployed/student	9	7	4	0	8
Not in labour force	32	35	33	25	32
Household income <\$20,000	27	30	25	12	27
\$20,000 – \$50,000	44	41	34	50	42
\$50,000+	30	29	40	38	31
Income not stated	36	27	29	36	34
Managers/professionals	45	43	37	21	42
Tradespeople	23	20	19	36	23
Grey collar workers	22	30	33	33	25
Other blue collar workers	9	8	11	9	9
<b>Occupation for 1996-97</b>					
Managers/professionals	58	57	46	54	56
Tradespeople	14	14	21	12	15
Grey collar workers	16	19	21	12	17
Other blue collar workers	12	10	12	21	12

Source: 1997 and 1998 Authority surveys.

It is very difficult to draw conclusions from these diverse impacts of occupation. On balance it appears that managers and professionals tend to spend less on EGMs and tradespersons and other blue collar workers tend to spend more. However, this does not mean that occupation is a strong determinant of gambling behaviour. The impact of occupation appears to be rather mild.

Spending group was defined using estimated spending on EGMs, method 3. The first group contains persons which do not spend on EGMs, the second group the 60 per cent smallest spenders (of all spenders), the third group the middle 30 per cent of spenders, and the fourth group the top 10 per cent of spenders.

Managers/professionals also include paraprofessionals. Grey collar workers include clerks and salespersons and personal service workers. Other blue collar includes plant/machine operators/drivers and labourers.

A similar methodology was used for Table A4.6. Spending group was defined using the absolute value of the fortnightly expenditures or gains on EGMs. The first group are the persons who did not spend on EGMs within the two weeks of the HES diaries, the second group are the 60 per cent smallest spenders (of all spenders), the third group the middle 30 per cent of spenders, and the fourth group the top 10 per cent of spenders.

**Table A4.6 Socioeconomic profile by gambling group, HES 1994 for NSW and ACT**

Socioeconomic characteristics	Estimated spending on EGMs (per cent)				
	None	60%	30%	10%	All
<29	23	27	30	19	23
(<29, Victoria and Queensland)	(25)	(23)	(22)	(33)	(25)
30 – 44	35	27	28	25	34
45 – 59	23	21	22	27	23
60+	20	25	20	29	20
Male	47	58	63	65	48
(Male, Victoria and Queensland)	(51)	(50)	(47)	(47)	(51)
Dependent children	44	31	38	25	43
Employed	62	61	62	69	62
Unemployed	5	5	8	4	5
Not in labour force	32	35	30	27	32
Household income <\$20,000	26	30	26	19	26
\$20,000 – \$50,000	41	37	38	42	41
\$50,000+	33	33	36	40	33
Managers/professionals	37	27	24	24	36
Tradespeople	13	16	20	18	13
Grey collar workers	32	35	38	32	32
Other blue collar workers	19	22	18	26	19

Source: 1994 HES.

Table A4.6 provides the socio-demographic profiles from the 1994 HES for New South Wales and the Australian Capital Territory. The following points can be made when comparing this profile with the 1998 Victorian estimate from the Authority survey.

- The age distributions of the Authority survey for 1998 Victoria and from the 1994 HES for New South Wales and the Australian Capital Territory are virtually identical. Also, the number of dependents, income distribution (the HES incomes have been updated to be more comparable with the income levels of the Authority surveys) and labour force status are fairly comparable. Considerable differences have been observed for occupation between the three surveys. Also the gender ratio differs considerably between the HES and the Authority surveys.
- The Authority survey showed a rather flat age profile, with the share of any age group is roughly the same for the various gambling groups. For example, the share of young persons (<29) is 22 per cent in the survey. Top spenders consist of 23 per cent young persons and non-gamblers consist of 21 per cent young persons, which does not differ significantly from the average of 22 per cent.

In contrast, the HES shows that persons aged 60+ are over-represented among the top 10 per cent of spenders as are persons aged 45 to 59. This means that persons aged 60+ have a higher probability of belonging to the top gambling group than any other age group. However, this does not mean that most 60+ year olds belong to the top gambling group. In fact, the top gambling group is very small and consists of approximately 2 to 3 per cent of adults only.

The HES does not show these effects of age for Victoria or Queensland. This may indicate that many persons who played EGMs during their working life played even more after retirement. This effect can be observed in New South Wales because of the long EGM tradition, but not yet in Victoria because in 1998 EGMs were in operation for only a few years.

An alternative interpretation is that strong supply side factors impact on these results, for example in New South Wales clubs may have older clientele while the EGM premises in Victoria may attract younger clientele. In fact the Authority surveys show for Victoria that 18 per cent of EGM gamblers are 60+ while the HES gives a share of 24 per cent for New South Wales and the Australian Capital Territory.

The surveys also differ for the young. In the HES the young are over-represented among the small and medium gamblers, while the Authority survey does not show this effect for 1998, but does in 1997. The HES also shows a similar effect for Victoria and Queensland, the two emerging EGM markets, see Table A4.6. The small sample sizes for the 10 per cent group of top spenders increases the chance of spurious results for each of the surveys analysed. However, on balance it is slightly more likely that the 1998 Authority survey is biased than that both the HES and the 1997 Authority surveys are biased. If this is correct, young persons are over-represented as small and medium gamblers.

- The gender ratio of the 1998 Authority survey is biased. Only 42 per cent of the respondents of the Authority survey are male, while the HES has a more realistic gender ratio of 48 per cent. It should also be noted that the 1997 Authority survey significantly under-represents males (40 per cent of respondents are male). Both the HES and Authority surveys state that the top gambling group contains more males than females. However, the Authority survey states that less than half of small gamblers are male while the HES indicates that all gambling groups consist of more males, with males becoming increasingly predominant in the higher gambling groups.



For Victoria and Queensland the HES does not show significant differences in the gender composition of the various gambling groups. Possibly the results for New South Wales and the Australian Capital Territory are impacted by the different types of gambling premises. Alternatively (or in addition), EGM gambling may attract more men than women after a longer period of time.

- The impact of dependent children is similar in the two surveys in as far as the top gambling group has fewer persons with dependent children than the other gambling groups. Some less pronounced differences for small and average (medium) gamblers between the surveys may be caused, at least partly, by different definitions of “dependent children” in the surveys.
- The labour force profiles of the gambling groups are similar for the surveys: the top 10 per cent group has many more workers and less unemployed persons. However, the Authority survey indicates that very few of the top spenders are unemployed, while the HES states that the share of unemployed is very similar in the various gambling groups. The Authority 1997 survey also gives a constant share of unemployed for the gambling groups and it may well be that the results of the Authority 1998 survey for the top spending group are unreliable because of the small sample size.
- The income profiles also show considerable similarities between the surveys: the top gamblers have a smaller share of low income households and a higher share of high income earners. The picture for middle income households is not clear.
- The occupation profiles show considerable similarities between the HES and the 1998 Authority survey: the top and medium spenders consist of less managers/professionals and of more tradespeople and other blue collar workers are evenly represented in all of the gambling groups. Only the results for grey collar workers are contradictory. However, for grey collar workers substantial differences were observed between the 1997 and the 1998 Authority survey. The HES shows that grey collar workers are fairly evenly represented in the various gambling groups, the Authority survey of 1998 shows that they are heavily over-represented among the medium and top gambling groups and the 1997 Authority survey shows that the medium gambling group contains more grey collar workers than average, but the top spenders contain less grey collar workers.

### **A4.3 Analysis of the Authority surveys: the issue of the financing of gambling expenditures**

The Authority survey contains three questions from which conclusions could be drawn as to the impact of gambling on expenditures. These questions are also used in the SOGS, currently the most popular method of estimating the prevalence of problem gambling. The three questions are:

- Question 11 asked all respondents (excluding only those who stated that they spent, on average, \$0 on gambling), “where does this weekly outlay (the money you spent) come out of?”

The predefined categories were not read out.

The question provides essentially four sources for the gambling outlay:

1. income, i.e. no budgets have been used;
2. specific budgets have been used:
  - (a) pocket money;
  - (b) entertainment budget; or
  - (c) gambling budget;
3. general bank savings; or
4. other budgets have been used, that is other expenditures were reduced or at least deferred as a consequence.

It should be noted that category 3 above refers to bank savings, that is drawing on old savings. No question was asked whether the respondent thinks that his/her savings are reduced as a result of the gambling expenditure. Also no question was included which asks whether other budgets or other expenditures had decreased or increased as a result of the gambling activity.

- Question 30 asked all respondents whether the respondent had borrowed money or sold assets to pay a betting or gambling debt?

The respondents were asked to provide their answer in the form of: “strongly agree”, “agree”, “neither agree nor disagree”, “disagree”, or “strongly disagree”.

Two comments need to be made about this question. First, by using answer categories such as “I agree”, the respondent may think that the question is not whether he had borrowed money but whether he agreed this would be acceptable or he might do it. Secondly, and most importantly, the question does not relate to making gambling debts or to borrow money to gamble, the question relates to a combination of the mentioned issues, namely to borrow money to pay back gambling debts; and

- Question 35 asked persons who gambled within the past six months a number of sub-questions relating to “general aspects of gambling behaviour”, including:
  - have you gambled more than you wanted?
  - do you feel that gambling sometimes gets out of control?
  - did you borrow money to gamble?
  - did you sell property to gamble?

Table A4.7 shows the distribution of the gambling outlay sources by estimated amount spent on gambling for 1998.

**Table A4.7 Source of gambling outlay by estimated EGM spending in 1998**

Spending group	Income	Pocket money	Entertainment budget	Gambling budget	Savings	Other budget
Did not spend	43%	40%	9%	2.0%	1.7%	2.2%
60% (<\$200 pa)	43%	34%	14%	3.2%	1.4%	2.5%
30% (\$200-\$1,300 pa)	47%	31%	14%	2.7%	3.3%	1.3%
10% (\$1,300+ pa)	46%	26%	15%	7.4%	0.0%	1.8%
<b>All (no cases)</b>	<b>492</b>	<b>411</b>	<b>125</b>	<b>29</b>	<b>20</b>	<b>24</b>

*Notes:* Spending group was defined using estimated spending on EGMs, method 3. The first group contains persons which do not spend on EGMs, the second group the 60 per cent smallest spenders (of all spenders), the third group the middle 30 per cent of spenders, and the fourth group the top 10 per cent of spenders. Some respondents said "I can't say" (12), or "other" (10), thus the percentages given in the table would be higher if they had only referred to valid answers. It should be noted that some cells have very small numbers of observations, e.g. the 1.4 per cent for savings are based on four observations only.

*Source:* Authority survey 1998.

The main findings are:

- 80 per cent of respondents said that the money comes out of income or pocket money and only 4 per cent stated that the gambling amount comes out of savings or other budgets;
- the share of gamblers who use savings or other budgets does not increase with spending on EGMs; and
- persons who spend more on gambling are more likely to have a budget for it.

It is not surprising that the likelihood of having a budget is higher if expenditures are larger. However, the fact that there is a budget does not mean that the budget is sufficient as the actual expenditures on gambling are a multiple of the expected average expenditures on gambling. As a result, one would expect that gambling expenditures have unplanned impacts on expenditure or savings patterns, in addition to the ones planned when defining the budget.

The analysis for Table A4.7 has been repeated using the data of the 1997 Authority survey, but using total expected gambling expenditures (calculated using method 1). It has been shown previously that the gambling expenditures which a respondent expects to spend, on average, represents only a small share of the actual expenditures. Thus the analysis shown in Table A4.8 differs not only by year, but also by concept from Table A4.7, and thus represents a way of confirming the results described above.

Table A4.8 largely confirms the results of Table A4.7, however, the following differences were noted.

- In 1997 the share of respondents stating pocket money as the source is only half the share of 1998, it appears that many respondents who stated income as the source in 1997 were coded as "pocket money" in 1998.
- The share of respondents stating "savings" or "other budget" as the source halved from 1997 to 1998. Presumably this is the result of differences in coding.

- The share of high spending respondents (top 10 per cent group) who stated that they used their savings is much higher than for other groups. However, as this result is based on only nine observations, this may be a spurious result, in particular given that the share of respondents who used “other budgets” as a source to finance gambling did not increase with the expected gambling amounts.

**Table A4.8 Source of gambling outlay by expected total gambling spending, 1997**

Spending group	Income	Pocket money	Entertainment budget	Gambling budget	Savings	Other budget
Did not spend	25%	8%	0%	0.0%	0.0%	0.0%
60% (<\$333 pa)	45%	14%	3%	0.5%	2.5%	5.6%
30% (\$333-\$1,893 pa)	67%	13%	7%	1.6%	2.5%	6.0%
10% (\$1,893+ pa)	64%	10%	2%	8.2%	5.3%	4.7%
<b>All (no cases)</b>	<b>901</b>	<b>232</b>	<b>70</b>	<b>26</b>	<b>47</b>	<b>95</b>

*Notes:* Spending group was defined using expected spending on gambling, method 1. The first group contains persons which do not spend on gambling, the second group the 60 per cent smallest spenders (of all spenders), the third group the middle 30 per cent of spenders, and the fourth group the top 10 per cent of spenders. A considerable number of respondents said “I can’t say” (331), or “other” (27), thus the percentages given in the table would be higher if they had only referred to valid answers. It should be noted that some cells have very small numbers of observations, e.g. the 1.4 per cent for savings are based on four observations only.

*Source:* Authority survey 1997.

Table A4.9 gives the scores for selected components of Question 30. The main findings are:

- big gamblers (top 10 per cent) have scores to borrow money to payback gambling debts which are 3.5 times higher than for persons who do not play EGMs. This does not necessarily mean that big gamblers have 3.5 times the potential to borrow money. This would only hold true if the assignment of scores to the answer categories correctly reflect the potential to borrow, which cannot be checked with the data at hand; and
- the statement “I have been criticised for gambling” has much higher scores than the “borrow” question. That is, one can assume that respondents feel that they have been criticised more often than borrowed. More importantly, the scores for being criticised for gambling increase much more strongly with EGM expenditures than the scores for borrowing.

**Table A4.9 Average scores for various gambling behaviours by estimated EGM expenditures**

	I borrow to pay gambling debts	I have been criticised for gambling	I bet more if I can win more
Did not spend	0.2	0.2	0.5
60% (<\$200 pa)	0.3	0.4	0.9
30% (\$200-\$1,300 pa)	0.4	0.7	1.1
10% (\$1,300+ pa)	0.7	1.2	1.3
<b>Ratio top 10% to non-spenders</b>	<b>3.5</b>	<b>6.0</b>	<b>2.6</b>

Notes: The following scores were given:  
 "Strongly agree" :4  
 "Agree" :3  
 "Neither agree nor disagree" :2  
 "Disagree" :1  
 "Strongly disagree" :0

Spending group was defined using estimated spending on EGMs, method 3. The first group contains persons who do not spend on EGMs, the second group the 60 per cent smallest spenders (of all spenders), the third group the middle 30 per cent of spenders, and the fourth group the top 10 per cent of spenders.

Table A4.10 shows the extreme distribution of the response categories for the "borrow" question. It is worth noting that 16 out of 1,712 respondents = 0.9 per cent for 1998 and 17 out of 1,955 = 0.9 per cent for 1997, gave as a response "I agree" or "I strongly agree" to the borrowing question. In the literature the share of problem gamblers is often estimated between 1 and 3 per cent. Borrowing money to pay back gambling debts is often used as one of the indicators designed to test the severity of problem gambling. Whilst not all problem gamblers would answer yes to such a question, and indeed non-problem gamblers may answer yes, on occasion, the similarity in the levels is worth noting.

Table A4.10 also indicates that from 1997 to 1998 many responses have shifted from "strongly agree and strongly disagree" to "agree and disagree".

Table A4.10 has been repeated using estimated EGM expenditures (method 3) instead of expected total gambling expenditures. The results are very similar.

**Table A4.10 Responses to the statement "I have borrowed money or sold assets to pay a betting or gambling debt" 1997 and 1998**

Spending group	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree	
	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997
Did not spend	0	0	1	0	0	0	9	5	17	20
60% (<\$333 pa)	2	5	2	3	3	1	198	101	544	881
30% (\$333-\$1,893 pa)	0	0	3	3	1	0	114	63	246	433
10% (\$1,893+ pa)	0	3	8	3	1	0	36	20	81	140
<b>All (no cases)</b>	<b>2</b>	<b>8</b>	<b>14</b>	<b>9</b>	<b>5</b>	<b>1</b>	<b>357</b>	<b>189</b>	<b>888</b>	<b>1474</b>

Notes: Spending group was defined using expected spending on gambling, method 1. The first group contains persons who do not spend on gambling, the second group the 60 per cent smallest spenders (of all spenders), the third group the middle 30 per cent of spenders, and the fourth group the top 10 per cent of spenders. The spending limits given above in the table relate to 1998, for 1997 the respective spending limits have been used for the spending groups.

Results from Question 35 are summarised in Table A4.11. The main findings include:

- only a very small number of respondents admitted to having borrowed money or sold assets for gambling purposes, around 1 per cent of respondents. Consequently, the standard error of these results is very high. However, basically the same results have been obtained from the 1997 and the 1998 surveys;
- 5.5 per cent of the top 10 per cent of gamblers admitted to having borrowed money or sold assets for gambling. This is 5.5 times the average incidence;
- most respondents who borrowed did so from banks as well as from relatives/household money; and
- all respondents who sold assets also borrowed money, but not all borrowers sold assets. However, the small sample size and the limited information available prevents firm conclusions being drawn from the data.

**Table A4.11 Persons who stated that they borrowed money or sold assets to gamble by expected gambling expenditures, 1997 and 1998**

Spending group	Borrowed from				Sold assets	Borrowed and sold assets	
	Relatives	Household money	Banks	Total			
<b>1998</b>							
Did not spend	0	1	0	1	0	0.2%	1
60% (<\$333 pa)	3	3	4	6	3	0.8%	6
30% (\$333-\$1,893 pa)	0	1	4	3	0	0.8%	3
10% (\$1,893+ pa)	4	3	3	7	1	5.5%	7
<b>All (no cases)</b>	<b>12</b>	<b>8</b>	<b>10</b>	<b>17</b>	<b>4</b>	<b>1.0%</b>	<b>17</b>
<b>1997</b>							
Did not spend	0	0	0	0	0	0.3%	0
60% (<\$333 pa)	4	2	3	6	0	0.6%	6
30% (\$333-\$1,893 pa)	4	1	4	7	0	1.4%	7
10% (\$1,893+ pa)	5	6	7	9	2	5.4%	9
<b>All (no cases)</b>	<b>13</b>	<b>9</b>	<b>14</b>	<b>22</b>	<b>2</b>	<b>1.1%</b>	<b>22</b>

*Notes:* "Borrowed from relatives" includes separate prompting borrowing from spouse/partner, other relatives.  
 "Borrowed from banks" includes separate prompting for banks/finance companies/credit unions and credit cards and high interest finance companies.  
 "Sold assets" includes separate prompting for cashing in stocks/bonds/other securities and for selling personal or company property.  
 Spending group was defined using expected spending on gambling, method 1. The first group contains persons which do not spend on gambling, the second group the 60 per cent smallest spenders (of all spenders), the third group the middle 30 per cent of spenders, and the fourth group the top 10 per cent of spenders.  
 The spending limits given above in the table relate to 1998, for 1997 the respective spending limits have been used for the spending groups.

*Source:* 1997 and 1998 Authority surveys.

Table A4.12 shows the respondents who borrowed money or sold assets for gambling spent.

While the previous tables showed that only a small share of the population borrowed and/or sold assets to gamble, Table A4.12 shows that these persons are responsible for a considerable share of total gambling expenditures: between 13 and 19 per cent of total EGM expenditures and between 6 and 12 per cent of total gambling expenditures. In addition, gamblers who borrow/sell assets are responsible for approximately 20 per cent of expenditures of the top 10 per cent of gamblers.

The large difference in the shares of total expected gambling expenditures between 1997 and 1998 reflect that the results are essentially based on only 17 (1998) and 22 (1997) observations.

Spending group	Per cent of total expected gambling expenditure		Per cent of total estimated EGM expenditures	
	1997	1998	1997	1998
Did not spend	–	–	–	10.0
60% (<\$333 pa)	1.0	1.0	3.5	1.0
30% (\$333-\$1893 pa)	1.6	1.0	1.3	1.4
10% (\$1,893+ pa)	17.6	8.3	20.7	25.0
<b>All</b>	<b>12.4</b>	<b>5.6</b>	<b>13.7</b>	<b>19.4</b>

*Notes:* Spending group was defined using expected spending on gambling, method 1. The first group contains persons who do not spend on gambling, the second group the 60 per cent smallest spenders (of all spenders), the third group the middle 30 per cent of spenders, and the fourth group the top 10 per cent of spenders. The spending limits given in the table relate to 1998, for 1997 the respective spending limits have been used for the spending groups.

*Source:* 1997 and 1998 Authority surveys.

It was found previously that the Authority surveys from 1996, 1997 and 1998 differ considerably and it was thought that differences in the sampling plan and differences in the operation of the survey may have caused these differences. The impacts of differences in the sample plans are analysed in Table A4.12. Table A4.12 gives the socio-demographic profiles of the postcodes surveyed, weighted by the number of respondents in each postcode. Thus the socio-demographic profiles in Table A4.12 represent the sample population if one assumes that within postcodes the sampling was at random.

Table A4.13 shows that the potential gambling expenditures and the socioeconomic characteristics of the sample plan are quite similar (see the summary below). The observed differences cannot explain the major differences in results between the surveys. Even though the sampling plan was developed on a CCD basis, major differences in the sampling plan would be identified with the postcode data used. In addition, the supplier of the sample plans for 1996 to 1998 verbally indicated that the sample plans should be comparable.

It is unfortunate that the differences in the survey results were not caused by the sample plan but by the way the survey was conducted (e.g. whether the interviewers called during the day or evening, distribution of weekday/weekends, coding practices, were the interviewers male or female and other factors, most of which are very difficult to quantify). Differences in sample plans can often be corrected using reweighting and geo-demographic methods. Differences in the operation of the survey are very often almost impossible to correct.

The main conclusions to be drawn from Table A4.13 are as follows.

- Potential gambling expenditures, in \$/week per adult (adult is defined here as any person aged 15 or more) are almost identical for the samples in the three years, 1996, 1997 and 1998. These expenditures are sourced from SpendInfo 1998 which is a model based on the 1994 HES, the 1996 Census, the Australian Gambling Statistics, the ANA, CPI and other data sources.
- The size of the postcodes has decreased slightly.
- The largest difference between the three years is observed for the metro/other breakdown. In 1996 and 1997 about 67 per cent of respondents were drawn from Melbourne, whereas this share increased to 74 per cent in 1998. Seventy-four per cent is approximately the share of Melbourne to total Victorian population.
- Probably as a result of the increased share of metro areas in the sample plan, the share of high rise flats increased from 0.8 to 3.5 per cent, as did the share of renters, while the number of cars per adult decreased slightly and the share of workers using public transport increased slightly.



**Table A4.13 Gambling expenditures and socioeconomic profiles of the Authority sample plans**

	1996	1997	1998	All
Lottery tickets, \$/week	0.02	0.02	0.02	0.02
Lotto etc., \$/week	2.40	2.49	2.31	2.41
TAB, betting, \$/week	4.06	4.24	3.97	4.10
EGMs, \$/week	7.90	8.22	7.91	8.02
Casino, \$/week	1.12	1.13	1.08	1.11
Other gambling, \$/week	0.49	0.51	0.47	0.49
Number of household persons	17 465.27	17 125.19	16 838.63	17 140.90
Number of households	6 630.70	6 566.29	6 386.88	6 529.27
Area – metropolitan	0.68	0.67	0.74	0.69
Area – other urban	0.33	0.33	0.26	0.31
Area – rural	0.00	0.00	0.00	0.00
Household income \$1,000/annum	41.72	41.17	41.55	41.47
Income per person \$1,000/annum	15.84	15.79	15.76	15.79
Income <\$8,268 p.a. adult	0.22	0.22	0.23	0.23
Income >\$36,400 p.a.	0.11	0.11	0.11	0.11
Income >\$52,000 p.a.	0.04	0.04	0.04	0.04
Household size, persons	2.63	2.61	2.64	2.63
Persons 0 to 5 years	0.09	0.08	0.08	0.08
Persons 6 to 14 years	0.13	0.13	0.12	0.13
Persons 15 to 29 years	0.22	0.22	0.23	0.22
Persons 30 to 44 years	0.23	0.23	0.24	0.23
Persons 45 to 60 years	0.17	0.17	0.17	0.17
Persons 60+	0.16	0.17	0.16	0.17
Couples, income <\$36,348	0.11	0.11	0.11	0.11
Couples, income >\$36,348	0.24	0.24	0.23	0.24
Couples, no children, income <\$36,348	0.14	0.15	0.14	0.14
Couples, no children, income >\$36,348	0.11	0.10	0.11	0.11
Sole parents	0.10	0.10	0.10	0.10
Singles	0.24	0.25	0.25	0.25
Employed of adults	0.56	0.56	0.56	0.56
Unemployed	0.10	0.10	0.10	0.10
Unemployed youth (15 – 24)	0.17	0.17	0.17	0.17
White collar workers	0.78	0.78	0.78	0.78
Managers and professionals	0.27	0.28	0.28	0.28
Other white collar workers	0.50	0.50	0.51	0.50
Tradesmen	0.13	0.13	0.13	0.13
Other blue collar workers	0.09	0.09	0.08	0.09
Immigrants	0.24	0.23	0.25	0.24
Australian born	0.76	0.77	0.75	0.76
Immigrants, English background	0.07	0.07	0.07	0.07
Asian/North African born	0.06	0.05	0.06	0.06
European born (excluding United Kingdom)	0.09	0.09	0.09	0.09
Separate house	0.83	0.82	0.78	0.81
Row house	0.06	0.06	0.08	0.07
Flats	0.11	0.12	0.14	0.12

**Table A4.13 Gambling expenditures and socioeconomic profiles of the Authority sample plans (continued)**

	1996	1997	1998	All
Flats, 1 to 3 storey	0.10	0.11	0.11	0.11
High rise flats	0.01	0.01	0.04	0.02
Own their home	0.46	0.46	0.45	0.46
Pay mortgage	0.28	0.27	0.28	0.28
Renters, public and private	0.26	0.26	0.28	0.27
Public renters	0.03	0.04	0.04	0.04
No vehicle	0.11	0.11	0.13	0.12
Average number of cars per adult	0.74	0.75	0.72	0.74
Use public transport	0.11	0.11	0.12	0.12
Mortgage >\$1,200 or rent >\$200	0.12	0.12	0.13	0.12
Institutionalised persons	0.3	0.3	0.10	0.06
Persons 15+ in '000s	13.74	13.49	13.11	13.45
Labour force adults	0.62	0.62	0.62	0.62
Labour force 15 – 24, number	1 675.28	1 643.94	1 603.43	1 640.88
University degree, adults	0.16	0.16	0.17	0.16
Diploma, adults	0.09	0.09	0.09	0.09
Vocational training, adults	0.18	0.18	0.19	0.18
No training, adults	0.58	0.58	0.56	0.57
Qualification in business	0.07	0.07	0.07	0.07
Qualification in health	0.05	0.05	0.05	0.05
Qualification in education	0.05	0.05	0.05	0.05
Qualification in cultural	0.05	0.06	0.06	0.06
Qualification in science	0.03	0.03	0.03	0.03
Qualification in engineering	0.10	0.10	0.11	0.10
Qualification in building	0.03	0.03	0.03	0.03
Qualification in agriculture	0.01	0.01	0.01	0.01
Qualification other, adults	0.03	0.03	0.03	0.03
No qualifications	0.58	0.58	0.56	0.57
<b>INDUSTRY</b>				
Agriculture	0.04	0.05	0.04	0.04
Mining	0.00	0.00	0.00	0.00
Manufacturing	0.16	0.16	0.16	0.16
Electricity, gas and water	0.01	0.01	0.01	0.01
Construction	0.06	0.06	0.06	0.06
Wholesale trade	0.06	0.06	0.06	0.06
Retail trade	0.14	0.14	0.14	0.14
Accommodation, restaurants	0.04	0.04	0.04	0.04
Transport and storage	0.04	0.04	0.04	0.04
Communication	0.02	0.02	0.02	0.02
Finance and insurance	0.04	0.04	0.04	0.04
Property and business services	0.10	0.10	0.10	0.10
Government administration	0.04	0.04	0.04	0.04
Education	0.07	0.07	0.07	0.07
Health and community services	0.10	0.10	0.10	0.10

**Table A4.13 Gambling expenditures and socioeconomic profiles of the Authority sample plans (continued)**

	1996	1997	1998	All
Cultural and recreational	0.02	0.02	0.02	0.02
Personal and other services	0.04	0.04	0.04	0.04
Industry not stated	0.03	0.03	0.03	0.03
Household income <\$199 per week	0.02	0.02	0.02	0.02
Household income <\$299 per week	0.20	0.21	0.20	0.20
Household income <\$499 per week	0.18	0.18	0.18	0.18
Household income <\$699 per week	0.15	0.15	0.15	0.15
Household income <\$999 per week	0.18	0.18	0.18	0.18
Household income <\$1,499 per week	0.16	0.16	0.16	0.16
Household income <\$1,999 per week	0.06	0.06	0.06	0.06
Household income >\$2,000 per week	0.05	0.05	0.05	0.05
Public transport, males	0.16	0.15	0.17	0.16
Public transport, females	0.16	0.15	0.17	0.16
Work at home, males	0.10	0.11	0.10	0.11
Work at home, females	0.13	0.13	0.12	0.13
Did not go to work	0.46	0.46	0.45	0.46

*Notes:* The numbers given are the shares of all persons or households that belong to the specified category, e.g. income bracket. For example, in all four years 5 per cent of households had income of more than \$2,000 per week.

*Source:* SpendInfo 1998 and Population Census 1996.



## **Appendix 5**

### **Venue surveys**

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## Appendix 5: Venue surveys

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### A5.1 EGM machines at pubs, taverns, bars and clubs

In 1994-95 New South Wales had 2581 gaming venues and this increased to 2994 in 1997-98. Victoria on the other hand had 416 in 1994-95 and 660 in 1997-98. Although the New South Wales market is more mature than Victoria's a comparison of selected statistics at venues gives some insight into the likely development of the Victorian market and highlights some differences.

In 1995 and 1998 the ABS surveyed clubs and pubs, taverns and bars (referred to as hotels from now on) differentiating between venues with gaming facilities and venues without gaming facilities. The following tables present time series data for Victoria and New South Wales.

From Tables A5.1 and A5.2, Victorian venues with gaming machines have higher employment, wages and salaries and income per employee than non gaming venues. For instance, hotels with gaming have nearly three times the employees per business than non-gaming venues. Income per employee is also substantially larger at gaming venues. This situation is repeated in the New South Wales data presented in Tables A5.3 and A5.4.

Comparing the two Victorian tables over time yields the following.

- Total employment in venues with gaming has increased from 11,762 in 1994-95 to 17,733 in 1997-98, or 14.7 per cent per year. This is far above total employment growth in the state.
- Gross income per employee has risen by 8.3 per cent over the period at gaming hotels and fallen by 1 per cent at gaming clubs. This compares to a 5.5 per cent decline in income per employee at non gaming hotels and a massive 42.3 per cent jump at non gaming clubs. Little evidence for a substitution effect between gaming and non gaming venues can be drawn from these mixed results.
- Clubs without gaming facilities have reported a large increase in wages and salaries and income per employee over the period. Income per employee has increased from \$37,835 to \$53,833 putting it close to the level experienced by employees at gaming clubs. The strong result has been influenced by a reduction in employment per business, however even without this effect the ratios would still show a large jump.
- Income and wages and salaries at clubs with gaming has remained stagnant when measured on a per employee basis.

**Table A5.1 Pubs, taverns, bars and clubs – Victoria: selected employment statistics by venue status 1994-95**

	Pubs		Clubs	
	With gaming	Without	With gaming	Without
Businesses	259	847	157	321
Employment <sup>1</sup>	8112	9128	3650	3058
Wages and salaries	132	112.4	66.4	36.1
Gross income	642.7	648.8	205.9	115.7
Employee per business	31	11	23	10
Wages and salaries per employee	16272	12314	18192	11805
Gross income per employee	79228	71078	56411	37835

*Note:* 1. Employment in this section includes working proprietors, directors, other partners and other employees employed by the business.

*Source:* ABS 8687.0 1994-95.

**Table A5.2 Pubs, taverns, bars and clubs – Victoria: selected employment statistics by venue status 1997-98**

	Pubs		Clubs	
	With gaming	Without	With gaming	Without
Businesses	455	721	205	303
Employment	13549	7242	4184	2413
Wages and salaries	249.8	81.5	77.2	38.2
Gross income	1162.7	486.4	233.7	129.9
Employee per business	30	10	20	8
Wages and salaries per employee	18437	11254	18451	15831
Gross income per employee	85814	67164	55856	53833

*Source:* ABS 8687.0 1997-98.

Comparing the two tables for New South Wales over time yields the following.

- The number of employees per business at non gaming hotels has declined significantly. From an average of 17 in 1994-95 to 8 in 1997-98. This has had the effect of raising the per employee ratios and suggests significant competition exists.
- Despite a slight reduction in employee numbers per business across the board, all per employee ratios increased, with strong movements at non gaming hotels and non gaming clubs.

**Table A5.3 Pubs, taverns, bars and clubs – New South Wales: selected employment statistics by venue status 1994-95**

	Pubs		Clubs	
	With gaming	Without	With gaming	Without
Businesses	1261	126	1320	83
Employment	18795	2177	39979	1366
Wages and salaries	281.8	25.7	810.1	25.3
Gross income	1758.4	106.4	3352.8	66.4
Employee per business	15	17	30	16
Wages and salaries per employee	14993	11805	20263	18521
Gross income per employee	93557	48875	83864	48609

Source: ABS 8687.0 1994-95.

**Table A5.4 Pubs, taverns, bars and clubs – New South Wales: selected employment statistics by venue status 1997-98**

	Pubs		Clubs	
	With gaming	Without	With gaming	Without
Businesses	1520	156	1474	54
Employment	21653	1233	40892	808
Wages and salaries	340.3	16.3	1005.1	20.1
Gross income	2292.2	86.3	4079.3	57.7
Employee per business	14	8	28	15
Wages and salaries per employee	15716	13220	24579	24876
Gross income per employee	105861	69992	99758	71411

Source: ABS 8687.0 1997-98.

Growth in gaming venue employment in Victoria over the 1994-95 to 1997-98 period has been 51 per cent, whilst in New South Wales the growth has been much slower at 18.5 per cent. This probably reflects the early stage of development in Victoria's gaming market. It is expected that as the market matures, growth in employment will stabilise to a rate similar to that in New South Wales.

A final point to make from the venue statistics is the closing of the gap between gaming and non gaming venues. Using gross income per employee as a performance measure, non-gaming venues are increasingly reaching the performance levels of gaming venues. The following table shows that in all cases except with Victorian hotels that non-gaming venues increased their performance as measured by the ratio of income per employee at non-gaming venues to income per employee at gaming venues.

An example from Table A5.5 is as follows. In 1994-95 non-gaming venues in New South Wales had 52 per cent of the income per employee of gaming venues. This ratio rose to 66 per cent in 1997-98. The growth in these ratios suggests that non-gaming venues are able to compete with gaming. It cannot be said however that they are becoming as profitable as gaming venues because the measure does not include venue costs.



**Table A5.5 Venue performance – income per employee ratio – gaming and non-gaming venues 1994-95 to 1997-98**

	New South Wales		Victoria	
	1994-95	1997-98	1994-95	1997-98
Hotels	52	66	89	78
Clubs	57	71	67	96

## A5.2 State government taxation

The aim here is to present a picture of the level of revenue derived from EGM gaming.

In the Victorian State Budget, revenue collected from electronic gaming machines makes up 9.4 per cent of total taxes, fees and fines of \$8,597.9 million for 1998-99.

Table A5.6 presents direct State Government revenue from 1996-97 to 1999-00. As previously mentioned taxes from gaming make up a large proportion of total taxation revenue. From a little over 1 per cent in 1992-93 gaming revenue is forecast to represent nearly 10 per cent of State Government taxation by 1999-00.

Gaming revenue account for approximately 70 per cent of all gambling revenue collected by the Government.

In modelling the effect of government spending on the economy in Section 5 it is assumed that 100 per cent of EGM revenue goes towards current expenditure. This assumption allows us to distribute the benefits of this expenditure across the state, at the same time as applying the multiplier effect to today's expenditure.

**Table A5.6 Direct state government taxation – electronic gaming machines (\$ million)**

	1996-97	1997-98	1998-99 <sup>1</sup>	1999-00 <sup>1</sup>
Gambling tax – EGM	589.4	704.0	806.1	843.0
Per cent of total taxes, fees and fines	7.1	8.3	9.4	9.7

Note: 1. Estimates.

Source: Victorian Budget Papers 1996-97 to 1999-00.

## A5.3 Comparison of overall results with previous Authority surveys

A comparison across the years of the Authority venue survey gives us an indication of the overall movements of the sector over time.

The Authority conducted the first survey in 1994, covering all venues in operation prior to 1 September 1993. The second survey covered all venues in operation by 31 December 1994. The 1997 survey covered all venues operating as at 31 December 1996. The latest survey covered all venues operating as at 31 December 1998. It was conducted by Market Solutions for the 1999 Hotel and Club Industry Gaming Impact Study.

Given all four represent only survey information, the estimates need to be adjusted to reflect the total survey population. In other words, estimates need to be derived for gaming venues which did not return survey questionnaires.

The 1999 survey has been adjusted by leveraging up the survey derived estimates by the number of EGMs in the total population. That is, taking account of the number of EGMs in the venues that returned the survey and pro rating that figure to the total number of EGMs at venues in Victoria.

For the 1997 survey NIEIR adjusted some employment estimates from the survey to obtain total actual estimates taking into account the different employment intensity in hotels and clubs and metropolitan and non-metropolitan venues. In the case of the first and second survey, the estimates were pro-rated up using the crude response rate. The difference in adjusting the survey responses to obtain a total employment figure may account for some of the differences reported through time.

Table A5.7 shows total employment separated into area of operation for selected periods from the four surveys.

	1/19/93	31/12/94	30/12/95	30/12/96	20/12/98
Number of licensed EGMs	15 037	19 542	22 141	24 931	27 304
Gaming	1 049	2 230	2 197	2 829	4 871
Bar	1 021	1 650	2 024	2 321	3 025
Meals	826	1 454	1 541	1 853	2 804
Entertainment	35	97	125	129	306
Administration	516	792	806	988	1 278
Other	346	562	463	575	1 104
<b>Total</b>	<b>4 043</b>	<b>7 284</b>	<b>7 755</b>	<b>9 385</b>	<b>13 388</b>

*Note:* 1. FTE denotes full-time equivalent. These figures are not the direct survey results. They have been adjusted to account for the response rate for each respective survey. They represent the actual estimates, taking into account the total survey population ( actual number of gaming venues ) at the time of each survey.

2. Victorian Casino and gaming Authority figures.

*Sources:* The effect of gambling on employment in Victoria.  
1999 Survey of gaming venues.

Table A5.7 indicates that total employment at gaming venues increased from 4,043 FTE employees in October 1993 to 13,388 FTE employees by December 1998. Employment generally increased across all areas of operation over the three year period. From 1996 large increases occurred in the gaming and meals area.

The growth in FTE employment of course directly reflects growth in the number of licensed gaming venues in Victoria over this period.

Growth in the total number of FTE employees from December 1995 to December 1998 was 72 per cent. This compares to the ABS growth estimate of 51 per cent over a similar time span. It must be noted that the ABS figure is a measure of total employment, not FTE core staff. Even so both estimates show a large increase in employment in Victoria over the period.

## A5.4 Expenditure by gaming venues on construction activity

These survey results contribute to the overall analysis of the economic impact. The survey questions on expenditure will provide valuable insights into the total level of construction activity stimulated by gaming.

From the survey we can also ascertain the impact gaming has had on revenue at both gaming and non gaming venues. This measures the degree of increase in complementary spending at gaming venues on the various functional areas such as the bar or meals trade. Connected to this is the degree of decline in revenue at non-gaming venues, which is attributable to the introduction of gaming machines. These factors are critical to the analysis because the benefits accruing to gaming venues in the form of employment and income could be at the expense of non-gaming venues.

The following table shows actual and planned construction expenditure at gaming venues that are attributable to the installation of gaming machines. Total expenditure could be any of the following:

- expenditure relating to the provision of gaming facilities (e.g. gaming room); or
- expenditures relating to projects that enhance the venue's attraction as a gaming venue.

Out of 338 respondents to the survey approximately 40 per cent indicated they either planned or were undertaking construction projects attributable to gaming. Table A5.8 shows that actual expenditure on new projects and facilities over 1997 and 1998 totalled \$63.5 million and planned expenditure over 1999 and 2000 totalled \$67.3 million.

These points are worth noting from Table A5.8:

- average expenditure per project is slightly higher at hotels;
- more projects are occurring at club type venues, with 111 projects completed or commenced in 1997 or 1998 and 115 planned at clubs, compared to 45 and 38 respectively for hotels; and
- compared to the 1997 survey of gaming venues average actual expenditure per project has dropped from \$709,000 to \$407,500. This may reflect the maturing of the market as venues become established.

This information is important since it assists in identifying the level of employment generated in the construction industry, which may not have occurred without gaming machines. To use these figures for the impact on the economy an estimate of the total amount of construction work undertaken must be derived. The best way to do this is to use the total levels of construction expenditure for hotels and clubs and pro rata the figures up by the total survey response rate. This maintains average expenditure per project and takes the disproportionate level of projects undertaken by clubs into account. The appropriate adjustment factors are 1.9 for hotels and 1.5 for clubs.

**Table A5.8 Actual and planned expenditures at gaming venues – 1997 to 2000**

	Number of projects	Total expenditure	Average expenditure per project
<b>Actual expenditure 1997 and 1998</b>			
Hotels	45	21,743,000	483,178
Clubs	111	41,838,581	376,924
<b>Total all venues</b>	<b>156</b>	<b>63,581,581</b>	<b>407,574</b>
<b>Planned expenditure 1999 and 2000</b>			
Hotels	38	20,724,000	545,368
Clubs	115	46,599,188	405,210
<b>Total all venues</b>	<b>153</b>	<b>67,323,188</b>	<b>440,021</b>

Note: N = 138.

Source: Authority Venue Survey 1999.

For the economic impact analysis the flow on effects to the construction industry are \$104.2 million in commenced or completed projects over 1997 and 1998 and planned projects of \$109.3 million over 1999 and 2000. This equates to just over \$50 million in construction activity per year.

## **A5.5 The impact of new gaming on venues without gaming facilities**

As part of the Hotel and Club Industry Gaming Impact Study, Market Solutions conducted a brief survey of hotels and clubs in Victoria with no gaming facilities. The objective of the survey was to assess the impact of new gaming facilities at gaming venues on hotels and clubs without gaming facilities.

A total of 900 hotels and clubs were surveyed in Victoria. The response rate to the survey was 40 per cent. The survey covered the following areas:

- trading experience;
- employment; and
- expenditure.

There are a number of potential biases associated with this survey of non-gaming venues. These include:

- a number of businesses may have already closed, and hence are excluded from the sample; and
- the review of the number of EGMs in Victoria may have encouraged venues without EGMs to respond negatively.

The first section of the survey, trading experience, was designed to ascertain the current trading positions of non-gaming venues compared to before the introduction of EGMs in the locality. The first such question asked the respondent to qualitatively single out the effect on the current trading position, compared to before the introduction of gaming.

Table A5.9 shows the effect, on revenue, that the introduction of EGMs has had. The question asked respondents to compare revenue prior to 1992 (the introduction of EGM) to today.

	Bar	Meal	Entertainment	Accommodation	Conferences	Other	Total
<b>Hotels</b>							
Increase	12.7	23.9	14.1	19.3	25.0	31.5	31.7
Same	37.3	35.0	50.0	59.6	52.8	42.5	34.1
Decrease	50.0	41.0	35.9	21.1	22.2	26.0	34.1
n = 140							
<b>Clubs</b>							
Increase	28.0	25.0	16.7	14.3	41.7	33.9	39.4
Same	43.0	57.5	70.8	85.7	54.2	53.2	43.7
Decrease	29.0	17.5	12.5	0.0	4.2	12.9	16.9
n = 105							

Source: Survey of Non-Gaming Venues 1999.

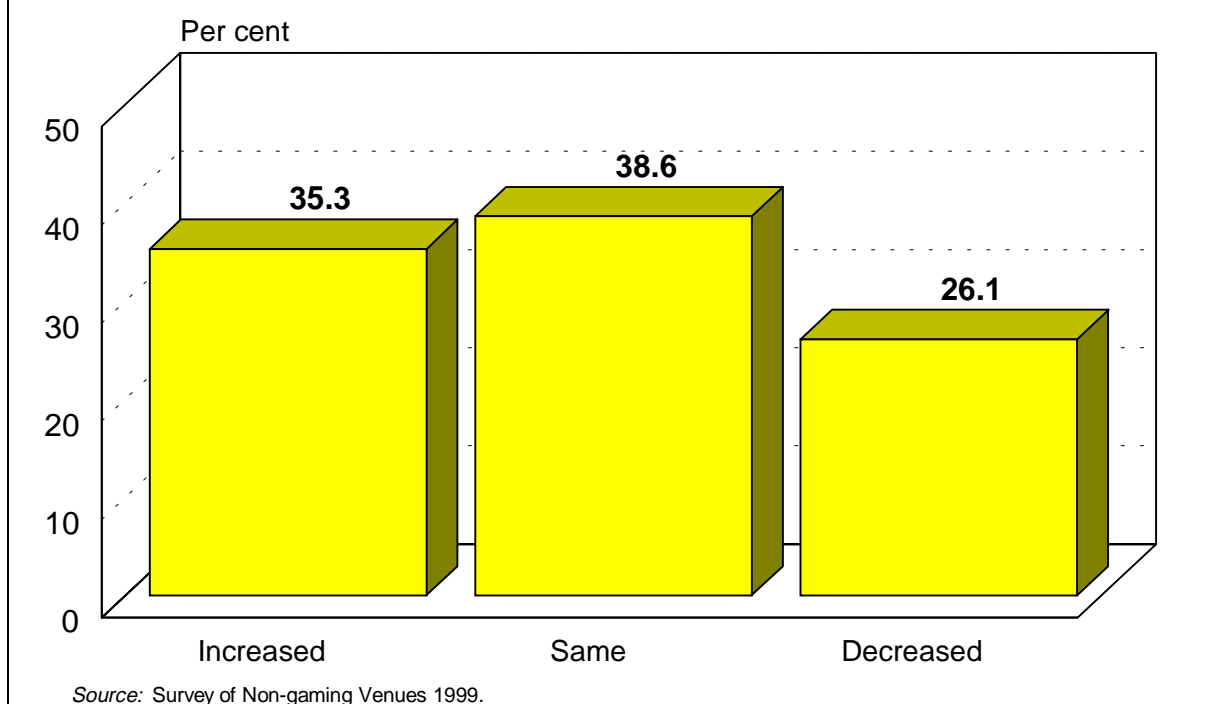
The table indicates that hotel type venues have on average experienced changes in revenue of similar magnitude with roughly one third of respondents answering each alternative. Of interest is the 50 per cent decline in bar revenue reported by non-gaming hotels. This compares to 29 per cent of club venues experiencing a similar fall. The result may be due to the general decline in alcohol consumption per capita during the decade, or a capita substitution effect towards consumption at gaming venues or a combination of both.

Clubs on average have reported similar income levels to before the introduction of EGMs or (43.7 per cent), or increased levels (39.4 per cent). Only 16.9 per cent reported a decline in total revenue.

Figure A5.1 shows the effect on total revenue for all non gaming venues. The figure shows the following:

- that the majority of non-gaming venues reported income levels similar to or above 1992 levels; and
- approximately 25 per cent of venues reported a decline in income following the introduction of EGMs in Victoria. This compares to 36 per cent of venues in the 1997 Non-Gaming Venue Survey.

**Figure A5.1: Non-gaming venues - trading position following introduction of EGMs - Victoria**



## A5.6 The impact of new gaming on venues with gaming facilities

A similar question was asked in the survey of gaming venues. It was designed to capture the level of complimentary expenditure associated with becoming an operational gaming venue.

Table A5.10 shows the results to the question about how your current trading position compares with that prior to becoming a gaming venue.

The table indicates the following:

- that most respondents have experienced an increase in revenue across all functional areas. This is especially true with bar takings where 61 per cent of hotels and 86 per cent of clubs experienced an increase; and
- a large increase in food revenue for hotels and clubs.

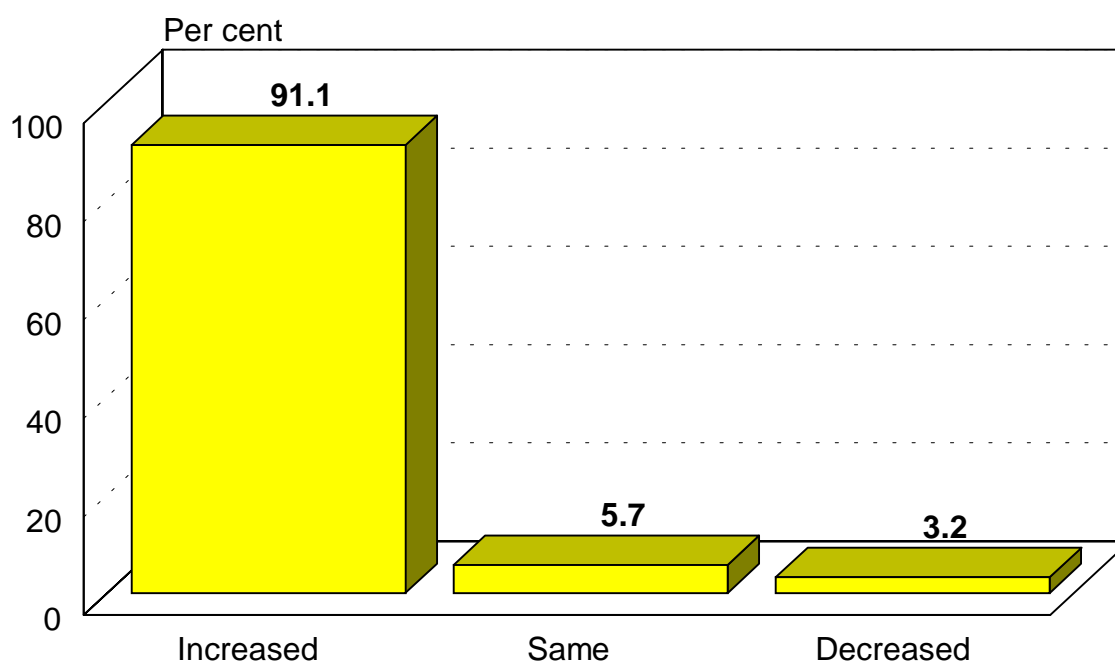
Figure A5.2 shows the consolidated effect on total revenue for hotels and clubs. An overwhelming majority of venues reported an increase in total revenue following the introduction of EGMs at the venue.

These results support the hypotheses developed previously, that gaming expenditure gives rise to additional complimentary purchases at the venue. The degree to which they are substituted from non-gaming venues is still inconclusive.

**Table A5.10 The effect on revenue from becoming an operational gaming venue – by area of operation**

	Bar	Meal	Entertainment	Accommodation	Conferences	Other	Total
<b>Hotels</b>							
Increase	61.3	77.5	20.5	32.0	23.8	58.3	86.8
Same	17.2	16.9	48.7	60.0	61.9	33.3	7.5
Decrease	21.5	5.6	30.8	8.0	14.3	8.3	5.7
n = 94							
<b>Clubs</b>							
Increase	86.2	81.1	55.1	11.8	51.5	73.2	93.3
Same	7.2	15.5	36.4	88.2	45.6	23.6	4.8
Decrease	6.6	3.4	8.4	0.0	2.9	3.3	1.9
n = 185							

Source: Survey of Gaming Venues 1999.

**Figure A5.2: Gaming venues - trading position following introduction of EGMs - Victoria**

Source: Survey of Gaming Venues 1999.





## **Appendix 6**

**Local Government Area  
Reported gaming expenditure  
The Authority, March 2000**



<b>Central</b>	CITY OF BALLARAT	8	8	16	\$8,886,363.00	\$17,881,126.00	\$22,705,265.00	\$27,178,768.00	\$30,214,638.74	\$34,167,149.99	\$39,402,060.00
<b>Highlands</b>	SHIRE OF HEPBURN	2	1	3	\$0.00	\$682,783.00	\$2,036,977.00	\$2,747,042.00	\$2,601,373.20	\$2,515,888.20	\$2,758,420.00
	BALANCE OF LGAs-	2	2	4	\$370,303.00	\$1,217,650.00	\$2,534,041.00	\$3,979,395.00	\$6,310,699.90	\$6,833,425.20	\$7,730,103.00
	CITY OF MOORABOOL										
	RURAL CITY OF ARARAT										
	SHIRE OF PYRENEES										
	<b>Sub-total (5 LGAs)</b>	<b>12</b>	<b>11</b>	<b>23</b>	<b>\$9,256,666.00</b>	<b>\$19,781,559.00</b>	<b>\$27,276,283.00</b>	<b>\$33,905,205.00</b>	<b>\$39,126,711.84</b>	<b>\$43,516,463.39</b>	<b>\$49,890,583.00</b>
<b>East</b>	SHIRE OF EAST GIPPSLAND	8	4	12	\$346,126.00	\$4,336,505.00	\$7,933,972.00	\$12,052,412.00	\$13,234,390.70	\$14,846,673.79	\$16,035,423.00
<b>Gippsland</b>	SHIRE OF WELLINGTON	5	5	10	\$135,107.00	\$5,823,567.00	\$7,966,680.00	\$9,921,423.00	\$11,847,080.33	\$13,491,941.50	\$15,448,176.00
	<b>Sub-total (2 LGAs)</b>	<b>13</b>	<b>9</b>	<b>22</b>	<b>\$481,233.00</b>	<b>\$10,160,072.00</b>	<b>\$15,900,652.00</b>	<b>\$21,973,835.00</b>	<b>\$25,081,471.03</b>	<b>\$28,338,615.29</b>	<b>\$31,483,599.00</b>
<b>Gippsland</b>	BASS COAST SHIRE	4	4	8	\$40,531.00	\$2,025,135.00	\$5,253,838.00	\$7,997,029.00	\$10,217,625.61	\$11,355,365.19	\$12,394,808.00
	SHIRE OF BAW BAW	1	2	3	\$1,404,920.00	\$1,669,682.00	\$2,348,539.00	\$4,494,027.00	\$6,080,210.10	\$6,558,747.80	\$7,592,339.00
	SHIRE OF LA TROBE	11	8	19	\$8,397,013.00	\$19,371,157.00	\$24,603,781.00	\$30,257,878.00	\$31,976,458.50	\$33,992,954.05	\$37,667,076.00
	SHIRE OF SOUTH GIPPSLAND	4	1	5	\$0.00	\$800,076.00	\$2,606,190.00	\$3,912,617.00	\$4,476,359.92	\$5,215,835.16	\$5,540,346.00
	<b>Sub-total (4 LGAs)</b>	<b>20</b>	<b>15</b>	<b>35</b>	<b>\$9,842,464.00</b>	<b>\$23,866,050.00</b>	<b>\$34,812,348.00</b>	<b>\$46,661,551.00</b>	<b>\$52,750,654.13</b>	<b>\$57,122,902.20</b>	<b>\$63,194,569.00</b>
<b>Goulburn</b>	CITY OF GREATER SHEPPARTON	4	3	7	\$789,071.00	\$4,399,912.00	\$8,863,914.00	\$14,294,269.00	\$16,534,814.40	\$18,190,324.50	\$21,488,650.00
	SHIRE OF CAMPASPE	1	2	3	\$714,190.00	\$1,523,917.00	\$2,353,660.00	\$4,073,805.00	\$5,123,929.00	\$5,672,202.90	\$6,397,897.00
	SHIRE OF DELATITE	3	1	4	\$0.00	\$139,103.00	\$2,165,631.00	\$3,766,088.00	\$4,917,862.70	\$5,692,614.70	\$6,203,860.00
	SHIRE OF MITCHELL	4	1	5	\$311,817.00	\$1,556,619.00	\$2,579,313.00	\$4,501,836.00	\$5,160,053.70	\$6,634,935.14	\$8,629,813.00
	BALANCE OF LGAs-	2	1	3	\$158,057.00	\$872,292.00	\$1,770,239.00	\$2,221,114.00	\$2,379,096.22	\$3,377,691.70	\$3,630,022.00
	SHIRE OF MOIRA										
	SHIRE OF MURRINDINDI										
	SHIRE OF STRATHBOGIE										
	<b>Sub-total (7 LGAs)</b>	<b>14</b>	<b>8</b>	<b>22</b>	<b>\$1,973,135.00</b>	<b>\$8,491,843.00</b>	<b>\$17,732,757.00</b>	<b>\$28,857,112.00</b>	<b>\$34,115,756.02</b>	<b>\$39,567,768.94</b>	<b>\$46,350,242.00</b>
<b>Statistical Division</b>					<b>TOTAL NET EXPENDITURE 92-93</b>	<b>TOTAL NET EXPENDITURE 93-94</b>	<b>TOTAL NET EXPENDITURE 94-95</b>	<b>TOTAL NET EXPENDITURE 95-96</b>	<b>TOTAL NET EXPENDITURE 96-97</b>	<b>TOTAL NET EXPENDITURE 97-98</b>	<b>TOTAL NET EXPENDITURE 98-99</b>
<b>Local Government Area</b>	<b>TAB</b>	<b>Tatts</b>	<b>Total</b>								
<b>Loddon</b>	CITY OF GREATER BENDIGO	8	5	13	\$858,190.00	\$7,284,515.00	\$16,636,960.00	\$22,706,159.00	\$25,133,540.95	\$27,566,036.92	\$31,693,292.00
	SHIRE OF MACEDON RANGES	2	1	3	\$0.00	\$0.00	\$143,441.00	\$3,015,819.00	\$4,397,000.10	\$5,223,104.50	\$6,255,680.00
	BALANCE OF LGAs-	1	2	3	\$0.00	\$1,070,027.00	\$2,726,100.00	\$4,397,911.00	\$5,497,085.00	\$6,820,810.10	\$7,671,304.00
	SHIRE OF CENTRAL GOLDFIELDS										
	SHIRE OF LODDON										
	SHIRE OF MOUNT ALEXANDER										
	<b>Sub-total (5 LGAs)</b>	<b>11</b>	<b>8</b>	<b>19</b>	<b>\$858,190.00</b>	<b>\$8,354,542.00</b>	<b>\$19,506,501.00</b>	<b>\$30,119,889.00</b>	<b>\$35,027,626.05</b>	<b>\$39,609,951.52</b>	<b>\$45,620,276.00</b>
<b>Mallee</b>	RURAL CITY OF MILDURA	4	3	7	\$3,531,354.00	\$7,147,614.00	\$10,093,229.00	\$13,032,312.00	\$14,411,796.70	\$15,365,177.65	\$16,998,177.00
	RURAL CITY OF SWAN HILL	3	1	4	\$0.00	\$105,975.00	\$705,043.00	\$2,334,823.00	\$3,638,766.30	\$4,607,544.20	\$5,681,853.00
	BALANCE OF LGAs-	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	SHIRE OF BULOKE										
	SHIRE OF GANNAWARRA										
	<b>Sub-total (4 LGAs)</b>	<b>7</b>	<b>4</b>	<b>11</b>	<b>\$3,531,354.00</b>	<b>\$7,253,589.00</b>	<b>\$10,798,272.00</b>	<b>\$15,367,135.00</b>	<b>\$18,050,563.00</b>	<b>\$19,972,721.85</b>	<b>\$22,680,030.00</b>



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## Glossary

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### Explanation of terminology used

#### ***Complementary expenditures***

Complementary expenditures are expenditures induced or triggered by other expenditures. The decision to gamble, for example, triggers other expenditures such as transport costs (to the gambling venue) and eating and drinking expenditures while gambling. The decision to gamble is the catalyst for these expenditures.

#### ***Consumer surplus***

This is the total benefit obtained by the consumer from an expenditure or activity. The suppression of gambling forces consumers to undertake activities that yield a total lower level of consumer benefits (that is surplus) than what would have been the case if gambling had been available.

#### ***Easy money policies***

Easy money policies occur when the real interest rates are at historically lower levels and/or there is no attempt by the monetary authorities to control the demand for credit at the prevailing interest rate level. Credit supplies to whatever level the market will bear.

#### ***Gross state product***

The total value added produced by a state. Since value added equals labour and capital income from production, gross state product equals the sum of labour and capital income produced by all industries in the state.

#### ***Household debt service ratio***

The household debt service ratio is the ratio of household total interest and principle repayments on debt to household disposable income.

#### ***Household disposable income***

This is an Australian Bureau of Statistics National Accounts concept. It is the difference between all sources of household income, namely:

- wages;
- interest receipts;
- dividends;
- unincorporated business income; and
- social security payments,

and claims on household income which include:

- interest payments; and
- tax payments.

### ***Household savings***

Household savings is the difference between household disposable income and household consumption expenditure.

### ***Resource expansion effect***

This occurs when a stimulus to the economy absorbs into the production of goods and services previously idle labour and capital resources.

### ***Resource re-allocation effect***

This occurs when a shock to the economy results in the transfer of capital and labour resources from one activity to another.

### ***Standard error***

The standard error of a statistical estimated coefficient such as a demand or price elasticity measures the confidence for believing that the estimated value is close to the true value.

### ***Unemployed or unutilised resources***

Unemployed or unutilised resources are labour and capital resources that are currently idle because of a deficiency of demand.

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## Abbreviations

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<b>ABS</b>	Australian Bureau of Statistics
<b>ANA</b>	Australian National Accounts
<b>ANZIC</b>	Australian and New Zealand Industry Classification
<b>CIE</b>	Centre for International Economics
<b>CSF</b>	Community Support Fund
<b>EGM</b>	Electronic gaming machines
<b>FTE</b>	Full time equivalent
<b>GDP</b>	Gross domestic product
<b>GOS</b>	Gross operating surplus
<b>HES</b>	Household Expenditure Survey
<b>JTW</b>	Journey to work
<b>LGAs</b>	Local Government Areas
<b>NIEIR</b>	National Institute of Economic and Industry Research
<b>NPV</b>	Net present value
<b>SP bookmakers</b>	Starting price (SP) bookmakers are illegal (or unregistered) bookmakers.
<b>The Authority</b>	Refers to the Victorian Casino and Gaming Authority
<b>VCGA</b>	Victorian Casino and Gaming Authority
<b>WSC</b>	Workplace Study Centre