

Economic impact of the Brisbane casino

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1. Introduction

The Brisbane Treasury Casino has had significant impacts on patterns of economic and social activity in the Brisbane CBD. It is less clear, however, what the impact has been on the broader regional economy.

The object of this paper is to provide a framework for assessment of economic aspects of the impact of the Treasury Casino on the Brisbane regional economy, defined for this purpose as the Brisbane-Moreton Statistical District, which covers most of the 'south-east corner' of Queensland, including the Brisbane metropolitan area and the Gold Coast. The framework has been developed with the aim of allowing for integration between analysis of purely economic effects and the broader socioeconomic analysis of the project as a whole.

As yet, data on casino revenues and on the sources of those revenues is not available. For this reason, only a preliminary analysis has been feasible. The approach adopted has been to estimate the economic impact per unit of annual gross revenue. For convenience, the unit selected is \$100 million. As a comparison, the gross revenue of Jupiter's Gold Coast casino was just over \$200 million in 1994-95 (Compendium of Statistics, GSO).

The paper is organised as follows. Section 2 contains background information on the Brisbane regional economy. Section 3 describes the regional economic impact of casinos. Section 4 reports modelling of the regional economic impact of the casino. Section 5 is a discussion of economic impacts within the Brisbane CBD. Section 6

contains concluding comments.

2. Economic background

This section gives a brief outline of the economic development of the South-East region of Queensland. The region under consideration is comprised of the Brisbane Statistical Division and the Moreton Statistical Division. For some of the data sets presented here separate information is available for each Statistical Division but in many instances information is only available for the aggregate area.

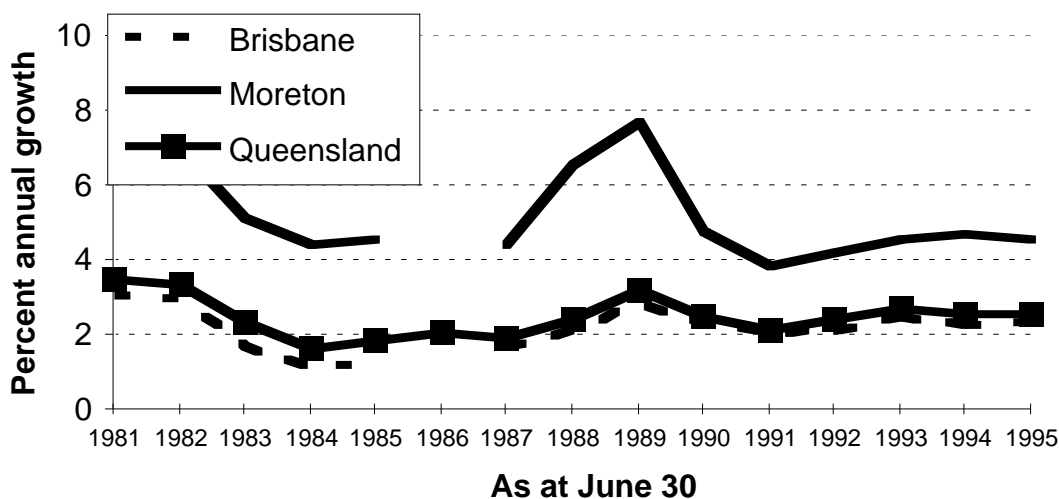
The analysis is not intended as a comprehensive description of the regional economy. Attention is focused on those factors relevant to an analysis of casino development.

Population

While the Brisbane-Moreton district only occupies ??% of the land area of Queensland it is home to more than 60 percent of the state's population. In June 1981 the Brisbane-Moreton district population of 1,408,860 was 60.1 percent of the state total. By 1995 the district's population had grown by 47.2 percent to 2,073,284 persons or 63.2 percent of the state total.

The average annual population growth over the period was 2.8% with the actual annual population growth figures shown in the following chart.

Figure 1: Annual Population Growth Rates South East Queensland - 1981 to 1995



Source: ABS 3201.3 & 3202.3, there were significant boundary changes in 1986 so that % changes in that year are not applicable.

As can be seen by the chart there has been a marked difference in the growth rates for the two statistical divisions. Over the period Moreton grew at an average of 4.6% per annum which was more than twice the rate for Brisbane of 2.2%. Growth for the Brisbane area was comparable to that of Queensland as a whole, which was higher than for Australia as a whole.

The growth rates reported above reflect a combination of trends. First, there is the general movement of population to Queensland, and particularly to coastal areas with recreational opportunities, including the Gold Coast and Cairns. The establishment of Jupiter’s casino on the Gold Coast in ... both reflected and contributed to this trend.

The second trend is the general tendency for urban populations in all developed countries. to spill out into what was formerly the rural hinterland of the cities. This tends

to slow the growth of Brisbane and accelerate the growth of Moreton. For a variety of reasons, the relative decline of the central business district is often seen as a matter of concern. The establishment of centrally located entertainment facilities, such as the Brisbane casino, is often seen as a way of 'revitalising' the city centre and reversing its relative decline. The assumption behind this approach is that casino patrons will not simply commute to and from the casino but will spend time and money in the city centre as part of a casino visit. Against this, there is concern that a casino may divert expenditure already allocated to other central business district.

Economic Base

In the same way that Gross Domestic Product (GDP) figures are used to describe the economic performance of a country, Gross Regional Product (GRP) figures can be used to describe the economic performance of a region. The Queensland Government's Statistician's Office has so far only produced GRP figures for Queensland regions for two time periods - 1986/87 and 1990/91 - and the figures are only available for relatively large regions. Information is only available for the combined Brisbane-Moreton area. GRP estimates for that area are shown in the following table in constant 1989/90 prices.

Table 1 Gross Regional Product at Market Prices

Constant 1989-90 Prices: Brisbane-Moreton Division

	1986/87			1990/91			Annual Growth Rates	
	GRP	% of Qld Total	GRP Per Capita	GRP	% of Qld Total	GRP Per Capita	GRP	GRP Per Capita
	\$m	%	\$	\$m	%	\$	%	%
Brisbane -Moreton	27468	57.6	16786	33378	60.0	18065	5.0	1.9
Qld	47705	-	17829	55645	-	18795	3.9	1.3

Source: Estimates of Gross Regional Product Queensland, Government Statistician's

The table shows that GRP grew over the four year period at a rate of 5.0% per annum. When adjusted for the high population growth GRP per capita grew at a much lesser rate of 1.9%. In both instances the growth in the Brisbane-Moreton region were slightly above the Queensland rates. The region in 1990/91 was responsible for 60.0% of the overall state GRP which was an increase from the 1886/87 figure of 57.6%.

The contribution to regional GRP by the various industry sectors is shown in the following table. The three biggest contributors in 1990/91 were (i) Wholesale and Retail Trade (17.1%), (ii) Public Administration, Defence and Community Services (16.0%), and (iii) Manufacturing (13.3%). The two biggest absolute changes between 1986/87 and 1990/91 were (i) Manufacturing (-2.3 percentage points) and (ii) Finance, Property and Business Services (+2.5 percentage points). These trends are characteristic of the national economy over this period, with the growth in the finance, property and business services sector reflecting the boom following financial deregulation.

The next biggest proportional change was in recreational and personal services which increased from 4.4 to 5.6 per cent of GRP, a proportional increase of 27 per cent in excess of the general rate of growth of the regional economy. The long-term prospects for

expansion in the recreational and personal services sector appear promising. Developments in this sector such as the expansion of casino gambling are therefore of particular interest.

Table 2 Industry Contribution to GRP: Brisbane-Moreton

	1986/87 %	1990/91 %	Difference %
Agriculture	1.7	1.4	-0.3
Mining	0.9	1.4	0.5
Manufacturing	15.5	13.3	-2.3
Electricity, gas and water	4.0	3.7	-0.3
Construction	10.8	9.4	-1.4
Wholesale and retail trade	16.3	17.1	0.8
Transport, storage and communication	9.8	9.7	-0.1
Finance, property and business services	7.4	9.9	2.5
Public administration, defence and community services	17.3	16.0	-1.3
Recreation, personal and other services	4.4	5.6	1.2
Ownership of dwellings	8.8	10.1	1.3
General government	3.1	2.5	-0.6
All industries	100.0	100.0	-

Source: Estimates of Gross Regional Product Queensland, Government Statistician's Office

Labour force shift-share analysis

Labour force data for the Brisbane-Moreton region is available to show changes over a longer period of time than just the four year period shown in the GRP tables above. Using data from the 1981 and 1991 ABS Censuses of Population and Housing in a shift-share analysis provides another indicator of structural change in the area. As explained by Mangan¹, Shift-Share analysis divides the growth in jobs per industry sector into three components, they being:

- the national economic growth component,
- the industrial mix component, and
- the region-specific component reflecting the difference in growth rates between national and state industries and the comparative advantage (disadvantage) of the region.

The table shows that if the region had merely maintained national trends over the period then 72,989 jobs would have been added. But, overall 197,310 jobs were added with more than half of these (107,808 or 54.6%) added due to by region-specific conditions.

Using manufacturing as an example, the expected job increase due to national trends was 11,621. However the change in the mix of industries in the sector resulted in a negative effect of -26,409 jobs, which was more or less balanced out by the region-specific or competitive element of 24,072 additional jobs. The net result for manufacturing was an increase of over 9,283 jobs over the period. It can be seen that the biggest increase in job numbers came from (i) community services (51,367 jobs), (ii) wholesale and retail trade (48,891), (iii) finance, property and business services (37,842) and (iv) recreation, personal and other services (29,281). The growth in the recreation, personal and other services sector over this period is particularly impressive because of the low base from which growth began.

¹Mangan, D, (1994) The Queensland Labour Market: An Overview, Monograph No. 1/94, Government Statistician's Office, Brisbane.

Table 3 Shift-Share Analysis of Industrial Employment (persons) - Brisbane-Moreton: Between 1981 and 1991

Industry specific	Growth Component			Total Change in Employment
	Share	Mix	Region	
	persons	persons	persons	persons
Agriculture	2,205	-4,875	1,470	-1,200
Mining	543.0	-678.0	-620.0	-755.0
Manufacturing	11,621	-26,409	24,072	9,283
Electricity, gas and water	1,277	-3,987	-73.0	-2,782
Construction	6,519	-3,753	7,481	10,247
Wholesale and retail trade	15,733	10,803	22,355	48,891
Transport and storage	4,417	-4,928	6,648	6,137
Communication	1,886	-2,865	310.0	-670.0
Finance, property and business services	7,767	20,958	9,116	37,842
Public administration and defence	4,680	181.0	4,809	9,670
Community Services	11,844	19,140	20,383	51,367
Recreation, personal and other services	4,496	12,926	11,859	29,281
Total	72,989	16,513	107,808	197,310

Source: ABS Census Data

The two categories, "not classified" and "not stated", in the original data have been dispersed proportionally between the other categories.

Employment by Industry

The previous table only covered the period to 1991 so that it is important to determine any further significant changes in the employment patterns of the region. The following table compares labour force survey information between February 1991 and February 1996. Two of the industry sectors showed both a high percentage increase and large increase in the actual number of persons employed. These were (i) wholesale and retail trade with a 51,800 increase in numbers at an average annual rate of 4.8%, and (ii) finance, property and business services with an increase of 41,100 persons at an average annual rate of 6.8%. This reinforces the pattern established for the 1981-91 period by the previous shift-share analysis. By contrast, growth in the recreational and personal services sector was relatively weak.

Table 4 Employment by Industry: Brisbane-Moreton Region**February 1991 and February 1996**

	Feb 91 '000	Feb 96 '000	Difference '000	Annual %Change
Agriculture	22.1	23.8	1.7	1.5
Mining	3.4	4.1	0.7	3.8
Manufacturing	102.2	120.1	17.9	3.3
Electricity, gas and water	6.0	7.6	1.6	4.8
Construction	74.9	83.6	8.7	2.2
Wholesale and retail trade	198.2	250.0	51.8	4.8
Transport and storage	45.1	49.2	4.1	1.8
Communication	12.3	17.6	5.3	7.4
Finance, property & business services	106.0	147.1	41.1	6.8
Public administration and defence	32.2	38.7	6.5	3.7
Community Services	143.2	158.7	15.5	2.1
Recreation, personal and other services	72.8	83.8	11.0	2.9

Source: ABS 6201.3

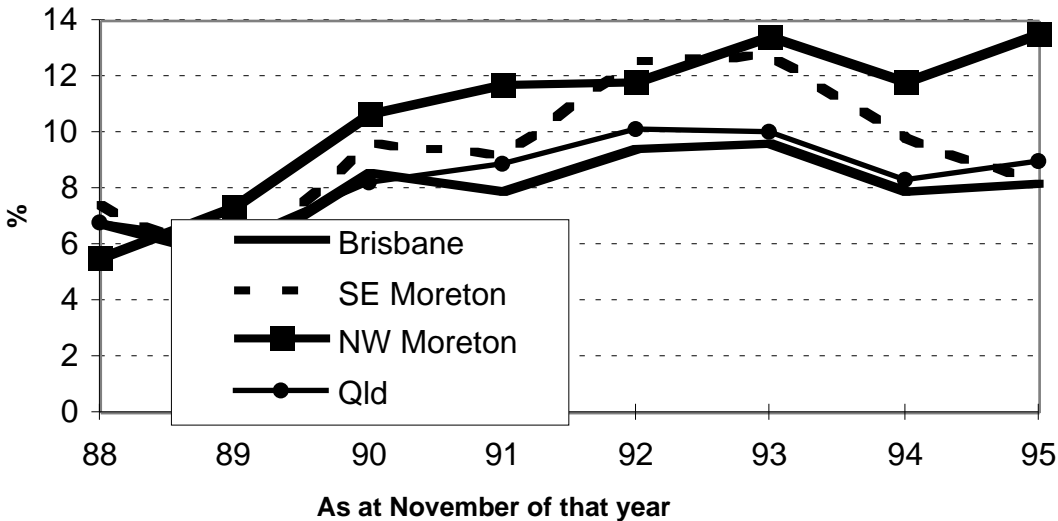
Unemployment Rate

Changes in unemployment rates are shown in Figure 2. On the whole, unemployment rates are comparable with those for Australia as a whole, despite the significantly stronger growth in employment and population. This result supports the view that employment growth has been a consequence rather than a cause of population growth. On this view, changes in population and employment are seen as arising from changes in lifestyle

preferences leading to a northward drift in population (arguably a lagged response to the development of effective systems of home airconditioning). This contrasts with a ‘developmentalist’ view in which population growth is seen as an endogenous response to job opportunities created by a dynamic economy. On this view, we would expect a differential between unemployment rates in the rapidly growing regions of Queensland and those in other areas of Australia, which does not appear to be evident.

There are significant variations in unemployment rates within the region, especially with respect to the North-west Moreton region which has experienced unemployment rates well over 10% in recent years. By contrast, South-East Moreton has had a significant drop in its rate over the last two years in line with the general economic recovery.

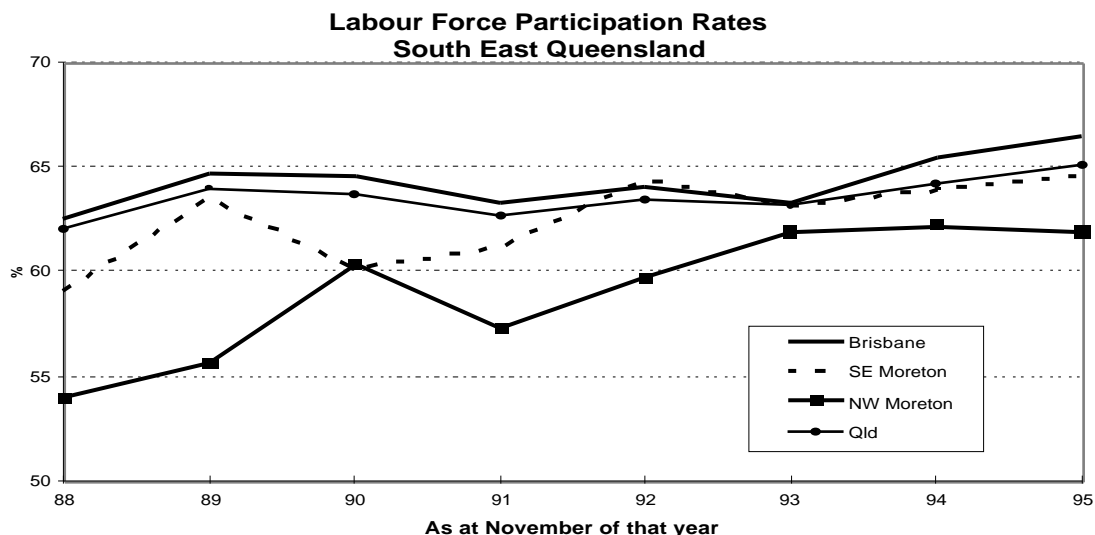
Figure 2: Unemployment Rates South East Queensland



Source: ABS 2301.3

Participation Rate

The following chart on participation rates also indicates employment problems in the North-west Moreton area. That is, the previous chart indicated high unemployment levels and the information here indicates lower participation rates than the remainder of the region.

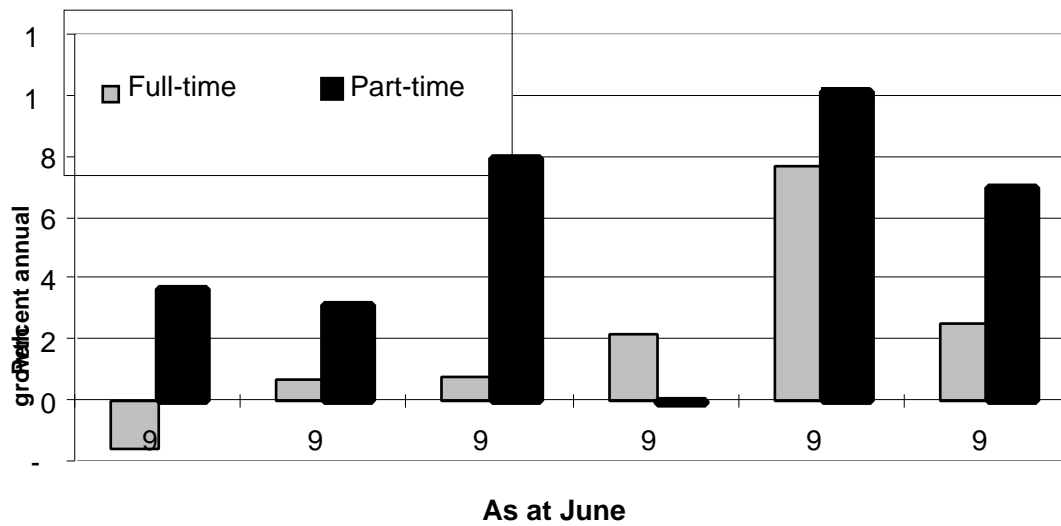


Source: ABS 2301.3

Full-time/part-time work

The following chart shows that part-time employment has been growing in the region at a much faster rate than full-time employment. Currently approximately 25% of employment is part-time employment however, of the 152, 000 positions added to the employment levels between 1989 and 1995, 45% of those were part-time positions. This trend is consistent with developments in the national economy. A shift in employment from sectors such as manufacturing, where full-time employment fits in naturally with production systems, to sectors such as recreation and personal services, which have a strong demand for flexible part-time employees is one factor contributing to this trend.

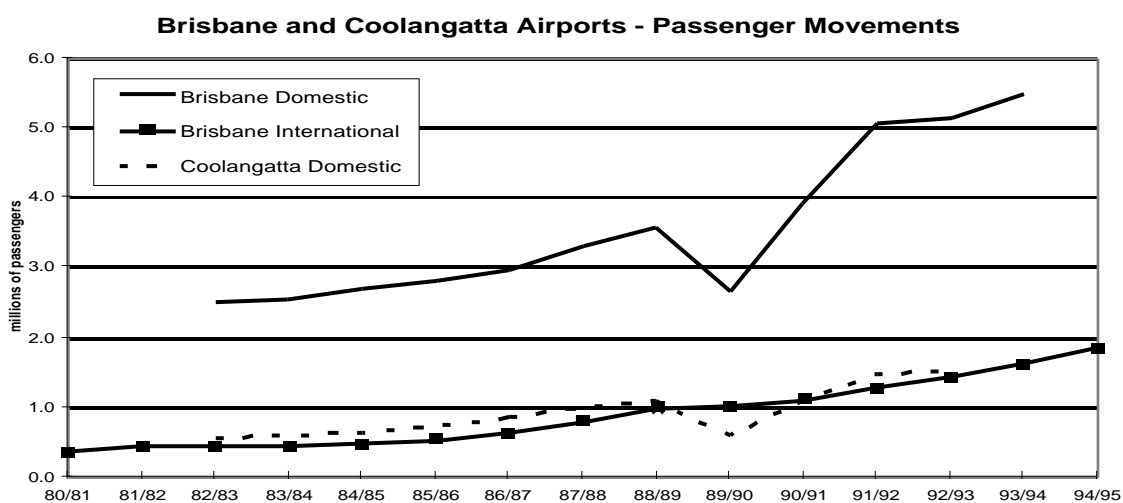
**Figure 3: Annual Percentage Increase in Full-time and Part-time Employment
Brisbane-Moreton Region**



Source: ABS 2301.3

Some Basic Tourism Indicators

A number of basic indicators of tourism activity in the South-East Region are shown below.



Source: Department of Transport and Communications

Table 5 Visitor Arrivals in Brisbane - ('000)

	1989	1990	1991	1992	1993	1994
International	477	483	520	487	570	575
% change		1.3	7.7	-6.3	17.0	0.9
Domestic	2524	2730	2823	2514	2532	2474
% change		8.2	3.4	-10.9	0.7	-2.3
Total	3001	3213	3343	3001	3102	3049
% change		7.1	4.0	-10.2	3.4	-1.7

Source: BTR

Expenditure Patterns

Household expenditure patterns are occasionally surveyed by the ABS and the results of the most recent survey are shown below for Brisbane and Moreton. Neither of the Statistical Divisions shows a wide divergence from the overall state average expenditure pattern. But this is not surprising given that together they have 60% of the state's population, so that their consumption pattern is a large determinant of the state's average.

Table 6 Average Weekly Household Expenditure - 1993/94

Broad Commodity or service expenditure Group	Brisbane 1987	Moreton 1987	Qld 1981	Brisbane	Moreton
	87.0	87.0	81.0	107%	107%
Current housing costs	12.0	12.0	12.0	100%	100%
Fuel and power	107.0	103.0	103.0	104%	100%
Food and beverages	17.0	18.0	18.0	94%	100%
Tobacco	10.0	9.0	9.0	111%	100%
Clothing and footwear	32.0	30.0	29.0	110%	103%
Household furnishings and equipment	33.0	35.0	37.0	89%	95%
Household services	32.0	34.0	32.0	100%	106%
Medical care and health expenses	26.0	25.0	26.0	100%	96%
Transport	99.0	104.0	95.0	104%	109%
Recreation	77.0	75.0	75.0	103%	100%
Personal care	12.0	13.0	12.0	100%	108%
Miscellaneous	51.0	46.0	47.0	109%	98%
Total expenditure	595.0	590.0	576.0	103%	102%
Selected other payments					
Income tax	147.0	115.0	128.0	115%	90%
Mortgage payments principal	17.0	22.0	17.0	100%	129%
Other capital housing costs	24.0	-48.0	14.0	171%	-343%
Superannuation and life insurance	27.0	14.0	22.0	123%	64%
Number in sample	567.0	205.0	1148.0		

Source: ABS unpublished data

3. Regional economic impact of casinos

To undertake an input–output analysis, it is most useful to distinguish three sources of revenue for casinos:

- (i) residents of the local region
- (ii) diversion of expenditure from the existing tourist market (more precisely, from tourists whose planned stay and total expenditure are unaffected by the casino)
- (iii) new tourists and tourists who extend their stay in order to include a visit to the casino or spend money on casino services in addition to amounts they would have spent otherwise.

The demand drawn from the first two markets may be regarded as a diversion of existing demand, with no net impact on the regional economy. On the other hand, any increase in visitor numbers associated with the casino will imply an expanded demand for accommodation, food and other services.

The classification appropriate for an input-output analysis will not be appropriate for other purposes. For example, in considering the social impacts of casinos it is desirable to differentiate local residents by economic status, age, sex and possibly ethnicity. Similarly in market projections for casinos, a more elaborate classification of the tourist market is appropriate. Because an input-output analysis is concerned primarily with the effect of changes in aggregate demand, the individual characteristics of casino patrons are relatively unimportant, and changes in the pattern of demand for goods and services within the region are the central issue of concern.

Local demand for casino services

The demand for casino services from local residents represents, at least in the first instance, a diversion from other expenditure². Other areas of expenditure may be ranked in terms of the likely degree of substitution with casino gambling. The closest substitution is between casino gambling and other gambling outlets. Existing casinos and venues offering poker machines are the most obvious. The Treasury casino is in competition with the existing Gold Coast casino. However, the distance between the two casinos and the differences in the style of gambling means that the two products are not perfect substitutes.

Casinos offer poker machine gambling, thereby competing directly with machines in hotels and clubs. Brisbane Casino has ... poker machines compared to a regional total of ... machines. Casinos will also compete with other forms of gambling though the degree of substitution will not be as great. There is a closer similarity between casino gambling and poker machine gambling in a pub or club setting than between either of these gambling forms and, say, Lotto or betting on horse races. More generally, casino gambling will be a substitute for other recreational expenditure, such as restaurant meals.

The availability of a casino would be expected to lead to some expansion of total recreational expenditure at the expense of other expenditure. For the majority of local residents this net effect will be small. There is, however, concern that the opening of the casino will lead to an increase in the number of 'problem gamblers'. In economic terms, problem gamblers may be identified as those for whom the share of gambling in total expenditure is large³. Studies of gambling markets generally suggest that the number of

² Total current expenditure may increase in the short term, representing a reduction in savings. However, this must ultimately result in a reduction in future consumption.

³ Note however, that not all such people may regard themselves, or be regarded by others, as having a problem. In particular, some high income 'premium' and 'junket' players may spend a significant share of total income on gambling and related activities without compromising their ability to maintain a high standard of living. The extent to which gambling is a 'problem' depends on social circumstances as

such problem gamblers is small, but their economic impact may not be. Because of their high average expenditure, problem gamblers contribute a disproportionate share of total gambling expenditure. Much of this expenditure will represent a reduction in general demand.

As an illustration, the UQ Labour and Industry Unit indicates that 40 per cent of the adult population of Brisbane undertakes poker machine gambling. Within that 40 per cent, however the majority of poker machine gambling expenditure is accounted for by the 30 per cent of players (12 per cent of the adult population) who play at least monthly. Within this group, it may be possible to identify a relatively small group of high-frequency high-expenditure players who account for a large share of total expenditure.

New and existing visitors

Given that visitor numbers are unlikely to be greatly affected by the opening of the casino, the key issues are

(i) whether visitors extend their stay to incorporate visits to the casino

(iii) whether expenditure on casino gambling is additional to total tourist expenditure or is diverted from alternative recreational spending

A detailed analysis of this question will require separate consideration of different subgroups of visitors. For the purposes of subsequent analysis, it will be assumed that additional expenditure associated with longer stays is approximately equivalent to expenditure diverted from alternative recreational outlets to casino gambling with the result that the net impact on final demand is equal to expenditure on casino services.

4. Modelling

The basic approach employed here is that of input-output analysis (see Appendix). much as on personal characteristics.

The analysis begins with an estimate of the initial impact of the casino on demand for final goods and services, taking account of demand diversion and the impact of new visitors to the region. Taking account of the diversion effects considered above, this initial impact consists of a net increase in demand for the output of the recreation services sector (which includes casinos) and a partially offsetting net reduction in the demand for the output of all other sectors.

The input-output matrix is then used to determine the change in total output, including intermediate goods and services, that is required to adjust to the change in demand for final goods and services. The model yields predictions of the change in regional value-added, employment and income. From the viewpoint of the theory of economic welfare these latter effects are more relevant than the change in total output. As discussed in the Appendix, the impacts of changes in the output of a particular sector on a given variable of interest may be expressed as a multiplier. The aggregate effect of a casino development may be derived by summing the effects across all sectors.

Impact calculation (illustrative estimate)

Unfortunately, data on casino revenues was not available in time for the preparation of this Report. An illustrative estimate of the impact of \$100 million of expenditure at the Brisbane casino has therefore been prepared. The following assumptions have been in the preparation of estimates.

- (i) Thirty per cent of all demand is diverted from the existing Gold Coast casino
- (ii) Forty per cent of demand comes from visitors to the Brisbane-Moreton region
- (iii) For the net increase in local demand for casino services, it is assumed that 50 per cent is diverted from expenditure on recreational services and the remainder from

general expenditure⁴.

Assumption (iii) is consistent with available survey evidence. When data on revenue and usage patterns available, assumptions (i) and (ii) and the illustrative quantity of \$100 million will be replaced by parameters derived from the data.

We begin by netting out the estimated impact of the casino on the existing Gold Coast casino. The net increase in demand for casino services is then divided into local demand and visitor demand. This yields the following breakdown for a revenue of \$100 million.

Diverted from existing casino		\$30 million
Net increase in visitor demand		\$28 million
Local expenditure diverted from		
recreation expenditure	\$22 million	
other local expenditure	\$17 million	
imports ⁵	\$3 million	
Total		\$42 million
Total revenue		\$100 million

The second-round and subsequent impacts arising from effects on demands for input to production are then traced through. The final impact may be summarised by a multiplier which is applied to the initial impact. Table 7 gives the initial and ultimate

⁴ Since recreational expenditure makes up about 5 per cent of general expenditure, the final reduction in non-casino recreation expenditure is slightly more than 50 per cent of the local expenditure on casino services

⁵ Here 'imports' denotes spending outside the region. Imports may come either from overseas or from elsewhere in Australia.

impacts on output and employment by sector under alternative estimating procedures. The first, referred to as Type I, takes account of multiplier effects arising from demands for input to production. The second, referred to as Type II, takes account of these factors and of multiplier effects arising from changes in household incomes. These issues are discussed further in the Appendix.

Table 7: Impact of \$100 million in casino spending

	Output (\$m)			Value added (\$m)			Employment		
	Initial	Type I	Type II	Initial	Type I	Type II	Initial	Type I	Type II
Agriculture	-0.1	0.8	1.3	-0.1	0.4	0.6	-3	14	22
Mining	-0.1	-0.1	-0.1	0.0	0.0	0.0	-1	-1	-1
Manufacturing	-3.7	-1.4	2.2	-1.0	-0.4	0.5	-27	-12	13
Electricity, gas and water	-0.1	1.6	2.5	0.0	0.7	1.2	-1	7	11
Construction	-3.3	-2.7	-2.5	-1.4	-1.1	-1.0	-29	-25	-22
Wholesale and retail trade	-2.8	-0.7	4.7	-1.5	-0.4	2.4	-49	-13	81
Transport and communication	-1.0	1.7	3.6	-0.5	1.0	2.0	-10	17	37
Finance and dwellings	-2.7	4.9	12.0	-1.7	1.7	6.2	-12	70	102
Public admin & defence	-0.7	-0.5	-0.2	-0.3	-0.3	-0.1	-7	-6	-2
Community services	-1.9	-1.4	0.5	-1.3	-0.9	0.4	-39	-28	11
Recreation & personal	47.9	53.1	55.6	18.7	20.8	21.7	760	842	882
Total	31.5	55.2	79.6	10.8	21.3	33.9	584	866	1133

The first three columns in Table 7 are concerned with effects on gross output. The first column is a more detailed statement of the breakdown of initial impacts derived

above. The second, based on a Type I multiplier analysis takes into account the effect of input purchases. The third, based on a Type II multiplier analysis takes into account the effect of increased household demand. The next three columns deal with value added, that is with output net of imports and primary inputs. From an economic viewpoint, value added is the most important variable, since it is only increases in value added that ultimately constitute increases in income. The final three columns deal with initial, Type I and Type II employment impacts, expressed in terms of the number of jobs.

The basic results may be explained as follows. The initial impact shows a transfer from all other sectors to the recreation and personal services sector. The reduction in output, value added and employment is greatest in those sectors, such as wholesale and retail trade and community services, that play a major role in final consumption. The impact on construction may be explained in the same way, but it should be noted that this illustrative analysis refers only to the operating phase of the project. During the construction phase, which will be analysed in a subsequent report, the casino project acted as a stimulus to the construction sector.

In the Type I analysis, the negative effects on other sectors of the change in final demand is offset by the input demands of the casino. This generates net gains for those sectors that supply significant quantities of inputs to the casino, notably the financial services sector, but sectors supplying final demand still have reduced output. In the Type II analysis, impacts on the final demand of the household sector are incorporated, leading to an increase in output, value added and employment in most sectors of the economy.

On the whole, the Type I analysis is a more realistic representation of the impact of the casino. As was argued above, employment growth in Queensland is being driven by population growth, not *vice versa*. Even if the casino had not been built, the number of households, and therefore total household demand would have increased. A Type II

analysis therefore tends to overstate the total impact of the casino.

The Brisbane-Moreton economy has an annual gross product of \$27 billion, growing at an annual rate of 5 per cent, or around \$1.4 billion. In this context, the increase in gross output associated with the casino project, estimated on the Type I approach at around \$50 million per \$100 million of gross revenue is too small to be noticeable in the aggregate behavior of the economy.

Similar comments may be made regarding employment. The regional economy has generated around 20 000 new jobs per year over the past 15 years. An increase in employment of between 500 and 1000 will not have a noticeable impact on the state of the labour market. This is not to trivialise the impact of the casino. For the people who get the extra jobs, the impact will not be trivial. But in terms of the probability of an arbitrarily selected unemployed person gaining work or of the upward pressure on wages arising from a tighter labour market, the casino will make no perceptible difference. It is for this reason that an input-output analysis, rather than a more sophisticated analysis incorporating macroeconomic closure assumptions, is appropriate.

5. Other issues to be addressed

Analysis thus far has focused on the development of a baseline analysis and models for the estimation of aggregate economic impact. A number of other issues will be dealt with in subsequent work

CBD impact

General analysis of the impact of casino development has been presented in the previous section. The economic component of the analysis will focus on issues such as effects on land prices and the appropriate treatment of spillover effects on patterns of

economic activity within the CBD.

Welfare analysis

Standard economic analysis would suggest that the opening of the casino represents an increase in consumer welfare, since consumers can now consume a service that was not previously (legally) available. To the extent that expenditure is diverted from other gambling services, or from other goods and services, this may be interpreted as an indication that the service provided by the casino is preferred to the items that were consumed previously.

However, the applicability of standard welfare analysis to casino gambling is debatable. There is a widespread view that expenditure on gambling is undesirable, either in itself or because expenditure is diverted from more desirable ends. There are also issues of distribution of resources within households. Casino gambling expenditure is undertaken exclusively by adults and, it appears likely, frequently only by one adult within a household. Substantial levels of gambling expenditure, even if they do not constitute a problem in the perception of the person undertaking the expenditure, may represent a redistribution of resources away from other members of the household, and particularly from children. The view that expenditure on gambling is undesirable is one reason for the acceptance of heavy taxes on gambling.

Microeconomic analysis of employment effects

The input-output modelling described above derives effects on the demand for labour derived from changes in the pattern of final demand for consumption goods. It is also necessary to look at the specific employment relationships within the casino and their effects on labour demand and supply at the micro-economic level. This part of the analysis will involve a comparison between experience at Cairns, where a specific attempt has

been made to provide opportunities for long term unemployed workers, and Brisbane, where no specific program is in place. This analysis will be undertaken primarily in 1997.

Taxation

Gambling is one of the most heavily taxed activities in the Australian economy. There are considerable conceptual difficulties in estimating effective tax rates on gambling and assessing the effects of taxation on economic welfare. These difficulties are complicated by the facts that much taxation takes the implicit form of allocations of monopoly rights and that much revenue is hypothecated to specific projects. The taxation of casinos in Queensland has been undertaken on a case-by-case basis. In addition to a general revenue payment, casinos are required to contribute to a community development fund.

Information on Queensland casino license conditions and tax rates				
	Jupiters Casino Gold Coast	Breakwater Casino Townsville	Treasury Casino Brisbane	Reef Casino Cairns
Opening date	November 1985	May 1986	April 1995	January 1996
Operator	Conrad International Hotels Corp.	Sheraton Pacific Hotels P/L	Conrad International Hotels Corp.	Casinos Austria International (Cairns) P/L
Number of tables	101	32	101	50
Number of machines	1083	274	1224	540
Tax rate (per cent of gross winnings)	20	10	20	10
Community benefit levy (per cent of gross winnings)	1	1	1	1
Casino licence fee (\$ '000 per quarter)	125	125	125	125
Number of hotel rooms	605	192	136	128
Source:				

Casino tax revenues		
Year ending May	Casino tax revenue (\$ million)	Community benefit levy revenue (\$'000)
1986	8.8	438
1987	17.9	959
1988	22.8	1210
1989	27.9	1479
1990	31.6	1672
1991	34.2	1807
1992	36.5	1924
1993	38.4	2023
1994	45.5	2380
1995	49.3	2586
Total at May 1995	315.3.3	16479

6. Concluding comments

The purpose of this draft report has been to estimate the impact of the Brisbane casino on the regional economy. The results serve primarily as a background for exploration of the social and political issues raised by the casinos.

Appendix — Input-output analysis

Analysing the impact of projects such as casinos is complicated because of the complex relationships that make up the economy itself. Most importantly, projects purchase inputs from a wide variety of suppliers who in turn purchase inputs from others and so on. Produced inputs to production are referred to as intermediate outputs. The existence of intermediate outputs has two main implications. First, not all of the output of a new project represents an increase in final output. The contribution to final output is the difference between total output and consumption of intermediate outputs and is referred to as value-added. The second implication is that a new project will have multiplier effects on the output of other sectors.

There are two⁶ main approaches to formal modelling of the impact of developments such as casinos: input-output models and computable general equilibrium (CGE) models. CGE models. The input-output approach is the simpler of the two.

CGE models are built on the basis of input-output tables. They incorporate more flexible and realistic representations of the technology of production, allowing for substitution between factors of production such as labour and capital. They also take account of the aggregate resource constraints affecting the economy as a whole, allowing wages and returns to capital to adjust in order to satisfy these aggregate constraints, collectively referred to as model closure assumptions.

Although CGE models are more theoretically appealing than input-output models, there are a number of practical difficulties, particularly when modelling small regions of a

⁶ An even simpler approach is informal ‘back of the envelope’ modelling. This was adopted in the McMillen, Ryand and Quiggin (1995) baseline study of the Cairns casino, generating results quite close to those of an IO model based on the same assumptions.

larger economy. First, the effort involved in constructing CGE models is substantial, at least if any effort is made to estimate technological coefficients appropriate to the region in question, rather than simply cutting down a larger CGE to fit the region in question.

Second, because labour and capital flow fairly freely, but not perfectly freely, between regions, the model closure assumptions normally used in CGE models, in which factor supplies are either exogenously fixed or perfectly elastic are not appropriate in regional models. The closure approach used in input-output models, where demand for final consumption is fixed, seems to be a reasonable approximation.

Finally, the output of CGE models is less transparent than that of input-output models. If surprising results emerge it can be very difficult to trace the way in which those results were derived. This means that it is hard to assess whether the results are valid, or are due to inappropriate assumptions.

For these reasons, the input-output approach is adopted here. The basis of input-output analysis is the observation that goods and services are produced using a combination of factor inputs, such as labour and capital, intermediate goods that are themselves produced in the region concerned and intermediate goods imported from other regions. Hence an expansion in the output of one industry will require an expansion in the output of others and so on. This fact can be summarised by an $N \times N$ matrix of input-output coefficients A , where N is the number of industry sectors in the economy and the input-output coefficient A_{ij} is the quantity of the output of the i -th sector required to produce one unit of output in the j -th sector (common practice is to normalise the units of output so that, at current prices, one unit of output is worth \$1 in each sector).

Suppose that final consumption is given by an $N \times 1$ vector Y . The gross output X required to supply this final consumption must include all of the intermediate outputs used in its own production, as well as the final consumption Y . By the definition of the

input-output matrix A , the quantity of intermediate outputs is given by the $N \times 1$ vector AX . Hence

$$X = AX + Y$$

or

$$(I - A)X = Y$$

where I is the $N \times N$ identity matrix. Hence

$$X = (I - A)^{-1}Y$$

The matrix $(I - A)^{-1}$ is often denoted Z and referred to as the ... matrix. The ij entry of the matrix Z is the increase in the final output of commodity i associated with a unit increase in final consumption of commodity j . Assuming units have been chosen so that units of each commodity have the same value, the sum of the entries in the j -th column is therefore the total increase in final output associated with a unit increase in final consumption of commodity j .

Precisely because intermediate goods are used up in production, the change in aggregate output is of only moderate interest. The relevant economic concept of output in a given sector is that of value added, that is, the difference in value between the output of the industry and the value of the intermediate goods consumed as inputs. The value added per unit of output in a given industry is referred to as the initial value added multiplier. To derive the regional value added associated with a given final demand, it is necessary to multiply each of the rows of the matrix Z by the corresponding initial value added multiplier. In a very similar fashion, it is possible to derive predicted initial and final multiplier effects on employment and income.

It should be noted that high output multipliers for a particular industry generally imply that the industry uses large quantities of intermediate inputs and that the associated

initial value added multiplier is therefore small. By construction, the output multiplier must be greater than one, and the initial value added multiplier less than one. Because some inputs are imported from outside the region, the final value added multiplier is also less than one. The average value added multiplier is approximately equal to the share of regional factor inputs in regional output (for the regions used in this analysis around 0.75).

Type II multipliers

In all of the analysis used to derive the multipliers discussed so far, final consumption has been assumed to be determined exogenously. Multiplier effects have been generated solely through the input demands of enterprises. A Keynesian multiplier analysis focuses on effects transmitted through household income. When demand increases, firms not only purchase intermediate goods, they also hire additional labour and make payments to other factors such as capital. The recipients of this income then purchase additional goods and services. In a Keynesian analysis, attention is focused on the resulting multiplier effects.

In terms of the logic of the input-output model, all that is required to incorporate such multiplier effects is to think of the services of input factors as a particular kind of intermediate good. Households produce this good using the components of household consumption as inputs. Hence, we simply add an extra row (containing the value of factor inputs used in each sector and an extra column, containing the proportion of household income allocated to consuming the output of each sector to the matrix A , producing an augmented matrix A^* . The multipliers derived from the associated matrix Z^* are referred to as Type II multipliers, as distinguished from the Type I multipliers obtained using the matrixes A and Z . As with Type I multipliers, it is possible to derive multiplier effects for output, value added, employment and income. Type II value added multipliers may be

greater or less than one. Labor intensive industries will normally have Type II value added multipliers greater than one, while industries that make significant use of imported inputs will have Type II value added multipliers less than one.

Critics of Keynesian macroeconomics argue that the multiplier effects identified in a Type II input-output analysis will be offset by various forms of ‘crowding out’. For example, an increase in the demand for labour in one sector will bid up wages, reducing employment in other sectors. Defenders of the approach suggest that these effects are unimportant in a regional context with relatively free flows of labour and capital between regions. In this paper both Type I and Type II multipliers will be reported, with a primary emphasis on the Type I value added multiplier.