IMPACT OF THE CURRENT GLOBAL FINANCIAL CRISIS ON AUSTRALIA'S AIR PASSENGER MOVEMENTS: A SCENARIO ANALYSIS

(A paper presented at the 32nd Australian Transport Research Forum conference held from 29 September to 1 October 2009 in Auckland)

Krishna Hamal

Bureau of Infrastructure, Transport and Regional Economics
GPO Box 501
Canberra ACT 2601

IMPACT OF THE CURRENT GLOBAL FINANCIAL CRISIS ON AUSTRALIA'S AIR PASSENGER MOVEMENTS: A SCENARIO ANALYSIS

Dr Krishna Hamal
Senior Economist
Bureau of Infrastructure, Transport and Regional Economics
Canberra

ABSTRACT

The number of aircraft movements through Australian airports has been increasing over the last 30 years due to a strong growth in passenger movements, largely due to an increase in the real income level of travelers and competitive airfares resulting from the introduction of low-cost carriers on Australia's domestic and international routes. Since the real income level is the major driver of air passenger movements in Australia, the current Global Financial Crisis (GFC) is expected to have an adverse impact on the number of air passenger movements through Australian capital city airports. This is because the GFC is likely to reduce economic growth, thereby the real income level, in Australia and its trading partners.

In this paper, an attempt has been made to analyse the possible impact of the GFC on the number of air passenger movements through Australian capital city airports. The impact has been analysed as at June 2009 using econometric models and all the required information available at that point of time. The models underline the fact that the number of air passenger movements depends largely on the real income level of passengers, population, prices of travel and accommodation and exchange rates. Results of the impact analysis suggest that the GFC would have a significant downward impact on air passenger movements. The impact would be high in the first few years of the impact period and low in other years.

INTRODUCTION

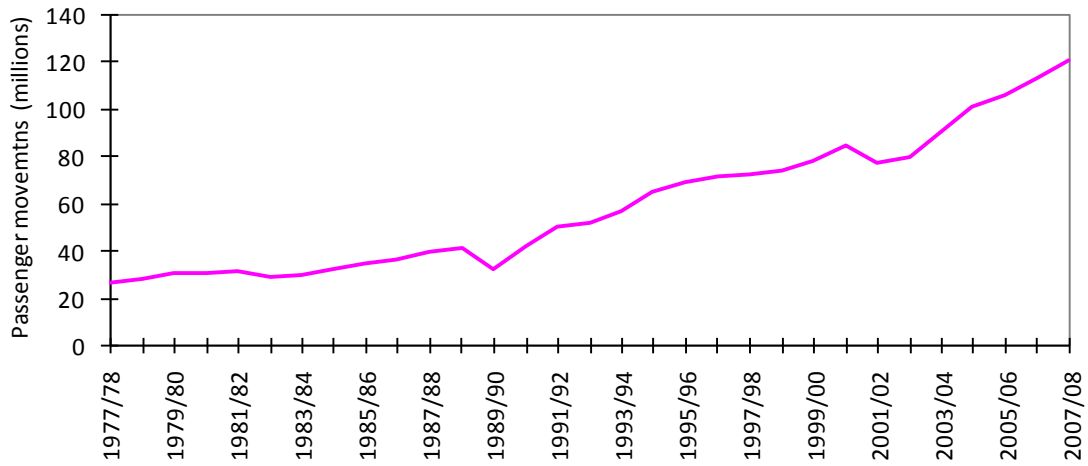
The number of aircraft movements through Australian airports has been increasing over the last 30 years due to a strong growth in passenger movements, largely driven by an increase in the real income level of travelers and competitive airfares. In recent years, airfares have become increasingly competitive with the introduction of low-cost carriers on Australia's domestic and international routes.

Although the number of air passenger and aircraft movements declined sharply in 1989-90 due to the pilots' strike in Australia and in 2001-02 due to the 9/11 terrorist attacks and the collapse of Ansett Australia Airlines, the long term trend in air passenger movements has remained generally positive over the last 30 years. The number of passenger movements increased by an average compound growth rate of 5.2 per cent a year over the last 30 years, from 27 million in 1977-78 to 122 million in 2007-08 (Figure 1).

According to BITRE (2008), real household disposable income, which is positively related to economic growth, is the major driver of air passenger movements through Australian capital city airports. Since the

current Global Financial Crisis (GFC) is expected to lower the economic growth in Australia and its major trading partners, it is expected to have an adverse impact on the number of air passenger movements through Australian capital city airports. In this paper, an attempt has been made to analyse the possible impact of the GFC on the number of air passenger movements through Australia's eight capital city airports (Adelaide, Brisbane, Canberra, Darwin, Hobart, Melbourne, Perth and Sydney). The analysis was carried out in June 2009 using all the required information available at that point of time.

Figure 1: Air passenger movements thorugh all Australian airports



ANALYTICAL METHOD

The impact of the GFC on air passenger movements has been analysed by forecasting air passenger movements under two scenarios: Base case scenario and GFC scenario. The Base case scenario includes economic growth rate assumptions without the GFC influence, whereas the expected GFC influence has been included in the GFC scenario. The assumptions are presented in Figures 2 and 3 and Table 1.

Data on international and domestic passenger movements, population, GDP and the trade weighted index that were used to estimate the passenger movement models and to forecast passenger movement numbers were obtained from ABS (2004), Access Economics (2006 and 2009), BTRE (2009), OECD (2003), Monash University (2008), and Treasury (2009a and 2009b).

The economic growth assumptions suggest that the Australian and the OECD economies would suffer from the Current Global Financial Crisis in 2008-09 and 2009-10. However, these economies are expected to recover from the GFC from 2010-11 onwards. According to forecasts presented by Treasury (2009a and 2009b), the Australian economy is expected to perform strongly from 2011-12 to 2016-17, mainly due to

Australia's banks being in a strong position and Australia's excess mining capacity ready to take advantage of a Chinese economic recovery.

Assumptions on population growth, exchange rates and domestic airfares remain the same under both scenarios. A detailed discussion of these assumptions is presented in BITRE (2008).

Figure 2: Real GDP growth rates: Australia

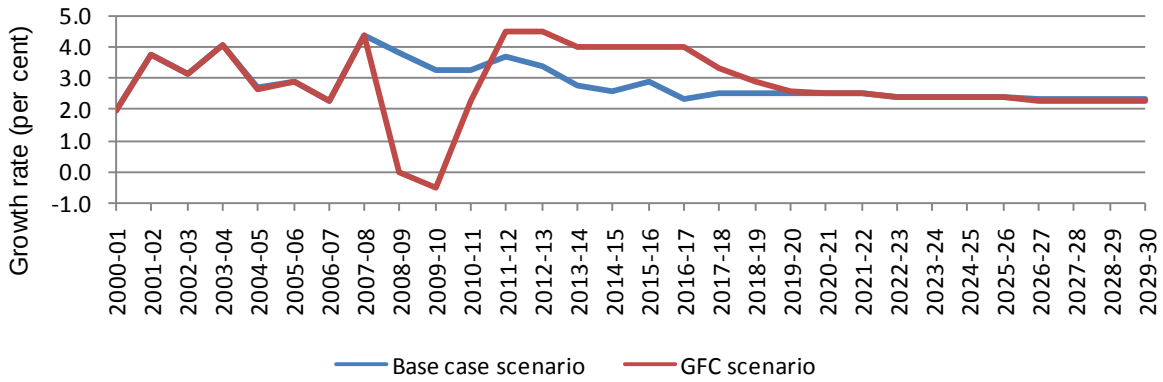
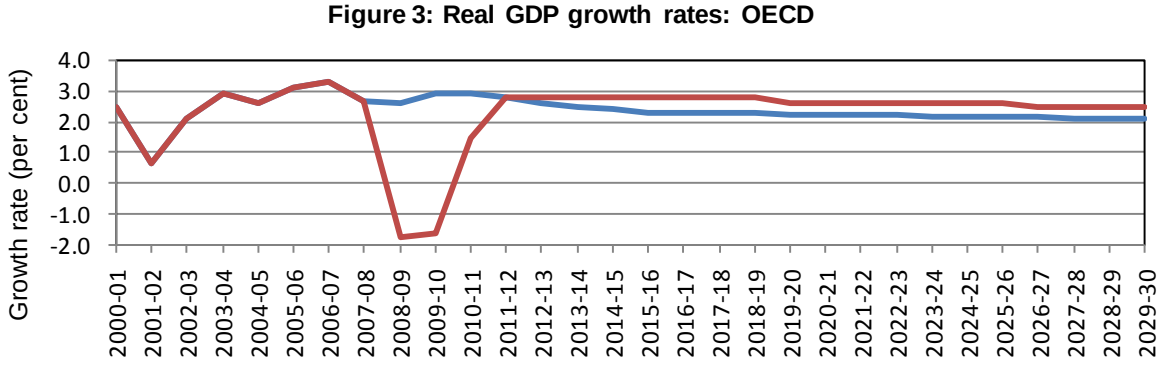


Figure 3: Real GDP growth rates: OECD



The assumptions on economic growth, population, exchange rates and domestic airfares were fitted in the econometric demand models of air passenger movements to develop forecasts of air passenger movements through capital city airports. In this study, single equation econometric models in a double logarithmic linear functional form have been used for forecasting purposes. The models are easy to estimate, provide superior fit and the estimated parameters can be directly interpreted as elasticities. The models have been widely used in many tourism and transport demand forecasting studies, such as Hamal (1997a, 1997b and 2004) and BITRE (2008).

Forecasts of international outbound and inbound and domestic passenger movements were separately developed as they are driven by

different factors. The domestic and international movements of Australian residents are largely influenced by the real income level of Australians, whereas the international movements of overseas visitors to and from Australia are driven mainly by the real income level of overseas visitors.

Table 1: Economic growth rates (per cent)

Year	Australia		OECD	
	Base case scenario	GFC scenario	Base case scenario	GFC scenario
2007-08	4.4	4.4	2.6	2.6
2008-09	**3.8**	**0.0**	**2.6**	**-1.8**
2009-10	**3.3**	**-0.5**	**2.9**	**-1.7**
2010-11	**3.3**	**2.3**	**2.9**	**1.4**
2011-12	**3.7**	**4.5**	**2.8**	**2.8**
2012-13	**3.4**	**4.5**	**2.6**	**2.8**
2013-14	**2.8**	**4.0**	**2.5**	**2.8**
2014-15	**2.6**	**4.0**	**2.4**	**2.8**
2015-16	**2.9**	**4.0**	**2.3**	**2.8**
2016-17	**2.3**	**4.0**	**2.3**	**2.8**
2017-18	**2.5**	**3.3**	**2.3**	**2.8**
2018-19	**2.5**	**2.9**	**2.3**	**2.8**
2019-20	**2.5**	**2.6**	**2.3**	**2.6**
2020-21	**2.5**	**2.5**	**2.3**	**2.6**
2021-22	**2.5**	**2.5**	**2.2**	**2.6**
2022-23	**2.4**	**2.4**	**2.2**	**2.6**
2023-24	**2.4**	**2.4**	**2.2**	**2.6**
2024-25	**2.4**	**2.4**	**2.2**	**2.6**
2025-26	**2.4**	**2.4**	**2.2**	**2.6**
2026-27	**2.3**	**2.3**	**2.2**	**2.5**
2027-28	**2.3**	**2.3**	**2.1**	**2.5**
2028-29	**2.3**	**2.3**	**2.1**	**2.5**
2029-30	**2.3**	**2.3**	**2.1**	**2.5**
Average annual	2.7	2.7	2.4	2.2

*Numbers in bold are forecasts

The model of outbound, inbound and domestic passenger movements is specified in equations 1, 2 and 3 respectively.

$$\ln PCIMAR_{it} = \beta_{0i} + \beta_{1i} \ln PCRGDPAU_t + \beta_{2i} \ln RPOTA_{it} + \beta_{3i} DASIAN_t + \beta_{4i} DSEP11_t + \varepsilon_t \quad (2.2)$$

$$\ln PCIMOV_{it} = \alpha_{0i} + \alpha_{1i} \ln PCRGDPOE_t + \alpha_{2i} \ln TWIAU_t + \alpha_{3i} \ln RPDTA_{it} + \alpha_{4i} DSARS_t + \alpha_{5i} DSEP11_t + \alpha_{6i} DOTHER_t + u_{it} \quad (2.1)$$

$$\ln PCDAPM_{it} = \gamma_{0i} + \gamma_{1i} \ln PCRGDPAU_t + \gamma_{2i} \ln RDDAFAU_t + \gamma_{3i} RPDTA_{it} + \gamma_{4i} DOLYMPIC_t + \gamma_{5i} DSEP11_t + v_t \quad (2.3)$$

Where:

- $PCIMAR_i$ = Per capita international movement of Australian residents through the ith airport in thousands

- $PCIMOV_i$ = Per capita international movements of overseas visitors through the ith airport in thousands
- $PCDAPM_i$ = Per capita domestic airline passenger movements through the ith airport in thousands, and this variable includes the passenger movements of both domestic and regional airlines
- PCRGDPAU = Per capita real GDP in Australia in billion dollars
- PCRGDPOE = Per capita real gross domestic product (GDP) in OECD countries in billion US dollars
- TWIAU = Trade weighted index of Australia
- $RPOTA_i$ = Ratio of the price of overseas travel and accommodation to the price of domestic travel and accommodation in the ith capital city
- $RPDTA_i$ = Ratio of the price of domestic travel and accommodation in the ith capital city of Australia to the domestic price of travel and accommodation in the OECD countries
- RDDAFAU = Real discounted domestic airfare in Australia, $RPDTA_{ij}$ = Ratio of the price of domestic travel and accommodation in the ith capital city to the price of domestic travel and accommodation in all other capital cities
- DASIAN = Dummy variable to capture a large variation in international movements of Australian residents following the Asian financial crisis
- DSARS = Dummy variable to capture a large variation in international movements of overseas visitors following the SARS incident
- DSEP11 = Dummy variable to capture a large variation in international movements of overseas visitors following the 9/11 terrorism incident in the USA
- DOLYMPIC = Dummy variable to capture a large variation in domestic passenger movements due to the Sydney Olympic Games in 2000
- DOTHER = Dummy variable to capture a large variation in international movements of overseas visitors due to some other possible event/incident
- ε, u and v = Error terms
- β's, α's and γ's = Regression coefficients
- i = ith airport (that is, Adelaide, Brisbane, Canberra, Darwin, Hobart, Melbourne, Perth, Sydney and other airports)
- t = Time subscript.

Population is included on a per capita basis to avoid the consequences of possible collinearity between population and real income. Real GDP is used as proxy for the real income variable. The Trade Weighted Index (TWI) which is also known as the effective exchange rate is used rather than a single country exchange rate to reflect the average

movement in exchange rates between the Australian dollar and the currency of Australia's trading partners.

Since the OECD countries account for around 70 per cent of Australia's total overseas visitor arrivals, the population and real income of the OECD countries are used as proxies for the population and real income of overseas visitors to Australia.

A detailed discussion of the models and their estimated regression statistics including income elasticities is presented in BITRE (2008). In this paper, the estimated income elasticities that were used to analyse the impact of the GFC on passenger movements are presented in Table 2. Since the above econometric models are presented in a double logarithmic functional form, the estimated values of regression coefficients, β's, α's and γ's, are directly interpreted as elasticities.

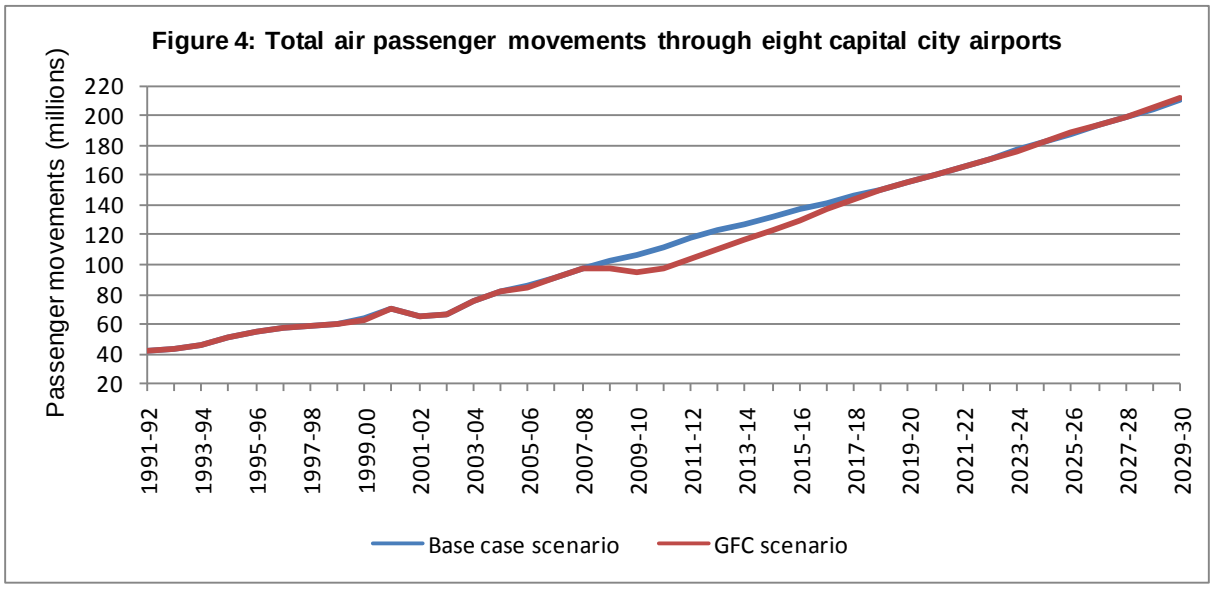
Table 2: Income elasticities of air travel demand

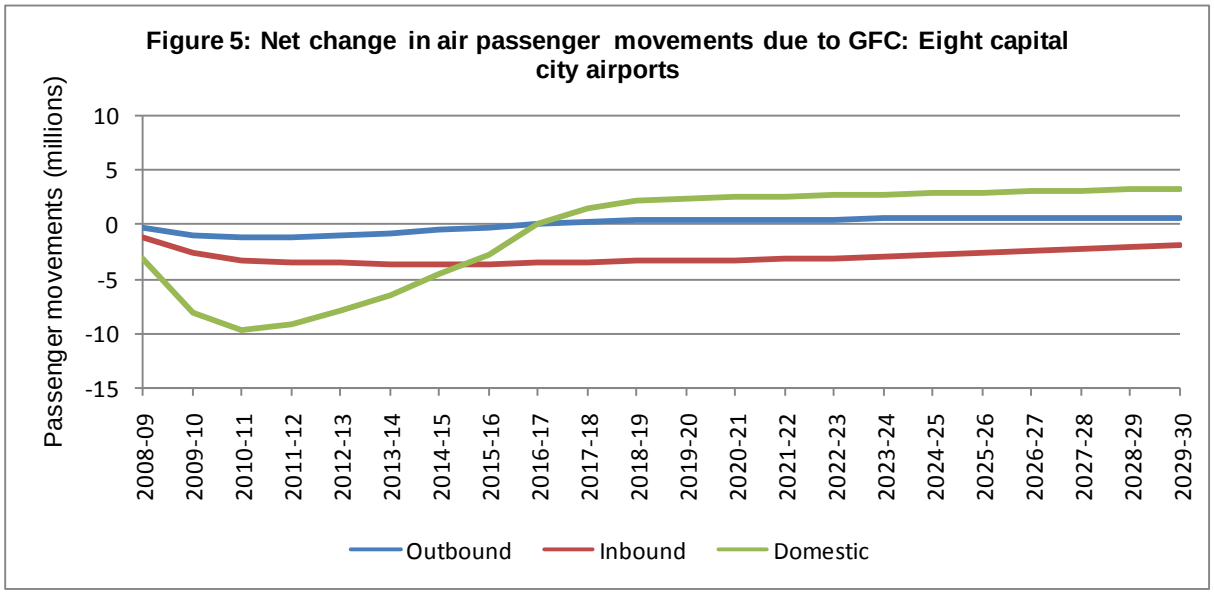
Airport	Outbound	Inbound	Domestic
Adelaide	1.754	1.699	1.395
Brisbane	1.646	2.429	2.004
Canberra	na	na	1.291
Darwin	0.776	1.696	1.634
Hobart	na	na	1.307
Melbourne	1.164	3.469	1.591
Perth	1.530	2.796	2.044
Sydney	1.622	2.100	1.457

na = Not applicable

RESULTS

Results of the impact analysis suggest that the impact of the GFC is significantly high during the first few years of the forecast period, and then it declines slowly over the forecast period (Figure 4 and Tables 3 and 4). The number of air passenger movements through the eight capital city airports over the next 22 years would be around 83.1 million fewer than the number given under the base case scenario. This includes a net loss of 1.2 million in outbound movements, 65.3 million inbound movements and 16.5 million in domestic movements. The impact would be relatively large on domestic movements in the first three years of the forecast period but it would decline from 2011-12 onwards as the Australian economy is expected to achieve a strong growth of 4.5 per cent in 2011-12 and 2012-13 and 4 per cent from 2013-14 to 2016-17 (Figure 5).





CONCLUSIONS

This paper presents an analysis of the possible impact of the current Global Financial Crisis (GFC) on the number of air passenger movements through Australian capital city airports, using econometric models. According to results of the analysis, the impact of the GFC is significantly high during the first few years of the forecast period, and then it declines slowly over the forecast period. The number of air passenger movements through the eight capital city airports over the next 22 years would be around 83.1 million fewer than the number given under the base case scenario. This includes a net loss of 1.2 million in outbound movements, 65.3 million inbound movements and 16.5 million in domestic movements.

Table 3: International air passenger movements (millions): Eight capital city airports

	Outbound			Inbound		
Year	GFC scenario	Base case scenario	Difference*	GFC scenario	Base case scenario	Difference*
2007-08	11.4	11.4	0.0	11.1	11.1	0.0
2008-09	**11.1**	**11.5**	**-0.4**	**11.4**	**12.6**	**-1.2**
2009-10	**11.0**	**12.0**	**-1.0**	**10.7**	**13.3**	**-2.6**
2010-11	**11.3**	**12.5**	**-1.3**	**10.8**	**14.1**	**-3.3**
2011-12	**12.0**	**13.2**	**-1.2**	**11.3**	**14.8**	**-3.5**
2012-13	**12.8**	**13.8**	**-1.0**	**12.0**	**15.6**	**-3.6**
2013-14	**13.4**	**14.3**	**-0.8**	**12.7**	**16.4**	**-3.6**
2014-15	**14.2**	**14.7**	**-0.6**	**13.5**	**17.1**	**-3.7**
2015-16	**15.0**	**15.3**	**-0.3**	**14.2**	**17.8**	**-3.6**
2016-17	**15.8**	**15.8**	**0.0**	**15.0**	**18.6**	**-3.5**
2017-18	**16.6**	**16.3**	**0.2**	**15.8**	**19.3**	**-3.4**
2018-19	**17.2**	**16.9**	**0.3**	**16.7**	**20.1**	**-3.4**
2019-20	**17.8**	**17.5**	**0.4**	**17.5**	**20.8**	**-3.3**
2020-21	**18.4**	**18.0**	**0.4**	**18.4**	**21.6**	**-3.3**
2021-22	**19.1**	**18.7**	**0.4**	**19.2**	**22.4**	**-3.2**
2022-23	**19.7**	**19.3**	**0.4**	**20.2**	**23.3**	**-3.1**
2023-24	**20.3**	**19.9**	**0.4**	**21.1**	**24.1**	**-2.9**
2024-25	**21.0**	**20.5**	**0.4**	**22.2**	**25.0**	**-2.8**
2025-26	**21.6**	**21.2**	**0.5**	**23.2**	**25.9**	**-2.6**
2026-27	**22.3**	**21.8**	**0.5**	**24.2**	**26.6**	**-2.5**
2027-28	**23.0**	**22.5**	**0.5**	**25.1**	**27.4**	**-2.3**
2028-29	**23.7**	**23.2**	**0.5**	**26.1**	**28.2**	**-2.1**
2029-30	**24.4**	**23.9**	**0.5**	**27.2**	**29.1**	**-1.9**
Total	**381.7**	**382.9**	**-1.2**	**388.6**	**453.9**	**-65.3**

*Difference in passenger numbers between GFC scenario and base case scenario.
**Numbers in bold are forecasts as at June 2009.

The expected down turn in the number of air passenger movements will have direct implications for the airline and tourism industries. Airlines operating over the Australian sky may reduce their routes and flight frequencies for a period. A further research study would be needed to examine the magnitude of the GFC impact on the performance of the airline and tourism industries, especially in relation to their financial returns and employment levels.

Further, the numbers presented in this study need to be considered cautiously as there is still uncertainty about the expected rate of economic recovery from the GFC. The Australian economy has proved resilient and recent comments on economic growth by the leading financial institutions, including the International Monetary Fund, suggest that economic growth in many countries is expected to be much better than predicted in June 2009 when the analysis in this paper was carried out. Hence, the estimated adverse impact of the GFC on air passenger movements through Australia's capital city airports presented in this paper could be slightly greater than actual outcomes in the coming years.

Table 4: Domestic and total air passenger movements (millions): Eight capital city airports

	Domestic			Total		
Year	GFC scenario	Base case scenario	Difference*	GFC scenario	Base case scenario	Difference*
2007-08	74.4	74.4	0.0	96.8	96.8	0.0
2008-09	**74.3**	**77.4**	**-3.1**	**96.8**	**101.5**	**-4.7**
2009-10	**72.8**	**80.8**	**-8.0**	**94.5**	**106.1**	**-11.7**
2010-11	**74.7**	**84.4**	**-9.7**	**96.8**	**111.0**	**-14.2**
2011-12	**79.6**	**88.7**	**-9.1**	**103.0**	**116.7**	**-13.7**
2012-13	**84.9**	**92.8**	**-8.0**	**109.6**	**122.2**	**-12.6**
2013-14	**89.8**	**96.3**	**-6.5**	**115.9**	**126.9**	**-10.9**
2014-15	**95.0**	**99.4**	**-4.4**	**122.6**	**131.3**	**-8.7**
2015-16	**100.4**	**103.2**	**-2.8**	**129.6**	**136.3**	**-6.7**
2016-17	**106.2**	**106.2**	**0.0**	**137.1**	**140.6**	**-3.5**
2017-18	**111.0**	**109.6**	**1.4**	**143.4**	**145.2**	**-1.8**
2018-19	**115.3**	**113.1**	**2.2**	**149.3**	**150.1**	**-0.8**
2019-20	**119.2**	**116.8**	**2.5**	**154.6**	**155.1**	**-0.5**
2020-21	**123.1**	**120.5**	**2.5**	**159.9**	**160.2**	**-0.3**
2021-22	**127.0**	**124.4**	**2.6**	**165.3**	**165.5**	**-0.2**
2022-23	**130.9**	**128.2**	**2.7**	**170.7**	**170.7**	**0.0**
2023-24	**134.9**	**132.1**	**2.8**	**176.3**	**176.1**	**0.2**
2024-25	**139.0**	**136.1**	**2.8**	**182.1**	**181.6**	**0.5**
2025-26	**143.2**	**140.3**	**2.9**	**188.1**	**187.3**	**0.8**
2026-27	**147.3**	**144.3**	**3.0**	**193.8**	**192.8**	**1.0**
2027-28	**151.6**	**148.5**	**3.1**	**199.7**	**198.4**	**1.3**
2028-29	**156.0**	**152.8**	**3.2**	**205.8**	**204.2**	**1.6**
2029-30	**160.4**	**157.2**	**3.3**	**212.1**	**210.2**	**1.9**
Total	**2536.7**	**2553.3**	**-16.5**	**3307.1**	**3390.1**	**-83.1**

*Difference in passenger numbers between GFC scenario and base case scenario.
**Numbers in bold are forecasts as at June 2009. Actual domestic passenger movements in 2008-09 totaled 75.6 million (BITRE, Aviation Statistics), 1.3 million more than in the GFC scenario.

REFERENCES

ABS (2004), *Population Projections,* Australian Bureau of Statistics, Canberra.

Access Economics (2006), *Business Outlook*, March quarter, Access Economics, Canberra.

Access Economics (2009), *Business Outlook,* March issue, Access Economics, Canberra.

BITRE (2008), *Air passenger movements through capital city airports to 2025-26,* Working Paper 72, Bureau of Infrastructure, Transport and Regional Economics, Canberra.

BITRE (2009), *Airline database,* unpublished data, Bureau of Infrastructure, Transport and Regional Economics, Canberra.

Hamal, K. (1997a), *Substitutability Between Domestic and Outbound Travel in Australia,* Pacific Tourism Review 11, 23-33.

Hamal, K. (1997b), *Modelling Domestic Holiday Tourism Demand in Australia: Problems and Solutions*, Asia Pacific Journal of Tourism Research 12, 35-46.

Hamal, K. (2004), *Forecasting container and freight ship movements on international routes to and from Australia,* a paper presented at the 27th Australian Transport Research Forum conference, 29 Sept - 1 Oct 2004 Adelaide: ATRF.

Monash University (2008), MMRF Model, Centre for Policy Studies and IMPACT Project, Monash University, Melbourne.

OECD (2003), *Quarterly Labour Force Statistics,* No. 3 Paris: Organisation for Economic Co-operation and Development.

Treasury (2008), *Australia's Low Pollution Future: The Economics of Climate Change Mitigation,* Commonwealth of Australia, Canberra.

Treasury (2009a), *Budget 2009,* Commonwealth of Australia, Canberra.

Treasury (2009b), *Economic growth projections,* The Australian, May 2009.