# RBA ECONOMICS COMPETITION 2010

*Australia's Real Exchange Rate*

## Second Prize

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# Australia's Real Exchange Rate

Australia's real exchange rate has appreciated significantly over the past decade or so, driven largely by a massive increase in the terms of trade and bringing with it benefits and challenges for the broader economy. Many variables have been identified as correlating with the real exchange rate, including productivity, inflation and investor perceptions. Through a combination of flexible labour markets, a floating exchange rate and prudent fiscal and monetary policy we have coped with these pressures admirably.

## Real Exchange Rate Appreciation

It is clear that the Australian dollar has appreciated in real terms over the past decade or so. The real exchange rate represents the relative purchasing power between one country and the outside world. If the variation in the nominal exchange rate equals the inflation differential between two countries the real exchange rate will be constant, if all else is equal. But all else is not equal. Australia's real exchange rate has been exposed to short term volatility and long term trends that have a significant impact on the relative competitiveness of goods and services.

Unfortunately, the real exchange rate cannot be directly observed, so proxies must be developed to provide an observable measure (Ellis, 2001). While determining these proxies is not without difficulty, the important measures paint a clear picture. The most commonly used measure of the real exchange rate, the Real Trade Weighted Index (real TWI), has increased by approximately 46% over the ten years to June 2010. While it has its pros and cons, the real TWI is popular as it measures Australia's exchange rate as a basket of currencies, weighted according to their relative shares of trade and allowing for relative changes in inflation. This has allowed for the relative importance of our East Asian trading partners to increase.

Graph 1 shows that both the nominal and real exchange rates have increased dramatically over the past fifteen years or so. While there was a sudden and precipitous drop at the time of the Global Financial Crisis (GFC), both have since returned almost to their pre-GFC levels.

1995=100
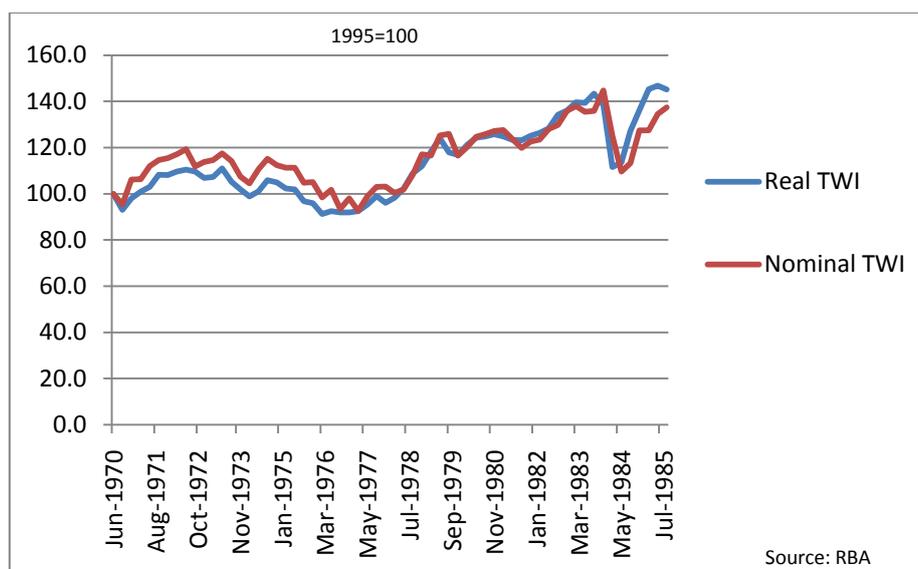
Graph 1

## Real Exchange Rate Drivers

There are many variables that at different times have been shown to have an influence on the real exchange rate. The most important of these are the terms of trade, productivity, inflation, interest rate differentials, net foreign assets and portfolio decisions.

In an open economy with a large share of exports driven by commodities, the terms of trade is perhaps the most important influence for the real exchange rate. Indeed the recent appreciation has been driven by massive increases in the terms of trade over the last decade or so, this rise being primarily due to the run up in prices of Australia's main export commodities. In 2005 price rises of 120 percent and 70 percent were seen in coking coal and iron ore respectively (RBA 2005). As a result, the terms of trade rose by approximately 75%, over the period between 2001 and 2007.

The directional influence is clear despite a weakening of the correlation over the period, particularly in the late 1990s/early2000s period. Between the beginning of the commodities boom in 2002 and the beginning of the GFC in late 2007, the real exchange rate appreciated by 46%. Much of this rise can be attributed to the terms of trade increase although other factors are considered below. The impact of a terms of trade boom is considered in the next section.

**Terms of Trade and Real TWI**

Quarterly, 1990 = 100
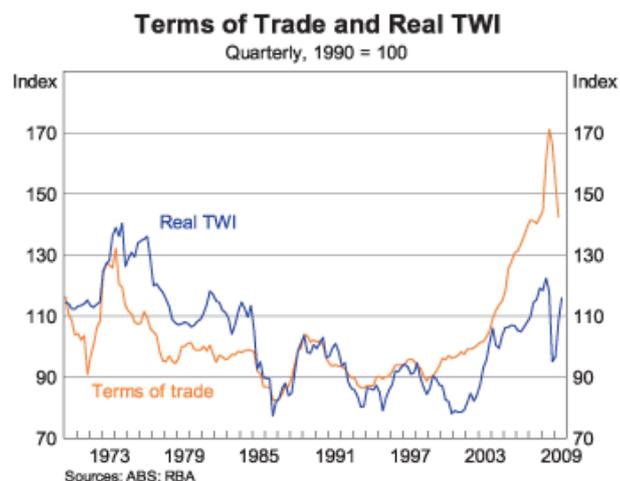


Graph 2

Relative productivity is an important long run driver of real exchange rates. Economies that experience large relative productivity growth will experience an appreciation of their exchange rates. The relationship, though, is not simple and depends on which sector experiences the productivity growth. If the growth occurs in the non-traded sector, then it can, in fact, lead to a depreciation of the real exchange rate (Gruen 2001). The overall impact on the real exchange rate depends on the differentials between the traded and non-traded sectors of the economy (Balassa 1964 and Samuelson 1964). In Australia's recent experience, large improvements in productivity in the Chinese traded goods sector may have applied downward pressure to the real exchange rate as our relative productivity declined. This variable may help to explain why the real exchange rate has not risen completely in line with the terms of trade but it is still not as influential.

Inflation has long been identified as a driver of exchange rates; however, its influence on the real exchange rate in the long term is fairly limited. Purchasing power parity suggests that the exchange rate between two countries will adjust to ensure their relative purchasing power is held constant. Although this theory is intuitively appealing, empirical support has been limited (Rogoff 1996). The law of one price, a key platform for purchasing power parity, has been very difficult to prove. There is some evidence though that relative inflation differentials can influence the real exchange rate in the long run (Rogoff 1996). This influence is less important to the Australian dollar than the terms of trade.

Interest rate differentials have been shown to have a strong correlation with the real exchange rate over certain periods. During the late 1980's the relationship with long interest rate differentials was particularly strong (Blundell-Wignall et al 1993). During the early, and also late, 2000's it is likely that these differentials have played a role (RBA 2010). During these periods the Australian economy was stronger than most OECD economies and relatively higher interest rates likely contributed to the appreciation of the real exchange rate over those periods.

In a floating exchange rate economy the net foreign asset position is not hugely influential on the real exchange rate, however, it can potentially play an important role in influencing portfolio decisions. The net foreign asset position was traditionally at the forefront of considerations about exchange rates and is most important under a fixed exchange rate. 'It should be expected, other things equal, that the higher the level of a country's net foreign assets, the higher will be its real exchange rate…' (Gruen 2001). In Australia's case, where we have a large net foreign liability position, this suggests that there will be downward pressure on the real exchange rate. Gruen (2001) goes on to show, however, that a large and sustained foreign liability position is the likely outcome where an economy is growing consistently. Under the current exchange regime, it is likely that the net foreign liability position will only have a significant impact on the real exchange rate if there were a shock to investor perceptions of risk. This is perhaps a more significant concern for other OECD economies.

Portfolio decisions are also not likely to be an important long term influence on the real exchange rate. They are nevertheless worth mentioning as they may help explain the reduced correlation between the terms of trade and the real exchange rate around the turn of the century. There is anecdotal evidence that Australia was considered an 'old economy' with lower prospects for growth than the United States in particular (RBA 2010). This likely put downward pressure on the real exchange rate. Shortly after the unwinding of the 'old economy' perceptions with the end of the dotcom boom, the real exchange rate regained much of its correlation with the terms of trade.
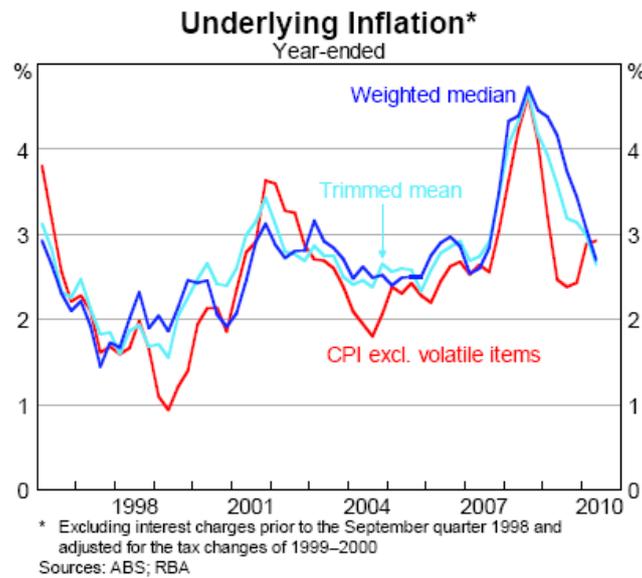
**Implications for Australia**

A terms of trade boom has a significant effect on the real economy. The appreciation reflects the relative increase in value of export goods to import goods. In Australia's case, this is normally driven by fluctuations in export prices due to the relative volatility of commodities. 'An increase in export prices relative to import prices means that a larger volume of imports can be purchased with a given volume of exports, thus increasing the real purchasing power of domestic production.' (RBA 2005) This has a significant income effect on the domestic economy, increasing investment and consumption, and flowing through to inflation and real GDP.

The extent and nature of this impact depends largely upon the exchange rate regime in use. If the real exchange rate rises in line with the appreciation in the terms of trade, the positive income effect for commodity industries will be equalled by the negative impact on other exporters. This necessarily imposes structural changes that can be painful in the short term and does not remove the income effect through lower import prices. Under a fixed exchange rate the full effect of the price rises will be passed through while, at the same time, other exporters maintain their relative competitiveness. As these various sectors of the economy compete for resources, prices inevitably rise. There are also leakages of income from the private sector through foreign ownership and government taxes. As long as export prices remain high much of this income finds its way back into the system through consumption and investment spending to develop resources. During previous terms of trade booms, in the 1950's and 1970's in particular, Australia's exchange rate was pegged to the GB£. Significant increases in inflation were experienced at these times. Under a fixed exchange rate regime, fiscal policy makers must work harder to tune policy settings to the effects of increases in income.

With a floating exchange rate, the current terms of trade boom is not being felt to the same extent. As the terms of trade has risen the nominal and real exchange rates have done likewise. This has reduced the relative value of domestic goods, encouraging substitution with imported goods and helping to keep a lid on inflation. The boost in incomes has not been entirely dampened, however, and significant adjustments have been made throughout the economy.

As Graph 3 shows, inflation threatened to break out of control in 2008, before falling back within the target band. The Global Financial Crisis may, in hindsight, have provided a useful dampener for inflation before expectations could adjust upwards.



**Underlying Inflation***
Year-ended

* Excluding interest charges prior to the September quarter 1998 and adjusted for the tax changes of 1999–2000
Sources: ABS; RBA

Graph 3

As the relative value of commodities increased, significant investment was made to build capacity and infrastructure in these increasingly profitable industries. Graph 4 shows the extraordinary increase in annual capital expenditure in the mining sector over the past decade, while Graph 5 shows that investment as a percentage of GDP grew strongly over the period between 2001 and 2008. The increase in world commodity prices encouraged exporters to develop previously unprofitable resources and export the largest volume possible from developed resources. This extraordinary increase in activity meant capacity was strained throughout the economy.

**Capital Expenditure Survey**
Current prices



**Investment***
Per cent of GDP, current prices
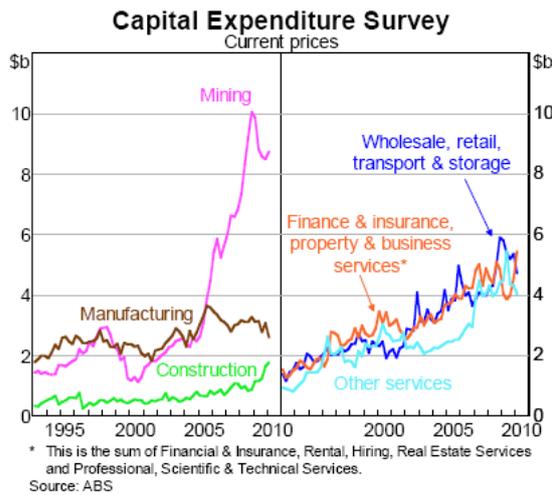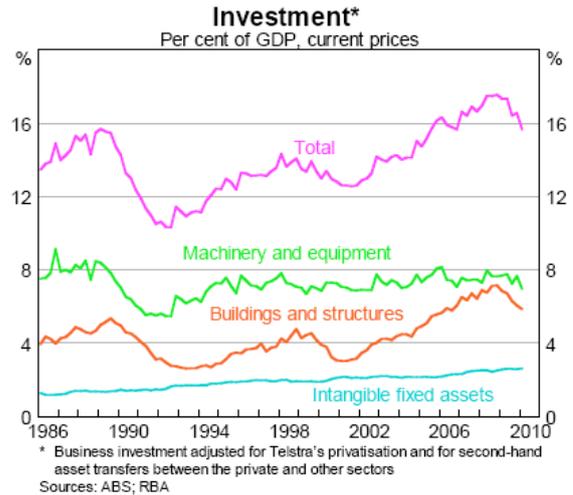


Graph 4                                    Graph 5

As Graphs 6 and 7 show, wage growth was consistently high over the same period as unemployment continued to fall, even despite increases in labour force participation. Increases in employment, coupled with rising wages, provided a significant income effect throughout the economy. Labour market reforms instituted by the Hawke-Keating and Howard governments were no doubt very important in ensuring that wage claims did not increase more dramatically. Flexibility was essential in an environment where various sectors of the economy were making extraordinary demands for increased productive capacity.

**Non-farm Nominal Unit Labour Costs**
Percentage change



**Labour Force**
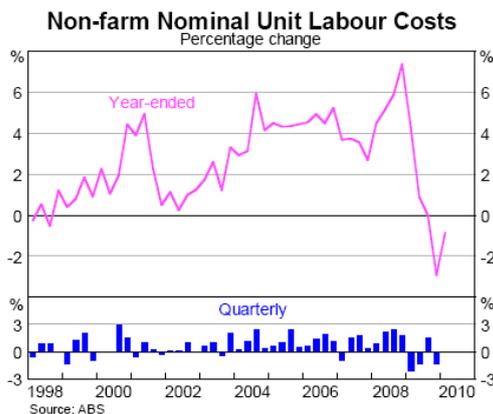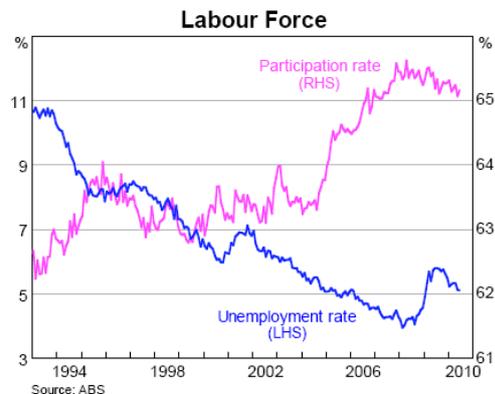


Graph 6                                    Graph 7

Structural change of this nature naturally brings with it significant adjustments throughout the economy. The 'two-speed' economy was well documented as the resource rich states

experienced a larger share of the rapid investment and consumption increases.[1] Graph 8 shows the relatively higher employment growth in Queensland and Western Australia. At the same time, it is important to note that employment levels grew strongly across all states ensuring the income effect was felt nationwide.
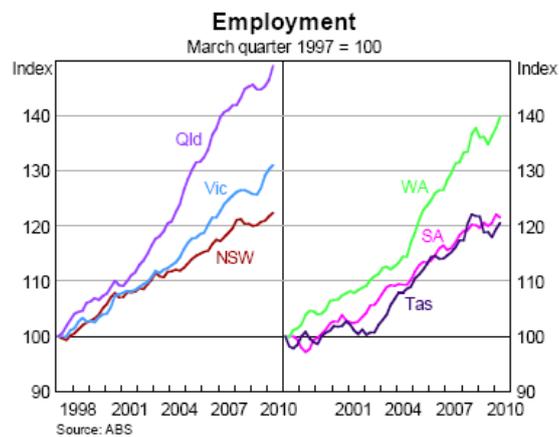


Graph 8

With commodity prices having returned to near their 2007 highs, these trends look set to continue. The GFC downturn in production means the economy is no longer at full capacity, allowing some growing room again.

**Conclusion**

It is clear then that Australia has experienced a significant and sustained shock to income levels through the terms of trade boom and corresponding increase in the real exchange rate. Due to the flexible labour markets, inflation targeting regime, a flexible exchange rate and responsible fiscal policy, Australia has so far handled the shock very well. Looking to the future, it is worth noting at this point that terms of trade booms have historically unwound rapidly. This time may indeed be different, being driven by structural demand changes from the emerging economies, but it is important not to allow ourselves to become complacent. In any case, the recent record should give us encouragement about the ability of the Australian economy to handle large movements in the real exchange rate.

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[1] See for example (Stevens 2008) for some discussion of 'blunt' instruments.

# References:

Balassa B., (1964), 'The Purchasing-Power Parity Doctrine: A Reappraisal', *Journal of Political Economy*, 72, pp 584–596.

Blundell-Wignall A., Fahrer and Heath (1993), 'The Exchange Rate, International Trade and the Balance of Payments', in A Blundell-Wignall (ed), *Major Influences on the Australian Dollar Exchange Rate*, Proceedings of a Conference, Reserve Bank of Australia, Sydney, pp 30–78.

Ellis, L., (2001), 'Measuring the real exchange rate: pitfalls and practicalities', *Reserve Bank of Australia Research Discussion Paper* RDP2001-04.

Gruen D., (2001), 'Some Possible Long-term Trends in the Australian Dollar', Reserve Bank of Australia *Bulletin* December, pp 30–41.

Gruen D. and Wilkinson J. (1991, 'Australia's real exchange rate – is it explained by the terms of trade or by real interest differentials?', *Reserve Bank of Australia Research Discussion Paper* RDP1991-08

Reserve Bank of Australia (RBA), (2005), 'Commodity Prices and the Terms of Trade', Reserve Bank of Australia *Bulletin*, April, pp 1–7

Reserve Bank of Australia (RBA), (2010), 'The Exchange Rate and the Reserve Bank's Role in the Foreign Exchange Market', viewed 16 August 2010. http://www.rba.gov.au/mkt-operations/foreign-exchg-mkt.html

Rogoff, K., (1996), 'The Purchasing Power Parity Puzzle', *Journal of economic literature*, 34(2), pp 647-668.

Samuelson, P., (1964), 'Theoretical Notes on Trade Problems', *Review of Economics and Statistics*, 46, pp 145–154.

Stevens, G., (2008), 'Monetary Policy and Inflation: How Does it Work?', Speech at the *Australian Treasury Seminar Series* 11 March, Canberra.

Stone A., Wheatley, T., and Wilkinson L., (2005), 'A Small Model of the Australian Macroeconomy: An Update', *Reserve Bank of Australia Research Discussion Paper* RDP2005-11.