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Global Economy and the Australian Dollar

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The Australian dollar is known as a commodity currency because it is sensitive to fluctuations of commodity prices. Although the structure of Australian production has historically moved from the primary commodities to manufacturing and services, market expectations of the currency are still strongly influenced by the variation of the commodities' prices. Recent evidence show that the Australian dollar has fluctuated in response to the growth of the Chinese economy. The empirical results from this study show that commodity prices as represented by oil price changes and the growth of China's economy are the most important variable influencing the Australian currency.

***Keywords**: Australian dollar, world growth rate, China's growth rate, oil prices, commodity prices*

***JEL Classification:** E41, E44, F31, F41, F43, Q41*

1. Introduction

It is well documented that Australian dollar fluctuations are influenced by commodity prices, which in turn are sensitive to the state of the global economy. Although the structure of Australian production has moved historically from the primary commodities to manufacturing and services, market expectation of the currency is sill strongly influenced by the variation of the prices of commodities. Recent evidence indicates that the Australian dollar has fluctuated in response to the growth of the Chinese economy. China is the largest importer of Australian mining products. Furthermore, the Australian currency has reacted to the variation of oil prices since the price of oil is the most important item in the basket of commodities.

The Australian economy was little affected by the global recession in 2008. However, the Australian dollar depreciated significantly when the global economy was depressed. The exchange rate against the US$ (US per Australian) in December 2006 was 0.7913 and reached 0.6028 in December 2008. The TWIs for the same two dates were 64.9 and 55.6 respectively. These depreciations were helpful to insulate the Australian economy against the global external shock in 2008. Similar developments occurred during the 1997 – 1999 Asian crises. Currently in May 2017 the US$ (US per Australian) is 0.7444 while the TWI is 63.9.

The purpose of this paper is to examine the effects of changes in the global (and US) and the Chinese economies on the Australian currency. Some graphical time series data and the review of literature are presented in Section 2. The theoretical model is developed in Section 3. The empirical results are discussed in

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Section 4. Some broader policy themes are introduced in Section 5 and summary and concluding remarks are offered in Section 6.

2. Time-Series Data and Review of Literature

A graphical presentation of the Australian dollar and the growth rates of the world and US are shown in Figure 1.

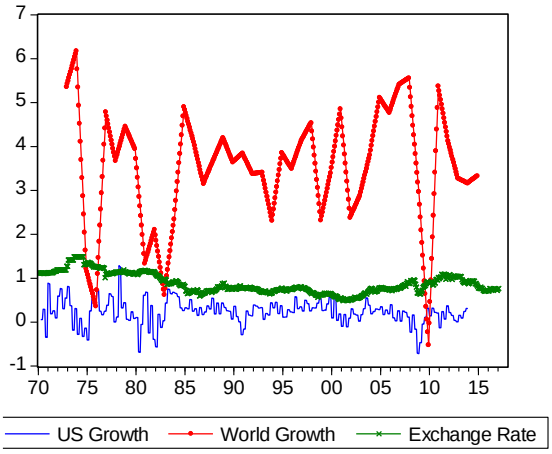

Figure 1. *World Growth US Growth and Exchange Rate*

The time series in the above graph are annual data collected from the World Bank national accounts data, OECD National Accounts and Reserve Bank of Australia data files.

Visual inspection of Figure 1 indicates a rough positive relationship between movements of the Australian dollar and growth rates. Coefficients of correlation between the Australian dollar exchange rate and growth rates of the world and the US real GDP were 0.16 and 0.39 respectively. These positive coefficients indicate that over the period of 1985 to 2015 the Australian dollar exchange rate (price of domestic currency) and global growth moved in the same direction. The starting point of the sample period was chosen as 1985 because the Australian dollar was floated in December 1983.

Much of the literatures in this area concentrate on the relationship between the Australian dollar and commodity prices. Bahr (2015) showed that the Australian dollar exchange rate was correlated with non-rural commodity prices since the commodity boom in 2000. Monadjemi (2016) showed that Australian dollar fluctuations are influenced by changes in the price of oil. Oil prices in turn react to changes in the state of the global economy. Monadjemi (2017) argued that unlike the oil price shock of the early 1970s, oil price changes do not exert significant influence on global output. Oil prices are the leading item in the basket of commodity prices. The approach of this study is to establish a relationship between oil prices and the global economy and then move directly to the relationship between the growth of the global economy and the Australian dollar exchange rate.

Yu, Rogoff and Rossi (2008) showed that the exchange rates of some small commodity exporters have a strong correlation with commodity prices. The authors also demonstrated that commodity prices Granger-cause exchange rates in the sample period, provided that structural breaks are taken into consideration. The study included the currencies of Australia, Canada, New Zealand, South Africa and Chile. In these commodities exporting countries changes in global commodity prices affects country's terms of trade which in-turn influences exports of that country. The authors suggest that one may extend the approach to consider countries that have few or no commodities, such as some Asian and European countries, to examine if commodity prices affect the value of their currencies, and if their currency fluctuations may offer forecasting power for, say, oil prices.

3. Theoretical Discussion

A VAR model is employed to investigate the relationship between the Australian dollar exchange rate and the global economy. In a VAR model, every variable is a function of its lagged values and lagged values of other variables in the model.

A VAR model based on k variables is presented in equation 1.

$$Y_t = c_t + A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots\ldots + A_p Y_{t-p} + U_t \quad (1)$$

The above model is p order, VAR(p), Y_t is a kx1 vector of variables where for example, $Y_{i,t}$ is ith variable at time t, c_t is a kx1vector of constants, A_i is kxk time invariant matrix multiplied by kx1 vector Y_{t-i} lagged values of variables and U_t is the vector of white- noise error terms. The model in equation 1 is p order VAR where each variable is lagged 1 to p period.

Assume that the exchange rate is influenced by the global output, oil prices (representing commodity prices) and the China's rate of growth. A VAR model based on four variables is presented in equation 2.

$$Y_t = c_t + AY_{t-1} + e_t \quad (2)$$

Where Y_t is a kx1 vector of four variables, c_t is a kx1 vector, A is a 4x4 matrix, Y_{t-1} is a vector of 4x1 lagged variables and e_t is 4x1 vector of white- noise error terms.

The results of VAR are useful for forecasting but convey little information regarding the cause and effect relationship between variables in the model. In other words, coefficients of lagged variables are economically meaningless.

For the investigation of cause and effects, with VAR models, econometricians have used impulse response functions (IRF) and variance decompositions (VDC). These statistical methods examine the short run and the long run responses of variables when one variable is shocked by one standard deviation. An IRF function from a VAR model is described below.

The IRF for an ARIMA process is the dynamic response of the system to an innovation shock, of one standard deviation. The specific impulse response calculated by impulse is the dynamic multiplier, defined as the partial derivative of the output response with respect to one standard deviation innovation shock at time zero.

For an ARIMA process, y_t, and innovation series ε_t, the impulse response at time j, ρ_j, is given by

$$\rho_j = \frac{\partial y_j}{\partial \varepsilon_0}$$

Expressed as a function of time, the sequence of dynamic multipliers, ρ_1, ρ_2,..., measures the sensitivity of the process to transitory change in the innovation process. Impulse computes the impulse response function by shocking the system with a unit impulse $\varepsilon_0 = 1$, with all past observations of y_t and all future shocks of ε_t set to zero.

The empirical results, including Granger causality and IRFs are presented in the next section.

4. Empirical Results

All of the time series in this study including world growth rate, US growth rate and China growth rate are annual observations collected from the World Bank and OECD National accounts data files. The exchange rate is annual average of monthly data collected from the Reserve Bank of Australia historical data. The oil prices were collected from the site MacroTrends.net (2017).

As a preliminary investigation, Granger Causality (GC) results between the Australian dollar, world growth, Chinese growth and oil prices are presented in Tables 1, 2 and 3.

Table 1. *GC World Growth and Australian Dollar*

Hypothesis	F Statistics	Probability
World Growth Doesn't GC A$	3.12	0.06
A$ Doesn't GC World Growth	0.67	0.52

Table 2. *GC China Growth and Australian Dollar*

Hypothesis	F Statistics	Probability
China Growth Doesn't GC A$	1.84	0.17
A$ Doesn't GC China Growth	0.83	0.44

Table 3. *GC Oil Price and Australian Dollar*

Hypothesis	F Statistics	Probability
Oil Price Doesn't GC A$	3.67	0.04
A$ Doesn't GC Oil Price	5.81	0.007

The results in Tables 1, 2 and 3 indicate that the hypotheses of world growth, China's growth and oil prices not Granger causing Australian currency is rejected (high values of F statistics together with low probabilities support rejection of the null hypothesis).

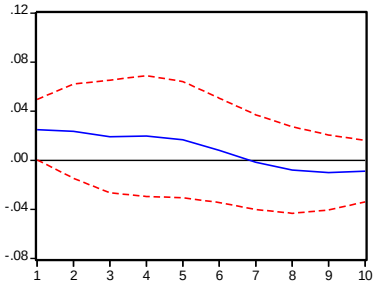

Figure 2. *Response to a shock of China's Growth*

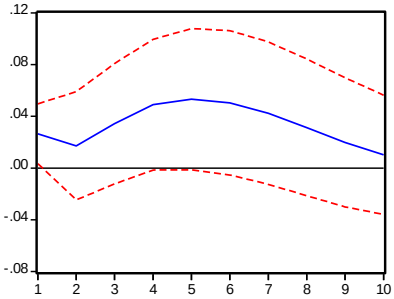

Figure 3. *Response to a shock of Oil Price*

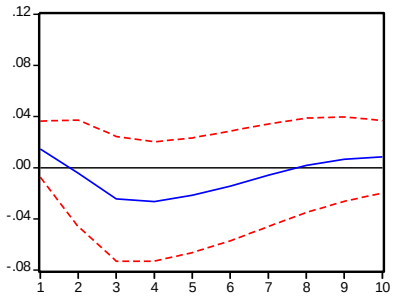

Figure 4. *Response to a shock of World Growth*

Response of Australian dollar to a shock of China's growth, in Figure 2, is positive in short and medium runs. However, in Figure 4, a shock of world growth is predominantly negative. A shock of oil price has a persistent positive effect on the Australian dollar exchange rate. These results suggest that fluctuations of commodity prices, represented by oil price changes, are the most important variable influencing the Australian currency.

5. Broader Policy Discussion

In this section we introduce themes that set the discussion in a broader context than just exchange rate and GDP growth interactions. It indicates that there are many more variables at play in this discussion.

China's impact on Australia

China's appetite for Australian natural resource exports has for a long time improved our terms of trade. This is correlated with the Australian exchange rate. The import of inexpensive Chinese products has assisted in keeping Australia's inflation rate at a low level. In recent years, the mining sector has been the main target industry for FDI, representing 40.1 per cent of total FDI stock in Australia at the end of 2015. All these factors have assisted the real appreciation of the Australian dollar. However, in concert with the more recent declining demand for some of our natural resources, in response to a significant fall in Chinese growth rates, the Australian dollar has since depreciated. This is a pleasing result for Australia's central bank that has long campaigned that depreciation is desirable for non-natural resource exporters and to assist the economy to

restructure away from natural resource dependence. The economy is currently continuing its transition following the end of the mining investment boom. The depreciation of the exchange rate since 2013 has assisted the economy in its transition.

Chinese investors are also Australia's major source of foreign investment. In 2015-16 they had approval to invest $A47.3 billion in Australia, mainly in real estate and mostly in residential housing. This far exceeds the $A31 billion pledged by our second largest foreign investor, the US (FIRB, 2017). This raises another conundrum relating to property prices and housing affordability in Australia's capital cities. There have been dire warnings of housing price bubbles and the unsustainability of mortgage payments should interest rates rise significantly. The central bank has been testing the robustness of commercial bank assets and liabilities in case of a housing slump and encouraging banks to clamp down on interest-only housing loans and to charge higher rates for investment loans compared to owner-occupied housing. Foreign bidders for real estate, and there have been tighter restrictions imposed here also, add to housing demand and eventually prices. The inflow of capital also tends to strengthen the exchange rate.

Profit shifting

A further issue relates to whether the trade statistics are accurately reflecting levels of economic activity and profitability. The interaction of different global tax rules allow profits to be shifted away from the countries where the profit creation is occurring to a lower taxing country. The Australian Tax Office (ATO) is concerned about (i) non-arm's length pricing of related-party dealings, (ii) the excessive allocation of debt to Australian operations that may result in additional tax deductions for interest payments, and (iii) international restructures of multinational enterprises, adopting global supply chains, with profit shifting consequences. In 2017 the ATO has written to 175 companies about potential liabilities under the multinational anti-avoidance law. Transfer pricing may distort export and import figures and hence the value of the exchange rate, as well as leading to taxation loss that impact the fiscal deficit, which again may have exchange rate implications.

Growth empirics

In the discussion about growth rates, commentators use real GDP figures. These statistics are regularly corrected subsequently by the statistical offices and that can distort any analysis using pre-corrected numbers. There are broader concerns about what real GDP represents, particularly in their relation to defining, measuring and promoting wellbeing. Economic growth may be a necessary but not sufficient measure of material progress.

There should also be awareness of the misuse of statistics, particularly when making international comparisons. Using exchange rate conversions leads to misleading commentary on the relative performance of different countries. Australian researchers have made pioneering contributions to what later lead to the Purchasing power parity comparative income measures and the International Comparisons Project. While keenly aware of the conceptual problems in PPP comparisons, as typical consumption baskets can vary considerably from country to country, researchers see this as a vast improvement on exchange rate conversions. It is a real eye opener to see the difference in results from using PPP and exchange rate conversions. The orders of magnitude involve differences in ratios of 66:1 compared to 16:1 or 120:1 compared to 40:1. Average incomes in poor countries were three or four times higher using PPP converters (Podger and Trewin, 2014).

6. Summary and Conclusions

The purpose of this research is to investigate the extent to which the Australian currency is influenced by external factors such as commodity prices, global output and China's economic growth. China is the largest importer of Australian mining products, changes in the size of Chinese's economy influences demand for Australian dollar. Like other commodity producing countries, such as New Zealand, Canada South Africa and Chile, the Australian dollar fluctuates in response to changes in commodity prices. In this study oil prices was chosen as a representative of commodity prices.

The empirical results from this study, based on Granger Causality and VAR, showed that oil price changes and the growths of China's economy are the most influential factors in explaining fluctuations of the Australian dollar. These results are supportive of the recent weakness of the Australian dollar as a result of depressive commodity prices. Furthermore, weaker growths of China's economy also contributed to the depreciation of the Australian currency. Future study in this area should consider the effects of internal factors such as monetary policy and lower interest rate on the dollar.

References

Bahr, R., 2015. Commodity Prices and Exchange Rate: An Australian Perspective. *International Journal of Economics and Finance*, 7(1), pp. 2-13.

Foreign Investment Review Board (FIRB), 2017. *Annual Report 2015-16*, Canberra. [online] Available at: https://firb.gov.au/about/publication/2015-16-annual-report/ [Accessed on 8 April 2017].

Macrotrends.net., 2017. *Crude Oil Prices - 70 Year Historical Chart*. [online] Available at: http://www.macrotrends.net/1369/crude-oil-price-history-chart [Accessed on 8 April 2017].

Monadjemi, M., 2016. Weak Oil Prices and the Global Economy. *Journal of Economics and Public Finance*, 2(2), pp. 353-359.

Monadjemi, M., 2017. Oil Price Rise and the Great Recession of 2008. *Expert Journal of Economics*, 5(1), pp. 14-19.

Podger, A. and Trewin, D., (ed.), 2014. *Measuring and Promoting Wellbeing: How important is Economic Growth? Essays in Honour of Ian Castles AO and a selection of Castles' papers*. Canberra: Australian National University.

Yu, C. C., Rogoff, K. and Rossi, B., 2008. Can Exchange Rate Forecast Commodity Prices", *Quarterly Journal of Economics*, March, pp. 2–22.