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# **Purchasing Power Parity in East Asia: Why all the Fuss?**

**Louise Allsopp and Ralf Zurbruegg**

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**University of Adelaide  
Adelaide 5005 Australia**

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**Louise Allsopp and Ralf Zurbruegg**

School of Economics  
University of Adelaide  
Adelaide, Australia 5005  
Phone: (+61) 8 8303 4930  
Fax: (+61) 8 8223 1460  
[louise.allsopp@adelaide.edu.au](mailto:louise.allsopp@adelaide.edu.au)

Associate Professor of Finance  
School of Commerce  
University of Adelaide  
[Ralf.Zurbrugg@adelaide.edu.au](mailto:Ralf.Zurbrugg@adelaide.edu.au)

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## ABSTRACT

Purchasing Power Parity (PPP) literature is now vast with literally hundreds of papers offering tests for PPP across a broad number of countries. However, despite all the elaborate techniques employed, very little explanation is given as to *why* PPP is so relevant<sup>1</sup> in policy making. This paper provides a basic understanding of PPP and shows why it is considered so important when making policy choices. The discussion is focused on the Asian economies since these have been subject to intense scrutiny following the 1997 crisis, particularly with regard to their choice of exchange rate regime and possible monetary unification.

**Keywords:** Exchange Rates Regimes, Purchasing Power Parity

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## **1. Introduction**

The literature investigating Purchasing Power Parity (PPP) has now reached enormous proportions. In the last twenty-five years, a whole host of elaborate econometric techniques have been employed on an equally large selection of countries to find out if there is a relationship between exchange rates and prices. However, in the majority of cases, relatively little emphasis is placed on the policy implications from the results. It is generally advocated that the discovery of PPP (or not) will have “implications for policy making” but the reader is usually left wondering what these implications might be and also what actually warrants the tests.

This paper provides a straightforward explanation of PPP and discusses its relevance for policy making. The focus is on the Asian region, since these economies have been subject to scrutiny in the aftermath of the 1997 crisis. In particular, this has led to discussions on which exchange rate regimes would be best for the countries in question (Hernandez and Montiel, 2001) and also whether a monetary union is optimal (Wylposz, 2002). Tests for purchasing power parity are instrumental in resolving these and other issues. For example, deviations of the nominal exchange rate from the PPP level have proved to be good indicators of a forthcoming crisis (Kaminsky and Reinhart, 1998 and Perry and Lederman, 1998). Therefore, tests on PPP are not limited in their use to prescriptive applications, but also as a tool for forecasting general economic circumstances.

Related to this is the idea of growth and income inequality. PPP allows international comparisons of national income to be made. This has proved to be invaluable for assessing world income inequality and thereby the impact of globalisation (Milanovic, 2002). Moreover, it has been shown that the deviations of the nominal exchange rate from PPP are larger in developing countries than for developed countries (Tang and Butiong, 1994). This has been attributed to differences in government intervention and trade restrictions. It therefore follows that PPP can also aid in measuring the degree of economic development in different markets.

To elaborate further on the above issues the rest of the article is organised as follows. The first section opens with a non-technical explanation of purchasing power parity, the aim of which is to merely outline the basic concepts. This is followed by a section discussing the policy implications of different test results, incorporating within this a comparison of some of the more recent professional and academic PPP studies concerning Asia and importantly, what their results imply. The final section provides concluding remarks and a brief outline of the current direction recent research is taking.

## **2. Purchasing Power Parity**

### **2.1 What is Purchasing Power Parity?**

The most restrictive form of PPP is the Law of One Price (LOP). If this holds, international arbitrage causes the price of every good across countries to be equalised when expressed in terms of a common currency. The most frequently cited example of this is the Economist’s Big Mac Index. It is published on a yearly basis and reports each country’s Big Mac price in terms of US dollars using the current exchange rate. A comparison can then be made as to where one might buy the cheapest burger but, more importantly, it tests to see if the LOP holds. While a number of studies have

investigated this relationship, there is overwhelming evidence against LOP attributed to transport costs (Dumas, 1992) and imperfect competition such as pricing-to-market (Ghosh and Wolf, 1994). It follows that policy-makers place a greater emphasis on the studies of purchasing power parity than LOP.

With PPP, the theory states that the nominal exchange rate between a pair of currencies will alter to reflect the movement in the price levels between the two countries. The underlying assumption is that arbitrage will ultimately force exchange rate movements so that comparable goods will cost the same in a number of countries.

## **2.2 Measuring Purchasing Power Parity**

In any test of purchasing power parity, the aim is to see if the nominal exchange rate alters to ensure that comparable goods in each country cost the same in real terms. To achieve this, economists use a measure of the price level (usually the consumer price index, producer price index or the GDP deflator) and the exchange rate. The nominal exchange rate tends to be expressed as the domestic price of foreign currency e.g. 2 Australian dollars to 1 US dollar where Australia is the domestic country and US is the foreign country. Deviations from PPP are then measured by taking the *real* exchange rate; that being the nominal exchange rate deflated by the ratio of the foreign to domestic price levels. When this equals 1, PPP holds. However, when it is smaller than 1, the nominal exchange rate is over-valued and hence the domestic currency would need to depreciate for the goods in each country to cost the same in real terms. Conversely, when the real exchange rate is bigger than 1, the nominal rate is undervalued and the domestic currency needs to appreciate in order for goods in each country to cost the same in real terms.

Any deviations from PPP are an indicator of frictions within the market. As mentioned earlier, these can take the form of transport costs or imperfect competition, such as pricing-to-market. However, they may also be signs of a large non-traded sector within a country or exchange rate intervention that prevents the rate from fluctuating with changes in the price level. This is all well-documented in the literature (see Haskel and Wolf, 2000) and the important point to note here is that the discovery of deviations from PPP is merely the first step in understanding what drives the exchange rate in an economy.

## **3. Policy Implications**

### **3.1 An Indicator of Currency Crises**

It is well documented that one of the symptoms of the 1997 Asian crisis was a large real exchange rate appreciation which emerged as a consequence of pegged exchange rate regimes in the region coupled with ill-sequenced financial liberalisation (Perry and Lederman, 1998). This, in turn led to current account difficulties for the countries in question since an overvalued currency implied falling exports and rising current account deficits. Furthermore, each country's stock of foreign exchange reserves began to deplete, ultimately generating a liquidity crisis.

Given the above sequence of events, it becomes a little clearer that a divergence of the nominal exchange rate from its PPP level may actually indicate that a currency crisis is imminent. If this indicator is reliable, a misalignment of the exchange rate could, in part, provide an early warning system for policy makers. They then have the chance to implement measures in order to lessen or avoid an attack. Not surprisingly a number of authors have investigated the degree of exchange rate

misalignment of the Asian countries with this in mind. For example, Chinn (2000) found that the Malaysian, Philippines and Thai currencies were overvalued prior to the crisis. By contrast, Korean and Indonesian currencies were undervalued. What may be said about these results? Certainly for the former group, the outcome is consistent with the real exchange rate story told above. However, for Korea and Indonesia the evidence appears counterintuitive given that they both suffered declines in their currency values. Could it be that examining PPP is not applicable for all countries?

Perhaps another study, by Perry and Lederman (1998), can shed some further light on the above. In their work the deviation of the exchange rate from PPP is just one of a number of economic indicators that were examined, along with export and import revenues, stock market indices, claims on the private sector and measures of foreign indebtedness to mention but a few. Their results confirm that Indonesia *did* suffer a real exchange rate appreciation on the eve of the crisis but that Korea's real exchange rate remained stable throughout the period, although it endured a considerable slow down in exports. The study then went on to examine misalignments in the Latin American exchange rates to establish the degree to which these countries were affected by the Asian crisis through contagion. Again, an appreciation in their real exchange rates was seen as an indication of current account difficulties, but only provides a clear picture when combined with a set of other economic factors. The lesson here is that deviations from PPP can be useful in predicting the onset of a currency crisis but that they should be used as part of a larger group of indicators<sup>1</sup>.

### **3.2 Monetary Union and Currency Pegs**

A second policy use for the PPP result concerns monetary union and currency pegs between countries. This is certainly a topical issue for the Asian and Latin countries with economists debating on the relative gains to be made by forming a currency union (Berg, Borensztein and Mauro, 2002 and Wyplosz, 2002). One of the early stages of complete monetary integration in which all countries embrace the same common currency, is the formation of currency pegs. It is therefore crucial that these pegs be set at an appropriate level for each of the participating countries<sup>2</sup>. With this in mind, economists have monitored exchange rate misalignments of the Asian and Latin countries in the pre and post crisis period to establish whether a monetary union is feasible. Factors such as a volatile real exchange rate resulting from domestic inflation, changes in a country's competitiveness, or unsustainable fiscal policy are signs that a country is not yet ready for economic integration. The general view point (Wyplosz, 2002) is that while a monetary union is desirable on a number of grounds, based on historical evidence the real exchange rate is unlikely to remain stable for long. First, countries are hit by asymmetric shocks. Second, they are typically at different stages of development, which implies variability of the real exchange rate both in the short and long run. For these reasons, experts have emphasised the need for convergence not just in terms of exchange rates but also in union-wide inflation objectives, which allow for differences among their members.

A closely related issue which has required the use of PPP testing concerns the debate surrounding hard pegs (the fixing of a currency). In terms of the Asian region, there is discussion regarding the appropriate exchange rate regime in the post crisis era. If a fixed exchange rate is employed, the next step is to decide which currency to peg against. Prior to the 1997 crisis, many of the countries in the region effectively operated a fixed rate against the US dollar. However, some studies have found (Azali,

Habibullah and Baharumshah, 2001) that PPP holds between the Japanese yen and a number of the Asian currencies in the region thus making a “Yen Bloc” a natural choice. However, even though a significant amount of research has been conducted on this topic, the results appear very sensitive both to the choice of econometric technique employed and the period in question. For example, when testing for PPP between the Asian economies and the US dollar, Wang (2000) finds no evidence of PPP in the pre-1997 crisis period. Conversely, economists using a data set incorporating the entire pre and post crisis period (Allsopp and Zurbruegg, 2003 and Razzaghipour et. al., 2001) find substantial evidence of purchasing power parity. It is probably because of this very reason that so much research surrounds this subject, as forming consensus opinions is still difficult, whether it be due to the use of different statistical procedures or using different types of data sets and time frames.

### **3.3 Income Inequality**

Purchasing power parity is also instrumental in comparing the welfare between individuals who live in different nations. Although some of the earlier studies in this field have merely used a simple exchange rate to convert the local currency into dollars, the results are usually misleading since they do not reflect the purchasing power of each national income. A typical example would be to compare price levels in India with those of Sweden. Clearly, an Indian travelling to Sweden would find living costs far greater than at home. Any measure of income between countries must take these differences into account. It therefore makes more sense to convert national currency income into a measure of welfare using purchasing power parity exchange rates. This has been achieved through the International Comparison Project (ICP) which collects information on relative prices in different countries. It is then used to form PPP exchange rates by examining the cost of purchasing the same basic bundle of goods and services in a number of countries. Of course, this too is fraught with difficulty and one can always argue that identical bundles of goods and services are not available in all countries. However, with these obvious flaws in mind, it is still a better method of comparing income between countries than a simple currency conversion.

As an example of using PPP to form income comparisons, Milanovic (2002) finds a strong case for income redistribution at the world level. He notes that greater integration of the world economies through globalisation coupled with decreasing costs of travel are having serious consequences. First, people are better informed and hence are increasingly aware of income inequalities throughout the world. Second, there is a growing pressure to migrate. Each of these factors exacerbates the already-existing disparities in world income and drives the motivation for governments to address this issue more closely.

### **3.4 Exchange Rate Misalignment and Economic Growth**

In addition to providing international comparisons of world income, testing for PPP also has uses in establishing the level of economic growth. It is a well known fact that developing countries are characterised by more government intervention and trade restrictions than their developed counterparts. Furthermore, the structure of these countries tends to be more diverse with changes occurring more frequently than in developed countries. We would therefore expect developing countries to exhibit larger deviations of their exchange rates from PPP.



However, there is a counterargument which states that smaller deviations from PPP would be more likely in the case of developing countries as a result of their tendency to apply capital controls. This is because exchange controls have the effect of reducing speculation against the currency, thereby generating lower exchange rate volatility. Tang and Butiong (1994) consider this issue when testing for PPP in a number of developing Asian countries. Sure enough they find considerable deviations from PPP in countries where there is high foreign exchange rate speculation and capital movements. Razin and Collins (1997) also consider exchange rate misalignments for a number of developed and developing countries (including the Asian economies) over a time frame of 16-18 years. They find that only extreme over-valuations of the exchange rate are associated with slower economic growth while moderate to high under-valuations of the exchange rate are typical of those countries experiencing rapid economic growth. The implication here is that, in terms of economic growth, only large over-valuations of the exchange rate pose a problem for a country's development. Testing for PPP can therefore be of extreme importance as a tool to aid policy-makers in monitoring and ensuring a country's growth prospects.

#### **4. Conclusion**

Testing for Purchasing Power Parity has proved invaluable within a number of different areas of international finance and economics. Also, within the field of development economics it has been used extensively to establish the degree of income inequality; an area of growing concern as globalisation has become a cause for debate. It has also allowed analysts to draw tentative conclusions about the connection between economic growth and real exchange rate valuations.

In terms of international finance, PPP testing has been instrumental in guiding policy makers in their choice of exchange rate regimes and the decision to form monetary unions. Furthermore, it has also proved to be a reliable guide in predicting current account difficulties and hence liquidity crises. Not surprisingly, it forms an integral part of an 'early warning system' designed to foresee economic crisis within a country.

In short, tests for PPP have played a key role in understanding a number of different economic scenarios. This also explains the emphasis that both professionals and academics place on testing for PPP within countries. Needless to say, as economic and financial circumstances change, the need to constantly test for PPP becomes a necessity and is unlikely to disappear from economic literature in the near future.

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- <sup>1</sup> An excellent summary of the papers investigating currency crisis and their respective indicators is found in Kaminsky, Lizondo and Reinhart (1998).
- <sup>2</sup> Indeed, one of the reasons put forward to explain the UK exit from the European exchange rate mechanism in 1992 was that its currency was overvalued and hence a devaluation was the only possible solution (Eichengreen, 2000).