

The 'Young Economist' Rybczynski Prize

For the second year running, KPMG generously sponsored a Rybczynski Prize for the best essay in business economics entered by a young member of the Society. This was awarded to Jens Nordvig-Rasmussen of Goldman Sachs International for a thoughtful analysis of the sustainability of currency appreciation in Central Europe. Nordvig-Rasmussen puts forward a persuasive argument why the sharp rise in real exchange rates in Central Europe may be the result of a shift in the equilibrium value for these currencies and not a bubble. As these countries continue to make the transition to the EU, and then EMU, questions of currency fair value will become increasingly important. We are pleased to publish the article in this issue.

Currency Appreciation in Central Europe – Equilibrium or Bubble?

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The economies of the Central European region – the Czech Republic, Hungary and Poland – have achieved remarkable economic results in the last ten years. Structural reform, including privatisation of financial and industrial sectors, liberalisation of goods and capital markets and improved institutional frameworks, has been driving the performance.

Macroeconomic stabilisation policies have also been increasingly successful. Inflation has declined to below the level in Euroland in the Czech Republic and Poland, and to below 5% in Hungary. Meanwhile, real GDP growth has been consistently stronger than in Euroland, averaging 3.7% over the last ten years, compared to 1.9% in Euroland. Growth has moderated since 2000 in line with weaker global economic conditions, but it has continued to outperform Euroland by a wide margin.

During the transition process, Central European currencies have appreciated strongly. The Czech Koruna, the Hungarian Forint and the

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Polish Zloty have appreciated 30-50% in real terms in the last ten years, with 25-30% of the appreciation happening in the last five years. Meanwhile current account deficits have been sizeable, and in Hungary and the Czech Republic external deficits are set to increase to more than 5% of GDP in 2002.

The strong real appreciation of the region's currencies seen in conjunction with high and rising external deficits begs the question whether this development is sustainable. Is the currency appreciation an equilibrium phenomenon or the result of a bubble?

Fundamental Explanations of the Appreciation

Persistent real appreciation contradicts traditional purchasing power parity-based theories of the exchange rate, which even in the relative form say that real exchange rates are constant in the longer run. Economic theory, however, offers alternative explanations for the appreciation.

The most popular theory of equilibrium real appreciation is encapsulated in the so-called *Balassa-Samuelson effect*, which says that countries with high relative productivity in the tradable sector should experience equilibrium real appreciation.

The underlying idea is that when productivity increases strongly in a country's tradable sector, this will allow strong wage increases. Assuming mobility of labour between sectors, wage increases will spill over to the rest of the economy, including sectors not exposed to competition from abroad. If productivity growth in the non-traded sector is less strong, wage increases will feed into price increases in non-traded goods. Therefore if one country has a large differential between productivity in tradable and non-tradable sectors relative to trading partners this will result in an equilibrium appreciation of the CPI-based real exchange rate.

The standard Balassa-Samuelson model links real appreciation to the differential in total factor productivity between traded and non-traded sectors. However, computation of total factor productivities requires reliable capital stock data, which are not available on a timely basis in Central Europe. Simpler measures of labour productivity, such as output per employee, can be constructed from directly observable variables, which are available with only a few months lag. Such measures show that labour productivity growth in the tradable sector has averaged close to 10% in the last five years, while labour productivity in the non-traded

sectors have been more moderate around 2%. This compares with productivity growth of below 2% in the tradable sector in Euroland.

The Balassa-Samuelson theory rests on a number of assumptions, which may be questionable in connection with the Central European region. However, both academic and private sector research finds that the mechanism is empirically important. Quantitatively, the Balassa-Samuelson effect is typically found to explain real appreciation in the order of 2% annually. While significant, this is only about half of the real appreciation actually observed.

An alternative theory focuses on how the terms-of-trade, the ratio of export prices to import prices, affect the real exchange rate. In relation to the Central European region, the idea is that the labour force in the formerly state-controlled economies in Eastern Europe at the outset of the transition process lacked general business skills such as marketing know-how. Catching up in terms of such skills – either through education, learning by doing or international transfers of key personnel in multinational companies – is likely to lead to better pricing of exports and a structural improvement in the terms-of-trade.

There is some evidence of such a structural improvement when adjusting for commodity price effects on the terms-of-trade. But the terms-of-trade factor is typically found to be quantitatively less important than the Balassa-Samuelson effect.

Flow-Based Explanations

Alternative explanations for the appreciations are based entirely on external flow considerations. Balance of payment flows influence actual exchange rate behaviour simply because such external flows can create spikes in demand for currency which influence the exchange rate.

One particular hypothesis is that the combination of high yields, increasingly successful disinflation policies and the prospects of EU and EMU membership within 3-6 years has triggered a surge in portfolio inflows, which has led to excessive appreciation of the currencies in the region. Given that yields have already converged to near Euroland levels, the hypothesis is that inflows are no longer sustainable and the currency bubble is likely to burst as speculative flows reverse.

While portfolio flows have become increasingly important, the fact that foreign direct investment (FDI) remains by far the most important source of financing in the region, suggests that the hypothesis is at best only partly true. From 1998 to 2001, FDI inflows financed 85-105% of the region's current account deficits. And the ratio for 2002 is set to be above 90%. Privatisation of large state-owned enterprises has been the largest source of FDI inflows, with some individual deals worth more than 5% of GDP. But FDI into new production facilities – so-called Greenfield investments – has been an increasingly important source of inflows.

While the short-term FX impact of different financial flows may be similar, FDI inflows are less likely to reverse than portfolio flows. The reason being that FDI projects are typically long-term investments with invested funds tied up in physical capital with low liquidation value. It can therefore be argued that FDI inflows are more likely to lead to sustainable exchange rate moves.

FDI inflows are also linked to 'deeper' fundamentals as it is often associated with management know-how and other skills in short supply in the region. In this sense FDI, and especially Greenfield FDI, is seen as a driver of productivity growth. Not only because the capital deepening that it provides boosts labour productivity, but also because total factor productivity tends to increase along with such investment.

The region continues to offer an attractive combination of highly-skilled labour and wages at about 30% of the level in Euroland. The geographical proximity to European markets and the prospect of EU membership by 2004 and EMU membership 2-4 years later are additional incentives for foreign investors. Given that the fundamental drivers of FDI inflows persist, a material slowdown in these flows appears unlikely within the next couple of years.

Fair-Value Models

Time series models of the real equilibrium exchange rate try to take into account a number of different factors that affect the equilibrium. However, even models that include a broad selection of explanatory variables are typically not able to account for the real appreciation observed. The models estimate that Central European currencies are over-valued in the sense that actual real exchange rates are strong relative to their estimated equilibrium levels.

An example of such a model is Goldman Sachs's GS-DEEMER model – a long-run model based on co-integrating relationships between fundamental variables and the real effective exchange rate. The fundamentals include both productivity variables, the terms-of-trade and foreign direct investment. This model currently estimates that Central European currencies are all overvalued with an average overvaluation of 20%.

The pure time series approach to fair value estimation has a number of potential drawbacks. First, the short sample period available for the countries in question makes robust estimation difficult. Panel methods can be used to obtain more robust estimates, but not solve this problem. Second, the nature of the structural changes is difficult to capture with standard economic variables. Third, the available time series cover a period of rigidly controlled prices. For this reason the observed real exchange rate, the endogenous variable in the model, may be a poor reflection of the underlying fundamentals for a significant proportion of the sample period. Anecdotal evidence as well as the very strong real appreciation in the early 1990s when prices were liberalised, amounting to more than 100% within a few years in Poland, suggest that this regime was characterised by artificially low prices. This implies that real exchange rates could have been significantly undervalued in a substantial part of the estimation period.

Standard estimation procedures implicitly assume that the actual real exchange rate is on average equal to the equilibrium real exchange rate. If the exchange rate has been undervalued in a significant portion of the sample period, this would tend to introduce a negative bias in the constant term in the model, leading to a downward biased estimate of fair value. If the fair value estimate is downward biased, the interpretation that a currency is overvalued is naturally questionable.

Alternative Pictures of Fair Value

The potential problems of the pure time series approach make alternative ways to assess competitiveness and fair value particularly relevant in the case of Central European currencies. Measures that rely on directly observable variables that are available on a timely basis are preferable in this regard.

The usual arsenal of tools includes analysis of external balances, with a view to what is sustainable in the longer term, and looking at trends in unit labour cost based exchange rates.

Current account deficits have increased in Hungary and the Czech Republic on the back of robust domestic demand growth. However, given the increasing openness of these economies the deficits remain modest. Expressed as a percentage of exports, the deficits are low by historical standards and certainly manageable compared to other countries. The Central European countries currently have deficits in the region of 10-20% of exports. In comparison, the US current account deficit is likely to reach more than 70% of exports this year.

Strong productivity growth has to some extent countered nominal appreciation and higher wage growth. Nevertheless, unit labour cost has increased relative to the level in Euroland. Based on data from industry, the best available proxy for the tradable sector, unit labour cost exchange rates have appreciated 15-25% in the last five years. But even if the ULC exchange rate has appreciated strongly, the question remains whether this reflects a correction to previous under-valuation or a build-up of over-valuation. The analysis provides little information about the equilibrium level.

Measures that pertain to the equilibrium level of the exchange rate are hard to come by, but such measures are particularly useful when evaluating the over-valuation estimates provided by a fair value model.

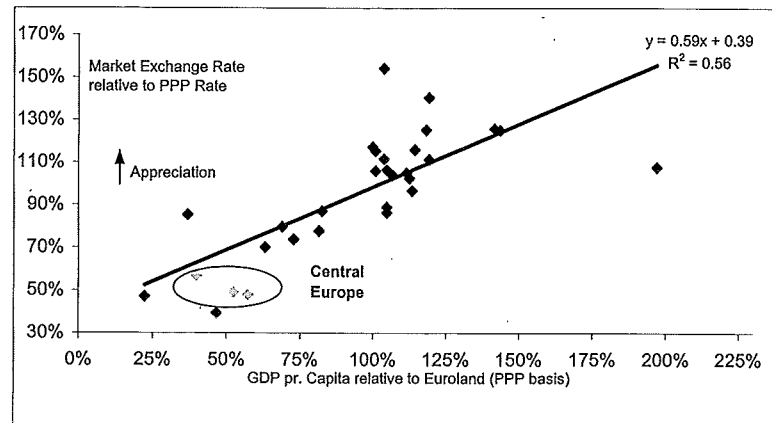
PPP-based exchange rates can be used as a simple benchmark. Chart 1 plots market exchange rates relative to PPP exchange rates against per capita GDP volume. Each dot represents a country and the countries shown are the ones for which the OECD calculates PPP rates.

The vertical dimension of the chart show that the Central European countries' actual exchange rates are at a level of only 50-60% of the PPP level, the exchange rate that would imply a consumer price level equal to the level in Euroland. That the price levels in Central Europe are substantially lower than the level in Euroland is well known and in line with the original relationship between real exchange rates and GDP per capita proposed by Balassa.

The horizontal dimension displays the per capita GDP levels relative to the level in Euroland. The chart also plots the fitted values of a simple OLS regression of the actual exchange rates relative to PPP rates on the GDP per capita variable. Interestingly, the Central European currencies lie below this line, suggesting that price levels are low – or equivalently

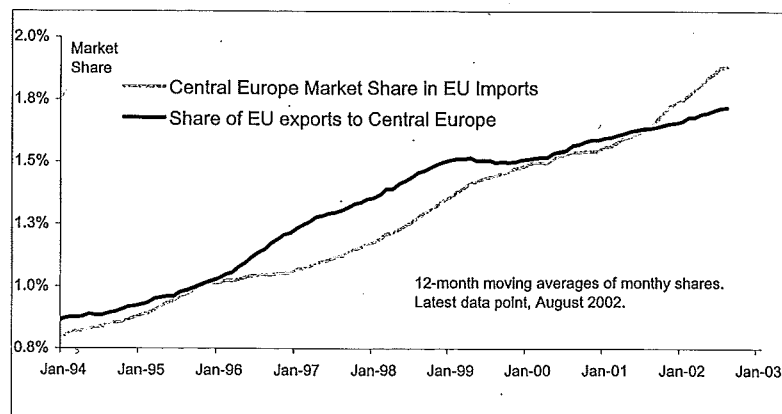
the currencies undervalued – even taking into account the usual relationship between price levels and per capita income.

Chart 1: Market exchange rates relative to PPP rates and GDP per capita



Source: OECD, Goldman Sachs and author's calculations

Chart 2: Central Europe market share trends



Source: Eurostat and author's calculations

Another way to assess the current level of the exchange rate is to analyze trends in market shares. Expanding market shares would signal under-

valuation and declining market shares over-valuation. Chart 2 looks at Central European countries' market share in the EU, the most important trading partner, accounting for 70% of external trade.

The market share is based on nominal figures. The euro value of Central European exports to EU relative to total EU imports in euro. As such the measure captures both volume and price effects, including the so-called marketing effect discussed above. This measure has advantages compared to the balance of trade, given that it is not distorted by fluctuations in imports related to cyclical variations in consumption and investment.

Given the trend of increased trade integration with the EU, Central Europe's market share in EU imports has to be viewed relative to Central Europe's share of EU exports. To avoid seasonal effects the chart plots 12-month moving averages of monthly shares.

The chart shows that Central Europe has lately been able to gain market share in the EU in excess of what the trend in trade integration would suggest. Due to the lag between real appreciation and actual trade performance the analysis may not capture the effect of the most recent part of the appreciation. However, based on the available data the picture suggests that the Central European currencies remain competitive.

Conclusion

Fundamentals-based time series models typically estimate the equilibrium real exchange rate appreciation of the Central European currencies of around 20% over the last ten years. This implies that actual appreciation has overshoot the equilibrium by about 20%. Specific problems related to the available time series suggest that such measures of over-valuation could be upward biased.

Simpler measures of competitiveness and fair value can provide a reality check to the more sophisticated model. Such measures suggest that Central European currencies remain competitive, implying that the observed appreciation is an equilibrium phenomenon and not a bubble.

This conclusion has important implications for investors and policy makers. Specifically, the Central European countries are expected to join the EU in May 2004 and join the ERM-II at the same time. Fair value considerations will be extremely important in setting central rates in the exchange rate bands.