Long-run equilibrium exchange rate notions in monetary policy strategies: the case of the Czech National Bank

Mojmír Hampl and Michal Skořepa[1]

On the most general level, notions of long-run exchange rates seem obviously relevant for the formulation of the monetary policy strategy of any central bank. This is especially true for central banks in small open economies. For them, the equilibrium exchange rate issue is often analysed within the simple but powerful "trilemma" framework: given that capital flows are essentially liberalised, the inflation differential and the nominal exchange rate vis-à-vis dominant trading partners are bound – in the medium to long run – to jointly evolve in accordance with the evolution of the equilibrium exchange rate.

Domestic monetary policy must be aware of this central role played by the equilibrium exchange rate (EER) and prepare the political arena and society at large for its implications. For example, in the inflation targeting regime, it must be understood that the choice of inflation target has strong implications for the future evolution of the nominal exchange rate. More specifically, if a relatively low inflation target is set, the economy may have to brace itself for long-term nominal appreciation of the domestic currency.

While the importance of long-run EER notions for monetary policy strategy seems clear on this general level, there are certainly many particular ways in which EER considerations may be taken on board.

The Czech National Bank (CNB) adopted inflation targeting in January 1998. The first several years after this fundamental decision were devoted to accruing experience with this regime and to trying to find a design that would best fit the Czech economy – as regards the level and form of the inflation target, the regular analytical, forecasting and decision-making process, communication and transparency, etc.

In the course of the 2000s and especially after the entry of the Czech Republic into the European Union in 2004, however, a new important element of the CNB's monetary policy strategy has gained in importance: the issue of entering the euro area and passing monetary policy authority for the Czech economy over to the ECB.

1.   The often neglected but crucial role of the equilibrium exchange rate in OCA considerations

The question whether an economy will gain or lose by switching to another economy's currency dates back to Mundell (1961) and McKinnon (1963). The resulting "optimum currency area" (OCA) literature is large and growing (for recent surveys, see Baldwin and Wyplosz (2009) and Dellas and Tavlas (2009)). The basic OCA logic is that a given economy (call it A) will benefit from entering a currency area (i) if A faces very similar shocks to those of the area, that is, A faces "symmetric" shocks, or (ii) if A is flexible enough to absorb any asymmetric shocks.[2]

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[1]   Czech National Bank.

[2]   Here we assume that A is small relative to the size of the currency area, so that the monetary policy of the currency area after A enters it is not significantly influenced by the situation in A.

We can distinguish several types of shocks that A and/or the currency area may face, such as:

- domestic demand shocks (essentially the domestic economic cycle);

- supply shocks, eg weather calamities or the domestic impact of foreign demand or of changes in world prices of commodities;

- credibility or short-term capital flow shocks.

Most of these shocks are unexpected and their effects are relatively short-term. So what is the connection between OCA considerations and long-term EER notions? To see this connection, we need to realise that there is one special category of "shocks", namely, shocks to the overall level of development of a given economy. More specifically, many less developed, poorer economies are observed to be subject to what might be called convergence shocks – a long-term, often foreseeable, drift of domestic technologies, institutional arrangements and rules of behaviour towards those of their counterparts in more developed, richer economies. And this convergence will be reflected not only in increases in measures of productivity and richness such as GDP per capita, but also in real appreciation of the domestic currency vis-à-vis the currencies of the richer economies.

The research preceding the formation of the euro area (eg Bayoumi and Eichengreen (1997)) focused predominantly on non-convergence shocks. Our central thesis in this contribution is the following: as soon as the level of development of economy A as a prospective member of a currency union differs from that of the rest of the union, convergence to the rest of the union – or long-term appreciation of the real equilibrium exchange rate vis-à-vis the currency of the rest of the union – is a crucial determinant of whether it makes sense for A to give up autonomous monetary policy and enter the union.

What are the likely consequences if, on the contrary, convergence-type asymmetric shocks are ignored (and A is not flexible enough to absorb these shocks on its own)? On average over the cycle, the union's single monetary authority will set its (nominal) policy rate i^* at a level that is the sum of the union-wide equilibrium real interest rate r^* and the union-wide long-term rate of inflation (or the authority's inflation target) π^*, that is, $i^* = r^* + \pi^*$. Given that within the currency union, A's currency will not be able to appreciate nominally, the long-term real appreciation to which A's convergence leads is bound to imply that A's long-term rate of inflation π_A will be higher than the area-wide inflation rate π^*. As a result, A will enjoy, on average, lower real interest rates: $r_A = i^* - \pi_A < i^* - \pi^* = r^*$.

If the equilibrium real interest rate for economy A is $r_A^* = r^* = i^* - \pi^*$, then A's entry into the union will trigger a long-term expansionary monetary policy shock on A. The size of this shock in terms of the real interest rate r_A will equal the inflation differential $\pi_A - \pi^*$, that is, it will equal the pace of the real equilibrium appreciation due to A's convergence to the rest of the union: $r_A - r_A^* = (i^* - \pi_A) - (i^* - \pi^*) = \pi^* - \pi_A < 0$. Since A is assumed to be less developed than the rest of the union, however, the equilibrium of its domestic saving-investment market can actually be expected to require a higher real interest rate (see eg Archibald and Hunter (2001) and Lipschitz et al (2002)), that is, $r_A^* = r^* + \Delta = (i^* - \pi^*) + \Delta$, where $\Delta > 0$. In that case, the size of the long-term expansionary monetary policy shock due to A's entry into the union will be even higher:

$$r_A - r_A^* = (i^* - \pi_A) - [(i^* - \pi^*) + \Delta] = \pi^* - \pi_A - \Delta < \pi^* - \pi_A < 0. \tag{1}$$

The rest of the story is simple (eg Ahearne and Pisani-Ferry (2006) and Fagan and Gaspar (2008)): permanently below-equilibrium real domestic interest rates in A are likely to induce above-equilibrium growth of domestic credit, private demand and investment. This will lead, in turn, to overheating of the domestic economy and even higher inflation (in prices as well as wages), resulting in a deterioration of external competitiveness and, finally, painful correction through a potentially protracted recession, a credit crunch, a fall in wages, and

unemployment. Alternatively, the credit boom may lead to a swelling current account deficit and a growing stock of foreign liabilities with undesirable consequences as well.

Note that these problems arise even if, apart from convergence, A and the rest of the currency area suffer completely symmetric shocks, for instance, if both economies have perfectly synchronised economic cycles. In other words, it is not enough that the values of real interest rates appropriate for A are perfectly *correlated* with those appropriate for the rest of the union; the values must also be roughly on the same long-term *level*. Note also that the above applies whenever economy A intends to enter into any fixed exchange rate arrangement with a currency area – the arrangement need not take the extreme form of a common currency.

2. How the CNB uses long-term exchange rate notions in relation to entry into the euro area

Since 2003 the various Czech governments and the CNB have been of the view that the Czech economy should join the euro area when this step is viewed as appropriate both by the EU/euro area authorities and by the Czech government. The principles of how the EU/euro area authorities decide whether it is appropriate for a given economy to join the euro area were stipulated in the early 1990s in the Maastricht Treaty.[3]

The principles of how the Czech government decides whether it is appropriate for the Czech economy to enter the euro area were stipulated in "The Czech Republic's Euro-area Accession Strategy", published in 2003. The basic three steps are:

(1)   The CNB annually prepares and publishes "Analyses of the Czech Republic's current economic alignment with the euro area" (eg CNB (2009)), which presents a number of detailed empirical analyses broadly along the lines of the OCA logic. As far as we know, no other prospective member of the euro area has produced such a comprehensive set of underlying empirical analyses on an annual basis.

(2)   Based on this package of analyses, the CNB and the Ministry of Finance prepare a suggestion for the Czech government on whether it is appropriate for the Czech economy to enter the euro area.

(3)   The Czech government makes the decision.[4]

The importance that the Czech National Bank attaches to long-term real exchange rate appreciation is documented by the fact that the very first analysis in the above-mentioned "Analyses" is focused precisely on this area: it maps the evolution of the real exchange rate of the Czech koruna vis-à-vis the euro since 1999, when the euro was introduced, and it also presents predictions on how the real exchange rate might evolve in the future. In light of what we presented earlier, it is clear that if these predictions indicate a long-term trend in the real exchange rate, it is an argument against the entry of the Czech economy into the euro area, and if they do not indicate any such trend, conversely, it is an argument in favour of entry.

The latest issue of the "Analyses", published at the end of 2009, shows that the Czech koruna has been appreciating against the euro in real terms most of the time since the euro

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[3]   The European Commission, the ECB and the EU Council in two different compositions are all involved at various stages of the process.

[4]   Technically, the very first decision is not directly on the entry of the economy into the euro area, but rather on the participation of the domestic currency in the exchange rate mechanism II (ERM II). This is because the Maastricht Treaty lists participation in ERM II as one of the preconditions for later entry into the euro area.

was introduced. The average pace of appreciation over the period covered has been about 4.2%. Figure 1 presents this development together with the appreciation trends of three other central European currencies.

Figure 1

Real exchange rates against the euro

(Based on HICP, 1998 = 100)
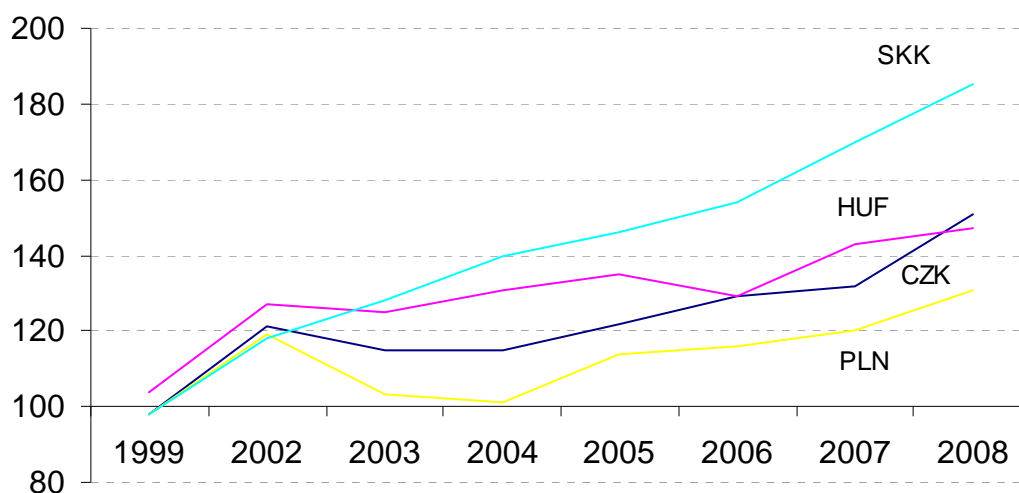
CZK = Czech koruna; HUF = Hungarian forint; PLN = Polish zloty; SKK = Slovak koruna.

Source: CNB (2009).

More importantly for the decision-making on euro area entry, the appreciation of the Czech koruna/US dollar exchange rate is predicted to continue in the future. Out of the many equilibrium exchange rate forecasting methodologies that could be used, the "Analyses" use two: one based on the correlation of the price level with the expected future evolution of GDP per capita, and the other based on a calibrated DSGE model of two countries at different stages of development. In the 2009 issue of the "Analyses", the real exchange rate was forecast by the two methods to appreciate over 2010–14 at an annual rate of around 1.3% and 3%, respectively. This means that if the Czech economy were to enter the euro area immediately, the implied expansionary shock to monetary policy interest rates would be at least 1.3 or 3 percentage points. The actual shock would be even stronger if we admit that the equilibrium real interest rate is higher for the Czech economy than for the rest of the euro area (see equation (1) above).

Currently there are several obstacles to the entry of the Czech economy into the euro area. The most immediate problem is that for the next several years, the Czech public finances will very likely not meet the requirements set by the Maastricht Treaty. Regardless of all these other obstacles, however, the prospect of further strong medium- or even long-term real appreciation of the Czech koruna against the euro would, in itself, strongly discourage the Czech authorities from declaring the entry of the economy into the euro area as appropriate.

3.   Long-term real exchange rate appreciation within the current euro area

The Czech economy is not, of course, the first one to consider entering the euro area while still having some convergence potential to the bulk of the euro area. The same basic phenomenon of distinct long-term real exchange rate appreciation was present already in some of the economies that entered the euro area upon its creation or soon after it – such as Greece, Ireland, Italy, Portugal and Spain (or GIIPS for short). Figure 2 shows the evolution of these five economies' real exchange rates vis-à-vis the ECU or (since 1999) the euro. The figure seems to indicate that a real appreciation process was taking place in all of GIIPS for most of the period 1995–2008 at an average yearly rate of about 2%.

Figure 2

Real exchange rates against the ECU/euro

(Based on HICP, 1995 = 100)
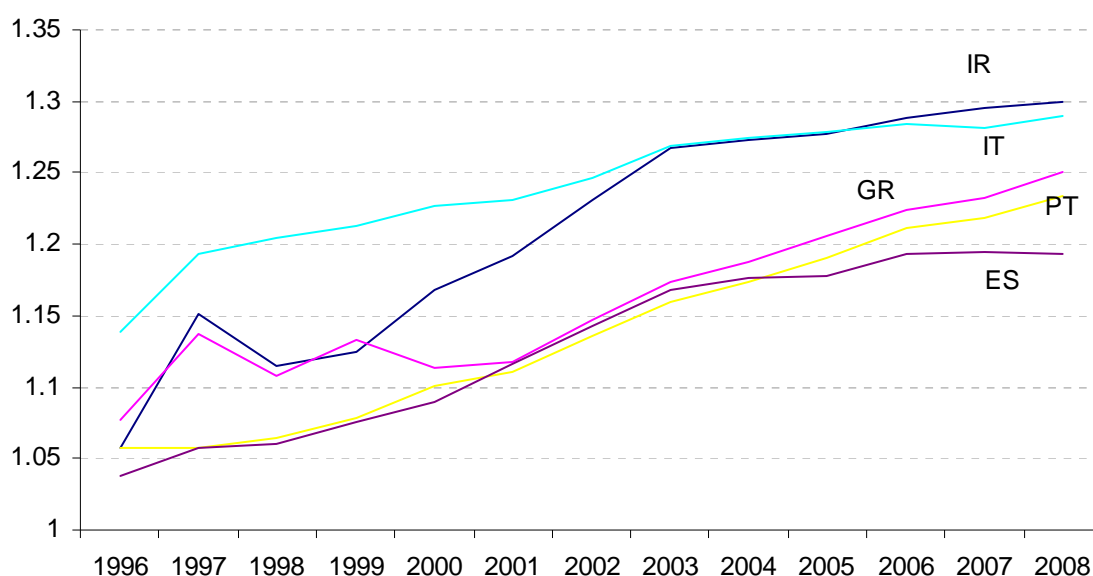
ES = Spain; GR = Greece; IR = Ireland; IT = Italy; PT = Portugal.

Sources: European Commission (AMECO); own calculations.

The above-described problem of too low real interest rates may be reduced if local nominal interest rates are actually higher than nominal rates in the anchor economy due to some kind of (risk or other) premium (*prem*). Symbolically, we assumed above that $r_A = (i^* - \pi_A)$ but now we admit that $r_A = (i^* + prem - \pi_A)$, where *prem* > 0. In consequence, the existence of *prem* will mean that r_A will not fall below r_A^* as much as was suggested earlier.

The overall experience of GIIPS as regards the value of *prem* is captured in Figure 3. Taking Germany as the anchor economy to which GIIPS converge, Portuguese and Greek companies faced higher local nominal interest rates than German ones up until 2008; after 2008, nominal interest rates have also been higher than German ones in the other GIIPS (with the exception of Italy since mid-2009). For the period 2003–07, the spread between the unweighted average of the interest rates in all of GIIPS and that in Germany was, on average, 0.15. Since January 2008, this spread has been 0.6.

As we see, *prem* was positive in GIIPS, especially after the outbreak of the recent financial and economic crisis. Was it high enough to fully offset the inflation differential? Figure 4 shows Portugal to be the only economy where *prem* was sufficiently high to imply real interest rates higher than or at least equal to those in Germany.

Portugal was thus the only one of GIIPS to feature a real interest rate differential in line – at least qualitatively – with the equilibrium of the domestic saving-investment market in the context of real convergence. The other GIIPS economies lived with real interest rates that seem to have been much too low to equilibrate the domestic saving-investment markets.

Figure 3

Nominal interest rates

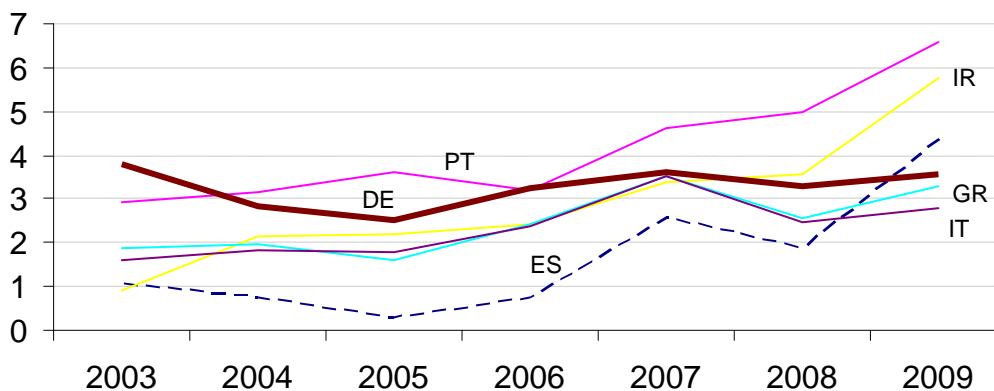(Loans to non-financial corporations, up to EUR 1 million, new business)
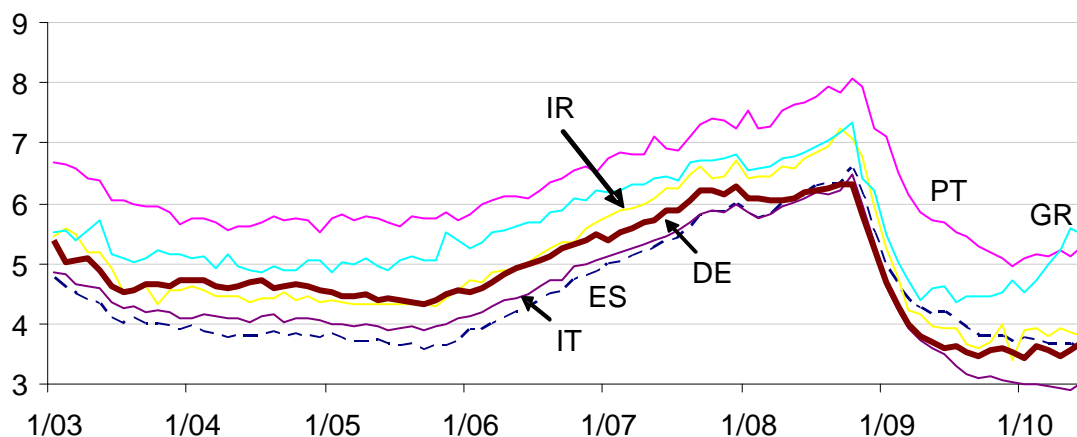
DE = Germany; ES = Spain; GR = Greece; IR = Ireland; IT = Italy; PT = Portugal.

Source: ECB.

Figure 4

Real interest rates

(Loans to non-financial corporations, up to EUR 1 million, new business, ex post)

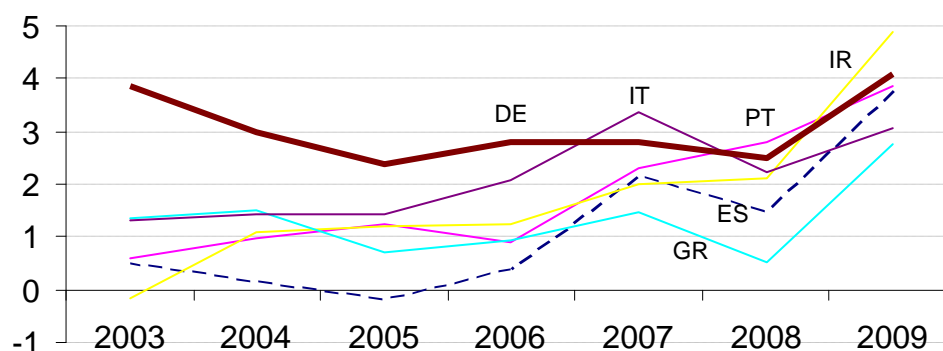DE = Germany; ES = Spain; GR = Greece; IR = Ireland; IT = Italy; PT = Portugal.

Sources: ECB; European Commission (AMECO); own calculations.

While Figure 4 focuses on loans to companies, Figure 5 shows analogous data for housing loans. Clearly, the segment of loans for housing worked with real interest rates that were even less consistent – relative to Germany – with the domestic saving-investment market equilibrium. This is true especially for the pre-crisis years; for Greece, however, the real rates remained below German ones even in 2008 and 2009.

Figure 5

Real interest rates

(Loans for housing, new business, ex post)

DE = Germany; ES = Spain; GR = Greece; IR = Ireland; IT = Italy; PT = Portugal.

Sources: ECB; European Commission (AMECO); own calculations.

A much more detailed analysis – and a longer sample period not contaminated by the crisis – would be needed to pinpoint all the causes of the above-described interest rate developments and to find out the extent to which the overly low real interest rates in GIIPS led to macroeconomic volatility and imbalances. A priori, it seems likely that real domestic interest rates hovering for a number of years perhaps even several percentage points below their equilibrium levels are bound to lead, sooner or later, to macroeconomic difficulties in any given economy.

4. Conclusion

The Czech economy is likely to experience further real exchange rate appreciation in the coming years. Some of the current euro area member economies seem to have been undergoing a similar process, resulting in their case in below-equilibrium domestic real interest rates. We think that these findings clearly corroborate our main thesis: that notions of long-term equilibrium exchange rates should definitely influence monetary policy strategies, at least as regards potential entry into a currency area. In the case of the Czech Republic, this influence is fundamental – as documented, for example, by the relevant segments of the annual "Analyses".

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