Capital inflows, monetary policy and exchange rate regime in New Member States: implications for the accession to the euro area[1]

(Preliminary draft)

Pavel Diev, Banque de France[2]

Emmanuel Kurtz, Banque de France

Abstract :

Motivated by euro area enlargement, we develop a simple model of exchange rate dynamics in a context of capital inflows (a modified version of Dornbusch's (1976) overshooting model). The model suggests that in a regime of inflation targeting and free float, the real and nominal exchange rates will exhibit important fluctuations after an exogenous shock of capital inflows, but in the long run the current account is balanced and price stability is maintained. In the case of a fixed exchange rate regime, the real exchange rate will appreciate permanently (through an inflation differential) following the shock, thus implying impossibility to maintain price stability and the current account balance. These insights show a conflict between exchange rate and price stability. In the context of euro area integration, the price stability criterion is stricter as the exchange rate criterion allows for (large) fluctuation bands. We then argue that the choice of inflation targeting-floating exchange rate regime strategically dominates the fixed exchange rate option. A second argument against the fixed exchange rate option is that it could lead to unsustainable developments. The model can also be used to analyse risks and challenges for NMS of an early adoption of the euro. Monetary union can be approximated by the case of a fixed exchange rate. In order to avoid unsustainable developments in this case, it is argued that the country might implement structural reforms in order to increase productivity and/or fiscal restrictions in order to contain demand. The extent of such challenges decreases with the openness of the economy and with the decrease in the size of capital inflows.

JEL Classification: E52, E58, F32

Keywords: Euro area enlargement, New Member States, Capital inflows, Currency board, Inflation targeting

[1] The views expressed in this paper are those of the authors and do not necessarily represent those of Banque de France

[2] Corresponding author: Banque de France, 46-1374 DGEI DAMEP SEMSI, 31 rue Croix des Petits Champs 75049 Paris Cedex 01, e-mail : pavel.diev@banque-france.fr, Tel : +33 1 42 92 91 48, Fax : +33 1 42 92 49 50

1. Introduction

On the "road to the euro", Central European New Member States (NMS) have adopted two different strategies: half of the countries have decided to maintain a fixed exchange rate vis-à-vis the euro (Estonia, Latvia, Lithuania, Slovenia and Malta), the other half have decided to maintain an inflation target and a flexible nominal exchange rate (Slovakia, Czech Republic, Hungary, Poland). A second important characteristic of NMS is the large inflow of foreign capitals, which was much bigger in recent years than the one in their homologues of the "cohesion" group (Greece, Ireland, Spain, Portugal) prior to their entry in the euro area. These capital inflows are an indicator for the still going on catching-up process and will be considered as an exogenous input for our analysis.

We develop a simple model (a modified version of Dornbusch's, 1976, overshooting model) that exhibits the macroeconomic dynamics in a country subject to (exogenous) capital inflows, as a function of the monetary and exchange rate policy chosen by the central bank.

In a regime of inflation targeting and floating nominal exchange rate, a capital inflow first enters the money and exchange rate market and implies a nominal appreciation of the exchange rate (with a short term overshooting). As this deteriorates external competitiveness, prices will decrease to restore the external equilibrium. The central bank that maintains price stability reacts by loosening its monetary policy which results in a depreciation of the nominal exchange rate and (the desired) increase in prices. On the aggregate level, the country will exhibit important fluctuations of the nominal and real exchange rates which will return to their "fundamental" value[3] in the long run.

In the context of fixed nominal exchange rate, a capital inflow enters directly the goods market (the money and exchange rate market being constrained to maintain the fixed exchange rate). The capital inflow leads to an increase in demand. Prices start to increase; this dampens external competitiveness and results in a current account deficit. At the new stationary equilibrium, the current account deficit is persistent as the stationary value of the real exchange rate has appreciated. On the macro level, the country will exhibit a persistent real exchange rate appreciation (through inflation differential) that will eventually make the external developments unsustainable. The only way to make the model consistent with long run external equilibrium is to add productivity gains that increase the value of output and/or budgetary policy as a tool to influence demand (not considered in our model for the sake of simplicity).

[3] In the sense of Williamson (2000), i.e. the value of the real exchange rate compatible with internal and external equilibrium.

This paper is linked with the literature about the "impossible trinity": the impossibility of having simultaneously a fixed exchange rate, independent monetary policy and free capital flows (see for example Obstfeld and Taylor 1998, Williamson 2000, Obstfeld, Shambaugh and Taylor 2003 provide empirical investigation about the validity of the "impossible trinity"). As Williamson (2000) states, the "impossible trinity" will appear in every Mundell-Fleming type model with perfect capital mobility. The Dornbusch model can be viewed as a direct descendant of the classic Mundell-Fleming model, embodying rational expectations and asymmetries of adjustment between goods and assets markets (see Rogoff 2002). Then it is not surprising that we will find a version of the "impossible trinity" here. However, we go further away in the analysis by providing a dynamic picture of the "impossible trinity" which allows suggesting solutions for it. In the case of NMS, free capital mobility is an exogenous input for the analysis and the relevant issue is to choose between fixed exchange rate regime and an independent monetary policy. The dynamic dimension of the model shows that the inflation targeting-floating exchange rate option is compatible with long run equilibrium but the "price to pay" is accepting high volatility in nominal interest and exchange rates. On the contrary, the fixed exchange rate option will be associated with the stability in the nominal interest and exchange rates, but will be incompatible with the equilibrium of the current account balance. In the long run, the fixed exchange rate option would be either unsustainable leading to a currency adjustment, i.e. an exit from the fixed exchange rate regime, or would have to be sustained by structural policies aimed to promote productivity gains in order to increase the level of potential output.

The results also have important political economy implications for the enlargement of the euro area. From the point of view of Maastricht criteria, the price stability criterion is stricter as the exchange rate criterion allows for (large) fluctuation bands. We argue that an inflation targeting regime with floating exchange rate should be strategically preferred by a NMS having as main objective to fulfill the Maastricht criteria. A second argument against the fixed exchange rate option during the convergence period is that it could lead to large current account deficits. The model also points out the risks and challenges of euro adoption. Monetary union can be proxied by the case of a fixed exchange rate. In order to avoid unsustainable developments coming from capital inflows, it is argued that NMS might implement structural reforms in order to increase productivity and/or fiscal restrictions in order to contain demand (monetary union can be viewed as an incentive device to implement reforms). Finally it is suggested that the extent of such challenges would decrease with the openness of the economy and with the decrease in the size of capital inflows.

2. The model

The basic structure of the model is close to Dornbusch's (1976) overshooting model (see also Rogoff 2002). We have a small open economy. Notations are as usual: y is the real output, p is the level of

prices, *i* is the nominal interest rate, *e* and *q* are respectively the nominal and real exchange rate, a dot indicates time derivatives and an asterix indicates rest of the world variables. All variables except the interest rate are in logarithms. Greek letters are positive parameters.

The first equation of the model is an equation of aggregate demand:

$$y^d = y + \delta(e + p^* - p - \overline{q}) \tag{1}$$

where $\overline{q}$ is the level of the real exchange rate that balance the current account (i.e. the "fundamental" value of the real exchange rate).

The second equation is the price adjustment equation (à la Mussa 1982): prices adjust in order to decrease the gap between demand and output and increase (decrease) with nominal exchange rate depreciation (appreciation) (i.e. the pass-through of nominal exchange rate fluctuations to price inflation):

$$\dot{p} = \psi(y^d - y) + \dot{e} \tag{2}$$

The third equation represents the uncovered interest rate parity: the anticipated variation of the nominal exchange rate should be such that returns on assets in the domestic country and in the rest of the world are equalized. Dornbusch (1976) shows the conditions under which rational expectations are consistent, i.e. equivalent to perfect foresight. We assume that these conditions hold and drop out expectations from the analysis:

$$i = i^* + \dot{e} \tag{3}$$

The particularity of the model consists in the following equation modelling the money market. In an open economy the money market is open in the sense that non residents ask for domestic money. Actually, we have two compartments in the money market: the domestic money market where agents exchange money against securities and the exchange rate market where agents exchange domestic money against foreign currency. A net capital inflow could be represented as an increase in the demand of domestic money in the exchange rate market. In the short run, the interest rate should increase in order to serve this demand (assuming that the money supply is kept constant). We model this feature by adding a new term, *f*, in the money demand function:

$$m - p = \mu y - \lambda i + \sigma f \tag{4}$$

The real exchange rate is by definition: $q = e + p^* - p$. We assume that the level of output, *y*, is determinate exogenously by the amount of resources and the state of technology, assumed to be fixed. We also assume that the level of foreign prices and interest rate are fixed and we normalize them to zero.

The only link between the money market and the goods market is the current account (i.e. the external demand). For the sake of simplicity we have neglected the link via the investment function. This doesn't change the qualitative results of the model. A net capital inflow (here an exogenous shock) will have an effect on the interest rate (money market) and on the level of the nominal exchange rate (uncovered interest parity). The shock is transmitted to the goods market via the change in the external demand, which in turn implies a change in prices. The change in prices has a direct effect on demand and an effect on the nominal exchange rate (via the interest rate). This gives a new level of aggregate demand and prices, etc. until a stationary equilibrium is attained.

3. Inflation targeting and floating exchange rate regime

We first solve the model in the context of a regime of inflation targeting and freely floating exchange rate. As there are asymmetries in the speed of adjustment between the goods market and the money and financial markets, we will found the standard case of "overshooting" of the nominal exchange rate.

The first equation of the dynamic system representing the economy is derived from equations (1) and (2) here before (the goods market). It represents the adjustment path of the real exchange rate.

$$\left.\begin{aligned} y^d - \bar{y} &= \delta(q - \bar{q}) \\ \dot{e} - \dot{p} &= -\psi(y^d - \bar{y}) \end{aligned}\right\} \Rightarrow \dot{q} = -\psi\delta(q - \bar{q})$$

The second equation is derived from equations (3) and (4) (the money and financial markets) and represents the adjustment path of the nominal exchange rate. One can easily derive the adjustment of prices by combining these two dynamic equations.

$$\left.\begin{aligned} \dot{e} &= i \\ m - e + q &= \mu\bar{y} - \lambda i + \sigma f \end{aligned}\right\} \Rightarrow \dot{e} = \frac{1}{\lambda}(\mu\bar{y} + \sigma f - m + e - q)$$

The dynamic system represented in matrix form is as follows:

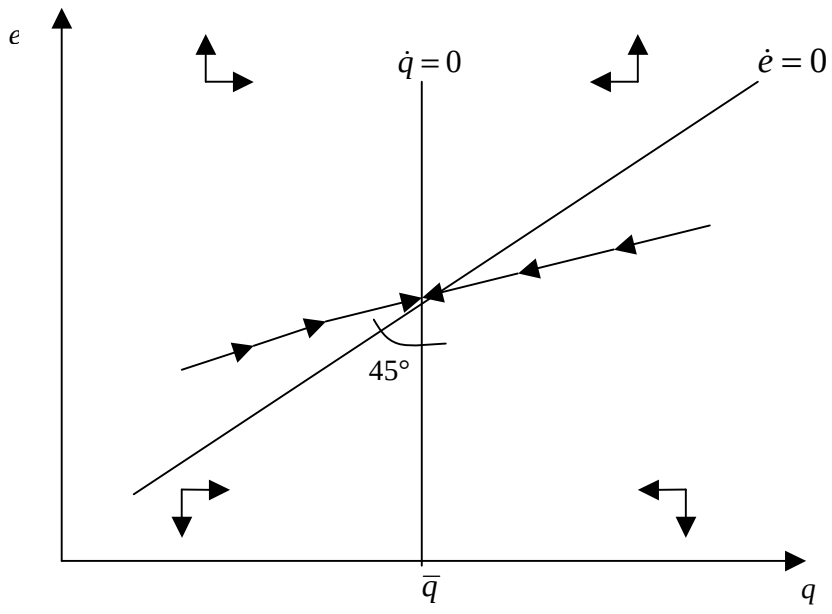
$$\begin{pmatrix} \dot{q} \\ \dot{e} \end{pmatrix} = \begin{pmatrix} -\psi\delta & 0 \\ -\frac{1}{\lambda} & \frac{1}{\lambda} \end{pmatrix} \begin{pmatrix} q \\ e \end{pmatrix} + \begin{pmatrix} \psi\delta\bar{q} \\ \frac{1}{\lambda}(\mu\bar{y} + \sigma f - m) \end{pmatrix}$$

The determinant of the Jacobi matrix being negative, we have "saddle" point equilibrium.

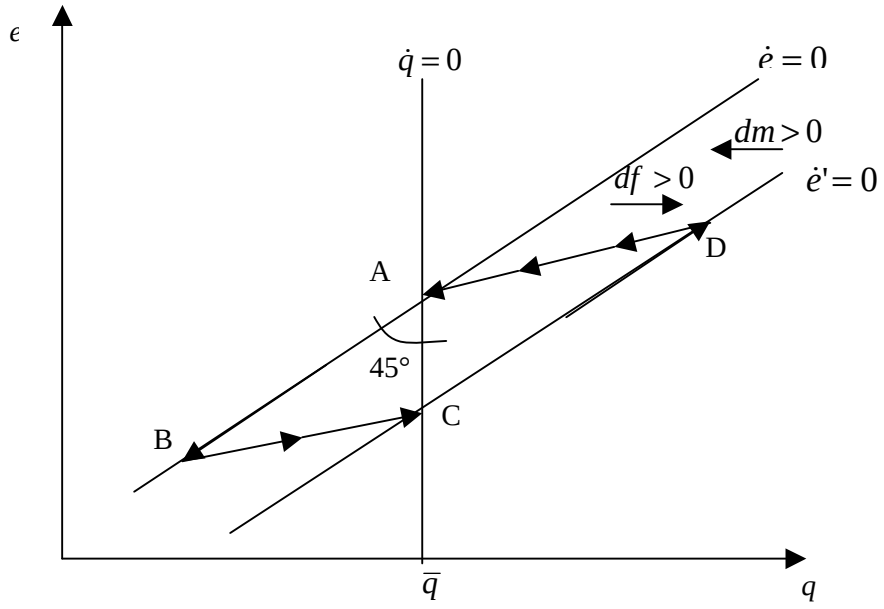
Adjustment path – the equations of the isoclines are as follows:

$$\dot{q} = 0 \Leftrightarrow q = \bar{q}$$
$$\dot{e} = 0 \Leftrightarrow e = q + m - \mu\bar{y} - \sigma f$$

Graphically, we obtain the following diagram representing the economy:



The effect of a permanent increase of capital inflows – an increase of *f* shifts the isocline $\dot{e} = 0$ to the right-down. Instantly, as the money supply is unchanged, the interest rate will increase to equilibrate the money market. The increase in the interest rate implies an anticipated future depreciation of the nominal exchange rate through the uncovered interest rate parity. For anticipations to be correct the "spot" rate might overshoot its long term level. We obtain an instantaneous appreciation of the nominal exchange rate (passage from point A to B) followed by a depreciation (passage from point B to C).



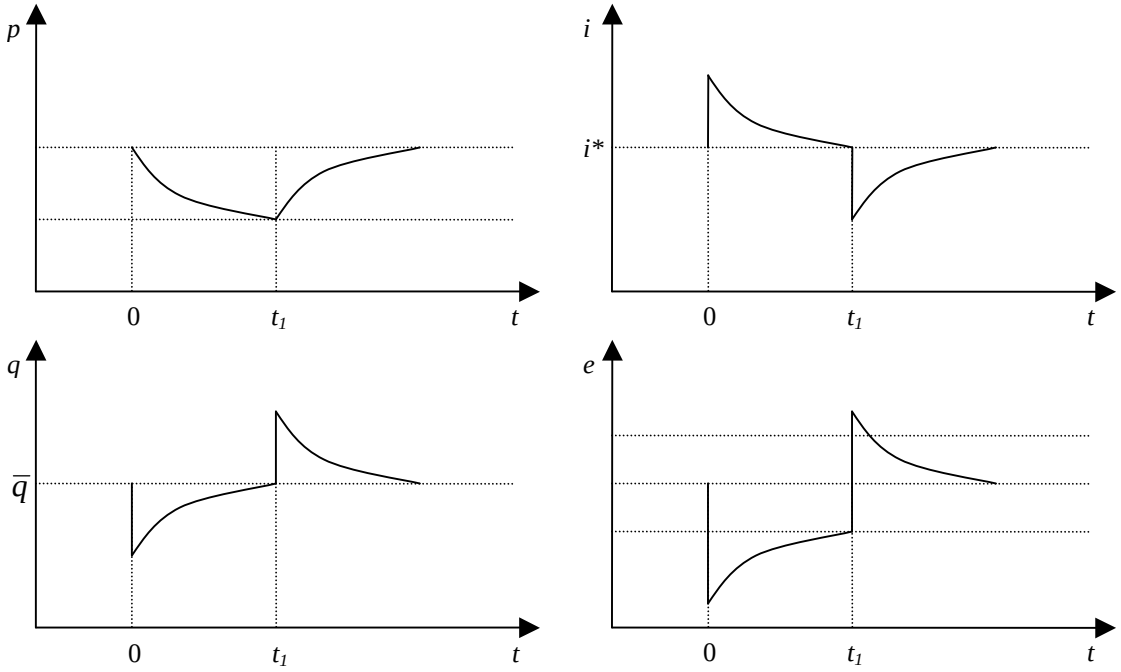
From one equilibrium to another (passage from point A to C) the level of the nominal exchange rate has appreciated and prices have decreased. During the adjustment path we have first an instantaneous appreciation of the nominal exchange rate and thus of the real exchange rate (prices being sticky in the short run). This has as effect to decrease aggregate demand through a worsening in competitiveness (i.e. a decrease in external demand). The decrease in demand is followed by a decrease in prices in order to equilibrate the goods market. At the same time the nominal exchange rate starts to depreciate in order to equilibrate the assets market. The combined effect is to restore external competitiveness and to balance the current account (which is in deficit during the adjustment path). If there are no policy interventions, the only long run effect of an increase of *f* is to appreciate the nominal exchange rate and to lower the level of prices.

Now, we consider the Central Bank which main objective is to maintain price stability. The reaction of the CB to the decrease in prices is to increase the money supply. This has as an effect to shift up-left the isocline $\dot{e}=0$. We have an adjustment path that is at odds with the one describes above. First there is an instantaneous depreciation of the nominal and real exchange rates (passage from point C to D). Aggregate demand increases and is followed by an increase in prices in order to equilibrate the goods market. At the same time the nominal exchange rate appreciates following the initial overshooting. The current account is positive during the adjustment path and balance at the long run equilibrium.

The following figure summarises the adjustment dynamics of the main variables of the model. The initial shock on *f* occurs at time 0. There is an instantaneous jump in the interest rate that triggers an instantaneous appreciation in the nominal exchange rate. Prices are sticky in the short run and the real

exchange rate appreciates with the nominal exchange rate. The appreciation of the real exchange rate decreases external demand and prices start to fall. The adjustment is such that the real exchange rate returns to its fundamental value. The Central Bank reacts at time t_1 by loosening its monetary policy. There is an instantaneous fall in the interest rate and an instantaneous depreciation in the nominal (and real) exchange rate. External demand increases and prices start to increase. At the same time the nominal exchange rate starts to appreciate following the initial overshooting and the real exchange rate returns to its fundamental value.

Adjustment dynamics (free float)



4. "Currency board" or "hard peg" regime

In this section we will show that the adjustment path in an economy characterised by a "currency board" or a "hard peg" regime will be very different than the one described in the previous section. In what follows we focus on the "currency board" regime assuming that there is no qualitative difference between a "currency board" and a "hard peg".

In a currency board regime the money supply is proportional to the amount of foreign exchange reserves of the Central Bank. As the CB is engaged to maintain a fixed exchange rate, a capital inflow will directly increase FX reserves and the money supply. The mechanism can be described as follows: a foreign investor that would like to buy domestic assets will change foreign currency to domestic currency in order to pay the residents. The CB buys the foreign currency at the fixed parity and creates

a corresponding amount of domestic currency. This new created amount of money ends up into the hands of the resident that is selling the asset.

We now turn to the impact of this additional money supply on the goods market. First observe that the maintain of a fixed nominal exchange rate will imply, through the uncovered interest parity, that the domestic interest rate will be equal to the (fixed) foreign interest rate ($i = i^*$). This means that the domestic money demand is fixed. An additional money supply then could not be equilibrated by the traditional mechanism of decrease in the interest rate. The only way to equilibrate the money market would be an increase in prices. The increase in prices will actually materialise through the behaviour of domestic agents that have more money in hands than what they would like to keep. As the agents do not like to hold more assets, the interest rate being fixed, they will use the additional money supply to buy goods. This has a positive impact on aggregate demand and prices. The increase in prices dampens external competitiveness. On the aggregate level we will have a substitution of foreign demand by domestic demand and the result is a persistent current account deficit.

Formally, we model the above discussion by adding a positive effect of capital inflows *f* on aggregate demand. The system of equations that describe the economy is as follows:

$$\left.\begin{array}{l} y^d = y(f) + \delta(\hat{e} - p - \bar{q}), \quad y'(f) > 0 \\ \dot{p} = \psi(y^d - \bar{y}) \end{array}\right\} \Rightarrow \dot{q} = -\psi\delta(q - \bar{q}) - \psi(y(f) - \bar{y})$$

The solution of this dynamic equation gives the adjustment path of the real exchange rate:

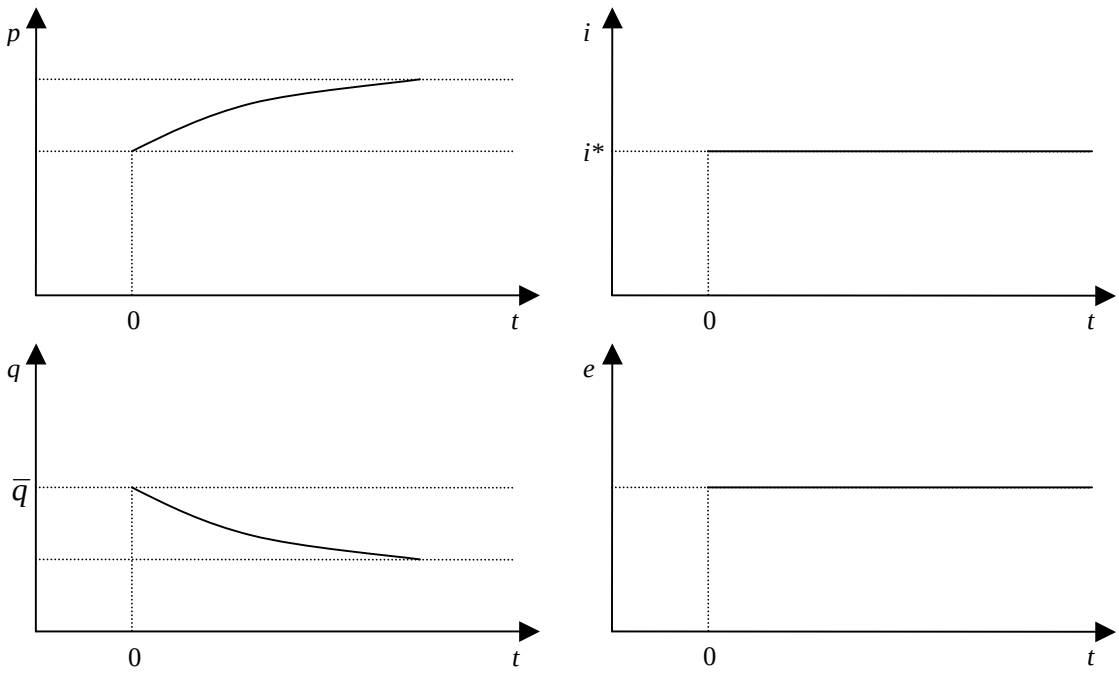
$$q(t) = Ke^{-\psi\delta t} + \bar{q} - \frac{1}{\delta}(y(f) - \bar{y}).$$

The essential part in the above expression is the stationary value of the real exchange rate to which it will converge in the long run, namely $\bar{q} - \frac{1}{\delta}(y(f) - \bar{y})$. This expression offers the following interpretations. A permanent increase of *f* will have a long lasting appreciation effect on the real exchange rate and thus a persistent negative effect on the current account. The size of this effect will depend on the parameter δ which measures the sensibility of aggregate demand to external demand (i.e. a proxy for the openness of the economy). We see that the more important δ is, the less important the external disequilibrium will be following a change of *f*. Put alternatively, the more important δ is, the easier for policy-makers will be to adjust the external disequilibrium by policies other than monetary policy (namely budgetary and structural policies). This can be interpreted as an argument in favour of fixed exchange rate regimes for more open economies.

Nevertheless, an increase in *f* will deteriorate the current account balance and the question is how the external equilibrium could be maintained in the context of a fixed exchange rate regime. The answer is given by the term $\frac{1}{\delta}(y(f)-\bar{y})$ which represents the deviation of the real exchange rate from its fundamental value. It gives the conditions for a fixed exchange rate regime to be sustainable: high openness of the economy and productivity gains (increase of potential output $\bar{y}$).

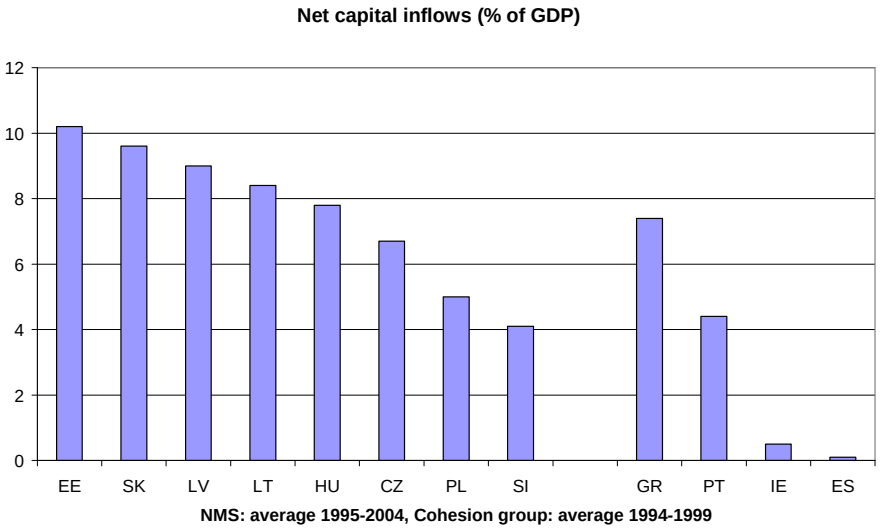
The following figure summarises the adjustment dynamics of the main variables of the model. The interest rate and the nominal exchange rate are fixed by definition. As monetary policy is no longer independent, the economy will be completely vulnerable to external shocks. The initial shock on *f* creates an overheating in the goods market and a price increase. The price increase dampens competitiveness and deteriorates the current account balance.

Adjustment dynamics (fixed exchange rate)



5. Empirical study

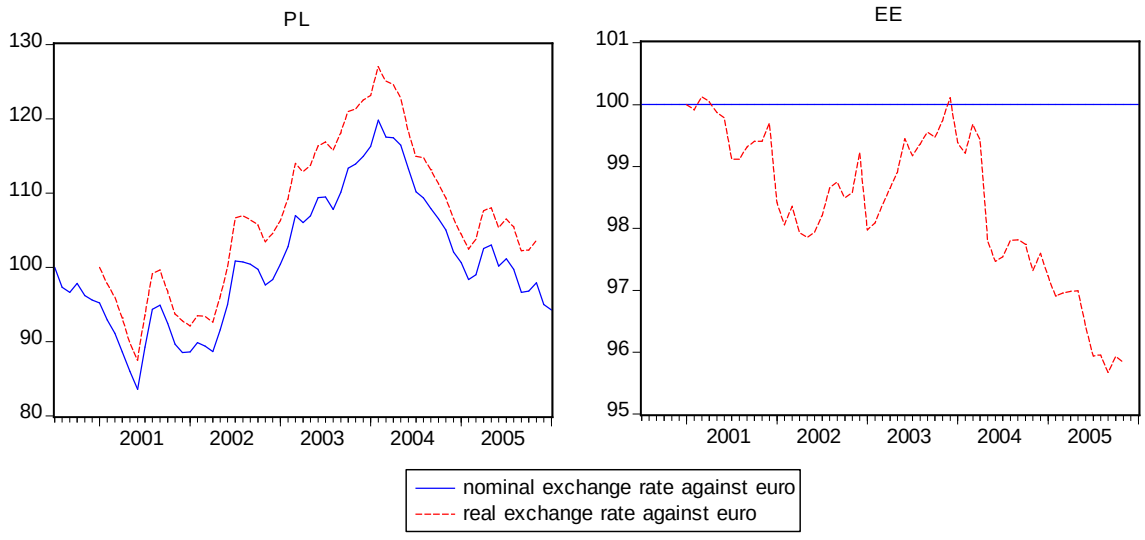
We start by showing that net capital inflows have been very important in NMS during the last decade, much bigger than in the "cohesion" group countries prior to their entry in euro area. This supports our intuition that capital inflows could be a major source of shocks in NMS.



Source : BIS

Case study: Poland vs. Estonia

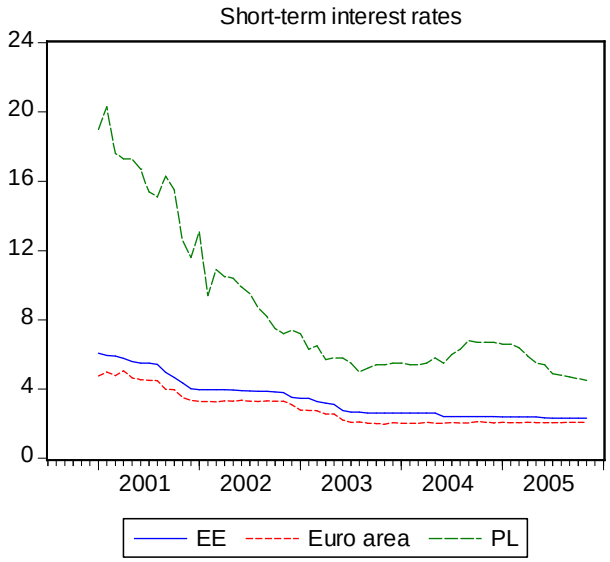
A first case study will focus on empirical developments in Poland and Estonia. Among NMS, Poland is a representative example for a regime of inflation targeting and freely floating exchange rate and Estonia is a representative example of a currency board regime. The two countries are also different in size and openness: Estonia is a small very open economy while Poland is a big relatively closed country.



Source: IMF, increase=depreciation

Looking on real exchange rate developments, a first finding is that the behaviour of the real exchange rate mimics closely the theoretical predictions of the model. In Poland the real exchange rate fluctuates a lot. In Estonia the real exchange rate shows a clear appreciation trend.

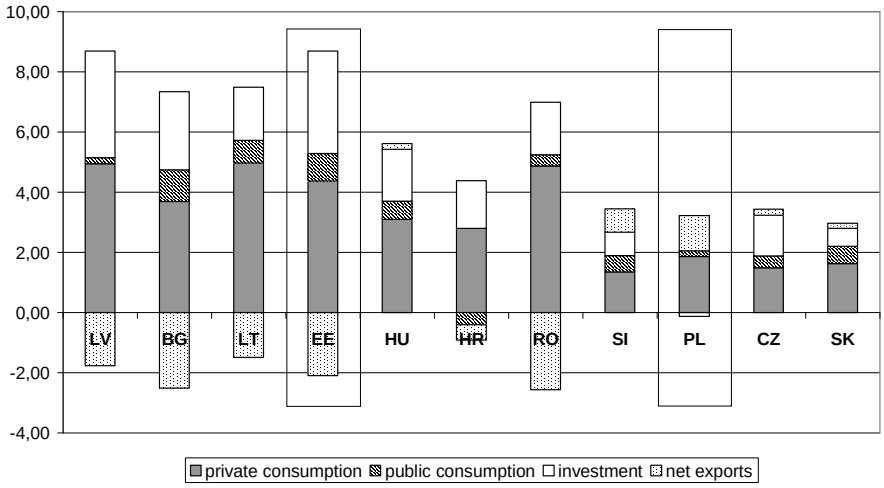
The next figure shows that the interest rate in Estonia was close to the one in the euro area, to which the currency was pegged. This confirms that the uncovered interest rate parity was respected (adding a small risk premium for Estonia). The interest rate in Poland was much more volatile compared to the one in Estonia, suggesting the shock responding movements of the interest rate shown by the model.



Source: IMF

We next look on the developments of aggregate demand. The contribution of internal demand to GDP growth is much higher in Estonia than in Poland and the contribution of net exports is negative in Estonia and positive in Poland. The same findings are visible for other currency board regimes such as Bulgaria, Lithuania and Latvia compared to other inflation targeters such as the Czech Republic and Slovakia. This data is once again consistent with the theoretical predictions of the model.

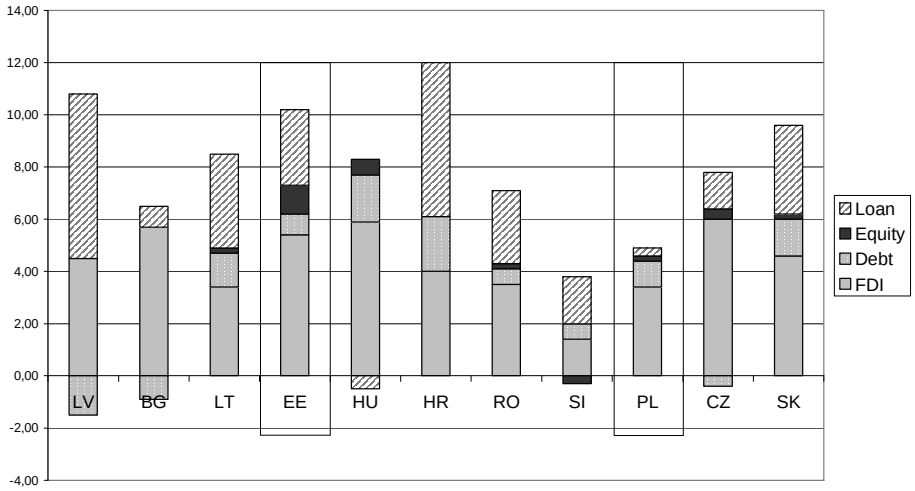
Contribution to real GDP growth (percentage points, average 2000-2005)



Source: Ameco

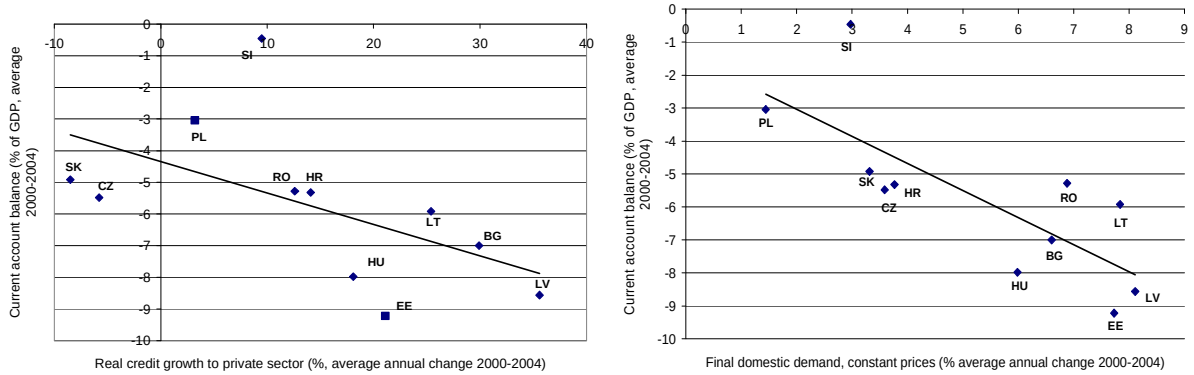
The two countries have received big amounts of capital inflows during the transition period. In relative terms the size of capital inflows was almost twice bigger in Estonia than in Poland. This brings the question if fixed exchange rate regimes are more favourable to attract foreign capitals. As shown by the model, fixed exchange rates are generating external deficits and thus there is a need to attract more capitals in order to finance these deficits. Another explanation could be that the volatility of the exchange rate generates more precautionary savings, thus there is less need to ask for foreign capitals in order to finance domestic investment (see Chinn and Prasad 2003).

Net private capital flows (% of GDP, average 1995-2004)



Source: BIS

The share of loans in the total capital inflows was much bigger in Estonia than in Poland. This can be explained by the structure of the banking system which is owned at 98% by foreign banks in Estonia compared to 71% in Poland. A big share of capital inflows are transiting through the banking system in Estonia where credit growth is linked with capital inflows. On the other hand, credit growth has contributed to boost domestic demand and to deteriorate the current account deficit.



Source: IMF, EBRD

In summary, the case study for Poland and Estonia supports the main findings of the model. We can see that in a context of large capital inflows Estonia has recorded an internal overheating that has contributed to persistent appreciation of the real exchange rate and a large current account deficit. In Poland, on the contrary, internal demand has been contained, the real and nominal exchange rates have fluctuated a lot (with signs of overshooting) and the current account has remained roughly in balance.

6. Discussion: strategic aspects of euro area enlargement

How the theoretical predictions of the model and the empirical developments in the NMS presented above can be linked with the integration of these countries to the euro area?

To answer this question we start by listing the main criteria that a country should meet in order to be accepted in the Monetary Union (the so called Maastricht criteria). These criteria can be summarised by the following main points: (i) low inflation (globally no inflation differential with the euro area) (ii) stability of the nominal exchange rate around a well defined central parity (i.e. participation in the ERMII) (iii) fiscal discipline (limitation of public deficit and public debt at 3% of GDP and 60% of GDP respectively) and (iv) low long-term interest rates.

First, the model developed here can be used to give a simple comprehension of these criteria. The situation in a monetary union can be approximated by the case of a fixed exchange rate regime. *Ex ante* monetary integration, the performances of a future member can be assessed by requiring the

nominal exchange rate to be stable, thus the exchange rate criterion. We have seen that in a hard peg regime there is a risk of overheating (through interest rate convergence) that leads to an inflation differential deteriorating external competitiveness and the current account, i.e. unsustainable developments. The inflation criterion was designed to rule out the possibility for such an overheating. In the absence of independent monetary policy, a way to correct a positive demand shock is to implement a more restrictive budgetary policy. The budgetary criterion was designed to assess the ability of the country to maintain fiscal discipline in this context.

A second insight of the model is that in the case of a catching-up economy that is attracting large amounts of foreign capitals, if the country decides to maintain low inflation it might exhibit important exchange rate fluctuations, or, if it decides to maintain exchange rate stability it might exhibit an inflation differential. This shows a clear conflict between the inflation criterion and the exchange rate criterion for a NMS economy. However, the exchange rate criterion gives explicitly more room of "manoeuvre" as it allows a large fluctuation band around the central parity. In this context, an inflation targeting regime with floating exchange rate should be strategically preferred by a country which main objective is to fulfil the Maastricht criteria. Moreover, the ECB states:

> "Within the framework of ERM II, exchange rate stability is explicitly subordinated to the primary objective of price stability for all participating currencies" (Policy Position paper of the Governing Council of the ECB, published on 18 December 2003)

A third insight of the model is that a premature entry in the monetary union with still going on catching-up process could lead to unsustainable developments in NMS that might be damaging to the economy and would require costly structural adjustments in order to be compensated. The model shows that a more open economy will be more "viable" in a monetary union (see the above discussion on the parameter δ) and thus more open economies will have bigger incentives to become members. This could partly explain why a small open economy such as Estonia is more willing to integrate quickly the euro area than a big and more closed economy such as Poland.

Case study: The Slovenian example

A second case study focuses on Slovenia which is forecast to be the first NMS to enter the euro area in 2007. In this section, we try briefly to explain why Slovenia could succeed in fulfilling the Maastricht (nominal convergence) criteria and to evoke the further challenges.

Disinflation process accelerates after 2000 in relation with a new monetary policy oriented to price stability after abandoning the intermediate target for monetary growth. In March 2006, inflation

reached 2.0 % (y-o-y) in Slovenia (2.2 % in the euro area). The fall in inflation resulted also from the pursuit of structural reforms with in particular the step by step de-indexation of wages.

Slovenia benefited of a rather high level of development, by comparison with most of NMS, with a GDP per capita close to 81 % of the average of EU-25, which likely contributed to support the nominal convergence in terms of relative price catching-up.

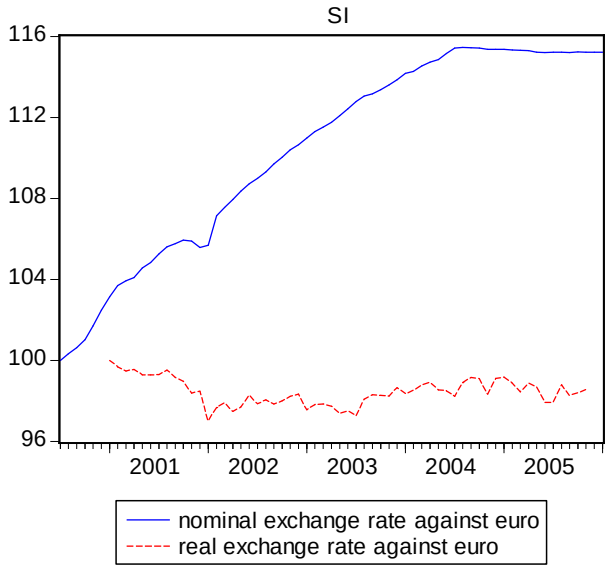
GDP per capita in Slovenia and selected NMS (PPP, EU-25=100)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Slovenia	**68.9**	**68.9**	**70.6**	**71.5**	**73.8**	**72.8**	**73.9**	**74.5**	**76.0**	**79.1**	**80.9**
Estonia	35.3	34.7	38.1	39.1	38.8	41.0	42.2	45.0	48.2	51.2	55.8
Poland	40.5	42.1	43.9	44.9	46.0	46.8	46.1	46.3	47.0	48.8	49.8
Hungary	49.3	48.4	49.5	50.7	51.8	52.9	55.8	58.1	59.3	60.1	61.9

Source: Eurostat

Slovenia pursued a cautious approach regarding the external financial developments. This situation contributed to limit the exogenous shocks which could result from large capital inflows. The country was the one among NMS that received the lowest amount of capital inflows (as a % of GDP) during the last decade. In terms of foreign direct investment, the slow pace of privatisation of large State firms has not triggered strong capital inflows until 2005 (35 % of GDP is still under state control according to the EBRD). This situation of low capital inflows can be partly explained by the high level of development at the beginning of transition. Foreign investors might have seen Slovenia offering less return on investment compared to other less developed Eastern European economies.

After implementing an exchange policy of steady nominal depreciation of the tolar vis-à-vis the euro until June 2004, the Slovenian currency has entered in the ERMII. Since, it has remained close to the central parity inside the fluctuation band of +/-15 %. The real exchange rate was roughly stable and accounted depreciation since the third quarter 2003 until 2005 resulting in particular from the disinflation process. This policy has contributed to preserve the competitiveness of exports, which has permitted to maintain a small trade balance deficit (less than 3.5 % of GDP) and a broadly balanced current account deficit since 1995.



Source: IMF, increase=depreciation

Finally, a remarkable fiscal discipline has contributed to maintain a low level of public deficit along the transition path (the public deficit has decreased since the peak of 3.9 % of GDP in 2001 to a level of 1.8 % of GDP in 2005). The level of public debt was close to 30 % of GDP in 2005, that compared to 27.4 % in 2000, but is still far below that of the euro area (70.8 %).

Risks and challenges of euro adoption: In spite of the satisfactory results in terms of macroeconomic stabilisation, the new exchange rate regime constraints the Slovenian authorities to implement measures to keep the disinflation process sustainable and to stabilise the current account deficit. One of the most important risks for an increase in inflation in Slovenia is the credit growth which has accelerated since 2003 and which was triggered by the decrease in the interest rates even if the refinancing rate was raised by 25 ppb in December 2005 to 3.75 %. In this context, external competitiveness could be dampened by the surge in inflation.

Credit growth in Slovenia and selected NMS (to private sector, %, y-o-y)

	2003	2004	Q1 2005	Q2 2005	Q3 2005	Q4 2005
Slovenia	**16.1**	**20.2**	**23.3**	**24.2**	**24.1**	**24.8**
Estonia	27.0	31.2	30.6	32.5	37.0	33.4
Hungary	33.4	18.6	18.8	15.3	17.2	18.9
Latvia	37.2	46.8	48.8	53.1	57.1	63.6
Lithuania	54.5	38.8	37.8	37.3	45.9	62.2
Poland	7.9	2.9	5.6	8.4	10.5	12.6
Czech Republic	9.3	12.4	16.4	18.3	18.9	20.0

Source : BIS

In the medium term, the further implementation of privatisation of the remaining firms under state control could contribute to increase capital inflows and to generate the above mentioned overheating effects. The risks relative to an increase in inflation and to worsening of the external situation have become higher with the implementation of a quasi-fixed exchange rate regime.

7. Conclusion

With the advancement in the catching-up process net capital inflows will naturally decrease in NMS. The model suggests that, whatever the exchange rate regime at this time, the real exchange rate should stabilise. The time of stabilisation of the real exchange rate could be viewed as the optimal date at which NMS might integrate the euro area (i.e. a stable real exchange rate means that there are not asymmetric external shocks between the candidate country and the euro area which can be interpreted as an optimal condition for monetary integration from the point of view of the theory of "optimal currency areas")

We have presented here three heterogeneous examples of macroeconomic performance and monetary and exchange rate policy in NMS. We have shown that in the case of Poland and Estonia the real exchange rate was far from stable suggesting that these countries are subject to large external shocks related to the catching-up process (the two countries still have relatively low levels of GDP per capita). In the case of Slovenia the real exchange rate was stable for a long period mainly due to a crawling peg like regime until June 2004. The interesting part is that since that, i.e. since the entry of Slovenia in ERMII and the fixing of the nominal exchange rate, the real exchange rate has remained stable, thus suggesting that the country has achieved (nearly) convergence to the euro area. Real exchange rate stabilisation implies nominal convergence and integration to the euro area is achieved naturally.

From a theoretical point of view the model developed here could be extended and ameliorated. One of the possibilities that we would like to investigate in future work is to change the assumption of exogenous output. In the case of NMS, a large part of capital inflows are direct investments that might have a positive effect on output. In this case the "fundamental" value of the real exchange rate would no longer be fixed but will depend on the inflows of FDI. Another interesting extension is to add a risk premium in the uncovered interest parity that could change with the sentiment of foreign investors thus adding another source of shocks. All this would make the model richer but eventually more complicated in order to be used as a policy tool by decision-makers.

References

Chinn, M. and Prasad, E. (2003) "Medium-term determinants of current accounts in industrial and developing countries: an empirical exploration" *Journal of International Economics* 59 47–76

Dornbusch, R. (1976) "Expectations and Exchange Rate Dynamics" *Journal of Political Economy* 84(6) 1161-1176.

Mussa, M. (1982) "A Model of Exchange Rate Dynamics" *Journal of Political Economy* 90(1) 74-104.

Obstfeld, M., J. C. Shambaugh and A. M. Taylor (2003), "The trilemma in history: Tradeoffs among exchange rates, monetary policies and capital mobility". DNB Staff Reports 2003, No. 94.

Obstfeld, M. and A. M. Taylor (1998), "The great depression as a watershed: International capital mobility in the long run." In The Defining Moment: The Great Depression and the American Economy in the Twentieth Century, edited by M. D. Bordo, C. D. Goldin and E. N. White. Chicago: University of Chicago Press.

Rogoff, K. (2002) "Dornbusch's Overshooting Model After Twenty-Five Years" IMF Working Paper /02/39.

Williamson, J. (2000) "Exchange Rate Regimes for Emerging Markets: Reviving the Intermediate Option" Policy Analyses in International Economics No. 60, Institute for International Economics, Washington DC.