One Size Fits None? Common Monetary Policy and Inflation Differentials in EMU
[Provisional and incomplete draft]

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Nominal divergence: violation of the “law of one price”? 

Nominal divergence is the deviation of absolute, i.e. money prices from average values, which emerge on homogenous markets. On the one hand, such deviations may be interpreted as violations of the "law of one price", signalling market failure or imperfections. Either agents are to blame for a lack of rationality or arbitrage is limited because of institutional restrictions. On the other hand it has to be examined whether the market is homogenous in the first place; if not, persistent price differences reveal a market separation, nominal divergence turns out to be a relative price.

Nominal divergence may appear on labour, goods and asset markets, i.e. on markets where flows or stocks are traded. Financial integration in EMU has made great strides; we observe interest rate conformity even of those assets that cannot safely be regarded as homogenous assets, namely public debt paper issued by different national agencies. Real estate prices however show large divergence across Europe. There are several possible explanations:

• In a process of general asset price inflation (which is currently observed as a mirror image of euro M3 growth) agents are searching for real estate objects in order to improve their portfolio allocation. Because of lagging price developments and expected locational quasi-rents in some countries a market equilibrium is not yet achieved.

• Structural change, which is a by-product of the catching-up process, brings about a strong demand for real estate objects in some countries.

• Demand for real estate may show a particular dynamic because national inflationary expectations drift apart from average EMU inflation target. The reason for such discrepancies have to found by analyzing goods and labour market dynamics.

EMS already was oriented towards the elimination of nominal wage differentials throughout Europe. Wage inflation, which because of a lack of credibility of national monetary institutions diverged from the Bundesbank norm, was expected to be lowered to the German standard by means of a fixed exchange rate. EMU has sharpened this approach by abolishing exchange rates altogether. From the point of view of the institutional theory of credibility and inflation it could be argued that a common EMU rate of inflation would emerge, as the possibility of devaluation no longer existed and the common goods market improved. Actually, national rates of inflation have adjusted to a large extent; what remains is
a small amount of inflation divergence, which – looking at the national level – show strong persistence. Small and persistent differences with respect to inflation rates run up to large differences of national price levels. Hence, it is important to understand the origins and consequences of such adjustment failures.

Analyzing a simple macro model

On the highly aggregate level, wage formation moves into the centre stage. Early debates on the transition from EMS to EMU were dominated by the question how the precarious interplay of wage and monetary policies would be affected by the change of leadership role from the Bundesbank to the ECB. The existence of two countries equipped with a different "stability culture" (as measured by the vertical distance of their national Phillips Curves) enforces nominal exchange rate adjustments in a fixed-rate system. Whereas the Bundesbank exerted a disciplinary pressure on German wage policy, the latter ruled the roost in the competition in all EMS countries. With a currency union established, the "Italian" Phillips Curve is expected to shift downwards if ECB preferences conform to those of the Bundesbank (De Grauwe 2005: pp. 52).

However, the ECB was established just because it appeared intolerable, from a political point of view, to maintain the Bundesbank style of policy making, or – to be more precise – to let the Germans alone decide on Europe's money. The early discussion on EMU often started from the assumption that preferences of the new monetary policy institution might be less stability oriented, compared to the Bundesbank. Moreover, German wage policies might perceive the ECB's monetary control to be "more remote", compared to the previous regime.
As a consequence, German leadership in wage policies might get lost. If national unions tend to downgrade the Euro-wide inflationary effects of their own wage claims, and the degree of the ECB's dislike of inflation, the outcome would be stagflation: supply-side wage pressure and demand-determined unemployment (Soskice/Iverson 1998, Hefeker 2002).

The decisive weakness of that debate is its focus on autonomous factors of wage formation, particularly inflation expectations. This is the legacy of the Barro-Gordon era in the theory of monetary policy where the focus was on strategic "games" at given full employment and where inflation was explained by credibility gaps on part of the central bank. This scenario is hardly appropriate for analyzing EMU. There is no doubt of the ECB's preference for price stability. But, nevertheless, inflation in some countries appears to be uncoupled from the common European guidelines.

In order to understand the logic of this deviation, the following model tries to grasp the macroeconomic constellation of a single EMU member country. Domestic inflation depends on the output gap and the shock term $w_t$. Inflation expectation is built of two components: the forward-looking element is given by the belief in the long-term realization of the ECB's inflation target $p^E$; the adaptive element, on the other hand, is fed by the experience of domestic inflation itself. The weights of both elements add up to unity and are assumed to be constant. However it appears plausible to suppose that the experience of persistent differences between $p^E$ and $p_t$ will diminish the value of the parameter $\mu$.

$$p_t = \mu p^E + (1 - \mu) p_{t-1} + \alpha y_t + w_t$$

Goods demand depends on the real interest rate, calculated in terms of domestic inflation, and on the change of the real exchange rate (for reasons of keeping the model as simple as possible, price levels do not appear explicitly). Hagen/Hofmann (2003) assume that domestic firms calculate real interest rates by using EMU inflation. This leads to more favourable
results with regard to dynamic stability. However, it is not true that all producers deliver their
goods on the European market. Domestic autonomous demand \( g_t \) can be interpreted as a
not serially correlated shock term; persistence of macro activity is modelled by the parameter
\( 0 < \theta < 1 \).

\[
y_t = \theta y_{t-1} + g_t - \beta \left( i^E - p_t \right) + \tau \left( p^E - p_t \right)
\]

The euro nominal interest rate depends on the estimated equilibrium real interest rate (which
equals \( g^E / \beta \)) and on the inflation target. As macro equilibrium is assumed on the EMU
level, Taylor reaction terms can be dropped from the interest rate rule:

\[
i^E = \frac{g^E}{\beta} + p^E
\]

A compact presentation of the model in vector-matrix form \( \mathbf{v} = \mathbf{A} \mathbf{v}_{t-1} + \mathbf{B} \mathbf{z} + \mathbf{c} \) is:

\[
\begin{bmatrix}
    p_t \\
y_t
\end{bmatrix} = \begin{bmatrix}
\frac{1 - \mu}{\Psi} & \frac{\alpha \theta}{\Psi} \\
\frac{(\beta - \tau)(1 - \mu)}{\Psi} & \frac{\theta}{\Psi}
\end{bmatrix} \begin{bmatrix}
    p_{t-1} \\
y_{t-1}
\end{bmatrix} + \begin{bmatrix}
\frac{1}{\Psi} & \frac{\alpha}{\Psi} \\
\frac{\beta - \tau}{\Psi} & \frac{1}{\Psi}
\end{bmatrix} \begin{bmatrix}
    w_t \\
g_t - g^E
\end{bmatrix} + \begin{bmatrix}
\frac{\mu - \alpha(\beta - \tau)}{\Psi} \\
\frac{\mu - \alpha(\beta - \tau)(\mu - 1)}{\Psi}
\end{bmatrix} p^E
\]

where \( \Psi = 1 - \alpha (\beta - \tau) \). The solution \( \mathbf{v} = (\mathbf{I} - \mathbf{A})^{-1} (\mathbf{B} \mathbf{z} + \mathbf{c}) \) is

\[
\begin{bmatrix}
p_t - p^E \\
y_t
\end{bmatrix} = \begin{bmatrix}
\frac{1 - \theta}{\Omega} & \frac{\alpha}{\Omega} \\
\frac{\beta - \tau}{\Omega} & \frac{\mu}{\Omega}
\end{bmatrix} \begin{bmatrix}
w_t \\
g_t - g^E
\end{bmatrix}
\]

where \( \Omega = \mu (1 - \theta) - \alpha (\beta - \tau) \), assumed to be positive. Both domestic variables, inflation
and the output gap, deviate from their equilibrium values, \( p_t = p^E \) and \( y_t = 0 \), only in case
of shocks. Note that domestic output, under specific parameter constellations, may even
increase after a wage shock, which can be explained by the impact of the real interest rate.

The crucial issue is the question of dynamic stability. Temporary shocks may divert both
the endogenous variables from equilibrium and bring about cumulative processes (this threat
will be all the more imminent if the shocks are serially correlated, which has been ignored
here for simplification). Stability can be checked by inspection of matrix \( \mathbf{A} \). Applying Schur's
Theorem, the twofold condition for convergence is given by

\[
\frac{\theta (1 - \mu)}{\alpha (\beta - \tau) - 1} < 1 \quad \text{and} \quad \frac{\mu (1 - \theta) - 1}{\alpha (\beta - \tau) - 1} < 1
\]

A numerical analysis of these relations by means of "reasonable" parameter values shows
that convergence prevails if \( \beta < \tau \), i.e. if the real exchange rate channel dominates the real
interest rate channel. If however $\beta > \tau$ is assumed, the interplay of two other coefficients, the degree of the belief in the realization of EMU target inflation and the degree of domestic output persistence, move into centre stage. After fixing the parameters $\alpha = 0.1$, $\beta = 3$ and $\tau = 1$, the region of stability with respect to $\mu$ and $\theta$ can be displayed as follows:

![Graph showing the region of stability with respect to $\mu$ and $\theta$.](image)

The message is straightforward: if market agents put little trust in the ECB’s inflation target, but are highly impressed by last period’s domestic inflation (low $\mu$) and/or if the domestic cycle unfolds strong persistence tendencies (high $\theta$), the national economy may stray from EMU average.

Note that convergence is not guaranteed if $\mu = 1$. This case corresponds to a scenario, which sometimes is recommended as a baseline for European wage policies: these ought to be oriented by the EMU inflation target and domestic productivity growth (which has been excluded from the model). The problem of such a wage guideline is twofold: it does not ensure stability and it suppresses market forces in wage determination – this is the typical drawback of (mostly) Keynesian income polices. A sure-fire recipe for convergence is given by $\alpha = 0$, i.e. if the slope of the supply function is zero. This implies that national wage polices do not react to labour market conditions, a hardly realistic assumption from an empirical point of view. Here again the tension between market forces and policy norms, two forces that control wage formation, is revealed.

The following graphs show the path of domestic output and inflation gaps after a 1.0 demand shock and a 0.2 supply shock, respectively. Equilibrium values are normalized to zero; in addition to the parameter specification as indicated above, $\theta = 0.4$ was chosen, supplemented by $\mu = 0.2$ and $\mu = 0.4$, respectively. This last mentioned alternative represents a rough watershed between convergence and divergence ($\mu = 1/3$ yields the unit root case).
Instability stems from both the persistence of the domestic cycle and the weak belief in the realization of the EMU inflation target in the home country. The latter topic may not be confused with the well-known problem of central bank credibility; it is simply that market agents in EMU member countries learn that the ECB target rate, whether realized or not, is of little significance for the national economy. It is true that the domestic economy suffers from a loss of competitiveness vis-à-vis the European market if $p_r > p^E$, but the real interest rate strengthens domestic demand so that employment, and thus prices, increase. This pattern of the macro process shows not only in case of demand, but also in case of supply shocks: there is no "stagflation", i.e. high inflation and low output.
Deviations of national inflation and output gap from EMU average.

Deviations of national current account balance and inflation from EMU average.

Deviations of national current account balance and output gap from EMU average.
Looking at the data

In the above model, economies deviating from the European average are characterized by high output and high inflation (in case of positive shocks); accordingly, although not modelled, trade deficits will prevail. Now we study whether this highly stylized pattern can be found when we look at the performance of EMU countries. First, some relationships between important macro variables are displayed, without identifying their country-specific origin (on previous page). The findings are somewhat disappointing, however.

- There are some weak signals of a positive inflation-output nexus, a relationship that can be expected to prevail because of the macro supply function. Deviations from that pattern might be explained by supply shocks.
- There is also a weak negative link between the current account and inflation which confirms the analytical assumption with regard to effect of varying competitiveness.
- Finally, there is hardly any relation between current account and output. This ambiguity can be explained on theoretical grounds: on the one hand, a domestic recession typically improves the trade account, on the other, a demand stimulus from abroad at the same time strengthens domestic output and the export performance.

Next, the focus is on the performance of single countries. With respect to cumulative inflation differences since 1999, a group of low inflation countries (Germany, Finland, Austria, France, Belgium) stands opposed to some high inflation countries (Ireland, Greece, Spain, Portugal), with the Netherlands and Italy forming an intermediate position (Busetti et al. 2006). Note however that there is no linear trend of deviation in all countries. The rapid increase of relative inflation in Ireland has stopped since 2003, a marked stabilization can also be observed in the Netherlands and in Finland. Both these countries show a positive performance also when we look at the current account. The graph shows that the deterioration of competitiveness of Greece, Spain and Portugal brings about large trade deficits. In Greece, and to a lesser extent in Spain, the unfavourable trade account might be explained also by cyclical effects, i.e. by strong domestic demand (measured by the relative output gap). The low-income high-export nexus is clearly to be seen in the Netherlands where macro stabilization dampened price increases and demand.

By comparing the inflation, output and trade performance we may guess in which EMU member countries the $\beta > \tau$ scenario analyzed in the model gives an appropriate image of the actual market process. Two obvious candidates are Greece and Spain where a strong domestic macro activity with respect to output and prices is accompanied by substantial trade deficits. Two mirror-image candidates are Austria and Germany where low domestic activity and moderate inflation go along with trade surpluses. A dominance of the real exchange rate over the real interest effect ($\beta < \tau$) seems to prevail in Portugal, where high inflation depresses output via the trade effect, and in Finland, where low inflation boosts output via the export channel.
The case of Germany where macro activity now seems to recover indicates that the criterion of $\beta > \tau$ or $\beta < \tau$ may not be invariable in historical time, and thus may not be suitable to separate macroeconomic regimes for longer periods. Low-inflation countries like Germany over time may succeed in strengthening domestic demand by means of the trade channel. On the other hand, a real interest driven boom over time may collapse as the increasing loss of competitiveness finally may take over command.

*Economic policy consequences*

The basic message of the model and the cursory inspection of empirical trends is that nominal divergence in EMU not necessarily results from market failure or "bad behaviour" of market agents. Therefore, enhancing (labour) market flexibility and asking for unions' wage restraint will not improve the situation. If, because of an at least temporary low weight of the real exchange rate impact on demand, domestic cyclical activity becomes detached from the macroeconomic conditions on EMU level, national fiscal policy regains its responsibility for stabilization purposes. Thus, in case of excessive national inflation, a fiscal tightening might help to reduce the inflation gap, excess demand and the trade deficit.

But the main problem is that with the transition from EMS to EMU macroeconomic restrictions for the national economy have changed substantially. Surely, the competitive pressure stemming from the Common Market may have gradually strengthened. The decisive distinction between the former fixed rate system and the current currency union is that trade deficits have lost their stabilizing force with respect to a monetary transmission channel. Beyond their indicative role for signalling the competitive weakness of a EMS country, trade deficits also triggered devaluation expectations of a country's exchange rate (mostly vis-à-vis the mark), which made domestic interest rates rise beyond the level defined by the key currency country (Germany). In general, this type of domestic interest "policy" (which actually was induced by foreign exchange speculators) helped to stabilize to national economy.

Today, from the point of view of a prospering EMU country, large imports are welcome as they tend to dampen price increases on the national goods market. But with a lacking speculation against the national currency, macro imbalances between EMU countries thus can be financed on a larger scale, and for longer periods of time. Current account imbalances of a much larger amount (up to 10 %, compared to only 5 % in the EMS) are financed by intra-EMU capital flows which are no longer exposed to any exchange rate risk. Trade deficits therefore no longer pose a problem for national economic policy making, at least in the case of excess demand. Matters are different if low competitiveness and high unemployment prevail, but this state of affairs may emerge and persist just because the current account constraint is no longer present in the European economy.

If member countries remain "out of line" for too long, macroeconomic stabilization and
institutional reform are difficult to implement as there is no obvious sign of "crisis". Rather, threatening tendencies of a transfer union might come up (Flassbeck/Spiecker 2005). A remedy that hopefully might help to prevent such a state of affairs is the re-introduction of EMS-type sanctions in the working of EMU monetary policy: the ECB should differentiate its main refinancing interest rate according to the macroeconomic condition in the member states (Siebert 2006). If national debt paper can be used in repurchase transactions only with a heavy discount, depending on the country’s trade and/or budget deficit, or on the national inflation gap, interest rates on securities issued by public and private agents of that particular country will rise.

Surely, this kind of monetary reform will undermine the uniformity of the euro bond market. But this feature did not rank prominently amongst the promises that were used to propel the EMU project. Market agents still can dispose of a single currency in their transactions. The re-introduction of the instrument of interest rate differentials only serves to maintain a market-oriented character of the necessary adjustments, and helps to prevent the EU from drowning in the abyss of transfer policies.

References