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**THE EXPECTED EFFECT OF THE EURO ON THE HUNGARIAN MONETARY
TRANSMISSION^{*}**

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Abstract

The most important mechanism through which monetary policy affects the real economy in Hungary is the exchange rate channel. With euro adoption, this mechanism will largely disappear and the impact of monetary policy will be transmitted via the interest rate channel, presently seen as rather weak. This has raised concerns that the influence of monetary policy on the real economy in Hungary could be very limited after euro adoption. On top of this, other concerns have been voiced as regards potential asymmetries in the wage-setting behaviour, the exchange rate and credit channels. Based on the experience of today's euro area participating countries and the structural characteristics of the Hungarian economy, this paper argues that after euro adoption 1) we may expect a broadening of the scope of the interest rate channel of monetary policy after euro adoption, 2) there are no institutional obstacles in the way of the effective functioning of the expectations channel in Hungary 3) substantially different monetary conditions from that in the euro area as a result of a different trade orientation are unlikely, and, finally 4) some asymmetries in the balance sheet channel may continue to exist for some time between Hungary and the core euro area countries but its effect will be significantly smaller after euro zone entry.

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1 Introduction

The prime motivation for the research on monetary transmission in the euro area was to find out whether it is possible to detect asymmetries within the monetary union which may make the transmission of the single monetary policy significantly different across participating countries. If such concerns are justified, then the enlargement of EMU by including countries with potentially very different monetary transmission mechanisms (MTM's) could be costly for new entrants on the one hand and disruptive for the functioning of the ECB by provoking disagreement among decision-makers on the other. In this case it may also be questioned that it is the interest of the new Member States to become full participants of EMU sooner rather than later.

At present the most important mechanism through which monetary policy affects the real economy in Hungary is the (euro-forint) exchange rate channel. After the permanent and irreversible fixing of the euro-forint parity, this mechanism will no longer exist and the impact of monetary policy will be transmitted mainly via the interest rate channel, which is presently seen as rather weak. This has raised concerns that the influence of the ECB's interest rate policy on the real economy in Hungary could be very limited after euro adoption. Furthermore, fears have been voiced regarding the responsiveness of social partners to monetary policy signals, i.e. the effectiveness of the expectations channel of monetary policy. An additional key concern, which was particularly strong prior to the launch of the euro, is that a member state may experience markedly different monetary conditions within the monetary union due to differences in the composition of the effective exchange rate as result of a very different trade orientation. Lastly, asymmetries of MTM between the euro area and Hungary could be reinforced by large differences in the strength of the credit channel.

Our ultimate goal in this study is to find out to what extent such concerns regarding the propagation of the single monetary policy to the Hungarian economy are justified. We review the euro area monetary transmission literature and some stylised facts from the euro area and Hungary in order to formulate expectations on the changes in the Hungarian MTM after Hungary has adopted the euro. The following section details the changes we expect in the scope of the interest rate channel in Hungary after euro adoption. The third section discusses the expectations channel in order to explore the responsiveness of negotiated wages to monetary policy signals. The fourth section looks into the issue of extra-euro area trade orientation. In this section we focus on asymmetric *effects* of the same policy, as opposed to asymmetric *shocks* that a single policy has to react to. The fifth section deals with the expected changes in the credit channel of monetary policy. The last section concludes.

2 Expected changes in the scope of the interest rate channel

Although the pass-through of bank lending and deposit rates from money market rates is already quite powerful in comparison to the euro area (see Horváth *et al.* 2004), credit extended by banks to firms and households lags behind the European average and a large share of it is foreign currency denominated. As a consequence, the effect of interest rate changes on macroeconomic performance is considered to be rather weak and the exchange rate is presently seen as the key channel of monetary transmission. For these reasons, concerns have been voiced that the disappearance of the euro-forint exchange rate channel after euro adoption will leave Hungary without a proper mechanism through which monetary policy may affect the real economy.

In this section we deal with the expected changes in the scope of the interest rate channel of monetary policy including the expected progress in financial deepening after Hungary has adopted the euro. By changes in its scope we mean mechanisms that presently do not belong to the interest rate channel, but will be part of the interest rate channel after euro adoption. We argue that the interest rate channel will embrace a broader set of mechanisms after euro adoption than they do today, because the ECB's monetary policy already affects the Hungarian economy in a number of ways, or will do so once Hungary has adopted the euro. In the following we discuss these effects one by one.

2.1 Domestic liabilities in foreign currency

Euro adoption is expected to enhance the interest rate channel by turning euro denominated liabilities of domestic agents into a medium of monetary transmission. These liabilities already play a role in the MTM process, but they transmit monetary policy actions from the ECB and not those of the domestic monetary authority.

As seen in Table 1 nearly half of the total outstanding domestic credit was denominated in foreign currency by 2004, of which 80% is denominated in euros and the rest is mostly in Swiss francs. The figures also reveal that this has to do with a high stock of corporate FX borrowing, with many firms using foreign currency loans. The increase in FX borrowing was remarkable in this sector in the second half of the 1990's when economic integration with the euro area accelerated. Moreover, we have witnessed a trend of rapidly growing household indebtedness in foreign currencies, albeit from a very low base.

Table 1 Forint and foreign currency loans in Hungarian private sector credit (% of GDP)

		1997	1998	1999	2000	2001	2002	2003	2004
Forint	Firms	13.4	13.2	13.1	14.0	15.0	14.2	14.0	13.4
	Households	4.0	3.5	4.0	4.9	6.2	9.4	13.1	13.7
FX	Firms	14.8	17.5	19.4	23.7	22.6	16.9	20.5	21.4
	Households	0.0	0.1	0.2	0.4	1.0	1.4	2.9	5.0
Total	FX	14.9	17.6	19.5	24.2	23.6	18.3	23.4	26.4
	Forint	17.4	16.7	17.0	18.9	21.2	23.7	27.1	27.1

Source: MNB

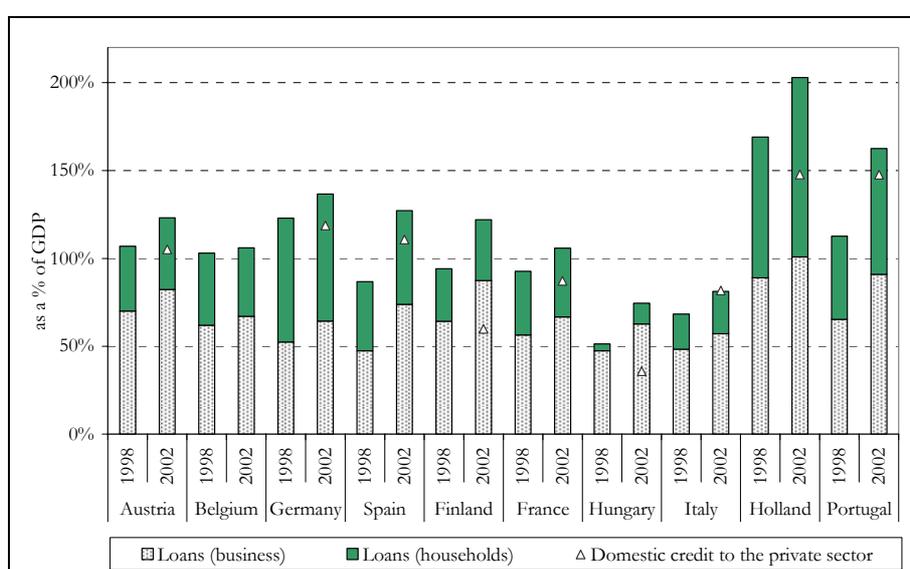
2.2 Domestic and total private sector credit

In this subsection we present evidence that the private sector is actually more exposed to changes in interest rates due to higher indebtedness than domestic credit figures would suggest. At

present this would not matter much for monetary transmission, as an overwhelming share of this stock is denominated in foreign currency, however, with euro adoption, it will substantially extend the scope of the interest rate channel.

Looking at data from Eurostat's financial accounts allows us to get a better picture of the level of corporate and household exposure to monetary policy than the generally used domestic credit figures. As shown by the white triangular markers in Figure 1, the distinction between domestic bank credit and the actual loan exposure of the private sector is very important in the case of Hungary (also for Finland). The discrepancy between the figures implies that a large share of total loans of the private sector is extended by non-residents (either banks or firms), which makes debtors sensitive to foreign monetary policy. However, to the extent that the Hungarian private sector borrows in euros, the cost of these loans will be influenced by euro area monetary policy.

Figure 1 Loans to the non-financial private sector



Source: EUROSTAT and IFS. Data for Greece, Ireland and Luxemburg are not available

Nonetheless, even if we increase the credit stock to include loans granted by non-residents (or resident firms), we still find that the indebtedness of the non-financial sectors is lagging behind the euro-zone average and this is mainly attributable to the small scale household lending. However, it is also apparent from the figures that there was a considerable increase in this value between 1998 and 2002. The figures reported in Table 1 show that this growing trend has been sustained since then.

2. 3 Prospects of financial deepening

In the following part of the paper, we discuss expectations of a further deepening of the Hungarian financial sector on the road to the euro based on the experience of present day euro area participating countries. This process is likely to be reinforced by the adoption of the euro.

The financial catching-up process referred to in the previous subsection is further underpinned by the convergence process and the introduction of the euro both directly and indirectly (IMF 2004). On the one hand, the process of convergence of permanent incomes and high rates of return on investment projects will boost the demand for credit in the region. On the other hand, lower nominal interest rates will push down the nominal cost of borrowing and this may in some cases be reinforced by higher equilibrium inflation rates reducing real rates. Fiscal convergence

can also promote private credit growth by reducing the financing requirement of the government. The experience of non-core euro area countries suggests that the dramatic expansion of private credit could begin as early as five years before euro adoption and continue thereafter. Some region-specific factors should lessen the risk of a credit boom, such as the more advanced stage of yield convergence and greater competition in the banking sectors, making the drop in bank lending rates less abrupt. Moreover, FDI could continue to substitute for some bank borrowing.

The IMF (2004) estimated an error correction model for the euro area including bank loans to the private sector, the long-run real interest rate and per capita income on PPP. Applying the parameters obtained from this model to Hungary, it is suggested that the credit ratio was 38.4 percent below its equilibrium level in 2002 (this average value for Central European countries is 41%). Dynamic simulations in IMF (2004) reinforce the intuition that adjustment could take place very rapidly in the years to come.

Box 1 Empirical evidence of a stronger interest rate channel as a result of euro-driven financial deepening – the Spanish experience

The Banco de España has recently published some results concerning the relationship between financial deepening and the interest sensitivity of economic agents (de Molina – Restoy, 2004). Significant changes have taken place in the financial accounts of the household and corporate sector in Spain throughout the 1990's, especially in the size and composition of households' financial assets, and households have also become more indebted. The authors present the results of the formal tests carried out on the stability of parameters in the consumption and investment equations of the Spanish Quarterly Projection Model using a rolling window technique. The results suggest that the parameters of the interest rate, financial and housing wealth, user cost and cash flow have been very unstable, and increased significantly in absolute value between 1990 and 2002, which means that the wealth effect and the effect of the user cost increased significantly. Another important finding is that simulating a 200 bps rise in the short and long term interest rates with the model's parameters set for 2002 they obtained considerably larger GDP-responses than with parameters for 1990. This analysis provides some evidence in support of the assertion that increased monetary stability in the convergence period and the subsequent participation in the monetary union implies stronger income and wealth effects of monetary policy also for new member states.

2. 4 The role of interest-sensitive industries

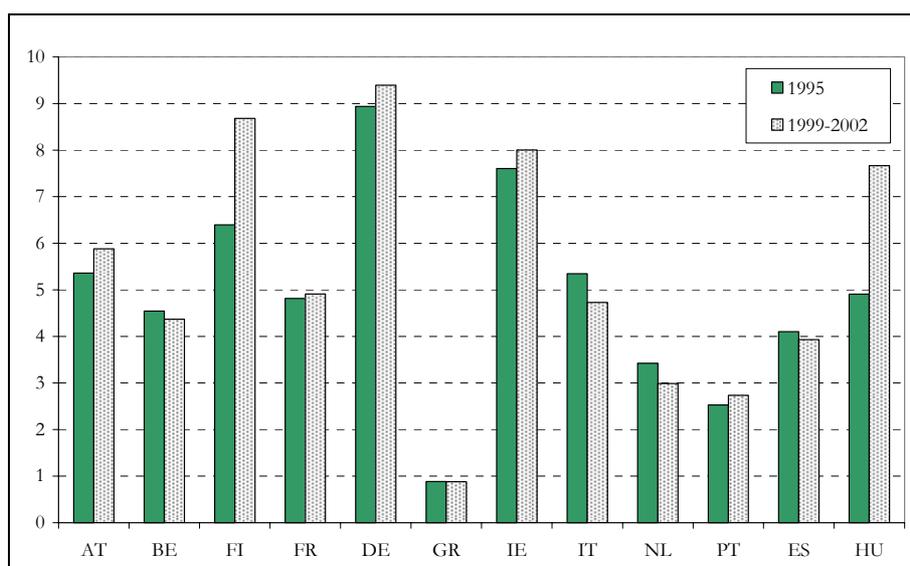
A large share of the Hungarian manufacturing output is produced in interest-sensitive industries (see Box 2), in which foreign presence is the most pronounced.

Box 2 Empirical evidence on interest-sensitive industries

The empirical work by Dedola and Lippi (2000, 2003) gives an estimate of the impact of an unanticipated monetary policy shock on 21 industrial sectors of 5 OECD countries using a VAR which contains industrial production, commodity prices, the price level, the money stock and the short-term interest rate. Their results confirm the hypothesis that the machinery and equipment and the motor vehicles industries (these together constitute the production of durable goods) are considerably more sensitive to interest rate movements than the average sensitivity of manufacturing to monetary policy. This finding has been confirmed by Peersman and Smets (2002). The data reported in Dedola and Lippi (2000) show that among the larger countries of the euro zone, Germany is relatively more specialized in durable goods and that manufacturing in general has a greater weight in Germany's and Italy's output. The update by Dedola and Lippi (2003), however, finds much smaller heterogeneity at the country level than at the level of industrial sectors as regards the impact of the single monetary policy.

Figure 2 shows that those industrial branches that are found in the literature to be particularly interest rate sensitive have a fairly high share in Hungarian manufacturing. Nonetheless, Hungary is certainly not an outlier, because Finland, Ireland and Germany have very similar figures.

Figure 2 The share of interest rate sensitive sectors (machinery and equipment, motor vehicles)

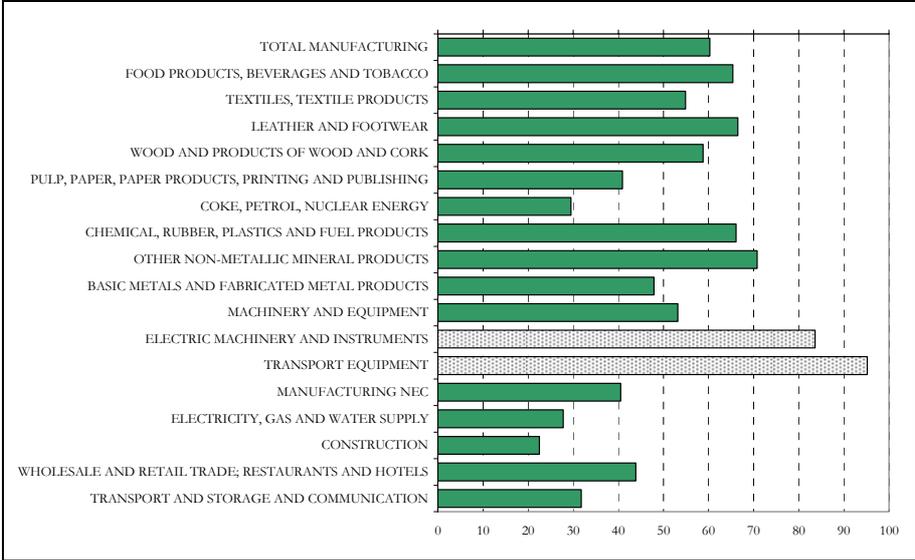


Source: OECD-STAN database

In Hungary the large share of interest rate sensitive industries is largely attributable to the composition of FDI (see Figure 3), implying that these sectors are not actually sensitive to Hungarian monetary policy. In terms of the cost of capital, they may be influenced by monetary policy measures of the home country, as affiliates of foreign enterprises choose between financial markets between the two countries when it comes to raising capital. Furthermore, the goods and services produced by the affiliates of non-resident firms are mostly sold in foreign markets, so the demand for these goods is not sensitive to domestic monetary policy, but the monetary policy of the destination country mostly but not exclusively in the euro area. A significant portion of Hungarian exports consists of intermediate goods to be re-exported by final exporters, mostly German ones. From this we conclude that both the demand for the products of these sectors and

investment into these sectors are sensitive to ECB monetary policy. This effect will increase the significance of what we will call the Hungarian interest rate channel after euro adoption.

Figure 3 The share of FDI as a % of total equity, 2001



Source: Hungarian Central Statistical Office

2. 5 The effect of macroeconomic performance in the euro area

Finally, the monetary policy of the ECB already has a third indirect, though equally important influence on the Hungarian macroeconomic performance through its impact on the euro area growth and inflation developments. As Hungary is very closely integrated with the euro area in terms of foreign trade, changes in the euro area business cycle have a strong impact on the Hungarian real economy (for recent results see e.g Darvas-Szapáry (2004) and Benczúr-Rátfai (2005)). After euro adoption this effect may no longer be considered an “external demand” effect, but rather as an impact of monetary policy on GDP and inflation.

3 The expectations channel: nominal wage developments and wage-setting institutions

3.1 The importance of the expectations channel in EMU

The development of wages is one of the most important factors determining the price level and inflation. This is because wages are not only part of the aggregate demand, but also constitute input cost of the production of goods and services. In this double role nominal wages affect price developments in the EMU and the competitive position of a participating country within the monetary union as well.¹ Wage bargaining partners tend to take into consideration the future price developments as well as the central bank's expected reactions to price and wage developments.

EMU has brought about an economic environment characterized by credible monetary stability. Thus, wage bargaining parties should be governed by expectations based on lasting price stability and the negotiated nominal wages should be in accordance with it. Negotiated wages are important, because these tend to last variously for one to three years in EMU participating countries and so insert some nominal rigidity into the economy. Negotiated wages are translated into nominal unit labour costs by productivity. The resulting economy-wide unit labour cost (ULC) development directly affects inflation. A simple rule of thumb can be applied: a nominal wage increase equal to the sum of expected inflation and rate of productivity growth is neutral for inflation. In this way nominal unit labour costs remain unchanged.² As price stability is defined as small but positive inflation rate (close to but below 2 per cent in EMU), ULC increasing below but close to 2 per cent could be seen as neutral for inflation on average. However, price inflation occasionally exceeds this average or medium term value and productivity also changes – sometimes unexpectedly – with changes in the economic cycle, so it is important to look at actual productivity and inflation figures for the assessment of wage developments.

In this section we look at the more recent wage developments of selected euro area member countries to assess two risks from the point of view of Hungary's EMU participation. First, there is a concern that in Hungary's case the frequent calls for wage convergence – based on the still huge wage differential compared to EMU-average – with little regard to developments in productivity, may imply that monetary policy signals, i.e. the expectations channel of the Hungarian monetary transmission mechanism, may be weaker in Hungary than in the euro area.

Second, the wage bargaining institutions in Hungary are in a formal sense quite flexible, because there are no strong centralized wage-bargaining institutions at the aggregate or even the industry level.³ We would like to understand its implications for expectations channel of MTM after euro

¹ Nominal wage developments are so important that some economists see it as the most decisive factor to provide an answer to the puzzle of monetary policy working in an approximately predictable way in a large group of countries despite the limited knowledge about monetary transmission. See for example Bofinger (2001), p. 114.

² The above is really a rule of thumb, because it does not take into account many factors that affect cost and demand conditions in an economy. In many cases, actual wage developments diverge from the negotiated wages thanks to various bonuses in case of unexpectedly strong productivity growth or promotions (“wage drift”, see ECB (2002), Box 5. on p 37. Wage contracts in most of the European countries include compensation for higher than expected inflation rates (see European Commission (2004), Table 2. on page 215. In open economies exchange rates and commodity prices are also important. On the demand side saving and investment balance, indebtedness, the government expenditures, while on the supply side taxes and the economy's cyclical position are very important for inflation. Finally, this simple formula does not take into account whether the initial level of wages had been appropriate and deviation from the rule of thumb would be justified to correct past developments.

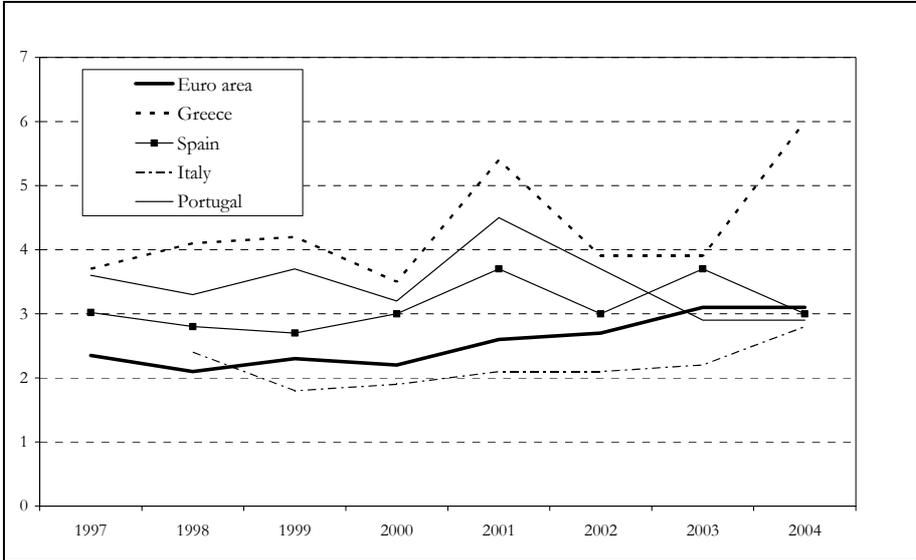
³ See for example OECD (2004) p. 151.

adoption. Therefore we investigate the question whether the historical record on wage negotiations of their institutional setup is a strong determinant of the extent to which the wage-bargaining process in a participating country was able to adapt to the new monetary regime.

3. 2 Negotiated wages and nominal unit labour costs in selected participating countries

It is interesting to look at the negotiated wages in those countries where historically the inflation rate has been higher than price stability as defined by the ECB. The following countries have been picked up on this basis: Greece, Portugal, Spain, and Italy. It is also interesting to look at wage developments in yet other countries, where inflation convergence did not pose great challenge before entering EMU, but inside EMU significant positive inflationary divergence have taken place. These countries are Ireland and the Netherlands. We have also added Finland to the other two as this country had been exposed to significant inflationary pressures.

Figure 4 Negotiated wages in the euro area, Greece, Portugal, Spain and Italy (%)



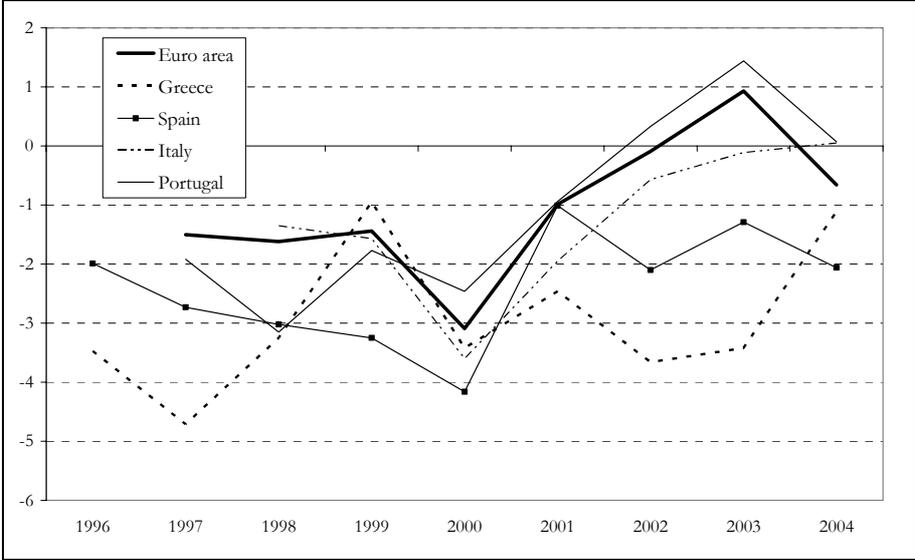
Source: European Industrial Relations Observatory (EIRO)

There are countries formerly characterised by high inflation rates, such as Italy, where wage increases have been moderate recently. Figure 5 illustrates that unit labour costs exerting disinflationary effects except in the year 2003, when they became neutral for inflation.

In other countries such as Greece nominal wage increases mostly compensated only for excess inflation over the inflation rate expected at the time of concluding the wage contract (see Figure 4.) and nominal wage increases did not exceed the sum of increase in productivity and inflation. In Greece’s case it cannot be excluded that wage bargaining partners and price setters had agreed on temporary wage and price moderation aiming only to help the country to comply with the convergence criteria, and to return to higher nominal wage and price increases after entering the euro area (Figure 5).

In Portugal excessively high negotiated wages resulted in a boom and a sharp correction during the downturn phase and in 2003 unit labour costs were inconsistent with price stability.

Figure 5 Use of the scope for distribution* in the euro area, Greece, Spain, Italy and Portugal (%)



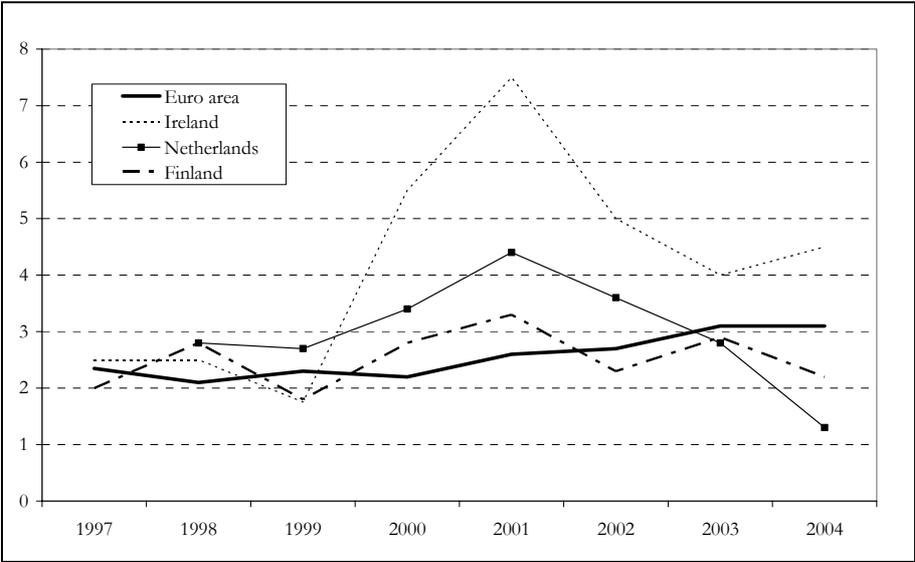
* “Scope for distribution” stands for the difference between nominal wages and the sum of the increase in productivity and inflation. The expression refers to the fact that in case of zero difference, there is no change in the distributional shares in the national income between the factor owners. The terminology has been borrowed from Hein *et al.* (2004).

Source: AMECO database

In the past decade wage-setting behaviour in these countries has been consistent with price stability, with Portugal in 2003 being the only exception. This suggests that wage bargaining in previously high inflation countries adapted mostly successfully to the environment of monetary stability.

However, we also have a reverse example: the Netherlands, a country showing nominal and real wage moderation for nearly two decades, experienced excessive wage increases in both nominal and real terms after entering the euro area (see Figure 6).

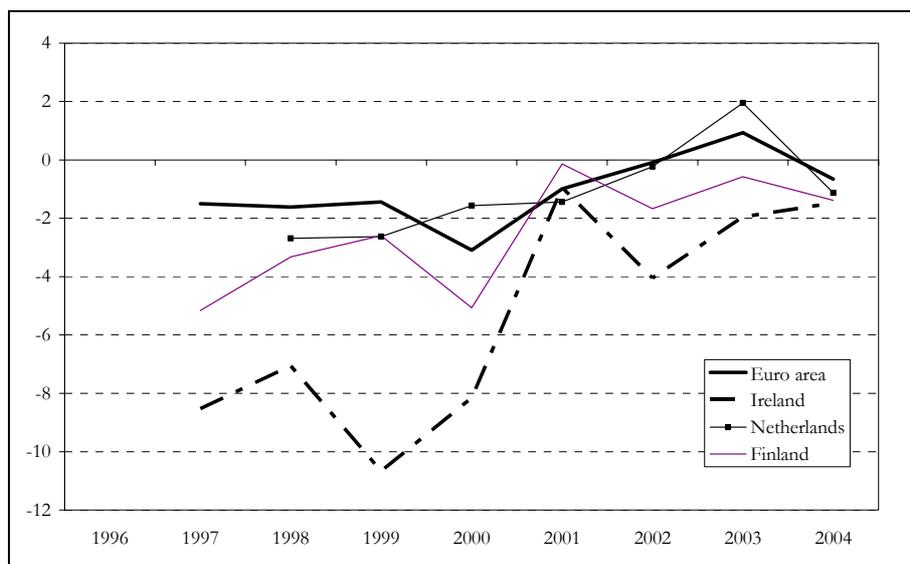
Figure 6 Negotiated wages in the euro area, the Netherlands, Finland and Ireland (%)



Source: EIRO

In Finland’s case the excessive negotiated wages are the most modest among the three and the quickest to return to wage moderation (i. e. quicker than both in the other two smaller countries and in the euro area as a whole, see Figure 6). In our view Ireland’s negotiated wages only reacted to external shocks in this period and was the consequence, rather than the cause of the upward pressure on the price level. Both in Ireland and the Netherlands, the wage excesses were larger than in Finland and the correction takes more time to be effected. Nonetheless, it is expected that wages will return to moderate levels by 2004 or 2005. It is interesting to see that in these three countries wage increases have been fairly moderate, if we compare them to the sum of inflation and productivity increase (see Figure 7), with one exception being the Netherlands in 2003.

Figure 7 Use of the scope for distribution* in the euro area, Ireland, Finland and the Netherlands (%)



* See note to Figure 5.

Source: AMECO

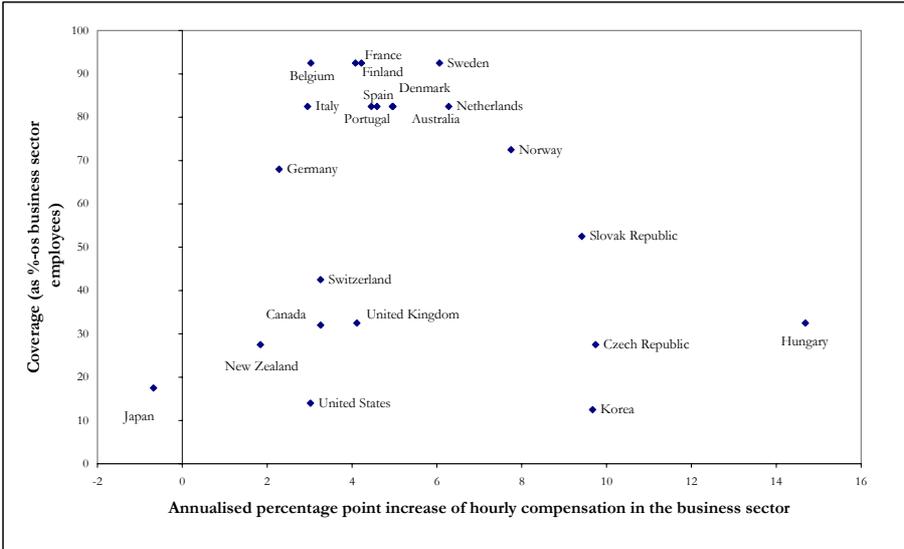
Based on the evidence discussed above, there does not appear to exist a strong link between the wage-bargaining track record and the extent to which a particular country was able to adapt to a new environment of monetary stability after the adoption of the euro. This suggests that from this point of view Hungary will not necessarily experience a radically different expectations channel from that in the euro area.

3. 3 Institutional factors of wage formation

Before the inception of EMU many commentators questioned the suitability of the existing European wage-bargaining institutions and labour market regulations for the monetary union. These wage-setting institutions were expected to aim at excessive wage growth, which could lead to a loss of competitiveness and decreased employment because of the little scope for businesses to pass over wage premia on consumer prices in competitive European markets. According to this view, a solution for this “excessive wage claim bias” would be to move in the direction of either total decentralisation or complete centralisation of wage-bargaining institutions.⁴ In most large European countries the dominant type of wage-bargaining institutions is the intermediate one. These are held in this view as having the most serious inflation bias, because they are too small to internalise all the gains from macroeconomic benefits of moderate wage developments (as the wholly centralised systems do), but are too big to take into account the consequences for competitiveness (whereas bargainers at the company level do).

⁴ This advice is based on the famous „hump-shaped” view of wage-bargaining institutions invented by Calmfors and Driffil (1988). OECD (1997) and later studies – including Calmfors (2001) himself – found limited support for this simple and apparently compelling relationship.

Figure 8 Bargaining coverage and nominal compensation (2000-2002)



Source: OECD (2004).

The experience of the present EMU-participating countries demonstrates that the existing wage-bargaining institutions could adapt to the new realities of EMU. As seen from Figure 8, there is no strict relationship between the institutional arrangements and wage inflation in the period under review. We can conclude from the above, that as far as lasting price stability is concerned, present wage-setting institutions do not seem to pose a major problem in Europe.

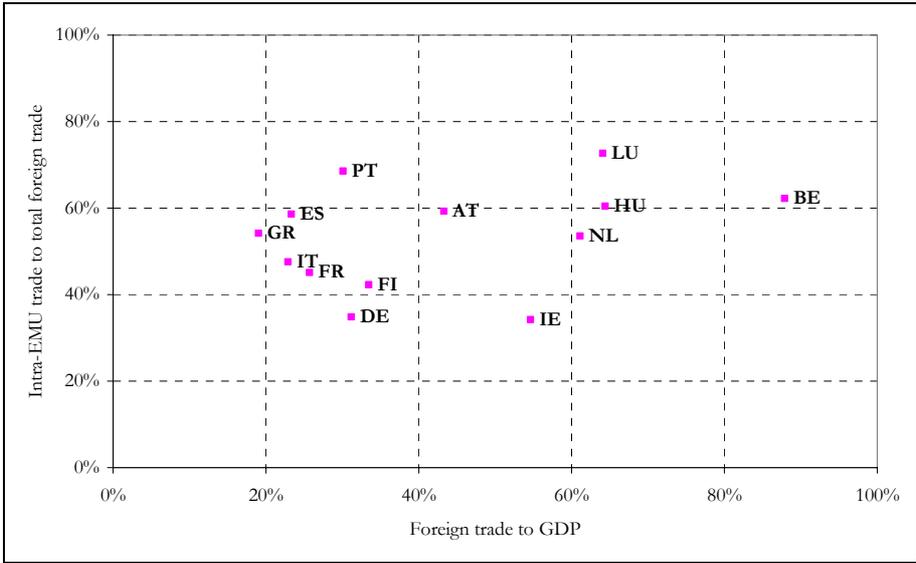
The implications for Hungary of the experience of present participating countries before and after joining EMU are mixed. In standard theory Hungary’s institutional set-up would lead to moderate wage developments. However, as we can see from the above evidence, decentralised bargaining institutions are far from being a guarantee for appropriate wage developments. Nonetheless, there does not seem to be anything in the current Hungarian institutional set-up that inherently prevents quick and sustained wage moderation supportive to price stability and sustained long-term growth.

4 The exchange rate channel

An additional key concern, which was particularly strong prior to the launch of the euro, is that the loss of the exchange rate channel may not affect every country in the same way. A member state may experience markedly different monetary conditions within the monetary union due to differences in the composition of the effective exchange rate as result of a very different trade orientation. A country participating in the monetary union cannot rely on monetary policy to adapt to asymmetric shocks that might occur due to a higher degree of openness toward non-participating countries than the EMU-average. The problem is particularly important for smaller countries that have little weight in the aggregate EMU economy; hence their conditions have little effect on interest rate decisions by the ECB.

As Figure 9 shows, in EMU, most small countries that are characterised by a high degree of openness are fairly well integrated with the euro area as concerns their trade relationships. Two exceptions are Finland and Ireland, both of which are small and quite open economies with most economic ties linking them to outside the euro area. Among the larger countries of the euro area, Germany has a high share of extra-EMU trade in its total foreign trade, which makes it very sensitive to the euro exchange rate despite the large size and lower degree of overall openness of its economy.

Figure 9 Openness (the ratio of intra-EMU trade to foreign trade and foreign trade to GDP, 2003)



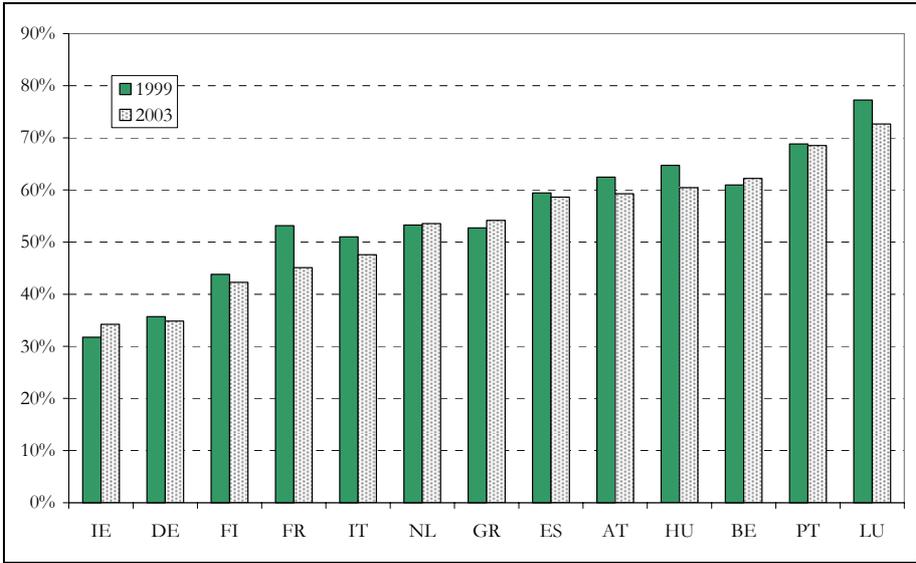
Source: IMF Direction of Trade Statistics, AMECO

Figure 10 suggests that by 2003 many countries of the euro zone, especially the larger ones increased their share of trade with countries outside the currency area in total trade to above the 1999 level. This fact seemingly contradicts the general consensus which holds that the single currency should enhance trade between the countries participating in the monetary union (see e.g. Rose 2000). This increase in extra euro area trade, however, is minor, and it is probably attributable to a number of temporary factors such as strong US demand, the rise in oil prices, greater economic integration with Central and Eastern Europe and other fast growing economies (like China) and perhaps even the weakening of the euro against the US dollar in part of this

period (HM Treasury 2003). Gravity models of trade⁵ and other empirical research have shown that the introduction of the euro actually promoted trade integration to a measurable extent. Micco *et al.* (2003) use a panel of 22 developed countries including the 12 participants of the European monetary union from 1992 to 2002 and find that EMU has not only increased bilateral trade between participating countries but also with the rest of the world.

The picture may change even more after Central and Eastern European countries have introduced the euro. The openness of Austria, Italy and Germany towards the enlarged euro area will increase disproportionately more than that of Hungary or any of the newcomers or old EMU-participants because of their closer linkages to the CEEs. We expect that this development will decrease heterogeneity across countries already in the euro area and those joining later.

Figure 10 The share of trade with the euro area in total trade 1999, 2003



Source: IMF Direction of Trade Statistics, AMECO

Hungary is already one of the countries most integrated into the euro zone, even though it has not adopted the euro yet. Hungary has relatively close ties with those euro area countries that are more exposed to external shocks (e.g. Germany or Italy), but this would be gradually mitigated somewhat as more and more CEE countries adopt the euro, considering that Germany and Italy settle a substantial share of their total foreign trade with these countries. On the other hand, trade integration with the euro area is expected to be further reinforced as a consequence of full EMU-participation (as shown in the study edited by Csajbók-Csermely 2002).

⁵ E. g. HM Treasury 2003.

5 The credit channel

A separate, so-called credit channel has been added recently to the more traditional channels of the MTM discussed above. Limitations of space and focus prevent us from discussing this channel in greater detail.⁶ For our purposes suffice it to remember that it refers to various financial market imperfections (agency costs, moral hazard and adverse selection). As a result, credit markets do not always clear by attaining equilibrium prices (in this case interest rates). In this view financial intermediaries sometimes and/or vis-à-vis some sort of clients apply credit rationing instead of setting market clearing interest rates.

As this view of MTM relies heavily on imperfect financial markets, it has been seen as naturally applicable to Europe. The reason for this is that financial markets in Europe are dominated by banks and bank dominance in itself is seen as a sign of capital market imperfection. The credit channel has been further divided into balance sheet and bank lending channels. First, we start with the bank lending channel then we turn to the so-called balance sheet channel.

5.1 The bank lending channel

In the bank lending view of the MTM it is supposed that banks play a unique role in the economy: they provide credit for those clients who are not able to raise external funds from other financial intermediaries or from directly issuing securitised debt. Thus, certain sorts of clients may be rationed by their sole source of external finance, namely banks. Smaller firms and households are affected disproportionately more than the larger ones. As a consequence, the output of these clients will diminish which results in a slowdown of the economy as a whole. A related issue is that not only the size of their clients, but also the size of the bank's themselves may be crucial for credit channel. The logic behind this is similar: smaller banks are more often liquidity constrained and find it difficult to offset the tightening actions of the central bank. Some researchers refined the argument by looking for more direct indicators of potential liquidity constrain than the sheer size of a bank: direct measures like the proportion of liquid assets in total assets have proved to be significant determinants of banks' reactions to monetary tightening.

In principle, a very powerful bank lending channel could make the Hungarian MTM asymmetric compared with the euro area and its presence could be an important source of concern regarding the propagation of ECB's monetary policy measures through the Hungarian economy. However, the relevance and validity of the approach itself has been subject to fierce theoretical criticism. We think it is fair to say that most of the controversies are directed to one basic feature of the theory, namely that banks are directly constrained in their ability to lend by available liquidity on the inter-bank market and this liquidity is fully or nearly so controlled by the central bank.⁷ Thus, proponents of the bank lending channel found themselves in a position where they had to ignore (or deemphasise) the importance of financial innovations in circumventing quantity constraints on financial markets. Also, they had to ignore those important recent developments that have led

⁶ The literature on the subject is voluminous. A textbook presentation of the subject and a good summary of empirical literature can be found in Walsh (1998) Chapter. 7. For a list of articles see p. 286, footnote 1 of the same book. For representative application on MTM see the conference volume of Boston Fed (Peek et al. (eds) 1995). Stiglitz and Greenwald, who were two of the earliest advocates of financial market imperfections and non-standard MTM channels nicely summarised their views in a new book, Stiglitz et al. (2003). For a more critical survey of capital market imperfections as a basis for new macroeconomic paradigm see for example Delli Gatti et al. (2001).

⁷ See Goodhart's contribution to the volume edited by Scheffold (2002). For an empirical model and test of credit channel with the central bank targeting interest rates instead of money supply see for example Bofinger et al. (2004).

to the use of models and operation frameworks in which monetary aggregates do not play any significant role. These new approaches are based on the short term interest rate as a key variable both as an instrument and an operating target of the central bank. The justification of a separate bank lending channel in addition to the traditional interest rate channel is equally hard empirically. Available econometric techniques are not suited to identify a separate bank lending channel which is capable to separate the demand and supply of bank loans and isolate this from the broader balance sheet channel.⁸ They mostly try to find variables that could be used as instruments for the loan supply effect. However, empirical works using such roundabout ways seem to have little chance to settle the debate between researchers.

5. 2 The balance sheet channel

Proponents of the balance sheet channel aim to explain the widely shared experience that smaller firms and households periodically face credit constraint when it comes to raising external funds because they cannot offer sufficient amount of collateral for creditors. In a perfect market only the expected earnings should limit the creditworthiness of banks' clients or their projects.⁹ In an imperfect real world this does not seem to be the case for many categories of potential borrowers.¹⁰ As financial market imperfections are more prevalent in the case of low net worth clients with little to offer as collateral, adverse financial conditions tend to affect smaller firms and households more heavily. In addition, the collateral value itself is dependent on the state of the economy and subject to change responding to interest rate movements. Thus, credit flows toward these clients tend to be pro-cyclical: a fall in credit supply may result from a monetary tightening also because it devalues firms' collateral base and so the more widespread is the use of collateral, the higher is the influence of interest rates on loan supply

A corollary of non-price clearing of the market is its pronounced non-linearity. A relatively small interest rate change – e. g. an increase of policy rate by the central bank – can have large effect on real activity, depending on the initial conditions of the balance sheet of non-financial companies and households. This is also called the financial accelerator effect.¹¹

The balance sheet channel seems to be partly relevant to Hungary's case. A rough comparison of potential importance of credit rationing can be obtained by using available data on enterprise balance sheets in EMU countries and Hungary.¹² The following graph shows that in Hungary the enterprise sector consist of smaller entities than the EMU average measured by either in terms of total assets, turnover, value added or employment (see Figure 11). The difference between Hungary and EMU seem to be the largest in the case of employment, where the Hungarian figure exceeds well the maximum value of the EMU as well. In the case of the other three variables, the Hungarian value is very close (turnover and value added) to, or below (total assets) the maximum EMU figure.

⁸ See for example Walsh (1998).

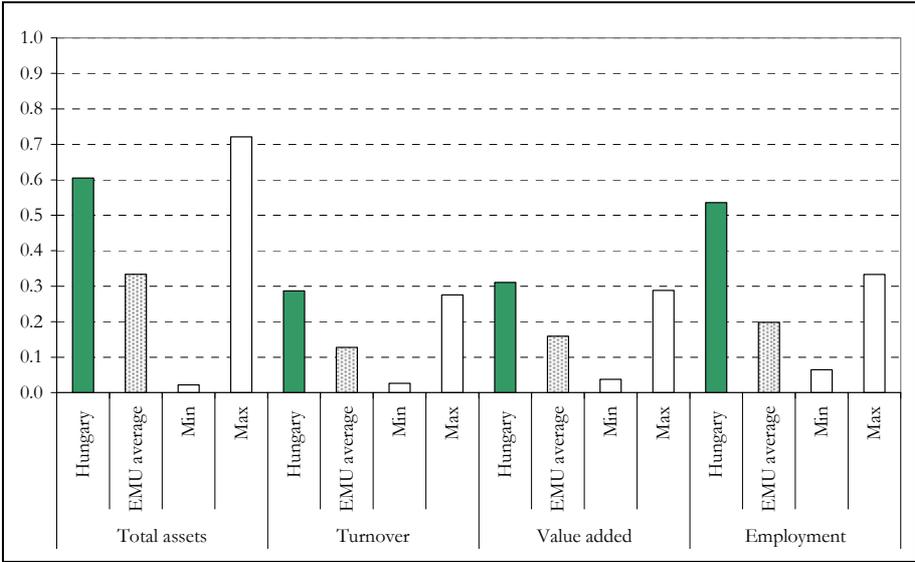
⁹ In a traditional general equilibrium framework, there is no difference between internal and external sources of finance. All the relevant information about the riskiness and expected payoff of the projects are available freely to all participants. In this perfect world there is no room for debt contracts and financial intermediaries. Not even for firms, hence the use of "projects", instead of companies. In a world with imperfect markets, not all the relevant information are readily available to all, thus, financial intermediaries – called „banks” – emerge to gather and process the necessary information. The information collected in this way is costly, but would lose its economic value if it were available for third parties.

¹⁰ Even if the cash flow plan is realised, the borrower may choose not to (fully) repay the credit if she thinks it is more profitable to her.

¹¹ See the concept in a business cycle context in Bernanke *et al.* (1995).

¹² For a more detailed description of data and calculations see Appendix 2: Data on the balance sheet channel.

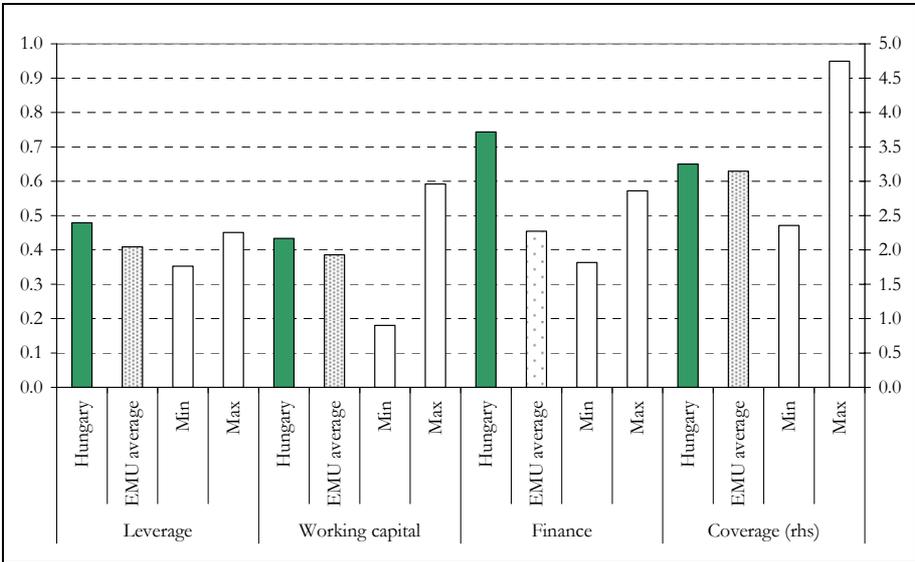
Figure 11 Proportion of small enterprises (% of total)



Source: BACH and APEH databases

More direct indicators of potential financial accelerator effects can be seen from the standard financial ratios (see Figure 12). The differences between the enterprise balance sheets in Hungary and in the EMU participating countries does not seem to be terribly large. This is certainly true for the most important single indicator, the financial leverage ratio (Leverage).

Figure 12 Financial ratios of small enterprises



Source: BACH and APEH database

However, the widespread opinion of the market participants seem to be supported by our calculation, namely, that Hungarian enterprises rely more heavily on short-term financing as compared to longer-term one (Finance). Thus, the two charts show that Hungarian enterprises are more exposed to short term interest rate variations, including the changes of the policy rate. However, these differences are not pronounced in general, and in the future, we can expect some convergence of these ratios to the EMU ranges and averages.

As for the balance sheet channel we may conclude that with EMU-participation, the increased macroeconomic stability should enhance creditworthiness of companies, especially if – as seems to be the case – there are significant non-linearities in credit markets. A good illustration of this is to look at the long-term segment of the credit markets: in a low inflation environment, longer term finance is much more attractive than in a volatile environment, where long-term finance may not be available at all. However, there seems to be little evidence for the existence of a bank lending channel. The banking sector is in a net excess liquidity position vis-à-vis the central bank. As in the EU – and contrary to the US – not simply the size, but the banks' liquidity proved to be the relevant indicator for bank lending activity. This aggregate net excess liquidity position of the banks probably will change into the reverse upon EMU-participation, but even in that case it would not be an indication of structural shortage liquidity position in the sense that the banks could not raise external funds in EMU financial markets. Rather, it would be a decision variable for banks based on profit motives, instead of being constraint, and could be adjusted according to business interests of banks.

Conclusions

The aim of this paper was to look at the concerns that have been voiced as regards the potentially asymmetric propagation of monetary policy measures after Hungary will have adopted the euro. These concerns are worth considering, because they point to the risks of a disruptive single monetary policy from the point of view of the Hungarian economy after euro adoption, even if the euro area and Hungary are found to constitute an optimum currency area.

In particular, we have dealt with four major issues in this paper: 1) the interest rate channel 2) the behaviour of wage-bargaining parties and wage-bargaining institutions and their responsiveness to monetary policy signals 3) trade orientation and 4) the credit channel. We have reviewed relevant stylised facts from the euro area and Hungary in order to compare the structural features affecting MTM. To formulate expectations on the changes in the Hungarian MTM after Hungary has adopted the euro we looked at the experience of present day full EMU participants.

Based on this evidence we may conclude that the risk of divergent macroeconomic performance of the Hungarian economy due to asymmetries in the monetary transmission mechanism is fairly small. First, although the interest rate channel may be weak today, we expect significant changes in its scope after euro adoption. The interest rate channel will embrace a broader set of mechanisms after euro adoption than they do today, because the ECB's monetary policy already affects the Hungarian economy through both the large size of euro-denominated loans and the high share of interest sensitive sectors which are mostly foreign owned. These sectors produce durable goods whose financing and sales opportunities strongly depend on the euro interest rate.

Furthermore, the exposure of the Hungarian non-financial sector to changes in interest rates may be greater than we would conclude from data on domestic credit to the private sector, because loans from foreign banks and firms and therefore foreign interest rates play a relatively large role in total non-financial private sector liabilities. Although the level of household borrowing at present is indeed quite low, a dynamic expansion is already underway and it is further underpinned both directly and indirectly by the convergence process and the introduction of the euro.

Last but not least, the ECB monetary policy strongly affects the euro area business cycle, which in turn affects the Hungarian macroeconomic performance. This channel is presently seen as an "external demand" effect, but after euro adoption it will be better characterised as an impact of interest rate policy on GDP and inflation. The combined effect of these changes in the scope of the interest rate channel is a relatively strengthening of this channel after euro adoption.

Looking at the experience of today's euro area countries, neither the historical record, nor the institutional setup of wage negotiations is a strong determinant of the extent to which the wage-bargaining process of a country is able to adapt to the under the new monetary regime. This suggests that there is no reason why Hungarian wage-setting behaviour can become consistent with price stability even without a change in the institutional setup. However, the evidence suggests that a decentralised system is no guarantee for wage developments consistent with price stability, either.

As for asymmetric responses to changes in the exchange rate of the euro, Hungary is likely to be much less exposed than most of the current full participants of EMU as trade relations with the euro area are very strong. This is likely to be further reinforced after Hungary (and other new Member States) will have adopted the single currency. As for the balance sheet channel, some asymmetries may continue to exist here for some time between Hungary and the core euro area countries but we expect its effect to be significantly smaller after euro zone entry.

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Appendix: Data on the balance sheet channel

In an attempt to assess the potential importance of credit channel in the Hungarian economy relative to the present EMU participating countries, we tried to compare three financial ratios of the enterprise sectors. Unfortunately, there is no one single such database, which contain all the necessary data for both EMU and Hungarian enterprises. Thus, we had to use the BACH database¹³ for the EMU countries and the APEH (Hungarian Tax Authority's) database for the Hungarian companies. The former database had been used by Peersman *et al.* (2002) to assess the asymmetric effect of financial accelerator in the monetary transmission mechanism among EMU countries.

Although the constructors and data providers of the BACH database try to make the nationally different balance sheets comparable, important differences remain. Moreover, as we have used another database for Hungarian enterprise balance sheets, the comparison with that of the BACH's is even more problematic, as accounting conventions and practices may very well differ. Another problem is that due to large differences in income levels and structural changes in the economy, the Hungarian enterprise sector seem to be undercapitalised and populated dominantly by smaller entities. Despite of this, we have decided to apply the same amount of turnover in constructing the small and large enterprise groups as used for EMU participating countries. The reason for our choice is that inside EMU Hungarian enterprises will have to operate in roughly the same financial environment as the companies of the larger EMU-participating countries. Thus, we took the 7 million euros turnover as the upper limit for small enterprises and 40 million euros as lower limit for the group of large enterprises (using the average HUF/euro exchange rate for conversion). In all cases, the time period is three years, between years 2000-2002, the latest available time period. We decided to use three years averages instead of one single year because in a few cases data have changed quite a lot from one year to another. The Hungarian sample contains all those companies that are obliged to adopt double-bookkeeping, the largest population of companies available for financial analysis.

Due to data limitations, we could obtain data for only 8 EMU participant countries: Austria, Belgium, Finland, France, Italy, the Netherlands, Portugal, Spain. No data was available for Austria and the Netherlands in calculating the proportion of small enterprises in terms of employment, so these proportions are calculated only for the remaining six countries.

The financial ratios used as indicators of potential financial accelerator channel are same as used in Peersman *et al.* (2002): an indicator for financial leverage (Leverage=total debt over total assets), and indicator of the demand for working capital (Working capital=ratio of working capital – which is itself equal to current assets minus creditors payable within one year less short term bank loans - over value added), another of the coverage of interest rate obligations (Coverage= gross operating profits over total interest rate payments) and finally one for indicating the need for short-term financing (Finance=ratio of short term finance to long-term finance).

¹³ See http://europa.eu.int/comm/economy_finance/indicators/bachdatabase_en.htm