SZENT ISTVÁN UNIVERSITY, GÖDÖLLŐ

Some coherence between economic convergence and monetary policy

THESES OF Ph.D. DISSERTATION

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Gödöllő
2009

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I. THE PRECEEDINGS AND THE MAIN OBJECTIVES OF THE THESIS

In the study the relation between disinflation and competitiveness as two partly conflicting economic policy goals represents the main starting point. For establishing the theoretical foundation of the antiinflationary policy under examination, which is inflation targeting, I gave a brief overview of the various economic approaches explaining what role monetary policy plays in the economy, as well as some corresponding fiscal policy, game theoretical and institutional aspects of the same, then went on to introduce the special literature interpreting and evaluating the above strategy.
Inflation targeting is indeed the economic policy framework which determined the economic convergence of the four Central European economies – the Visegrád Countries - which are in the focus of my examination beginning with the date of acceptance of their entry to the European Union and committed themselves to adhere to the eurozone membership. The subject of the Economic and Monetary Union can therefore be regarded as an alternative of the independent monetary policy for the Central-European countries as the economic convergence process of these transition countries can not be assessed without introducing the level of compliance with the eurozone accession criteria and the experiences since the establishment of the currency union.

The **paper focuses on two basic issues** within the extremely complex topic:

(1) it examines whether inflation targeting applied as part of an overall stabilisation policy is able to produce any additional results comparing to other traditional monetary policy approaches through which it can be qualified as more adequate tool of disinflation, and respectively
(2) it assesses the adaptability of the above monetary policy strategy in the case of countries converging to the eurozone illustrating the problem by the example of the Visegrád Four countries.

1. The antiinflationary commitment is of indisputable priority in nowadays' economic policy as through price stability economic actors can better plan their future decisions and do not have to count with the continuously changing purchasing power of their means of payment in their everyday transactions. Monetary policy based on inflation targeting as one of the possible means of achieving price stability has found application in numerous industrial, emerging and ex-socialist countries (such as Czech Republic, Poland, Hungary and Slovakia). Since Hungary's accession to the European Union and in

light of its approaching monetary union membership the evaluation of the effectiveness of the strategy based on the announcement of a medium-term inflation target and central bank transparency in the practice of countries within and outside Europe has become a particularly timely issue.

Within the examination of countries applying inflation targeting special emphasis should be put on the analysis of the Visegrád Countries which countries, having processed very similar economic historical paths in the last two decades, have reached the threshold of EMU membership. These economies have uniformly assigned price stability as the final goal of their monetary policy and have reached significant results in curbing inflation since the 90's. Whereas in the first year of transition the annual increase in the price level surpassed a rate of inflation of 30, in some cases even 50% (e.g. Poland) the rise of consumer prices was diagnostised as ufewer than 5% in all the four countries in the last five years.

In the economic policy system under discussion the central bank strives to break and anchor inflationary expectations. The inflation forecast is itself an intermediate goal in the system of objectives of the central bank, which is often supplemented by choosing the short-term market rate as operational objective to be able to keep control over the quantity of money and the price level. Maintaining the money market rate of interest at an adequate level is a precondition for the creation of savings sufficient for covering internal demand and that the disinflation process is not followed by a significant decline of economic performance therefore the targeted level of inflation should appear together with a real economic objective in the loss function of the central bank.

In practice, however, there are many obstacles of using the right policy objectives and tools, not only the defined by the resource capacities, social characteristics of the economy but the requirements of various supernational organisations supervising nation states also binds the economic decision-makers.

One of the main questions the paper aims to address is whether Central European economies pursuing an inflation target are capable of fulfilling the price stability criteria defined as one of the conditions of the Economic and Monetary Union and whether the direct inflation target defined within the confines of monetary policy was more successful in maintaining the right pace of disinflation than an exchange rate target or a money supply rule.

2. The room for manoeuvre of the Hungarian monetary policy – like in the case of other Central European countries – is restrained by the approaching monetary union membership while achieving the average level of income of the Union itself requires enormous efforts to be made; however, it is the most important long-term task for the healthy operation of the economy. To be able to enhance economic performance or at least maintain an appropriate level of growth depends on the external competitiveness and attracting foreign capital investment. On the basis of economic literature it can be asserted that principally competitiveness is not influenced by the nominal exchange rate but there is a strong relationship between economic performance and real exchange. The ever narrowing scope of intervention of the monetary policy and the real appreciation of the exchange rate further on makes the question due: how the dynamics of progress of the countries under examination can be supported in the future. Real exchange calculations based on different price and cost indices have shown that the national currencies of the Visegrád Countries follow a tendency of appreciation which seems to lead us to the conclusion that in emerging economies the two economic policy objectives: price stability and competitiveness can only be realised at the expense of each other.

In addition, despite the need for improving the often incomplete infrastructure, increasing the support of R&D, inward investment and SMEs, the frames of budgetary spending are also restricted as a consequence of the requirements concerning the fiscal discipline in the EMU. The examination of nominal and real convergence is therefore reasonable as reconciling these two priorities seems to be hard to phase in the case of emerging Central European economies.

On the basis of the above the analysis encompasses the survey of national economic indicators of the Visegrád Four countries from the 90's with special regard to the period between 1995-2008. Though the review of models describing some important factors of the convergence process (inflation, budgetary deficit, exchange rate) it is necessary to choose one which might best characterise the so far highlighted problems most adaptable taking into consideration the content and extension of the available data basis. The paper also aims at estimating whether the available statistical system corresponds to the data needs of research of similar nature.

The foreign exchange policy can manage short-term shocks – becoming more and more frequent following full capital liberalisation – as long as the other objectives of the central bank are not subordinate to the inflation target as in the case of the countries under examination. The collapse of international financial markets, however, has raised serious doubts whether any stabilisation policy exists which is able to restore the upset economy without real economic consequences. The recent crisis of the system of financial intermediaries and its dragging post oscillation calls our attention to watchfully evaluate the real economic effects of central bank interventions. Notwithstanding, I am not attempting to reveal the causes and consequences of the crisis, therefore I restrict my research aimed at introducing the most important characteristics of economic convergence to the period reaching until 2008 in the interest of pointing at long-term relations.

Considering structural peculiarities of Central European economies it is worth examining how economic policy can contribute to the sustainment of economic competitiveness in a restricted fiscal and monetary policy framework and with a strong commitment to an inflation targeting strategy.

II. AN OVERVIEW OF THE SPECIAL LITERATURE AND METHODS APPLIED

I am endeavouring to answer the two main questions of the paper through introducing the macroeconomic relationship in the theoretical literature, the analysis of the various studies and data describing the economies under examination as well as testing the main variables with the help of econometric models.

A) The most important themes of the studied literature:

1. The inflation targeting system

In the thesis I am making a survey over the various macroeconomic directions (classical, Keynesian and monetarist views), the rules versus discretion debate and some important correspondences on the frontier between fiscal and monetary policy so as to be able to explain the central bank strategy under examination and to establish the theoretical basis of the same. I am aiming to point out that despite the dynamic inconsistency revealed by Kydland and Prescott (1977) and the tenet of rational expectations marked by Lucas (1980) there exists a realistic monetary policy alternative.

Ben S. Bernanke and Frederic S. Mishkin (1993) established the theoretical basis of applying inflation targeting, Svensson (2005) offered guidance for defining the optimal strategy and the literature having piled up to a whole library so far offers numerous model solutions. (Orphanides-Williams 2002, Parrado 2004, Polgár 2005, Yao-Porter 2005, Cuche-Curti-Dellas-Natal 2008).

2. The monetary policy of the EMU as the alternative of self-supporting monetary policy

The theory of Optimal Currency Zones having become well-known through the works of Mundell (1961) and Mc Kinnon (1963) set the foundations for the operating preconditions of currency unions. Through the further development of the theory (Friedman 1953, Ingram 1962, McKinnon 1963, Kenen 1969, Mintz 1970, Fleming 1971, Cohen és Wyplosz. 1989, Weber 1990, European Commission 1990) it has been supplemented to a complex system by now. For the evaluation of the already existing integration, the Economic and Monetary Union, a possibility is offered by the above theoretical approaches and further macroeconomic analyses (Bayoumi and Eichengreen, 1992, Bayoumi and Prasad 1995, Babetski et al 2002, Alesina, Barro and Tenreyo 2002, Rácz 2003, Lőrincné Istvánffy 2005, Győrffy 2008).

3. The most important characteristics of the monetary policy of the Visegrád Countries

The four Central-European countries started applying inflation targeting at a different time, under different exchange rate regimes and with a somewhat different strategic set of instruments which has mostly proved to be successful in anchoring inflationary expectations especially if it was supported by a general governmental commitment (Rácz 2003, Csermely 1997, 2006, Horská 2001, Miroslav-Šmídková 2004, Neményi 2008). Apart from establishing the general technical conditions the operation of the system was determined by the level of central bank independence which we can obtain a more detailed analysis about via Beblavy's study (2003).

Apart from inflation convergence the question of budgetary discipline can largely influence the monetary policy of Central-European countries' monetary policy (Blanchard-Giavazzi 2004, Darvas-Rose-Szapáry 2005, Darvas-Szapáry 2008).

The economic policy makers of the Visegrád Countries have to consider the objectives of: (1) enhancing competitiveness, (2) strengthening the growth potential of the country and (3) the problem of disinflation (Neményi 2003). Competitiveness is decided at the company level there exist, however, such indicators which enable evaluating and ranking the international performance of whole national economies (Losoncz 2004). Among the main indicators the most often used are based on productivity and competitive advantages in terms of prices and costs. (pl.: real effective exchange rates) (Kovács 1999, Jakab-Kovács 2000, Tarafás 2006).

4. Empirical research precedents

A great number of economic studies (Neumann and von Hagen 2002, Ball and Sheridan 2003, Hu 2003, Wu 2004, Batini-Laxton 2005, Williard 2006) aimed at analysing the practice of inflation targeting countries with the help of empirical models. The success of disinflation is assessed by inflation persistence examinations. (Gadzinski and Orlandi 2004, Altessimo et al. 2006, Franta et al. 2007, Czech National Bank 2007, Hungarian National Bank 2008). There are considerable research results available analysing the main factors driving the Central European economic growth (Borys-Polgár-Zlate, 2008, Darvas-Szapáry, 2008). The relationship between the real exchange defining long-term convergence and productivity (Balassa-Samuelson effect) has been estimated by many experts (Szapáry 2000, Kovács 2002, Égert 2007).

B) The synthesis of results gained from the special literature and the econometric testing of assumptions:

- *The first and most important task of my work was to synthesise any systematise the results of already available research results.* Among the resources providing a good background for further research we can find analyses made by research institutions of the various countries, of central bank experts as well as of research teams of the European Central Bank and the International Monetary Fund. I divided the various aspects of the particular studies into main facts affecting nominal and real convergence in the long run pointing out the economic coherence between them.

- *I confirmed those relationships I ascertained on the basis of the special literature having been worked up through own data collection and I tested my hypotheses with the help of these data.* As the results of research in the field of nominal convergence and real economic growth provided an adequate background for analysis in these subjects the task of updating or supplementing the available data was reasonable. For a more detailed examination of the disinflation process and competitiveness a substantive data processing is necessary which I carried out on the basis of the data bases offered by the Eurostat, the ECB, the IMF IFS, the European Economy and the OECD. I collected the quarterly time series of inflation and relating variables (budgetary and household consumption data, balance of payments statistics, and commodity prices) for the period between 1990 and 2008. Among the indicators of competitiveness the most often applied ones rest on competitive advantages in productivity and price and cost relations (e.g.: real effective exchanges). For the analysis of the various real exchanges between 1995 and 2008 the time series of productivity and budgetary spending by Eurostat are only available from 1999 at full scale. During the research I found that the various statistics do not provide comparable and complete data (as a consequence of different currency denominations, and basis prices), so I converted them to a common denominator, moreover I tested different data with similar content (budgetary expenditures).
- *I made regression estimations on the basis of econometric models proposed by the special literature.* When choosing the right econometric approach the most important aspect was how (1) the inflation targeting conception can be compared to previous applications and (2) how the long-run international competitiveness of the four Visegrád Countries can be assessed.

  1. I tested the statistical goodness of the inflation targeting monetary strategy relying on the analysing study of Wu (2004) with the help of the regression equations included in the same supplemented by various indicators influencing the rate of inflation (current account balance, relative price changes, the expansion of domestic consumption) with an econometric model estimation. The panel

examination extended to 14 countries (13 OECD members and Romania) evaluated the effectiveness of monetary strategy in the four Visegrád Countries. I did not use a control group for the panel estimation I solely compared the inflationary process before and after introducing inflation targeting for the whole sample and for the countries in the focus of the examination. I preserved the indicator of the quarterly inflation rate with a one-period lag from the original function of the model as well as the inflation targeting dummy, the statistical significance level of which formed the basis of the hypothesis examination. The variables of the original model for difference in difference estimation were replenished with some other variables of overriding significance and of processable time series. For the estimation of the regression equation obtained this way the necessary data were provided by the IMF IFS data basis for the period between 1993 and 2008. I adopted the indicators of inflation targeting and central bank independence from the study of Batini-Laxton (2005) and Daunfeldt-de Luna (2008).

2. In pursuance of the examination of the inflation convergence of the Central European countries the analysis of productivity dynamics of the catching-up economies and the impact of relative price changes on competitiveness is a priority area. The research material of Oomes - which came to light as one of the working papers of IMF in 2005 - provides a good guidance for the above problem. Applying *the behavioural equilibrium exchange rate theory*[1] the trend of the (consumer pries based, producer price based and unit labour cost based) real exchange indicators were examined - according to the study of Oomes - considering the productivity differentials towards the eurozone and the potential exchange appreciating effect of government overspending as well as the interest rate differentials. I used those indicators whose quarterly data formed a continuous time series. I contrasted the growth rate of the particular variables with the help of logarithmised data. The data for the period between 1995 and 2008 were offered by the Eurostat and European Economy data bases.

I conducted the parameter estimation of both econometric models at a 5% significance level with the OLS-method by applying the Gretl 1.8 open-source software package with graphical surface mainly used for econometrics.

[1] The method originally proposed by Faruqee (1995) and MacDonald (1997) the equilibrium exchange rate is approximated by a single-equation estimation in the case of non-stationary time series. The equilibrium exchange rate resulting in this way is the theoretical value of the model backed by fundamental variables of the model.

III. RESEARCH RESULTS

1. Theoretical results

The paper has put the inflation targeting strategy in a comprehensive logical system through the overview and evaluation of the theoretical and practical aspects of various monetary policy approaches. Apart from drawing a parallel between the history of economic theory and practice it also endeavoured to clearly point out the theoretical background of some overlappings between fiscal and monetary policy. The thesis deduces what made it reasonable to formulate the strategy in question reasonable and the more and more widespread practical introduction of the same and reveals that economic policy based solely on monetary foundations is condemned to failure, as it can only be brought off followed and reinforced by the creation of real economic stability. Through the synthesis of some milestones and present dilemmas of monetary policy the applied central bank strategy can better be appraised from the point of view of both theoretical research and everyday practice.

2. Numerical research results

The thesis only applies such econometric analyses which are restricted to the hypothetical examination of the two questions raised in the introduction. It evaluates the effectiveness of the economic policy considered and evaluates competitiveness through the examination of the tendency and main components of different real effective exchange indicators.

I. The econometric analysis based on the panel estimation of countries applying inflation targeting is an improvement of Wu's method of 2004. During the analysis I came to the conclusion that between explanatory variables of inflation, the applied economic policy and the change in the price level show a significant correlation in most of the cases. The quarterly rate of inflation as dependent variable in the selected equation could be approximated by the inflation rate lagged with one period, the dummy variable of inflation targeting, the GDP proportionate consumption of households, the change in the world commodity prices at the best significance level, furthermore the trade balance has a somewhat more significant component in the equation than the current account (both in terms of GDP). The inflation targeting dummy gained a significant negative coefficient which confirmed the viability of the applied central bank strategy. In the case of the Visegrád Countries the same coefficient takes a lower value than in the whole panel, however, it had enough justificatory power to confirm the affect of central bank independence and credibility. It would need further research efforts to establish an unequivocal relationship between the temporal change in inflation targeting and inflation inertia, despite this the economic policy under examination has proved to be a successful antiinflationary tool when comparing the average and the volatility of inflation (before and after the adoption of inflation targeting). The quarterly inflation data with a one-period lag had a greater coefficient in the case of the Visegrád Countries than in the whole sample, which can probably be attributed to more vigorous price stickiness.

II. During the analysis of competitiveness – the particular real exchange indicators – I came to similar results like Oomes (2005) in that respect that the real appreciation experienced during the catching-up process does not necessarily lead to the deterioration of competitiveness. The various price and cost (CPI, ULC and GDP deflator) based indices of real exchange in the four Visegrád Countries have followed – apart from some smaller or greater intervals - a general appreciation tendency in

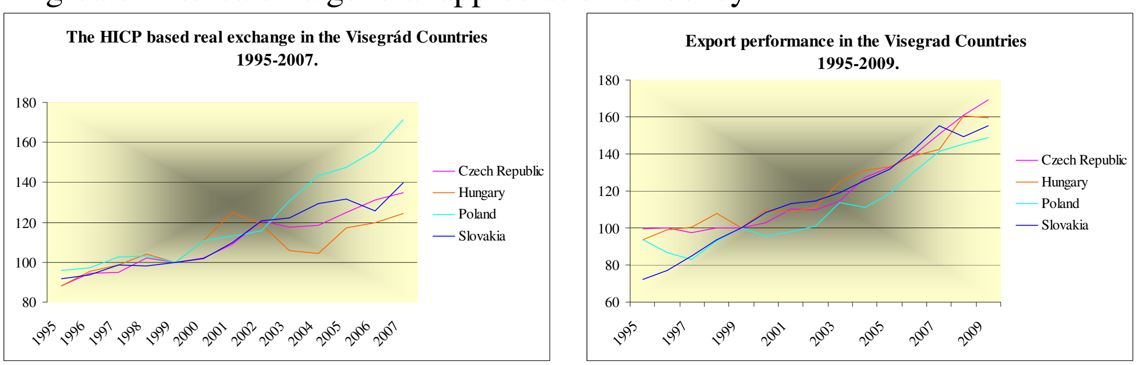

Figure 1-2: The HICP based real exchange and the export performance between 1995-2008 (2009 forecast)

the last 10-15 years this nevertheless did not block the spectacular upswing of the export activity. *(Figure 1-2).*

The nominal exchanges have adopted a similar course since 2004, apart from the Hungarian exchange rate path, the trend of which was not well-balanced in the last years preceding 2008.

The relationship laid down by the above referred author, that is budgetary spending evokes exchange appreciation, could not be attested. On the basis of variables reflecting budgetary spending an outcome reflecting a rather negative relationship between real exchange and the former ones was recorded. (A slight positive correlation between the budgetary deficit figures and the different real exchange rate measures could be detected only in the case of Hungary.) The interest rate differentials gained a positive coefficient in the equation but thanks to their positive correlation with productivity this result can only be interpreted with reservation. It can not be unequivocally confirmed that that the interest premium against the eurozone led to an increase in the exchange rate in the period under examination. On the basis of the above results I query that meeting the budgetary deficit convergence criterion should be the only priority of economic policy as its long-run impact on competitiveness is questionable.

3. Results obtained from the studied literature and from the substantive data collection

From the point of view of fulfilling the Maastricht criteria Slovakia shows the best results in 2007 *(Table 1)* which is not surprising as among the four countries only Slovakia joined the EMU in January 2009. As a consequence of the successful financial stabilisation in the last ten years, all the four countries got closer to the eurozone average in respect to the convergence criteria but since 2007 there has been a slight halt in the inflation convergence process which according to the Ecofin forecast (October 2008) will be followed by the deterioration of economic performance owing to the global financial crisis.

Table 1: Convergence criteria in 2006-2007

Country	**Inflation (%) (HICP)**		**Budgetary balance (GDP%)**		**State debt (GDP %)**		**Long-term interest rate (%)**	
	2006	**2007**	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**
Czech Republic	2,1	3,0	-2,7	-1,6	29,4	28,7	3,78	4,3
Poland	1,3	2,6	-3,8	-2,0	47,6	45,2	5,23	5,5
Slovakia	4,3	1,9	-3,6	-2,2	30,4	29,4	4,41	4,5
Hungary	4,0	7,9	-9,2	-5,5	65,6	65,8	7,12	6,7
Reference value*		**3,2**		**3**		**60**		**6,5**

Source: Eurostat, ECB

Comment: *On the basis of the 2008 ECB convergence report

Hungary counts to the least disciplined member state of the EU in respect of budgetary processes and also lags behind in the creation of disinflation partly on account of the backward-looking nature of inflationary expectations.

The four countries have shown a strong real convergence: the productivity has continuously improved in the last ten years accompanied by the prominent dynamics of export and investment. *(Table 2).*

Table 2: The growth of per capita GDP in 1999-2007

	1999	2000	2001	2002	2003	2004	2005	2006	2007
Czech Republic	1,5	3,8	2,9	2,1	3,6	4,4	6,0	6,4	5,4
Poland	4,6	4,3	1,2	1,5	4,0	5,4	3,7	6,3	6,7
Slovakia	-0,1	1,3	3,8	4,8	4,7	5,1	6,5	8,4	10,3
Hungary	4,5	5,5	4,3	4,4	4,5	5,1	4,2	4,3	1,2
EU-15	2,7	3,5	1,5	0,6	0,6	1,7	1,2	2,3	2,1
EU-27	2,8	3,6	1,7	1,0	0,9	2,0	1,5	2,7	2,5

Source: Eurostat

At the same time with the productivity increase the level of employment has remained low in three of the four economies. The Czech Republic performed somewhat over the eurozone average (65,7 %) whereas Hungary and Poland has fallen short of the average (the employment rate among the 15-64 aged is a 57% as it were) and Slovakia is in the medium field range with an employment rate of around 60%.

It is not possible to establish a rank between the countries according to competitiveness. The performance of the four economies, however, has shown a mostly favourable picture which largely depends – among others – on *the over average productivity increase, the economic invigorating effect of FDI, the significant degree of economic openness, the relative wage advantage compared to the education level of the labour force*. *(Table 3).*

Table 3: Some indicators of competitiveness in 2006-2007

Country	Youth attain-ment level (%)* 2007	Average gross monthly wages EUR (industry) 2006	Labour-productivity (GDP/ employed person) EU27=100 2007	R&D /GDP 2007	FDI (GDP %) 2005-2007 average	EBRD infrastr. reform index 2007
Czech Republic	91,8	974	71,9	1,54	6	3,3
Poland	91,6	865,3	60,6	0,56 (2006)	4,9	3,3
Slovakia	91,3	748,5	75,1	0,46	5,9	3,0
Hungary	84	888,7	73	0,97	20,2	3,7
EU-15	75,2	3656,3	110,3	1,91	6,3	n.a.
EU-27	78,1	2817,7	100	1,83	6,4	n.a.

Explanation: *the percentage of young people aged 20-24 years having attained at least upper secondary education

Source: Own compilation and calculation on the basis of Eurostat data

The globalisation of international financial markets has made the domestic currency of small, open economies vulnerable as a consequence of sudden

capital in- and outflows, the issue of eurozone integration therefore emerges from time to time as an urgent question.
The summary of the various central bank examinations enables the comparison of the costs and benefits of abandoning the substantive monetary policy and those deriving from the eurozone accession. *(Table 4).*

Table 4: The advantages and disadvantages of eurozone membership

Country	**The decrease in transaction+ administrative costs and foreign exchange risk (one-time effect on the level of GDP)**	**The long-term effect of the decrease in interest rates**	**The increase of external trade and other long-term effects (annual GDP growth)**	**The cost of lost seigniorage and other income**	**Effects of disinflation**
Czech Republic	Comparable to the other countries	The joint effect of the two factors would have enhanced GDP by 1,68% in the case of eurozone accession in 2006 + a 1,4% annual saving for enterprises because of the decrease in exchange rate risk		-0,86% for enterprises	1-3% real appreciation
Poland	0,14+0,07 %	-(150-200) basis points	+ 0,35-0,77% GDP growth	n.a.	the decrease in GDP growth by a 0,3-0,8%. during two years
Slovakia	0,3+0,05+0,02%	0,5-1% point decrease in interest rates	+ 0,4-1% GDP growth	-0,03% one-time+ -0,04% annual	1,5% greater inflation
Hungary	+(0,11-0,22) +0,08 %	+ 0,08-0,13 % GDP growth	+ 0,55-0,76% GDP growth	-0,17-0,23%	-

Source: Research Centre, Mendel University (2007), Borowski et al. (2004), NBS (2004), Csajbók-Csermely (2002)

The above data were predicted on the basis of the enlargement of external trade by approximately 75% (within a period of about 20 years) which can not be underpinned according to the eurozone tendencies rendered so far. (MNB 2008). Among the expected consequences of EMU-membership above all the reduction in transaction costs are worth emphasising bringing advantages for the companies operating in the real sphere (as financial institutions fall short of some of their revenue because of the same reason). The benefits from introducing the common currency principally affect trade in the long run. The equalization of interest rates to be expected in the future can still contribute to the reduction in the level of interest rates through the decrease in the interest premia. Notwithstanding, according to the economic literature it can also be presumed that the sudden drop in interest rates can lead to an overheated economy and further indebtedness, as it was observed in the case of some earlier eurozone members (e.g.: Portugal).

IV. NEW AND NOVEL SCIENTIFIC RESULTS

The thesis did not exclusively assess the success of the disinflation process by the example of the Visegrád countries but considered it as an important aspect of the overall economic catching up process without dispensing its further bearings.

1. The novelty of the present research appears in that it simultaneously evaluates the monetary policy of countries on the threshold of EMU accession, countries opting out from EMU and that of other inflation targeters with a great past experience, therewith it somewhat breaks with the practise of predecessors addressing the same subject. In earlier literature namely the target group consisted of either industrial or emerging countries, little effort has been made to universally assess the two different groups of countries on the basis of the commonly applied central bank strategy. The examination has found that transition economies can still be characterised with higher average rate of inflation, stronger inflationary persistence (and with mostly higher price level volatility) than the developed world, the introduction of inflation targeting has significantly contributed to the long-run reduction in the rate of inflation in the previous group as well.

2. Whereas earlier models considered inflation targeting in relation with economic growth *the methodological approaches I selected enabled the parallel examination of disinflation and competitiveness*.

3. *The thesis made a review of methodologies used for testing the hypothesis of inflation targeting* as optimal central bank strategy and selected that methodological solution which offered the best results, moreover it imported some further elements from other research materials in the same field.

4. *The examination* adopted in the frames of the thesis *inserted new elements into the already existing model*, it replenished the 2004 model of Wu with other numerical indicators which presumably execute the greatest control over the given level of (in this case quarterly) inflation in the long run. The selected explanatory variables have resulted a statistically reliable model estimate, their inclusion in the equation have proved to be reasonable.

5. The examination, however, aims at revealing the relationship between the given economic policy conception and economic performance apart from confirming its reason of existence and achievements in the field of price stability. It underpinned the scientific result that inflation targeting does not necessarily block economic performance but it can even be stimulating for growth.

6. While reasoning the evaluation of competitiveness the examination ascertained the scientific hypothesis stating that real economic convergence is above all determined by competitiveness in the long run. Price and cost competitiveness reflects productivity tendencies, and real exchange influences export performance having an outstanding importance in the case of countries where export is the major drive of economic growth.

7. During the selection of the right methodology for testing competitiveness indicators it relied on already existing research results (Oomes 2005), but in addition to those *it approximated the real exchange rates with the help of more indicators* of government consumption (due to the various data content of the indicators) and finally chose the variable best characterising the given country for further research. It also involved the difference in money market interest rates between the given country and the eurozone because it seemed to be reasonable to take into account a financial variable as the real appreciating effect of budgetary spending could not be confirmed. The various real exchange indicators reacted to the change in productivity in different ways which can be regarded as a sign of difference in the speed of adaptation and the role productivity plays in the real appreciation of the currency which leads us to conclude that those countries where productivity contributed to appreciation more than any other economic factor were more successful in sustaining competitiveness despite the inevitable exchange appreciation and price level increase.

8. A further result of the thesis is that is *did not only discuss the practical or theoretical relevance of one single economic policy conception but provided an overall picture about its conditions and its future alternative*, contrasting the self-supporting control over the quantity of money and exchange rate with those advantages and disadvantages that a currency union might offer for new members.

V. CONCLUSIONS AND RECOMMENDATIONS

1. It seems that as an inevitable consequence of globalisation – monetary policy be ever so elaborated – small nation states are forced to shelter their economy exposed to abrupt changes in international capital markets by the protecting wings of a financial integration, the membership in a common market is succeeded by the membership in a monetary union. The recent financial crisis has sharply pointed at the vulnerability of monetary policy realised in the frames of a nation state. Membership in the currency union, however, has serious prerequisites which can only be met by making strong stabilisation efforts not to mention that the period following accession does not always hold forth blooming economic prospects. It is not all the same how economic policy-makers can reconcile stabilisation endeavours with the urgent requirements of economic convergence, whether the creation of equilibrium is accompanied by any welfare loss and at what level of development should monetary union accession be realised.

   On the basis of the literature and my own research results I am summarizing the main conclusions of the paper below:

- The **disciplinatory power of the inflationary criterion definitely has a positive impact on the economic policy of countries which are in for joining the eurozone.** During the period between 1994 and 2001 there was a trade-off between economic growth and disinflation but following 2001 the Visegrád Four countries were able to sustain the pace of economic growth together with international competitiveness, manifested in the growing export activity. The goals and instruments of monetary policy and fiscal policy should therefore be defined in a way that best serves the price stability goal and facilitates the necessary development that the structural characteristics of the economy make desirable.

- The thesis is not extended to an overall comparison of the various economic policy directions of Central European converging economies as the Visegrád countries being in focus of attention have uniformly realised their stabilisation efforts within the frames of inflation targeting. Numerous studies have, however, proved that the above central bank strategy applied in floating exchange rate regime has in general proved to be successful in ensuring financial stability and the circumstances for balanced growth during the period before 2008. It is hard to give empirical evidence to underpin the same conclusions though, as the available quality and extension of data bases available for research in this field is limited.

- *Inflation targeting represents a theoretically well-established monetary policy direction*, whose adaptability raises some important questions. The strategy does not require the fulfilment of a rigid system of criteria, the technical preparedness of the central bank, the lack of central bank credibility and independence, the less then adequate depth of financial markets, the unpredictability of budgetary policy actions and the backward-looking nature of expectations can hurdle the successful conduct of the same.

- On the basis of research carried out for different groups of OECD countries and Romania it can be ascertained that *both industrial and emerging economies have made a significant progress through the application of inflation targeting in reducing the level and volatility of inflation*, as well as anchoring inflationary expectations. Furthermore, there is no evidence for this policy restraining economic growth, some experts, on the contrary, argue that it rather contributed to a higher GDP growth.

- Through setting an intermediate inflation target the Visegrád countries have in most of the cases successfully fought against extreme price level increases and in exchange for disinflation they did not have to leave a moderate growth rate path. The joint realisation of nominal and real convergence, however, can lead to conflicting economic policy objectives.

- In the field of *nominal convergence* Slovakia proved to be the best performing economy which made it qualify for EMU membership in January 2009. Essentially – apart from the case of Hungary – the Visegrád Countries managed to comply with the Maastricht criteria by 2007 (disregarding that only Slovakia has joined ERM II by then). Hungary is somewhat lagging behind as it has not been able to combat inflation to the required level and has breached the fiscal discipline criteria many times. The high level of inherited state debt, the discretionary fiscal policy measures in recent years, the backward-looking nature of economic actors' inflationary expectations, and the barriers of the exchange policy have made it difficult to accomplish all nominal convergence conditions necessary for eurozone maturity. Since 2000 (till 2008) the currencies of neighbouring economies constantly appreciated and as the exchange rate is the most important transmission channel of monetary policy, the price level convergence happened through the nominal exchange rate and not through a major excursion of the consumer price index.

- Concerning real convergence – measuring it in GDP per capita terms – the Czech Republic enjoys precedence, and all the four countries have reached 50% of the eurozone per capita GDP at purchasing power parity by now. *In the remaining period of economic adjustment price level growth and the welfare convergence will continue to go hand in hand*, the price and cost competitiveness of the economy will get even more emphasis which can be best illustrated by the path of real exchange rates. Convergence to the eurozone level of development is determined above all by international competitiveness as the major drive of economic performance is productivity, whereas the most important components of GDP growth is export and (foreign) investment.

- Through the survey of the various indicators of real exchange international competitiveness can be safeguarded despite the continuous rise of the price level it necessitates the exploration of such competitive advantages which do not necessarily appear in the difference of labour costs, but in the sphere of human resource qualification level, the development of education, R&D and infrastructure. The distortionary effect of budgetary spending can not be supported empirically, and though the conditions of fiscal discipline are of high priority it is not necessary to subordinate all economic policy objectives to the reduction of budgetary spending.

- *The timing of eurozone accession is another dilemma that should be responded by decision-makers* as it has become clear via the experiences of eurozone members that opportunities within the eurozone (falling interest rates, rapid extension of foreign trade) are not as significant as was presumed on the eve of becoming a full member of the EU (2004). Subsequent upon a sudden inflationary pressure because of higher price level in the eurozone negative real interest rates can lead to extensive credit granting dynamics to an overheated economy and to the explosion of inflation higher than the eurozone average levels after entering the monetary integration. The flare of trade as it seems so far will most probably not live up to expectations as it has not reached more than 50% of what has been expected.

2. *It could be worth extending the examination of the above results to the other countries of the Central European region for a comparative analysis*

of different alternatives of self-supporting monetary policy. Among theoretical research materials we can discover some aspirations alike. The ex post analysis of different economic policy conceptions which have been defined for the period of convergence could contribute to a better understanding of the development of transition economies and to an assessment of the advantages and disadvantages of eurozone membership.

3. The thesis can serve as a basis for a course book which helps to illustrate the model-like definition of various central bank actions in addition to the exposition of the main directions of various economic schools of thought.

VI. **AUTHOR'S PUBLICATIONS RELATED TO THE FIELD OF DISSERTATION**

a) Scientific articles

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1. **Novák, Zs.**: Some theoretical and practical results of inflation targeting. Gazdálkodás 19. számú különkiadása. 2007. pp. 102-108.

In Hungarian:

2. **Novák Zs.**: Robert J. Barro és a költségvetési túlköltekezés. Elmélettörténeti Füzetek 2., Budapesti Műszaki Egyetem 2006. (befogadó nyilatkozat)
3. **Novák Zs.** - Vámos I.: Az ESA'95 módszertanának alkalmazása a költségvetésben. Pénzügyi Szemle. 2008. 1. szám. pp. 107-122. ISSN 0031-496-X.

b) Scientific conference presentations in conference publications:

In foreign languages

4. **Novák, Zs.:** Inflation targeting and competitiveness. "3rd International Conference for Young Researchers" 28-29. September, 2004. Gödöllő. Vol. II. pp. 94-99 ISBN 963 9483 42 7ö; 963 9483 44 3
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6. Sági J., **Novák Zs.**, Farkasné Dr. Fekete M.: Inflation rates, the convergence of food prices within new EU members, Abstract, XL Croatian Symposium on Agriculture. February 2005 Opatija. pp 117-119. ISBN 953-6331-31-4
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11. **Novák Zs. -** Vámos I.**:** Az ESA’95 módszertanának alkalmazása a költségvetésben; XLVIII. GEORGIKON NAPOK „Agrárgazdaság, vidék, régiók – multifunkcionális feladatok és lehetőségek” 2006. szeptember 21-22. ISBN 963 9639 12 5
12. **Novák Zs**.: C. Menger vélekedése a pénz különös természetéről (On the origins of money) – 1892. Konferenciaelőadás. Budapesti Műszaki Egyetem. 2008. május (folyamatban)

c) Other publications in printed or electronic form

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14. Farkasné Fekete M. - **Novák Zs.** - Sági J.: Pénzügyi piacok, értéktőzsde a nappali tagozatos hallgatók számára. Gödöllő, 2004. p. 120
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16. Budapesti Corvinus Egyetem Pénzügy Tanszék szerzői kollektívája: Munkafüzet a Pénzügytan tankönyvhöz (magyar és angol nyelven). Tanszék Kft., 2008. p. 30