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**Non-Discretionary Monetary  
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# **Non-Discretionary Monetary Policy: The Answer for Transition Economies?**

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## **Abstract**

It is a well-established fact that monetary institutions help shape the macroeconomic environment of countries by stabilizing prices. In the early 1990s, transition economies had the opportunity to rearrange their monetary institutions to better achieve low levels of inflation. Those economies had several prominent monetary arrangements to choose from, such as sovereign central banks or currency boards. This paper surveys the monetary institutions currently in place in several transition economies and compares them based on their ability to control inflation. More specifically, we intend to test whether the transition economies have better inflation performance when they import the monetary policy of a credible central bank.

Keywords: Transition economies, currency board, European monetary union.

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## **1- Introduction**

The fall of the Berlin Wall in 1989 and the rise of independence movements in the Baltics and other Soviet republics led to the implosion of the USSR in December 1991. The USSR's implosion was followed by the birth of a multitude of self-governing states. These newly-freed, and self-governing, states are referred to as transition economies because they are transitioning from centrally-planned economies to market-based economies. Following their independence, almost all of the transition economies created their own national currency and established a central bank to enact a national monetary policy. As mentioned by Schuler (1996), the conventional view among monetary economists at the time of the formation of the transition economies was that every independent country should have its own central bank in order to conduct an independent monetary policy.

In contrast, around the same time of the independence movement, the leaders of eleven Western European countries were busy signing the Maastricht Treaty, which called for the creation of a single European currency and a common European Central Bank. The European Central Bank was created to implement one single monetary policy to all members of the European Monetary Union. This new central bank is completely independent of any political influence and has the overriding role to achieve price stability in the Euroland.<sup>1</sup>

The fact that eleven countries gave up their monetary sovereignty to the European Central Bank has created a surge in the academic literature on discretionary monetary policy. Some economists, such as Feldstein (2000), speculate that the loss of monetary

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<sup>1</sup> Euroland is conventionally used to refer to the area governed by the European Central Bank, which includes the area of its member nations.

autonomy would hurt the economies of the member nations by not allowing them to optimally respond to asymmetric shocks. Other economists such as Fratianni and von Hagen (1993) argue that the commitments to price stability, which some countries were lacking prior to the union, could contribute to more sound monetary policy in Europe. According to these authors, the member nations that lacked commitment to price stability would gain credibility by adopting the new monetary institution. In other words, the high-inflation countries could use the European Monetary Union as means to achieve reduced inflationary pressures.

Historically, most countries in transition have faced extreme difficulty in maintaining price stability. The most predominant explanation, as supported by Sachs (1997), is that the transition economies have heightened need for increased government expenditures, which has put pressure on their monetary authorities to print more money. In other words, the fiscal imbalances, which are caused by the inability of the newly-created governments to collect sufficient revenue, put pressure on the central banks to collect seigniorage revenue. As noted by Sachs (1997) the resulting high inflation rates can primarily be attributed to the rapid increase in the money supply.

The aim of this paper is to test whether the transition economies have better inflation performance when they import the monetary policy of a credible central bank. For example, we test to see whether transition economies that adopt a currency board or de facto exchange rate peg, experience more stable and/or lower levels of inflation than the transition economies that use more discretionary monetary policy. We also test to see whether transition economies that are on the fast track to join the European Monetary

Union experience lower levels of inflation than the other transition economies.<sup>2</sup> Clearly the real heart of the issue revolves around the degree of discretionary policy that the transition economies have.

First, we propose that those transition economies that limit their ability to use discretionary policy (adopting a currency board or experiencing a de facto exchange rate peg) will fare better in their attempts to control inflation. Our results confirm this proposition, as we find that transition economies operating with a currency board or classified as having a de facto exchange rate peg, experience lower inflation rates relative to transition economies without such monetary institutions. Second, we propose that being on the fast track to join the European Monetary Union may also provide a discipline effect on those countries monetary regimes, as the countries have to meet certain criteria before joining the European Union. However, we also propose that the fast track to join the European Monetary Union may not significantly impact the inflation performance of transition economies, because it is only an announcement to join at a later date, and may not significantly tie the hands of the monetary authority to limit discretionary policies. Our results show that the transition economies that are on the fast track to join the European Monetary Union do not experience significantly lower inflation rates, relative to those countries that are not on the fast track.

This paper will proceed by first presenting a brief survey of the different types of institutions that are in effect in the existing transition economies.<sup>3</sup> In particular, we

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<sup>2</sup> We refer to countries being on the ‘fast track’ to join the European Monetary Union as those countries that joined the European Union in 2004.

<sup>3</sup> The IMF classifies the following countries as being transition economies: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Czech Republic, Croatia, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Poland, Romania, Russia, Slovak Republic, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and Yugoslavia.

characterize currency board institutions and review the literature on the possible effects they have on the economic performance of transition countries. Next, we examine the relationship between inflation and economic growth in the transition economies to evaluate if a macro policy that aims at reducing inflation provides a better environment for economic growth in those countries. We then proceed to compare the economic performance of twenty-six transition economies by measuring the mean and variance of their inflation rates across the period 1995-2002. This analysis will compare and contrast the performance of transition economies that have adopted a currency board or a de facto-peg regime to those using a traditional central-banking system with more discretionary power. Finally, we perform a panel study to test the effect that adopting a currency board, experiencing a de facto exchange rate peg, or being on the fast track to join the European Monetary Union has on inflation in selected transition economies.

## **2- Central Banks versus Currency Boards**

According to public choice theory, an institution's performance is conditional on the incentives that the individuals within the institution face. For example, Friedman (1982) emphasizes the importance of looking at the incentives that monetary policy makers face. According to Friedman, the forces that control the behavior of the policy maker are not necessarily in-line with the social welfare function of the monetary institution. For example, a central banker with less discretion in implementing monetary policy could better achieve economic stability. Similarly, studies by Toma (1982), and Shughart and Tollison (1983) found that the lack of constraints on central bankers result in an overproduction of money beyond the optimal welfare level, which could hurt economic

stability. Therefore, the lack of constraints on central bankers, which allows them to enjoy more discretion in implementing monetary policy, could result in a less (rather than more) stable economy.

When the transition economies seceded from the former Soviet Union, the new independent governments' revenue requirements were substantial. Sachs (1997) analyzes in detail why Poland, as did many of its neighbors, experienced a higher budget deficit while transitioning to the market-based economy. Aizenman (1987) suggests that greater government demand for revenue will increase the use of inflation as a revenue-generating device. Clearly, the choice of the monetary institution, which affects the discretionary ability of the transition-economy policy makers, is an important determinant in the overall performance of the monetary authority's ability to control inflation. More specifically, the institutions that limit the monetary authority's incentive to cater to revenue-generating pressures will theoretically allow for more control of inflation.

Most of the transition economies chose to implement a sovereign central bank as their monetary institution. The traditional socialist monobank system, which had no distinction between central banks and state-owned commercial banks, was transformed to a two tier banking system with a sovereign central bank and a separate commercial banking system. The new central banks use discretionary monetary policy and, according to Cukierman, Miller, and Neyapti (2002), have a significant degree of legal independence from the government. The designed independence of the central banks shows that the governments of the transition economies had good intentions to protect the new central banks from political and budgetary pressures. Nevertheless, as stated by Toma (2001), the independence that governments attribute to central banks does not

create enough constraints for the policy maker to effectively enact policies in the interest of the general public. Toma's observation would imply that the independence granted to the transition economies' monetary institutions is not enough to prevent policy makers from rapidly increasing the money supply.

In an attempt to further reduce the influence of political motives in the money supply process, some governments chose to restrict their discretionary use of monetary policy by adopting another form of monetary institution—a currency board. This alternative form of monetary institution was adopted by four of the transition economies (Estonia, Lithuania, Bulgaria, and Bosnia and Herzegovina). Currency boards effectively tie the hands of the monetary authorities by inhibiting the fiduciary issue of their currency, as the backing of the currency must be at least 100%. More specifically, a currency board is required to exchange domestic currency for foreign reserve currency at a specified and fixed rate. To perform this function the board is required to hold financial assets in the foreign reserve currency at least equal to the value of the domestic currency outstanding. Another characteristic of a currency board (unlike a central bank) is that it cannot function as a "lender of last resort" to the state treasury or commercial banks, implying that the board cannot monetize the government's budgetary deficits.

At the time that the transition economies were deciding on what monetary institutions to adopt, the International Monetary Fund dismissed the currency board idea. In particular, Nenovsky (2001) documents the skepticism of the IMF during Estonia and Bulgaria's early attempts to adopt the currency board institution. The IMF's initial rejection of currency boards was based on the notion that the currency boards would not allow flexibility in offsetting country-specific shocks, which would eventually lead to the

deterioration of their economic performance. Moreover, the traditional central bank institution just seemed to fit better with the mainstream ideology of the IMF's senior economists.

However, the IMF position was relaxed by the findings of Gosh, Gulde, and Wolf (1998, 2000), all economists at the IMF, which show that countries with currency boards enjoy lower inflation levels, as well as, higher output growth relative to countries with self-governing central banks. Recently, many other economists have been analyzing the economic performance of countries under currency boards. In particular, a recent event study by Hanke (2002) found compelling evidence supporting the notion that transition economies that adopt currency boards experience improved economic performance.

However, all economists do not agree on the benefits from adopting a currency board. In particular, some economists, such as Nouriel Roubini (1998), believe that currency boards are “weak” institutions with very mixed economic outcomes. Therefore, the debate is still on going, and the following sections will attempt to shed some light on the economic performances of transition economies with currency boards.

### **3- Economic Performances in Transition Economies.**

The academic literature such as Fisher (1993), Motley (1994), and Fisher, Sahay, and Vegh (2002) tends to find a negative relationship between inflation rates and economic growth. The first question that is raised in this section is whether or not this relationship holds for the transition economies. More specifically, are lower levels of inflation associated with higher output growth in the transition economies?

[Figure 1 about here]

A simple analysis of the inflation and output growth performances of the transition economies is performed to try and answer this question. Specifically, we analyze the relationship between each transition economy's average annual inflation rate with their average annual GDP growth rate, from 1995-2002. The results of this analysis are presented in the scatter plot diagram illustrated in Figure 1. The scatter plot diagram shows that the inverse relationship between inflation and GDP growth exists in the transition economies. Therefore, any macroeconomic policy that encourages lower levels of inflation is likely to promote (or at least be consistent with) economic growth in the transition economies.

Next, our analysis will focus on determining which type of monetary institution is best for achieving low and stable inflation rates. Hanke and Schuler (1992, 1994) argue that the nations that are trying to become market economies are placing too much responsibility on the central bank. According to the authors, in order for transition economies to issue a fiat currency that retains its purchasing power (value), the central banks need to be credible and effectively control domestic prices. After the collapse of the Soviet Union, and the distrust of the Ruble, none of the transition economies' central banks seemed to possess the required credibility to supply a sound and valuable currency. Generally, the newly created national central banks had yet to acquire a credible reputation of following low-inflation policies, and the public perception of these central banks was that they would inevitably fail at producing low and stable rates of inflation.

Previous papers, such as Hanke (2002), look at the economic performance of various developing countries around the globe that have switched from a central bank to a currency board, and find that their economic performance improved after the switch. The

contribution of this paper is that it is the first to explicitly focus on all the transition countries and statistically compare their performances in maintaining stable and low inflation rates with the structure of their monetary institutions. Our objective is to examine whether or not transition countries with currency boards offer sounder money, in other words lower inflation, than transition countries with central banks. Also, we expand the comparative analysis to incorporate those transition economies that experienced a de facto exchange rate peg, as classified by Bubula and Otker-Robe (2002). We consider both of these characteristics to be institutional factors that will lead to lower and more stable inflation rates. Countries that adopted a currency board regime or experienced a de facto exchange rate peg will be referred to as “non-discretionary regimes.”

To perform this analysis we compute the average annual inflation rates and inflation variances for twenty-six transition economies. Then, our analysis proceeds by statistically comparing the inflation variances of transition economies with non-discretionary regimes to the inflation variances of transition economies operating under a central bank system, which gives more opportunity to employ discretionary policy. Finally, we perform the same comparisons using the average annual inflation rates of the two groups of transition economies.

Table 1 presents the variance of inflation rates, as well as, the average annual inflation rates of twenty-six transition economies for which data were available for the time period, 1995-2002.<sup>4</sup> The transition economies with non-discretionary regimes are

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<sup>4</sup> The data come from the IMF and are available for twenty-six transition economies. Variance and average inflation rates are taken from the period 1995-2002. In 1995, Estonia and Lithuania were already under a currency board system. Bulgaria and Bosnia and Herzegovina abandoned the central banking system in the summer of 1997. For those countries central bank observations go from 1995-1996, and currency board observations go from 1998-2002. The year 1997 was unclassifiable to either of the categories due to the annual data availability.

highlighted in bold and italic print, and if the switch from central bank to currency board occurred during the sample period the data for both periods are separately reported for comparison purposes. Furthermore, to motivate simple comparisons across countries, the transition economies are ranked based on their corresponding variance of inflation and average annual inflation measures.

[Table 1 about here]

More formal comparisons of the two groups are presented in the last rows of Table 1. The comparisons are first motivated by averaging the inflation measures of the transition countries with central banks, and also, the transition countries with non-discretionary regimes. Then, difference in variances and difference in means tests are performed on the two groups. More specifically, the difference in the inflation variances is measured as the average variance of inflation under central banking minus the average variance of inflation under non-discretionary regimes; while the difference in the inflation means is measured as the average inflation under central banking minus the average inflation under non-discretionary regimes.

The difference in the average inflation variances between the two groups is found to be positive. This result implies that inflation under central banking is more volatile than inflation under currency board and de facto pegs. In other words, our results imply that the regimes with more discretionary power in monetary policy result in increase volatility of inflation when compared to non-discretionary regimes. In order to check the significance of the findings, a difference in variance test was performed, which included the null hypothesis that the variances are not statistically different. Using a standard two-tailed F-test we can reject the null hypothesis of equal variances at the one-percent level

of confidence. Therefore, we find that inflation is significantly more stable in countries with non-discretionary regimes than in countries with central banking systems. This result is in accord with Hanke and Schuler's (1994) claim that central banks will not produce stable currencies in the transition economies.

The difference in the annual average inflation between the two groups is also found to be positive. This result implies that inflation under central banking is higher than inflation under currency boards or de facto pegs. In other words, our results show that regimes with more discretionary power in monetary policy produce more inflation relative to non-discretionary regimes. In order to check the significance of this finding, a difference in means test was performed, which included the null hypothesis that the average inflation rates under non-discretionary regimes is lower than the average inflation rate under a central bank system. Using a standard t-test we find that inflation is significantly lower in countries with non-discretionary regimes than in countries with central banking systems.

In summary, our results show that transition economies operating under non-discretionary regimes experience lower and more stable inflation than their counterparts experience under a central banking system. Our results support the findings of Hanke and Schuler (1992), which argue that countries gain substantial credibility by adopting a currency board, where the gain in credibility is exemplified by a sounder money (a lower, and more stable inflation rate). Our findings are also in line with the findings of Gosh, Gulde, and Wolf (1998, 2000) that countries with currency boards enjoy lower inflation levels. Furthermore, our finding that currency boards control inflation conforms with the results of Hanke (2002) which shows that developing countries adopting currency board

regimes experience lower inflation. Finally, our incorporation of de facto exchange rate pegs conforms with the results of Bleaney and Francisco (2003), who found that only “hard pegs” make a difference for inflation.

#### **4-Panel Analysis of the Determinants of Inflation in Transition Countries**

In this section we analyze the determinants of inflation in transition economies. Particularly, extending the analysis from the previous section we will investigate the relationship between adopting a non-discretionary regime and inflation rates. In addition, we will look at the effects of other discretionary policy restraints on inflation rates. Specifically, we have collected panel data on twenty-five transition economies, spanning from 1995-2001, to test the effects that different monetary institutions have on inflation in the selected transition economies.<sup>5</sup>

We build off of the standard model of inflation, however, the empirical model that we use is original as it introduces the effect of adopting a currency board and experiencing de facto exchange rate pegs, as well as, the effect of being on the fast track to join the European Monetary Union. First, we expect that those transition economies that limit their ability to use discretionary policy (adopting a currency board or experiencing a de facto exchange rate peg) will fare better in their attempts to control inflation. We will add to the work of Bleaney and Francisco (2003) which shows that “only hard pegs make a difference.” The authors use a large sample of developing countries to test if hard pegs (currency boards or a shared currency) reduce inflation. The

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<sup>5</sup> The 25 transition countries included in our study are Albania, Armenia, Azerbaijan, Belarus, Bosnia, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, Slovenia, Slovakia, Tajikistan, Turkmenistan, and Ukraine.

authors find that “hard pegs significantly reduce inflation, while “soft” pegs, those that are flexible, do not confer any monetary discipline. The author’s sample of developing countries excludes countries in transition, so our current sample, which focuses solely on countries in transition, will serve as a robustness check to the author’s findings within their chosen sample.

Second, we propose that being on the fast track to join the European Monetary Union may also provide a discipline effect on those countries monetary regimes, as the countries have to meet certain convergence criteria before joining the European Union. However, it could also be that the fast track to join the European Monetary Union may not significantly impact the inflation performance of transition economies, because it is only an announcement to join at a later date, and may not significantly tie the hands of the monetary authority to limit discretionary policies.

We used the term fast track to refer to transition countries that have joined the European Union in 2004. More specifically, in 1999, the fifteen member states of the European Union announced that eight transition countries: Poland, Hungary, Estonia, Lithuania, Slovenia, Slovak Republic, Czech Republic, and Latvia will be able to join the Union in 2004. In December 2002, the member states of the European Union gathered in Copenhagen, to begin the biggest enlargement of the European Union. There, the eight countries from the former Eastern Soviet bloc were officially invited to join the European Union in 2004. In April 2003, in Athens, the eight new members signed the Treaty of Accession to the European Union. After ratification of the treaty, the eight new members were permitted to join the existing fifteen on May 1st, 2004 (which has since occurred). Those eight countries are referred to as being on the fast track to join the European

Union. Among those eight countries, Lithuania and Estonia have adopted a currency board system and the remaining six countries on the fast track to join the European Union have chosen to stay under a central banking system.

The interesting case will be to test the effect of being on the fast track to join the European Monetary Union has on inflation. This is interesting because it does not involve an “institutional” change, but more of a change in the self-discipline of the government. We propose that the commitment of a transition economy to become a member of the European Union will produce credibility, as well as, disciplinary gains through the “acquis communautaires” set forth by the European Union. The ‘acquis communautaires’ include: stability of institutions; the existence of a functioning market economy; the ability to take on the obligations of membership including adherence to the aims of political, economic and monetary union. The announcement to meet these specified criteria can serve as a non-institutional force of discipline on the monetary policy of the transition economies and can potentially influence inflation.

Rogoff (1985) and Hanke and Schuler (1994) have documented how non-institutional factors can influence inflation. Rogoff (1985) shows how a “conservative” central banker, or movement to stronger self discipline by primarily and explicitly targeting inflation, can provide the credibility needed for the monetary institution to implement effective policies that lead to lower inflation and more economic growth. Hanke and Schuler (1994) underline the “upright character” of the Czech finance minister, Vaclav Klaus, which helped maintain inflation rates in his country that were significantly lower than those experienced by the other transition economies.

To examine the determinants of inflation we estimate a panel regression that takes the following general form:<sup>6</sup>

$$\text{Inf}_{it} = M_{it} \beta_1 + X_{it} \beta_2 + C_i + \varepsilon_{it} \quad i=1,\dots,N \text{ and } t=1,\dots,T$$

Where Inf stands for the inflation level of country  $i$  at time  $t$ ,  $\beta_1$  and  $\beta_2$  are vectors of parameters to be estimated,  $M$  is a vector of monetary regime indicators,  $X$  is a vector of control variables that closely conforms to what has been previously used in the literature,  $C$  are the fixed effects for each country, and  $\varepsilon$  is the error term.

We include three monetary regime indicators.<sup>7</sup> (1) Bubula and Otker-Robe (2002) classify de facto exchange rate regimes into 13 categories based on the degree of exchange flexibility. More specifically, the authors assign numbers from 1 to 13, where the lower numbers represent the least flexible exchange regimes, and higher numbers represent more flexible exchange regimes. The Bubula and Otker-Robe (2002) index is expected to carry a positive sign, showing that when exchange flexibility is increased, and therefore discretion is increased, the resulting inflation will be higher. (2) We include a control for the years in which a country had a currency board arrangement, or were classified by Bubula and Otker-Robe (2002) to experience a de facto exchange rate peg (i.e. non-discretionary regimes). This variable is constructed as a dummy variable equal to one for the years with the above specified criteria, and zero otherwise. The non-discretionary regime control is expected to carry a negative sign, showing that hard pegs lead to lower inflation. (3) Based on our definition of being on the fast track to join the

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<sup>6</sup> All data are from the World Bank's World Development Indicators Database, unless stated otherwise. We would like to thank Jizhong Zhou for help in collecting pieces of our data set.

<sup>7</sup> The choice of the monetary regime is taken as exogenous following the approach of Hanke (2000) and Fatas and Rose (2001).

European Monetary Union, we include a dummy variable equal to one for those countries classified to be on the fast track for years after the 1999 announcement, and zero otherwise. The fast track control variable is expected to carry a negative sign, to show that the announcement to join the European Union, and the convergence criteria can act as a non-institutional limitation on discretionary policy and lead to less inflation.

Generally, the control variables include fiscal, economic, and structural influences on inflation. The fiscal influence is measured as the government fiscal balance as a percentage of GDP (*Budget Deficit (% of GDP)*). This variable is expected to carry a positive sign because of the assumption that fiscal motives drive inflation pressures, particularly in transition economies. We include several economic influences that are traditionally used to explain inflation rates. According to the economic literature on inflation and economic growth, such as Fisher (1993), Motley (1994), and Fisher, Sahay, and Vegh (2002) there is an inverse relation between economic growth and inflation. However, the causal relation is not agreed upon, so the annual real GDP growth rate (*Real GDP Growth Rate (Lag 1 period)*) is treated as endogenous and is expected to carry a negative sign. The country's openness to trade, measured as a country's imports plus exports as a percentage of GDP (*Trade Volume (% of GDP)*), is expected to carry a positive sign because countries with a larger foreign trade sector are more exposed to external shocks that may increase inflation. The share of the value added of agriculture in GDP (*Agriculture Value Added (% of GDP)*), is expected to carry a positive sign based on the arguments of Cukierman, Edwards and Tabellini (1992) that the agricultural sector is the most difficult to tax. Following this logic, the countries with more pronounced agricultural sectors, may rely more on seigniorage relative to other countries, which may

lead to higher inflation. To account for structural influences on inflation we include the index of legal central bank independence (*Independence of Central Bank*) developed by Cukierman, Miller and Neyapti (2002). The independence index is expected to carry a negative sign because increased independence implies that the central bank is less exposed to seigniorage pressure, and thus may experience lower inflation.

[Table 2 about here]

The estimated determinants of inflation are presented in Table 2. There are six regression specifications reported in Table 2 that vary by the inclusion of different combinations of monetary regime indicators.<sup>8</sup> Our base model accurately explains the inflation of our selected transition economies, as our R-squared measure remained consistently around 0.60. So we are explaining roughly 60% of the variation in the inflation rates of our transition economies.

Generally, the control variables all retained the expected signs and significance levels throughout the regression specifications. The budget deficit was found to be significant in two of the six regressions (specifications [c] and [d]) and carried the expected positive sign, which shows that fiscal motives increase inflationary pressures in the transition economies. The real GDP growth (lagged one period) is significant at the 1% level in all regressions and carried the expected negative sign, which implies that high growth is consistent with low inflation. The openness to trade remained significant at the 1% level in all regressions and exerted the expected positive influence on inflation, which reveals that added exposure to external shocks increases inflationary pressure. The share of value added in agriculture had the expected positive sign, and was significant at

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<sup>8</sup> All regression specifications included country fixed effects, which are available upon request to the authors. Also, the regressions were estimated including year fixed effects, and the results remained virtually unchanged from those reported in Table 2.

the 5% level or better in all regressions. The central bank independence measure was never significantly different from zero. So, the central bank's independence was not found to significantly influence inflation in the sampled transition economies.

The variables of interest in our analysis are the monetary regime indicators. The Bubula and Otker-Robe (2002) exchange rate index was included in specifications [a, b, e, and f]. In specifications [a] and [b], those without the non-discretionary regime control, the exchange rate index was significant at the 1% level and had the expected positive coefficient. This shows that increases in the degree of exchange rate flexibility will result in higher inflation. However, the exchange rate regime index lost its significance in specifications [e] and [f], those with the non-discretionary regime control. This confirms the findings of Bleaney and Francisco (2003) that really only "hard" pegs significantly impact inflation.

The non-discretionary regime control was included in specifications [c, d, e, and f]. In specifications [c] and [d], those without the exchange rate index, the non-discretionary regime control was significant at the 1 % level and had the expected negative coefficient. This result implies that countries that adopt a currency board system, or experience a de facto exchange rate peg, have significantly less inflation relative to countries that have the traditional central banking system with flexible exchange regimes. Again the rationale is that the currency board institution and hard pegs constrain the government and do not allow it to over issue its currency. More specifically, these arrangements constrain the ability to use discretionary policies to debt finance through inflation taxes. The non-discretionary regime control retained its negative sign and was significant at the 5% level in specifications [e] and [f], those that also included the

exchange rate regime index. Again this result confirms the hypothesis that only hard pegs matter for inflation.

The Fast Track to Join the European Monetary Union indicator was included in specifications [a, c, and e]. The indicator had the expected negative sign, however, the estimated coefficient was never found to be significantly different from zero at conventional significance levels. This result implies that countries that are on the fast track to join the European Monetary Union do not experience lower inflation relative to those countries that are not on the fast track. Thus, we conclude that the announcement alone to join the European Union and European Monetary Union at a future date, did not serve as a non-institutional influence on inflation in the transition economies sampled.

## **5- Conclusion**

Most economists agree on the fact that a country that wants to achieve high and sustainable economic growth needs to maintain low and stable inflation. In the transition countries, where pressures to use the inflation tax to help cover the government's expenditures is strong, the choice of a monetary institution seems to be of utmost importance. In recent years the view that currency boards should be adopted in transition countries to add credibility and alleviate inflationary tendencies has divided economists.

This paper first shows that, in transition economies, lower inflation levels are consistent with greater economic growth. Relying on statistical difference tests, we find that transition economies with non-discretionary regimes (those with currency boards or that experienced de facto exchange rate pegs) have more stable and lower rates of inflation relative to transition economies with central banks. Next, we use a panel model that builds off of the traditional model of inflation to test whether non-discretionary

regimes produce less inflationary bias. We also test to see if the transition economies that have committed to joining the European Monetary Union effectively import more credible monetary policy through self-discipline, and thus lower their inflation rates. We find across all specifications that adopting a non-discretionary regime is an effective way to achieve lower levels of inflation. It is also interesting to note that transition countries being on the fast track to join the European Monetary Union did not experience significantly lower inflation rates relative to those countries that are not on the fast track. Generally, the announcement to join the European Monetary Union has not had a noticeable impact on the inflation of the fast track countries, revealing that the announcement alone has not served as a non-institutional control on inflation.

This paper strongly advocates that changes in monetary institutions towards those that limit discretionary power are necessary to significantly impact inflation in transition economies. Our results suggest that transition economies that replace existing central banking regimes with a non-discretionary regime should experience lower inflation because of the added monetary policy discipline. In other words, our findings show that transition economies can ‘import’ credible monetary policy by adopting currency boards and de facto pegs, to lower their inflation. This study helps to strengthen the existing literature on the benefits of adopting a currency board or a implementing “hard pegs.” These arrangements appear to be effective institutions to discipline monetary policy and help avoid the expansionary monetary policy bias coming from fiscal pressures that monetary authorities of transition economies often face.

Clearly this paper has focused on the direct effect of discretionary power on inflation; however, the costs of disinflation have not been examined. Our further research

will estimate the costs of disinflation of transition countries and investigate whether the costs of disinflation are lower when monetary institutions enjoy less discretionary power in controlling their monetary policy. The existing literature that analyses the cost of disinflation has mainly focused on OECD countries and has not given much attention to transition economies.

Figure 1

Average annual inflation and GDP growth (1995-2002)

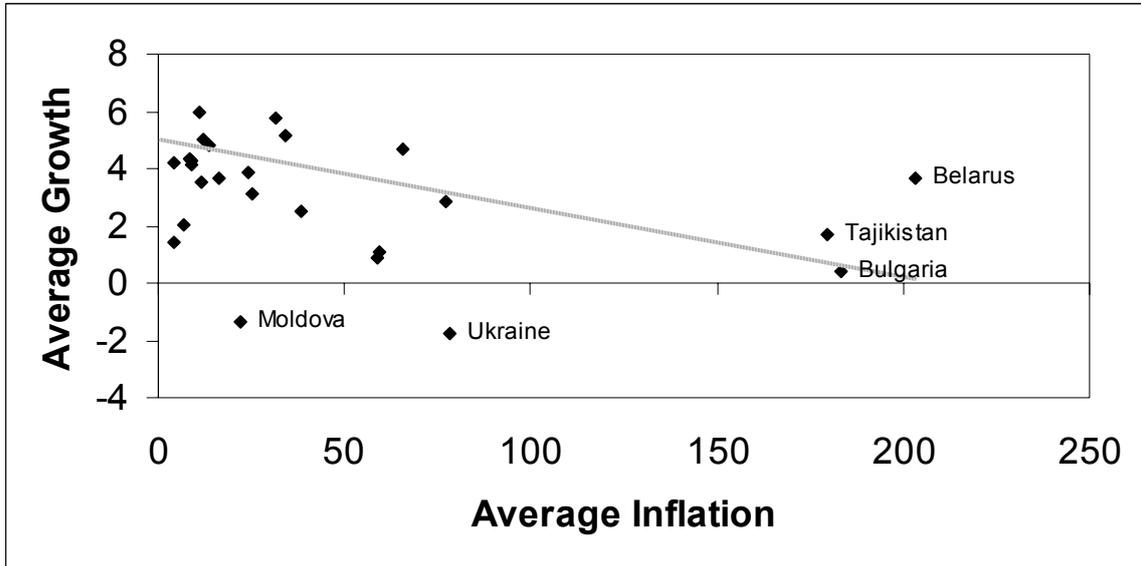


Table 1

Comparing Inflation Variances and Average Annual Inflation Rates for  
Selected Transition Countries (1995-2002)

Transition Country	Variance of Inflation	Transition Country	Average Annual Inflation
Croatia	1.85	<b><i>Bosnia</i></b>	<b>3.00 (-6.75)</b>
<b><i>Bosnia</i></b>	<b>3.29 (96.61)</b>	Croatia	4.19
Slovenia	4.68	<b><i>Macedonia</i></b>	<b>4.31</b>
Slovakia	7.39	Czech Republic	6.30
Czech Republic	10.91	Slovakia	7.84
<b><i>Macedonia</i></b>	<b>26.77</b>	Latvia	8.28
<b><i>Bulgaria</i></b>	<b>36.97 (1854.41)</b>	Slovenia	8.86
Hungary	62.33	<b><i>Bulgaria</i></b>	<b>9.14 (92.55)</b>
Poland	69.73	<b><i>Lithuania</i></b>	<b>10.29</b>
Latvia	73.07	Albania	10.29
<b><i>Estonia</i></b>	<b>95.27</b>	<b><i>Estonia</i></b>	<b>11.04</b>
Albania	125.79	Poland	12.44
Moldova	159.80	Hungary	14.86
<b><i>Lithuania</i></b>	<b>204.52</b>	Moldova	20.03
Kyrgyz Republic	206.60	Kyrgyz Republic	21.90
Mongolia	422.82	Mongolia	22.85
Romania	1755.96	Armenia	28.00
Georgia	2990.36	Georgia	30.79
Kazakhstan	3400.20	Kazakhstan	34.49
Armenia	3655.93	Russia	53.93
Russia	3954.19	Azerbaijan	53.96
Uzbekistan	9241.96	Romania	54.4
Ukraine	15935.64	Ukraine	69.38
Azerbaijan	20967.64	Uzbekistan	70.38
Tajikistan	51245.39	Tajikistan	158.64
Belarus	52438.34	Belarus	183.28
Non-discretionary Regime Central Bank	73.36 7333.98	Non-discretionary Regime Central Bank	7.56 41.78
Central Bank – Non-discretionary Regime	7260.62***	Central Bank – Non-discretionary Regime	34.22*
Statistical Difference Test	F = 99.97	Statistical Difference Test	t = 1.87

Notes: Significance levels represented by: \*\*\* 1%, \*\* 5%, \* 10%

Transition economies with Non-discretionary regimes (currency boards or de facto exchange rate pegs) are in bold and italic print. For those countries that switched from central bank to currency board, their measures are presented in the following manner: currency board measure (central bank measure), so that comparisons can be made.

Table 2  
Determinants of the Inflation Rates of Selected Transition Countries (1995-2001)

	Specifications					
	[a]	[b]	[c]	[d]	[e]	[f]
Exchange Rate Regime Index	16.02*** (3.78)	14.91*** (3.60)			7.20 (1.29)	6.01 (1.13)
Non-discretionary Regime			-212.66*** (4.31)	-212.83*** (4.33)	-156.09** (2.36)	-165.70** (2.57)
Fast Track to Join European Monetary Union	-38.12 (1.20)		-10.87 (0.36)		-22.89 (0.72)	
Budget Deficit (% of GDP)	3.22 (0.93)	3.42 (0.99)	5.74* (1.67)	5.79* (1.69)	4.91 (1.41)	5.13 (1.48)
Real GDP Growth Rate (Lag 1 period)	-7.94*** (5.95)	-7.89*** (5.90)	-8.07*** (6.13)	-8.05*** (6.14)	-8.01*** (6.10)	-7.98*** (6.09)
Trade Volume (% of GDP)	0.66*** (6.06)	0.66*** (6.04)	0.69*** (6.35)	0.69*** (6.37)	0.68*** (6.31)	0.68*** (6.32)
Agriculture Value Added (% of GDP)	6.07** (2.49)	6.23** (2.56)	7.20*** (2.98)	7.25*** (3.01)	6.89*** (2.84)	7.03*** (2.92)
Independence of Central Bank	35.12 (0.39)	20.26 (0.23)	73.47 (0.83)	68.50 (0.79)	58.56 (0.66)	51.44 (0.58)
Country Fixed Effects	YES	YES	YES	YES	YES	YES
R-Squared	0.58	0.58	0.60	0.60	0.60	0.60
Number of Observations	175	175	175	175	175	175

Notes: Absolute t-ratios in parenthesis, estimated country fixed effects available upon request to the authors. Significance levels are represented by: \*\*\* 1%, \*\* 5%, \* 10%

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