BANK OF ALBANIA

MONETARY TRANSMISSION MECHANISM IN ALBANIA

GRAMOZ KOLASI,
HILDA SHIJAKU,
DIANA SHTYLLA*

CONTENTS

ABSTRACT

This paper revisits the monetary transmission mechanism in Albania, summarizing findings of previous studies and presenting new evidence based on a SVAR estimation. We investigate the effect of monetary transmission channels on aggregate output and headline and core inflation. We conclude that the exchange rate channel is not as strong as reported in previous works, and that the money and expectations channel play the most important role within the transmission mechanism. Our findings also suggest that the Bank of Albania should pay attention to the exchange rate fluctuations, as they seem to have an adverse impact on real output fluctuations.

I. INTRODUCTION

There is hardly a need to explain the importance of investigating and understanding the monetary transmission mechanism (MTM), for economists in general and for central bankers in particular. The amount and scope of research work on the monetary transmission channels in Albania is limited and the corresponding literature is no older than 7-8 years. The purpose of this paper is twofold: to summarize the findings of previous empirical work; and to re-estimate a simple SVAR model in order to give a fresh opinion concerning the importance of specific transmission channels. A few words about the monetary policy framework and economic performance in Albania are in order.

Bank of Albania[1] mandate is to achieve and maintain price stability. In the last decade this objective has been roughly translated as having a CPI[2] annual inflation rate in the 2-4% range and in the last two years as a point target equal to 3% +/-1 pp. The BoA follows a monetary targeting regime[3] with distinct elements of an implicit inflation targeting. In 2000, the controls on the interest rates of 3-, 6- and 12-month deposits of state banks were removed and indirect instruments of monetary policy were set in place. At present, the operational framework of BoA consists of open market operations, standing facilities and required reserves. Since the beginning of the transition period and the establishment of the BoA as a modern central bank, the role of monetary policy in the Albanian economy has strengthened and gained importance in the overall framework of macroeconomic policies. For the better part of the last decade, output growth has been strong, inflation low and exchange rates stable. While the blooming market economy eradicated some of the problems inherited from the previously centralized system, new challenges emerged. Albania, at present, has an underdeveloped financial system; capital markets are almost inexistent; there is a high degree of informality and significant structural reforms and transformation are on the way.

So far, the monetary policy decision makers at the BoA have had no quantifiable basis on which to judge the effect of the monetary policy on the real economy and especially on inflation. Quantitative results on the size, direction and time-lag of the effect of the applicable transmission channels are essential to conducting good monetary policy. Two of the crucial questions posed by monetary policy authorities in the country today are: (1) what is (are) the most important transmission channel(s) functioning in the Albanian economy?, and (2) how can monetary policy be employed to ensure continued price stability?

This paper attempts to shed some light upon the nature and characteristics of the MTM in Albania. In section 2 we present some theoretical background on the monetary transmission channels, complemented with summarized findings of studies focusing on MTM in transition countries. A review of previous studies of the MTM in Albania is given in section 3. In section 4 we replicate the results of a VAR model by Muço et al (2003) and present a new set of results obtained using a SVAR model. Section 5 concludes with a short discussion of implications for monetary policy.

II. THEORETICAL BACKGROUND ON MONETARY TRANSMISSION CHANNELS AND EVIDENCE FROM EMERGING AND TRANSITION COUNTRIES

In this section we present a theoretical overview of the MTM channels. Drawing from results of research on emerging and transition economies we draw parallels and present our judgment about the expected strength and relative importance of each of the channels in the case of Albania.

The MTM is the process through which monetary policy decisions affect the economic activity in general and the price level in particular. At one end of the transmission mechanism stand the instruments that can be controlled by the monetary authority, and at the other end are the final objectives of the monetary policy such as price stability, output growth and employment. There is growing consensus among economists that monetary policy can only be used to smooth short-term output fluctuations and does not affect long-term real growth. Monetary policy can, however, be an effective tool to achieve price stability, which has been established as the single final objective of many central banks all over the world. In line with the specification presented by Mishkin (1996), we look at the following channels of monetary transmission: the interest rate channel, the exchange rate channel, the asset prices channel and the credit channel. This standard scheme is often augmented to include an expectations channel, which has received considerable attention in recent research work.

- *The interest rate channel*

The interest rate channel implies the mechanism through which the change in the policy interest rate is translated into market deposits and loans interest rates, and, at a second stage, the mechanism through which the new market interest rates affect firms and households spending and investment decisions. It is important to keep in mind that the size and the direction of the effect of a certain monetary policy decision on market interest rates depends on the extent to which the policy change was anticipated and on how the change affects expectations about future policy decisions. It is generally believed and proven that a change in the policy rate is reflected in an almost immediate change in the same direction and of a similar size in the short-term lending and deposit market interest rates. The speed with which these rates adjust depends on the characteristics and depth of the market, on the strength of competition among financial institutions etc.. The long-term rates, on the other hand, may move either in the same or in the opposite direction after a change in the policy rate. The actual effect on long-term rates of an official rate change, will partly depend on the impact of the policy change on inflation expectations (BoE MPC Report). If investors expect a rate rise to be followed by lower interest rates in the future, the long-term rates may fall in response to the current rise in the official rate. Theoretically, an expansionary monetary policy, i.e. a decrease in the official nominal interest rate, is followed by a fall in real interest rates (in a sticky prices framework), which in turn leads to lower cost of capital and increases businesses and consumers investment, and finally increases aggregate output (Mishkin, 1996).

The empirical results of the studies on interest rate pass-through for the CEE countries are very similar to the findings for the euro area (Égert and MacDonald, 2006). In general, it seems that: the most complete pass-through is found for short-term corporate lending rates, followed by long-term corporate lending rates and the lowest pass-through is found for consumer loans; the pass-through to deposit rates is less complete than for lending rates; and there is substantial cross-country heterogeneity for the long-run pass-through.

The second stage of the interest rate channel consists in the link between market interest rates and real activities such as consumption and investment. Changes in real interest rates affect income and spending through the substitution, the wealth, the income and the cost of capital channel. Changes in interest rates can have conflicting effects, as they affect both savers' and borrowers' behaviour. The empirical work on this stage of the interest channel for CEEC is still scarce and the results are inconclusive.

For Albania, we believe that the interest channel has been inexistent for the major part of 1990-2005. The adoption of an indirect policy instrument (the one-week reverse repo rate), as the official policy rate in the economy, occurred only recently. By the end of the 90s, the domestic monetary policy was still facing a great challenge in the form of undeveloped financial markets, large informal credit and foreign exchange markets, and a low degree of financial education and public trust in the banking system, aggravated particularly after the 1997 collapse of the pyramid schemes. There is a consensus, however, that the switch from direct to indirect monetary policy instruments and the increasing credibility and transparency of the central bank have helped strengthen the relationship between money and inflation. Although the interest rate channel may not be the most significant monetary policy transmission channel in Albania at present, it is believed to have assumed a greater role over the last few years.

- *The exchange rate channel*

Changes in official interest rates can also affect the exchange rate. As the exchange rate indicates the value of domestic currency relative to foreign currencies, it can be influenced by foreign interest rates, as well as domestic interest ones. The size and the direction of the impact of a change in the policy rate on the exchange rate is difficult to predict, as it will depend on expectations about domestic and foreign interest rates and inflation (BoE MP Report). The normal reaction to a rise (fall) in the policy rate, would be an appreciation (depreciation) of the domestic currency, as assets denominated in domestic currency would become more attractive for foreign investors. An appreciation of the domestic currency would make imports more expensive and exports cheaper, so net exports and, consequently, aggregate demand would decrease. In addition to the effect on net exports and aggregate demand, the exchange rate has a direct effect on domestic inflation, because it determines the price of imported goods expressed in domestic currency. In the literature, this is known as the pass-through effect. The exchange rate channel can also work through the wealth and the balance sheet channels, which are generally included in the discussion about the asset prices channel. The exchange rate affects the balance sheets of firms with large foreign currency denominated debt. When foreign currency is appreciated (domestic currency appreciates), the debt burden of these firms increases, and with no corresponding assets denomination to match this increase, the net worth of firms goes down. The same happens with consumers holding large amounts of foreign currency assets; their wealth decreases and so does their consumption. In this framework, the exchange rate working through the balance sheet and the wealth channel, affects aggregate demand in an opposite direction compared to the traditional net exports channel.

The exchange rate channel has received particular attention in research on transition economies, as it is believed to be particularly important in high inflation environments and in countries with poor financial markets (Aslanidi, 2007). Kamin et al (1998) state that, for transition countries, the exchange rate channel, in contrast to the other channels, affects not only aggregate demand, but also aggregate supply. However, here we focus on the role played by the exchange rate as a channel through which monetary policy affects aggregate demand. For the exchange rate channel to work within the monetary transmission framework, two relationships must hold. First, there must be a link between monetary policy and the exchange rate, and second, the exchange rate must influence output and inflation.

Empirical evidence for transition countries for the first stage of transmission, i.e. from monetary policy to the exchange rate shows mixed results. Vonnák (2007) concludes that two different studies on Hungary find similar responses of the exchange rate to monetary policy in the last 5-10 years. An unexpected 25 basis points rate increase, on average, appreciates the exchange rate almost immediately by 0.5-1.0%. For other transition countries Égert and MacDonald (2006) state that VAR models give mixed results on this relationship. A positive interest rate shock can lead to an appreciation or depreciation of the exchange rate. This phenomenon, known as the exchange rate puzzle, under special circumstances can be attributed to the unsuccessful defence of an exchange rate level. Vonnák (2007) argues that the presence of shocks to risk premiums renders measuring the effect of monetary policy on the exchange rate difficult. If the Uncovered Interest Parity condition is augmented with a risk premium term[4], it can be seen that an increase in the risk premium can lead to higher domestic interest rates, to a spot depreciation, or can be offset by depreciation in the future (Vonnák, 2007). If this is the case, the stronger the dominance of risk premium shocks, the more likely it is to observe an opposite reaction of the exchange rate, i.e. a weakening of domestic currency after monetary tightening.

Turning to the second stage of the channel, Aslanidi (2007) finds that the exchange rate is more efficient in influencing fluctuations in output, monetary aggregates and credit than the interest rate and foreign exchange interventions in Georgia. Moreover, foreign exchange interventions seem to have a stronger impact on the level of the exchange rate and on the real economy than the interest rate. In their transition countries survey, Égert and MacDonald (2006) summarize the results of the studies of the exchange rate pass-through to inflation as follows: (a) there is considerable cross country heterogeneity especially for the CPI; (b) the pass-through is different for subgroups of the CPI, PPI and import prices; (c) exchange rate pass-through has declined lately for almost all countries; (d) the pass-through seems strongest against the anchor or benchmark currency.

The Albanian economy is a small open economy. The goods trade deficit stands at 40% of GDP and exports and imports of goods and services are as high as 80% of GDP. The current account persistently records large inflows in the form of migrants' remittances, which have played a significant role in the financing of Albania's trade deficit and in keeping exchange rates stable in the last ten years. Albanians living abroad represent a large share of the number of non-residents coming to Albania as tourists especially in the summer and winter. Capital inflows consist primarily of foreign direct investment and official transfers. Based on the nature and structure of imports and exports of goods and services, we would expect changes in the exchange rate to have a greater influence on the volume of imports of goods and services, rather than on the volume of exports of goods and services. Vika[5] (2006) found that real income is the main determinant of trade flows in the long run, particularly for exports. Furthermore, changes in relative prices appear to have a larger impact than exchange rate fluctuations have on the volume of merchandise imports. The opposite is true for the export supply, which seems to react greater and faster to changes in the Lek/Euro exchange rate than to relative prices. These findings shed light on the relative importance of the exchange rate among other foreign trade determinants (relative prices, domestic and foreign income etc..), but they do not help us to assess the relative importance of the exchange rate channel as part of the overall monetary policy transmission mechanism. Regardless of the direction and magnitude of the influence of exchange rate on net exports, we are convinced that the exchange rate has had a measurable and strong effect on inflation in Albania in the last decade, by affecting import prices and inflation expectations.

- *The asset prices channel*

Asset prices channel reflects the impact of monetary policy on prices of assets, such as shares, bonds, real estate and other domestic assets. Hórvath and Maino (2006) summarize: this channel operates through changes in firms' market value and in household wealth. The former channel alters the relative price of new equipment, affecting investment spending, while the latter affects household consumption and the availability of collateral for borrowing. Mishkin (1996) explains that an increase in the money supply, would, according to Tobin's q theory, lead to higher spending in the stock market, an increase in stock prices, a higher value of q[6] and an increase in investment spending. The wealth effects are manifested in changes in households' wealth due to changes in stock prices. When stock prices increase, consumers become wealthier and have more money to spend. In the case of a monetary expansion, a decrease in the official interest rate would lead to higher investment and higher consumption, and consequently to higher aggregate demand.

It is hard to find empirical results on the strength of the asset prices channel for transition countries. This channel has attracted less attention and research than the other more traditional channels such as the interest rate channel, the exchange rate channel and more recently, the credit channel. For Hungary, Vonnák (2007) asserts that there are two reasons for considering the stock price channel as irrelevant. Firstly, there is no empirical evidence that monetary policy affects stock prices. And secondly, shares play a minor role in Hungarian households' financial wealth. Housing wealth may be the more important component of the asset prices channel for Hungary, due to the large share of its wealth relative to other households' financial assets. However, Vonnák (2007) concludes that the housing market is incapable of explaining the effect of monetary policy in Hungary.

In the case of Albania, it is way too early to consider the existence of an asset prices channel within the monetary transmission mechanism, as the range of domestic assets is limited to real estate assets, while bonds and stock markets are nonexistent. There may be a reason to suspect a link between increasing house prices and increased consumer spending, but we do not expect to find a relationship between monetary policy and house prices for the period under analysis. In our model, we include a house price index to analyze the role of this channel in the transmission mechanism.

- *The credit channel*

The functioning of the credit channel is considered to be closely linked to the information asymmetries in the credit market (Mishkin, 1996). Following the Bernanke and Blinder (1988) argument, this channel is often viewed as an enhancement channel that amplifies the interest rate channel. Central to the bank-lending channel is the imperfect substitutability between credits and other financial assets in the banks' balance-sheets on the one hand, and that between bank credits and other forms of financing in firms' balance – sheets, on the other (Égert and MacDonald, 2006). The credit channel works through the bank lending channel and the balance-sheet channel. Believers in the bank lending channel stress the special role of banks as solvers of asymmetries in the financial system. An expansionary monetary policy would increase bank reserves and deposits and the quality and quantity of available loans. The increase in loans would lead to increased investment and, consequently, increased output. The mechanism of the balance-sheet channel, alternatively known as the broad-lending channel or the financial accelerator, allows changes in the money supply to cause changes in the net worth and cash flow of borrowers. An expansionary monetary policy would raise the net worth and the cash flow of borrowers. As a result, there would be less asymmetric information and moral hazard in the credit market and the amount of loans would increase. In either case, higher lending would lead to higher investment and to higher output (Mishkin, 1996).

Égert and MacDonald (2006) observe that the body of empirical literature focusing on Central and Eastern European Countries concentrates on the first stage of the lending channel, i.e. the reaction of bank loans to monetary policy changes, more than on the second stage of the transmission, i.e. the effect of changes in credit aggregates on output and prices. Evidence from micro data for most countries suggests that, in general, banks react differently to monetary policy changes depending on bank characteristics such as size, liquidity, capitalization and ownership structure. In addition to cross-country heterogeneities, various authors find different results for the same country at different periods. In the case of CEE countries, foreign involvement generally seems to increase banks' responsiveness to monetary policy actions[7].

In a study examining the link between credit and output and inflation, Hericourt (2005) finds that an increase in credit temporarily increases both output and prices for Poland, Slovakia and Slovenia, but causes an initial fall in output in the Czech Republic (which is recovered later). Égert and MacDonald (2006) note that the literature on the credit channel in CEEC-s is still very scarce and looks only at selected aspects of the credit channel. One shortcoming of the studies, in their view, is that they assume that credit markets are in equilibrium and that the models data reflect this equilibrium. The authors suggest using more disaggregated credit data such as corporate short and long-term loans and various types of consumer loans, in order to understand how, if at all, the credit channel works in these countries.

Without ruling out the possibility of the existence of a credit channel in Albania, we think that the relative importance of this channel in the transmission mechanism may not be significant.

The large share of foreign currency loans (about 70% of the total credit stock), the large degree of concentration in the banking system and the low dependence of firms on bank loans to finance their activity, do not favour the functioning of a credit channel in Albania. In this paper, we do not consider the credit channel as a separate channel in the monetary policy transmission.

III. LITERATURE REVIEW

In this part we present a summary of empirical findings of studies focusing on the monetary transmission mechanism in Albania. The papers are presented in chronological order, as most of them build upon or refer to the results of previous work. Three of the papers presented here look at the overall monetary transmission mechanism by investigating the relative importance of different channels and their evolution over time. One paper focuses on the credit channel using commercial banks' micro data, and another paper focuses on the exchange rate pass-through. As a general impression, there seems to be a consensus that the exchange rate channel was and, to a lesser extent, continues to be significant in the overall transmission mechanism framework; monetary policy has gained importance after the adoption of indirect monetary policy instruments and there is little evidence to support the existence of a credit channel.

One of the early works that looks at the monetary policy transmission mechanism in Albania is by Muço, Sanfey and Luçi (2001). The authors argue that none of the traditional channels - interest rates, exchange rates, credit rationing and inflation expectations – is likely to be an effective tool for monetary control in Albania. The authors state that inflation had little correlation with money supply growth during 1994-2000, but there was a strong link between exchange rate stability and inflation. A reaction function is used to investigate how monetary policy instruments, namely the money growth and the policy rate, react to aggregate economic information and to political factors[8]. The authors conclude that the BoA reacts by reducing the M3 growth rate six months after an unexpected rise in inflation takes place. There is no evidence of BoA reaction to the real sector changes. The decision of the BoA to change the deposit interest rate seems more likely react to changes in the inflation level rather than to an unexpected rise in inflation. The authors do not find evidence of the effect of monetary policy on the real economy. This result was expected as the real economy does not rely heavily on credit from the banking system. A simple VAR analysis with monthly data over 1994:01-2001:08 shows that there is not any strong causality running from inflation to M3 growth, while the political dummy positively affects both inflation and money growth.

In a later paper, Muço, Sanfey and Taçi (2003) examine the conduct of monetary policy in Albania during the transition period using a VAR model. The period under investigation stretches from January 1994 to May 2003 and the model uses monthly data on the following five variables: M3 monthly rate of growth, monthly CPI inflation, the logarithm of the Lek/USD exchange rate, the logarithm of remittances in USD, and the monthly rate of growth of trade balance. The ordering restrictions for the estimation of the VAR model are as follows: remittances → money growth →exchange rate →inflation →trade balance. Remittances are thought to influence both money supply and the exchange rate. Money growth is believed to affect the exchange rate, and both money growth and exchange rate should affect the rate of inflation. The final link in the chain is the trade balance which is affected by inflation, or the change in relative export/ import prices. The chosen lag length for each variable is two. The estimation period is divided into two sub-samples to account for the shift from direct to indirect monetary policy instruments[9]. The overall result for the first period is that monetary shocks do not appear to be related to inflation. Remittances and the trade balance have an expected positive short-term effect on inflation, lasting between 2-4 months after the shock, and the exchange rate shock has a small negative effect that persists over a period of 12 months[10]. The variance decomposition of the forecast error shows that shocks to remittances and the exchange rate explain about 14% of the error variance, while the contribution of money growth is extremely small. The picture is different for the second period. Money growth appears to have a positive effect on inflation, which peaks after three months and dies out after four to five months. The exchange rate effect is similar to that found for the first period. Shocks to money growth explain a significant part of the trade balance as well. The variance decomposition of forecast errors shows that the effect of the money supply is stronger than in the first period explaining about 16% of the error variance after 12 months. The effect of remittances and exchange rate are still high, indicating that these factors are food indicators of inflation expectations. The strong effect of remittances on trade balance (60% of forecast error variance), and the visible effect of money growth on trade balance (33%), according to Muço et al indicate that the exchange rate transmission channel was present during the period of indirect monetary policy instruments.

In a slightly different approach, Peeters (2004) looks into the details of the monetary policy transmission mechanism in Albania and tests the hypothesis that the exchange rate is the most important channel in the monetary policy process. The author analyzes the relative importance of the exchange rate channel, the deposit and credit channel and the wage channel. Peeters argues that the exchange rate channel is likely to be weak due to the sizable trade openness of the country and that movements in the exchange rate are likely to be influenced by foreign factors rather than by domestic monetary policy. The deposit and credit channel is also expected to be weak due to the fact that demand for deposits is highly inelastic[11] and that the extent of loans in domestic currency in Albania is still limited. Concerning the wage channel, the author maintains that the high level of unemployment and the weakness of labour unions, could slow or impede wage pressures altogether. Relying on graphical inspection of the underlying variables, the Peeters suggests that: the relationship between exchange rate and inflation has weakened since 2001[12]; the deposit channel seems to be functioning as the easing of monetary policy since 2002, has been reflected in decreasing deposit interest rates and in decreasing volumes of new lek deposits for 12, 6 and

3 month maturities; and that the working of the credit channel seems somehow troubled as the relationship between policy rates, credit rates and new lek loans differs across the years under analysis and is not always consistent with expectations. Regarding the wage channel, Peeters argues that there may be a strong link between annual wage growth, especially for the non-agricultural private sector, and CPI inflation, as the correlation between the variables suggests. In the author's view, the cost-push linkage may be rather stronger than the demand pressures caused by changes in the wage level. Peeters conducts a VAR analysis using monthly data on the monetary policy rate, the exchange rate[13], the volume of deposits, the volume of credits and inflation. In comparing the two most influential exchange rates in the Albanian economy, Peeters shows that the Lek/Usd rate hardly explains the variance of inflation in the 2002-2004 period. The Euro/Lek exchange rate, on the other hand accounts for the greatest part of the inflation variance in 2000-2002. In the following period, the exchange rate seems to have become weaker at the benefit of credits. In decreasing order, inflation variance is explained by movements in inflation itself, credits, exchange rate, deposits and the monetary policy rate in 2002-2004. The author acknowledges the lack of the wage channel as one of the drawbacks of this VAR analysis and states that the analysis merely provides information on the relative importance of the factors included. The major conclusion of this paper is that there are strong shifts in the monetary policy transmission channel and these shifts point at a diminishing role of the exchange rate at the benefit of the credit channel.

Luçi and Vika (2005) conducted an empirical study of the credit channel in Albania for the period Q1:2001-2004:Q3, using data on individual banks. They measured the effect of changes in monetary policy on the volume of new credits and deposits, and the role played by commercial banks' characteristics in the transmission process[14]. The authors argue that, in the absence of developed money and capital markets, bank credit is the most important and possibly the only external source of financing especially for small-to-medium size firms in Albania. However, the penetration of credit services in the

Albanian economy remains very limited and firms rely mostly on internal sources and other informal sources for finance. The authors argue that the capability of the central bank to affect credit supply through monetary policy in Albania is expected to be quite limited due to numerous problems in the credit market. The dominant position of the Savings Bank, the large share of liquid assets to total banks' assets and the large informal credit market that flourished in the mid 90s, undermined the role of monetary policy during this period. Luçi and Vika (2005) summarize as follows: the effectiveness of the credit channel in Albania remains modest, hindered by the large share of cash transactions, by an undeveloped interbank market, by strong banks' preference to lend in foreign currency and by an overall low penetration of credit services in the economy. The hypothesis that credit supply was not affected by changes in monetary policy and that there were no significant differences among individual banks, could not be rejected. The authors also found that a monetary policy contraction had not caused a contraction in the volume of new lek deposits. This study concluded that there is very little empirical evidence to support the existence of a credit channel in Albania.

Istrefi and Semi (2007) assess the extent and speed of exchange rate pass-through to consumer prices in Albania using vector autoregression model (VAR). The reference measure of exchange rate is the NEER. The main result is that the exchange rate pass-through is almost complete but in decline. The pass-through of an exchange rate shock to consumer prices after 4 months is about 42% and after 9 months it is almost complete (99%). Furthermore, exchange rate shocks appear to be more important in explaining consumer price variance than the other variables (M3 growth and 3-month Lek deposit interest rates). Exchange rate shocks explain up to 25% of the consumer price variance. The results suggest the presence of an asymmetry in the pass-through: pass-through is higher in the case of domestic currency depreciation and lower in the case of depreciation. Dividing the sample into two sub-samples (1996:01-2000:08 and 2000:09-2006:12) reveals a weaker pass-through in the last 7 years. The authors argue that the low inflation environment, the domestic currency stability and increased monetary policy credibility may have contributed to a dampening of the exchange rate pass-through during the last decade.

In an analysis of the monetary policy rule followed by the BoA in the period Q4:1994-Q1:2003, Samiei (2003) concludes that there is some evidence that the bank has followed a systematic approach to monetary policy by reacting both to inflation and output developments - although severe data problems reduce the reliability of results. In the author's opinion, this approach has played an important role in maintaining low inflation. The systematic monetary policy has also been helped by a gradual fiscal consolidation and large foreign currency inflows, which have helped maintain a strong exchange rate. Samiei adds that inflation in Albania is significantly influenced by supply shocks, so reacting to a demand shock by following a standard Taylor rule, may not be always feasible for monetary policy.

Since in this paper we replicate the work of Muço et al (2003), we comment on some weak points that we have identified in this analysis. Regarding the nature and form of variables, we think that: the use of M3 as a measure of money is not the best choice given the limited effect of monetary policy on this monetary aggregate; the Lek/USD exchange rate is an inferior alternative to the Lek/Euro rate given the different conditions prevailing at the time when the study was carried out; the inclusion of the trade balance series in nominal form does not seem very advisable as import and export values in USD are affected both by exchange rate and relative prices developments; the remittances variable, despite its importance as a major contributor to exchange rate stability, is unpromising from the statistical point of view as there is no direct measure of this type of flows for Albania – the estimation methodology is such that might lead to a strong inherent correlation of this series to merchandise imports. We also do not favour the use of monthly changes as they introduce a lot of noise in the data series and complicate the estimation of the model.

Regarding the presentation of the results, since the responses of variables in the impulse response functions seem rather flat an inclusion of confidence intervals would be necessary to better understand the significance of the response and the relative importance of the different channels. In our replication of this model we try to address some of these issues and make improvements where the data permit.

IV. RECENT FINDINGS

Following our review in section III, we investigate if the results in Muço et al., (2003) hold for a longer data span. The reason why we choose to replicate this study is because it provided a good insight of how monetary policy effects on final variables of interest might have changed over time. However as explained in section III a short time span available to Muço et al., (2003) especially for the second time period, leads us to question the reliability of the findings given the asymptotic properties of SVAR analysis. Further, we test if the results hold even if the model is modified to account for the critique in section III.

REPLICATION OF THE MODEL OF MUÇO ET AL. (2003)

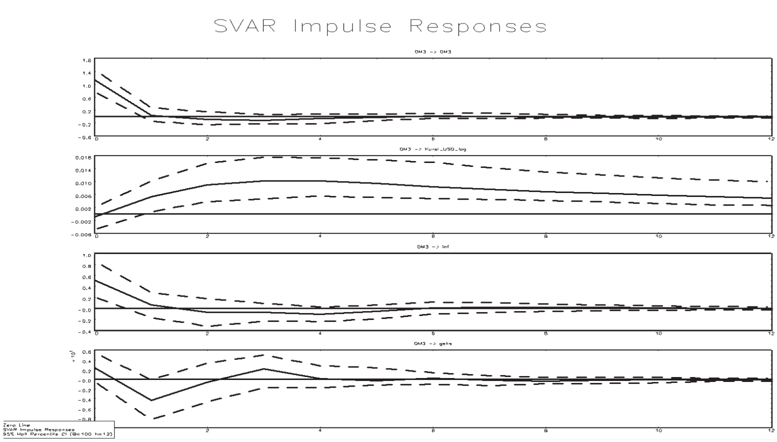
We conduct the replication for the second subsample referred to in Muço et al. (2003) and extend it for later observations so that the total period is 2000 M8 – 2007 M6. In Appendix 1 tables 1 – 3 we present the tests for residual autocorrelation, non-normality and conditional heteroskedasticity of the estimated VAR 2 model. The first test is the Jarque- Bera test on the normality of residuals in Doornik and Hansen (1994). Table 1 indicates the normality hypothesis is rejected at conventional levels of significance for all equations except the equation for the USD exchange rate. Table 2 displays the ARCH-LM test in Doornik and Hendry (1997) and indicates that the hypothesis of no heteroscedasticity of the residuals can be rejected at conventional significance levels for the remittances equation and the trade balance equation[15]. In table 3 we present the Breusch-Godfrey LM test for autocorrelation of the residuals and the Edgerton and Shukur (1999) LMF test which corrects for small sample bias. Both tests indicate rejection of the null of no serial correlation. In charts 1 and 2 Appendix 1, we present the CUSUM and CUSUM Sq tests of the stability of the VAR. The Cusum Sq indicates instability of the VAR in the money and trade balance equations. While estimations of VAR models are generally robust to deviations from normality (Juselius, 2006), the violation of the serial correlation assumption is seriously harmful for VAR analysis. On the other hand it is worth noting that the residual correlation and heteroskedasticity tests are derived under normality assumptions and vice-versa, hence it is impossible to know which of the tests can be trusted. The residuals and stability tests should serve as a warning about the reliance we place on the VAR analysis results.

Next we present the impulse responses of different equations in the system following a shock to money growth, trade balances, inflation, the exchange rate, and remittances respectively. We observe the following:

A shock to the change in money (Chart 1) causes:

- A permanent exchange rate depreciation occurring after one month. The effect is totally different from that in Muço et al.,
- A temporary surge in inflation that dies out quickly within one month. This could be explained by rising inflation

Chart 1 Response to money indicator shock
(money, exchange rate, inflation, trade balance)



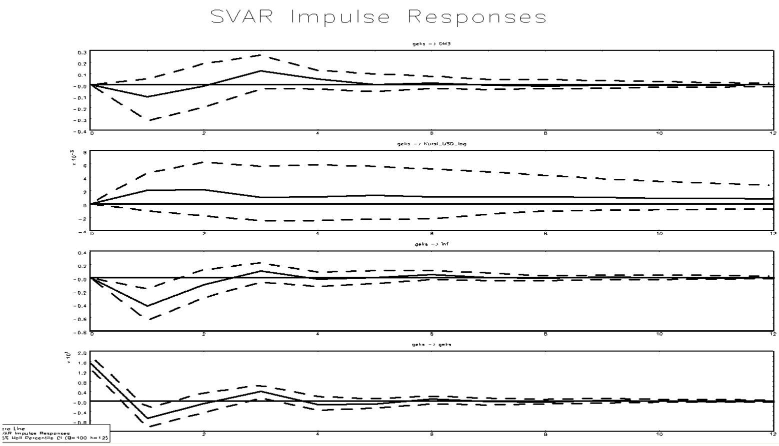
expectations following monetary easing. The effect is similar to that observed by Muço et al.,

- No significant effect on trade balances. The effect is totally different from that in Muço et al.,

A shock to the growth in trade deficit (Chart 2) causes:

- No significant effect on M3 changes. The effect is totally different from that in Muço et al.,
- No significant effect on the exchange rate. The effect is the opposite to that in Muço et al.,
- A puzzling temporary decrease in inflation. The effect is similar to Muço et al..

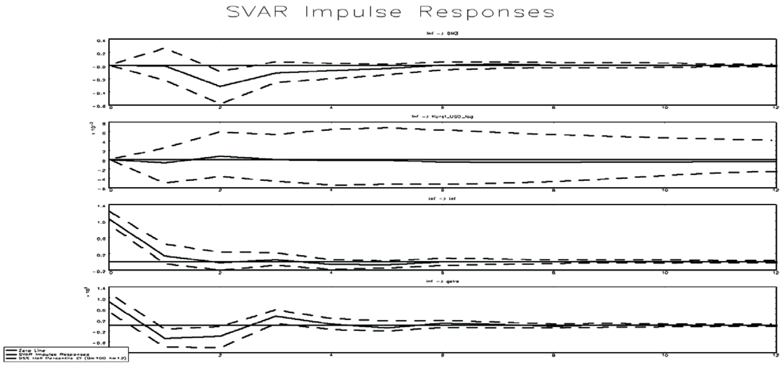
Chart 2 Response to trade balance shock
(money, exchange rate, inflation, trade balance)



A shock to inflation (Chart 3) causes:

- Temporary fall in M3 after 2 months. The effect is similar to Muço et al. at the beginning but in their case there is a permanent increase in money growth following the shock.
- No effect on the exchange rate, and the shape of the response is similar to that of Muço et al..
- Temporary increase in the trade deficit growth followed by a decrease in the trade deficit growth. The effect is similar in shape to that of Muço et al..

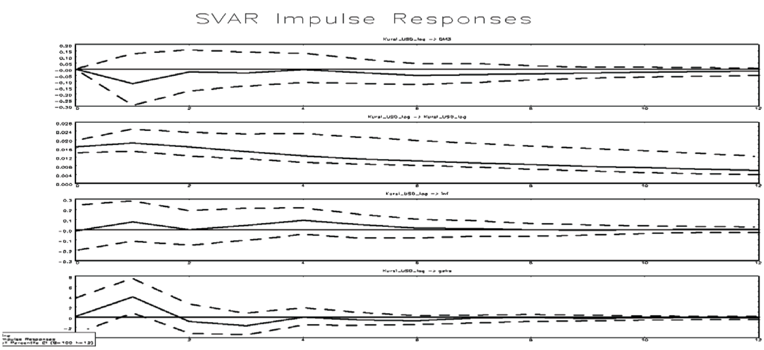
Chart 3 Response to inflation shock
(money, exchange rate, inflation, trade balance)



A shock to NEER - depreciation of lek (Chart 4) causes:

- No effect on money growth. The effect is similar in shape to that in Muço et al..
- No effect on inflation, and the shape is different from that in Muço et al..
- Temporary increase in the trade deficit after one month. The effect is similar in shape to that in Muço et al..

Chart 4 Response to exchange rate (NEER) shock
(money, exchange rate, inflation, trade balance)



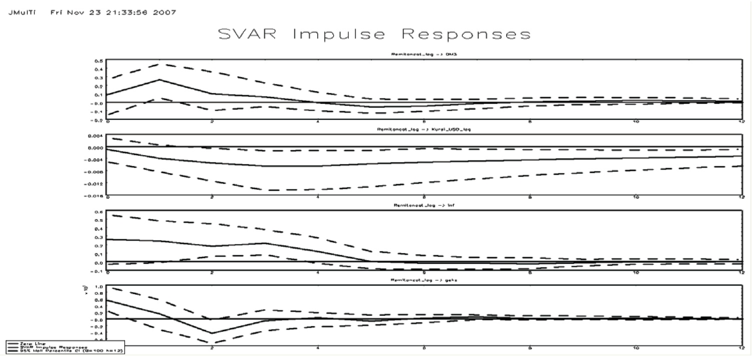
A shock to remittances (Chart 5) causes:

- Temporary increase in money after one quarter
- Permanent fall in the exchange rate after 2 quarters. The effect is totally different from that in Muço et al.
- No significant effect on the trade deficit. The effect is similar

to that of Muço et al.

- Temporary increase in inflation after one month lasting for 4 months. The effect is totally different from that in Muço et al.

Chart 5 Response to remittances shock
(money, exchange rate, inflation, trade balance)



Overall the response of the system in our sample is quite different from that found by Muço et al. (2003). In addition, by presenting confidence intervals we make a distinction between significant and insignificant effects, which were not presented in Muço et al.(2003). With regard to the transmission hypothesis the money growth effect on inflation was the only robust result, while other effects were found to be either different or insignificant. In table 1 we show the forecast error variance decomposition. Comparing these results with those of Muço et al. (2003) we observe that although the money shock is still important in explaining the forecast error in inflation after 12 months, both remittances and the exchange rate proportions of forecast errors in inflation are significantly smaller than those reported by Muço et al. (2003). The same could be said of the forecast error in the trade deficit growth, suggesting that evidence of a strong exchange rate channel could not be found.

Table 1 Forecast error variance decomposition in inflation for: remittances, money, exchange rate, inflation and trade balance

Proportions of forecast error in “Remitancat_log”					
forecast horizon	Remitancat_log	DM3	Kursi_USD_log	inf	geks
1	100%	0%	0%	0%	0%

6	72%	17%	2%	9%	1%
12	71%	17%	3%	9%	1%
Proportions of forecast error in "DM3"					
1	1%	99%	0%	0%	0%
6	6%	84%	1%	8%	2%
12	6%	83%	2%	8%	2%
Proportions of forecast error in "Kursi_USD_log"					
1	0%	0%	99%	0%	0%
6	8%	20%	71%	0%	1%
12	10%	24%	65%	0%	1%
Proportions of forecast error in "inf"					
1	5%	18%	0%	77%	0%
6	12%	16%	1%	60%	11%
12	12%	16%	1%	60%	11%
Proportions of forecast error in "geks"					
1	9%	2%	0%	21%	68%
6	10%	6%	4%	23%	57%
12	10%	6%	4%	23%	57%

SVAR ANALYSIS OF THE MODIFIED MODEL

As a next step of our analysis, building on this research and the critique to it in section III, we modify the model as follows:

1. We replace the bilateral exchange rate USD/lek with NEER data on the basis that a composition of exchange rates would overcome potential problems resulting from a shift from USD to EURO as the primary foreign currency in Albania. The NEER variable (index) is taken in logarithm form.
2. We replace the broad aggregate M3 with M2 as M2 excludes foreign currency holdings and accounts for the measurement problem arising from the conversion of foreign currency deposits in lek with the prevailing exchange rate of the period. It has been shown that this later measure is better related to monetary policy. We convert M2 to real M2 using CPI inflation as a deflator and use annual growth rates of real M2.
3. We replace trade balance with a measure of GDP on the basis that this measures effects more accurately on other components such as investment and consumption. Nominal GDP is converted into real GDP using CPI.

4. We include a variable that directly captures the movements of monetary policy: the repo rate. The repo rate is taken in levels.
5. We use annual growth rates for headline and core inflation.
6. We conduct the analysis with quarterly data instead of monthly data in order to avoid unnecessary noise in the data series.

The specification tests for our model (Appendix 2) indicate that autocorrelation is still a problem, however longer lags were also tried and did not bring significant improvement. Both normality and heteroskedasticity tests do not find enough evidence to reject the nulls of normality and no heteroskedasticity of the residuals. Stability tests indicate that the model is generally stable although the CUSUM Sq test detects some instability in the money equation.

Differently from Muço et al. in identifying the structural shocks from the residuals in each equation we use the scheme proposed by Kim and Roubini (2000). This scheme (presented in table 2) allows for a formulation of a money demand equation in shocks, allows for the contemporaneous reaction of all shocks in the exchange rate. The scheme uses information lags in monetary policy decision in that the repo rate does not react to contemporaneous shocks in inflation and real output. This scheme as explained in section III seems more realistic in the case of Albania when information, especially as regards output is available with considerable lags.

Table 2 The scheme of money demand equation proposed by Kim and Roubini, 2000. Variables are presented according to the following order: gross domestic product, money (M2), nominal effective exchange rate, base interest rate, inflation

rgdp	rm2	NEER_log	REPO	Head Inflation
*	0	0	0	0
*	*	*	*	0
*	*	*	*	*
0	0	*	*	*
*	0	0	0	*

In charts 6-7 we examine the response of the system to shocks to the repo rate, which may be considered pure monetary policy shocks, and shocks to the exchange rate. We seek to investigate whether the exchange rate channel is in fact as weak as resulted from replication. The reason why we concentrate on this channel is that we suspect that using the bilateral USD/ lek exchange rate may not fully capture the importance of this channel given the lesser importance of this foreign currency over the last years.

Chart 6 The system's response to base interest rate – REPO shock
(gross domestic product, money, nominal effective exchange rate, inflation)

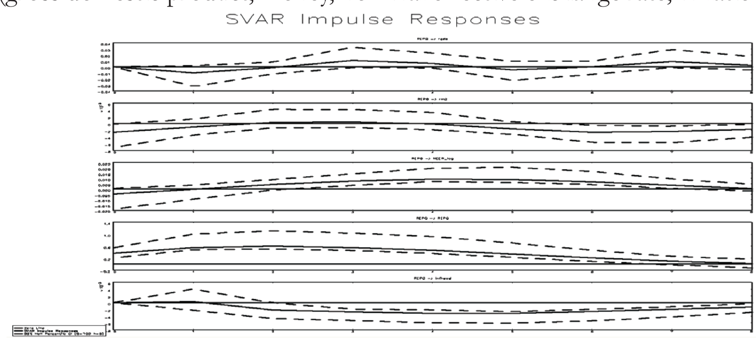
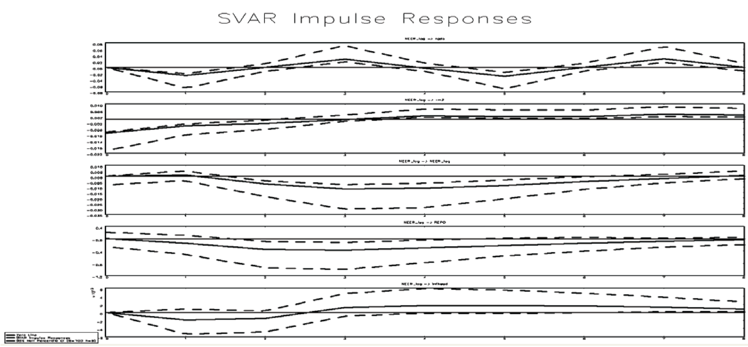


Chart 7 The system's response to exchange rate shock
(gross domestic product, money, nominal effective exchange rate, inflation)



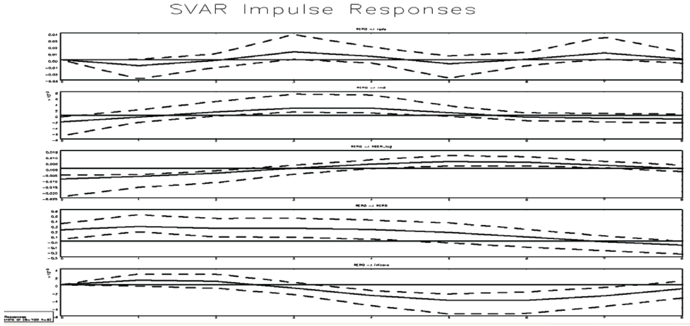
We observe the following:

- An increase in the repo rate does not have any significant effect on GDP.
- A rise in the repo rate brings a significant fall in real money holdings after 5 quarters.

- There is a puzzling exchange rate depreciation becoming significant after 1 quarter and dying after the 7th quarter.
- A rise in the repo rate lowers inflation after 2 quarters.
- A shock to the exchange rate brings fluctuations in real production. As we mentioned in section II, there are wealth effects positively affecting spending, following exchange rate depreciation in economies where agents hold a considerable part of their portfolio in foreign currency. Our results suggest the BoA should pay attention to the exchange rate fluctuations.
- A positive shock to the exchange rate initially causes a fall in M2 in line with currency substitution theory, but after 2 quarters M2 increases with respect to its initial levels. The money balances behaviour may reflect fluctuations in output.
- A positive shock to the exchange rate causes a fall in the repo rate, with an effect becoming significant after one quarter indicating that the BoA has in fact considered exchange rate shocks smoothing in its policy rule.
- A positive shock to the exchange rate increases inflation after 4 quarters, but the effect is just marginally significant.

Finally we investigate whether it is possible to better understand the transmission process if we focus on a core measure of inflation that excludes temporary fluctuations. Since the central bank can control only the evolution of the monetary policy component of inflation, by allowing the central bank to form expectations only on core inflation, it is also expected to improve the model

Chart 8 The system's response to base interest rate – REPO shocks
(gross domestic product, money, nominal effective exchange rate, core inflation)



diagnostics (Appendix 3). However our estimation does not find evidence of this hypothesis. We consider the impulse responses of all variables after shocks in the repo rate and the exchange rate. In chart 8 we present the impulse responses of a shock to the repo rate, while the responses to an exchange rate shock are shown in Appendix 4 since there was no difference from those obtained in our original modification.

By replacing headline inflation with core inflation we observe the following differences:

- A shock increasing the interest rate has an initial positive effect in money balances but this effect dies out after 5 quarters. The shape of the response in similar to that in our first modification but the statistical significance has changed.
- A positive shock to the repo rate causes an initial fall in NEER in line with our expectations, but this is reversed after the 4th quarter.

V. CONCLUSIONS AND IMPLICATIONS FOR MONETARY POLICY

This paper focuses on the monetary policy transmission mechanism in Albania. It presents some theoretical background and recent findings of research work on the MTM in transition countries. A first conclusion is that there is significant heterogeneity across countries and across periods regarding the strength and relevance of particular transmission channels. In some countries the interest rate channel appears to be gaining importance over time and in others, the dominant role is still played by the exchange rate channel. Results concerning the credit channel and other asset prices channels are more mixed and inconclusive.

For Albania, we re-estimate a VAR model originally estimated by Muço et al (2003) using the data in their original form, and then making modifications in the type of variables, their frequency and their ordering. An attempt to replicate the results using identical data but longer time series shows that the response of the system in our sample is quite different from that found by Muço et al. (2003). In addition, by presenting confidence intervals we make a distinction between significant and insignificant effects, not presented in the earlier paper. With regard to the transmission hypothesis the money growth effect on inflation was the only robust result, while other effects were found to be either different or insignificant. Although the money shock is still important in explaining the forecast error in inflation after 12 months, both remittances and the exchange rate proportions of forecast errors in inflation are significantly smaller than those reported by Muço et al.(2003). The same can be said of the forecast error in the trade deficit growth, suggesting that evidence of a strong exchange rate channel could not be found.

The original model was modified to include real GDP instead of nominal net exports, real M2 instead of nominal M3, NEER instead of the Lek/USD exchange rate, to include the BoA policy rate, and to exclude remittances. We use annual changes instead of monthly changes and the periodicity in the revised model is quarterly. We observe that an increase in the policy rate does not have a significant effect on real GDP; it causes a strong drop in real money holdings after 5 quarters; it causes a depreciation of domestic currency after one quarter and, most importantly, it lowers inflation after 2 quarters, but the inflation rate goes back to its original level in about 8 quarters. A positive shock to the exchange rate increases inflation after 4 quarters, but the effect is just marginally significant. We also observe that a shock to the exchange rate causes fluctuations in real output. We suspect wealth effects being at work here, giving rise to a drop in spending after exchange rate depreciation.

The results obtained after replacing headline inflation with a core inflation measure, show no major differences in the responses of the other variables to a shock in the policy rate. However, we would strongly advocate the use of a core inflation measure, preferably one that excludes the effect of administered prices, to monitor monetary policy effectiveness in the future.

Overall, we believe that the exchange rate channel is not as strong as reported in previous works, and that the money and expectations channel play the most important role within the transmission mechanism. Our findings also suggest that the BoA should pay attention to the exchange rate fluctuations as they seem to have an adverse impact on real output fluctuations.

APPENDIX 1 SPECIFICATION TESTS FOR THE MODEL OF MUÇO ET AL. (2003)

Table 1

JARQUE-BERA TEST				
variable	teststat	p-Value(Chi^2)	skewness	kurtosis
u1	31.07	0.00	0.04	6.05
u2	194.20	0.00	1.99	9.51
u3	4.00	0.14	-0.48	3.52
u4	17.52	0.00	0.74	4.75
u5	7.00	0.03	0.71	3.32

Table 2

ARCH-LM TEST with 12 lags				
variable	teststat	p-Value(Chi^2)	F stat	p-Value(F)
u1	31.36	0.00	4.85	0.00
u2	4.50	0.97	0.40	0.96
u3	6.97	0.86	0.65	0.79
u4	40.38	0.00	8.29	0.00
u5	7.10	0.85	0.66	0.78

Table 3

LM-TYPE TEST FOR AUTOCORRELATION with 5 lags	
Reference: Doornik (1996), LM test and LMF test (with F-approximation)	
LM statistic:	192.2664
p-value:	0.0001
df:	125
LMF statistic:	1.8626
p-value:	0
df1:	125
df2:	196

Chart 1

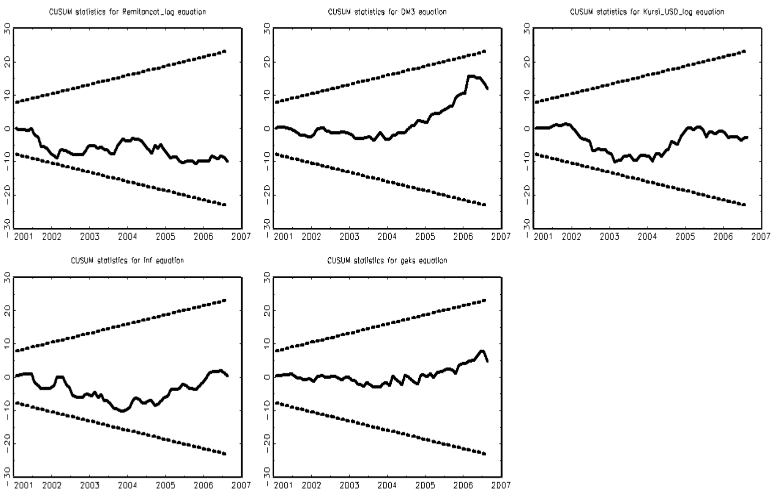
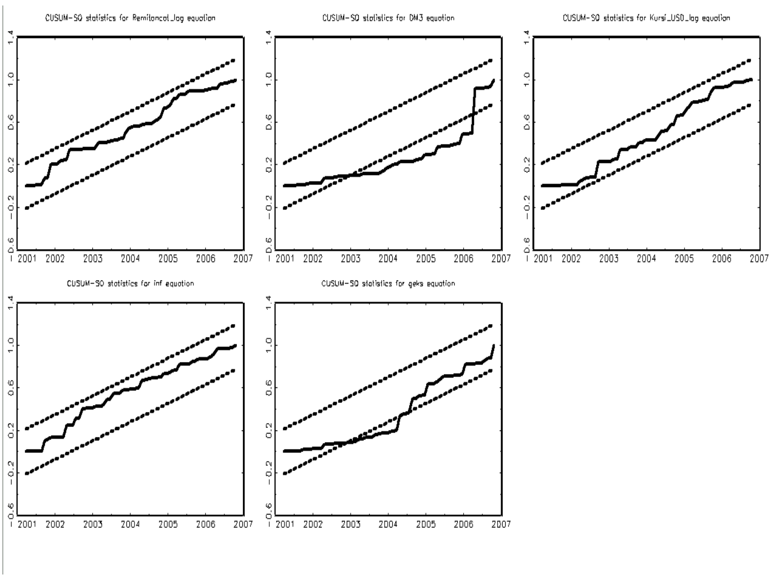


Chart 2



APPENDIX 2 SPECIFICATION TESTS FOR THE MODIFIED MODEL (MODEL 1)

LM-TYPE TEST FOR AUTOCORRELATION with 4 lags	
Reference: Doornik (1996)	
LM statistic:	-345.089
p-value:	-1
df:	100

JARQUE-BERA TEST				
variable	teststat	p-Value(Chi ^ 2)	skewness	kurtosis
u1	0.4923	0.7818	-0.2453	2.6416
u2	0.017	0.9915	-0.0296	3.0963
u3	0.2971	0.862	0.2356	3.0287
u4	4.8354	0.0891	-0.8411	3.8926
u5	0.3998	0.8188	-0.2707	3.0822

ARCH-LM TEST with 4 lags				
variable	teststat	p-Value(Chi ^ 2)	F stat	p-Value(F)
u1	2.3476	0.6721	0.6406	0.6389
u2	3.8337	0.429	1.1105	0.3756
u3	4.7268	0.3165	1.4217	0.2584
u4	4.5457	0.3372	1.3567	0.2796
u5	3.6144	0.4607	1.0375	0.4093

Chart 1

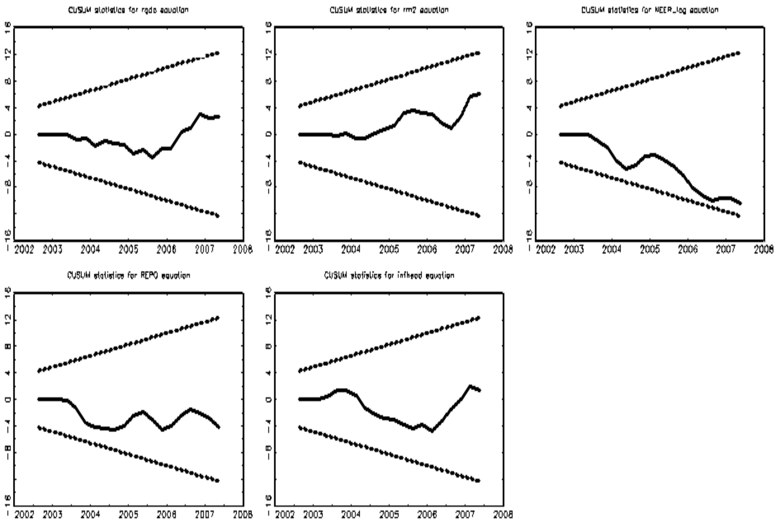
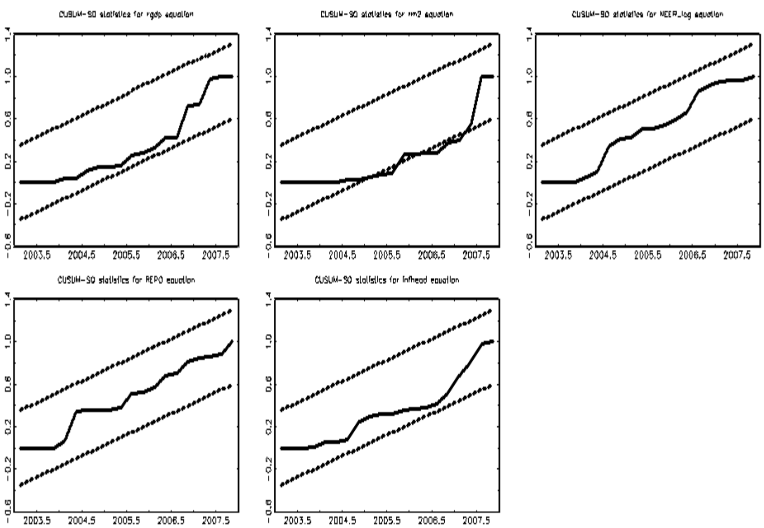


Chart 2



APPENDIX 3 SPECIFICATION TESTS FOR MODEL 2

Variables are included in the following order: rgdp, rm2, NEER_log, repo, infcore.

LM-TYPE TEST FOR AUTOCORRELATION with 4 lags	
Reference: Doornik (1996)	
LM statistic:	159.9999
p-value:	0.0001
df:	100

ARCH-LM TEST with 4 lags				
variable	teststat	p-Value(Chi^2)	F stat	p-Value(F)
u1	2.8626	0.5811	0.7971	0.5393
u2	4.2397	0.3745	1.2491	0.3183
u3	7.5018	0.1116	2.5618	0.0656
u4	6.158	0.1877	1.9736	0.1323
u5	4.8237	0.3059	1.4569	0.2476

JARQUE-BERA TEST				
variable	teststat	p-Value(Chi^2)	skewness	kurtosis
u1	1.5104	0.4699	-0.1459	1.9765
u2	0.0827	0.9595	-0.0713	3.2042
u3	1.1197	0.5713	0.458	3.0297
u4	4.4975	0.1055	-0.739	4.0903
u5	1.2196	0.5435	-0.4402	2.6264

CUSUM and CUSUM sq tests for stability

Chart 1

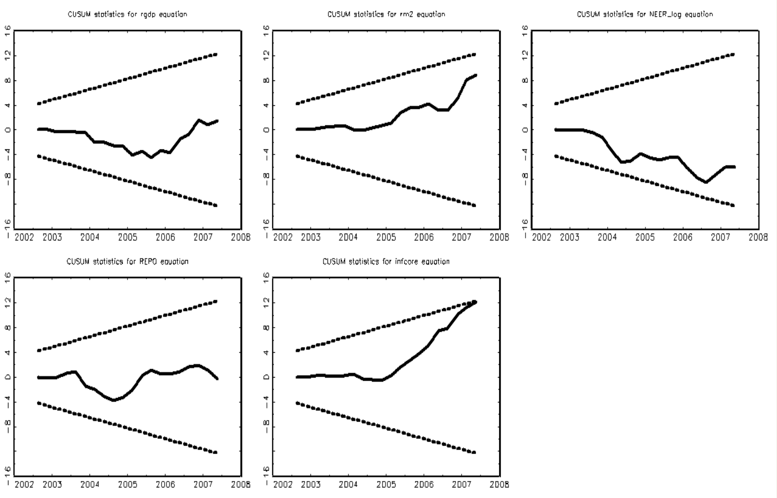
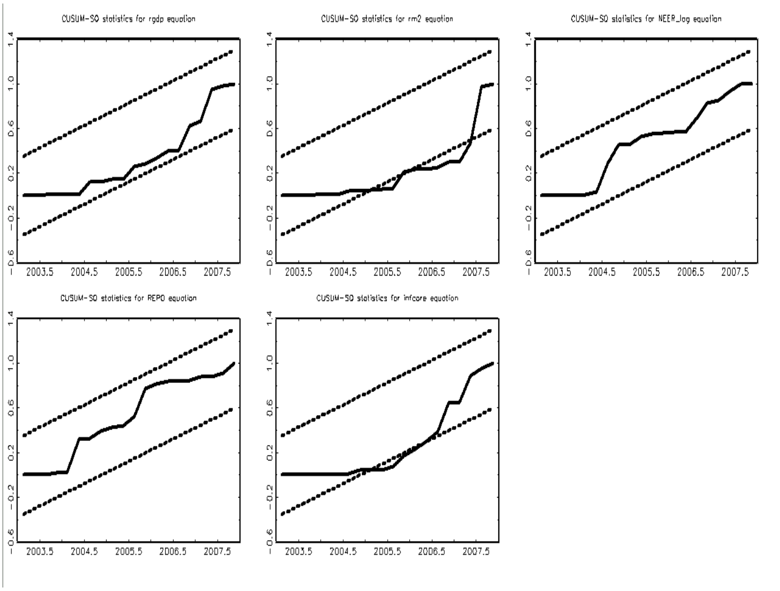
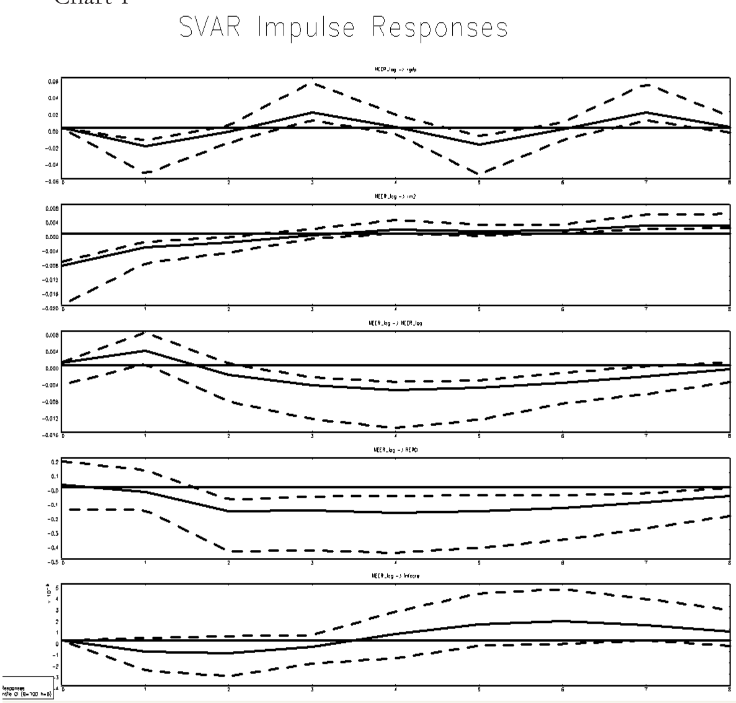


Chart 2



APPENDIX 4 THE SYSTEM'S RESPONSE TO A SHOCK TO EXCHANGE RATES (MODEL 2)

Chart 1



REFERENCES

The Transmission Mechanism of Monetary Policy, The Monetary Policy Committee, Bank of England, available on the BoE's website: www.bankofengland.co.uk.
Aslanidi, O. The Optimal Monetary Policy and the Channels of Monetary Transmission Mechanism in CIS-7 Countries – The Case of Georgia, CERGE-EI Discussion Paper No. 2007- 171, January 2007.
Doornik, J. A. and Hansen, H. (1994) A practical test of multivariate normality.
unpublished paper, Nuffield College.
Doornik, J. A. and Hendry, D. F. (1997) Modelling Dynamic Systems Using PcFiml 9.0 for Windows, International Thomson Business Press, London.
Égert, B., MacDonald, R., Monetary Transmission Mechanism in Transition Economies: Surveying the Surveyable. Magyar Nemzeti Bank Working Papers, 2006/5.
Edgerton, D. and Shukur, G. (1999) Testing autocorrelation in a system perspective, Econometric Reviews 18: 343-386.
Horváth, B., Maino, R. Monetary Transmission Mechanism in Belarus, IMF WP/06/246, November, 2006.
Juselius, K. (2006) The Cointegrated VAR Model: Methodology and Applications, Oxford University Press.
Kamin, S. Turner, P. Van't dack, J. The Transmission Mechanism of Monetary Policy in Emerging Market Economies: an overview, BIS
Kim, S. Roubini, N. (2000) Exhange rate anomalies in the industrial economies: a solution with a structural VAR approach, Journal of Monetary Economics, 45 (3) p561-586.
Mishkin, F. (1996) The Channels of Monetary Transmission: Lessons for Monetary Policy. Banque de France: Bulletin: Digest, 27, 33-44.
Muço, M. Sanfey, P. Taçi, A. Inflation, exchange rates and the role of monetary policy in Albania,
Muço, M. Sanfey, P. Luçi, E. Stabilization, monetary policy and financial institutions in Albania
Peeters, M. What about monetary transmission in Albania? Is the exchange-rate pass through (still) the main channel?
Vonnák, B. The Hungarian Monetary Transmission Mechanism: An Assessment. Magyar Nemzeti Bank Working Papers, 2007/3.

ENDNOTES

* Gramoz Kolasi, Director, Monetary Policy Department, Bank of Albania;
Hilda Shijaku, Chief of Sector, Statistics Department, Bank of Albania;
Diana Shtylla, Chief of Sector, Monetary Policy Department, Bank of Albania.

[1] Henceforth denoted as the BoA.

[2] CPI - Consumer Price Index measured and published by the National Statistical Office – INSTAT.

[3] With broad money (M3) growth as an intermediate target.

[4] The augmented UIP formula is $i_t = i_t * + E_t s_{t+1} - s_t + rp_t$, where i and i* are domestic and foreign interest rates, s is the spot rate, Es is the expected exchange rate and rp is the risk premium term.

[5] Unpublished BoA discussion paper: 'Measuring import and export functions in Albania' by Ilir Vika, Research Department.

[6] Q=Market value of firm/ Replacement cost of capital in the Tobin's q Theory of Investment. The higher the q-ratio, the cheaper it is for firms to purchase new plants and equipment by issuing new equity. In this scenario, firms would be encouraged to increase investment spending.

[7] For a detailed review of these papers see Egert and MacDonald (2006) pp28-29.

[8] Reaction functions for money growth (M3 growth) and for the 12-month deposit interest rate are respectively:

$$\Delta M_t = \alpha(L)\left[\pi_{t-1} - \pi^f{}_{t-1}\right] + \beta(L)\left[y_{t-1} - y^f{}_{t-1}\right] + \chi(L) POLDUM_t + \delta(L)\Delta M_t{}^w + u_t$$

$$\Delta R_t = \alpha(L)\left[\pi_{t-1} - \pi^f{}_{t-1}\right] + \beta(L)\left[y_{t-1} - y^f{}_{t-1}\right] + \chi(L) POLDUM_t + \delta(L)\Delta R_t{}^w + u_t$$

where ΔM is the annual change of broad money (M3); ΔR is the 12 month deposit interest rate quarterly change; L are the lag operators; $\pi_{t-1} - \pi^f{}_{t-1}$ is unexpected annual inflation and $y_{t-1} - y^f{}_{t-1}$ is unpredicted output.

[9] Period one: January 1994- August 2000; Period two: September 2000-May 2003.

[10] Here we do not present the results of the shocks of the other variables.

[11] Because alternatives to deposits like equity or bonds are rare or missing.

[12] As inflation seems to follow the exchange rate with a lag of 5 months for the period 1998-2001, but there is no evidence of this relationship for the following period (2001-2003).

[13] Both the Lek/Euro and the Lek/Usd exchange rates are used.

[14] Three commercial bank characteristics: size, liquidity, capitalization, were used to detect the presence of distributional effects among banks.

[15] Other lags were also tried and diagnostics problems persist. Therefore, in this section we continue the analysis with the same lag order as in Muco et al(2003).

CIP Katalogimi në botim BK Tiranë

Gramoz Kolasi, Hilda Shijaku, Diana Shtylla
Monetary transmission mechanism in Albania /
/ Kolasi Gramoz, Shijaku Hilda, Shtylla Diana - Tiranë:
Banka e Shqipërisë, 2010

-44 f; 15.3 x 23 cm. (material diskutimi ..)

Bibliogr.
ISBN:
978-99956-42-24-2

You may find this paper in the following address:

www.bankofalbania.org

If you want to receive a hard copy of this paper, write to us at:

Banka e Shqipërisë
Sheshi "Skënderbej" Nr.1 Tiranë Shqipëri,
Tel.: +355-(0)4-2222152;
Faks: +355-(0)4-2223558

or send an e-mail to:

public@bankofalbania.org

Printed in 500 copies