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*Monetary Policy and Inflation*  
*in Georgia 1996-1998*

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## **1. Introduction**

Monetary policy and inflation in Georgia in the years 1996-1998 are the subject of this paper. As it is written in the middle of 1997, the discussed period is in a natural way divided into two parts: past and future. Correspondingly, first sections of the paper deal with facts which have already occurred and with their interpretation, while the remaining sections contain some projections that the authors tried to make for the future.

The paper is organized as follows. Section 2. describes the framework in which the monetary policy of Georgia is conducted. The first part of this section names the monetary authority, shortly sketches the legal and political framework in which it operates and lists the instruments which it can use. The second part concentrates on the IMF's ESAF program which is implemented in Georgia since 1996 and will be continued until 1998, and which tightly constraints the acceptable monetary policy range. The discussion of this program revolves around its two core (and sometimes inconsistent) macroeconomic elements: the quantitative performance criteria and the exchange rate policy. Section 3. discusses two characteristic features of the Georgian economy that were inherited from the hyperinflation period 1993-1994: low money multiplier and low monetization. Low money multiplier is directly related to the situation in the banking sector, which is thus also sketched. Low monetization is an indirect indicator of a whole set of factors. While discussing it we resort to recent literature on this problem and to international comparisons contained in it. Section 4 is of a more descriptive nature: it presents the past behavior of money supply and of the exchange rate in a chronological fashion, but attempts to interpret the observed phenomena are also made.

Section 5 opens the forward looking part of the paper: it characterizes prospects for the future for M2 and real output. Section 6 sketches the econometric modeling strategy which the authors applied for Georgia. The constructed model has been used to obtain forecasts of inflation and nominal GDP, on the basis of assumed scenarios of money supply and the real output. The forecasts for 1997 H2 - 1998 (the remaining part of the discussed period) are presented in section 7. Finally, some conclusions are drawn in section 8. Technical details of the estimations can be found in the Appendix.

## **2. Framework for Monetary Policy in Georgia**

### **2.1. Monetary Authorities and Instruments of Monetary Policy**

Monetary policy is conducted by the National Bank of Georgia (NBG), with the statutory goal of securing the purchasing power of the national currency and the stability of the banking and payment system<sup>1</sup>. The bank acts in conditions of full

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<sup>1</sup> *Law on National Bank of Georgia, Art. 2.*

independence from the government<sup>2</sup>. The President and the Council of the bank, as well as every year's General Directions of Monetary Policy are approved by the Parliament.

From time to time the Parliament exerts pressure for softening the monetary policy and banking system reform policies. The acting President and the Council of the NBG have not been approved for a long time<sup>3</sup>. Mr. Nodar Javahishvili, who has been heading the Bank since the end of 1993<sup>4</sup> and is known as a decided supporter of market reforms, failed to obtain the Parliament's acceptance in April 1997 (the first time when the issue of Parliament approval was tackled) and the next vote was postponed indefinitely. In the somewhat uncertain situation the leadership of the Central Bank manages to withstand political pressure. The growth of Domestic Assets of the NBG is broadly in line with the IMF's recommendations.

The main instrument which the NBG has at its disposal is the intervention (sales and purchases of foreign currency) at the Tbilisi Interbank Currency Exchange (TICEX). Other instruments, less effective in the current conditions, are the required reserve ratio and activity on Interbank Credit Auctions. The government bonds market is in an early stage of development. The total issue planned for 1997 amounts only to 10 mln. lari, so this instrument is not effective as of 1997, and this will not change much in 1998.

## **2.2. ESAF Program**

The rate of tax and customs collection in Georgia is, at 8.1% of GDP in 1996 [IMF (1997), p.4], among the lowest in the FSU. Government expenditures (at 13.9% of GDP [ibid.]), although shrunk to hardly sustainable levels, exceed the revenues significantly. Thus, net government savings are negative. Private net savings are probably also negative. As a result, Georgia has a large current account deficit, which in 1996 amounted to about -7.7% of GDP [ibid., p.82]<sup>5</sup>. In the presence of the serious fiscal and external imbalance, the ability of the monetary authorities to control inflation and prevent depreciation is mainly confined to an external support. Implementation of the IMF designed structural adjustment program plays a crucial role in applying for the support.

On February 28, 1996 Georgia entered into an Enhanced Structural Adjustment Facility (ESAF)<sup>6</sup> arrangement with the IMF. During the 3 year program Georgia will

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<sup>2</sup> *Law on National Bank of Georgia*, Art. 3.

<sup>3</sup> Managers of the former state banks (so far none of these banks is eligible for obtaining a license) are lobbying for a cheap credit and against bank licensing, so the present Central Bank leadership is unacceptable for them.

<sup>4</sup> He took this post after the mysterious death of his predecessor, Demur Dvalishvili, who was responsible for an unprecedented extending of Central Bank credit and, partly, the resulting 1993-1994 hyperinflation.

<sup>5</sup> Both trade and GDP data are extremely inexact. The IMF estimates the nominal GDP for 1996 at 5724 mln. lari and the current account balance at -350 mln. dollars [IMF (1997b), p.4], and the State Department of Statistics at 5123 mln. lari and -300 mln. dollars respectively.

<sup>6</sup> ESAF is a 3 year arrangement in which the recipient country obtains concessional financing, under the condition that it realizes a comprehensive Structural Adjustment program, designed under the IMF supervision. ESAF is designed for low income countries (with per capita GDP less than 905

obtain 166.5 mln. SDR (i.e., 150% of its quota), 55.5 mln. SDR each year (at the rate of 1.35 USD/SDR it amounts to 75 mln. USD). The disbursements are conditional on implementation of comprehensive structural reform policies. The implementation is evaluated periodically in terms of compliance with a set of structural and quantitative performance criteria.

Structural performance criteria concern a legislative reform and institutional reform of the economy, public finance sphere and the banking sector. Thus they determine prospects for the real growth which influences money demand, internal and external stability which concerns directly the inflation and the exchange rate, and the prospects for the money multiplier and monetization growth. The quantitative performance criteria and indicative targets define the possible monetary policy range.

### ***2.2.1. Program Targets***

According to the usual ESAF framework<sup>7</sup>, the IMF sets ceiling on the growth of Net Domestic Assets of the NBG, which comprise mainly credit to the government and, to a lesser extent, to commercial banks. A floor is set for Net International Reserves (Net Foreign Assets — NFA) of the NBG. Reserve Money which is equal to the sum of the NFA and NDA is thus constrained. In particular, it cannot grow as a result of excessive financing of the government budget deficit, or fall at the cost of excessive depletion of Gross International Reserves. In terms of monetary policy objectives, this controls inflation and secures the currency stability.

As for the latter component of Net Domestic Assets, the NBG gives credit to banks only under strict conditions, and the amount of this credit was insignificant in 1996 and the first half of 1997<sup>8</sup>. The credit to the government is already constrained very tightly in the Law on National Bank<sup>9</sup>, but this article has not yet been implemented. For the period of the ESAF program it was suspended by a special decision of the Parliament, in order to allow the IMF loans to be channeled through the NBG lending to the government.

Consecutive ESAF loan tranches are disbursed semiannually on an account in the NBG, increasing the stock of Gross Foreign Reserves. In the program years budget deficits (1996 and 1997 budgets and 1998 budget project), the amount of National Bank credit is adjusted to the amount of ESAF financing. Thus, the NBG is in a position to sterilize the impact of lending to the government on reserve money. It does

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USD in 1995), and the financing comes in a form of loans with 0.5% interest rate, 5 years grace, 10 years maturity, to a maximum amount of 190% of the country's quota in the IMF. [IMF Internet site, Fact sheets, The IMF concessional financing through ESAF].

<sup>7</sup> See IMF (1987), IMF (1997a).

<sup>8</sup> The maximum term of the loan is 3 months and it has to be properly secured [*Law on the National Bank of Georgia*, Art. 33]. The net claims on banks have fluctuated between 2,5 and 13 mln. lari (source: Accounts of the NBG 1995-1997), their size and duration proves that the NBG credit has been solely an instrument of liquidity management of the banks and not the means of crediting the economy.

<sup>9</sup> Maximum term of the credit to the Ministry of Finance is 6 months. It should not exceed 5% (under certain conditions it can be extended to 8%) of average annual budget revenues. [*Law on the National Bank of Georgia*, with corrections from September 19, 1995 and May 28, 1996, Art. 57]

so by intervening on the currency market, buying back the laries it lent for the dollars from ESAF loan.

### ***2.2.2. Exchange Rate Policy and Its Role in the Program***

In December 1996, following the liberalization of the exchange rate regime, Georgia declared that it had met the rules of the Article VIII of the IMF Articles of Agreement. Thus, the lari is fully convertible for current account transactions. The official exchange rate is determined daily on the Tbilisi Interbank Exchange Market (TICEX). The exchange rate regime is classified as a managed float and, as stated above, the NBG intervenes almost permanently on the account of IMF loans to prevent a fast depreciation, otherwise a danger, considering the existing inflation and the current account deficit.

**A stable exchange rate plays a key role** in the Georgian economic program. It is crucial for public confidence in the national currency and in the whole reform policy of the government. Also, it puts a constraint on inflation. Since 1994 the authorities and the IMF seem strongly committed to resisting the depreciation below the psychologically important threshold of 1.3 lari/USD. In the first half of 1997, while defending this rate, the NBG let its International Reserves fall below the program targets. Because of this commitment, in practice the exchange rate can be treated as fixed, or fluctuating within a narrow band. This has crucial consequences for interpreting Georgia's monetary policy: in a small open economy operating under a fixed exchange rate there is no control over the money supply. It fluctuates in line with the demand, determined both by internal developments and by foreign trade balance which determines the demand for foreign currency. Also, as long as the exchange rate stays quasi-fixed, the compliance with the ESAF target will depend only on the extent to which it is realistic, taking into account the money demand developments.

## **3. Heritage of the Past**

Together with most other transition economies, soon after gaining independence Georgia went through the period of economic instability and high inflation. The annual rate of inflation amounted to 1178.5% in 1992, 7484.1% in 1993 and 6473.6% in 1994 [Ghosh (1997), p.6]. The economic situation was exacerbated by general chaos and armed conflicts. With returning political stability, a successful stabilization program was launched in 1994 [Wellisz (1996), p.8]. Tight monetary policy and fixing of the exchange rate for over half a year led to an exceptional success in fighting inflation, which dropped to 57% in 1995 and 13.8% in 1996. However, the turbulent period left persistent traces on monetary characteristics of Georgian economy.

### **3.1. Money Multiplier and the Banking Sector**

During the hyperinflation period population's bank savings were eaten up by inflation. In addition to that, several bank frauds happened. The heritage of these developments is a low confidence in the banking system. As a result, the **level of bank deposits is extremely low**. With regard to lending, after the difficult period bank portfolios consisted mainly of bad loans. A set of comprehensive measures has been

taken to strengthen the banking sector<sup>10</sup>. Among other measures, prudential regulations were introduced and most of uncomplying banks were closed. The remaining **banks undertake little credit activity**. The quality of the banking system is still low and this is reflected in a high spread between average deposit and lending interest rates (according to the calculations of Georgian Economic Trends it amounted to about 50% (percentage points) in the beginning of 1996, and about 40% (percentage points) in the middle of 1997). The margin is decreasing, but it is still high.

Another sign of the unhealthy state of the banking sector is the high dollarization ratio (calculated as a share of foreign currency deposits in the banking system to the domestic currency ones). This indicator fluctuates around the level of 50% and shows no diminishing trend. What is most worrying is that banks tend to offer higher interest rates on dollar deposits, than for lari<sup>11</sup>. This means that they are not interested in working in the national currency.

As a result of the situation in the banking sector, the **money multiplier is very low**, i.e., the broad money is not much bigger than the monetary base (see Table 1., Figure 1. and 2.). Money creation by the banking sector is proportional to the level of financial intermediation, which in Georgia is very low. In the extreme case when no credits are given, the multiplier value goes down to 1. But actually, in Georgia the multiplier calculated as a ratio of M2 aggregate to the Reserve Money (comprising the currency in circulation plus all kinds of deposits that commercial banks hold in the Central Bank) was less than 1 for much of the 1996 (in the whole year it was 1 on average). Thus, the banking sector performed money shrinking instead of money creation. It is paradoxical from the point of view of a normal banking business, but banks often held more money in vaults (so it is not included in M2) and on accounts in NBG (which do not bear any interest), than they received in form of deposits from the customers. This is how the multiplier can be even smaller than 1.

### ***3.1.1. Why the Money Multiplier was Smaller Than 1***

There are two types of balances held by the banks in the Central Bank: the required (obligatory) reserves, and the voluntary reserves held on correspondent accounts. The required reserves are held on the account of the customers deposits. The reserve requirement has been reduced from 20% to 18% in January 1996, to 15% in September 1996, and should be reduced further to 12% before the end of 1997. Regardless of the reductions, it is rather high. The first reduction apparently had no effect on the multiplier. However, the multiplier started to grow in the fourth quarter of 1996, which could be associated with the second reduction, although the figures are too volatile to draw any firm conclusions.

As for the balances on correspondent accounts, they are used for clearing inter-bank transactions. The size of these balances is large in Georgia. In 1996 they were on average 30% higher than the required reserves, although, especially for individual banks, their volatility is very high. There are two reasons for the large size of these balances. First, inter-bank payments are very slow. Second, in the difficult economic

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<sup>10</sup> The issue of a banking sector reform is always accentuated in the IMF adjustment programs [IMF Internet site, Fact sheets, Banking System Soundness].

<sup>11</sup> GET 2<sup>nd</sup> quarter 1997, forthcoming.



conditions both long term depositors and attractive lending opportunities are scarce, and a large share of banks activity constituted payment services for firms<sup>12</sup>.

The liquidity management of some of the banks can be imperfect (although after a certification process only 55 of the best banks are left from over 200), but most of the deposits are short term ones, and this is the reason for the high cash holdings. Finally, the high dollarization ratio together with the fact that the reserve requirement for foreign currency deposits must be met in lari explain how the banking system shrunk the amount of domestic money.

### **3.2. Monetization**

Monetization of an economy is usually defined as the ratio of a money aggregate to annualized GDP in current prices (a reverse ratio gives money velocity). This measure shows how much money circulates in the economy. It is a useful indicator of money supply and demand interactions, as well as the depth of financial markets and the degree of intermediation [De Broeck et al. (1997), p.6, Ghosh (1997), p.12]. It conveys information which is important from the point of view of the monetary policy. When monetization is low, there are poorer prospects for collecting sustainable seignorage<sup>13</sup> revenue. More generally, lower monetization leads to less stability, because a given nominal change in the quantity of money constitutes a bigger relative change. Therefore, prices and exchange rates are more vulnerable to monetary shocks and confidence outflows.

The monetization of the Georgian economy is extremely low (see Table 1.) as a result of the hyperinflation of 1993-1994. For M2 the average annualized monetization in the 4 quarters of 1996 was 3.2% (or velocity equal to 31) [De Broeck et al. (1997), p.37]. People learned to live without holding domestic money which kept losing its value. Currency substitution has not been fully reversed. An unmeasurable, but certainly large amount of dollars is still in circulation, and occasionally they are even used for day to day transactions, apart from their obvious purpose as a savings instrument. In some border areas Russian rubles are used along with the lari. There is also an obvious link between monetization and the money multiplier. Other countries' experience confirms that when the banking system is more efficient and credible, the money multiplier is higher and the level of monetization is also higher (see Figure 3.).

Recent studies of the FSU countries show that, although monetization falls fast with inflation growth, a kind of a "ratchet effect" happens and the process is not symmetrically reversed when inflation decreases. Atish R. Ghosh [Ghosh (1997), p.10] points out that although the average annual inflation in those countries fell from 1000% in 1994 to 296% in 1995 and 53% in 1996, the average monetization actually fell in 1995. In 1996 it grew only slightly and even this result is questionable, as the GDP recovery happened mostly in the unregistered sector and is not properly measured. Ghosh's regression analysis shows, that elasticity of money demand with respect to inflation is high during demonetization, but very low or insignificant during remonetization [Ghosh (1996), Ghosh (1997)]. The author points to a threshold annual

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<sup>12</sup> In many banks revenues from commissions and fees exceeded normal interest profits.

<sup>13</sup> Seignorage is a revenue of a state from printing money. Real seignorage is defined as:  $[M(t) - M(t-1)]/P(t)$ , where M means monetary base and P — price level.

inflation rate of 6% (!), below which remonetization is likely to happen. The interpretation of these observations is that households learn to avoid holding money and even after the original incentives disappear, they stick by inertia to the acquired habits [Ghosh (1997), p.12].

Authors of another study of velocity in the FSU countries [De Broeck et al. (1997), p.31] also detect a change in the nature of the real money demand after stabilization is reached. This leads to a similar conclusion: that the pace of remonetization, even in conditions of low inflation, is incomparable with the pace of the preceding demonetization. The authors argue that the cumulative inflation from 1992 until stabilization is a main determinant of money velocity in the FSU countries. Indeed, Georgia with a price index of 112184.4 is much worse than even Ukraine (42453.9), Armenia (38656.2) and Kazakhstan (15995.0), and its monetization is also lowest. Finally, the historical experience of Germany, Austria and Bolivia after hyperinflation episodes reviewed in IMF (1997b) [IMF (1997b), Appendix IV] suggests, that remonetization usually progresses only very gradually.

Georgia has made a remarkable progress towards normalization of the monetary situation. In October 1995, after a prolonged period of a fixed exchange rate and a diminishing inflation, a new national currency — the lari — was introduced. This step met with wide public acceptance, which led to a significant increase in the monetization of the economy. The remonetization happened at the cost of ruble and, to a lesser extent, dollar holdings. In 1996 M2 grew by about 38% which with the estimated real GDP growth of 11% and inflation of 13,8% implies a 9% increase in the willingness of economic agents to hold domestic currency. In light of the studies quoted above it is doubtful that further progress will be so fast in the near future. The unexpectedly fast money growth stopped for the first half of 1997.

Further remonetization will be conditional on consolidating the attained stability. Thus, it will depend on a cautious management of the NBG gross international reserves, which serve as a cushion for shocks. Progress in banking sector reform is another important factor for money demand growth. A healthy banking system increases portfolio demand for (broad) money holding. It should also provide an efficient payment system, which would stimulate a switch from foreign currency to the domestic one, thus decreasing dollarization of the economy. But even in the most optimistic scenario low monetization will remain a characteristic of the Georgian economy in the next few years.

## **4. Changes in Monetary Aggregates, Inflation and the Exchange Rate From the Introduction of Lari Until 1997 H1**

### **4.1. Monetary Aggregates**

#### ***4.1.1. Consolidation of the New Currency in 1995***

M2 grew 2.4 times after the successful introduction of lari in October 1995. This was caused by a growth of confidence in the new domestic currency and a resulting increase in demand. The broad money kept growing at a high rate during the last quarter of 1995 (13% in November and 20% in December), as lari was consolidated. The Foreign Reserves of the NBG kept increasing: even though the NBG almost withheld the interventions on TICEX and in December it was a net buyer of dollars, lari appreciated until the end of the year.

#### ***4.1.2. Fast Money Growth in 1996***

The increased supply of domestic currency pushed up consumer prices by about 3% per month in the first quarter of 1996. This inflation cannot be attributed solely to seasonal food price increases, as most of other items grew as well. In January M2 fell by 5% and for the rest of the quarter it remained at almost the same level. M2 started growing in the second quarter, and the speed of growth of 3% to 8% per month also continued in the third quarter, when the NBG dramatically increased its lending to the government. The fast money growth was in line with real demand, as inflation fell. The average monthly inflation for the 2<sup>nd</sup> and the 3<sup>rd</sup> quarters was 0.4%, with higher inflation in April reversed by a summer seasonal price fall. Increased interventions in TICEX in the last quarter and resultant money contraction helped to keep the monthly inflation rate around 0.8% till the end of the year, despite of a possible lagged influence of the summer expansion. In December there was another increase in the money supply, by 11%.

Annual broad money (M2) growth amounted to 38.3% in 1996. At the same time the end year CPI inflation was 13.8%, far below the initial target of 29%. The deficit financing was revised upwards by the Parliament, partly because of delays in disbursement of the World Bank and European Union support [GET 4<sup>th</sup> quarter 1996, p.26]. As a result of a policy of sterilization, the Net Foreign Assets of the Central Bank fell from about 73 mln. dollars in the end of 1995 to a slightly negative level, while, through the use of IMF resources, the gross reserves remained at the constant level.

#### ***4.1.3. Money Growth Stagnation in the First Half of 1997***

In the previous two years real GDP fell significantly in the first quarter, and so did the money supply. This pattern was continued in 1997. The revenue performance

in the beginning of the year was poor, so the government reduced its deposits in the NBG thus increasing the amount of money in circulation [GET, Statistical Update March 1997]. However, the effect was more than netted out by the sterilization. After a dip in February (9% fall from December), M2 started growing again and by the end of April it regained its level from December 1996, and then fell slightly again. Since the seasonal peak in February (2.1%) the monthly inflation fell to its lowest rate since the hyperinflation: -1.9% in June, when the influence of the tight monetary policy was reinforced by the seasonal fall in food prices.

Credit to the government (a change in position “Net Claims on General Government” in the NBG balance sheet, corrected by 33.7 mln. lari because of the change in accounting convention in March 1997) amounted to 124 mln. lari. The source of this credit was the international reserves of the National Bank of Georgia, which were used for sterilization. They fell quite dramatically during the same period, from -0.5 to -160.1 mln. lari<sup>14</sup>. After the first 6 months of 1997, M2 was 1% lower than in the end of 1996 and inflation since December 1996 amounted to 3%.

#### ***4.1.4. Main Features of Money Supply Behavior***

Georgia's money supply is volatile, as in the short run it is determined by government finance factors on the one hand, and on the other by the level of NBG intervention which depends on the demand for foreign currency (as well as its availability). Money supply also seems to follow the seasonal pattern of demand for money for transaction needs, as determined by the size of real output.

## **4.2. Exchange Rate**

The official lari/dollar exchange rate and the NBG activity on the TICEX are presented in Table 3.

#### ***4.2.1. Changes Since the Introduction of the Lari***

During the last quarter of 1995 the new currency was consolidating and it kept appreciating (from 1.3 in the period before lari introduction to 1.23 in the end of December) in spite of the money expansion. The first depreciation happened in the first quarter of 1996, in spite of the sale of 27 mln. dollars by the NBG and a consequent reduction of M2 by 4.5%. The temporary increase of imports before the removal of some custom duty exemptions is pointed to as a factor that increased the demand for foreign currency [Ibid., p.41]. In the second quarter of 1996 the exchange rate stabilized around 1.26 and the scale of intervention needed was low. The next depreciation happened during the third quarter, possibly as a natural reaction to the summer money growth, until the NBG reacted with greater determination in September stabilizing the exchange rate at the level of 1.27 and holding it for next two months. The retail rate in Foreign Exchange Bureaus (FXB) even reached 1.285 in that period which indicated the lack of confidence of the public.

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<sup>14</sup>Part of this decline can be attributed to the mentioned change in accounting standards in March 1997, but nevertheless the fall is very significant.

Indeed, defending the lari on the level of 1.27 lari/USD was costly: NBG had to sell \$44 mln. in September, October and November, compared to the \$20 mln total intervention needed since March. Factors that undermined market confidence in the first place were: high deficit financing, growth of grain imports after foreign aid was reduced, and the special seasonal credit for wine factories that Parliament obliged the NBG to issue [Ibid., p.40]. In November the Central Bank gave up. The year 1996 closed with an average rate of 1.28 lari/USD in December.

In the period from January until May 1997 the rate depreciated gradually to almost 1.30 lari/USD while the excess demand for dollars (i.e., the size of NBG intervention) remained high. Although it was lower than in the period of defending the 1.27 lari/USD rate it was about 2.4 times higher on average than in the calm period of summer 1996. However, the NBG showed determination to resist depreciation beyond the threshold of 1.30 lari/USD, until the summer economic (and probably export) revival came and the pressure on the lari subsided. In June the NBG even became a net buyer of dollars for the first time since 1995.

#### ***4.2.2. Relation With Balance of Payments and Real Output***

The obvious link between the balance of payments situation and the demand for foreign exchange is somewhat hard to identify, as the statistic coverage of international trade is extremely poor. In the whole of 1996 the net intervention by the Central Bank amounted to \$97 mln., whereas the estimated trade deficit was about \$350 mln.<sup>15</sup>. Certainly, apart from unrecorded aid flows, there are a lot of unregistered exports and an unknown amount of foreign currency enters Georgia with the return of capital flight and remissions from Georgians working abroad.

It is easier to reconcile the exchange rate developments with monetary changes and real output. Obviously, the critical period is the 4<sup>th</sup> and the 1<sup>st</sup> quarters. In winter prices rise, and economic activity slows down. Seasonality resulting from the high share of the agriculture sector (over 30%) is reinforced by the persistent energy crisis. As a result of this crisis, electricity supplies, which are erratic anyway, are especially scarce in the cold period when demand is high. Thus real GDP falls and this results in a fall of the real demand for money, switching from lari into dollar holding and a fall of the money supply. The process is exacerbated by poor revenue performance in the beginning of the year and the resulting increased government needs for Central Bank credit. These widen the gap between the money supply and demand, which has to be filled by interventions on TICEX.

#### ***4.2.3. Short Run Exchange Rate Policy***

The market is shallow and plagued by big waves of demand for foreign currency which are separated by periods when the volume of transactions is low. The NBG applies a reasonable policy of optimal management of the resources which are at its disposal, giving up gradually when the defense of an exchange rate is too costly (when the difference between the TICEX and the street, retail rate is excessive) but trying to prevent excessive variation. The Bank's managers aim to influence the psychology of

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<sup>15</sup> Without aid flows [IMF (1997b), p.4]. The differences between quoted figures are large.

the market, so that nervous attacks on lari cease to occur, and the national currency gains wider acceptance as a means of saving<sup>16</sup>. This policy is costly, and it has resulted in a decrease of the international reserves. However, close cooperation with the international financial organizations and the general success of Georgian economic reform sustains the expectation that the balance of payments deficit will be supported in emergencies.

#### **4.2.4. Real Exchange Rates**

In 1996, with 13% annual inflation and about 3.3% nominal depreciation, real appreciation of the lari against the dollar amounted to 6%<sup>17</sup>. An appreciation is natural in conditions of capital inflow and concern about short run export competitiveness should be relatively small. An economy which is undergoing deep structural reform and quality improvements should in the longer term improve its export performance.

Developments in the real exchange rate with ruble are influenced mainly by Russian economic policies (ruble depreciation) but as of 1996 a slight real appreciation of the lari was thought unlikely to have any significant effect on the trade balance [GET 4th quarter 1996 p.41].

## **5. Prospects for 1997 H2 and 1998**

### **5.1. Monetary Indicators**

Given the developments of the first half of 1997, high increases in the monetary base seem to be improbable in the rest of the year. However, moderate increase is possible, especially taking into account the fact that the NBG should try to rebuild its international reserves. The growth should be faster in summer 1997 than in the end of the year. The rationale for this pattern is that it should be easier to rebuild reserves in summer, when the effect of the increase in money on domestic prices will be partly offset by a seasonal drop in inflation.

In our scenario the main cause of an increase in broad money in 1998 is a growth of the money multiplier (M2 divided by the Reserve Money). In June 1997 it was still quite low — around 1.04.

Since both the multiplier and the demand for money depend on the progress of reforms, we can think of two scenarios for 1998. In the pessimistic one we assume that the general financial system framework stays the same as it was in 1996 and in the first half of 1997 and thus, the demand for money growth is explained by the real growth and the fall of inflation rate. In the optimistic one we assume that progress of reforms will lead to a growth of the money multiplier and to some extra demand for money. This extra demand will gradually increase during 1998 and reach 10% of the broad money M2 at the end of the year.

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<sup>16</sup> In Abkhazia, where dollars are scarce, people make their savings in lari, even though possessing of the Georgian currency is forbidden and subject to punishment.

<sup>17</sup> GET calculations on the basis of FXB lari/USD rate [GET 4<sup>th</sup> quarter 1996 p.41].

Considering the possible evolution of the monetary aggregates we stuck to a general assumption that the monetary and budgetary policy will be kept in accordance with the target of maintaining the inflation rate in 1998 not higher than the one in 1997.

## **5.2. Scenario for the Real GDP**

After sustained decline the Georgian economy grew by 2.4% in 1995 and in 1996 it accelerated to 10.5% (according to the IMF estimates). The revival gradually embraces new sectors. In first 6 months of 1997 real GDP was 8.5% higher than in the corresponding period of 1996. This increase is only slightly lower than what was observed in 1996<sup>18</sup>. No substantial changes are expected in this rate in the short term, although it is obvious that it is related to the low base from which the growth started and thus not sustainable over the longer term. We accept the view that for the whole 1997 the real growth will amount to 10%. It is also generally agreed that this trend will continue in 1998. The actual speed of expansion will depend on various factors. One of these will be the degree of improvement in the electricity supply. The current situation in that sphere certainly complicates the creation and operation of small business. Given the high share of agriculture in total production, weather conditions can also significantly influence the economic performance. In the more pessimistic scenario we assume an 8% and in the optimistic scenario an 11% increase.

# **6. Econometric Modeling of Money Demand and Inflation in Georgia**

## **6.1. Underlying Theory**

The model for forecasting inflation and GDP in Georgia is built on the basis of the general theory of money demand. The theory says that the real demand for money balances depends on the real income and the opportunity costs of holding money. The importance of real income results from the transaction motive for holding money. One should expect a positive relation between money demand and real GDP. The opportunity cost of holding money is reflected in the first place in the inflation rate (high inflation obviously discourages people from keeping money) and the interest rate on financial assets that are alternatives to cash. The last variable is not significant in Georgia, as the banking system and the financial markets are in an early stage of development.

Summarizing, we are basing on the following relationship:

$$\frac{M}{P} = f(Y, i) \tag{1}$$

where  $M/P$  is the real money demand,  $Y$  denotes real GDP and  $i$  — inflation rate.

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<sup>18</sup> In the first half of 1996 real growth over the first half of 1995 was at 9.1%.

The relationship is assumed to be of the long-run type: it does not hold instantaneously, but only after economic agents perceive the changing reality and adjust their behaviour to it. If the actual money holdings differ from what is predicted by the money demand relationship, a pressure on prices emerges. As the prices adjust, the relationship starts to hold again. To apply the above mechanism practically for forecasting, we introduce it in the following way:

Initially the model calculates the equilibrium price level — the CPI predicted by the estimated money demand equation. It is derived from the fitted value of this equation. Subsequently, the equilibrium price level is introduced into the dynamic forecasting equation. So, in the dynamic equation the inflation rate is related to the difference between the actual and the equilibrium price levels. This factor proves to be statistically significant. In addition, a seasonal variable reflects the summer food price falls. Also, we introduce monetary emissions and past values of inflation to account for the dynamic influence of monetary shocks and for inertia in the inflation rate.

The above modeling strategy was originally suggested by Prof. Georges de Menil (France), one of the authors of a French quarterly forecasting model. It was used in several countries, including countries in transition such as Ukraine<sup>19</sup> and Romania<sup>20</sup>, and in many cases it showed its efficiency. A detailed description of the model, the data used and the statistical results of estimations are given in the Appendix.

## **6.2. Construction of Forecasts**

The model allows us to study the relation between the real GDP, money supply and inflation. In construction of a forecast the first two variables are taken as exogenous, according to an assumed scenario, and the resulting inflation rate is obtained (calculating nominal GDP is then straightforward). It is difficult to predict a scenario of money supply behavior because the exchange rate can be regarded as fixed in the periods when it is defended. In those periods money supply is beyond control and the official plans and declarations are mere wishes and guesses. We assume that only a falling inflation rate can be reconciled with the exchange rate fixity. Therefore, inflation forecasts obtained for different money supply scenarios have been a guideline in choosing a plausible money growth rate. Further we present forecasts for scenarios that the authors found plausible and which are described above in section 5.

# **7. Results of the Forecast**

## **7.1. Forecast for the Second Half of 1997**

We assume real GDP growth of 10% in 1997 and money growth of only 15%. The money growth accelerates in the second half of 1997 as the National Bank of

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<sup>19</sup> Soros International Economic Advisory Group, *Memorandum on the nominal GDP, inflation and budget revenues forecasting*, Kiev, various issues 1996-1997.

<sup>20</sup> Foundation Pro Democratia International Economic Advisory Group, *Short run Inflation Forecast for the Romanian Economy*, Bucharest, May 1997.



Georgia builds up the international reserves. As a result, annual CPI inflation will reach the rate of 8.5%. After a seasonal fall in the summer, prices are supposed to grow in an accelerating fashion, caused by the accumulating lagged influence of the money growth. Nominal GDP will reach 4189 mln. lari in the second half of the year and 6747 in the whole 1997.

An important feature of the inflation forecast is that monetary policy in the second half of 1997 will be crucial for 1998 too. The inflation level which we forecast for 1997 is below the original official target of 10-12%. However, taking into account the results of the first half of 1997, it is clear that sustaining annual inflation of 12% in 1997 would mean a sharp increase in prices and monetary aggregates in the second half of 1997. It would endanger the stability in 1998, especially in the first quarter, when inflationary inertia and lagged influence of monetary emissions would be aggravated by seasonal effects in prices. The results in terms of the public confidence fall would be very difficult to compensate.

We reasoned that the authorities understand all the negative aspects of such possible policy and that the foreign exchange market will discipline them anyway, so that the course of events will be close to our assumptions (8.5% inflation).

## **7.2. Forecast for the 1998**

### ***7.2.1. Pessimistic Scenario***

In the pessimistic scenario we assume real GDP growth of 8% in 1998. According to this scenario monetization will not increase as public confidence will be undermined by the lack of positive developments in the real sphere and in the banking sector. As a result, without endangering the already attained macroeconomic stability and putting the exchange rate under hazard, the monetary authorities manage only to increase domestic money by 10%.

In this scenario inflation hardly falls (from 8.5% to 8.4%). The prices grow fast in the first quarter as a result of the monetary overhang from the previous year, and also due to a seasonal fall in GDP which contributes to a lower money demand and growth of the money velocity. We expect a standard (so far) seasonal fall of prices in June and July, and a subsequent gradual increase in the last quarter. The nominal GDP projection is 8097 mln. lari for 1998.

We forecast a slight decline of a monetization level in this scenario (0.1% since June 1996). The reason for this is the necessity of a tight monetary policy in 1998. Without reserves for monetary base growth, M2 can increase mainly with the increase of the money multiplier. Its growth is doubtful without substantial improvement in banking sector efficiency.

### ***7.2.2. Optimistic Scenario***

In the optimistic scenario real GDP growth will accelerate to 11% annually. As a result of the consequent reforms the real demand for money will increase. The monetary authorities will manage to expand the M2 aggregate by 21% without violating the aim of reducing inflation. Annual inflation will fall to 7.2% and most of

the price growth will happen in the first quarter, as a lagged result of the Central Bank foreign reserve buildup in the second half of 1997, reinforced by the seasonal fall in GDP. Monetization will increase slightly, but still will not reach even the modest level of 4%. It seems that one has to wait longer for a significant growth of this variable.

The details of the forecasts are presented in the Table 4.

## **8. Conclusions**

General macroeconomic situation provides grounds for cautious optimism. Inflation is falling and the exchange rate is stable while at the same time the real growth is remarkably fast and its base is widening. It means that it is a healthy revival and not the result of artificial overheating. Further progress in privatization is necessary to create the foundations for long run growth. Success in a fight against widespread corruption in local authorities and tax services would be necessary to diminish the share of the shadow economy and ensure, that economic growth contributes more to remonetization.

Reforms in the banking sector are underway and they should be pursued further, so that the situation in the financial sector normalizes.

Fiscal constraint is the biggest threat to the stability of the macroeconomic situation. The inability of the state to mobilize sufficient revenue increases pressures on the National Bank. Special Parliament decisions force it to give special credits or guarantees. As a result, the international reserves, which are fundamental to market confidence, are being depleted. Such a situation only contributes to low monetization. The 1998 budget should be realistic rather than optimistic. If the revenue performance is much lower than expected and at least a part of the financing gap is translated into another pressures on the NBG's international reserves, the danger of de-stabilization is not worth the possible gains from even the most reasonable budget outlays. The long run solution is to improve the fiscal revenue performance. Stability of inflation and the exchange rate cannot be regarded as achieved until Georgia can finance a sustainable level of government expenditures from tax revenues.

We find it quite possible to reach an even lower rate of inflation than was originally projected. This would be an important development, since attaining lower inflation would result in reducing the price growth inertia. As the experience of many transition economies shows, such inertia emerges easily and afterwards is costly to overcome. Georgia faces a rare possibility of avoiding this scenario.

Our forecasts are not excessively optimistic in terms of a projected growth of the level of monetization. After the unfortunate hyperinflation episode the money demand is likely to rebuild only very gradually. An extremely cautious monetary and exchange rate policy in the coming years seems to be the only remedy.

## **Appendix: Database and the Econometric Model Used in Construction of the Forecasts**

Below we present the data used and the econometric estimations. The length of the data series is very short and the quality of the available data (except for the monetary aggregates) is low. In these conditions any econometric results should be treated very cautiously. At the present stage the model is capable of providing reasonable short run forecasts, but in medium term forecasting its reliability is only hypothetical. The model is being developed and, as longer time series become available and the quality of the data improves, it is likely to undergo further changes.

### **1. Data Base**

#### *1.1. Statistical Data*

**Nominal GDP** (PY) in current prices.

There exist several different estimates of nominal GDP, with a different degree of reliability. We used the following two:

- IMF estimates, annual, after: Georgia Recent Economic Developments, IMF, February 1997.
- State Department of Statistics (SDS) quarterly Production Based data, which include some estimates of unrecorded activity (shadow economy). Shadow economy correction amounts to increasing the official data by several percent. The correction is not applied consequently — it differs every year, varying from 12% of the official economy in 1995 and 33% in 1996 to 40% in 1997. Production Based Georgian GDP figure is a relatively rough estimate but we assume that it conveys some of the quarterly dynamics of economic activity during the year.

SDS started to set up and publish also consumption based GDP figures, which are regarded as more reliable. However, they are only annual and they exist only for the year 1996. Therefore, to preserve consistency of the series, we turned to the IMF estimates.

**Consumer price index** (CPI), monthly, calculated by the SDS. This data is also relatively inexact and the technology of price measurement is currently being improved.

**M2 — Broad money in domestic currency**, monthly, from the Monetary Survey prepared by the National Bank of Georgia, Department of Macro-Analysis. We also tested other aggregates, such as currency in circulation or M3, but M2 proved to be most significant in the equations.

**Index of Industrial Production**, monthly, calculated by the SDS. It shows changes in the real value of industrial production in a given month, relative to the

same month of the previous year. For the year 1996 there exists also an index reflecting changes relative to the previous month. This enabled us to construct a series IIP with a single base, equal to 1 in December 1995.

Information about the data is summarized in the table below:

series name	units	frequency	source
PY - IMF	GEL millions	annual	IMF Recent Economic Developments
PY - SDS	GEL thousands	quarterly	SDS
CPI	index, base Dec.95	monthly	SDS
M2	GEL thousands	monthly	NBG - Monetary Survey
IIP	index, base Dec.95	monthly	SDS, calculations of the authors

The data cover the years 1995, 1996 and the first half of 1997.

Actually, it is possible to obtain data for a longer period. However, we decided to start our analysis from 1995, when inflation subsided and some economic stabilization had already been reached. The earlier data is also subject to a much wider margin of error, because of historical events underway in Georgia and the resulting difficult conditions in which statistics was gathered.

### ***1.2. Series used in the estimations***

Because of the relatively short period covered it is necessary to use maximum possible frequency data - the monthly series, to have more observations. Therefore, we had to construct an approximation of monthly nominal GDP, because such statistic is not calculated in Georgia. We used the SDS data on nominal output and industrial production to break down the annual IMF figures into quarterly and monthly series. In construction of real GDP (denoted below as *Y*) we used the CPI as a deflator.

In statistical estimations in the next sections the reader will meet the following series names:

series name	meaning	units	obtained:
Y	real GDP index	GEL millions	PY divided by the CPI index
CPI	CPI index	index, base Dec.95	SDS
M2	broad domestic money	GEL thousands	NBG - Monetary Survey
DCOUP	dummy for the period when coupons were in circulation	-	Jan.95-Sep.95 equal to 1 0 - afterwards
DSEAS	seasonal effect on inflation	-	equals 1 in June and July, 0 in remaining months
TRD9607	linear trend	-	Jan.95-June 96 equal to 1. linear trend beginning July 96

## 2. Money Demand Equation

The money demand equation was estimated as follows:

$$\log\left(\frac{M2_t}{CPI_t}\right) = \alpha_0 + \alpha_1 \log(Y_t) + \alpha_2 \log\left(\frac{CPI_{t-1}}{CPI_{t-2}}\right) + \alpha_3 DCOUP_t + \alpha_4 \log(trend_t) + \varepsilon_t \quad (II)$$

Apart from the variables whose presence is explained by the general theory of money demand there are two more, a dummy variable DCOUP and a linear trend. They are introduced in order to reflect specific Georgian conditions.

### *2.1. Dummy Variable for the Coupon Period*

DCOUP is a dummy variable. It is equal to 1 before introduction of the new national currency (lari) and 0 after that. Prior to October 1995 coupons were used as a national currency and public confidence in them was low. For current transactions population often used US dollars and Russian rubles. Introduction of the lari changed the money market seriously, so we reflected it with a shift variable.

### *2.2. Remonetization Trend in the Equation*

If trend is not included in the money demand equation, the residuals at the end of the estimation period are constantly positive. This suggests that some processes in the economy which lead to an increase in the money demand are left out of the estimations. Possible examples of such processes are: a gradual growth of a public confidence in the lari, a gradual change in peoples habits with respect to liquidity management or an impact of the banking sector reform and money multiplier growth.

To include this effect we introduced a trend into the money demand equation. The trend beginning in July 97 proved to be most significant in the estimations. It is introduced after taking logarithm because other variables are in logs too. If introduced directly, it would amount to an exponential trend with respect to M2/CPI, which is not especially plausible and certainly not suitable for forecasts.

### *2.3. Sample Period*

A sample consists of two parts: the coupon period and the lari period. Situation in September and October 1995 was quite unique. These two observations, as outliers, had quite a dramatic influence on the estimated coefficients. Therefore, we decided to reject these two months as conveying an information on exceptional phenomena of the currency change moment, which do not contribute much to studying money demand behaviour in “normal” periods.

## 2.4. Results of the Estimation

Below are the results of the estimation<sup>21</sup> (see also Figure 5.)

Dependent Variable is LOG(M2/CPI)

Sample(adjusted): 1995:02 1995:08 1995:11 1997:06

Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.961	0.252	23.616	0.000
LOG(Y)	0.165	0.031	5.385	0.000
D(LOG(CPI(-1)))	-0.501	0.177	-2.829	0.010
DCOUP	-1.084	0.020	-53.169	0.000
LOG(TRD9607)	0.070	0.008	8.295	0.000
R-squared	0.996			
Adjusted R-squared	0.995			
Durbin-Watson stat	1.566			

As expected, real GDP influences money demand positively, but the elasticity of the latter with respect to the former turned out to be low. This might be a result of the fact, that shadow economy estimates have a significant share in the total growth figures. Growth of the shadow sector can influence monetization less, because probably gross of business transactions in this sphere are made in cash dollars. Part of the GDP growth impact is also contained in the trend coefficient.

Inflation decreases real money demand. The first lag of inflation proved to be more significant than the contemporary value or any longer distributed lag structure. Obviously, demand for money was lower before introduction of the lari than after it, which is reflected in the negative value of the coefficient of the DCOUP dummy. Trend coefficient is significant and positive.

The fit is good, which is however not so impressive, as the equation is in levels. Also, in light of some autocorrelation in errors, reflected by the Durbin-Watson statistics, the t-values should be interpreted cautiously. We do not treat this problem as serious, as the nature of the equation is of a long run type, and its main purpose is to obtain errors for the Error Correction Mechanism that we introduce in the short run equation.

## 3. Dynamic CPI Equation

The second equation is the dynamic CPI equation (see Figure 6.). Monthly percentage change in the CPI is the dependent variable.

We suppose, that if the CPI differs from its equilibrium value, the economy will tend to move towards the equilibrium. Therefore, we introduce a lagged difference between the equilibrium and the actual values of the CPI to the dynamic equation. It

<sup>21</sup> In this place, as well as in the following sections we present a standard output of Econometric Views - a program in which the estimations were conducted. D(x) denotes the first difference of a variable x:  $x_t - x_{t-1}$  and LOG(x) means a natural logarithm of x (with the base equal to Euler's e).

bears an analogy to Granger's Error Correction Mechanism, but here errors are not applied to a differenced original equation, but to a new one.

Second regressor is a change in money supply. Second lag proved to be most significant.

A seasonal dummy variable is introduced to take into account the effect of summer food price falls on inflation, which are most visible in June and July.

Monthly inflation rate is also often autocorrelated, either because of some price growth inertia, or because of a persistence of some fundamental factors not captured in the equation. Therefore, the first lag of inflation is introduced.

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Dependent Variable is D(LOG(CPI))
Date: 07/29/97 Time: 16:26
Sample(adjusted): 1995:11 1997:06
Included observations: 20 after adjusting endpoints
    
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009	0.002	4.064	0.001
LOG(PST(-1))-LOG(CPI(-1))	0.164	0.051	3.210	0.006
D(LOG(M2(-2)))	0.030	0.009	3.333	0.005
DSEAS	-0.029	0.006	-5.061	0.000
D(LOG(CPI(-1)))	0.133	0.063	2.105	0.053
R-squared	0.759			
Adjusted R-squared	0.694			
Durbin-Watson stat	1.199			

Above, PST denotes the equilibrium CPI, calculated in the previous equation. The error correction coefficient implies that it takes about 5 months to reduce a gap between the equilibrium CPI and the actual one by half (it can be checked in a straightforward way with a spreadsheet).

Monetary emissions influence inflation positively with an average lag of 2 months. For simple practical inferences it has to be corrected by the lagged money supply influence contained in the equilibrium CPI factor (first regressor), and inflation autocorrelation, which is also significant and positive.

To study the meaning of equation coefficients, experiments can be conducted to isolate the influence of single variables on the forecasts. In such tests coefficients are applied to an artificial data set, and the resulting fitted values are calculated. Reasonable thing is to start with the values of experimental data which imply that the model is in equilibrium in the first period, i.e. price level is stable. Then one can observe impacts of shocks to single variables while the other ones remain unchanged. In Figure 7. we present graphically a result of a money supply shock: a 50 mln. lari increase of M2 in period 0, while all other variables remain unchanged. Seasonal effects are neglected, to make the picture more clear.

The peak of inflation resulting from money emission happens after 2 months, although an effect in the first and third months is also strong. Subsequently the inflation subsides. It diminishes slowly, as a result of a gradual adjustment to the new equilibrium value and of the autocorrelation in inflation, i.e. the inflation inertia.

## 4. Price Shocks

During the covered period, some of the specific goods and groups of goods in Georgia have experienced exogenous price shocks, resulting for example from administrative price increases. However, the analysis done by the authors did not show any significant effect of these price shocks on the overall CPI index. The most obvious reason for this fact is that usually the cause for administrative price increases was an increase in prices for non-controlled goods, and consequent rise in costs of keeping the controlled prices unchanged.

To study the effect of the price shocks, we used a breakdown of the overall CPI into 6 main groups of goods. We constructed 6 variables, equal to the differences between price indices for specific groups of goods and a weighted average of indices for remaining goods. Subsequently, we constructed an overall price shock variable, equal to the weighted average of the 6 specific price shock indices. However, this aggregated price shock variable did not prove to be significant when introduced into the dynamic CPI equation.

## 5. The System of Equations

The model described above is actually represented by a set of equations:

$$M2 = \text{ScenarioFor}M2 \quad (1)$$

$$Y = \text{ScenarioFor}Y \quad (2)$$

$$PST = \exp(\text{LOG}(M2) - (5.960805 + 0.16460235 * \text{LOG}(Y) - 0.50134208 * D(\text{LOG}(CPI(-1))) + 0.070127963 * \text{LOG}(TRD9607))) \quad (3)$$

$$D(\text{LOG}(CPI)) = 0.0090300719 + 0.16448364 * (\text{LOG}(PST0(-1)) - \text{LOG}(CPI(-1))) + 0.030148449 * D(\text{LOG}(M2(-2))) - 0.029287188 * DSEAS + 0.13346524 * D(\text{LOG}(CPI(-1))) \quad (4)$$

$$CPI = \exp(\log(CPI(-1)) + D(\text{LOG}(CPI))) \quad (5)$$

$$PY = CPI * Y \quad (6)$$

In the equations, the reader will recognize the coefficients from the estimated regressions. After assuming scenarios for exogenous variables the system can be solved forward for forecasts.

## 6. Summary

In construction of the model we took into account the specificity of Georgian economy and the course of developments in the examined period. The availability of data has also been a guideline in designing the model, as it is designated for practical purposes. Data limitations have been dealt with in a way the authors found optimal.

All coefficients have the a priori expected signs. This indicates that the model captures relationships that are grounded in economic theory. Durbin-Watson value, indicates that specification of the dynamic equation is still not perfect. Money demand



elasticity with respect to real GDP is lower than expected, which may be a result of a shadow economy growth.

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## Tables and Figures

Table 1

### M2, CPI inflation, monetization and the money multiplier.

quarter	date	M2		CPI inflation	monetization		multiplier***
		lari th.	% change		quarterly*	average**	
Q4	Dec. 94	37 609					
Q1	Mar. 95	33 570	-11%	10.4%	0.012		0.79
Q2	Jun. 95	37 506	12%	2.8%	0.011		0.73
Q3	Sep. 95	48 815	30%	8.4%	0.012		0.99
Q4	Dec. 95	157 645	223%	27.8%	0.035	0.017	1.02
Q1	Mar. 96	150 571	-4%	9.4%	0.032	0.022	0.97
Q2	Jun. 96	176 181	17%	2.4%	0.030	0.027	1.02
Q3	Sep. 96	202 038	15%	-0.9%	0.031	0.032	0.97
Q4	Dec. 96	217 952	8%	2.5%	0.038	0.033	1.04
Q1	Mar. 97	205 068	-6%	3.6%	0.036	0.034	1.02
Q2	Jun. 97	215 562	5%	-0.6%	0.031	0.034	1.04

\* Calculated as the end quarter M2 divided by annualized quarterly GDP.

\*\* Moving average of the previous measure over the preceding 4 quarters.

\*\*\* M2 divided by reserve money.

Sources: NBG Monetary Survey (M2), Accounts of the NBG (Reserve Money for multiplier calculation), State Department of Statistics (CPI), IMF estimates of the annual GDP (for calculation of monetization), calculations and estimates of the authors.

Table 2

### Main items of the NBG balance sheet and their quarterly changes, in thousands of lari\*

quarter	date	NET FOREIGN ASSETS		NET DOMESTIC ASSETS		RESERVE MONEY	
		end period	change	end period	change	end period	change
Q4	Dec. 94	6 446		36 618		43 064	
Q1	Mar. 95	-12 215	-18 661	54 593	17 975	42 378	-686
Q2	Jun. 95	3 828	16 043	47 382	-7 211	51 210	8 832
Q3	Sep. 95	-26 830	-30 657	75 950	28 568	49 120	-2 090
Q4	Dec. 95	90 837	117 667	62 977	-12 973	153 814	104 694
Q1	Mar. 96	50 346	-40 491	105 281	42 304	155 627	1 813
Q2	Jun. 96	53 343	2 997	119 760	14 479	173 103	17 476
Q3	Sep. 96	9 291	-44 052	198 984	79 224	208 276	35 173
Q4	Dec. 96	-523	-9 815	209 483	10 499	208 960	684
Q1	Mar. 97	-99 219	-98 696	299 491	90 008	200 272	-8 688
Q2	Jun. 97	-160 118	-60 899	368 283	68 792	208 165	7 893

\* By accounting identity: NFA+NDA=RM, dNFA+dNDA=dRM (d denotes nominal change).

Source: Accounts of the National Bank of Georgia (NBG).

*Table 3*  
**Lari/dollar exchange rate and the NBG intervention on TICEX**

Date	lari/dollar exchange rate	NBG sales of dollars (\$ th.)	NBG purchase of dollars (\$ th.)	NBG net sales of dollars (\$ th.)
Sep 95	1.30	6 776	0	6 776
Oct 95	1.27	185	6 749	-6 564
Nov 95	1.25	1 767	660	1 107
Dec 95	1.25	1 785	1 848	-64
Jan 96	1.24	7 731	0	7 731
Feb 96	1.25	11 947	0	11 947
Mar 96	1.26	8 218	0	8 218
Apr 96	1.26	3 942	151	3 791
May 96	1.26	4 915	0	4 915
Jun 96	1.26	2 616	397	2 219
Jul 96	1.26	4 499	1 484	3 015
Aug 96	1.26	6 049	0	6 049
Sep 96	1.27	8 260	0	8 260
Oct 96	1.27	20 223	0	20 223
Nov 96	1.27	15 578	0	15 578
Dec 96	1.28	5 910	528	5 382
Jan 97	1.28	15 100	0	15 100
Feb 97	1.29	8 140	258	7 882
Mar 97	1.29	7 383	40	7 343
Apr 97	1.30	7 436	0	7 436
May 97	1.30	9 372	0	9 372
Jun 97	1.30	1 765	5 450	-3 686

Source: National Bank of Georgia.

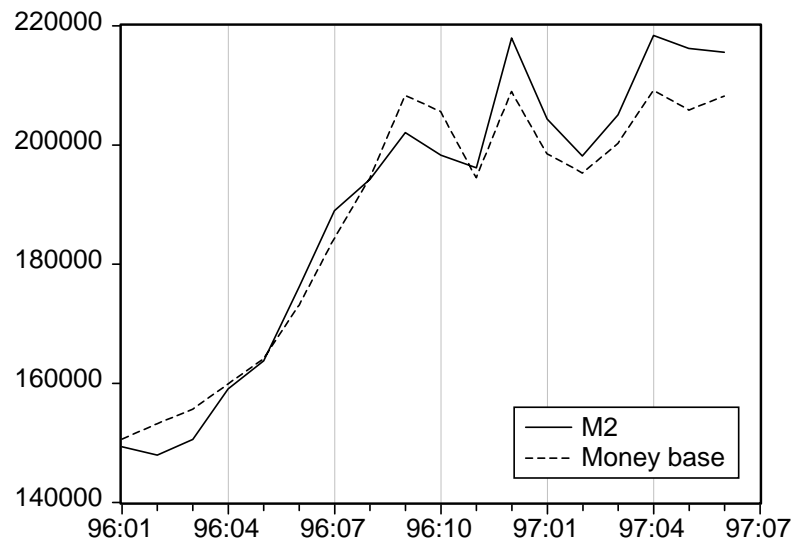
Table 4

**Forecasts\* of the CPI inflation and the nominal GDP based on the pessimistic and the optimistic scenario.**

Date	Optimistic scenario			Pessimistic scenario		
	CPI		GDP	CPI		GDP
	Index base Dec.95	% change	Nominal (mln. lari)	Index base Dec.95	% change	Nominal (mln. lari)
1996	113.80	13.8%	5 724	113.80	13.8%	5 724
1997	<i>123.49</i>	<i>8.5%</i>	<i>6 747</i>	<i>123.49</i>	<i>8.5%</i>	<i>6 747</i>
1998	<i>133.86</i>	<i>8.4%</i>	<i>8 097</i>	<i>132.35</i>	<i>7.2%</i>	<i>8 231</i>
1997 Q1	117.90	3.6%	1 002	117.90	3.6%	1 002
1997 Q2	117.23	-0.6%	1 556	117.23	-0.6%	1 556
1997 Q3	<i>117.72</i>	<i>0.4%</i>	<i>2 028</i>	<i>117.72</i>	<i>0.4%</i>	<i>2 028</i>
1997 Q4	<i>123.49</i>	<i>4.9%</i>	<i>2 161</i>	<i>123.49</i>	<i>4.9%</i>	<i>2 161</i>
1998 Q1	<i>132.44</i>	<i>7.3%</i>	<i>1 197</i>	<i>131.02</i>	<i>6.1%</i>	<i>1 223</i>
1998 Q2	<i>132.89</i>	<i>0.3%</i>	<i>1 915</i>	<i>131.07</i>	<i>0.0%</i>	<i>1 939</i>
1998 Q3	<i>130.43</i>	<i>-1.9%</i>	<i>2 437</i>	<i>129.04</i>	<i>-1.6%</i>	<i>2 479</i>
1998 Q4	<i>133.86</i>	<i>2.6%</i>	<i>2 548</i>	<i>132.35</i>	<i>2.6%</i>	<i>2 589</i>
Jan.97	114.70	0.8%	326.6	114.70	0.8%	326.6
Feb.97	117.10	2.1%	328.3	117.10	2.1%	328.3
Mar.97	117.90	0.7%	346.6	117.90	0.7%	346.6
Apr.97	118.30	0.3%	507.2	118.30	0.3%	507.2
May.97	119.50	1.0%	535.4	119.50	1.0%	535.4
Jun.97	117.23	-1.9%	513.4	117.23	-1.9%	513.4
Jul.97	<i>116.07</i>	<i>-1.0%</i>	<i>693.3</i>	<i>116.07</i>	<i>-1.0%</i>	<i>693.3</i>
Aug.97	<i>116.31</i>	<i>0.2%</i>	<i>649.5</i>	<i>116.31</i>	<i>0.2%</i>	<i>649.5</i>
Sep.97	<i>117.72</i>	<i>1.2%</i>	<i>684.9</i>	<i>117.72</i>	<i>1.2%</i>	<i>684.9</i>
Oct.97	<i>119.62</i>	<i>1.6%</i>	<i>707.4</i>	<i>119.62</i>	<i>1.6%</i>	<i>707.4</i>
Nov.97	<i>121.58</i>	<i>1.6%</i>	<i>717.3</i>	<i>121.58</i>	<i>1.6%</i>	<i>717.3</i>
Dec.97	<i>123.49</i>	<i>1.6%</i>	<i>736.5</i>	<i>123.49</i>	<i>1.6%</i>	<i>736.5</i>
Jan.98	<i>125.31</i>	<i>1.5%</i>	<i>385.3</i>	<i>125.31</i>	<i>1.5%</i>	<i>396.0</i>
Feb.98	<i>129.05</i>	<i>3.0%</i>	<i>390.7</i>	<i>128.44</i>	<i>2.5%</i>	<i>399.7</i>
Mar.98	<i>132.44</i>	<i>2.6%</i>	<i>420.6</i>	<i>131.02</i>	<i>2.0%</i>	<i>427.6</i>
Apr.98	<i>135.33</i>	<i>2.2%</i>	<i>626.7</i>	<i>133.40</i>	<i>1.8%</i>	<i>634.9</i>
May.98	<i>136.37</i>	<i>0.8%</i>	<i>659.9</i>	<i>134.18</i>	<i>0.6%</i>	<i>667.3</i>
Jun.98	<i>132.89</i>	<i>-2.5%</i>	<i>628.5</i>	<i>131.07</i>	<i>-2.3%</i>	<i>637.1</i>
Jul.98	<i>129.60</i>	<i>-2.5%</i>	<i>836.0</i>	<i>128.28</i>	<i>-2.1%</i>	<i>850.5</i>
Aug.98	<i>129.57</i>	<i>0.0%</i>	<i>781.4</i>	<i>128.35</i>	<i>0.1%</i>	<i>795.6</i>
Sep.98	<i>130.43</i>	<i>0.7%</i>	<i>819.6</i>	<i>129.04</i>	<i>0.5%</i>	<i>833.4</i>
Oct.98	<i>131.56</i>	<i>0.9%</i>	<i>840.3</i>	<i>130.01</i>	<i>0.8%</i>	<i>853.5</i>
Nov.98	<i>132.75</i>	<i>0.9%</i>	<i>845.9</i>	<i>131.13</i>	<i>0.9%</i>	<i>858.8</i>
Dec.98	<i>133.86</i>	<i>0.8%</i>	<i>862.3</i>	<i>132.35</i>	<i>0.9%</i>	<i>876.2</i>

\*The forecasts (values of the variables starting with July 97) are printed in italic.

*Figure 1*  
**M2 and monetary base, the NBG data**



*Figure 2*  
**M2 multiplier (M2 divided by monetary base)**

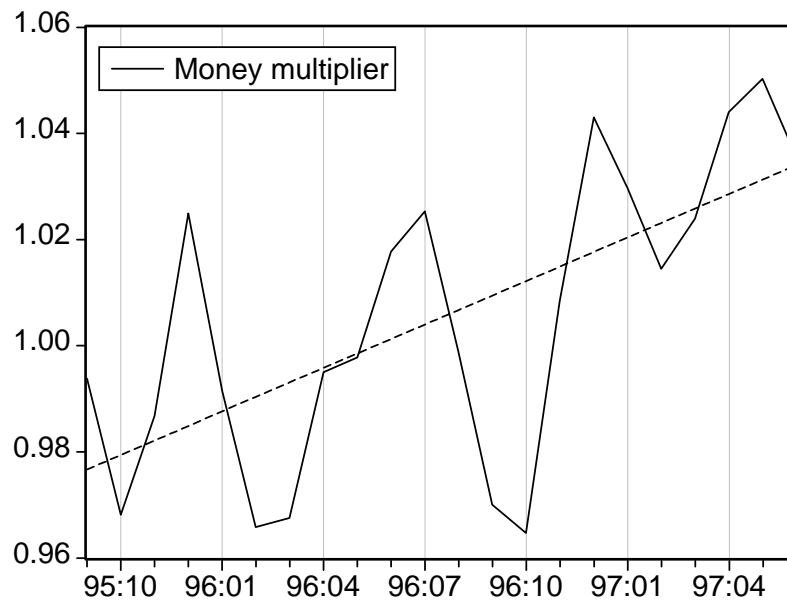


Figure 3  
 Monetization and money multiplier in transition economies

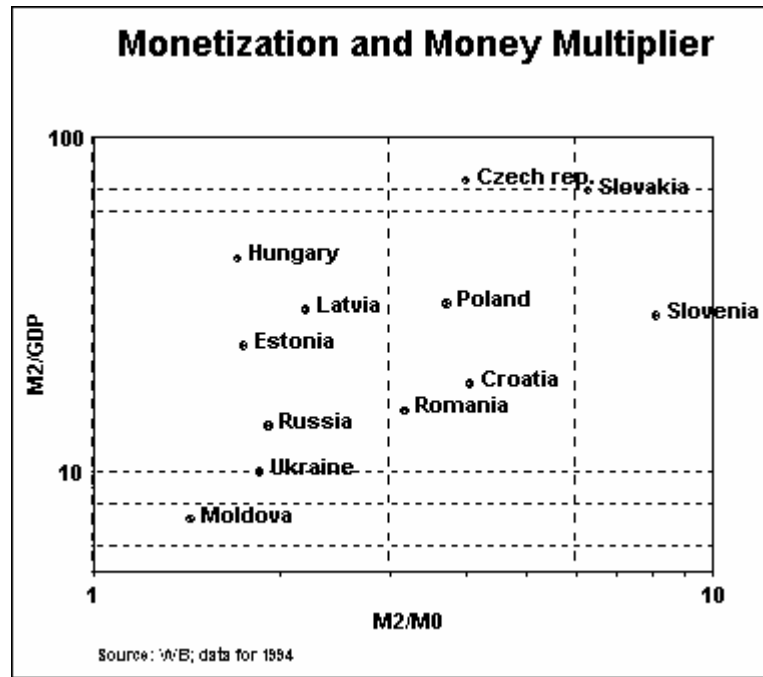


Figure 4  
 Monthly inflation: fact and forecasts according to two scenarios

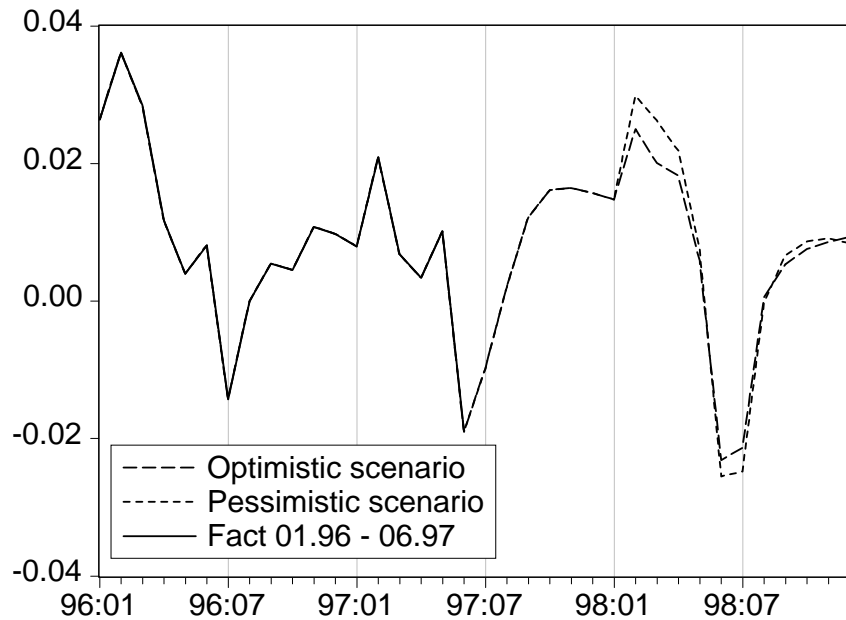


Figure 5

Estimation of real money demand: actual, fitted values from the estimated regression and residuals.

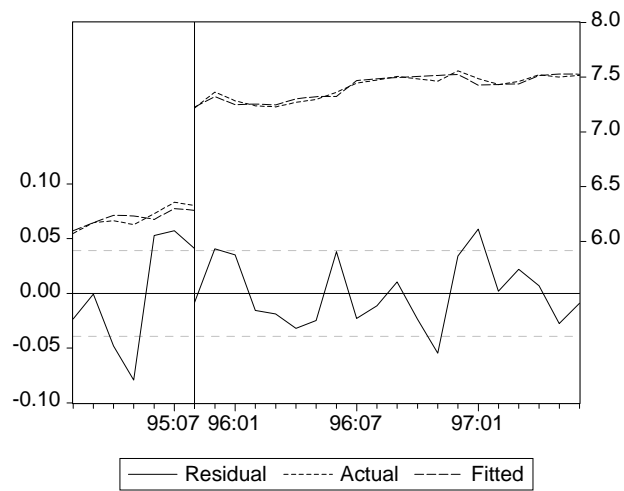


Figure 6

Residuals, actual and fitted values in the short run regression equation for inflation

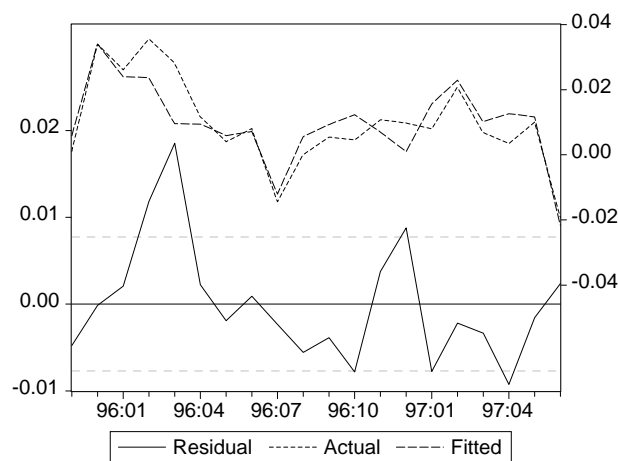




Figure 7

**Experiment: an isolated effect of a big money emission (50 mln. lari) on inflation, inferred from the estimated equations.**

