

RCEP/WP no.10/October 2000

Why Are Domestic Interest Rates So High?

COSTIN BORC

Department of Economics, University of Wisconsin-Madison

- Abstract -

This paper aims to explain the high level of domestic interest rates in Romania during the last three years (1997-1999). Romania's government was running a tight monetary policy while simultaneously trying to reduce the fiscal deficit with the declared intention to stop the decline of economic activity and create a sound base for long term economic growth. Many observers blamed the high interest rates as the main roadblock for a potential upturn in the real economy. One of the major questions that was asked during the period we are focusing on was how to reduce interest rates. We explored the literature on stabilization and inflation to search for an answer and we were able to come up with a mixed response. In our opinion, there is no single action that can be taken that will substantially influence the level of interest rates. The factors that we are considering in this paper are the impact of using exchange rates as a nominal anchor, the existence of chronic inflation, tax arrears, and the monopoly position of banks in both the Treasury securities and interbank markets.

There are multiple factors that affect the interest rate and the government must address all of them to significantly influence or reduce its level.

I. Introduction

This paper aims to explore the behavior of domestic interest rates--more precisely their level--in the Treasury securities market and in the interbank market in Romania since 1996 and examine some potential explanations for their observed behavior. However, we cannot have a discussion about interest rates without taking a closer look at the underlying economic conditions during this period.

To better understand the current situation and to develop better economic policy, it is very important to understand the economic conditions in Romania, especially since the end of 1996. We have decided to consider 1996 as an important turning point for economic policy in Romania because it represents a clear break with past policies. At the end of 1996/beginning of 1997, a tougher approach towards reforming state enterprises was taken and monetary and fiscal policies were articulated in order to accompany the structural changes. But what exactly defines Romania's behavior after 1996?

In statistical terms, we observe a decline in real GDP (-6.9% in 1997, and a 7.3% decline in 1998), with industrial output registering an especially sharp decline. The current account deficit widened in 1997 and 1998 to 7.9% of GDP in 1998. The central government fiscal deficits as a percentage of GDP were 4.9% in 1996, 3.6% in 1997, and 3.1% in 1998.

Real wages economy-wide (deflated by PPI) decreased by 22.1% in 1997, and increased by 19.5 % in 1998.

What is in store for 1999? A decrease in GDP by 3.5%, a decrease in the current account deficit, a lowering of the central government fiscal deficit and a small decrease in real wages¹.

Therefore, we are in the third consecutive year of decreasing GDP, setting the stage for what any economist will call a deep recession.

Numbers might not always tell the whole truth and a closer look at the policies in place since 1996 should be able to shed more light. There were a number of policies that were put forward. Under an agreement with the IMF, the National Bank of Romania is pursuing an exchange rate-based stabilization program aimed at containing inflation and achieving broad exchange rate stability. The Ministry of Finance is pursuing a contractionary fiscal policy with limits on spending, tax increases, and structural reforms to the banking and enterprise sectors. With a lot of weight put behind the structural reforms--especially in the state enterprise and banking sectors--the current reform program aims to reduce the negative externalities of these two sectors. Under the current approach, it is expected that one effect of the structural reforms in the enterprise and banking sectors will be a positive impact on the level of domestic interest rates.

¹ Data is taken from the IMF Press Release on the occasion of Stand-By Credit approval for Romania. Sources are Romanian authorities and IMF staff estimates.

The important structural reform measures of the program that were agreed to by the International Monetary Fund and the World Bank are:

- ◆ In the banking sector, to close down Bancorex, move its bad loans to an Asset Resolution Trust (AVAB), and to restructure Banca Agricola by splitting it into a good bank and a bad bank. The bad assets of Banca Agricola will also be transferred to AVAB².
- ◆ In the state enterprise sector, to close down the large loss-making enterprises that account for a large portion state sector losses and to privatize through World Bank procedures a significant number of companies from the State Ownership Fund portfolio³.

It is worth mentioning that this is the second program within a three year period. The first one was put in place in the spring of 1997 and failed (officially) in the spring of 1998. Understanding why the first program collapsed and why the second one may survive may prove to be a key for better policy formulation and implementation.

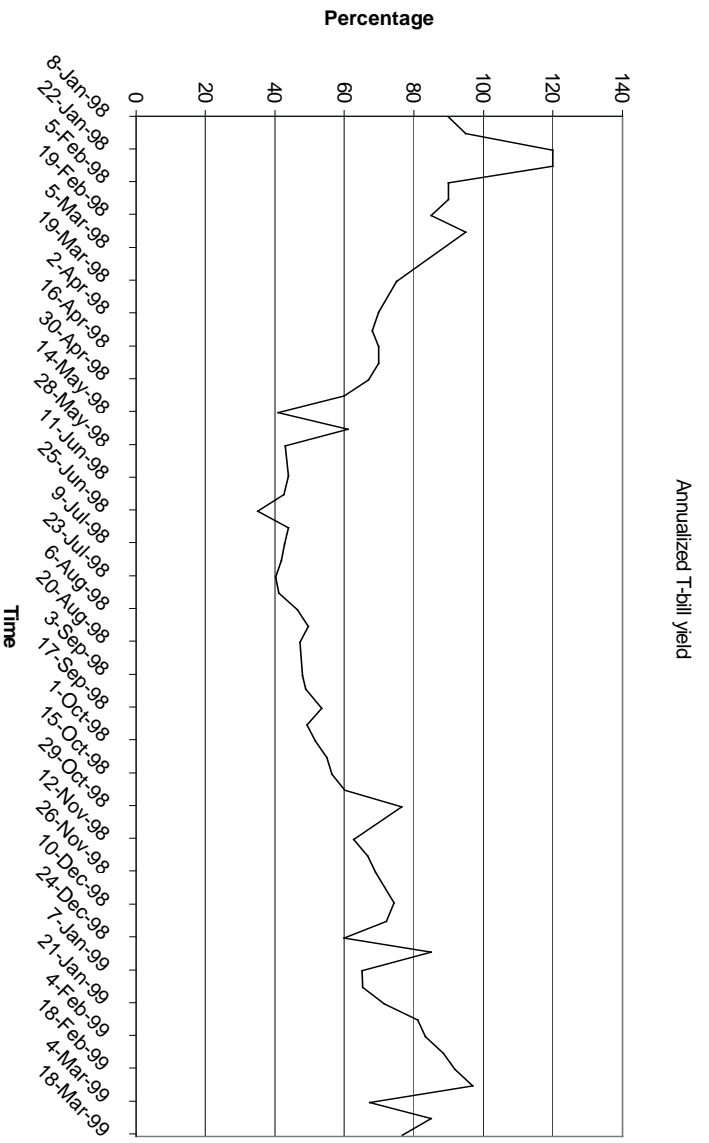
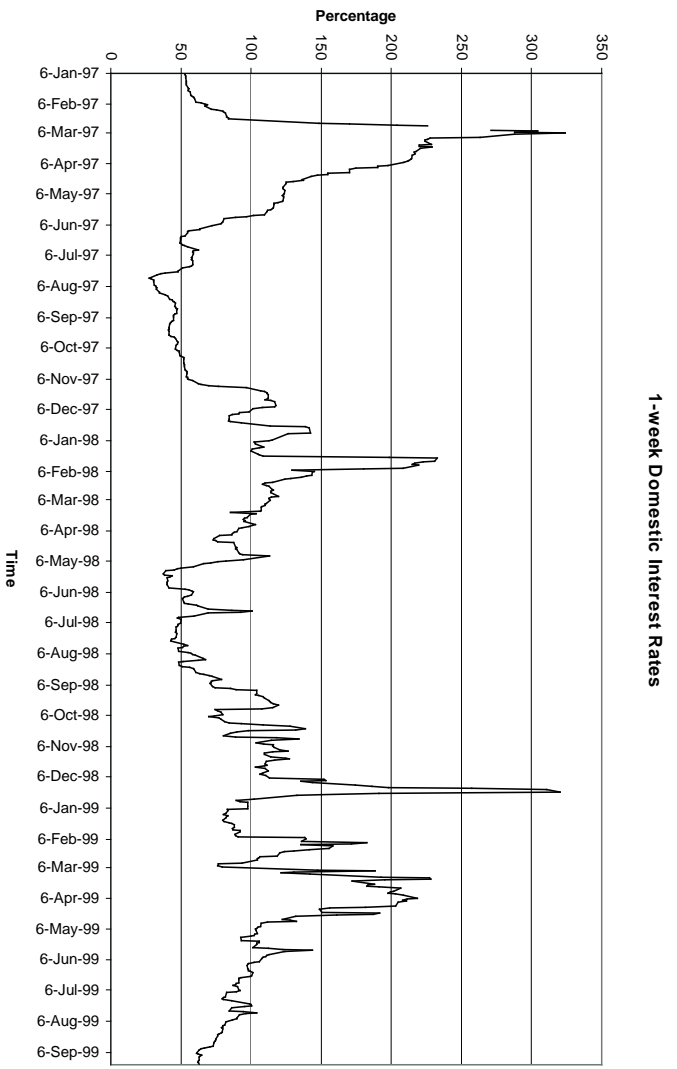
Many economists suggested that the unusual behavior of interest rates might be an explanation for the Romanian economy's failure to take-off. This paper aims to look at the interbank market and the Treasury securities market and to try to find compelling explanations for the interest rate levels and variations during this period. Section II presents the data on interest rates, Section III presents reasons for the observed high interest rates, Section IV presents some policy recommendations, and Section V concludes.

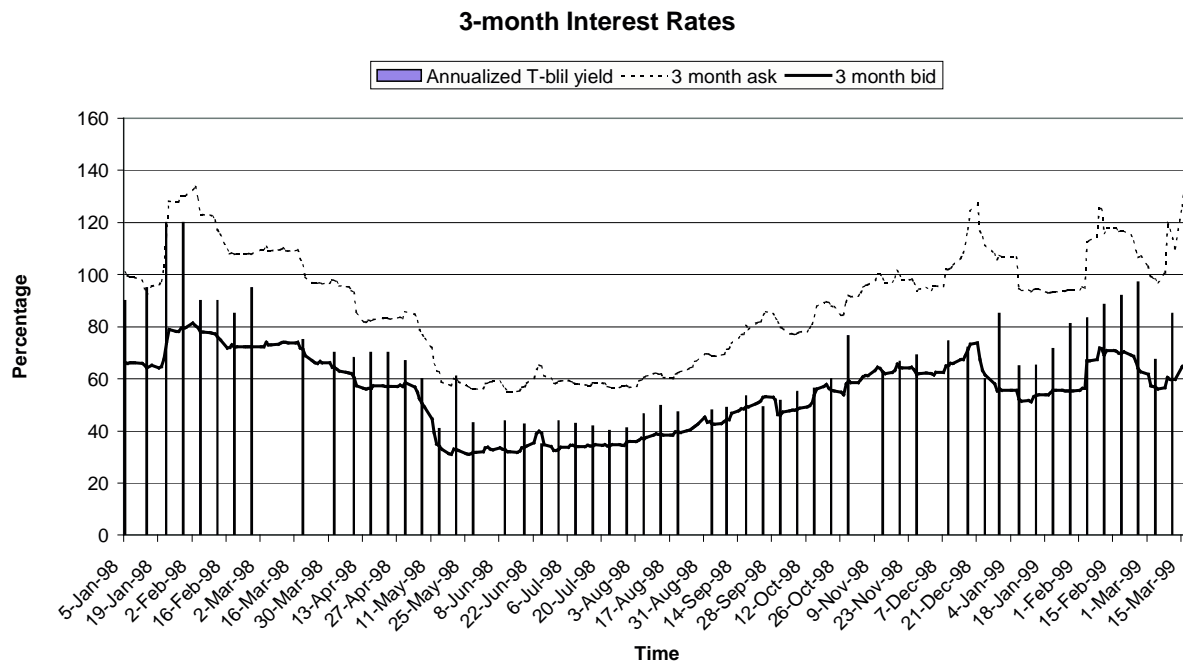
II. Interest Rates in the Treasury Securities and Interbank Markets

This section presents the data on interest rates for both the interbank market and the T-bill market. We have data for one week, one month, three month, six month, nine month, and twelve month interest rates since the beginning of 1997 for the interbank market--both ask and bid--and data on treasury bills sold since January 1998. Data on annualized T-bill yields is presented in Table 1 of the Appendix. Figure 1 presents one week (ask) domestic interest rates for a period spanning from January 1997 to September 1999. It is the most volatile interest rate and its movements capture all events. There are three major spikes: the devaluation of February-March 1997, the government crisis of January-March 1998, and the Bancorex crisis of December 1998. One can see that these movements in the interest rate are not isolated to the interbank market. Figures 2 and 3 show the annualized T-bill yield and the 3-month interest rates (ask and bid).

² The Memorandum of Economic Policies specifies that by end-August 1999 at least 50 percent of Banca Agricola's nonperforming assets will be identified and transferred to the AVAB.

³ The Memorandum of Economic Policies mentions: "... the program envisages, during 1999: (a) initiation of privatization for 50 enterprises acceptable to the World Bank through reliance on a "pool" method (these enterprises account for 10.7 percent of SOF's share capital); (b) initiation of privatization for nine large enterprises acceptable to the World Bank through a case-by-case method involving international tenders (these enterprises account for 7.8 percent of SOF's share capital); (c) initiation of work-out/liquidation for another five large enterprises through this method (these enterprises account for 6.4 percent of SOF's share capital); as well as (d) continued direct privatizations by the SOF (enterprises accounting for 8 percent, 11 percent, and 14 percent, cumulatively, of SOF's share capital by end-July, end-October, and end-December 1999, respectively)".





III. Why were Interest Rates so High?

In this section we will try to find reasonable explanations for why the interest rates were so high during this period. It is important to understand that the inflation risk premium is not in itself the determining factor of the high value of the domestic interest rates. We find that no single factor in itself accounts for a large portion of the risk premium, but that the combination of several factors influences the interest rates. The factors that we analyze are the impact of using the exchange rate as a nominal anchor, the existence of chronic inflation, tax arrears, and the monopoly position of banks in both the Treasury securities and interbank markets.

III.a. Drawbacks of monetary policy with the exchange rate as a nominal anchor

The recent Memorandum on Economic Policies submitted to the Board of Directors of the International Monetary Fund specifies that: “Key objectives of monetary policy will be to reduce inflation so as to preserve the gains in competitiveness brought about by the recent depreciation, and gradually to stabilize the exchange rate of the leu, owing to its importance as a nominal anchor.”

A recent paper by Mishkin (1999) presents countries’ experiences with monetary policy. In the chapter devoted to exchange rate targeting, the author makes a solid argumentation against the use of this type of monetary policy by emerging market countries.

The first argument that is presented explains why exchange rate targeting in emerging markets is dangerous. Due to the uncertainty of the future value of the domestic currency, most

banks and many non-financial institutions find it much easier to issue foreign currency denominated debt. Mishkin (1999) argues that in the case of exchange rate targeting, depreciation, when it occurs, is a highly nonlinear event⁴ which generally has little effect in developed countries since the debts in the balance sheets of households, firms and banks are denominated in local currency. In emerging markets, this is not necessarily true, since they have a different institutional structure. When there is devaluation, the debt burden of firms and households, if this debt is denominated in foreign currency⁵, increases, with no increase in the value of domestic assets. The resulting deterioration in the balance sheet makes lending less attractive due to the reduced value of the collateral and the increase in moral hazard. That is, firms will be more willing to take greater risk since they have less to lose if they default on loans since they are already in a negative net worth situation. Obviously, this kind of behavior will lead to an increase in the interest rate.

A second reason against using exchange rate targeting presents another channel in which currency devaluation influences interest rates by triggering a rise in the actual and expected inflation. In emerging markets, there might be less credibility in the willingness of the central banks to fight inflation. This perceived behavior of the central bank would cause a rise in expected inflation combined with a sharp rise in interest rates. Since the emerging markets are dominated by short term contracts, the rise in interest rates will substantially increase interest payments, thereby further weakening the balance sheets of the firms.

Mishkin (1999) concludes by suggesting that, due to these drawbacks, exchange rate targeting is better served in emerging economies by a currency board which will make a very strong commitment to defend the local currency.

III.b. Chronic inflation

For a better understanding of the phenomena that took place in Romania in past years, we should first define Romania's status as a chronic inflation country. First used in a paper by Pazos (1972), the term chronic inflation refers to high and persistent inflation, which is different than what the literature defines as hyperinflation. The duration of "chronic inflation" is measured in years or even decades, and countries learn how to live with high and persistent inflation by designing various indexation mechanisms, which in turn will perpetuate the high inflation. Under the described circumstances, inflation does not tend to accelerate, and if it does, it soon reaches a new plateau.

Looking at Romania's inflation rates for the last decade, it is then easy for us to categorize it as a chronic inflation country, together with most of the Latin American countries and Israel. However, we should not infer that once a country is coined as one with chronic inflation it will never get out of this regime. The experience in Argentina under the recent currency board

⁴ When sudden devaluation occurs, it is a break with the established, or known, devaluation rate. The disruption in the devaluation rate will be a temporary, high value decrease, and after a transition period the devaluation rate returns to a known trend. It is easy to imagine the sudden devaluation as a step-function.

⁵ Even if debt is not denominated in foreign currency, but contracts are implicitly in foreign currency, the effect will be the same. In Romania's case, even if there is a willingness to reduce debt denominated in foreign currency it is usual to have most of the contracts linked to the US dollar, in order to reduce the exchange rate risk. For example, most of the contracts for privatization of SOF owned enterprises are US dollar denominated.

regime and in Israel or Chile shows that countries can successfully reduce inflation to international levels.

Therefore, to get some insight into the behavior of domestic interest rates in Romania during 1997-1999, we will look at what the literature has to say for the case of an exchange rate-based stabilization effort and its influence on interest rates and on other macroeconomic variables.

Calvo and Vegh (1997) present empirical regularities for four chronic inflation countries pursuing major exchange rate-based stabilization during the last 35 years, for a total of 12 events. The literature identifies the following main regularities associated with exchange rate-based stabilization programs:

- i) Slow convergence of the inflation rate (measured by the CPI) to the rate of devaluation;
- ii) An initial increase in real activity – particularly, real GDP and private consumption – followed by a later contraction;
- iii) Real appreciation of the domestic currency;
- iv) Deterioration of the trade balance and current account balance;
- v) An ambiguous impact to domestic real interest rates;

The authors constructed a panel of annual observations for four countries (Argentina, Israel, Chile, and Uruguay) which covers 16 years (1978-1993) for a total of 64 observations. The panel includes 7 of the 12 exchange rate-based stabilization attempts (listed in tables in Calvo, G. and Carlos A. Vegh (1997) “Inflation Stabilization and BOP Crises in Developing Countries”, mimeo, University of Maryland), and ten macroeconomic variables (devaluation rate, inflation rate, rates of GDP growth, private consumption, durable goods consumption, fixed investment, and public consumption--all expressed in per-capita terms, along with real exchange rate, current account deficit as a proportion of GDP, and real lending rate). All data is presented in “stabilization time”, where T is the year in which the stabilization was implemented.

In the same mentioned study figures with the variations of the macroeconomic variables during a stabilization period are presented.

In Romania’s particular case, the only behavior that is not consistent with the general behavior in exchange rate-based stabilization is the initial decrease in GDP. We will attribute this behavior to the very early failure of the stabilization program. It is argued by many that the first “after 1996” Stand-By arrangement, signed on April 23, 1997, lasted until late spring of 1998 or early summer, when the Government of Romania agreed to close it. However, if we look at the concessions made by the Government of Romania to the strikers in Brasov in early April 1997, it is clear that the signal to the market was that the Stand-By arrangement with the IMF would fail, although it was not even signed. The behavior of one year interest rates in the interbank market does not show any impact on the date when the program was signed, probably because the information about the failure was already incorporated into the interest rate.

In their paper on inflation stabilization, Calvo and Vegh (1997) try to explain the stylized facts shown by most countries that have undergone an exchange rate-based stabilization. It is not

surprising to find out that the two main explanations advanced by the authors are inflation inertia and lack of credibility. The other explanations focus on the influence of durable goods, credit and wealth effects. We will look closely at each of them, apply them to the case of Romania, and try to understand their effect on the domestic interest rate.

Inflation inertia. Generally, in models of inflation and stabilization like Rodriguez (1982), a credible decline in the rate of devaluation will provoke a decrease in the domestic interest rate through the interest parity condition. But this behavior will only be observed under conditions of high capital mobility, which was not the case in Romania at the end of 1996. The model presented in Calvo and Vegh (1994), in which they study the impact of a once-and-for-all reduction in the rate of devaluation of the local currency, shows that the domestic interest rate falls on impact and increases later until it reaches a plateau. Now, considering the real case of Romania, in which there is no announcement of a once-and-for-all reduction in the rate of devaluation, but an announced commitment to a stable exchange rate, and given the sticky expectations of inflation, we can easily argue that the reduction in the domestic interest rate will not even take place.

The lack of credibility will influence the interest rate at least as much as the inflation inertia. Stabilization is costly, and from a policymaker point of view it might not be optimal to succeed. If the private sector believes that the program might fail (which, we argued earlier, was the case of Romania), then the theory predicts that under perfect capital mobility we expect the interest rate to be low from 0 to T and expect it to increase thereafter. What if we do not even think that the program will last a year, i.e. the program will be discontinued before the second disbursement, and we do not have perfect capital mobility? Then we will see no influence on the interest rates for deposits for a period longer than a year. This is the actual behavior observed in the one year interest rates in 1997.

Under lack of credibility, inflation persistence is not due to an ad-hoc mechanism, but is an effect of a lack of policy credibility.

III.c. Tax arrears

In the next paragraphs, we argue that the tax arrears in the Romanian economy are one of the major contributors to the high level of interest rates.

The tax arrears problem is very significant in Romania and it comprises not only bankrupt, outdated state enterprises, but also a larger number of healthy companies that choose to maximize profits and optimize their behavior by not paying taxes on time.

A report by the Adam Smith Institute and Roland Berger (1998)⁶ shows that the scale of the problem is large. Overdue tax debts at the end of 1997 amounted to 6.1% of GDP. The report mentions that “firms are not keeping up with current tax payments: net taxes accrued in 1997 exceeded tax payments made by an equivalent of 3.2% of GDP. Rapid inflation in the first half of 1997...means that in effect the Government provided firms with large amounts of cheap

⁶ *Tax Arrears in Romania: Analysis and Policy Choices*, Adam Smith Institute, Policy Review Unit Project, November 1998

working capital. The net benefit to firms (inflation erosion of tax debt net of interest and penalties on overdue taxes) amounted to 7.1% of GDP.”

Of greater importance than the usual answer that large inefficient enterprises are not paying their dues to the state is the report's conclusion that the tax arrears problem has spread out of the group of loss-making firms to utilities and profitable firms.

The likely explanation for this accumulation of tax arrears by healthy firms is that the effective interest rate that is paid by a firm on a delayed tax payment is almost always more attractive than an alternative source of financing. The Ministry of Finance charges a flat rate of 0.25 % per day in penalties. There is no compounding of interest rates, or interest for the principal due. Therefore, under this scheme, a firm will have to pay a flat 91% per year in penalties. The actual data collected by the Ministry of Finance shows that the average effective interest rate on overdue taxes is about 45% per year, or half the statutory rate. This scheme makes no incentive for a firm to pay in advance or a portion of the amount due. On the top of these problems, there are periods when the entire amount due is interest free for some taxes. In particular the profit tax is paid quarterly.⁷ Another reason why profitable firms may not pay taxes is that the tax collection system is complicated and cumbersome, especially for tax arrears, and subject to political pressure. The third reason is the history of tax arrears forgiveness, which induces a strong moral hazard. All discussions centered on the articles in the new privatization law that deal with the treatment of tax arrears were inducing a non-compliance behavior for firms with tax arrears⁸. Why pay taxes, if at the moment of privatization, they will be erased anyway?

The whole tax arrears issue influences the interest rates in a multitude of ways. First, they influence the credit market. If a bank knows that a company has a history of tax payment defaults it makes lending riskier, even if the company is healthy. The bank will require a risk premium to lend to this company. If the tax default behavior is common in the economy, then the increase in the interest rates is general. Also, the availability of funds through the tax arrears channel (i.e. cheaper working capital than from banks) under the imperfect competition conditions of the Romanian banking sector might make credit more expensive for certain customers.

The tax arrears behavior of healthy firms also influences the Treasury bill market. If the Ministry of Finance is not able to collect taxes from firms, it will aggressively pursue a policy of selling Treasury bonds to finance the government spending. In a tight market, and we will argue in the next pages why the T-bill market is tight, this implies an increase in the interest rate.

III.d. Monopoly position in the markets

⁷ All observations are for the period 1997-1998, and do not refer to the current system of paying taxes.

⁸ In the new privatization law of 1999 there is a provision in which tax arrears are negotiated between the State Ownership Fund, the Ministry of Finance and the buyer at the time of the sale of the company. Previous proposals dealt with total cancellation of the tax arrears. It is obvious that the rational behavior of any state company manager is to accumulate as much debt as possible in the form of tax arrears. If he obtains a good price for the company, this will be an incentive for the Ministry of Finance and for the State Ownership Fund to cancel or at least highly discount the amount due.

A closer look at the mechanisms in place in the interbank market will shed some more light on the behavior of the interest rates. During the whole period of 1997-1998, the interbank market transactions were dominated by a bilateral bargaining game. One side of the game consisted of two large state-owned banks (Bancorex and Banca Agricola) with large portfolios and with a high rate of default on loans extended. The other side of the game consisted of a large number of small healthier banks that were benefiting from the liquidity crunch of Bancorex and Banca Agricola. It is not our purpose to explain why this was the situation, or why the portfolio of either Bancorex or Banca Agricola was so damaged. Arguments made before may explain how balance sheets of banks may deteriorate due to the monetary policy. In each trading session, the lack of liquidity for Bancorex or Banca Agricola made them actively borrow on the interbank market at higher and higher rates. Their lack of liquidity as well as the potential intervention of the state in their favor was common knowledge. The “too large to fail” story was used by the lending banks to continue lending to the ailing state banks, but the risk was high. Therefore, the lending banks asked for high interest rates in the interbank market. The behavior of the interest rate could, in some instances, be easily linked to policy formulation on the issue of reforming Bancorex. For example, at the end of 1998, there is a very large increase in the interest rate (from December 8 to December 21, a 170 percentage points increase in the 1-week interest rate.) This very high increase, we argue, was due to the rumors that the bank would be closed by the end of the year. During this period, lending banks were asking a very high risk premium for their funds placed with Bancorex or Banca Agricola.

In the Treasury securities market, we can observe the same bilateral game, played mainly by the same banks against the Treasury this time. We have already presented above some reasons with respect to tax arrears and general collection policy that might explain why the Treasury is cash strapped. On the other hand, under the agreement with the IMF, the Ministry of Finance committed to a low budget deficit, and therefore is running a contractionary fiscal policy. The demand for funds from the Treasury is high and there is strong political pressure to increase spending. Given difficulties in the collection of tax arrears and the constraints to increasing taxes, the Ministry of Finance tool of last resort for financing the government spending is an increase in the public debt. The Treasury is very aggressive in selling Treasury bonds in order to meet its liquidity requirements. The market for Treasury securities is very tight with foreign banks or firms not being allowed to participate at auctions. Many times in the past, the Ministry of Finance was forced to refuse to sell bonds due to the high interest rate (or low price). However, it is common knowledge that there is no other source to finance the current government spending, as well as the deficit. Therefore, the next session concluded with the same low prices. The unavailability of foreign resources due to the Ministry of Finance's lack of presence in the international financial markets is also common knowledge.

IV. Policy Recommendations

In the field of monetary policy, a strong commitment of the central bank to fight inflation and to stick to a constant rate of devaluation will probably alleviate most of the fears expressed in Mishkin (1999). Pre-announcing targets for inflation and exchange rates and meeting them most

of the time will help increase the credibility of the monetary policy and implicitly of the central bank.

Also, to avoid having bad banks bid up the interbank interest rates, the central bank could offer a Lombard facility (discount window) to the banks that do not meet required reserves. A policy of actively regulating and supervising banks in general, restricting the activities of the ones in trouble and isolating them in order to prevent a domino effect on other healthier banks should be in place. This policy would help in quickly isolating any potential crisis.

A secondary market for T-bills will help banks sell T-bills when they need to do it and to have easier access to liquidity.

An effort should be done to limit debt denominated in foreign currency as much as possible, as well as explicit or implicit contracts expressed in foreign currency. The introduction of International Accounting Standards will help improve the information contained in a company's balance sheet and therefore will reduce the risk of deterioration in the balance sheet when a sudden devaluation occurs.

The Ministry of Finance (The Treasury) should work on issuing longer term leu-denominated T-bills. Also, it should open the market to more players, especially institutional foreign investors and domestic retail investors, in order to reduce the monopoly position of some current players. There might be a high fixed cost for foreign institutional investors to enter into the Romanian T-bill market which might make low interest rates unappealing to them. In this situation, the Ministry of Finance should work on lowering the cost of the information that is necessary to enter the market, and to lower the cost itself. For example, the Internet offers a good opportunity to spread out information about the T-bill market and is available at low cost.

With regard to tax arrears, some recommendations include⁹ keeping the tax arrears limited to loss-making, financially distressed firms and restoring tax discipline in profitable firms and utilities. For all categories of firms, the government should avoid any write off and rescheduling of tax arrears, as these kinds of measures are extremely dangerous because they create moral hazard. The treatment of interest and penalties should also change to solve the problems outlined above. For example, the country should charge compound interest on all overdue taxes at a rate linked to inflation or interest rates. A rate for tax arrears that is higher than the current rates published by the National Bank of Romania will cut down the current incentive to use government funds as working capital and will force companies to go to the banks and ask for loans. As the credit market develops, banks will be selective in extending credit, and therefore the companies will have an incentive to behave properly. Another option is to stop charging lower rates for penalties and interest overdue, as this is just a different (hidden) form of subsidies to firms.

The lack of credibility issue is the one that is the hardest to address. Governments need time to establish credibility and currently the outlook in Romania is one of short-term optimization. We are confronted with a phenomenon that evolves as a vicious circle. The higher the inflation,

⁹ *Tax Arrears: Analysis and Policy Choices*, November 1998

the lower the intertemporal rate of substitution, and therefore the shorter the horizon for which a representative agent maximizes its utility. As they demand current period policy improvements, the behavior of the policymakers is quite erratic with no particular emphasis on long-term policy goals. This increases the lack of credibility and this in turn induces high inflation.

One suggestive example of a policy that induces lack of credibility is the current suspension of fiscal facilities to investors. Due to low revenues to the budget, the Ministry of Finance was required to temporarily cancel, for a one-year period, facilities to investors that were granted by law. From a dynamic point of view, this announcement caused investors to postpone their planned developments for a year and to continue when the facilities will be again in place. A much better approach would have been either for the President to veto the law, after it was approved by the Parliament, or to announce a permanent cancellation of the fiscal facilities. This would have forced investors to redraw their plans and invest according to the new regulations.

Under the current circumstances, to establish credibility for economic policies the Government must actively continue with the reform package that was agreed to with the International Monetary Fund and the World Bank and meet every deadline of both programs. This argument is not based on the idea that the agreements are good--it does not intend to establish any valuation of the reform package--but only intends to show that failing the agreements is too costly for Romania from a credibility perspective.

V. Conclusion

In conclusion, we have summarized some of the potential determinants of the domestic interest rates and we have presented how they are influencing the level of interest rates. We looked at the impact of using the exchange rate as a nominal anchor, the existence of chronic inflation, tax arrears, and the monopoly position of banks in both the Treasury securities and interbank markets. The paper does not answer what is each determinant's share in the risk premium. This is because it is hard to put weights on each determinant and to quantify how much it influences the level of interest rates without a formal model. The answer that comes up from this paper is that no one factor is in itself responsible for the observed high level of interest rates. Another conclusion is that the observed high level was not an anomaly, but a normal behavior of the interest rates given the underlying conditions in the Romanian economy. There are many factors that influence and determine the domestic interest rates and only a common approach will succeed in reducing them.

References:

- [1] Calvo, G., and Carlos A. Vegh (1997) "Inflation Stabilization and BOP Crises in Developing Countries," mimeo, University of Maryland.
- [2] Mishkin, F. S. (1999) "International experiences with different monetary policy regimes," *Journal of Monetary Economics*, 43 (1999), 579-605.
- [3] Pazos, F. (1972) *Chronic Inflation in Latin America*. New York: Praeger Publishers.
- [4] *Tax Arrears in Romania: Analysis and Policy Choices*, Adam Smith Institute, Policy Review Unit Project, November 1998.

Appendix

Table 1. Annualized T-Bill Yields

Auction Date	Days	Forex Auction	Forex Maturity	Annualized T-Bill Yield	Annualized Gain/Loss
08-Jan-98	91	8269	8419	90	82.48
15-Jan-98	91	8418	8395	95	97.68
22-Jan-98	91	8303	8375	120	117.17
29-Jan-98	91	8199	8345	120	112.52
05-Feb-98	91	8367	8451	90	86.36
12-Feb-98	91	8285	8484	90	79.7
19-Feb-98	91	8043	8500	85	59.98
26-Feb-98	91	8142	8499	95	75.43
19-Mar-98	91	8104	8542	75	51.58
01-Apr-98	91	8476	8687	70	60.27
09-Apr-98	91	8419	8689	68	53.75
16-Apr-98	91	8395	8650	70	57.06
23-Apr-98	91	8375	8724	70	52.09
30-Apr-98	91	8345	8728	67	47.35
07-May-98	91	8451	8723	60	46.43
14-May-98	91	8484	8718	40.95	29.64
21-May-98	91	8500	8768	61	47.7
28-May-98	91	8499	8910	42.99	23.07
10-Jun-98	91	8566	9027	43.88	21.73
18-Jun-98	91	8542	9059	42.65	17.88
25-Jun-98	91	8620	9066	35.01	14.02
02-Jul-98	91	8687	9262	43.86	16.81
09-Jul-98	91	8689	9294	42.92	14.57
16-Jul-98	91	8650	9359	41.89	8.87
23-Jul-98	91	8724	9430	40.19	7.67
30-Jul-98	91	8728	9548	41.13	3.67
06-Aug-98	182	8723	12106	46.51	-22.06
13-Aug-98	91	8718	9873	49.66	-2.46
20-Aug-98	182	8768	12319	47.18	-23.76
03-Sep-98	182	8966	13262	47.92	-32.12
09-Sep-98	182	9027	13558	48.98	-33.96
17-Sep-98	182	9059	15115	53.47	-47.86
24-Sep-98	91	9066	10760	49.28	-21.05
01-Oct-98	56	9262	10053	51.68	-3.01
08-Oct-98	91	9294	11244	55	-23.47
15-Oct-98	91	9359	11242	56.36	-19.61
22-Oct-98	91	9430	11498	60.13	-22.14
29-Oct-98	91	9548	11550	76.46	-5.44
12-Nov-98	91	9873	12207	62.72	-25.26
19-Nov-98	91	9877	12319	66.76	-25.24
26-Nov-98	91	10053	12816	69.05	-31.56
09-Dec-98	85	10374	12244	74.4	-1.67
17-Dec-98	98	10551	14531	72.1	-48.93

24-Dec-98	91	10760	14531	60	-59.04
30-Dec-98	85	10983	14531	85	-39.71
07-Jan-99	91	11244	14615	64.99	-41.82
14-Jan-99	91	11242	14817	65.22	-46.6
21-Jan-99	91	11498	14844	71.63	-34.16
28-Jan-99	91	11550	14948	81.15	-27.6
04-Feb-99	91	12106	14942	83.26	-7.73
11-Feb-99	91	12207	14988	88.45	-1.38
18-Feb-99	91	12319	15463	91.83	-7.38
25-Feb-99	91	12816	15566	97.04	10.14
04-Mar-99	91	13262	15725	67.39	-5.2
11-Mar-99	91	13558	15781	84.95	17.5
18-Mar-99	91	15115	15695	76.74	60.11

Table 1 Major Exchange Rate-Based Inflation Stabilization Plans

Programs	Beginning and Ending Dates	Exchange Rate Arrangement	Inflation Rate 1/			Did the program end in crisis?
			Initial 2/	Lowest	Date achieved	
Brazil 1964	March 1964-August 1965	Fixed exchange rate, with periodic devaluations	93.6	18.9	May 1968	No. In spite of switching to a regime of mild devaluations after the August 1965 devaluation, inflation remained stable around 20 % per year until 1974.
Argentina 1967	March 1967-May 1970	Fixed exchange rate	26.4	5.7	Feb. 1969	Yes. The initial 14 % devaluation was followed by further devaluations and an 82% decline in reserves.
Uruguay 1968	June 1968-December 1971	Fixed exchange rate	182.9	9.5	June 1969	Yes. The initial 48 % devaluation was followed by successive devaluations and an 81% decline in reserves.
Chilean tablita	February 1978-June 1982	Feb. 1978-June 1979, pre-announced crawling peg June 1979-June 1982, fixed exchange rate	52.1	3.7	May 1982	Yes. About 65% percent of reserves were lost and by February 1983 the currency had depreciated by 52%.
Uruguayan tablita	October 1978-November 1982	Pre-announced crawling	41.2	11.0	Nov. 1982	Yes. By March 1983 the central bank had lost 90% of its reserves and the peso had devalued by 70%.
Argentine tablita	December 1978-February 1983	Pre-announced crawling peg	169.9	81.6	Feb. 1981	Yes. By April 1982, the currency had depreciated by 40% and reserves fell by 71%.
Israel 1985	July 1985-present	Exchange rate policy had four stages 3/	445.4	7.8	Nov. 1995	No. Inflation has continued to decline gradually.
Austral (Argentina)	June 1985-September 1986	June 1985-March 1986, fixed exchange rate March 1986-Sept. 1986, crawling peg	1,128.9	50.1	June 1986	Yes. By September 1987, reserves had fallen by 75% and monthly inflation was above 10 percent.
Cruzeiro (Brazil)	February 1986-November 1986	Fixed exchange rate	286.0	76.2	Nov. 1986	Yes. By March 1987, reserves had fallen by 58% and by December 1987, monthly inflation had reached 21%.
Mexico 1987	December 1987-December 1994	Feb. 1988-Dec. 1988, fixed exchange rate 4/ Jan. 1989-Nov. 1991, preannounced crawling peg Nov. 1991-Dec. 1994, exchange rate band	190.0	6.7	Sept. 1994	Yes. Between February 1994 and January 1995, reserves fell by 85% and, following the December 1994 devaluation, the peso depreciated by about 100 percent in four months.
Uruguay 1990	December 1990-present	Exchange rate band with a declining rate of devaluation	133.7	24.4	Dec. 1996	No. Uruguay was not much affected by the Mexican crisis, and inflation has continued to decline gradually.
Convertibility (Argentina)	April 1991-present	Currency board with a one-to-one parity to the U.S. dollar.	267.0	0.1	May 1996	No. As the Mexican crisis of December 1994 spilled over, reserves fell by 52% between mid-1994 and March 1995, but the fixed parity was maintained.

Notes: Unless otherwise noted, all pegs are against the U.S. dollar. The fall in reserves is measured with respect to peak reserves during program. Data end in Dec. 1996.

1/ Twelve-month inflation rate.

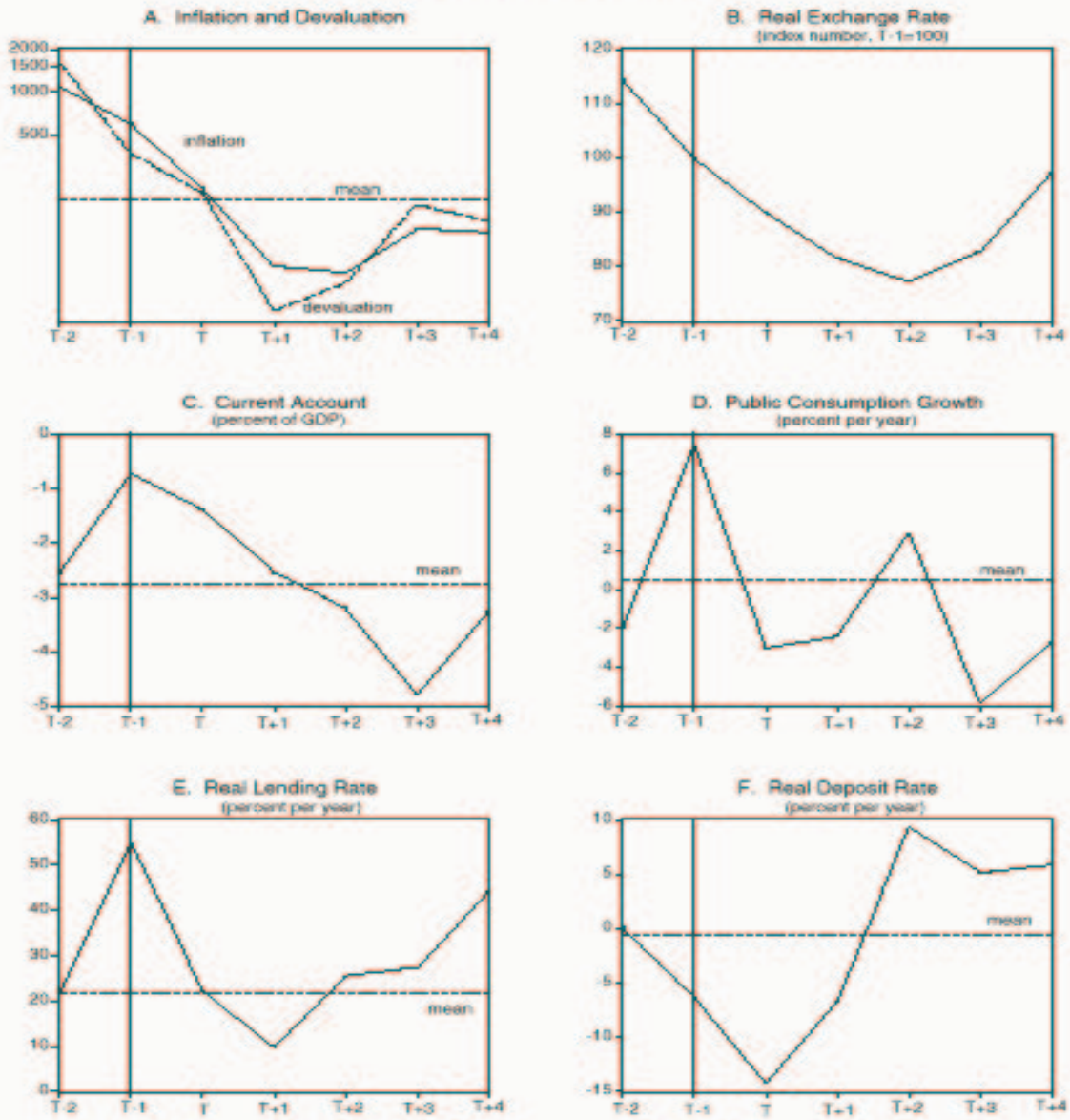
2/ Twelve-month inflation rate in the month in which the program was implemented.

3/ On July 1985, the New Israeli Sheqel was pegged to the US dollar; in August 1986 the dollar peg was replaced by a peg to a basket of currencies. The second phase of the program consisted of a sequence of devaluations during 1987-early 1989. In January 1989 a band with a fixed central parity was introduced. In December 1991 a crawling band was introduced.

4/ The exchange rate fixing followed some initial devaluations between Dec. 15 and Feb. 29, 1988.

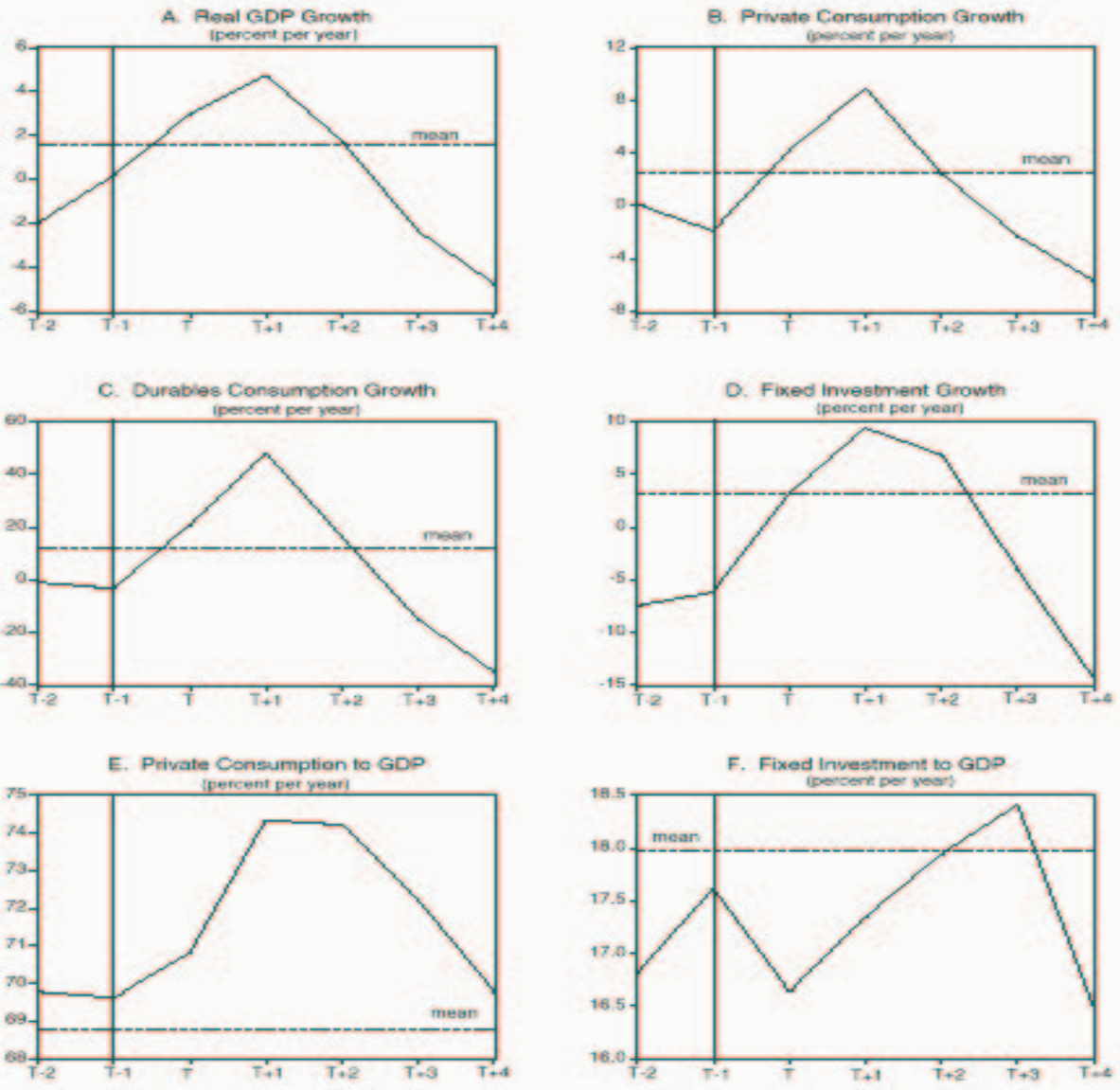
Source: Reinhart and Vegh (1995b), based on data from International Financial Statistics (IMF) and case studies cited in the text.

Figure 1. Exchange rate-based stabilization



Source: See text

Figure 2. GDP, consumption, and investment in exchange rate-based stabilization



Source: See text