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## THE INTERENTERPRISE ARREARS CRISIS IN RUSSIA

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# The Interenterprise Arrears Crisis in Russia

Barry W. Ickes and Randi Ryterman<sup>1</sup>

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**Abstract:** Two American economists discuss in considerable detail the critical problem of interenterprise arrears (overdue payments for goods and services) in Russia that undermines the transition to a market economy and privatization. The study is based on interviews involving directors of 32 industrial enterprises, managers of commercial banks, and Central Bank officials in Moscow, Novosibirsk and Sochi from May to mid-November 1992. In addition to analyzing the causes of the mounting accumulation of debt and highlighting the financial problems of enterprises coping with the crisis, the authors examine the anatomy of present-day banking and extension of credit to finance production in the former USSR. *Journal of Economic Literature*. Classification Numbers: P21, O17, G20.

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## INTRODUCTION

In January 1992, inter-enterprise arrears—overdue payments for goods and services—in Russia were approximately R37 billion. By the beginning of July, the volume of arrears had grown to over R3.2 trillion (Whitlock, 1992, p. 33). This dramatic explosion, an eighty-fold increase in six months, and the subsequent decline in arrears since July, is one of the most important byproducts of the reform process in Russia. The arrears crisis threatened to bring down the financial system and also led to the replacement of the chairman of the Central Bank of Russia, Georgiy Matyukhin, with Viktor Gerashchenko. Since July, the level of arrears has been reduced dramatically. The inflation that resulted from the “resolution” of the arrears crisis contributed to the forced resignation of Yegor Gaydar after the December Congress. But, as shall be shown, the policies that were implemented to reduce the stock of

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arrears accumulated prior to July 1, 1992, have addressed the symptoms but not the fundamental causes of the arrears.

The purpose of this paper is to examine the causes of this extraordinary growth in arrears, and to highlight the financial behavior of enterprises in the unstable economy of present-day Russia. It is not, however, the problem of arrears themselves that motivates the present discussion. The central premise is that the arrears crisis is not so much a cause of problems in the Russian economy, but rather a symptom of more serious underlying problems. The phenomenal growth in arrears in the first half of 1992 were a result, as argued here, of inconsistencies in the economic reform program combined with underdevelopment of the financial system. Understanding the causes of the growth in arrears thus provides additional insights regarding the nature of reform. This perspective also suggests that policies designed specifically to deal with the arrears may be counterproductive.

The problem in the case of Russia (and implicitly in other economies in transition, as well) is that interenterprise borrowing replaced other forms of financial activity, resulting in an explosive growth in the stock of such debt. By the end of June, arrears were about 70 percent of GDP (Lipton and Sachs, 1992).<sup>2</sup> Beginning from such a small base, this explosive growth in debt carried with it the real threat of financial collapse. The policies that have been designed to address the arrears crisis have not attacked the fundamental causes, and therefore threaten the process of economic reform in Russia.

Interenterprise borrowing is not necessarily detrimental. Trade credit is an important component of finance in modern economies. In the United States, for example, total trade credit of nonfinancial corporations was \$973.5 billion in the first quarter of 1992 (Board of Governors, 1992). Trade credit was thus on the order of magnitude of the narrow money supply (M1), and was about one-fifth of GNP. In an industrial economy, firms borrow from their suppliers and customers on a regular basis. There is one critical difference, however, between trade credit in the United States and interenterprise lending in Russia. In the former case, the interest rates that are charged tend to be quite high, certainly higher than interest rates charged by banks (Jaffee and Stiglitz, 1990, p. 879). The nominal interest rate on interenterprise lending in Russia, on the other hand, is almost always zero, translating into a negative real rate. Trade credit in the United States is a means of financing that firms use when they cannot get access to bank credit.<sup>3</sup> The higher interest rate reflects the increased risk associated with the loan. The fact that real interest rates are negative for interenterprise

<sup>2</sup>At the end of July ruble M2 was approximately 14.8 percent of GDP (Lipton and Sachs, 1992, Table 4). This would make arrears at the end of June on the order of five times the size of M2.

<sup>3</sup>Large firms in the United States tend to have greater access to bank credit and the commercial-paper market than small firms. Therefore, large firms often borrow from banks and lend to small firms (Jaffee and Stiglitz, 1990, p. 879).

lending suggests that it is not access to credit but difficulty in selling that is critical.

The problem of large interenterprise arrears is not unique to Russia and the former Soviet Union.<sup>1</sup> As the process of economic transition has severed the connection of enterprise balances to the government budget, the financial losses of enterprises may become manifest in arrears. What distinguishes the experience in Russia is the explosive growth in the level of arrears. The resulting large stock of arrears proved to be a great hindrance to the process of economic reform.<sup>2</sup> It makes privatization of state enterprises problematic by making it impossible to assess the financial viability of relevant establishments. Also, large outstanding debts tended to exacerbate the difficulties of enterprises seeking to secure further credits, especially from banks. Furthermore, arrears are an important mechanism through which the problems of some loss-making enterprises are spread throughout the entire economy. And, the rapid growth in the level of arrears indicates that this phenomenon is more than the natural mismatch of expenditure and receipts in a modern economy.

The development of the arrears crisis is intimately tied to the state of the Russian financial system. Consequently, this paper examines how the current financial structure creates motives for creditor and debtor enterprises to participate in this market. The puzzling nature of this problem is mostly clearly understood in the context of the following question: why do enterprises extend credit, at negative real interest rates, to other enterprises that may not be solvent?<sup>3</sup> While the incentives for the debtor enterprise to accept credit may appear obvious, the incentives for the creditor enterprises to extend credit are not. The present research attempts to answer this question for the case of Russia; however, we believe the growth in arrears in each of the emerging market economies stems from a common base.

## INCENTIVES AND INFORMATION

This paper is organized around two major themes. First, it emphasizes that arrears have arisen because of specific incentive problems in enterprises created by the current financial system. Second, it argues that high levels of interenterprise debt are both caused by and are the

<sup>1</sup>For a discussion of the Romanian case, see Clifton and Kahn (1992), and for the cases of Hungary and former Yugoslavia, see Mitchell (1992).

<sup>2</sup>To a large extent, the growth in arrears reflects the contradictions in the reform process. That is, the arrears have risen precisely because many enterprise directors did not believe that the program's calls for hard budget constraints were credible. As they continued to behave as if it were business as usual, the arrears have materialized as the outcome.

<sup>3</sup>Interenterprise arrears do not bear interest. Hence, given inflation, the real interest rate on this form of credit is negative. Of course, interest could be reflected in a higher price for the good when interenterprise credit is extended. Our interviews with Russian enterprise directors, however, suggest that this is not common.

cause of serious information problems in the Russian economy. It is the interaction between the peculiar system of incentives created by the financial system and the informational problems that have combined to create the explosion in arrears that continues to plague the Russian economy.

### The Structure of Incentives

The current state of the transition in Russia has created a particular set of incentives that enterprises face. In order to understand the behavior of Russian enterprises, one needs to get acquainted with the intricacies of this incentive system as well. Many enterprises are motivated by behavior that does not look like standard profit maximization. These alternative motives stem from the uncertainty that has accompanied the shift from the planned economy to a mixed economy, and the ensuing composite regimes under which enterprises must operate.

At least three important regimes characterize enterprise incentives in the current situation. First, many still operate with soft budget constraints. These tend to be large state-owned enterprises that often are politically important. Many have their roots in the defense sector or in some of the heavy industry sectors that were favored under central planning.<sup>7</sup> These enterprises operate as if it is "business as usual." Evidently, the current financial system fails to place effective limits on their operation.

The second operating regime of Russian enterprises is a semisoft or survival constraint.<sup>8</sup> Under this regime, enterprises anticipate a hard budget constraint with respect to wages, but a soft budget constraint with respect to other production costs. In part, the origin of this constraint is in the monetary system that has been inherited from central planning, which distinguished between cash (*nalichnyye*) and noncash (*beznaichnyye*) rubles. Because wages must be paid in *nalichnyye* and other costs in *beznaichnyye*, constraints on the availability of cash potentially affect enterprise viability.<sup>9</sup> We believe this constraint encompasses most enterprises, including both the state-owned and the formerly state-owned ones.

The third type of operating regime that is prevalent in present-day Russia is the hard budget constraint. This type of constraint is most

<sup>7</sup>Enterprises in cities and towns having only a few enterprises or industries also may have soft-budget constraints. In such municipalities, governments may be reluctant to liquidate or dramatically restructure enterprises in fear of the level of unemployment such policies may induce.

<sup>8</sup>An enterprise that is operating under this regime sacrifices long-term profits for survival. The important behavioral aspect is the emphasis placed on current cash flow as opposed to the long-run value of the assets. One could think of such enterprises as highly risk-averse, maximizing discounted profits with an infinite discount rate. In essence, the enterprise places enormous weight on surviving to next period.

<sup>9</sup>The fact that receivables take the form of *beznaichnyye*, which cannot be used to pay wages, lessens the incentives for enterprises to seek repayment.

common in new enterprises. These enterprises do not expect to receive subsidies; they must cover expenditures out of receipts. Relative to enterprises operating under survival constraints, these enterprises are more likely to take a long-term view in their decision-making. This mixture of operating regimes suggests that enterprises have different motives when they extend credit to other enterprises.<sup>10</sup>

## Information

The second theme of this paper is that high levels of interenterprise debt are both caused by and the cause of the serious information problems that plague the present-day Russian economy. When a country's financial system is underdeveloped, the quality of enterprise-specific information that is available to agents in the economy tends to be low. In this circumstance, the economy lacks institutions that evaluate enterprise-level performance and, so, provide arm's-length information on the value of an enterprise. Without capital markets, information that is necessary to construct balance sheets for enterprises often is missing.<sup>11</sup> Without information on balance sheets, the notions of illiquidity and insolvency become intertwined, making the evaluation of an enterprise's creditworthiness complex.

One of the primary implications of the information problem is that even creditworthy enterprises with the proper incentives might not have access to adequate bank credit.<sup>12</sup> However, other agents in the economy might possess some information concerning an enterprise's creditworthiness, namely its suppliers and customers. This feature provides a basis for the interenterprise credit market.

On the surface, the presence of informal credit markets appears to be an efficient response to a situation where information is both decentralized and costly to collect. It may be the case that only trading partners have adequate information about an enterprise to make a decision about extending credit. However, this conclusion is based on the assumption that enterprises possess hard budget constraints.<sup>13</sup> When enterprises do not possess hard budget constraints, interenterprise lending may exceed

<sup>10</sup>The nature of these differences and their impact on the behavior of enterprises participating in interenterprise credit markets will be described below.

<sup>11</sup>Without capital markets, in particular vis-a-vis ownership rights to assets, one cannot obtain the true market values of most, if not all, assets, and with no way to assess market value it is impossible to calculate net worth.

<sup>12</sup>In an environment of asymmetric information, banks may choose to ration credit rather than charge market rates of interest. As interest rates rise, risk-averse enterprises tend not to borrow, leaving a pool of less risk-averse enterprises as potential borrowers. Thus, unless credit is rationed, banks face a problem of adverse selection. This theory presumes that banks face hard budget constraints.

<sup>13</sup>Prices reflect opportunity costs when there is competition and when enterprises are not receiving *ex post* subsidies (that is, subsidies that are related to after-the-fact performance). When these conditions are absent, prices may deviate from opportunity costs, and hence give improper signals about the allocation of resources, including credit.

(and seemingly has exceeded) efficient levels. Specifically, we find that the process of interenterprise lending, in itself, leads to loss of information. A key part of the payments problem is the collective lack of knowledge about the solvency of trading partners. Enterprises cannot evaluate the creditworthiness of their customers when such customers are also extending credit to their customers. Thus, over time, even enterprises with the proper incentives may not be able to assess the quality of their receivables. This problem not only complicates the process of credit assessment, but also makes solutions that attempt to distinguish between "good" and "bad" enterprises difficult to devise.

It should be emphasized that softness in an enterprise's budget constraint provides only a partial explanation for the extension of interenterprise debt. Many enterprises are concerned with at least some portion of their costs, in particular, those costs that affect the availability of cash rubles to pay workers. At its current state of evolution, the banking system acts as both a payments system and a means of tax collection; hence, the current financial situation, in effect, imposes a tax on using the payments system.<sup>14</sup>

## METHOD OF INVESTIGATION AND DEFINITIONS

This study is based, in part, on two sets of interviews we conducted with enterprise directors, bank managers, and government officials in Russia.<sup>15</sup> In May and June 1992, we conducted interviews in Moscow with the directors of ten enterprises, in both light and heavy industry, and with the managers of three commercial banks. The enterprises ranged in size from 300 employees to over 8,000 employees. The commercial banks included a former branch of Gosbank, as well as a new, privately formed bank. At the same time, we met with officials from the government of the Russian Federation and the Central Bank of Russia. In late October and November, we conducted a second set of interviews, with 22 enterprises, this time in Moscow, Novosibirsk, and Sochi.<sup>16</sup> The enterprises ranged in size from less than 200 employees to over 10,000. The focus of both sets of interviews was on financial aspects of transition and, in particular, on the financial behavior of enterprises in the transition.<sup>17</sup>

<sup>14</sup>As noted below, this linkage induces enterprises to postpone collection of receivables, often by moving payments transactions underground.

<sup>15</sup>These interviews were carried out during two World Bank missions to Russia.

<sup>16</sup>The authors are grateful to Annette Brown, Alan Gelb, and I J Singh—our colleagues on this mission conducted for The World Bank—for access to their interview notes and for helpful discussions on many of these topics.

<sup>17</sup>The interviews in both cases were based on interview protocols focused on the financial behavior of enterprises.

Because of a great deal of confusion in discussions of as complex a topic as arrears, it is especially important to clarify the meaning of key concepts. Accordingly, the focus in this section is on the measurement of arrears and on several key distinctions: debt and arrears, the stock and flow of arrears, and gross and net debt.

Estimates of gross arrears are made by the Russian Central Bank from reports provided by commercial banks. Until July 1, 1992, banks were required to collect all payments in arrears in a separate file, *Kartoteka Dva*; this information was then collected from the banks by the Central Bank of Russia. Thus, estimates of gross arrears reported by the Central Bank include only the portion that is channeled through the banking system. As noted below, all payment transactions legally are required to take place within the banking system. However, as the arrears problem worsened, many enterprises did not submit their billing invoices to the banks. Hence, some portion of the total arrears is unreported. The magnitude of unofficial debt transactions is, of course, unknown.

Three aspects of interenterprise debt often are confused in the discussion of their economic importance. First, the terms *debt* and *arrears* often are used interchangeably. This confusion stems from a lack of clarity in their measurement. In Russia, any debt that remains unpaid for two or more months is identified as a debt in arrears. However, it is quite possible that such debt is not in arrears, because it is contracted on the basis of mutual consent between enterprises that repayment is to materialize during a period exceeding two months. More generally, one may presume that debts that fall in arrears are essentially renegotiated. Given that enterprises continue to extend credit to other enterprises despite the obvious risk, we presume that much of the debt transactions we observe are based on mutual consent. Nonetheless, in order to be consistent with the general discussion of these issues, the terms debt and arrears are used interchangeably.

Second, any discussion of the interenterprise debt problem must distinguish between the existing stock of debt and the flow or growth of debt.<sup>13</sup> Policies that can cope with one of these problems may exacerbate the other. A major problem associated with the stock problem is that it may induce a credit crunch and an associated fall in output, as enterprises are no longer able to continue adding to their debt. But even more important is the loss of information about enterprises that results from the large stock of arrears. Any solution to the stock problem that ignores the incentives for arrears to grow risks not only re-creating the stock problem, but re-creating it on a bigger scale if expectations of future bailouts are ratified.

<sup>13</sup>Much emphasis is placed on the magnitude of arrears. But it is not the size *per se* that is the problem, but rather the incentive system under which lending is made. The stock of arrears outstanding is the result of credit decisions where the agents do not bear the full weight of their actions.

Last and most important, any analysis of interenterprise arrears must distinguish between gross and net interenterprise debt. Often this distinction can be a source of great confusion. Gross debt refers to the total amount of interenterprise debt owed by an enterprise, or the sum of that debt over all enterprises, at a given point in time. Net debt is a more difficult concept. It is easy to define with respect to a given enterprise, simply comprising debt that is not offset by credits from some other enterprise. In the aggregate, however, net debt so defined will sum to zero.

The problem with defining aggregate net debt in this way becomes apparent when one considers the liabilities of an enterprise that cannot cover its debts, even if liquidated. To the creditors of this enterprise, the IOUs are worthless.<sup>19</sup> They neither represent a real claim to resources nor can be used as collateral to obtain credit elsewhere. But the liabilities still exist on the books of the debtor enterprise. In an accounting sense the credit and debit offset each other. But in an economic sense they do not. In the absence of liquidation, the debtor enterprise continues to operate and continues to generate losses. And it is precisely these losses that create a chain of arrears.

It seems fruitful, therefore, to think of net debt as liabilities that will not, or cannot, be repaid, because there are no corresponding net assets.<sup>20</sup> It should be noted that there is no simple relationship between gross and net debt.<sup>21</sup> A small amount of net debt can create a large chain of arrears, as the inability of one enterprise to pay its debts clogs the system.<sup>22</sup> This possibility is especially likely when the payments system is ineffective. When it takes a long time for payments to clear, the failure of a few enterprises to pay their debts can create a chain of arrears. Moreover, once a chain of arrears exists, it becomes extremely difficult to distinguish enterprises that are illiquid due to a chain of arrears from enterprises that are illiquid because they are essentially insolvent.

<sup>19</sup>Except to meet some restrictions about withdrawing the wage fund.

<sup>20</sup>As noted below, net debt can arise from other sources besides persistent loss-makers. Transactions with enterprises in non-Russian parts of the ruble zone appear to be an important source of such debt.

<sup>21</sup>We suggest for consideration the chain of production in a given sector of the economy. The reader may assume that, for each enterprise  $i$  ( $i = 2, \dots, n$ ), there are purchases from enterprise  $i - 1$  equal to 100 rubles and sales, with credit extended, of 100 rubles to enterprise  $i + 1$ . For enterprise  $i = 1$ , a credit of 100 rubles is obtained from a bank. The  $n$ th enterprise, machine tools, sells on credit to a defense enterprise that produces output but cannot sell it. Now, for every enterprise 1 through  $n$ , there is a credit and a liability equal to 100 rubles outstanding. For enterprise  $n + 1$ , there is only the debt to enterprise  $n$ . Hence, net debt in the enterprise sector is 100 rubles. But, since  $n + 1$  cannot pay  $n$ ,  $n$  cannot pay  $n - 1$ , and so on. Hence, there is gross debt of 100 $n$  rubles. Since  $n$  is arbitrary, so is the relationship between net and gross debt.

<sup>22</sup>It is not even necessary that any net debt exist for arrears to arise. Problems in the payments system, if severe enough, can create a chain of arrears when every enterprise is solvent. Nonetheless, the presence of some net debtors appears to be important in the case of Russia.

## THE RUSSIAN FINANCIAL SYSTEM

The present structure of the Russian financial system has its roots in the financial institutions that were inherited from the Soviet period. While many of these institutions have changed in a formal sense (e.g., have become commercial banks), the behaviors they induced still persist and are at the foundation of the problems in the financial system that exist today. This paper identifies three elements of the current Russian financial system that are, in the authors' opinion, at the core of the growth in arrears: the systems of payments, money, and subsidies.

### The Payments System

Under central planning, the working capital of each enterprise was supplied by Gosbank as part of the central financial plan. When the plan was constructed, planners identified the amount of working capital that would be required to produce targeted output. Then, when an enterprise delivered goods to another enterprise, the seller immediately delivered a payment order to its branch of Gosbank.<sup>22</sup> The order would then be delivered to the branch of the enterprise that received the goods. If sufficient funds to purchase the goods were available, the Gosbank account of the purchaser was automatically debited and, correspondingly, the account of the seller was automatically credited.

On many occasions, the account of the purchaser contained insufficient funds to pay for delivered goods.<sup>23</sup> Under these circumstances, purchasers accumulated debts to their suppliers, which were monitored by Gosbank.<sup>24</sup> These imbalances in interenterprise accounts were settled by Gosbank at the end of the production cycle. Gosbank simply provided each enterprise account with the net funds necessary to bring its account into balance, the policy comprising the functional equivalent of a guarantee of solvency for each enterprise.

The monobank structure of the Russian financial system provided the system with its most characteristic features. Because all transactions flowed within the monobank, temporary imbalances in enterprise accounts had no real effects on the flow of production. Gosbank could carry on its books deficits in the accounts of enterprises with no immediate need to settle these accounts. Thus, transactions between enterprises could be recorded in the accounts of enterprises in different branches of Gosbank at the time of transaction without regard to payment.

<sup>22</sup>The fact that the seller delivers the payment order had little effect on the payments mechanism under the old regime. It does, however, play an important role in the new regime, as discussed below.

<sup>23</sup>This problem typically arose when actual production deviated from planned production.

<sup>24</sup>Implicitly, Gosbank extended credit to the purchasers, since the accounts of the suppliers were credited as if they were fully paid.

Technically, under the old system, enterprise accounts cleared at the time of transaction, but were settled at the end of the period<sup>26</sup>—a distinction that is significant because it meant that no one branch of Gosbank needed to hold reserves to settle imbalances in enterprise accounts.

Beginning in 1987, the monobank system underwent a series of reforms, culminating in the dissolution of Gosbank at the end of 1991.<sup>27</sup> Consequently, the branch banks of Gosbank were transformed into independent commercial banks. While enterprises continued to be bound by requirements to conduct all transactions through the banking system, transactions that formerly were *intra*bank became *inter*bank transactions. This change greatly complicated the payments mechanism, although in ways that were not apparent at the time.

Although the demise of Gosbank and the explosion in the number of commercial banks altered the structure of the banking system, much of the infrastructure of that system remained intact. In 1987 there were only six banks in the entire Soviet Union (albeit with many branches). Of course, each of the six was state-owned. They differed in their service function; Gosbank (commercial), Sberbank (savings), Vneshekonombank (foreign), Promstroybank (construction), Agroprombank (agriculture), and Zhilsotsbank (social and small-enterprise sector). Reforms in 1988 and 1989 led to the emergence of new banks, formed as joint-stock companies. By the end of 1991 there were over 2,000 commercial banks in the former Soviet Union, 1,500 of them in Russia alone, with 500 just in Moscow.<sup>28</sup>

The rapid growth of the banking industry is due primarily to three factors. First, chartering rules are rather lax, and capital requirements are not too stringent. Regulatory prohibition of banks' opening branches further increases the incentives for entry (World Bank, 1992, p. 112). Second, many of the commercial banks are former branches of Gosbank (and of other specialized banks) that have become joint-stock companies, keeping their old clientele under a different organizational form. Third, many enterprises choose to found banks to gain access to credit, often at preferential terms. In interviews, enterprise directors explained how investing in a bank allowed their enterprise to move to the head of the line for credit.<sup>29</sup> Being a founder of a bank may also reduce the time

<sup>26</sup>The literature on payments mechanisms distinguishes between clearing and settling. The former involves the transmission of payments instructions, while the latter, the actual transfer of a generally accepted payments medium (Folkerts-Landau, Garber, and Lane, 1992).

<sup>27</sup>Especially significant was the decree of the Council of Ministers promulgated on July 17, 1987, and the law enacted on December 11, 1990.

<sup>28</sup>Additional information on banking in Russia is to be found in World Bank (1992, pp. 105-115).

<sup>29</sup>Interviews gave us the impression that enterprise directors did not draw a sharp distinction between shares and deposits. Shares seem to be bank deposits in another name. But, deposits are subject to reserve requirements (70 percent), whereas shares are counted as bank capital. A bank that invests to gain access to preferential credit is thus able to avoid the "reserve tax on deposits" and at the same time obtain credit. It appears that founders are able to borrow up to three times their founding investment.

lag for collection of receivables. To the extent that enterprise directors believe that ownership leads to preferential treatment, the proliferation of banks will continue.

It should be noted that not all commercial banks in Russia are former branches of Gosbank. Specifically, two other types can be distinguished: association banks, established by groups of enterprises to cater to the needs of the group, and new commercial banks that have entered the industry under private ownership. This picture is further complicated by the increasing tendency of enterprises to participate in the founding of banks to secure access to subsidized credits. The behavior of these banks differs dramatically from that of banks that were former branches of Gosbank. Consequently, their role in the growth of interenterprise arrears differs markedly.

To understand the system of bilateral clearing that has developed since the demise of Gosbank, one must distinguish two levels of the payments system: intrabank (i.e., between the enterprise and its bank) and interbank transactions. At both levels there is a critical need for reserves because of the temporal mismatch of payments and receipts. Under the old regime reserves were not needed; imbalances in enterprise accounts were settled only at the end of the period. Because settlement was fully anticipated, enterprises were not concerned with delayed payment. And, because there was only one bank, there were no interbank payments.

The demise of Gosbank made holding reserves critical. At the intrabank level, reserves are needed to smooth out temporary imbalances in enterprise accounts, as receipts and expenditures often do not match up.<sup>30</sup> These reserves can be held by the enterprise (as a positive average bank balance) or by the bank (by providing overdraft protection to enterprises). The need for reserves is accentuated given that enterprise solvency is no longer guaranteed by the state, at least in theory. Without this guarantee, banks will only extend credit based on the financial position of the enterprise. Given the lack of financial information about enterprise viability in early 1992, the likelihood that banks would provide these reserves decreased dramatically. Hence, enterprises have to hold them.<sup>31</sup> If enterprises do not hold reserves to smooth out payments, and if banks are unwilling to extend credit to enterprises, then payments will be sequential; payments are released only when funds are received. Debts in this case pile up, and are paid according to their priority.<sup>32</sup>

At the interbank level, reserves are needed to smooth out payments

<sup>30</sup>For example, because costs of production must be paid before revenues are received.

<sup>31</sup>If the enterprise was losing rubles prior to January 1992, it could not have built up reserves to enable it to meet payments needs out of its own deposits.

<sup>32</sup>Currently, Russian enterprises are required to pay debts in the order they are incurred. For reasons noted below, this law typically is violated.

and receipts between banks. If banks held deposits at the Central Bank of Russia, and if these were of sufficient magnitude to meet regular activity, interbank payments could still operate in a multilateral fashion through the Central Bank. The Central Bank could establish a payments clearinghouse that would allow for the netting out of payments within the period.<sup>33</sup> In the absence of sufficient reserves, however, interbank payments take on a sequential fashion as well. Each transaction must be recorded and settled before the next one in line is executed.

Without sufficient reserves to make periodic net-balance payments, the system can find itself in gridlock. Each successive payment is delayed because of lack of payment by another participant. Without reserves, settlement can occur only through a sequential, or, queuing system, where payments are made only when the payer has good funds available to transfer in settlement. The problem in this case is that the entire system of payments may be suspended in gridlock, where each enterprise finds its ability to pay blocked by the inability to collect what it is owed. If the system ends up in gridlock, then gross payments in the entire system may be blocked, even though net payments for the period for each enterprise are small relative to available reserves.<sup>34</sup>

Sequential clearing of transactions increases the premium for information about the financial status of enterprises. If accounts are settled rapidly, the current status of a bank account becomes the critical information that is necessary for the purpose of payments.<sup>35</sup> With slow settlement, on the other hand, recipient enterprises and banks are bearing increased risk that the payment will not clear. Accordingly, their demand for information about the financial status of the enterprise increases.<sup>36</sup> The larger the quantity of outstanding transactions at any point in time, the smaller the informational content of enterprise account balances, and the greater the need to know the true credit-worthiness of the enterprise. All told, the change from simultaneous settlement within Gosbank to sequential settlement dramatically increased the informational requirements of agents in the Russian economy.

<sup>33</sup>This procedure is called a netting arrangement. Under such a scheme, at the end of a given time period (two days, two weeks), each agent must deliver to the system sufficient funds to cover its net balance to the system. To implement such a system, it is critical that participants hold reserves that they can use to clear a net debt position. Unfortunately, the financial system currently lacks such reserves. There is also the problem of payments risk. In a private netting system, the participants are jointly responsible for the failure of any participant to pay. Willingness to participate in such a system is therefore related to the perceived reliability of the other participants. Alternatively the Central Bank could assume liability, but such an arrangement could be quite costly for the government.

<sup>34</sup>For an excellent discussion of payments systems, see Folkerts-Landau, Garber, and Lane (1992).

<sup>35</sup>Assuming that there are controls for check-kiting and similar practices.

<sup>36</sup>With slow settlement the current status of a bank account is a poor indicator of financial solvency because of the unknown quantity of credits and debits outstanding. At the same time, slow settlement makes the acquisition of information about the financial state of the enterprise more costly, especially for outsiders. Hence the increased likelihood that credit will be extended by insiders (customers or sellers).

Under the old system, enterprises dealt with the same institution (i.e., branch bank) as they do now, although this institution is now an independent commercial bank. Typically, the institution is headed by the same bank manager as before. But payments patterns that appear to be formally identical to those prior to January 1992 have very different systemic effects because of two factors: the end of the guarantee of solvency and the inadequacy of reserves held in the system to smooth payments. These two factors raised the demand for financial information about enterprises precisely at the moment when the amount available decreased dramatically. Without such information, the newly independent commercial banks are unwilling to extend the same level of real credit to enterprises.

The potential for payments gridlock was magnified further by the system of centralized clearing. As in the old regime, payments are cleared at the top of the banking hierarchy, now at the Central Bank of Russia. This centralization forced the incredibly large mass of payments to flow through a single institution, delaying settlement. The Central Bank maintains a network of approximately 1,400 cash-settlement centers (CSCs), through which payments are made (Summers, 1992). Every branch of every bank maintains an account at its local CSC. Payments flow from the various CSCs and through the Central Bank itself by paper, through the public mail, creating two effects. First, the system utilizes reserves inefficiently, because a bank spreads its accounts over various CSCs. Second, because payments are processed physically, the time lag is further lengthened.

The time delay in settlement exacerbates the liquidity problems of the banking sector because of the nature of the accounting system used by the Central Bank of Russia. The account of the payer is debited when payment is made, but the account of the payee is not credited until the payment is received. In the interim, the funds are, in effect, frozen, creating what is called "payments system float" (Summers, 1992). The longer it takes for payments to be made, the larger is the float. This credit float shows up on the balance sheet of the Central Bank of Russia, but if it is not offset by the Central Bank, it results in a decline in the liquidity of the banking system. Thus, the technical delays associated with processing transactions further worsens the problem of inadequate reserves, which, in turn, exacerbates the problems of the payments system.

The delays in settlement between banks and the difficulties enterprises faced in obtaining working capital combined to bring the payments system to a crawl. Enterprises often were forced to wait for receipts to be credited at the bank before they could make payments. The lag between delivery of goods and receipt of payment became larger. Hence, a mismatch developed between the timing of flows of goods between enterprises in production and the corresponding flows of payments between enterprises.

## Money

A second aspect of the Russian financial system that has contributed to the growth of arrears is the system of money. The Soviet financial system strictly distinguished between cash rubles, or *nalichnyye*, and noncash rubles, or *beznaichnyye*. This distinction arose to provide a mechanism to monitor the behavior of management (*kontrol' rublyom*) and to enforce incomes policy. The government created sufficient cash rubles to pay wages, while at the same time setting the aggregate wage bill to be in balance with the nominal value of retail goods. Noncash rubles could be used by enterprises only to purchase inputs. It was therefore believed that credit extension to finance production would have no macroeconomic consequences.<sup>37</sup>

The distinction between cash and noncash rubles persists in the present financial system. Part of the explanation rests in the continued presence of enterprises with soft or survival constraints. Without hard budget constraints, enterprises would be willing to increase wages regardless of enterprise profitability. As *beznaichnyye* are converted into *nalichnyye*, effective cash emission by the government would increase,<sup>38</sup> with disastrous effects on the control of inflation. Finally, cash rubles are in short supply. If the currency were unified, then holders of *beznaichnyye* would attempt to convert their accounts to *nalichnyye*. But cash reserves in both the commercial banking system and the Central Bank of Russia are simply inadequate to meet the demand.

With few exceptions, official interenterprise transactions are conducted using *beznaichnyye*.<sup>39</sup> This factor has important implications for the behavior of enterprises, in particular for those with survival constraints. Given the official nonconvertibility of noncash into cash rubles, the cost of extending credit to other enterprises is lower than one might otherwise suppose; the debt, if repaid, will be repaid in rubles that cannot be used to pay wages.

During the spring of 1992, most of the financial activity of Russian enterprises was concentrated on obtaining cash rubles to pay workers. For various reasons, some technical (e.g., the 5,000-ruble note was not issued until the summer of 1992, for example), ruble emission during the spring lagged behind credit growth. Many enterprises were unable to pay wages for several weeks, some even for months.

<sup>37</sup>It should be noted that cash rubles are produced only by the Central Bank of Russia.

<sup>38</sup>A unified currency implies that deposit holders would have the right to convert *beznaichnyye* into *nalichnyye*. If credit in the interenterprise sector continued to be easy relative to the cash sector of the economy, the equilibrium rate of exchange between the two forms of rubles would be greater than par. Because unified currency requires cash and noncash rubles to be traded at par, unification would lead to a run on cash, as holders of noncash rubles emptied their accounts.

<sup>39</sup>A wide range of unofficial interenterprise transactions continues to forgo the use of *beznaichnyye*. Cash has long been an important component of second-economy transactions, and barter is also prevalent and on the increase, given the problems with official payments mechanism.

Of course, the difficulty of obtaining cash varies across enterprises. However, in general, an enterprise can obtain cash from two sources. First, it can choose to conduct its financial transactions with banks that have large cash reserves. For most enterprises, such a choice entails using a former branch of Gosbank as their primary bank. For obvious reasons, managing employees of such banks tend to have long-standing relationships with former Gosbank staff, now employed by the Central Bank of Russia, and thus provide superior access to cash and other Central Bank services. Other enterprises may choose to conduct their financial transactions with new private banks. Such banks typically obtain their cash not from the Central Bank but from the interbank market. Because new private banks operate on commercial principles, they only accept enterprises that clearly are creditworthy as clients.

Alternatively, enterprises can obtain cash by engaging in barter transactions. An enterprise that produces a production good (say machine tools) that can only be sold for *bezmencheynye* will trade it for a consumer good (like sugar) instead.<sup>40</sup> Barter thus provides enterprises with the opportunity to obtain goods that can be sold directly to consumers for cash. Enterprises also purchase goods from other enterprises for sale to their workers; this not only reduces the shopping costs for the workers, but also provides a source of cash for the enterprise.<sup>41</sup>

To obtain cash for its wage fund, an enterprise, at least nominally, is required to demonstrate a positive balance in transactions with other enterprises (i.e., that receivables and liquid assets exceed debts). However, it appears that for many enterprises this constraint is not binding. Enterprises use two mechanisms to undermine its effectiveness. Some, such as large or otherwise important enterprises, appear to have true soft budget constraints and can obtain cash regardless of their balance. They can apply directly, or have their bank apply, to the Central Bank of Russia for both cash and credit. Alternatively, some enterprises try to manipulate their balances. Those with survival or hard budget constraints typically hide some portion of their debts, so that their balance may not be accurately measured by the bank. Banks do not attempt to monitor this illegal behavior.<sup>42</sup>

It is precisely this feature of the banking system—its reliance on the

<sup>40</sup>One would think that this would be simpler if the purchaser of the machine tool sold the sugar for cash and then paid cash for the machine tool. Direct barter between enterprises appears to be more prevalent, however. This pattern might arise because it is illegal for an enterprise to sell intermediate goods for cash. An alternative explanation is that the sugar producer seeks to avoid the taxes associated with sales through official channels. Tax avoidance is an important motivation for barter transactions.

<sup>41</sup>The discussion below focuses on procedures used to obtain cash by most enterprises that use former state banks as their primary bank.

<sup>42</sup>When calculating an enterprise's balance, banks do not discount its receivables to reflect the likelihood of collection. They assume all debts will be paid. Of course, even if discounting were attempted, it would be highly inaccurate, because the presence of interenterprise debt confounds any calculation of the likelihood that an enterprise will repay its debt.

net balance criterion as the primary determinant of financial viability—that makes enterprises with survival constraints so eager to extend credit to other enterprises. Because banks do not discount the value of receivables based on their probability of repayment, enterprises in search of cash are nearly as willing to extend credit as to accept *bezna lichnyye* in payment for goods.<sup>43</sup>

## Subsidies

When the economy was centrally planned, the allocation of subsidies was predominantly transparent and fully anticipated. During the production cycle, loss-making enterprises continued to order and receive inputs into production, despite the fact that their Gosbank accounts did not contain sufficient *bezna lichnyye* to repay their obligations in full. At the end of the production cycle, the bank accounts of these enterprises were in deficit. In response, Gosbank automatically would transfer sufficient funds to settle the accounts.

With the transformation of the monobank into a two-tier system of banking, this procedure was eliminated and replaced by a revised system of subsidization. The new system is much less transparent, involving the rationing of limited cash and credit among enterprises.

In part, it is not surprising that financial resources are rationed in an economy such as the Russian one. In an environment of imperfect information, banks will choose to ration credit rather than charge market rates of interest (Stiglitz and Weiss, 1981; Jaffee and Stiglitz, 1990). As interest rates rise, the mix of loan applicants that the bank faces changes. Enterprises with less risky projects tend not to borrow, leaving a pool of enterprises with riskier projects as potential borrowers.<sup>44</sup> Thus, unless credit is rationed, banks face a problem of adverse selection.

However, the nature of the process used to allocate scarce credit in Russia suggests that other economic motives are also at the foundation of rationing. Political influence and historical relationships appear to be among the most important criteria. The Central Bank distributes credit to commercial banks, often at subsidized rates. These subsidies are paid from the Russian budget and may be directed to either specific industries (by providing them to banks serving the subsidized industries) or to specific enterprises. In the latter case, either the enterprise (if large) or the enterprise's commercial bank applies to the Central Bank for a

<sup>43</sup>The most important reason why banks do not discount receivables is that they have very poor information about the quality of these notes. And, it is precisely because the banks do not discount receivables that enterprises likewise do not. Indeed, it is often in the interest of the latter to inflate the value of receivables.

<sup>44</sup>Enterprises with less risky projects drop out because they are more likely to pay back a loan; hence, a higher interest rate is of more concern to them. An enterprise with a high-risk project is less likely to pay back the loan, so the higher interest rate is less of a concern.

credit subsidy. If awarded, the commercial bank must provide the credit to the enterprise at a rate of interest that is equal to the Central Bank rate plus 3 percent. This nominal rate is far below the rate of inflation in Russia.

In this context, managers are unwilling to wean themselves from former state banks for two reasons. First, former state banks are more likely to act as conduits, or transfer agents, for credit and credit subsidies.<sup>45</sup> Second, managers fear that new commercial banks (i.e., private banks that were never part of the state banking system) will extend credit on the basis of creditworthiness rather than need. When we asked why less successful enterprises are often charged lower rates of interest than more successful ones, the chairman of one of Moscow's largest commercial banks responded by suggesting that if he charged higher interest rates to the state enterprises (to reflect the greater risk), they would just borrow more. "This would make it harder for them to pay their debts," he opined, "and could cause a collapse of the whole economy."

In their drive to obtain scarce financial reserves, many enterprises have resorted to establishing their own commercial bank. This action provides the founder with priority access to Central Bank credit. Typically, enterprises participate in the founding of one of two types of banks. First, they may participate in the transformation of a former branch bank of Gosbank into a commercial bank. Second, they may participate in the founding of an association bank. Association banks are commercial banks that are founded collectively by a former ministry and its associated enterprises. Some of the association banks are capture banks (members of the association are forced to use them for all banking services), while others do not bind members to use bank services. Association banks appear to pursue two goals. They try to obtain credit from the Central Bank for their member enterprises and they cross-subsidize enterprises (by providing differential interest rates on deposits and differential access to loans) in the industry to facilitate its survival.

The presence of institutions, such as association banks, that evolve primarily to facilitate the allocation of subsidies to special interests complicates the government's drive to move to a system of market incentives, and it is the absence of these incentives that appears responsible, in a large part, for the rapid escalation in interenterprise arrears.

## CAUSES OF THE GROWTH IN ARREARS

As noted in the introduction, the explosive growth in interenterprise arrears is the product of a complex set of causes. It is clear from the

<sup>45</sup>Our interviews with directors of commercial banks as well as officials of the Russian government suggest that it is not the banks but the government that bears the credit risk of subsidized loans.

timing, however, that the explosion that began in January and February 1992 corresponds to a regime change that includes the demise of the Soviet Union and the corresponding changes in economic policy. We will now focus on three aspects of this regime change: the creation of a ruble zone, the introduction of the Gaydar program of tight money and price reform, and the consequent interaction between open inflation and the tax system.

The regime change drastically altered the economic environment for enterprises. The effects of the regime change on the economy critically depend on how the behavior of agents is altered. In the present case, the behavior clearly varied, partly depending on the nature of the constraints facing enterprises. Those facing hard budget constraints could be expected to adjust more rapidly to changes in the environment than those with soft or semisoft budget constraints. We take these differences into account in the ensuing discussion.

The response to a regime change also clearly depends on how expectations are affected. If the policy program is not credible, agents will not react in the manner envisaged by policy makers. Changes in beliefs may prompt such policy makers to take actions they would prefer to avoid. In particular, it may be necessary to shut down an enterprise to make the threat of bankruptcy credible. In the absence of such actions, agents may proceed as though nothing changed. This lack of credibility appears to have played an important role in the generation of arrears.

## The Ruble-Zone Payments Problem

The dissolution of the Soviet Union plays an important role in the growth of arrears.<sup>46</sup> In this new economic environment, the role of ruble-zone trade in creating net arrears, and the complications that this system introduces to monetary and credit policy, are of considerable significance.

The replacement of the Soviet Union by 15 independent countries has, of course, altered the mechanism for trade between the former republics. Under the Soviet system, the volume of interrepublican trade was very large.<sup>47</sup> This trade continues, but now these transactions are more complex. Although no longer a single country, Russia and the former republics participate in a ruble zone,<sup>48</sup> which, it is maintained, facilitates trade by allowing the use of a common currency. This argument is especially evident in the enterprise sector. Enterprises have long

<sup>46</sup>For additional details, see Noren and Watson (1992).

<sup>47</sup>Trade among the former republics accounted for as much as 90 percent of their total. Although the volume of trade was large, there are strong reasons to believe that this partly was the result of diversion that will decline over time. For additional discussion, see Michalopoulos and Tarr (1992).

<sup>48</sup>Estonia has recently issued its own currency, and Ukraine essentially has as well. For more on the implications of introducing independent currencies, see Goldberg, Ickes, and Ryterman (1993).

traded with each other without the need to use an economically meaningful money and independent currencies would introduce a new layer of payments between them.

With the end of all-union institutions at the end of 1991, the old system of clearing across republics ceased to operate. Banks in the 14 former republics are no longer part of the same payments and collection system as Russian banks. Now noncash payments between the countries are cleared through bilateral correspondent accounts at their central banks.

This devolution of the banking structure greatly increased the lag in payments. In the case of the former Soviet Union, that lag poses a special problem because enterprises are simply maintaining relationships that were developed when they were part of a unified economy. Hence, the conduct of payments between former republics as operations between central banks (when the constituent enterprises act as if they are still part of the same economy) transforms routine transactions into international ones.

A special dimension of the problem is added when payments flow between former republics that continue to use the Russian ruble as their primary currency. Enterprises in any country in the ruble zone can choose to pay for inputs in either cash or noncash rubles. Transactions in cash can be conducted speedily, even when enterprises are in different member countries; cash transactions do not need to flow through central banks. On the other hand, transactions in noncash rubles are subject to the lags noted above; routine transactions that took several days prior to 1992 now take as long as two months.

Given the exceptional delay in payments that arises between enterprises in different countries in the ruble zone, one questions why enterprises ever choose to use noncash rubles.<sup>30</sup> In part, the explanation lies in the domination of enterprises with survival constraints in the economies of ruble-zone countries. Because cash rubles are necessary to pay wages, they are held at a high premium. However, another part of the explanation can be traced to the shortage of cash rubles that arises as a consequence of the international division of cash rubles, as we explain below.<sup>31</sup>

Russia's relations with the rest of the ruble-zone countries are an important generator of domestic net arrears. Its large trade surplus with the other countries in the ruble zone<sup>32</sup> is primarily financed in one

<sup>30</sup>There is, of course, a premium for cash rubles. But, why are enterprises unwilling to pay this, given the costs in delay of using noncash rubles? Of course, for enterprises outside Russia it is even more difficult to acquire cash rubles.

<sup>31</sup>Another reason is that continuing use of the same medium of exchange lowers the costs of trade between enterprises that are now in different countries.

<sup>32</sup>Although Russia's trade balance with the rest of the members of the ruble zone shows a surplus in world prices (Noren and Watson, 1992, p. 92), the relevant magnitude for our purposes is the surplus in rubles.

of the following two ways. First, the surplus can be financed by the domestic expansion of noncash rubles. The technical delay in clearing noncash transactions in the ruble zone contributes to the high level of interenterprise debt in Russia (and in the other ruble-zone countries as well). Second, the surplus can be financed directly by Russian enterprises, which deliver inputs without receiving payment. In this case, the ultimate lender may be the Russian government, which provides the Russian enterprise with an implicit supply of credit.

With each central bank within the ruble zone able to create *beznalichnyye*, there is a strong tendency towards inflation. Each central bank has an incentive to take a "free ride" on the other members of the zone. If a central bank issues credit to an enterprise, the benefits primarily remain within the country. But the inflationary effects of this expansion are felt throughout the ruble zone. Moreover, each central bank realizes that the other central banks face the same incentives. And all of the countries of the ruble zone, with the exception of Russia, are small in relation to the zone as a whole. Hence, their credit expansion will have a relatively small independent effect on inflation. But then each central bank is faced with an overwhelming incentive to expand credit even further. The outcome of this situation should be hyperinflation.

Why then has hyperinflation not yet arisen? The reason is that only the Russian Central Bank can issue *nalichnyye*, which is nonetheless needed throughout the zone to pay wages. A credit expansion in any of the countries of the ruble zone increases the demand for *nalichnyye*. This occurs through the effect on the price level, as well as through any resulting increase in production. Russia can use the supply of *nalichnyye* as a check on credit issue in the other parts of the zone—a powerful weapon used by the Russian Central Bank to check the inflationary tendencies inherent in the ruble zone.

There is, however, a policy dilemma that the Russian Central Bank must face. Net debt in Russia is created when enterprises in the other ruble-zone countries are unable to repay their loans to Russian enterprises. Interestingly, the Central Bank of Russia may, in part, be responsible for the delay in, or default, of payments. To avoid importing inflation from the rest of the ruble zone into Russia, the bank is reluctant to provide the other countries with adequate cash. A cash emission abroad may increase the trade surplus and, consequently, the flow of goods out of Russia. However, in limiting the supply of cash, the Russian Central Bank risks escalating the level of default on loans provided by Russian enterprises to enterprises in the other ruble-zone countries. As non-Russian enterprises become unable to obtain sufficient cash to pay their workers, many of their workers will leave; their debt to Russian enterprises may fall in arrears and, in fact, never be repaid.

To illustrate this problem, the following simple example is helpful. Suppose that each of the ruble-zone countries has a separate currency, and that there is a fixed exchange rate between them. Then, to trade

with a Russian enterprise, an enterprise in Belarus' would need to purchase rubles from the Central Bank of Belarus'. If Russian exports exceeded imports, then the Central Bank of Belarus' would find its reserves of rubles dwindling. Thus, the quantity of reserves held by the Central Bank of Belarus' would provide a limit to the size of the imbalance in trade.

In the current situation, the Belarusian enterprise uses the same currency as the Russian one. In this case, the trade imbalance does not manifest itself as a change in the reserve position of the Central Bank. Instead, Belarusian enterprises can continue borrowing from the Belarusian government or from Russian enterprises without a natural check to the process.

Now, suppose at least some enterprises in the non-Russian countries in the ruble zone are persistent loss-makers. Then, interenterprise debt *within* Russia cannot be cleared, even if there were no loss-making enterprises in Russia. As the chain of arrears in Russia lengthens, Russian enterprises may be unable to make payments to enterprises in Belarus'. Notice that it is even possible that the gross arrears of Russian enterprises to enterprises in Belarus' could be larger than the arrears in the opposite direction, even though the chain of arrears started with a Russian trade surplus with Belarus'. This problem is particularly significant given the size of the Russian trade surplus with the rest of the ruble zone.

Thus, as in the case of the loss-making enterprise, arrears from enterprises in other ruble-zone countries can generate arrears in Russia, which can in turn generate arrears from Russian enterprises to enterprises in other parts of the zone. Just as in the case of the loss-maker, the intra-ruble zone arrears stall payments by enterprises at one end of a long chain of payments, creating gross arrears that can be a large multiple of the net arrears that start the process.

## Price Liberalization and Tight Money

The key elements of the stabilization program initiated by Gaydar were the liberalization of prices, combined with a tight-money, tight-credit policy, and the replacement of the turnover tax with a value-added tax and a profits tax.<sup>32</sup> It was believed that, in combination, these policies would provide enterprises with a signal of the government's commitment to market incentives. This section focuses on the effects of the stabilization program on the growth in arrears. The specific effects of the changes in the tax system are discussed in the next section.

The impact of the stabilization program in Russia is believed by some to have three very different effects on production. First, the increase in

<sup>32</sup>The rate of the VAT has varied since it was announced in December 1991. It is currently 29 percent for goods that still are not subject to price control.

prices, combined with tight monetary policy, caused the real level of credit in the system to decline. As a consequence, enterprises were unable to obtain sufficient bank credit to finance production.<sup>53</sup> Therefore, they resorted to extending credit to one another. Second, changes in government priorities and consumer preferences, in part communicated by a change in relative prices, signaled the need for adjustment in the enterprise sector. Third, the tight-credit policy proved much more effective in constraining household purchasing power than with respect to enterprises. This policy led to a mismatch between the aggregate demand for final goods and aggregate supply. In all cases, however the extension of interenterprise debt provided enterprises with a mechanism to resist adjustment to the new structure of demand. Each of these hypotheses is examined in greater detail below.

**The Credit-Crunch Hypothesis.** The most apparent impact of the stabilization program is the appearance of open inflation. Between January 1 and June 1, the price level in Russia increased on the order of 15 times (*Commerzant*, June 23, 1992, p. 17).<sup>54</sup> By some accounts, inflation reached 2,500 percent in 1992 (*The Moscow Times*, January 15, 1993, p. 1). The rise in prices drastically reduced the real volume of credit in the economy. Enterprises that were due payment at this time saw their reserves decreased because of this revaluation.<sup>55</sup> This decline in the real level of credit played an important role in the growth of arrears.

The effect of price reform on the commercial banking system is evident when one compares the value of commercial bank assets on January 1 and May 1 of 1992. While prices increased on the order of 12.3 times, commercial bank assets increased only 1.6 times (*The Economist*, July 18, 1992; p. 85). Hence, the real value of commercial bank assets declined precipitously. The growth in the price level thus wiped out a large portion of the nominal reserves held by enterprises and banks. Consequently, the Central Bank of Russia was faced with a dilemma: either allow a large number of enterprises to collapse under the weight of a lack of credit or finance working-capital needs out of current credit emissions. This factor made it harder for the Central Bank to stick to its tight-credit policy. Reserves that were adequate for a repressed price level were no longer adequate for the post-January price increases. In

<sup>53</sup>The implications of stabilization programs in the former socialist countries on the supply of credit and the impact on production have been studied in a series of papers by Guillermo Calvo and Fabrizio Coricelli (e.g., 1992).

<sup>54</sup>By August inflation was approximately 10 percent per month (Lipton and Sachs, 1992). The ruble collapsed from 162 to the dollar in August to a low of 450 (to buy) in late November 1992 (*The Moscow Times*, January 15, 1993, p. 11). The All-Russian Exchange Bank quoted a range of 440 (to buy) to 482 (to sell) rubles per dollar on January 14, 1993 (*Izvestiya*, January 16, 1993, p. 1). Apparently, inflation has accelerated to nearly 50 percent per month (*Commerzant*, December 22, 1992, p. 13). This acceleration reflects the change in credit policy that was implemented as part of the plan to deal with arrears.

<sup>55</sup>Of course, some enterprises gained, as the real value of their payments fell. The only way, however, for the increased reserves of the "winners" to become available to the "losers" is via interenterprise lending!

practice, the Central Bank of Russia essentially took a middle ground. Credit emission was not large enough to compensate for the lack of credit, but too large to credibly signal a commitment to the tight-money policy.

One important consequence of the credit crunch is disintermediation. The fall in the real value of reserves weakened the banking system and made it relatively unable to meet the credit needs of enterprises. On the asset side, commercial banks were ineffective at attracting deposits from households (who prefer to hold deposits in Sberbank, the savings bank).<sup>36</sup> With the banking system lacking the resources to meet the task, enterprises resorted to allowing their debt to fall into arrears. Arrears represents the use of nontinancial sector intermediaries for credit needs. Hence, it reflects disintermediation. This behavior is socially costly because such bilateral lending does not channel credit to the most socially valuable uses.<sup>37</sup>

Many banks that made working-capital loans in January and February found themselves in arrears when enterprises fell behind in payments. Banks became more conservative in lending criteria. Thus, enterprises could not borrow from banks to settle interenterprise liabilities, precisely because banks found they could not distinguish between the quality of potential borrowers.

One of the major effects of a credit crunch is a decline in output, as enterprises lack the working capital to finance production. Thus, the credit crunch could be taken as an explanation of the current recession that Russia is experiencing.<sup>38</sup> The mechanism is straightforward. The shortage of credit made input purchases more difficult for enterprises. Interenterprise credit is a substitute for bank credit, but it is not a perfect one. Real resources are used to obtain interenterprise credit. Directors, for example, must often expend a good deal of effort to obtain such credit, and to maintain good relations with their bankers. Moreover, interenterprise credit is by its nature a localized market; hence, enterprises without access to these markets often experience a decline in production.

**The Composition-of-Demand Hypotheses.** Following the imposition of the stabilization program in January 1992, the structure of demand changed. In part, this change was a consequence of a change in government priorities; government demand for military goods fell. This shift

<sup>36</sup>Commercial banks acquire funds by borrowing from Sberbank. But, the rise in (official) prices since January 2 should have led to a decline in deposits, or at least to a decline in the growth of deposits.

<sup>37</sup>Note that the problem is not just that interenterprise lending leads to a localized credit market, but, more importantly, that the lack of information about the financial state of enterprises means that credit is extended without sufficient information about solvency. This information problem is discussed later.

<sup>38</sup>Industrial output in the first six months of 1992 was about 15 percent below the level for the same period in 1991. According to the Institute of Forecasting, output in metallurgy will fall 27 percent in 1992, and in light engineering, 33 percent (see *The Economist*, August 8, 1992, p. 62).

in priorities rippled through the economy as a shift away from producer goods to consumer goods. In addition, for the first time, the variety in consumer tastes could be communicated (although imperfectly) to enterprises via the price mechanism. Thus, subtle changes in the structure of demand occurred as well.

As a consequence, enterprises were faced with the need to adjust to the new structure of demand. However, many enterprises, including those facing an upsurge in demand, lacked the resources to correctly identify and respond to changes in the market. Other enterprises anticipated correctly that the demand for their goods was declining. In either case, enterprises wishing to survive developed a strategy that would enable them to continue obtaining the cash necessary to pay workers. By extending credit to other enterprises, they could ensure continuing demand for their output and the survival of their important customers. As long as they collected receivables in excess of their debts, they were ensured access to sufficient cash to pay their wage bill.

A problem arose, however, when final goods were produced. At the end of the chain of production, the customer had a hard budget constraint. In the case of consumer goods, the customer was the individual. In the case of military goods, the customer was the government. In both of these cases, the customer did not or could not accept credit and goods remained unsold.<sup>59</sup> An accumulation of inventories results.<sup>60</sup> A problem only arises when the final good cannot be sold; in this case, the final producer is unable to pay its suppliers, who are unable to pay their suppliers, and so on. Thus, a chain of arrears is created.

For this change in the composition of demand to lead to arrears, it is critical that enterprises that face declines in the demand for their products react in ways other than cutting production. Thus, to a great extent, this hypothesis assumes that enterprise directors did not believe that the change in regime was credible and/or that the behavioral response by enterprises takes longer than the architects of the regime change might have hoped.

**The Aggregate-Demand-Shock Hypothesis.** The stabilization program carried out by the government has led to the much noted cash shortage. Some economists have suggested<sup>61</sup> that this cash shortage has

<sup>59</sup>One implication of this process is an accumulation of inventories. It should be noted that this accumulation may occur at any and all stages of production, depending on the willingness of the enterprise to adjust production to demand. In fact, between November 1991 and April 1992, retail sales tripled in nominal terms, while the nominal value of output increased nearly eight times (*The Economist*, August 8, 1992, p. 62). This phenomenon is explained, presumably, by the accumulation of inventories. Further, there are frequent press reports about the accumulation of inventories of various goods by enterprises, bricks being a notable example.

<sup>60</sup>At the end of an interview we conducted in Moscow in June 1992 with a producer of women's shoes, the director proudly showed us his really valuable assets: a yard, almost the size of his factory, filled with bricks!

<sup>61</sup>Most notably, Sachs and Lipton (1992).

led to an aggregate demand shock that is an important cause of arrears. After price liberalization, noncash ruble emission and interenterprise credit grew faster than cash-ruble emission from the Central Bank. Thus, the real supply of *beznaichnyye* rose relative to the real supply of *naichnyye*. This expansion enabled enterprises to continue producing intermediate goods. With a shortage of cash, consumers were unable to purchase the aggregate quantity of goods produced. Thus, as the ratio of noncash rubles and credit rose relative to cash rubles, the potential for unsold inventories at all stages of production to accumulate also rose.<sup>62</sup>

This observation suggests a policy approach that is different from that implied by the credit-crunch hypothesis. According to the credit-crunch hypothesis, more credit should be supplied through the banking system to prevent enterprises from lending to each other.<sup>63</sup> The aggregate-demand-shock hypothesis, however, suggests that the culprit is the shortage of cash relative to noncash rubles.

The aggregate-demand-shock hypothesis has an important implication for thinking about policy towards the arrears. If this hypothesis is correct, then the proper policy response may require more rubles to be printed. As these rubles are used to purchase final goods, the economy will be stimulated and inventories will decline.<sup>64</sup> An extension of credit would only worsen the situation, since it would cause an even larger imbalance between *naichnyye* and *beznaichnyye*. Since the problem is the imbalance between the two types of money, an equivalent policy might appear to be tighter control of *beznaichnyye*. This is inherently difficult, however, as the very growth of arrears demonstrates.

Notice that the credit-crunch and the aggregate-demand-shock hypotheses contrast sharply. According to the former, the decline in bank credit constrained production, causing a leftward shift in the aggregate-supply curve. The aggregate-demand-shock argument asserts that the recession occurred because the demand for final goods from households fell relative to production as real cash balances fell relative to real credit and noncash rubles. Thus, the aggregate-demand curve shifted leftward. The credit-crunch view predicts that output is too low; the aggregate-demand-shock view predicts that it is too high relative to the purchasing power of the population.

<sup>62</sup>This argument assumes the absence of equilibrium prices. As inventories of goods accumulate, their prices should decline ultimately to a point that enables consumers to purchase the final goods with the given supply of cash. However, evidence suggests that a certain amount of relative-price rigidity exists in the Russian economy, preventing this type of adjustment.

<sup>63</sup>Of course, this response presumes that banks are able to allocate credit to fiscally sound enterprises. Otherwise, the expansion of credit could signal enterprises that the government is unable to commit to a policy of hard budget constraints.

<sup>64</sup>This argument presumes that the emission of cash will not stimulate the expansion of interenterprise credit.

## Tax Avoidance<sup>95</sup>

One important consequence of price liberalization is the transformation of hidden inflation into open inflation. The Soviet economy experienced inflationary pressure, but this was manifested in the prices for goods in the second economy, in longer queues in official markets, and in hidden inflation.<sup>96</sup> Price liberalization has resulted in inflationary pressures being channeled into official prices. Open inflation, surprisingly, has serious consequences for the creation of arrears because of the nature of the payments system and the way taxes are collected in the state sector.

The new value-added tax system was implemented in Russia on January 2, 1992. The tax is 28 percent of value added. Crudely, value added is defined as cash receipts less cash expenditures for raw materials and other inputs except for wages, with some allowance for depreciation. Receipts and expenditures are officially booked when a soft-ruble, *bezna-lichnyy* (bank deposit) payment in settlement of a claim is made through a bank.<sup>97</sup> Thus, the marginal tax on settlement of receipts through the banking system's payment net is 28 percent for unprofitable enterprises. In addition, there is a unified profits tax of 32 percent, the base of which also is determined from the same cash accounting principles. Hence, for profitable enterprises, the effective tax rate on using the payments system to settle the marginal receipt is 60 percent.

The implementation of the value-added tax has had an important effect on the functioning of the payments system.<sup>98</sup> The collection of this tax is essentially performed by the banking system. When a payment clears the account of the recipient is credited, and the amount of the value-added tax that is owed is collected. Using the banking system as a collection department was inconsequential in the old regime. With open inflation, however, this arrangement has had a major impact. Because of the high tax on using the traditional payment mechanism in an inflationary environment, enterprises choose to either delay payment of their bills or settle their accounts without bank intermediation.

<sup>95</sup>The following section draws heavily on notes written by Peter Garber and the first author.

<sup>96</sup>Under the old regime, the official prices of goods were controlled. Often, enterprises would rename goods to obtain a higher price. This phenomenon is called hidden inflation.

<sup>97</sup>Retail operations that receive currency are supposed to deposit the funds in a bank, at which time the receipt is booked for purposes of tax calculation.

<sup>98</sup>Specifically, a new system of taxes, which included a value-added and a unified-profits tax, was implemented at the beginning of 1992. Given the cash- (as opposed to accrual-) based accounting systems used in Russia, income and profits are not recorded until a payment works its way through the banking system. Under the Soviet system, financial transactions were designed to monitor the transactions of enterprises. This feature has remained in the current system. Thus, transactions conducted using banks are automatically subject to a high tax. In an inflationary environment, the real level of these taxes can be reduced simply by delaying collection on receivables and, so, the incidence of profits.

To make the argument, suppose first that the environment is one of fully creditworthy enterprises facing this cash-accounting tax system in a period of high inflation.<sup>29</sup> Because transactions are not counted in the taxable base before settlement occurs, enterprises can reduce their real tax bills by delaying payment. Suppliers encourage the postponement of settlement by their acquiescence to the nonpayment of invoices for creditworthy downstream buyers. To receive the tax benefit from such postponement, both parties should book prices at current market values at the time of the initial transaction. When settlement of these nominal amounts is eventually effected, the real value of the tax will have declined. To cover the depreciation of the nominal amount finally settled between the two parties and to permit payment of wages due in currency (which are the leakage from the interenterprise credit system), there will be a side payment in cash, *naichinye*, or in barter upstream from the buyer to the supplier.

For this arrangement to work, enterprises must be able to choose the order in which IOUs are paid. There is strong evidence that enterprise directors are in frequent contact with their bankers to determine which bills should be paid. It appears to be the case that suppliers extend credits to long-term customers. Presumably, these are the customers with which side payments can be most easily negotiated.

But it is not just avoidance of taxes through postponement that is at work here. The tax on use of the payments system also induces enterprises not to send documents through official channels at all. When asked if payments were kept off the books, enterprise directors answer, "Of course." As we noted earlier, this behavior is strictly illegal, but it is also rapidly becoming a widespread practice. However, because it is illegal to circumvent the payments system, a large fraction of payments and receipts generally would have to be booked through the banking system to avoid attracting the attention of the tax authorities.

The tax on using the payments system also induces barter. By engaging in barter with other enterprises, transactions can be prevented from appearing on the ruble-sales account (i.e., are not recorded as official sales). Barter can thus provide a mechanism for avoiding the VAT and the profits tax. It is difficult to disentangle the tax-avoidance motive for using barter from the payments-problems motive. Nonetheless, interviews with enterprise directors do indicate that barter is a means of tax avoidance. What prevents all transactions from being driven underground, besides the high cost of barter transactions, is the need to record ruble sales in order to qualify for the wage fund.

<sup>29</sup>Cash accounting as opposed to accrual. Accrual-based accounting is hardly known in the former Soviet Union. Taxes are paid when payments clear. Even if taxes were assessed on an accrual basis, the fact that they are not due until payment clears would enhance the effect discussed in the text. If, on the other hand, taxes were due on an accrual basis, then enterprises would face either a strong incentive to demand payment quickly, or to hide an even larger portion of transactions by taking them underground. Accrual-based accounting in Russia is clearly not the norm in Russia at present.

Even if enterprises that are uncreditworthy are added to the picture, the risk of loss from default may be lower than the certain loss due to tax, especially for highly profitable enterprises facing the excess-profits tax. Possibly, bankrupt enterprises can, to some extent, be cut out of the circle of transactions by the sounder enterprises insisting on quick settlement from them and settling with them, i.e., by paying the payments tax.<sup>70</sup> A good analogy to this situation is the relationship among members of a clearinghouse and their relationship as a group with nonmembers—nonmembers are required to settle more frequently.<sup>71</sup> If loss-making enterprises are in fact cut out of the circle, then, paradoxically, enterprises with large arrears may be more viable than enterprises with small arrears.

This tax-avoidance game would only emerge in a situation in which the participants anticipate rapid inflation so that postponement of nominal taxes due will reduce the real tax burden. If, in any case, government expenditures are so excessive that they can be funded only through inflationary finance, this incentive to avoid the payments system will exacerbate the inflation by expanding the fiscal deficit. Even without such excessive expenditures, there is a possibility of multiple equilibria, one inflationary and one stable. Suppose that the government lacks sufficient credit to raise revenue through bond sales or through foreign borrowing and that its expenditures are not flexible. If enterprises anticipate that the government will run deficits financed through money creation, the consequent anticipated inflation gives them the incentive to avoid the payments mechanism to reduce their tax bills. The decline in real tax collection from delayed payment, known as the Olivera-Tanzi effect, in turn ratifies the enterprises' initial anticipation of deficit-driven inflationary finance. Again, this incentive emerges because the cash-based accounting principles converts the payment mechanism into the primary tax-collection mechanism, effectively imposing a high tax on settlement. It is no surprise that most enterprises will elect to engage in an alternate, untaxed payment system with a much longer, even indefinite, settlement interval. Alternatively, if enterprises believe that government revenues will be sufficient to avoid inflationary finance, they will have no incentive to avoid settlement through the bank payments system, and the value-added and excess-profits tax base will be booked at the proper time.<sup>72</sup>

This loss of revenue is clearly one of the reasons why the government

<sup>70</sup>If this is the case, then the system has the result of requiring uncreditworthy enterprises forced by the others into effecting rapid settlement to pay higher taxes.

<sup>71</sup>Note that even if an enterprise is not creditworthy in the formal sense it may nonetheless participate in such schemes if there is a strong likelihood of a bailout. The only reason why such enterprises may be excluded is if directors believe that there is a strong likelihood that such enterprises will be closed down.

<sup>72</sup>If delays lower the real value of tax collection, and lower tax collection increases money creation, then inflation will result, which supports the expectation of inflation that starts the process.

worries about the arrears problem. If this argument is correct, then one would expect to see that enterprises are in arrears with "good" relations, since cooperation and trust are needed to successfully engage in tax avoidance.

## CONCLUDING COMMENT

A key assumption of the Gaydar reform program was that enterprises could be induced to behave like market-oriented firms. Subsidies were to be completely eliminated and enterprises were supposed to operate on hard budget constraints. For this program to succeed, it was critical that enterprise directors believe that, in the event of insolvency, the enterprise would be shut down. This set of beliefs, combined with a tight-credit policy, would induce enterprises to restructure, and would serve as a restraint on prices as enterprises responded to falling demand.

The problem, of course, was that this policy regime was not credible. Enterprise directors did not believe that the government would be willing to tolerate the unemployment consequences that would result if a large number of enterprises were closed. This, then, is the central dilemma of market reform. Inducing enterprises to respond to market signals requires that directors believe that they face hard budget constraints. If such beliefs arise, then in the face of a fall in demand enterprises will cut the prices for their products and lower production. Making such adjustments may in fact reduce the amount of unemployment that will occur in the transition. But to change beliefs enterprise directors must believe that the rules have really changed. The problem is that to signal this the government must be willing to tolerate some unemployment, and the shutting down of some enterprises. In the absence of such a signal enterprise directors may believe that it is "business as usual." Rather than adjust behavior, many enterprise directors instead have continued to behave as if softness in budget constraints would persist.<sup>73</sup>

Indeed, the belief that budget constraints are soft or semisoft is self-fulfilling, in part because it leads to the creation of interenterprise debt. Enterprises that are uncertain of their viability (or are certain of their nonviability) may be willing to engage in risky behavior if it leads to increased chances for survival. By extending debt to other enterprises, they begin a cycle that leads to a loss of information about the quality of receivables of all enterprises, thereby reducing the government's knowledge about the viability of any one enterprise.

A strategy of not paying one's bills is almost certain to result in

<sup>73</sup>The growth in the influence of Arkadiy Vol'skiv and his Union of Industrialists and Entrepreneurs and of the calls for a change in economic policy that were made in the April 1992 meeting of the Congress of People's Deputies must have had the effect of significantly reducing the likelihood that hard budget constraints would be enforced.

adverse consequences if carried out in isolation. It is precisely the "strength in numbers" that makes such a strategy viable. Because of the loss of information, policies aimed at rewarding "good" enterprises and punishing "bad" enterprises cannot be implemented. Not only can the "bad" enterprises pool with the "good" because of the large number of enterprises, but they are also aided by the deterioration in financial information caused by the chain of arrears.

The accumulation of massive levels of interenterprise debt by Russian enterprises, therefore, has far-reaching consequences for the success of economic reform. In particular, it confounds the evaluation of the financial viability of enterprises, and undermines the transformation of enterprise-level incentives. Progress in economic reform requires that a solution to the arrears problem be found.<sup>74</sup> A comprehensive solution to the arrears crisis cannot, however, be isolated from the incentive and information problems that are fundamental to the growth in arrears. An understanding of the relationship between interenterprise arrears and the information and incentive problems described here is a prerequisite for any final resolution of the crisis.

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