

# Working Paper

## Financial Position of Russian Enterprises under Transformational Crisis

*Andrey Klepach*

WP-96-125  
November 1996



International Institute for Applied Systems Analysis ■ A-2361 Laxenburg ■ Austria

Telephone: +43 2236 807 ■ Fax: +43 2236 71313 ■ E-Mail: [info@iiasa.ac.at](mailto:info@iiasa.ac.at)

# Financial Position of Russian Enterprises under Transformational Crisis

*Andrey Klepach*

WP-96-125  
November 1996

*Working Papers* are interim reports on work of the International Institute for Applied Systems Analysis and have received only limited review. Views or opinions expressed herein do not necessarily represent those of the Institute, its National Member Organizations, or other organizations supporting the work.



International Institute for Applied Systems Analysis ■ A-2361 Laxenburg ■ Austria

Telephone: +43 2236 807 ■ Fax: +43 2236 71313 ■ E-Mail: [info@iiasa.ac.at](mailto:info@iiasa.ac.at)

## Foreword

The Economic Transition and Integration (ETI) Project at the International Institute for Applied Systems Analysis (IIASA) started a research activity on the behavior of Russian enterprises under liberalization, privatization and restructuring in 1995–1996. This activity originated upon the initiative of the Ministry of Economy of the Russian Federation. The major reason for focusing on this subject was the fact that the current state and further transformation of Russian medium and large sized enterprises became a challenge for the continuation and success of transition related reforms. Despite certain positive tendencies, numerous enterprises still adjust themselves to ongoing changes without considerable market adaptation and modernization. The emerging ownership structure and financial markets demonstrate limited positive influence on stockholders' incentives, decision-making process and strategies of restructuring.

In the course of these enterprise studies, a workshop on “Russian Enterprises on the Path of Market Adaptation and Restructuring” was organized at IIASA on 1–3 February 1996. Russian and Western experts, extensively working in the area of enterprise performance under transition, focused the discussions on recent empirical findings and analyses concerning the following issues: typical models of enterprise behavior; development of the financial situation at the enterprises and its determinants; impact of emerging markets and competition on enterprises; the consequences of privatization and patterns of restructuring; and enterprise social assets divestiture and conversion. The workshop arrived at both analytical conclusions and recommendations for policy measures stimulating “constructive” enterprise behavior. Possibilities for a joint research project on the motivations and behavior of enterprises in transition economies were also discussed.

The circulation of selected workshop papers as IIASA Working Papers is undertaken in order to provoke broad discussions of presented analytical results. This study by Dr. Andrey Klepach reveals interlinkages between the transformation of the former state enterprises into market-oriented companies and macroeconomic equilibrium.



# Contents

<b>Abstract</b>	<b>1</b>
<b>1 The Enterprise in the Transformational Crisis</b>	<b>1</b>
<b>2 From Loose to Tight Budget Constraints: The Change of Structure of Enterprises' Active and Passive Operations</b>	<b>3</b>
2.1 Relative Isolation of Financial Capital from Production Capital . . . . .	4
2.2 Forced Self-financing and the Burden of Arrears . . . . .	6
<b>3 Main Trends of Enterprises Behavior in the Stabilization Environment</b>	<b>8</b>
3.1 Production and Demand . . . . .	8
3.2 Financial Condition . . . . .	9
3.3 Factors Restraining Growth . . . . .	10
3.4 Enterprises Differentiation . . . . .	10
<b>4 Types and Models of Production Activities</b>	<b>11</b>
<b>5 Principal Results of Econometric Analysis of Production Activities</b>	<b>14</b>
5.1 Relation of Production to Demand . . . . .	15
5.2 Dependence of Production on Enterprises' Financial Condition . . . . .	16
5.3 The Relation Between Demand and Financial Factors of Production . . . .	17
<b>References</b>	<b>17</b>
<b>APPENDIX: Figures and Tables</b>	<b>19</b>



# Financial Position of Russian Enterprises under Transformational Crisis

*Andrey Klepach\**

## Abstract

The purpose of this paper is to analyze the financial position of Russian enterprises under conditions of transformational crisis. The analysis is based on the official statistics and enterprise surveys. The main thesis is that the change of a state-owned plan-regulated enterprise to a capitalist-oriented firm creates sustainable financial disequilibrium. This disequilibrium takes the form of the shortage of revenues for financing enterprise investment and maintaining its production and labor potential. Most enterprises adapt to the new economy of shortages through the sharp reduction of output, employment cuts and the increase of debt.

The finance deficiency is constantly propagated in the course of price competition of sectors for the share of cumulative income and the high cost-push inflation related to it, as well as in the change of production structure in favor of sectors with low value added.

In 1994–1995, the transformational crisis moved to a new stage. A considerable number of enterprises have learned to survive in the crisis situation and their behavior with respect to production is increasingly determined by effective demand and financial conditions. While the change from the planned economy to market-financial regulation can be regarded as virtually completed, macroeconomic equilibrium which implies a substantial change of macroeconomic conditions, remains a long-term prospect.

## 1 The Enterprise in the Transformational Crisis

The financial and production behavior of Russian enterprises in 1992–1995 was determined by a combination of various crisis (non-equilibrium) processes:

- The change of a state-owned enterprise that used to operate in the planned, government-run economy of shortages, to a market-oriented capitalist corporation. This is one of the aspects of the transformational crisis and resulting output decline [3, 4, 11, 12];

---

\*Dr. Andrey Klepach is Senior Research Fellow at the Institute of Economic Forecasting, Russian Academy of Sciences in Moscow, Russia.

- The Soviet industrial model characterized by the high resources to output ratio, militarization and the limited consumption complex of poor quality has expended itself [6, Nos. 3, 4–5];
- The demand and production squeeze resulting from the financial stabilization policy (the reduction of government expenditure, contraction of credit emission and an increase in the real interest rates);
- The depreciation of financial assets and decreased propensity for investment resulting from high inflation, with the factors of inertia, costs, sectoral rivalry mostly prevailing over those of demand and monetary policy [6, 9].

In the course of conventional cyclical demand-determined crises, enterprises expropriate stocks and cut back on borrowing, which increases self-financing despite a decrease in the rate of return. In the depression phase, investment in stocks and liquid assets grows. At Russian enterprises undergoing transformational crisis, the structure of assets and liabilities has a different pattern. Despite the trend towards the stabilization of production in 1994–95, the enterprises' solvency and the share of investment in liquid assets kept declining (although at a slower rate), which suggests that the process of depressive stabilization was not over yet. Thus, one can describe the situation at the beginning of 1996 as the stagnation phase rather than sustained stabilization of the enterprises' economic and financial position.

Under the concept of transformational decline, output decline is inevitable as the plan-induced compulsion to extensively utilize most of the capacities is removed and unprofitable products are discarded [3, 4]. This “shedding” of uneconomic behavior was supposed to have resulted in the improvement of enterprises' financial position after a period of adaptation to price liberalization and the contraction of government subsidies. However, in the process of change from 1992 to 1995 the Russian economy was characterized by the steadily reproduced distortions of the volume and structure of fund and resource flows, lack of coordination in the movement of the functional forms of capital (commodity, productive and financial capital).

Disequilibrium that has taken the form of a considerable number of loss-making enterprises finding themselves on the brink of bankruptcy may be explained by the following factors: (i) the process of the state-owned, plan-abiding enterprise conversion to the private capitalist corporation is not over yet, (ii) the efficient mechanisms of insolvent enterprises' sanation are lacking, and (iii) governmental deflation policy is not stringent enough.

However, the inconsistency of the government's financial policy and the endogeneization of money supply, the inefficiency of sanation mechanisms need to be explained as such, which includes explanation at the microlevel. The capitalization process of enterprise behavior generates crisis processes itself as it requires substantial restructuring of enterprise assets in favor of financial capital, brings about tighter budget constraints, is

accompanied by increased uncertainty in the enterprise environment and the instability of contractual relations between economic agents [8, 11].

The lack of partnership between economic agents, the burden of structural disproportions in the Russian economy, inadequate monetary and fiscal policy coupled with the intensive cost-push inflation, cause the enterprise adaptation to the demand squeeze and financial constraints to go along the paths of output and investment cuts, arrears and a fall in liquidity rather than curbing price growth and reducing costs. It is not so much a monetary economy as a debt economy that is being formed [9, 10]. From the position of the superstructure over the mechanism of self-financing, the inter-enterprise arrears and arrears to the financial sector are turning into the leading factor for enterprise survival. These are becoming the price enterprises have to pay for preserving the production/technological potential and social infrastructure. They also are the shock-absorber of inter-sectoral and corporate contradictions.

The transformational crisis in the Russian economy is now entering its second stage: **the first stage (1992–1993)** — the disintegration of the centralized planning system and transition from the seller’s to the buyer’s market in the situation of an acute sales crisis, deregulated (in general), but non-equilibrium prices; **the second stage (1994–1996?)** — the increase in enterprise adaptability to the crisis, with the intermediate demand coming to the fore with regard to the regulation of production, the restriction of inter-enterprise arrears and the tightening of financial relations.

The second stage of the crisis is marked by the depressive stabilization of production and a slow-down of inflation. However, it is too early to mention either the beginning of recovery (in 1996, it is buoyancy at best) or the end of transformation in the sense of attaining macroeconomic balance and the formation of efficient businesses capable both of survival and strategic development.

It is not unlikely that in Russia, the transformational crisis will not result in the formation of a firm (even a managerial-type firm) with the free, self-sufficient development of financial capital. Instead, it may be a kind of company-family, (a corporation-community comparable to the Japanese corporation) where the capital flow is subordinated to the retention and renewal of “a firm’s identity”, its human, network and productive capital [2, 7].

## **2 From Loose to Tight Budget Constraints: The Change of Structure of Enterprises’ Active and Passive Operations**

In the course of reforms, Russian enterprises have encountered a tightening of financial constraints which was qualitative rather than quantitative in nature. The persistent shortage of current assets and the “bureaucratic withdrawal of profits” inherent to the centralized planning system were considerably relaxed in the late eighties, as the change to

“full cost-accounting and self-financing” was taking place. The share of profits transferred to the budget dropped from 60% in 1980 to 49% in 1988 (the share of retained earnings increased from 36% to 41%). During this period of “creeping” into the transition phase, loose budget constraints became even more relaxed, while enterprise behavior became more financially (capitalist)-oriented.

1992–1995 saw a radical change of the functional role of enterprise finance and, in spite of arrears, a drastic tightening of financial constraints. From the perspective of reproduction enterprise financial constraints can be roughly divided into two groups:

1. **Constraints on the income side** — receipts from sales, enterprises’ disposable income (value added, net profits).
2. **Budget constraints** — sufficiency of their own funds, the possibility to cover the shortage of their own funds by external financing, the level of solvency.

In our view, the criterion of financial constraints tightness should not be reduced to the costs of external financing [4]. The number of bankruptcies in the transitional economy cannot be used as a measure either. In the situation of external financing contraction, a more appropriate measure is the costs of survival through self-financing, which implies that the level of entrepreneurial activities (e.g., output) matches the flow of receipts and the accumulation of capital. The additional factors of the tightening of financial constraints are the uncertainty of financing terms, high risks involved in attracting external resources and investment, and the deformation of the passive assets structure towards short-term investment.

## 2.1 Relative Isolation of Financial Capital from Production Capital

The disbalancing of capital turnover is quite peculiar compared to the money squeeze situation in the Russian economy. It is assumed that the indicator of the shortage of financial resources is the acceleration of their turnover rate (money velocity) against a certain level which can be estimated as balanced. For the monetary sphere, it could be considered that this level was reached in mid-1991 when, following the partial adjustment and liberalization of prices (Pavlov’s reforms), a relative equilibrium had been achieved on the consumer and investment goods markets [10]. The ratio of money supply M1 to GDP rose from 64% in 1985 to 74–76% in 1990–1991 when, in the course of the mass switch-over to self-financing, enterprises considerably increased their current assets (an almost 50% growth versus the average level of the 80s). At the same time, this increase, is partially related to the accumulation of excess inventory and the onset of the receivables growth (Table 3).

The price liberalization and the ensuing high inflation led to a sharp increase in money turnover velocity (5–6 times), while the rate of enterprise working capital turnover

dropped rather than increased. With production having declined practically by half over four years, the period of working capital turnover increased from 160 days in 1991 to 280 days in 1992 and then decreased to 140 days (near pre-reforms level) (Table 4). At the same time, the turnover rate of the net working capital (less payables) increased, though to a lesser degree than money velocity (the former fell from 116 to 70 shipment days).

Under these conditions, the restoration of the pre-crisis output requires a considerable increase in the capital turnover rate or its amount, but the demand for current assets cannot be estimated without taking into account shifts in their structure. While the supplies (so-called material parts) accounted for almost 70% in the structure of the current assets of a resource-oriented state-owned enterprise, at a transitional-type enterprise operating in the inflation and decline environment, financial assets are prevalent (about 60%) (Table 3). By the estimates of managers (CEOs), based on surveys, the shortage of supplies amounts to nearly 50%.

A much discussed report by the Federal Agency for Insolvency (Bankruptcies) (FUDN) states that the main causes of the arrears are the predatory use of borrowed funds by the senior managers of large enterprises and the generation of deficiency of capital serving production purposes. The way the FUDN sees it, is the profit-producing assets include inventory and advance payments to the suppliers. Such an approach raises serious objections. Radical changes in the structure of the Russian enterprises' working capital are a fact of life. However, there are no abuses on the part of the senior managers (though they do occur, and the implemented privatization model has paved the way for them) that play the crucial role here. Rather, this is inherent to the change of a "self-financed" enterprise working under a government agency (branch ministry) to a capitalist-type corporation operating under the conditions of an unprecedented crisis.

To begin with, the functioning of capital does not only need material components, but at the very least, also funds in bank accounts. In the situation of demand deficiency, the swelling of stocks slows the turnover and raises costs rather than increases profits. The level of stocks in industry was relatively stable in 1992–1993 (nearly 100 days) and dropped to 55–60 days in 1995. The internal contradictions inherent in the accumulation of the profit-producing assets are indicated by a change in the stocks structure. In the economy, the ratio of the finished goods inventory to stocks rose from 26% in 1991 to 50% in 1992 which, to a great extent, was a transformation-based effect (the Kornai effect of transition to the market behavior model). In the first quarter of 1994, this ratio was 60% which had been caused by the demand deficiency and the spread of barter trade.

Thus, a large part of working capital, materialized in production ("finished goods" and production assets), is, in fact, isolated from the further stages of production and profit-making. To a great extent, the working capital increases due to the financial superstructure (cash and receivables). While in 1989 financial or borrowed capital (financial assets less funds in current accounts) amounted to about 15% of industrial enterprises' current assets, in 1992–1995 it was nearly 60–65%. The transformation of an enterprise into a quasi-bank is due not only to the peculiar features of the Russian economy of short-

ages, but also to the general nature of a “simple” production entity change to an agent of the economy, of financial (and credit) markets, and to the increase in transaction costs.

At the same time, the financial component of working capital plays a major role in maintaining the production process, i.e., it is not entirely isolated from the profit-producing assets. This takes a number of forms: (a) the receivables and payables make up for the effective demand and funds deficiency; (b) transition to the market economy deprives money of the passive role that it used to play under centralized planning and enhances the importance of money capital in the turnover process; and (c) the liquidity level turns into a criterion of survival and production regulator.

What is really deficient is not the current assets or tangible profit-producing means. Rather, these are highly liquid, mobile (primarily, financial) resources (from the side of enterprise assets) and their own funds (from the side of enterprise liabilities). As current assets become increasingly sufficient, the level of mobile funds sufficiency (including the balances of hard currency accounts) in industry fell from 18 days in 1991 to five days in the first half of 1995. The shortage of highly liquid current assets is a microreflection of the general money shortage, but it has its peculiarities. Primarily, it is the support of liquidity by means of hard currency accumulation, hence a relatively heavy dependence of enterprise finance on the exchange rate and exports, which was fully reflected in the introduction of the exchange rate corridor. In addition to this, in 1995 payments with Treasury bonds, the development of the GKO (T-Bill) market, and an intensification of the property intertwining process have caused enterprises to increase short and long-term financial assets (that exceeded the money balances more than twice).

## **2.2 Forced Self-financing and the Burden of Arrears**

In the late 80s, industry was developing in the direction of self-financing, however the transformation crisis coupled with the liberal monetarist model made enterprises dependent on borrowed funds (the share of their own funds fell from 50–60% to 20% of the working capital). In 1992–1993, the spiral of arrears originated; the increase in the receivables entailed the growth of payables at a more rapid pace (because prices for raw materials and supplies were rising faster than those for manufacturing). High inflation depreciated the accumulated arrears, while the seigniorage was confined to the drop in money balances in enterprises’ accounts (Table 6). The nature of payables and receivables changed at the beginning of the second half of 1994. The opportunities of arrears offsetting sharply decreased as payment relations were becoming tougher, and the attractiveness of financing through borrowing diminished due to a decrease in inflation.

The disbalance between liquid assets and debts was reflected in a drop in solvency ratios and the contraction of production expenses. While the current liquidity ratio exceeded the bankruptcy-safe level in 1992 (the ratio of current assets to current liabilities was 2:1), in mid-1995, practically all sectors became formal bankrupts (current liquidity ratio of 1.2). The crucial part of the solvency is the availability of funds to meet debt

obligations. While the recommended ratio is 0.2–0.3:1 (which was characteristic of late 1991–beginning 1992), the actual level by the beginning of 1995 was 0.1:1 (for cash — 0.05) (Table 5). Under these conditions, the payables begin to depend on the lack of gross profits rather than on the receivables. From the source of output support, they are increasingly turning into a barrier for production.

The insolvency of enterprises and an increase in the share of loss-making enterprises (up to 26% of industrial enterprises in 1995 versus 10–11% in 1990–1991) is another token of the capital turnover disbalance and the conflict between the structural realities of the Russian economy and price liberalization. Let us point out the following essential characteristics:

- (a) The lack of profits and other sources of the enterprise own funds. According to Belousov's estimate, the surplus of the real sector profits (with depreciation charges included) which was 6% of GDP in 1991 (21% of enterprises' requirement) was replaced in 1992 by the deficit of 16% of GDP (27% income requirement), and in 1994 amounted to 17% of GDP (33% of requirement) [6, Nos. 4–5]. This deficit is spurred on by the growth of costs of supplies (especially the costs of energy which rose to 16–17% against 6% in the 80s). In addition, a considerable portion of profit is inflationary and swallowed by arrears.
- (b) The structure of profits changed sharply in favor of the fuel and energy sector and export-oriented metallurgy (almost double compared to the pre-reform period). The price these sectors had to pay for their leadership was having to act as a forced donor to the manufacturing industry through the customers' arrears [6].
- (c) The enterprises switch-over to self-financing (inter-enterprise arrears were the internal source of financing for industry as a whole) was forced as the outside financial support from banks and the budget sharply declined (Table 1). The swelling of commercial lending was encouraged in 1993–1994 by the expensiveness of bank loans, which was indicated by the interest rates exceeding the rate of return, given the turnover rate (Table 2) [1, 5, 6].

In 1995, the potential of redistributing resources within industry through arrears to suppliers was expending itself. With decreasing profitability the arrears-ridden industry has to apply for borrowed funds. However, the fragility of financial markets, the generally low savings, expensive and unaffordable bank loans block the normal market mechanisms of channelling populations savings to industry, which has led to an increase in enterprise arrears to the budget.

By the amounts of loans extended in the form of tax arrears, the budget has already replaced the banking sector. While in late 1994, tax arrears in industry were about 80% of the debt to commercial banks, in the third quarter of 1995 they were over 120%. At the same time, the ratio of tax arrears to the overdue payments to suppliers increased

from 30% to 45%. The isolation of enterprise financing from the budget never completely occurred.

### **3 Main Trends of Enterprises Behavior in the Stabilization Environment**

#### **3.1 Production and Demand**

The stabilization of industrial production in the latter half of 1994–1995 is closely related to the slow-down of decline in domestic and the expansion of external demand. Surveys show that enterprises largely assess domestic demand (and the portfolio of orders) as deficient (the negative appraisal balance). As of mid-1994, the demand situation showed signs of improvement (Figure 1). To a large degree, this resulted from the money infusion in mid-1994 and the stabilization of real money supply in 1995.

The effect of monetary policies on production at enterprises is becoming increasingly indirect, for not all the fluctuations of the money emission are transformed into a change in demand and the replenishment of enterprise liquid resources. In addition to this, industrial enterprises only account for about 22% of funds in the settlement accounts of enterprises and organizations (or nearly 4% of M2). Demand has a positive effect both on production and prices for manufactured products. In 1995, with relatively tight monetary policy and the acceleration of cost-push inflation (primarily on the part of natural monopolies), the price movements were becoming less sensitive to change in demand (Figure 2).

1994–1995 saw a number of new trends in the production to demand relation:

1. Enterprises did their best to eliminate excessive inventories of finished products, and that markedly limited the self-sufficiency of production. According to the surveys of the Institute for the Economy in Transition (IET), in the fourth quarter of 1994 the balance between enterprises with excessive and deficient inventories was virtually reduced to zero. In the second half of 1995, the negative effect of decline in demand was mitigated by the inventory increase above (the general managers' assessment) the normal level (the stabilization of the aggregate appraisal of demand and inventories, Figure 1). The enterprises' shift to the policy of accelerated inventory turnover was caused both by the generally increasing financial constraints on enterprises' operations and the pressure of high real interest rates. With the increasing financial constraints and expensive credits, "the freezing" of the working capital in the excessive inventory became unaffordable.
2. Disequilibrium of demand and supply. While in 1993–first quarter of 1994, according to the general managers' appraisals (Russian Economic Barometer — REB), production was above the level of normal demand, beginning mid-1994 output was steadily lagging behind normal demand (about 15%). The IET's surveys also indicate the disappearance of excessive production by early 1994 and the convergence

of the normal demand and output levels in 1995. Subjective appraisals of the ratios of normal to actual values of supply and demand corroborate: (a) the data of the surveys indicating that the major production bottlenecks are accounted for by other factors than demand, largely financial ones; and (b) the existence of the production growth potential with the current demand pattern.

In the fourth quarter of 1995 this ratio appeared to be disturbed (according to IET's estimates) due to the sharp demand squeeze which threatened with a new wave of production decline. Moreover, this excessive supply runs counter to the output and demand convergence expected by enterprises and discernible at the moment (Figure 3). All this makes the demand-encouraging policy very relevant.

3. Surveys inadequately reflect demand generated by exports (the IET has been monitoring these since 1995), which boosted the raw materials sector and promoted the stabilization of the industrial output index. As the ruble appreciated, the appraisals of export demand started decreasing (in the fourth quarter of 1995 they were 12% lower than in the first quarter), while the overall index of enterprises' dissatisfaction with export demand is three times lower than the values related to home demand.

## 3.2 Financial Condition

The enterprises' short-term financial condition is represented by their earnings and expenses pattern, the availability of working capital and their ability to pay on debt obligations. The main trends of the financial condition during stabilization are:

1. The stabilization in 1995 of the availability of the working capital, especially highly liquid, along with the acceleration of stock turnover. This stabilization was perpetuating the lag between output and potential demand.
2. With the slowing inflation and the long-standing production crisis, the enterprises' financial condition depended upon the availability of funds in their accounts rather than upon the profitability and earnings dynamics (Figure 4). One should also note the sharp increase of "competition for liquidity" between payments to suppliers, those to the budget and wage payments. Unfortunately, the surveys do not reveal the changes in enterprises' liquidity.
3. The adjustment of depreciation charges for inflation and profits growth in 1995 notwithstanding, a trend towards the decrease in the availability of net working capital to enterprises persisted, which triggered the growth of payables — especially to the budget system (Figure 5). While in late 1993–early 1994 the tax arrears were about 24% of the overdue payments to suppliers, by late 1995 they rose to 40–45%, with the absolute amounts of tax arrears steadily outrunning the amounts of bank loans to industrial enterprises (though compared to the budget, banks provide more liquid resources).

The surveys of the Centre for Economic Analysis provide appraisals by enterprises of the availability of internal (not borrowed) financial resources which is closely related to the appraisals of enterprises' financial and economic condition. The drop in the balance of internal funds availability from  $-17\%$  in June to  $-26\%$  in October was accompanied by the declining appraisal of industrial enterprises financial condition from  $-47$  to  $-49$ .

### **3.3 Factors Restraining Growth**

As enterprise behavior becomes more commercially motivated and their monetary policies tightened, their production activities increasingly depend on their financial state (though in late 1995 the relative significance of demand has somewhat grown). As potential demand failed to be realized, liquid financial resources were causing problems rather than inventories ("production assets", using the terminology of the Federal Agency for Bankruptcies). Arrears, due to their low liquidity and toughening of the terms of inter-enterprise settlements, turned from an output-supporting (1992) to an output-restraining factor, thus enhancing the negative effect of cost-push inflation. Their role was reversed in mid-1994, when the arrears, instead of propping up production, started to keep afloat enterprises which were at a standstill. Econometric calculations corroborate the negative effect of the growth of receivables as well as the growth of receivables and payables ratio on output in 1994–95.

The demarcation line between demand-determined and financial factors is not clear-cut. Current assets are a demand-forming factor with respect to inventories; their level is linked to the prices for enterprises' products and thereby to the state of demand. At the same time, financial assets (especially receivables and financial investments) have their own movement pattern which is significantly different from the production and demand movement; this results in a gap between the production level, corresponding to potential demand, and financial resources available.

According to REB estimates, enterprises considered demand deficit to be the principal cause of production decline in 1992 (the ratio of demand appraisal to the appraisal of financial resources as the output-constraining factors exceeded 1). In 1993–early 1995, the biggest production bottleneck was working capital. In structuring the causes of industrial enterprises stoppages, financial constraints became prevalent, although this shift only occurred in late 1994.

### **3.4 Enterprises Differentiation**

What characterizes the stabilization period is the expansion of the group of enterprises that are steadily increasing output, have growing inventories and are in a relatively healthy financial condition (they evaluate it as "good" or "normal"). On the other hand, this group represents a minority of industrial enterprises including, in all likelihood, those who have learned how to survive rather than those who displayed the ability to develop production and attain a good financial and economic condition.

While during the period of the accelerated fall of output the share of relatively successful enterprises (REB survey data) was declining at the same pace as the industrial output index, in 1994–first half of 1995 this group of enterprises was growing against the background of the stabilization of general industrial trends (Figure 7).

It should be noted that the discrepancies between the dynamics of general industrial output indicators and financial indicators shown by the surveys might be due to the fact that the sample included mostly medium-sized enterprises, while the financial problems are more serious with large-sized enterprises, which accounts for the lower average output figures. The surveys practically failed to cover the “flops” where losses and stoppages are typical. According to GOSKOMSTAT (the State Statistics Committee of the Russian Federation) data, in 1994–95 the average of about 5,000 enterprises, i.e., about 25% of all industrial enterprises, had stoppages and sustained losses. Thus, the unsuccessful group is only slightly smaller than the successful one which, according to the REB estimates, included 29% of the enterprises in 1995 (up from 24% in 1994 and down from 36% in 1993), with a sharp growth of both groups having occurred almost simultaneously in mid-1994.

Surveys conducted by the Centre for Economic Analysis show a higher share of the enterprises which were satisfied with their financial and economic condition: about 50% of the sample (or about 2% of large- and medium-sized industrial enterprises), but the share of those that assess their position as “good” is only 1–2%. The gap between the data of the above surveys probably reflects both the structural element (the survey conducted by the Centre for Economic Analysis better represents raw materials producers) and the appraisal gradation (satisfactory/good).

It is evident that the factors bringing about the success of the enterprises are specific to individual enterprises and related to the style of management, labor relations, the specific features of production and the market niche found. At the same time, the surveys show that the dynamics of the successful group correspond to the other trends. The Centre for Economic Analysis surveys indicate that the share of enterprises satisfied with the level of output is practically the same as the share of those satisfied with their financial condition, which confirms a close relationship between financial activities and production. An increase in the portion of enterprises that are in a good and normal financial condition depends both on the ability of the companies to expand the portfolio of orders and output and the pace of price rises (consequently, the profitability level). At the same time, the number of enterprises increasing output has been steadily outrunning the number of those who are in a financially sound condition (by about 20% in 1995) which testifies to a certain conflict of financial and production priorities.

## 4 Types and Models of Production Activities

The classical theory of the firm views the operations of an enterprise primarily from the standpoint of the maximization of the firm’s objectives (output or market share — for a competing firm; profit — for a capitalist firm; value added — for an enterprise with strong

participation of employees in management), given resource limitations. For an enterprise operating in a transition economy Kornai developed the following approach. Instead of the optimization problem, to the fore comes the challenge of tightening budget constraints and changing the comparative role of factors limiting output, with the main role played now by demand and financial factors, as opposed to the factor of material resources. If the establishment of a relationship between demand/financial constraints and industrial output is the imperative of the transition period, then the comparative effect of these factors and the structure of demand and financial parameters are largely determined by the behavioral elements at the microeconomic level.

In 1992–1995, four principal types of production behavior can be identified in the Russian economy. The main difference between them lies in the relation of factors limiting output and in the structure of financial parameters — rather than in the objectives which enterprises seek to attain. We do not claim that these types cover the whole variety of behavioral patterns of enterprises. They classify production activities from the perspective of tightening enterprise budget constraints and the related change in the production decline factors. We are not examining behavior based on the monopolistic price rises. Such behavior is not predominant in the final manufacturing industries oriented towards domestic demand. In 1993–95 (unlike 1992) the enterprises' freedom of price-setting was quite restricted here. The movements of prices are determined by the cost-push inflation generated by fuel and raw materials sectors and natural monopolies. For this reason, output inventory fluctuations and related changes in working capital are becoming the main adaptive variable.

The following types of production behavior were fleshed out.

- (R) *Resource-oriented behavior* — output is limited by the availability of production resources. This type was predominant in the centralized economy of shortages, but production distortions due to unprecedented output decline for several recent years provoked a new increase of resource constraints (the increasing contribution of which in the output fall was also shown by the surveys).
- (D) *Behavior oriented towards demand and the flow of current revenues*. Output is determined by effective demand or revenues (value added), or — in more capitalized enterprises — by profits. An enterprise adapts to the gap between potential demand and real receipts through the output and barter drop along with adopting other enterprises' financial resources. Payables are determined by the dynamics of receivables and are the price that has to be paid for excessive production.
- (F) *Behavior oriented towards self-financing and maintaining the necessary level of liquidity*. Output is adapted to the financial capacities of an enterprise, i.e., to the real receipts, the sufficiency of liquidity for supporting turnover and the pressure of cost-push inflation.

(S) *Behavior oriented towards survival in a sense of retaining the “enterprise identity” (type of operations, number of employees (“working collective”), the control over an enterprise by the managerial “technostructure”.* This type of production activities corresponds to the so-called company-family (typical both of Japan and the Soviet system). On the other hand, this type implies a structural rather than a behavioral aspect. In sectors hit by the structural crisis (the defense industry, production of sophisticated durable consumer goods) running at 20–30% of capacity and less, many enterprises are in the state of “hidden bankruptcy”. Though output “matches” real demand, the retention of the production potential and survival of a company as such is only possible through funds provided by creditors (those are primarily suppliers and the budget). Payables are no more directly related to receivables. As the specifically oriented surveys show, companies in a “bad” financial condition (having losses) are characterized by an increased share of arrears to the budget and extra budgetary funds.

The difference between the above types (especially between types D and F) is quite relative, for enterprises’ reorientation to be real rather than potential demand and the decrease of payables should restore the relationship between output and liquidity. From the financial standpoint, type D is characterized by the leading role of enterprises’ active operations and financing mostly through debt. At type F enterprises production is typically subordinate to the structure of assets, and an emphasis is put on self-financing.

It is impossible to measure the actual correlation of the above types of behavior in the industrial sector (and its subsectors) based on the undertaken surveys. This calls for the use of different analytical techniques. At the same time, it may be suggested that on the microlevel the predominant occurrence of the F and S types of production activities corresponds to the macroshift of decline factors from demand to the working capital deficit. In industrial capitalist countries, a shift towards similar behavior is characteristic to the periods of market (conjuncture) crises. It sounds unlikely that in the Russian economy enterprises consciously adapt output to liquidity-determined constraints. It is more likely that what counts here is the availability of liquid resources, not only the material ones, for production and marketing performance.

At the same time, the toughening of relations with suppliers (hampering or stopping crediting through arrears) makes for a lasting objective relationship between output and the ratio of funds available in enterprises’ accounts to the amount of short-term debt. On the other hand, the development of the bankruptcy procedures, the slow-down of settlements, a system of advance tax payments and a drastically growing need to cover risks, make for an additional accumulation of liquid resources that is not directly related to production.

Let us draw up main equations revealing the above types of production behavior:

D is a model of demand-oriented production.

- |     |               |                                      |
|-----|---------------|--------------------------------------|
| (1) | $pQ = S - IZ$ | Q — output measured in fixed prices; |
| (2) | $S = DP = aD$ | S — sales; p — product price;        |
| (3) | $S - M = VAD$ | IZ — change in inventories;          |
| (4) | $S = cPR$     | DP — real demand;                    |
| (5) | $F = S + ED$  | D — potential demand                 |

M — materials costs; VAD — value added; PR — profit-brutto (expected or current); c — coefficient, reverse (inverse-?) to the share of profit in the price of production; a — demand effectiveness ratio measured by change in arrears and the scale of barter; F — financial assets; ED — surplus of external debt.

The enterprises' freedom of choice under this model (when prices of production are determined by the dynamics of prices for the purchased raw materials) is manifested in the trade-off between change in output and inventories, as well as the amount of receivables (i.e., parameter — (a) bridging the gap between real and potential demand and external debt (ED) needed to keep output up with demand.

**F is a finance-oriented model.**

$$pQ = FV \quad F \text{ — financial assets (or current assets in general)}$$

V is the rate of capital turnover which depends both on macroregulators (interest rate, inflation rate) and the structure of assets and liabilities of an enterprise, the methods of settlements with customers and suppliers. F is supposed to be determined by mostly internal funds (borrowing is minimized), whereas V depends positively on the profitability and the share of money in the structure of financial assets.

The freedom of choice is primarily displayed through the actions aimed at bringing about change in the velocity of financial and production capital turnover.

**C is a combination model showing the relationship between the financing and demand factors.**

$$pQ = [ DF ], [ FF ], [ IN ]$$

DF is a factor of demand (potential, real) and income from the products sale; FF is integral assessment of enterprises' financial conditions (availability of working capital and the critical funds; level of solvency); IN is an indicator of output decline inertia or of output “autonomous” dynamics determined by non-financial and non-demand factors.

## 5 Principal Results of Econometric Analysis of Production Activities

Equations of the models of production activities identified above produce similar results. The assessment period was 10.1992–9.1995. At the moments of sharp changes in the

behavioral patterns (5.1994 — a surge of stoppages and arrears, and 5.1995–9.1995 — domestic demand squeeze and the rising role of external demand), the quality of regression assessments deteriorates with respect to both demand and financial factors.

## 5.1 Relation of Production to Demand

Econometric calculations corroborate a close relationship between the dynamics of output measured in fixed prices in manufacturing industries (without the fuel and energy sector) and changes in demand. As far as the demand factor is concerned, the best results for the reviewed period were obtained by the IET with respect to the volume of paid shipments (which serve as a current revenue indicator), and the balance assessment of demand. All the demand factors within the reviewed period show rather high stability of the regression coefficients.

$$(D1) \quad \text{IQT} = .68 \text{ IQT} [-1]^{.7} \text{ Dbal}^{.07}$$

standard error — 3.2%,  $R^{*2} = .93$

IQT — index of output in processing industries in 1990 prices by 12.1991 (trend); demand factor Dbal — the balance of demand assessments (above normal–lower than normal), according to IET surveys, increased by the constant of 100. The introduction of the constant is caused by the negative balance of demand assessment. As the balance assessment of demand pertains to the beginning of a month, the equation shows the anticipating (+1 month) influence of demand on production. The use of the demand indicator with a one month lag slightly increases the average deviation error.

Econometric analysis confirms the relation of demand dynamics (assessments in surveys) to money supply (M2 in real terms, with a two month lag) on the macrolevel and to profitability (or real profit) on the microlevel.

The use of finished products inventory as the indicators of demand (effect of inventories on demand and output is assumed to be negative) deteriorates statistical estimates, as the regression coefficients show a drastic change in mid-1994–early 1995. The instability of relation of output elasticity ratios to the inventory size results from enterprises shifting to the acceleration of inventory and receivables turnover. At the same time, the surveys data about the actual finished products inventories may be used for forecasting the dynamics of enterprises inventories and current assets in general (in 1993, the correlation of survey estimates — with a four month lag — with the data provided in a monthly reporting form was .7).

The index of capacity utilization has proved to most closely correlate with the index of output in the fixed prices (REB) in the assessment of production represented in the surveys (for one factor dependence) with a free term  $R^{*2} = .85$ , standard error — 8%. It should be noted that in the surveys conducted by the REB enterprises display the so-called normal (economical) rate of utilization of about 60% which includes a certain level

of normally idle capacities (20%). As a result, the rate of utilization capacity is assessed as 45–50% which is comparable to the official data.

## 5.2 Dependence of Production on Enterprises' Financial Condition

Output depends on the flow of current revenues and the availability of money (financial assets). Profit is supposed to have a multiple function. It is an objective of a capitalized enterprise operation (current or expected profit) and a most important source of financing of working capital (and other types of activities). Among the indicators of an enterprise's financial condition, the figure of real amounts of money in enterprises' accounts was shown to be most closely related to production. This suggests that it is the availability of funds that has become the main limiting factor in the current economic situation (thus decreasing the importance of inventory and debt).

It is noteworthy that the reliable estimates of the dependence of output on financing parameters were only based on the GOSKOMSTAT data, for the surveys do not provide sufficient financial information. The assessment of “the share of enterprises evaluating their financial condition as normal or sound” (REB) based on those surveys have no visible relation either to the dynamics of industrial production or solvency ratios. The statistically significant positive dependence (after smoothing) was only found to be true with respect to the industrial sector profitability.

$$(F1) \quad \text{IQT} = .94 \text{ IQT}[-1]^{.65} \text{ IL}^{.08}$$

standard error — 3.7%,  $R^{*2} = .93$

IQT — the trend of output in the fixed prices in the final industries; IL — the index of money amounts in enterprises' accounts (as of the middle of a month) in 1.1992 prices. The results practically do not deteriorate if the index of money amounts is used with a two month lag. The regression ratios were stable over the entire period.

Such indicators as profit (in comparable prices), the absolute liquidity ratio or the complex index of an enterprise's financial condition (including the indexes of profitability, turnover of financial assets and ability to pay off debt) used as a factor of financial condition yield the estimates  $R^2$  of about .9–.92 and a standard error of 3.8–4%. At the same time, the elasticity of production index based on the above factors was steadily declining in 1994–1995. The peak of output sensitivity to profit occurred in the first half of 1993, which corresponded to the period of high inflation-induced profitability, while with respect to the complex financial assessment the peak was late 1993–early 1994.

It might well be that thanks to the high sensitivity of production to these financial parameters their sharp drop in the second half of 1993 played a key role in the acceleration of the recession and production decline below the level determined by demand constraints

as such. As the economy was moving over to the state of stabilization and slower inflation, new conditions for financing production were formed, which was reflected in the lower sensitivity (elasticity) of output to profitability and solvency bringing to the fore the availability of highly liquid resources and orders. Let us test this hypothesis by assessing the relation of output to the combined effect of demand and financial conditions.

### 5.3 The Relation Between Demand and Financial Factors of Production

Let us consider the two types of relations below:

$$(C1) \quad \text{IQT} = .722 \text{ IQT} [-1]^{.55} \text{ IL}^{.057} \text{ Dbal}^{.059}$$

standard error — 3.2%,  $R^{*2} = .94$

IQT is a trend of output in the fixed prices in final industries; IL is an index of funds in industrial enterprises' accounts; Dbal is an estimate of demand (according to the surveys).

$$(C2) \quad \text{IQT} = .76 \text{ IQT} [-1]^{.58} \text{ IK}^{.135} \text{ Dbal}^{.06}$$

standard error — 3.2%,  $R^{**} = .94$

The average quality of the statistical estimates of the two equations coincides, but the dynamics of ratios over the reviewed period are different. The sensitivity of the output to the complex estimate of the financial condition decreases, and in the second half of 1995 this factor was no longer relevant. The strongest relationship and the financing factor supremacy over the demand factor (with respect to the elasticity level) occurred in the second half of 1993—early 1994, i.e., during the sharp acceleration of production decline and the establishment of tougher payment relations rules (Figure 10). The use of money supply (M2 in real terms) as a demand factor produces a similar picture.

In contrast, the elasticity of production with respect to enterprises' funds is rather stable; in 1995 it was not much different from demand elasticity (Figure 11). Behind the difference between the dynamics of elasticity ratios there may well be two landmarks representing the toughening of enterprises financing constraints. The first one (beginning mid-1993) was related to the establishment of a close relationship between production activities and the levels of enterprises' revenues and debt (the structure of debt, the rate of turnover and balance of payables and receivables). The second one (beginning mid-1994) is characterized by highly-liquid (money) assets turning into the greatest bottleneck of production and the decrease of the shock-absorbing role of current revenues (swallowed by arrears) and enterprises mutual arrears. The symptom of moving to the second landmark was a surge of enterprises' stoppages in the summer of 1994 followed by a qualitative change of stoppages: the leading role was at that moment played by the stoppages caused by the lack of current assets as opposed to stoppages induced by the lack of demand.

# References

1. Alfandari, G. and Schaffer, M. (1995) On “Arrears” in Russia. Paper presented at the World Bank Workshop “Are Russian Enterprises Restructuring?”, 12–13 June.
2. Aoki, M. (1990) Toward an Economic Model of the Japanese Firm. *Journal of Economic Literature*, Vol. XXVIII.
3. Aukutsionek, S. (1995) The Market Reforms and Transitional Crisis. *The Russian Economic Barometer*, No. 1.
4. Aukutsionek, S. and Belyanova, E. (1994) If the Budget Constraints of Russian Enterprises Becoming Harder? *MEiMO*, No. 4.
5. Belka, M., Estrin, S., Schaffer, M. and Singh, I. (1995) Enterprise Adjustment in Poland: Evidence from a Survey of 200 Private, Privatized, and State-Owned Firms. Discussion Paper No. 233, April, London, United Kingdom: London School of Economics.
6. Belousov, A. (Ed.) *The Russian Economic Monitor*. Moscow, 1993–1995, Nos. 1–6.
7. Ickes, B. and Ryterman, R. (1994) From Enterprise to Firm: Notes for a Theory of the Enterprise in Transition. In: **The Post-communist Economic Transformation: Essays in Honor of Gregory Grossman**, R.W. Campbell (Ed.), Boulder, Colorado, USA: Westview Press.
8. Ickes, B., Ryterman, R. and Tenev, S. (1995) On Your Marx, Get Set, Go: The Role of Competition in Enterprise Adjustment. Paper presented at the World Bank Workshop “Are Russian Enterprises Restructuring?”, 12–13 June.
9. Ivanter, V. and Sapir, J. (Eds.) (1995) **The Monetary and Financial Problems of Transitional Period in Russia**. Moscow.
10. Klepach, A. (1995) The Economic of Non-Equilibrium. The Adaptation of Russian Economy to Monetary Constraints in 1992–1994. In **Kuda idet Rossia?**, Moscow.
11. Kornai, J. (1994) The Transformational Crisis. *Voprosy ekonomiki*, No. 3.
12. Kornai, J. (1992) **The Socialist System: The Political Economy of Communism**. Oxford.
13. Kozlov, N. (1995) Analysis and Forecasting of Liquid Capital of Enterprise under Period of Transition to Market. *Problemy prognozirovaniya*, No. 4.

## **APPENDIX: Figures and Tables**



Figure 1. Dynamics of Supply and Demand

Figure 2. Dynamics of Prices and Demand

Figure 3. Adjustment of Supply to Demand (REB Survey)

Figure 4. Dynamics of Supply and Financial State

Figure 5. Own Funds (Equity)

Figure 6. The Relation Between Demand and Financial Factors of Output (on results of survey, financial factor = 100%)

Figure 7. Dynamics of Financial State of Firms and Share of Firms in Good or Normal Financial Position

Figure 8. Dynamics of Share of Firms in a Good or Normal Financial Position and Prices

Figure 9. Dynamics of Shares of Firms in a Good Financial Position and Firms with Increasing Output (REB Survey)

Figure 10. Output Elasticity from Financial and Demand Factors

Figure 11. Output Elasticity from Financial and Demand Factors

Figure 12. Dynamics of Output and Expectations

Table 1: Financial Flows of Industrial Enterprises (cumulative, in % to proceeds)

	1993	1994	First Quarter 1995
State budget			
tax burden	-25	-22	-18
Including debts to state budget	-20	-17	-11
budget financing	6	4	2
saldo	-14	-13	-9
Credits	12	15	11
Net profit in % to total profit	68	59	78

Source: Goskomstat data, database of A. Belousov group, and the group N. Kozlov from the Institute of Economic Forecasting.

Table 2: Financial Results of Production

	1990	1991	1992	1993	1994
Profitability (profit to costs)	12	23.7	40.4	32	18.3
Annual profitability <sup>a</sup>		639.6	314	156.6	52.9
Wasteful enterprises <sup>b</sup>	13			7.8	22.5
Profit rate of current capital <sup>c</sup>		8.8	10.8	9.8	5.2
Gross profit % <sup>d</sup>		100	115.4	63.9	23.3

<sup>a</sup> — annual profitability (taking into account capital turnover velocity) to interest rate of three month credits.

<sup>b</sup> — In % of total amount of enterprises.

<sup>c</sup> — Monthly relation of gross profit to net current capital (without credits).

<sup>d</sup> — In December 1991 prices.

Source: Goskomstat data, database of A. Belousov group, and the group N. Kozlov from the Institute of Economic Forecasting.

Table 3: Structure of Current Capital (at the end of the period)

	1988	1990	1991	1992	1993	1994
Assets (100%)						
inventory	70	67	62	36	40	36
financial assets	30	33	38	64	60	64
debtors	19	14	23	47	50	50
short-term loans		0.4	0.8	1	1	4
money	6.9	11.8	9.3	14	8	5
including foreign currency				7	4	2
Liabilities						
own capital	37	62.4	60	30	25.5	16.7
bank debts	31	21	13	11	9.3	11
credit debts	33	17	28	60	65.2	72

Source: Goskomstat data, database of A. Belousov group, and the group N. Kozlov from the Institute of Economic Forecasting.

Table 4: Turnover (in days of sales)

	Fourth Quarter 1993	First Quarter 1994	Second Quarter 1994	Third Quarter 1994	Fourth Quarter 1994	Third Quarter 1995
Current capital	111	172	175	173	133	141
inventory	43	67	65	62	48	57
financial assets	68	105	110	111	85	83
debtors	55	81	82	87	66	71
money	9	11	10	10	6	5
Own current capital	28	29	34	31	22	24
Production assets <sup>a</sup>	37	91	50	36	27	31

<sup>a</sup> — production assets — production stocks (without finished inventory) and money deposits.

Source: Goskomstat data, database of A. Belousov group, and the group N. Kozlov from the Institute of Economic Forecasting.

Table 5: Solvency (%)

	Fourth Quarter 1992	Fourth Quarter 1993	Fourth Quarter 1994	Third Quarter 1995
Current liquidity	141	134	120	120
Time liquidity	90	82	76	71
Absolute liquidity	21	12	10	6
for money	20	11	6	4
Debtors/creditors	78	76	69	68

Source: Goskomstat data, database of A. Belousov group, and the group N. Kozlov from the Institute of Economic Forecasting.

Table 6: Inflationary Tax and Income (% to output)

	Fourth Quarter 1993	First Quarter 1994	Second Quarter 1994	Third Quarter 1994	Fourth Quarter 1994	First Quarter 1995
Seigniorage	-1.4	-0.7	-0.6	-0.4	-0.5	-0.7
In % to money assets	-10.9	-5.9	-4.9	-3	-5.5	-8.9
Inflationary income	3.6	5.6	1.9	5.4	5.1	2.6
including unpayments	42.7	60.5	46.4	40.6	35.4	39.3

Source: Goskomstat data, database of A. Belousov group, and the group N. Kozlov from the Institute of Economic Forecasting.