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Economic reform in Russia is one of the most illuminating and educating orthodox stabilization experiences in completely non-market institutional environment. Thus it demonstrates extremely well all effects and constraints of orhtodox therapy in society subject to structural distortions and external shocks. In such a society "irrational" from the point of view of economic common sense behavior of many variables and parameters as well as weak effects of price signals sometimes make theoretic equations useless or diminish considerably their explanatory power. Unpredictable reactions of economic agents and macro-aggregates aggravate chaos in economic system which in turn hampers its transition toward some sort of stable trajectory. Chaos produced by inadequate effects of governmental policy (especially taking into account its objectives) has as we can see in Russia very vulnerable consequences.

One of important factors impeding stable adjustment is unfavorable economic situation at the eve of Gaidar reforms. In 1991 produced national income fell by 11% as compared with 1990. Industrial output squeezed on accelerating scale (by 7.8% in average for the whole year beginning from 5 % in the first quarter to 11% in the last quarter of the year) as far as economic linkages collapsed and input shortages worsened. Industrial sectors with diversivied backward linkages and low supply elasticities (such as matallurgy, machinery, fuels) were among main losers. Deterioration of historical productive linkages and widespread violations of interenterprise contracts without any sensitive judicial and financial sanctions against contract breakers became one of the most visual symptoms of executive power paralysis.

Contraction of centralized investments struck previously heavily subsidized agricultural production. As compared with 1990 physical volume of corn production shrank by 24% and corn yield - by 22%. Production of

meat, milk and eggs fell by 7, 6 and 5% correspondingly. Gradual breakdown of centralized system of agricultural inputs distribution was equivalent to price shock as kolkhozniks and farmers had to pay for them three-four times higher prices on commodity exchanges. Agricultural producers adjusted by state,s orders fulfillment evasion and further barterization of their trade.

Price control became less and less efficient as far as government relied heavily on inflation taxation and seignorage gains to run the budget. Meanwhile in 1991 consolidated budget deficit reached 24-25% of GNP as a result of forced subsidization of the economy and monetary demand overheating. Administrative constraints in this situation could not resist inflation pressure: index of wholesale prices of enterprises jumped to 238 (1990=100), industrial inputs price index to 234, and aggregated retail price index for goods and services increased to 189.1.

Production crisis enhanced dramatic 30%-deep fall in exports. Imports squeezed by 45% aggravating internal shortages and repressed inflation. Despite imports contraction and positive foreign trade balance Soviet arrears to foreign partners rose from 73 at the beginning of the year to 80 bln.$ at the end.

Bad legacy of Union government was worsened even more by the collapse of the Soviet Union that shook all economic linkages and provoked extremely destructive external shock.

Productive squeeze, worsening of structural imbalances, underinvestment, ruined finances, repressed inflation transforming into open price escalation, very moderate inflow of foreign savings, serious balance of payments crisis constituted macro-economic framework when Gaidar program was started. The policy package included across the board price liberalization, fiscal austerity (deficit was targeted to 1% of GNP), tax reform imposing newly designed value added tax to become the bulk for the whole tax system, tight monetary policy and credit restrictions (interest rate of the Central Bank and reserve requirements of banking system were risen), foreign trade liberalization through gradual dismantling of quantity restrictions, quotas and licenses,

transformation of export and import tariffs into basic intruments of foreign trade regulation, demolishing of the system of differentiated exchange rates and organization of internal hard currency market.

In 1992 financial stabilization was the priority objective of the government policy. Institutional reforms to create market infrastructure, such as privatization and land reform, virtually remained of secondary importance. Russian experience in this period thus lacks evedence on the fundamental problem: how to coordinate stabilization efforts with very expensive (also in terms of social and productive costs) institutional transformations and structural adjustment programs.

1. Macroeconomic Dynamics.

Deindustrialization and production squeeze is a very familiar outcome of orthodox stabilization experiences all over the world. Meanwhile Russian story is in many respects extremely peculiar. The force of institutional and organizational inertia turned out to be here great enough to produce spontaneous mechanisms which softened the effect of demand contraction. In fact, despite extraordinarily unfavorable macroeconomic situation, the crunch of interenterprise linkages, and dramatic fall of investments (equivalent to tremendous internal shock) output contraction for a long time (practically until August) maintained its previous year's pace. Even after resistance potential of economic system seemed to be completely exhausted in August the shortfall of output was much more temperate than could be predicted. Unemployment growth still is also relatively moderate and inadequate to real output decrease.

One of fundamental macroeconomic effects of price liberalization is strong shift in the structure of total demand in favor of its intermediate segment. This shift is primarily nominal phenomenon and reflects rapid relative price increases for fuels and other inputs while input costs per unit of production in real terms remain highly inelastic to the price shocks. Correspondingly, the share of value added shrank, according to some estimations from 46% to 42-43%, leadind to the decrease of final

demand purchasing power.

Uneven downswing of different macroaggregates (See Table 1) reflecting restructuring of final demand provoked shifts in the composition of GNP. The drop of investments and private consumption in 1992 (together making 55% of GNP) far outstripped the downfall of GNP, while exports (including deliveries to former republics), government consumption, increase in stocks and repairs and rehabilitation of fixed assets were struck less severe. To some extent this final demand restructuring helped to smooth output losses. The decisive stabilizing role played exports to former republics, antiinflationary accumulation of input stocks at the enterprise level and switch of enterprises investment funds to financing of fixed assets rehabilitation (these components of final demand cover no less than 40% of GNP).

Price effects modify these structural changes in the real GNP, but obviously not very seriously. They must deepen the relative drop of consumer demand since retail prices lagged the increases in wholesale price index and improve by several percentage points the share of gross fixed capital formation.

TABLE 1.

Dynamics of Main GNP Aggregates (In % To the Previous Year, At Each Time Point Aggregates Are Denominated In Prices of The Previous Year).

Aggregate	1989	1990	1991	1992
GNP	2	-2	-11	-22
Private Consumption	6	10	-10	-38
Gross Fixed Capital Formation	1	-6	-15	-48

Deliveries Abroad	4	-9	-14	-19
(Including Exports To Former Soviet Republics)				

Source: Goskomstat Data and Belousov A., Abramova E., Klepach A. Russian Economy in 1992-1993. Prospects For Output and Inflation. - Unpublished Paper, Moscow 1992.

Relative price dynamics influences much more the sectoral composition of output (Table 2).

TABLE 2

Sectoral Structure of GNP in 1989/90 and 1992 (%. Current Prices)

Sector	1989	1990	1992
Industry	36.1	36.4	40.3
Agriculture	15.6	16.0	11.6
Construction	10.5	9.1	12.0
Transport			4.1
Other Material Production	11.6	12.4	18.5
Services	19.3	20.1	13.5

Source: Own Calculations Based on Goskomstat Data.

Nominal shock associated with price liberalization and monetary constraints shifted the intersectoral balance in favor of industry (strictly speaking, to its fuel sector), construction and other material production while the share of agriculture and services in GNP decreased. Different factors are at play behind these structural changeovers. The

slight rise of industry and construction GNP shares as well as decrease of agricultural share reflect effects of relative price changes. In physical terms agricultural output fell by much less degree than production in industry and especially in construction (Table 3), that was heavily struck by the severe squeeze in investment demand. Its nominal share was contracted because of highly distorted terms of trade with other sectors. In fact, agricultural prices adjusted much slower to nominal shocks as compared with industrial and, in general, were surprisingly rigid despite of high inflationary expectations. Partly this is explained by the fact that state purchase contracts were not renegotiated after price liberalization and agricultural producers could adjust prices only in autumn for commodities of the new harvest.

TABLE 3

Sectoral Gross Output in 1991/1992 in Comparison With The Level Of Previous Year (%, Comparable Prices).

Sector	1991	1992
Industry	92	81
Construction	94	63
Agriculture	91	94
Transport and Communication	91	84
State Trade & Distribution System	91	63
Total Gross Output	92	81

Source: Goskomstat Data and Belousov A., Abramova E., Klepach A. Russian Economy in 1992-1993.

The situation with increase of other material production share is quit different. It displays first of all the boom in non-state commerce and financial intermediation sectors especially straight away after

dismantling of administrative restraints on street trade. The importance of these sectors in economic structure rose tremendously while state distribution system practically came to collapse. The growth of trade margins in real terms made commerce one of the main fulcrums of private capital accumulation. Commerce, in turn, induced very strong backward effects on financial sector which credits primarily intermediary operations and on import demand transforming its structure in favor of consumer goods.

At the same time street trade absorbs considerable share of hidden unemployment and is the bulk of newly emerging informal sector in the economy. As compared with classical patterns of informal city economy in third world countries Russia lacks the evidence on hypertrophy of the services sector. On the contrary, income elastic demand for services shrank dramatically in line with real wages contraction strangling the sectoral real output to the level below the average rate of the economic downfall. Meanwhile, prices for services increased moderately relatively to other consumer goods. Combined these factors cut the services ratio of GNP to extremely low level if apply the international comparisons scale.

Shifts in the structure of GNP surprisingly did not lead to any sensitive changes in sectoral distribution of employment (Table 4) excluding transformation of retail and small wholesale trade into important subsidiary (and for some social strata - primary) imcome -generating activity. Unfortunately current statistics does not catch this phenomenon at all. One of the causes for extreme steadiness of labor force structure is strong institutional resistance to high unemployment rates. Despite large productivity losses and raising idle capacities ratio enterprise managers still tend to maintain working places to avoid destructive labor conflicts. In addition, the state has no political will and power either to settle class clashes or to sustain fragile social equilibrium on the labor market.

TABLE 4

Shifts In Sectoral Structure Of Employment In 1991/1992.

Sector	1991		1992	
	mln.	%	mln.	%
Industry	21.8	37.3	21.1	37.5
Agriculture	5.35	9.2	5.21	9.2
Transport	4.45	7.7	4.4	7.7
Communication	0.9	1.6	0.9	1.6
Construction	5.9	10.0	5.7	10.1
State Trade & Distribution	5.0	8.6	4.7	8.4
Health	3.7	6.3	3.7	6.3
Education	4.6	8.0	4.7	8.3
Total Labor Force	58.1		56.5	

Source: Goskomtrud Data. Some less important sectors are excluded from the Table.

2. Shifts In Sectoral Output.

On the sectoral level strong policy and spontaneous macroeconomic shocks violated stability of productive proportions supported previously by administrative system of resource and subsidies allocation. Weak responces of real output to price signals and highly distorted market mechanisms blocked production adjustment in line with demand feedbacks aggravating old and imposing new structural imbalances.

In agriculture the drop of husbandry produce below critical level (Table 5) propagated the most fierce bottleneck. Animal produce shortfall was brought about both by decrease of animals, productivity and decrement of the head of livestock. The main cause comes from bad provision of

collective and individual farms with fodder that is explained partly by dramatic contraction of imported inputs supply and partly by dismantling of state producer subsidies and price shock straight away after across the board liberalization. The last factor is especially important for agriculture as producers were practically unable to adjust output prices until new harvest.

TABLE 5

Physical Volumes Of Agricultural Production In 1991/1992

Goods	1991	1992
Crops, mln.tons	89.1	104.0
Potato, mln.tons	34.0	32.0
Sugar Beet, mln.tons	24.4	29.0
Sunflower Corns, mln.tons	2.9	3.3
Vegetables, mln.tons	10.5	10.8
Meat, mln.tons	9.3	8.0
Milk, mln.tons	52.1	47.0
Eggs, blns.	46.7	45.0

Source: Delovoi Mir, 5 January 1993.

Increasing shortages of animal produce aggravated inflationary pressure and at the same time strengthened the dependency on imports of foods and basic consumer goods. This dependancy has pretty good chances to become long-term structural characteristic of the economy since widespread livestock slaughtering provoked by the lack of fodder can in the nearest future strongly disturb the internal food balance.

Foods market imbalances were in 1992 softened to some extent by rich harvest of crops and vegetables (Table 5) that also helped to save hard currency for other items of critical imports. High harvest however was produced by favorable interplay of natural forces and weather conditions,

rather than by deliberate policy. This accidental event does not abandones high vulnerability of Russian agricultural production (in particular, strong dependence on weather fluctuations and subsidies inflow) and its very weak potential for self-sustained and stable growth.

Agriculture remains one of the weakest points of Russian economic system. It cannot rule out pretty fast shortages on the food market, suppress structural inflation by substituting imported foodstuffs, supply cheap basics and on the basis of efficiency expansion improve real incomes of producers; thus it cannot secure sound basis (both in economic and social sense) for structural adjustment policies, including support of Russian competitive advantages on the world market and targeted industrial policy. It also cannot provide as earlier in the history cheap resources to industry and other sectors what was the essence of adopted in the USSR model of unbalanced economic growth. In current situation just agriculture gets in the focus of structural policy. This fact imposes additional restraints on Russian industrial recovery and competitive advantages upgrading.

Meanwhile **industrial performance** in 1992 leaves out any hopes for spontaneous recovery and structural adjustment. The scale of industrial slowdown was close to the level of gross output contraction (approximately 19-20% in real terms for 1992). According to the rate of the downfall (See Table 6) and mechanisms of output adjustment at least two phases of industrial squeeze can be distiguished.

TABLE 6

PHYSICAL VOLUME INDICES OF INDUSTRIAL OUTPUT IN 1992

(In % To The Corresponding Period Of The Previous Year).

Month	Monthly Index	Mounting Total Index
January	84.9	84.9
February	87.9	86.5

March	87.7	87.0
April	87.8	87.3
May	85.0	86.8
June	85.4	86.5
July	78.5	85.2
August	72.8	83.4
September	75.2	82.4
October	75.4	81.9
November	76.0	81.4

Source: Goskomstat Data.

On the first stage, that lasted until July-August, unproductive effects of tight monetary and fiscal restraints - from one side, and of input price escalation - from the other, were partially offset by the micro-level reactions of economic agents. The rate of production decrease practically remained on the level of the previous year. Since principal characteristics of economic behaviour (equally with other types of social action, though) are deeply rooted in the institutional framework of society, prevailing adjustment mechanisms on the micro-level reflect institutional response to policy challenges.

The fundamental mode of institutional reaction in Russia, especially in the first half-year of 1992, was not adaptability and structural transformation but spontaneous informal resistance on the side of enterprises to new imposing by the government "rules of game" in order to preserve continuity of internal organization and stability of micro-economic environment. The most striking manifestation of this institutional resistance is so called payments crisis, or mounting arrears of enterprises the lion share of which falls on indebtedness on inter-enterprise transactions and on debt to state budget.

Rather than resort to orthodox recipes of insolvency treatment, i.e. to contract on large scale output and to fire off workers enterprises adjusted to new extremely unfavorable situation by refusing to pay mutual

bills for produce shipments and by spontaneous conversion of real payments obligations into fictitious arrears accumulated on banking accounts. In principle, this mode of adjustment is equivalent to informal commodity credits provided on preferential terms with negative interest rates (taking into account inflationary devaluation of arrears). In May-June the ratio of accumulated inter-enterprise arrears to GNP achieved 40-45%. Payments crisis weakens considerably the impact of deflationary shock on output. The contraction of real demand only partially shows up in production. The resulting gap is partially absorbed by increases in stocks, and partially by deliveries abroad of raw materials and fuels, but in general it enhances structural imbalances that artificially jam market and policy signals and brake resource reallocation.

Surprisingly, the share of arrears to banks that in normally tuned financial system are the principal form of liabilities is extremely low (near 1% of total value of arrears). The bulk of banking liabilities are outstanding on short-term credits what indirectly reflects aversion of banks to finance long -term investments in the real sector.

Internal organization of Russian financial system also contributed to payments crisis. First, possibilities for payments avoidance were much smaller if payments were effected against irrevocable confirmed letters of credit in favor of supplier valid within definite period of time. For technical reasons such sort of banking services is still unavailable in Russia. Secondly, in the situation of sharp shortages of credit resources commercial banks artificially slowed down the velocity of money in circulation by using transferring payments in operation for offering short -term credits. As a result, some part of outstanding arrears is due to payments delays caused by inefficiency of the banking system rather than to real lack of purchasing power on the end of enterprises. These payments delays trigger outflow of capital resources from the real sector in favor of banking system which is subsidized at the expence of potential (in the situation of skyrocketing inflation - real) profit losses of producers. A version of Taylor's gold effect (leakages from loans to firms into unproductive assets, See Taylor,1983, p.98-103) is at work.

The payments crisis is not the only reason of inadequate output responses to orthodox deflationary package. Other most important are preventive accumulation by enterprises of inputs stocks to smooth price liberalization shock, expansion of barter turnover and spillover of investment funds to financing of working capital and wage bills.

High inflationary expectations on the eve of Gaidar experiment provoked the growth of commodity stocks at the enterprises' disposal as well as investments in hard currency deposits and liquid securities. Ironically, all these huge outlays were made despite monetary restrictions and worsening financial solvency at the expense of arrears growth.

The ability of economic agents to manipulate, even when constrained in monetary funds, their demands highly distorts the flows of price and quantity signals and prevents the economic system from any sort of stable equilibrium. In terms of disequilibrium economics (See Benassy, p.19-20 for details) economic agents virtually face some version of manipulable rationing scheme, especially since many industrial inputs at reasonable prices are in shortage and customers in the real sector are very often pushed to the long end of the market.

Besides arrears and input stocks accumulation barter is another instrument to manipulate demands despite quantity and price constraints. It also highly influences the structural shifts and resource allocation in the economy since various enterprises have different bargaining power on the barter market. Enterprises that produce universally valuable or prestige final goods, such as consumer durables, or scarce and exportable industrial inputs get some sort of natural rent enjoying strong positions on the market of barter exchanges. In the financially repressed economy this quasi rent can very often more than counterbalance tax and credit preferences or, in opposite, penalties the government directs to definite sectors.

Macroeconomic implications of the payments crisis could be depicted with a help of the diagram (See Figure 1) borrowed in my previous paper with Zhukov (Zhukov, Vorobyov 1992, p.33 Fig.3). I consider trade-offs between the interest rate (that is treated as conventional opportunity

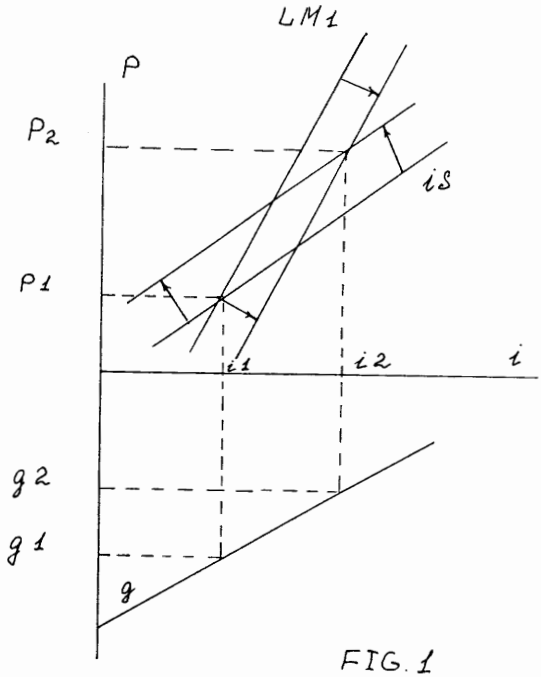

FIG. 1

cost of holding rouble balances) along the horizontal axis and price level along the vertical axis in the upper quadrant, with investments and growth responding to the interest rate below.

In my with Zhukov previous paper we provided some thought experiments concerning probable reaction of then still Soviet economy on orthodox stabilization efforts. We applied several scenarios and one of them rendered at Fig.1 seems to be pretty close to reality. That is the scenario when LM curve has a conventional positive slope or the assumption holds that "rouble does matter". This hypothesis proved to be right since tight monetary policy in the first half of 1992 provoked rise of demand for rouble balances.

Payments crisis add to Cavallo effect and excess demand disequilibrium another reason for positivity of the IS curve slope. Despite tight demand constraints imposed by the government informal inter-enterprise commodity credits through accumulation of arrears virtually sanctioned continuity of their price-setting policies. As a result, demand constraints on the market of industrial inputs and capital goods proved to be in many respects fictitious and industrial wholesale prices rose at a much quicker pace than retail prices which were held down by the fall of real personal incomes.

As because of payments crisis demand contraction failed to stop inflation, nothing could prevent the shift of the IS curve to the left as long as production shortfall exacerbated excess demand disequilibrium. Simultaneously LM curve tended to the right reflecting reduced supply of real rouble balances. The final outcome is stagflation: faster price increases and falling output.

In July marginal output supporting effect of payments crisis met its natural limits. The production downfall accelerated and reached the bottom point in August. As a result the gap between demand and output contraction rates began to squeeze (Table 7) signalling about gradual weakening of output inertia. The relative ebbing of the noise in demand-output feedbacks increased vulnerability of existing production structures.

TABLE 7

DYNAMICS OF REAL OUTPUT AND REAL FINAL DEMAND IN 1992

(% To The Corresponding Period Of The Previous Year)

	Quarters				1992
	I	II	III	IV	
1. Final Demand	58	66	66	74	67
2. Gross Output	84	80	78	82	81
3. Difference	26	14	12	8	14

Source: Calculated by Belousov A., Abramova E., Klepach A. Russian Economy in 1992-1993. Prospects For Output and Inflation. - Unpublished Paper, Moscow 1992.

Main factors that contained in July-August reliance on arrears accumulation as dominant adjustment mode of enterprises to external shocks were the following:

1. Dramatic decrease of firms' assets liquidity that strengthenes their dependence on commodity credits to the critical level. In January-May the ratio of enterprises' monetary balances to their arrears (including arrears to banks and suppliers) diminished from 55 to 14.6%. That cuts down wage and other cash bills, from one side, and disturbes strategies aimed at input suppliers diversification (which in inflationary economy with highly distorted production links and huge transaction costs is necessary condition for survival, let alone development) - from the other. As a result, violated payments cannot support output and offset demand shocks anymore, unless assets liquidity ratio will be improved.

2. Strong nominal shock associated with the first price increase for fuels in May enhanced by exhaustion of accumulated in the first quarter stabilizing input stocks. Mechanisms of cost inflation proliferated initial price wave to the highest point in June-August. Profit margins fell while arrears growth could not anchor mark-ups by allowing

compensating price increases.

3. Catastrophic decline of banking capital liquidity associated with enterprises' and households' assets depreciation and escalation of arrears. Commercial banks switched on from crediting firms to speculations on hard currency market. In January-July the share of credits in banking assets decreased from 69% to 49% while the share of hard currency assets jumped from practically zero level to 28%. One of fundamental reasons is negative interest rate and lack of selective instruments of credit channeling and allocation through economic sectors. The weakening inflow of credits into real sector provoked mounting shortages of working capital resources. In the input-intensive economy that inevitably produces output contraction.

Combined these factors enhanced industrial squeeze far below the rate of the previous year. To slacken the output fall government reinforced monetary emission. Growth rate of M3 aggregate reached in the third quarter 28% per month as compared to 15% in the second quarter, and 12% in the first. The growth of money supply was channeled first of all to sanation of inter-firm arrears and to crediting of working capital and transaction assets of enterprises. Target budget subsidies to agriculture, oil extraction and coal industry became another trigger of large money supply increments. As a result of more expansionist budget policies the ratio of the deficit in the GNP jumped from 9% in April to 16% in August.

Increased monetary injections into the economy helped to stabilize monthly rates of output downfall in relatively narrow range, but failed to tail them off, even to the level of the previous year. In general, monetary emission since July-August took up the output supporting role arrears and input stocks played in the first half-year. Money prompting, however, had nothing to do with Keynesian demand encouragement and demand constraints removal. Rather, it temporally broke down shortages of working capital and increased the liquidity of enterprises' assets.

Inter-firm arrears were also practically ruled out until the second price increase for fuels in September. Credit emission could not compensate completely for tremendous cost upsurge associated with this

increase while exhausted input stocks were unable to ease off the price shock. The resulting shortages of working capital were exacerbated by permanent artificial delays in payments due to inefficiency of banking intermediation and low rates of banking assets liquidity. After initial price shock propagated along productive chaines inter-enterprise arrears began to rise again responding to falling purchasing power of enterprises and narrowing gap between dynamics of real demand and output. Thus, at the end of the year only common work of both shock-absorbers - credit emission and accumulation of arrears - could uphold output above definite critical level.

3. Changes In The Structure Of Industrial Output.

Industrial squeeze was unevenly distributed across sectors and provoked serious shifts in the structure of industrial output. The switchover of aggregate output supporting (shock-absorbers) mechanisms also had great impact on configuration of industrial production structure.

TABLE 8.

SHIFTS IN THE STRUCTURE OF INDUSTRIAL OUTPUT

(Current prices, %)

Sector	1991		1992	
	Share	Growth Rate	Share	Growth Rate
Electricity	3.92	200.1	6.49	2152.5
Fuels, including	7.85	210.6	18.68	3211.7
- oil extraction	2.92	248.3	8.40	3982.9
- oil refining	2.63	213.1	6.93	3492.8
- gas	1.17	184.8	1.05	1193.8
Ferrous Metals	5.23	194.1	8.87	2357.1
Non-Ferrous Metals	6.66	226.2	9.51	1927.4

Chemistry	7.24	191.1	8.99	1605.3
Machinery & Metal Working	25.34	174.8	20.10	1079.6
Wood Working & Paper	5.64	225.7	4.51	1090.4
Building Materials	3.08	251.2	2.50	1093.6
Light Industry	17.05	290.2	7.38	619.8
Food Industry	13.38	243.8	9.49	965.9
Other	4.61		3.48	
Total Industry	100	213.3	100	1363.7

Source: Own Calculations Based On Goskomstat Data.

The principal structural changeover is dramatic rise of the fuel and moderate of other intermediate sectors share in gross output at the expense of compression in relative, let alone absolute, terms of machinery, light and food industries. Unfolded expansion of fuel sector is triggered by foreign trade liberalization that pushes internal prices for exportable goods to the world market level. This movement toward the level of world market determination confronts relatively soft demand constraints slackened by build-in shock-absorbers such as inter-firm arrears and credit emission.

The other outcome of trade liberalization is sharpening competition for material resources between exports anf domestic consumption that also drives up internal prices for exportable goods and aggravates shortages on domestic market. In general, "the law of one price" switched on by trade deregulation works to narrow the gap between the structure of production and exports. Since fuels are the main commodity of Russian exports, this "catching up" effect (strong exports feedbacks on output structure) highly increased the dependance of economic dynamics on fuel demand-production balance.

As a result, resource constraints of economic growth are tightening governing allocation efficiency. One of structural impacts of exports-induced resource reallocation is strengthening of economic dualism between export and domestic market oriented industries. Disintegration of

productive linkages between export enclaves and economic hinterland spurred by intersectoral competition for material resources is rather familiar symtom of Dutch disease.

Increased correlation of economic dynamics and fuel output make economic growth extremely vulnerable. Restrained excess capacities in the sector, falling by 6-7% per year physical volumes of production, lack of investments and technologies to stabilize output in the long-run, sectoral bottlenecks, first of all underdevelopment of oil and gas refining, limit time horizon of fuel industry' trigger effect and of its leadership in the economic growth. In 1992 Russian exports was practically preserved (decrease by 2%) on the level of the previous year only at the expense of sharp contraction in internal demand (by 7%) and deliveries to former republics (by 11%). Government, thus, is extremely time-constrained in using oil and gas revenues for structural adjustment and for support of dynamic competitive advantages.

At the same time, deprival of resources from other industries in favor of the fuel sector and, in general, simplification of economic structure contains serious threats to acute and potential competitive advantages as well as to the movement towards more or less stable macro-equilibrium. First, structural shifts in 1992 contrast enormously to the changes in the composition of industrial output in the economy with repressed prices of 1991 (See Table 8). In 1991 the leading sectors in the economy were light and food industries. In 1992 these sectors suffered the most severe shock giving up to imports a great part of domestic market. Rising import dependency ratio on consumer market puts away critically large share of oil revenues diverting resources from production modernization. Foods and, especially light industries are currently the prior targets for import substitution policies.

Secondly, the simplification of final demand structure struck heavily the most technologically advanced clusters and productive chains in machinery complex that determine the level of technical progress throughout the economy. For example, the annual nominal growth in instrument-making and machine-tool industries equaled 621.8 and 792.6%

correspondingly, as compared with 1363.7% all over the manufacturing.

Degradation of technical progress bearing industries ruins accumulated therein competetive advantages associated with scientific and technical achievements, skilled labor, historically high level of R & D spending etc. Shrinking demand for military produce aggravates the situation. Conversion of military industries usually leads to technological downgrading as far as domestic market has rather limited capacities to absorb products of high technologies. In addition, in many respects (lack of organizational skills and market expertise, restraints in acquiring appropriate technologies etc.) converted enterprises are practically in the position of "infant industries".

They have, however, very hard choice: either to get to export markets (and to overcome domestic demand failure) or to be doomed to the loss of technological advantages. Outflow of resources toward fuel and other intermediate sectors exacerbates the challenge. The breach of technological upgrading continuity will damage severely rather fragile dynamic competetive advantages based on matchless combination of technological skills, orientations of scientific research and human capital conditions. The loss of these advantages is equal to the break of national tradition of R & D and hardly could be compensated by any financial injections in the future.

The shifts in the structure of industrial output depriving resources in favor of intermediate sector - in general, and fuel industry - in particular, were enhanced both by relative price effects and asymmetric reaction of sectoral real outputs to demand contraction (See Tables 9 and 10).

TABLE 9

WHOLESALE MONTHLY PRICE INDICES ACROSS INDUSTRIAL SECTORS IN 1992.

Sector	January	February	March	April	May	June	July
Manufacturing	4.98	1.70	1.28	1.17	1.23	1.36	1.17
Electricity	3.69	1.55	1.49	1.35	1.32	1.92	1.49

Fuels	5.51	1.26	1.28	1.06	2.08	3.28	1.09
Ferrous Metals	4.61	2.60	1.25	1.33	1.27	1.24	1.11
Non-Ferrous Metals	6.00	2.57	1.67	1.12	1.27	1.37	1.42
Chemistry	6.02	1.78	1.33	1.34	1.25	1.22	1.17
Petrochemistry	11.47	1.37	1.20	1.34	1.16	1.38	1.23
Machinery	5.17	1.63	1.33	1.16	1.15	1.09	1.15
Wood Working, Pulp & Paper	4.71	2.23	1.26	1.10	1.10	1.11	1.11
Building Materials	4.84	1.69	1.13	1.14	1.15	1.30	1.22
Light Industry	3.32	1.61	1.16	1.06	1.08	1.08	1.07
Foods Industry	4.75	1.30	1.16	1.18	1.10	1.25	1.16

TABLE 9 CONTINUED.

Sector	August	September	October	November	December	1992/ 1991
Manufacturing	1.13	1.14	1.27	1.27	1.20	20.49
Electricity	1.19	1.05	1.05	1.32	1.17	27.57
Fuels	1.01	1.05	2.13	1.36	1.20	34.23
Ferrous Metals	1.08	1.04	1.12	1.14	1.07	31.85
Non-Ferrous Metals	1.09	1.08	1.26	1.28	1.45	29.50
Chemistry	1.07	1.09	1.31	1.22	1.15	23.93
Petrochemistry	1.08	1.01	1.23	1.33	1.32	29.94
Machinery	1.16	1.11	1.17	1.28	1.22	18.39
Wood Working, Pulp & Paper	1.10	1.05	1.17	1.14	1.23	15.65
Building Materials	1.12	1.11	1.29	1.27	1.14	17.05
Light Industry	1.07	1.13	1.11	1.39	1.26	9.74
Foods Industry	1.21	1.37	1.35	1.27	1.24	18.22

Source: Own Calculations Based On Goskomstat Data.

TABLE 10.

MONTHLY INDICES OF REAL OUTPUT ACROSS INDUSTRIAL SECTORS IN 1992 (Prices of 1990, December 1990 = 100)

Sector	Jan	Feb	March	Apr	May	June	July	Aug	Sep	Oct
Manufacturing	81.9	77.1	79.8	74.2	64.1	62.6	57.0	54.3	57.1	
Electricity	133.0	101.1	95.6	90.1	78.9	66.1	62.3	56.9	58.0	71.1
Fuels	102.8	96.7	99.4	94.4	95.6	90.3	91.9	91.6	89.3	91.6
Ferrous Metals	82.0	79.2	88.2	79.8	75.5	66.0	61.7	54.8	66.1	68.3
Non-Ferrous Metals	91.6	75.4	80.7	69.7	59.7	55.4	49.0	53.1	48.0	55.8
Chemistry	75.1	76.9	88.2	80.3	74.3	65.1	58.1	59.8	60.7	63.6
Machinery	73.0	71.9	70.1	67.6	54.5	58.9	54.9	50.5	56.9	64.4
Wood Working, Pulp & Paper	85.9	80.7	83.5	71.1	52.4	58.8	64.5	52.9	43.2	58.8
Building Materials	84.8	75.3	84.0	81.3	75.9	72.7	71.7	61.9	64.2	65.2
Light Industry	87.5	86.8	84.0	77.4	57.0	53.7	35.3	35.7	43.0	51.9
Foods Industry	53.1	52.9	61.3	60.1	59.8	63.8	58.6	54.0	55.4	66.9

Source: Own Calculations Based On Goskomstat Data.

Fuel industry was the leader of across-the-board price escalation and at the same time irrespective of prevailing mechanisms of shock absorbtion (that generally speaking determined regimes of industrial slowdown) turned out to be the most persistent to demand squeeze. Highly inelastic real output in the sector signals, first, about increasing fuel and power consumption per unit of production, and, second, about rising impact of sectoral output dynamics on the configuration of the macroeconomic trend. Fuel output determines its main parameters and resource constraints, other sectors adjust to.

The raising share of other intermediate industries, such as ferrous

and non-ferrous metals, chemistry and petrochemistry is caused primarily by favorable for them intersectoral terms of trade in the first half-year of 1992. Within that period prices for intermediate products rose at the fastest pace outdoing price increases for final goods. To the large extent this outstripping growth was sanctioned by huge arrears accumulation in customer industries (first of all, in machinery, See Table 11), while mounting arrears in the intermediate sector itself helped to slacken the output drop. After arrears sanation intermediate industries ran into much more tight demand constraints. As a result, the output fall accelerated while large credit emission was unable to brake it. The demand for intermediate products was also struck by large-scale dishoarding of input stocks in customer industries that followed the sanation of arrears and strengthening of demand constraints.

TABLE 11.

SECTORAL STRUCTURE OF INTER-ENTERPRISE ARREARS

(%)

Sector	March	June	September
Fuels	3	8	11
Ferrous Metals	13	18	18
Non-Ferrous Metals	6	8	7
Chemistry	10	10	13
Machinery	30	23	20
Wood Working, Pulp & Paper	7	6	6
Building Materials	4	3	3
Light Industry	12	9	7
Foods Industry	7	5	5

Source: Calculated by Belousov A., Abramova E., Klepach A. Russian Economy in 1992-1993. Prospects For Output and Inflation. - Unpublished Paper, Moscow 1992.

The drastic curtailment of final demand showed up in great real output losses in machinery that exceeded the average for manufacturing level. Debt arrears supported to some extent production volumes as well as preventive input stock accumulation did. In the second half-year, however, rates of real output decrease in machinery matched the average for industrial sector. The cause of such relative improvement was output crumbling in intermediate sectors rather than final demand recovery. Thus, the decline of machinery share in industrial gross output reflects mainly more slow price increases for its produce as compared with intermediate products. This effect is quite natural since in the input-intensive economy of Russian type demand for final goods is much more restrained and elastic than for intermediates.

The worst performance in industrial sector show foods and especially light industries. These sectors are outsiders both in terms of relative price increases and real output slowdown. The downgrading of these consumer · market oriented industries becomes one of the most serious structural bottlenecks.

4. Adjustment Mechanisms.

Adjustment to input price shocks. The shock associated with the escalation of cost inflation is usually listed among other factors of industrial downfall. Theoretically, if prices of final goods are demand constrained, price increases for inputs drive down the share of value added suppressing both savings ratio and final demand. This value redistribution effect reinforces the contractionary impact of initial demand squeeze. Shifts in factorial income shares - if have strong effect on real output dynamics - can partially offset this contraction trap. More stable adjustment, however, involves improvement in factor productivity and adoptation of less input-intensive technologies.

In contrast to these speculations Russian evidence doesn't uncover strong influence of input price increases on real output. To test this effect I estimated for each sector the following regression:

$$\ln Y(t) = a + b*\ln Y(t-1) + c*\ln P(t)$$

where: Y(t) - growth rate of sectoral real output (in prices of 1990), Y(t-1) - its own lag, and P(t) - aggregated index of input prices weighted by definite input shares in total sectoral material costs. Variables observations are made on monthly basis for 1991-1992.

Regression output is presented in Table 12.

TABLE 12.

IMPACT OF INPUT PRICES ON REAL OUTPUT ACROSS INDUSTRIES.

Sector	Coefficient c	Stdandard Error Of Coefficient c	R Squared of sectoral regression
Electricity	-0.0222	0.0196	0.730
Ferrous Metals	-0.0555	0.0210	0.785
Non-Ferrous Metals	-0.0554	0.0224	0.774
Chemistry & Petrochemistry	-0.0841	0.0309	0.751
Machinery	-0.1164	0.0246	0.885
Wood Working, Pulp & Paper	-0.0862	0.0295	0.747
Building Materials	-0.1299	0.0329	0.911
Light Industry	-0.0662	0.0366	0.787

Source: Own Calculations Based On Goskomstat Data.

Thus, shock associated with forced price increases for inputs had very moderate impact on real ouput. Much more significant factors of industrial slowdown are squeeze of aggregate demand and its sharp restructuring (spurred, first of all, by curtailment of military spending

and gradual convertion of military enterprises), disruption of historical productive linkages and aggravation of imported input and machinery shortages.

Price increases for intermediates show up primarily in rising prices for final goods. This way of adjustment to price shocks is in general brought about by relatively soft demand constraints prevailing on the market of inter-enterprise transactions (in 1991 large-scale subsidies to producers, in 1992 payments crisis and credit emission) that cannot curb firms to run so called Kalecki price-setting rule. Following this rule (that is rather widespread behaviour mode under monopolistic competition) producers set prices taking into account average prime costs and prices of firms producing the same or related products. Output prices are based on variable costs augmented by an mark-up at the rate usually predetermined historically. In highly monopolized Russian economy producers have enough market power to compensate cost increases by mark-up rate supporting rise of output prices.

Kalecki price-setting rule builds in one of extremely strong mechanisms of inflation propagation which, in addition, contributes to price growth inertia. As a result, cost inflation becomes the main trigger of price escalation.

I tested the hypotheses about Kalecki price-setting rule as the prevailing mode of micro-level adjustment to input price shocks using the methodology of Robert E.Hall (See Gregory Mankiv and David Romer, vol.1, p.390- 406).

Hall measures mark-up rate as the ratio of price to marginal cost. In competition mark-up rate is unity while with market power it exceeds one. Hall distinguishes only one type of input - labor input - and arrives at the regression equation that states: the rate of change of real output equals to the rate of change of labor input weighted by labor's share in revenue and multiplied by the mark-up ratio plus the constant and random elements of technical progress.

Instead of using labor input to estimate marginal cost I employed total material costs (or expenditures on intermediate inputs which are the

basic element of the cost structure; share of wages in the gross output value in the third quarter of 1992 decreased to 7-8%). I got sectoral mark -up estimates from the following regression:

$$Y=a + l*m*C + u$$

where: Y is sectoral growth rate of real output, C - sectoral growth rate of real material costs (both variables in prices of 1990), m - share of material costs in gross output value (in current prices), the slope l - the mark-up ratio, a - the average rate of technical progress, and u - random term of technical progress. Observations are made on monthly basis and belong to 1991-1992 period. Principal results of estimation are displayed in Table 13.

TABLE 13.

SECTORAL MARK-UP RATES AND MEASURES OF FIRMS' PRODUCTION EFFICIENCY (Third Quarter Of 1992).

Sector	Mark-Up Ratio		Technical Progress		Profit Rate	Profit Rate With Output Valued by Marginal Cost
	Coef.	Std.Err.	Const.	Std.Err.		
Electricity	2.783	1.463	-1.161	0.145	0.230	-0.411
Ferrous Metals	2.131	0.110	-0.372	0.022	0.355	-0.176
Non-Ferrous Metals	1.646	0.089	-0.132	0.036	0.312	-0.080
Chemistry	2.253	0.216	-0.335	0.046	0.381	-0.175

Machinery	1.912	0.150	-0.294	0.038	0.307	-0.170
Wood Working, Paper & Pulp	1.675	0.072	-0.204	0.028	0.279	-0.124
Building Materials	1.582	0.123	-0.200	0.0245	0.241	-0.127
Light Industry	1.558	0.034	-0.099	0.015	0.294	-0.064

Source: Own Calculations Based On Goskomstat Data.

As the regression output shows practically all Russian industries are noncompetitive in an important way. High mark-up rates across sectors emphasize serious threats associated with informal indexation of price decisions and with market power of producers that induces strong incentives to manipulate price and quantity signals.

High mark-ups, however, don't translate into productivity increases or any efficiency improvements. First, the calculated constant of technical progress is negative in all sample industries reflecting degradation of technological and scientific research and dissipation of capital and skills. Since resource constraints are becoming more bounding as far as physical volumes of oil production decline, negative technical progress makes prospects of industrial recovery extremely tiny.

Secondly, Russian enterprises don't pursue cost minimizing strategies, as one can expect looking at rather high profit rates. The firm that minimizes cost will earn market return on its capital when profit is calculated using marginal cost in place of price to value output. Profit rates calculated in this way are strongly negative in majority of Russian industries. Thus, producers fix cost in excess of the benchmark implied by minimizing cost with respect to constant-return technology. High mark-ups help to compensate productive efficiency losses.

Adjustment to aggregate nominal shocks. The way economy adjusts to nominal monetary shocks is crucial for macroeconomic policy. Actually, the prevailing adjustment mode determines the limits of aggregate demand management.

I expressed adjustment mode (that in general builds up shortrun inflation-output trade-off) by estimating the following equation:

$$\ln y(t) = \text{constant} + a*dx(t) + b*\ln y(t-1) + c*\text{time}$$

The log of real output growth rates (across industrial sectors) is regressed on its own lag, a time trend, and the change in nominal output. This sort of regressions was widely used, in particular by Ball, Mankiv, and Romer (Gregory Mankiv and David Romer, vol.1, p. 177-180). I used observations of variables on monthly basis for 1991/92.

The parameter of central interest is "a" which shows how much of a shock to nominal output translates into real output dynamics. In all sectoral regressions this parameter is both near zero and statistically insignificant (because of this fact detailed regression output is omitted). That tells us that practically all changes in nominal industrial output show up in prices without influencing real side.

Weak sensitivity of real output with respect to nominal shocks reflects, beside institutionally embedded low elasticity of supply to price signals, also quite natural for inflationary economy effect of frequent price re-adjustments. Decreasing nominal price rigidity implies that prices adjust more quickly to nominal shocks and thus these shocks have smaller real effects. In addition, informal price indexation and strong inflationary expectations, especially on the eve of announced large price increases, constrict the range of price staggering, also reducing price inertia.

Weak reactions of real output to nominal shocks produce macroeconomic effect very similar to the short-run effect of constrained productive capacities. In both cases (either output constrained or nominal demand inelastic industries) prices rather than real output adjust. Since wages

remain more rigid than prices, and enterprises through mark-up pricing strive to preserve in real terms their profit shares, price adjustments to nominal shocks push economy toward forced saving regime.

Price liberalization and subsequent correction of relative price structure enhanced forced savings (See Table 14).

TABLE 14.

CHANGES OF PROFIT RATES ACROSS INDUSTRIAL SECTORS WITHIN FIRST THREE QUARTERS OF 1991 AND 1992.

Sector	PROFIT RATES					
	1991			1992		
	1Q.	2Q.	3Q.	1Q.	2Q.	3Q.
Industry	0.238	0.250	0.213	0.408	0.354	0.302
Electricity	0.285	0.265	0.204	0.284	0.266	0.230
Fuels	0.220	0.241	0.204	0.344	0.363	0.317
Ferrous Metals	0.217	0.188	0.185	0.529	0.417	0.355
Non-Ferrous Metals	0.189	0.164	0.222	0.402	0.362	0.312
Chemistry & Petrochemistry	0.264	0.244	0.221	0.505	0.448	0.383
Machinery	0.194	0.301	0.297	0.431	0.359	0.301
Wood Working, Pulp & Paper	0.350	0.272	0.247	0.447	0.364	0.279
Building Materials	0.320	0.294	0.270	0.378	0.312	0.241
Light Industry	0.244	0.230	0.227	0.404	-0.233	0.294
Foods Industry	0.257	0.221	0.219	0.287	0.257	0.227

Source: Own Calculations Based On Goskomstat Data.

The first effect of liberalization was drastic increase of profit rate across all industrial sectors. Main winners were, however,

intermediate sectors. Profit rate increase was triggered by forced accumulation of input stocks in anticipation of announced price deregulation. Preventive stocks build-up slackened the input price shock devaluing current material costs while real wages decline drove up mark-ups.

As soon as stocks dried up (to the end of the first quarter) profit margins in average slightly fell while their sectoral layout became more diversified reflecting the strengthening of relative price variability. In the second quarter two opposite extremes were represented by fuel and light industries: fuel sector was the only where profit rate continued to rise, and light industry underwent negative profit growth provoked by severe disruption of linkages with former cotton-producing republics. In the third quarter profit rates declined further and matched in all sectors - but intermediate - the highest level of the previous year (the second quarter). In intermediate industries effect of forced savings remained relatively strong keeping up profit margins above the level consistent with repressed inflation regime of 1991.

In principle, in the economy of Russian type with inelastic real output the forced savings regime is practically the only way to mobilize investment resources. In 1992 forced savings however failed to produce strong impact on investment demand. First, a large part of excess profits was either disbursed to support working capital or placed on hard currency deposits to defend against inflationary risks. At the same time deindexation of depreciation funds cut down very important source of investment outlays. As a result, forced savings suppress consumer demand rather than induce investments.

5. Investment Hole.

Russian growth model inherited from Soviet times has at least two structural features. First, that is low mobility and substitutability of production factors. Adjustment to any sort of external shock through corrections in marginal productivity of definite factors and changes in

proportions of their combination is hampered by technological and institutional reasons. That makes Harrod's assumption about constant factor proportions at least in short-run realistic.

Secondly, well described by Kornai phenomenon of investment expansion drive heavily influences the structure of the economy and its mode of adjustment. Increments of investments' physical volumes are the main driving force of the economy while feedback mechanisms controlling their efficiency and limits of expansion are weak or negligible. Just structural adjustment policy has to strengthen these market feedback mechanisms. However, structural maneuvers themselves are hardly possible if investments contracted. Until constant factor proportions restrain efficiency improvements strong investment injections in strategically important sectors are the core of any serious structural policy.

Repression of investment demand (investments squeezed on much larger scale than output) is one of the fundamental effects of real demand contraction. Meanwhile, the shock was aggravated by serious shifts in the structure of aggregate demand that preceded the Gaidar monetarist experiment. In particular, dissipation of resources in unfinished construction and tremendous growth of idle capacities in perestroika years produced investment demand overheating that didn't translate into real output increase. Productivity of capital shrank to critical level. In this situation investments response to demand contraction partially corrected these imbalances.

However, this correction of investments supply-demand balance didn't improved radically capital productivity. Besides, relatively high investment ratio on the eve of 90-s was in many respects delusive. Instead of investments in new technologies, replacement of obsolete assets or their modernization investment resources leaked in keeping up the capital stock in working conditions. Already in 1990 new investments in fixed capital assets generated relatively moderate (8.3% according to my own calculations based on 1990 input-output table) share of gross output while reconditioning of capital stock and major repairs induced upto 18% of gross output. In fact, on the eve of orthodox shock capital was

underinvested in many sectors.

Investment hunger is aggravated by hypertrophied bias of machinery industries toward intermediate goods markets what impedes modernization of capital stock. According to my own estimations about 30% of sectoral output covers intermediate demand (for comparisons, in India and China this ratio lies between 15 and 20%). Coefficent of forward linkages in machinery (1.294) exceeds corresponding parameters even in some sectors in the middle of technological chain, such as ferrous metallurgy (1.060) and chemistry (1.157).

Another factor that makes the effect of disinvestments so painful is dramatic fall of machinery and equipment imports. Import substitution on domestic machinery market can only marginally set off this fall and prevent further degradation of capital stock.

Present investment ratio (4-6% of GNP) is hardly consistent with structural adjustment objectives. It is even insufficient to support the ordinary cycle of capital stock renewal. The fall in investments provoked by orthodox shock more than balanced the investment demand overheating, increasing sharply above critical level shortages of capital resources in the real sector.

At the same time scarce capital is reallocated in favor of fuel and other intermediate industries (See Table 15) with best export opportunities. This shift directs at least in medium-run the restructuring of output.

TABLE 15

SECTORAL GROWTH OF REAL INVESTMENTS IN 1991-1992

(Compatible Prices, In % To The Level Of The Previous Year)

Sector	1991		1992	
	Growth	Share	Growth	Share
Total Industry	82	50.6	49	65.1
Electricity	95	4.0	50	4.0

Fuels	81	16.1	85	27.9
Metallurgy	93	4.6	73	6.9
Machinery	71	10.1	50	10.3
- instruments, machine-tools, electronics			56	
- capital goods			66	
- cars and trucks			35	
- defense industries			42	
Chemistry, Wood-Working, Pulp & Paper	88	5.5	50	5.7
Light Industry	83	1.7	47	1.7
Food Industry	91	4.6	50	4.7
Construction	83	6.5	19	2.5
Agriculture	95	25.9	42	22.2
Transport & Communication	67	13.8	26	7.4

Source: Calculated by Belousov A., Abramova E., Klepach A. Russian Economy in 1992-1993. Prospects For Output and Inflation. - Unpublished Paper, Moscow 1992.

Allocative efficiency of forced capital leakages toward intermediate, primarily fuel, sector is rather questionable, especially in the long-run. First, these leakages (in line with Dutch disease) strengthen the dependence of output dynamics on fuel and other raw material exports. At the same time, maintenance, let alone upgrading, of potential comparative advantages in other industries, and especially in machinery, becomes problematic. Further, outflow of investments from machinery disturbs domestic supply of capital goods and restrains national producers adjustment both to world technical progress and to multiplier effects associated with investment demands of the fuel sector itself. Another threat is the break of technological skills and development continuity that hampers the contribution of national machinery industries to technical modernization of the economy. Crowding in effect of oil revenues

can be easily translated into competitve imports of machines and equipment rather than induce domestic output. Finally, structural imbalances are exacerbated by underinvestment in such output-constrained sectors as agriculture and transport.

6. Exports.

Collapse of the Soviet Union provoked serious shifts in the structure of Russian economy. Of central importance is squeezing of inner economic space associated with splitting off of former republics which induced increase of exports role among demand-side factors of economic growth (See Table 16, where shares of gross output generated by deliveries to former republics and to the rest of the world are compared). Openness of Russian economy and its dependence on foreign markets rose overnight. Correspondingly, foreign trade policy upgraded to one of the most significant instruments of structural adjustment.

TABLE 16.

OPENNESS OF RUSSIAN ECONOMY BEFORE AND AFTER COLLAPSE OF SOVIET UNION. SHARES OF GROSS OUTPUT INDUCED BY SEPARATE COMPONENTS OF FINAL DEMAND (%).

Sector	Deliveries To Former Republics	Exports To The Rest Of The World
Energy & Power	15.7	5.8
Oil & Gas	27.8	16.0
Coal	15.1	12.7
Ferrous Metals	26.2	8.4
Non-Ferrous Metals	28.3	12.6
Chemistry & Oil Refining	23.7	6.6
Machinery	15.4	6.5
Wood Working, Paper & Pulp	17.0	12.0

Building Materials	7.3	1.5
Light Industry	11.4	2.2
Food Industry	2.6	1.5
Total Industry	14.9	6.2
Agriculture & Forestry	3.0	1.6
Transport	18.9	7.9
Gross Output	12.0	4.9

Source: Own Calculations Based On 1990 Input-Output Table. Gross output induced by different final demand components is calculated using formula:

$$V = (I-A)^{-1} * F$$

where V - vector of gross output induced by specific element of final demand, $(I-A)^{-1}$ - matrix of total input coefficients, and F - vector of the corresponding final demand component.

Liberalization of foreign trade didn't prevent significant fall in both exports value (See Table 17) and physical volumes, although exports in general shrank on smaller scale than output. However, stabilization of export revenues (at monthly level of $2.5 -3 bln.) was reached only in the second half-year after steps were taken to restore control over exports of strategic raw materials and to spurn unqualified traders. All exporters of strategic raw materials were obliged to pass through registration at Ministry of Foreign Economic Relations.

Exports decrease was supported above the rate of output slowdown mainly due to expansion of trade with crude oil and relatively moderate contraction in deliveries abroad of some other raw materials, first of all gas, oil products and non-ferrous metals. This stabilizing effect is, however, rather double-edged. First, it led to squeeze of internal consumption and aggravated competition for inputs on domestic market, and,

thus, produced strong unproductive and inflationary impacts. Secondly, it spurred further worsening of export structure, driving up its raw materials concentration ratio to the critical level.

Relatively stable volumes of machinery exports are pretty delusive. After catastrophic fall in 1990/91 they actually reached the bottom level which is supported by transactions in service of long-term contracts signed several years ago. In fact, the lion share of machinery shipments falls on complete equipment to be installed in units constructed by former Soviet or Russian firms.

The rise of the share of raw materials in Russian exports prompts its re-orientation on Western markets. This switchover hampers improvements in exports commodity structure that could be reached on less sophisticated markets in the third world and Eastern Europe. Besides, bad geographical diversification "anchors" present commodity structure depriving Russian manufacturers of dynamic competitive advantages.

TABLE 17.

RUSSIAN EXPORTS IN 1992 BY PRINCIPAL COMMODITIES.

(US $bln.)

Products	USSR		Russia		
	1990	1991	1991	1992	1992 as % of 1991
Total Exports	103.9	71.2	50.9	45.0	88.4
Crude Oil	18.7	9.7	7.2	8.5	119.3
Oil Products	8.7	7.5	5.0	4.7	93.2
Natural Gas	11.1	10.7	8.3	7.5	90.1
Coal	1.9	1.3	1.2	0.9	70.7
Nitric Fertilizers	0.8	0.8	0.7	0.5	64.4
Potash Fertilizers	0.5	0.4	0.3	0.3	99.6
Cast Iron	0.9	0.5	0.4	0.2	62.0
Rolled Ferrous Metals	2.8	1.3	0.8	0.4	47.5

Non-Ferrous Metals					
including:					
copper	0.9	0.5	0.3	0.3	90.2
aluminium	1.6	2.0	1.1	1.1	105.7
nickel	1.3	1.0	0.8	0.6	80.8
Machines & Equipment	19.5	6.6	4.1	3.9	95.7

Source: Ministry Of Foreign Economic Relations.

Export performance in 1992 confirms the fact of weak real effects of price signals. Export volume continued to shrink and export structure deteriorated despite in general favorable for traders balance of prices for goods and hard currency. In fact, excluding two months (May and June), rouble exchange rate in real terms was droping down (See Table 18) what even with relatively high export tax rates created serious price incentives for export trade. In addition, since interest rates were indexed with respect to inflation with great delay and remained throughout the year strictly negative, export trade (as well as the whole trade sector with fast capital turnover) adjusted to monetarist constraints much easier than production sector.

TABLE 18.

DYNAMICS OF NOMINAL AND REAL EXCHANGE RATES IN 1992

Month	Nominal Exchange Rate	Industrial Wholesale Price Index	Real Exchange Rate
January	204.2	4.98	41.0
February	175.4	1.70	103.2
March	154.3	1.28	120.5
April	152.7	1.17	130.5
May	122.3	1.23	99.4
June	125.3	1.36	92.1

July	143.3	1.17	122.5
August	169.6	1.13	150.1
September	225.3	1.14	197.6
October	353.0	1.27	277.9
November	426.9	1.27	336.1
December	414.6	1.20	345.5

Source: Own Calculations Based On Goskomstat and Kommersant Data.
Notes to Table 18: Nominal exchange rate is the rate of Moscow Inter-Bank Hard Currency Exchange weighted by sales volumes. Real exchange rate equals nominal rate divided by industrial wholesale price index.

Naturally, hard currency efficiency of export transactions is differentiated across commodity groups. In principle, this efficiency differentiation should enhance changes in export structure in direction contrary to shifts in industrial output. As was mentioned above, price liberalization changed terms of inter-sectoral trade in favor of intermediate industries. Correspondingly, real exchange rates prevailing at transactions of intermediate products increased, diminishing hard currency efficiency of their exports. At the same time, post-liberalization structure of relative prices was in general favorable for exports of machinery and consumer goods. Inelastic output, especially in machinery complex, failed however to respond to these stimuli while bottlenecks in trade infrastructure jammed demand signals.

The response of exports to price signals was rather weak throughout economy including main export sectors. The log form regression of monthly exports growth rates on monthly real exchange rates in 1992 gives following results:

Variable	Coefficient	T-Statistics
Constant	-0.002	-0.013
Log Exchange Rate	0.311	2.777

R-Squared = 0.596

Export elasticity with respect to real exchange rate is, thus, far below one.

In contrast to neoclassical mainstream, real devaluation didn't also stimulate import substitution. Due to overall output contraction the effect of import substitution by domestic products was almost negligible. Despite demand constraints, especially tight on retail market, imports practically followed the path of exports without strong or even moderate negative reaction to currency devaluation. The log form regression of monthly imports growth rates on monthly real exchange rates yields:

Variable	Coefficient	T-Statistics
Constant	-0.023	-0.084
Log Exchange Rate	0.779	3.995

R-Squared = 0.727

Regression exercises imply that market price signals alone can in current situation neither enhance export growth nor improve its structure. They are also helpless to induce structural adjustment through import substitution. What is badly needed is active governmental policy aimed at support of exporters and at correction of highly distorted market mechanisms. Main objectives of this policy are to be identification and more efficient use of current and creation of new competitive advantages.

7. Policy Implications.

1. Strong structural bottlenecks, highly impertfect market mechanisms and institutional rigidity distort spontaneous improvements in allocative efficiency as soon as prices are freed. Ability of de-regulation policies to "get prices right" is on noncompetitive markets also pretty questionable. Demand feedbacks are heavily jammed by weak responses of real output to price signals. Real effects of liberalization and consequently its impact on productive efficiency are thus rather constrained. In this situation to break down structural imbalances and to

escape stagflationary trap market incentives must be complemented and corrected by active government industrial policy.

2. Aggregate demand management in Keynesian manner in current situation is not the policy option. Aggregate demand encouragement produces negligible real effects and are highly inflationary as long as nominal demand shocks show up primarily in prices. In addition, prevailing adjustment to input price shocks through final goods' price increases makes cost inflation the dominant trigger of price escalation. In case of aggregate demand contraction, stagflation is the outcome with real output squeeze slackened by more or less efficient institutional shock-absorbers (such as arrears accumulation).

3. Appropriate policy set must use the system of selective incentives and obstacles. They should support sufficient level of government interventions on markets of goods and production factors correcting market failures to improve productive efficiency. Allocative efficiency can suffer but on heavily non-competitive markets the cost of new allocative distortions wouldn't be pretty high in relative terms.

Principal instruments to channel resources toward priority sectors are multi-faceted price system (selective differentiation of prices for the same good) and investment subsidies. Multi-faceted price system is the only chance to provide critical supply of inputs to strategically important sectors. At the same time, in investment-driven economy selective investments subsidies are necessary to enhance supply responses and to push forward technological modernization. In current situation forced rise in investment supply to priority sectors is as important as encouragement of their investment demand by low interest rates.

In medium-run, the only way to reach industrial recovery and structural adjustment objectives is increase of GNP investment ratio. Across-the board investment subsidization is however wrong option. To prevent investment demand overheating and resource dissipation real interest rates need be set positive. In this situation to break down investments supply shortages and to stop degradation of capital stock the government can, first, try to tie up forced savings of enterprises

associated with price liberalization effect (by imposing, for example, profit rate targeting) or to translate some of them into productive assets (by establishing development corporations or investment companies with private share), and secondly, introduce indexation of depreciation funds. Indexation in short-run is less inflationary policy as compared with accelerated depreciation.

4. The main source of funds for industrial policy are obviously revenues from oil and gas exports. Correspondingly, to reach structural adjustment objectives, government has, first, to prevent fuel revenues leakages and, secondly, to launch efficient mechanisms of their conversion into productive investments in line with specified sectoral priorities.

Ruling out of leakages implies stabilization of Russian fuel exports and sharp decrease of oil subsidies to former republics. The switch of inter-republican trade on prices close to the world level inevitably reinforces the impact of "the law of one price" which surges domestic fuel prices up too. Government won't be able to constrain efficiently this spontaneous price movement toward world market level backed by strong vested interests in fuel sector. Thus, chopping of subsidies in inter-republican trade very easily translates into weakening of control over domestic prices.

Two principal instruments remain at government's disposal to soften this shock. First, multi-faceted price system which can help to provide sectors of priority with critical volumes of relatively cheap inputs on condition that government would be able to reimpose control at least over some segments of domestic commodity markets. Secondly, differentiated across commodity groups export tariff with highest rates imposed upon basic intermediates, and first of all fuels.

Appropriate capitalization of oil and gas revenues is perhaps the most fundamental problem of structural adjustment. Establishment of development corporation with strong private shares as the fulcrum of fuel incomes reallocation and disbursement is of central importance. Creation of financial infrastructure must be complemented by policies aimed at quick capital assets accumulation. Possible recipes include imposition of

some sort of royalty fee, or fees for land and natural resources, in proportion to physical volumes of minerals or fuels extracted, and state orders to registered strategic raw materials exporters to secure definite volumes of critical imports in exchange for provision them with certain amount of export quotas.

5. The fundamental criterion for identification of industrial policy priorities must be current and dynamic competitive advantages of definite sectors.

Primary efficient diagnostic of competitiveness requires microeconomic descent to the maximally disaggregated level of economic structure. The whole economy cannot be competitive as well as the competitiveness of each separate sector is attached to definite segments of its output. At the same time, comparative advantages of definite commodities highly depend on their potential markets.

As the world experience shows, the continuous break-through to the world market is ensured, as a rule, by intersectoral complex, or cluster (rather than by sole products), which is integrated by relatively stable backward and forward linkages and has dynamic capacities to absorb and to generate technological innovations. The competitive nucleus of such cluster takes over definite technological niche, generates strong multiplier effects on upstream industries and is encouraged by human capital and know -how inflows from related industries. Thus, in the framework of integral cluster competitive advantages in leader-sectors can induce advantages in related and supporting industries which constitute the unified technological space. The competitive upgrading of such cluster serves as locomotive for the whole economy.

Ideally, just the clusters must become main objects for government incentives and support. Criteria for their identification are the following:

a) favorable combination of production factors, especially of advanced factors, such as skilled labor, information networks, technological know-how, technical and scientific achievements and traditions of scientific research in this specific area and etc.;

b) export niches on the world market at given structure of domestic output and demand which can ease the switch to external markets;

c) access to global TNC network that can enhance the inflow of foreign investments into restructuring of productive systems;

d) competitive related and supporting industries that make possible intersectoral switches of technologies and skilled labor;

e) stability of backward linkages and potential of import substitution from former republics.

Obvious candidates for cluster-constituting role in Russian economy are such sectors with unquestionable competitive advantages and technological know-how as aircraft and space, laser and nuclear industries, ship building, space services, software services and other.

Beside acquiring financial, credit and tax incentives competitive clusters must also dictate main priorities for state scientific and technical programs. In addition, government must originate the system of preferences for inflow of foreign investments primarily in indentified clusters.

Relatively low efficiency of spontaneous market mechanisms in Russian conditions makes necessary active government management of competitive advantage upgrading. Such management is possible at least in three way:

- The state must very actively stimulate the supply of scarce advanced factors essential for export spurt. That requires serious investments in science and new technologies, professional education, communication and information networks which should be supported by tax credits and all the instruments from investments encouragement arsenal. It is important, however, to prevent overheating of aggregate demand by controlling its consumer segment and by chanelling mobilized investment resources, with few exemptions, into competitive clusters of the economy. The coordinated technological program based upon clear understanding of static and dynamic competitive advantages must become the criterion for restrictions and stimuli of government demand regulation.

- The state must direct its efforts on improvement of aggregate demand structure. The most important instruments of this policy could be

tenders of state orders for manufacturing of high tech products with strict standards of acceptance, permanent monitoring of technological innovations, potent policy, financial and tax incentives to enterprises investing in R & D.

- Direct government support of competitive clusters including investments in infrastructure, drawing in of foreign capital, encouragement of most efficient firms and enterprises etc.

6. The competiytiveness of economy is competitiveness of its enterprises and firms. Ideally, government only creates the institutional framework that induces competitive upgrading of enterprises and influences their organization and market behaviour. Under conditions of economic chaos and disruption of historical inter-enterprise linkages government must support the most viable and efficient productive structures that either are enclosed in the technological space of the cluster or are able to integrate it.

In this light some basic aspects of privatization policy and antimonopoly regulation deserve serious revision. In the situation of sharp structural imbalances aggravated by disruption of economic linkages upgrading of competitive clusters requires vertically, and sometimes even horizontally, highly integrated industrial organization with enclosed production cycles and with at most easy overflows of technologies, skilled labor and capital. Under conditions of chaos only such structures are able to develop high tech products with relatively moderate transaction and governance costs. That's why it is essential to privatize whole technological chains; privatization of their separate links and sections only exacerbates chaos and uncertainty.

Necessity of new type of industrial organization with vertically integrated financial-industrial groups being its backbone is also aggravated by rising in line with trade liberalization foreign competition on domestic market. Splitted in small non-viable structures historically highly integrated production complexes are notorious outsiders in competitive struggle with TNCs. In addition, with current market exchange rate, devaluing real and financial assets, even largest Russian

quasi-monopolies get at best in the category of medium-size international firms.

In current situation vertically integrated financial and industrial groups are almost only structures that could slacken forced degradation of productive efficiency all over the economy. The relative productive efficiency of vertical integration (in contrast to other forms of industrial organization) is explained by the following factors:

First, only this type of industrial organization secures economizing on transaction costs that boosted with productive linkages rupture. As world experience shows, low transaction costs are main motive for vertical integration in industrially developed countries. Taking into account Russian uncertainty significance of this factor sharply increases. In addition, high uncertainty and risks practically nullify associated with vertical integration losses in intertemporal adaptability and governance costs.

Secondly, vertically integrated structures are interested in support of existing technological chains and are able to generate strong stimuli to their modernization if artificial, constraining world market signals barriers are withdrawn. Because of it, this type of industrial organization objectively brakes downgrading of technological level spurred inevitably by forced simplification of aggregate demand structure and its shift towards intermediate pole.

Thirdly, vertically integrated financial-industrial groups are the only type of organization that ensures some inflow of investments into the real sector. Indexation of depreciation funds can make capital formation more brisk.

Fourthly, for financial-industrial groups it is much easier than for capacity-constrained separate industrial units with disrupted linkages and weak investment potential to get in touch with serious Western partners - in general, and to light on niches in global TNC's networks - in particular.

Vertical integration and institutionalization of financial-industrial groups, especially in potentially competitive clusters, can provide

government also with rather efficient instruments of stabilization policy.

First, productive efficiency of these structures to great extent depends on investments in support and modernization of technological chains as soon as government secures favorable environment for their break -through to the world market. High inflation, however, disturbes long-term expectations and impedes active investment behaviour. New type of industrial organization consolidates thus the block of social forces with strong interest in the efficiency of stabilization policy. Resting upon partnership with this coalition of interests government can launch heterodox stabilization package, first of all income policies and deindexation, with much weaker unproductive consequences in contrast to monetarist shock, which is impossible in current amorphous state of society.

Secondly, vertical integration switches significant part of inter-enterprise transactions from market on transfer prices. Without doubts, this switchover decreases the average price ceiling and at the same time stimulates the formation of multi-faceted price system which is essential in resource reallocation in favor of industrial policy priorities.

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