

## **Economic decline and collapse of the Soviet Union: a structural analysis.**

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### **Abstract**

After a long period of sustained fast growth of output, the USSR began experiencing in the Mid-1970s an economic stagnation, which was followed by the dismantlement of the Soviet economic system during the Perestroika. The attempt of this paper is to study the main causes of the slowing down of growth and the subsequent economic crisis. The first section of the article deals briefly with some important features of the Soviet economic system. The second section of the article discusses the reasons of the slowdown of Soviet economic growth from the 1970s to the Mid-1980s. The third section of the paper provides an analysis of the consequences of Perestroika and Glasnost reforms (1985-1991) on the Soviet economic system, ultimately provoking its collapse.

**Key Words:** USSR, Economic Stagnation, Perestroika, Economic Collapse.

### **Resumo**

Depois de um longo período de crescimento acelerado e sustentado de sua produção, a URSS começou a sofrer, a partir de meados dos anos 1970, de uma estagnação econômica que foi seguida pelo dismantelamento do sistema econômico soviético durante a Perestroika. O objetivo deste artigo é estudar as principais causas dessa desaceleração do crescimento e da crise econômica que seguiu. A primeira seção do artigo estuda de forma sucinta algumas características importantes do sistema econômico soviético. A segunda seção discute as razões pela desaceleração do crescimento econômico soviético da década de 1970 até meados dos anos 1980. A terceira seção fornece uma análise das consequências das reformas da Perestroika e da Glasnost (1985-1991) sobre o sistema econômico soviético, levando a seu colapso.

**Palavras-chave:** URSS, Estagnação Econômica, Perestroika, Colapso Econômico.

**JEL:** P20; P21, P26.

### **I. Introduction**

Until 1974, a long period of sustained fast growth of output and per capita GDP, thanks to a regime of extensive accumulation of capital, with increasing rates of investment and a major structural change could be observed in the USSR. This structural change, with the large transfer of labor from agriculture to industry, led to a growth in productivity, also due to technical progress incorporated in new machinery. Agricultural production made a lot of progress during that period, thanks to the colonization of the "virgin lands", mechanization, and the massive use of fertilizers and chemicals.

But, the USSR began experiencing in the Mid-1970s an economic stagnation, which was followed by the dismantlement of the Soviet economic system during the Perestroika. The attempt

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of this paper is to study the main causes of the slowing down of growth and the subsequent economic crisis.

The second section of the article deals briefly with some important features of the Soviet economic system. The third section of the article discusses the reasons of the slowdown of Soviet economic growth from the 1970s to the Mid-1980s. The fourth section of the paper provides an analysis of the consequences of Perestroika and Glasnost reforms (1985-1991) on the Soviet economic system, ultimately provoking its collapse. Section V offers brief final remarks.

## **II. Main features of the Soviet economic system**

The USSR was a planned command economy, which operated under conditions of capital scarcity, with state ownership of the means of production. Production was directed towards use and not towards sale and profit. Full employment of labor was constitutionally guaranteed. The state had the monopoly of foreign trade.

Central planning allocated resources for the entire production process. In the USSR, economic activity was defined and subordinated to the instructions from above. The plan was imperative. As Stalin (in ELLMAN, 1979, p. 17) put it: “plans are not forecasts but instructions”. “In both its design and implementation stages, central planning is based on a hierarchical pattern of national economy, which in turn presupposes obedience and discipline” (KOWALIK, 1987, p. 390). The central planning organ in the Soviet Union was the *Gosplan* (State Planning Commission). The *Gosplan* was in charge of the elaboration of the production plans. The pricing system was administered and the *Gosplan* defined goals of physical production for the whole economy. As pointed out by Kalecki (1966 [1993]) and Nell (1997), consumption of the workers was the adjustment variable between aggregate supply and aggregate demand, through forced savings. The production potential was limited by the stock of fixed capital, and its actual degree of utilization could be held low by a scarcity of circulating capital inputs or workforce (FEL'DMAN, 1928 [1964]; KALECKI, 1966 [1993], 1970 [1993]). The Soviet economy, as a socialist economy, was ‘resource constrained’, with “utilization parameters of resources determined [...] by the supply side” (KORNAI, 1979). The minimization of the costs and the increase of efficiency were not priorities.

There was no problem of effective demand in the Soviet Economy, on the contrary to capitalist economy. As stated by Kalecki (1970 [1993], p. 113), in “socialist economies [...] the problem of effective demand is really solved [...]: prices are fixed by planning authorities in relation to wages in such a way as to achieve full utilization of resources (and this is true not only in the long run but even in a short period)”.

The priorities of the Soviet system, at least until the end of the 1960's, were in order:

- 1) Economic growth thanks to investment

- 2) Military spending
- 3) Level of personal consumption of subsistence (food, clothing, housing)
- 4) Public consumption (spending on health, education, other social and cultural services)

So, diversification of consumption patterns (including consumer durables) was not considered a top priority before the 1970s.

As a command economy, USSR was characterized by a resource mobilization towards rapid industrialization (GROSSMAN, 1987). In the Soviet economic system, a priority was given to the allocation of investments to producer goods industries rather than consumer goods ones. This strategy was very clear as far back as the First Five Year Plan (1928-1933). Feldman (1964 [1928], p. 194), one of the leading Soviet economists of the 1920's stated that an "increase in the rate of growth of income demands industrialization, heavy industry, machine building, electrification".

The emphasis on heavy industry rather than light industry can be explained by the importance of the Soviet military-industrial complex. As Clarke (2007, p. 11) argues:

"the soviet system [...] was a system of surplus appropriation and redistribution subordinated to the material needs of the state and [...] of its military apparatus. [...] The development of the system was not subordinated to the expansion of the gross or net product in the abstract [...] but to expanding the production of specific materials and equipment – tanks, guns, aircraft, explosives, missiles – and to supporting the huge military machine."

The Soviet economy was heavily militarized because the country was constantly confronted with the hostility of the other foreign powers and especially the United States (and also China after 1960)<sup>3</sup>. This militarization of the economy had strong structural implications. The entire production of key sectors was controlled by the *VPK*, the Soviet military-industrial commission. Thus, most technological innovations and scientific breakthroughs were generally first allocated to military uses. Many industries were designed to be able to switch from civilian activity to the production of military equipment in a short notice:

"Almost any strictly civilian enterprise (although to a widely varying degree) was affected by the constraints on product design and plant layout imposed by the requirements of the military. Civilian technologies were supposed to be designed in a way guaranteeing easy conversion to military manufacturing". (Kuznetsov, in Gaddy, 1996, p. 41)

Similarly, many products such as transportation equipment (aircraft, trucks) had to be of dual use (both military and civilian). The geographic dispersion of industrial complexes was

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<sup>3</sup> In Gerschenkron's words: "there is very little doubt that [...] Russian industrialization in the Soviet period was a function of country's foreign and military policies" (GERSCHENKRON, 1962, p. 148).

decided for strategic not economic reasons. The existence of large stocks of inventories was also necessary in this context of a "permanent war economy" (Gaddy, 1996).

There was collective ownership and management of the land in the USSR since the collectivization process in the 1930s<sup>4</sup>. The collective farms were divided in two major categories: the kolkhozes and the sovkhozes. The kolkhozes were cooperatives and the sovkhozes were state farms. "Grain [...] was a strategic raw material indispensable to the process of running the State and of industrializing it" (LEWIN, 1985, p.142). The collectivization was a way to ensure the supply of agricultural produce to the increasing industrial workers class. It facilitated the transfer of a significant part of agricultural surplus to the capital accumulation in the industrial sector (PREOBRAZHENSKY, 1926 [1964]; ALLEN, 2003).

In a situation of abundance of available labor force and of cheap circulating capital inputs, the Soviet growth model was very successful until the mid-1970s and Gershenkron (1962, p. 150) could write in 1962 that:

"By holding down forcibly the consumption of the population [...], the Soviet government succeeded in channeling capital and human resources into capital formation".

### **III. The period of economic stagnation (1974-1984)**

From 1975 to 1984, Soviet economic growth slowed down markedly, leading to a period of relative economic stagnation in the USSR. The average per Capita GDP growth was less than 1% during this period<sup>5</sup>, contrasting with the 3,6% registered between 1950 and 1974 (MADDISON, 2006, p. 478-479)<sup>6</sup>.

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<sup>4</sup> Private agricultural production also existed in the USSR. It covered household plots and privately owned livestock. Private agricultural output was negligible in grain and industrial crops but significant in the livestock sector and the production of fruits and vegetables (NOVE, 1977, p. 26-27).

<sup>5</sup> It is worthy to observe that most of the capitalist industrialized countries also registered low growth economic rates in the late 1970s and in the 1980s.

<sup>6</sup> The reliability of official Soviet data has been the object of an intense controversy among scholars. Soviet statisticians were accused of manipulation for propaganda purposes by some Western specialists (mainly American). These accusations were generally rooted in ideological imperatives and "few indeed are those who believe that Soviet output statistics are invented. The consensus is that they represent the data which planners and statisticians themselves use" (NOVE, 1977, p.351). Other issue was the comparability of Soviet growth statistics with the Western ones. Soviet statisticians used the concept of 'Net Material Product' to measure the economic growth. 'Net Material Product' differed from 'Growth National Product' because it only took into account the activity of material production sectors, including only the services directly related to the physical goods production, like freight transport, communication and information services,... (LAVIGNE, 1979, p.226-228; NOVE, 1977; ELLMAN, 1980). Reconstructions of Soviet growth statistics on Western lines have been made by many scholars and are very heterogeneous in terms of

### **III.1. The depletion of the extensive accumulation model.**

In the traditional extensive Soviet model<sup>7</sup>, economic growth was limited by capital and also depended on the availability of labor force and of cheap circulating capital inputs (raw materials). But, since the end of the 1960s, the USSR was beginning to suffer both of labor scarcity and of the depletion of natural resources at a low cost that existed during the earlier phase.

One of the elements of loss of dynamism of the Soviet Economy was the tendency towards increasing costs of the exploitation of raw materials and energy resources. The USSR was the largest country in the world, covering 1/6 of the planet's surface and 11 different time zones. The country was extremely rich in raw materials and mineral deposits, particularly wood, iron, manganese, copper, nickel, lead and precious metals. The country contained at least 6 percent of the world's oil reserves and more than 30 percent of the world's natural gas reserves. However, the location of the most abundant mineral reserves has shifted eastward over time, where the climate is much more severe and cold (GADDY & HILL, 2003; BELLINGER & DRONIN, 2005). The extent of exploitation of natural resources to the East from the early 1970s has led to increasing material exploration costs, especially due to extremely cold weather<sup>8</sup>.

The pressure on the transport infrastructure was also increasing. Soviet infrastructure (roads, railroads, canals, ports) improved considerably from the 1920s to the 1950s, and a significant part of the total investment had been devoted to the sector. But this investment effort in transport infrastructure had been reduced since the 1960s. The case of the railways is an example of logistical problems. Railways were vital to the functioning of the Soviet economy, accounting for about 50 percent of freight transport. The share of Soviet total investment in railways fell from around 10 per cent in the 1930s to less than 3 per cent after the 1960s. At the same time, traffic was rising continuously, and the Soviet Union was confronted, from the 1970s, with tendencies to the congestion of its rail network, mainly visible if the density of use of its network is compared with the situation of the advanced capitalist countries of the time<sup>9</sup>.

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level of the average growth rate. But, they all show the same trend for the pattern of Soviet economic growth from 1950 to 1991 (KOTZ, 2007, p. 35).

<sup>7</sup> See a detailed analysis in MAZAT & SERRANO (2013).

<sup>8</sup> Soviet estimates reported by Dyker (1992) are that there was an increase of about 67% in natural gas production costs in the USSR between 1970 and 1973. Hill & Gaddy (2003) estimate that the cost of production and exploration in the cold areas of the USSR, the so-called "cold cost", would in general be at least twice the equivalent cost in temperate areas.

<sup>9</sup> In 1975, the density of use of the Soviet rail network was 23.4 million tons per kilometer, while that figure was only 4.7 million in the United States, the western country with the highest intensity of use. See Kontorovich in ELLMAN & KONTOROVICH (1992).

However, the key factor for the depletion of the extensive accumulation pattern was the tendency to a chronic shortage of labor (and its consequences). This labor scarcity was due to the depletion of the large reserves of underemployed rural workforce, demographic trends and the high rate of female participation in the labor force, largely due to the very success of the extensive accumulation regime. A solution could have been to go on rising the productivity in agriculture, by increasing investment in the sector, which had been done in the late 1950's and in the 1960's (Narkhoz in GAIDAR, 2007, p. 87). But, this strategy was not working anymore because of the drastic and surprising deceleration of agricultural productivity growth, which prevented the further reduction of the share of the labor force employed in agriculture (which stopped falling and stabilized around a high 20% in the 1980s [Narkhoz in SLAVIC RESEARCH CENTER, 2012]). Despite increasing investments in the sector, the rate of growth of agricultural productivity declined from 3.1% *per annum* in the period 1950-1978 to just 0.6% *per annum*, between 1978 and 1990.

The Soviet climate was very cold and extremely unstable, which meant that less than 20% of the land was cultivable, creating great difficulties for agriculture, with an average of three years of crop failure per decade between 1900 and 1990 (BELLINGER & DRONIN, 2005). The attempt to circumvent these difficulties by increasing even more the investments was not very successful.

The intense chemicalization depleted soil mineral content, disabling the agricultural use of land in various areas. Moreover, despite huge investments in irrigation, virgin lands were region of weather extremes, where harvests were much less reliable and depended more on favorable climatic conditions than in the traditional agricultural zone of the Western and Southern USSR (BELLINGER & DRONIN, 2005, p.193-206).

Likewise, the excessive irrigation in some areas of the Soviet territory caused the exhaustion of hydrographic reserves. The most famous example of this phenomenon is the Aral Sea, used to supply with water the irrigation canals for cotton crop. The failure of Soviet agricultural strategy is demonstrated by the fact that state production of grain remained almost unchanged from the late 1960s to the late 1980s, despite the considerable investments in the sector during the period (GAIDAR, 2007). The Soviet agriculture Soviet yields were lower than Western countries yields for almost all agricultural products (COOK, 1992, p.199). Throughout its history neither Russia nor Soviet Union, under different social systems and patterns of organization of production and investment in agriculture never managed to overcome the formidable difficulties of improving productivity in very cold weather agriculture (BELLINGER & DRONIN, 2005)

Other factors explaining the chronic labor scarcity were the high level of women participation in gainful employment in the 1970's<sup>10</sup>. So there was no 'reservoir' of labor anymore.

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<sup>10</sup> 51% of the Soviet workforce in 1973 were women (NOVE, 1977, p. 216).

On the top of that, the demographic transition phenomenon<sup>11</sup> had been amplifying, since the late 1960's, reflecting the rising urbanization of the population, the growing female activity rate, the improvement in educational and the problem of housing shortage (BROWN et al., 1994, p. 25).

The combined result of these demographic trends, the policy of full permanent employment and the exhaustion of previously underutilized labor in the countryside was the creation in the USSR of a chronic situation of labor shortages since the mid-1970s, a very rare situation in the capitalist world, except in times of total war.

The Soviet government realized that growth rates as high as in the past would no longer be feasible in the new circumstances of the mid-1970s. The pattern of investment and structural change in extensive accumulation was losing dynamism, largely by its own success both in taking advantage of the allocation of cheap natural resources and raw materials and by eliminating the reserves of labor. From 1975, an attempt was made to change the pattern of investment and structural change of the economy to what the Soviets called intensive accumulation, where a major emphasis should be placed on quality, variety and cost, not just quantity (HEWETT, 1988, KOTZ & WEIR, 2007).

Labor shortages were the main reason why growth, in the intensive accumulation pattern, would necessarily have to be based on the growth of labor productivity across the economy. However, in that period, the labor shortage itself led to the aggravation of a series of problems that conspired precisely against the growth of labor productivity. Not only have the productivity gains from the transfer of the labor force from agriculture to industry been exhausted, but labor has also been lacking to operate new machines with higher productivity (especially in remote regions such as Siberia). These problems were aggravated by the negative effect on productivity of the growing deterioration of the discipline of workers. As a consequence, rather than increasing, labor productivity growth in the economy as a whole declined from 2.7 percent to 1.0 percent between 1950-1978 and 1978-1990 and, in industry, productivity growth slowed From 3.3% to only 1.5% in the same periods (MADDISON, 2001).

In Stalin's time, coercion was used against workers to avoid the behaviors of insubordination, frequent labor turnover and absenteeism, which had become widespread in the USSR until the early 1930s. In 1940, for example, laws were adopted to criminalize job change and absenteeism (FILTZER, 1992, p.35). As the threat of unemployment had never existed in the USSR, the pressure of punishment was playing this role. However, the 'relaxation of discipline', which begun with the de-Stalinization<sup>12</sup> process under Khrushchev, intensified all along the 'Brezhnev

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<sup>11</sup> The birth rate massive decreasing - from 4,4% in 1926 to 1,59% in 1975 – was not compensated by the drop of death rate - from 2,37% in 1926 to 0,86% in 1975 (MARCHAND, 2008, p. 258).

<sup>12</sup> The ideological adhesion to the regime was also weakened by the de-Stalinization process.

Era' since State coercion was becoming weaker and weaker. In 1956, laws criminalizing job-changing and absenteeism were abandoned. The full guaranteed employment, the dismantling of the ruling coercive system during the Stalinist period and the real chronic shortage of labor, strengthened considerably the bargaining position of Soviet workers *vis-a-vis* the managers of state firms. Garegnani et al. (2002) offer a good analysis of this process:

“The question of insufficient labour productivity resides ultimately in the entirely new problems that the Soviet system has raised for labour discipline. That discipline had, in fact, originally appeared together with the capitalist system and, we believe, capitalism was able to achieve it essentially through two means: labour unemployment and the social competition that compels an individual to earn up to his neighbour and beyond, and distributes social respect accordingly. Now, by its own nature, the Soviet system had renounced just those two basic means of enforcing discipline, which that far, had characterised industrialised production. [...] at the root of the difficulties of labour productivity in the Soviet system there ultimately was the crisis of those two traditional methods of enforcing the discipline of industrialised labour. And such a crisis was bound to become decisive as extensive growth had to give way to a mainly intensive one where the increases in product per head had to come from an already industrialized production and not simply by shifting labour from traditional to modern methods. The disappearance of these two basic means of coercion left to workers so inclined, the possibility to do little, and carelessly, where work is repetitive or fragmented, or more generally ‘unpleasant’, as is the case for a large, though hopefully decreasing, part of the work of an industrialised society. And this was bound to favour the “free rider”, who cannot be easily repressed in such an environment, and may on the contrary, tend to become a model”.

The “deterioration of discipline” meant a minor adherence to commands such as output targets, technological rules and regulations. Enterprises manager faced more and more difficulties into controlling their employees, whose overall performance tended to fall. The attempts by Soviet leaders, starting with Khrushchev, to create wage incentives to achieve a greater commitment of the workers, replacing the "negative" incentives to the discipline of the work with "positive" incentives, contrary to what many expected, totally failed<sup>13</sup> (FILTZER, 1992; ELLMAN & KANTOROVICH, 1992).

In a context of labor shortages, increasing the output could be achieved by releasing the labor force employed in the old capital stock to operate new machines, that allowed higher labor

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<sup>13</sup> “Khrushchev had hoped that the promised bonanza would win over a more eager cooperation from the soviet workers, but the workers trapped in a downward spiral of disappointed expectations and decreasing commitment and did not respond in the measure that it was hoped for” (ROÀ, 2010).



productivity. This would be made by reducing the average age of installed equipment and increasing the work productivity of the industry as a whole.

But, the ageing of installed fixed capital has been a permanent problem of the Soviet system. Thus, the service life of fixed capital in the USSR was very high if compared with capitalist countries (CIA, 1986). It is explained by a very low retirement rate due to the focus on capital expansion<sup>14</sup>, rather than the improvement of installed machinery and equipment. Popov (2002) provides a convincing explanation for that phenomenon:

“The reason for massive investment in the expansion of capital stock at the expense of investment to replace retirement was the permanent concern of Soviet planners about expanding output and meeting production quotas. Replacing worn out aged machinery and equipment usually required technical reconstruction and was associated with temporary work stoppage and reduction in output. Even if the replacement could have been carried out instantly, the resulting increase in output (because of greater productivity of new equipment) was smaller than in case of the construction of new capacities or the expansion of existing capacities: in the latter case there was a hope that the new capacities would have been added to the existing ones that will somehow manage to operate several more years”.

Thus, despite the will to move to a pattern of intensive accumulation, the central planning system set up to maximize production from the mobilization of abundant resources to rapid capital accumulation did not easily fit the mission of increasing the efficiency of the capital already installed. Kalecki (1966 [1993]), for example, found correct the strategy of deliberately increasing the life of the equipment in labor-abundant conditions, thus maximizing the generation of industrial employment and reducing rural underemployment more rapidly. This also meant to reduce the consumption sacrifice relatively, since an extension of the life of the equipment would allow to obtain greater growth of the product with less effort of gross investment<sup>15</sup>. In this context, the extension of the useful life of capital was not irrational. It was simply something that made sense only in conditions of abundance of labor, but ceased to be functional in a situation of scarcity.

Due to the rigidity of the plan's production targets mentioned above, in practice, the average age of the capital stock increased instead of declining, even in the period of labor shortages, when

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<sup>14</sup> By the 1980s, “while in the U.S. manufacturing 50-60% of all investment was replacing retirement, and only 40-50% contributed to the expansion of capital stock, in Soviet industry the proportion was reversed: replacing the retirement required about 30% of gross investment, while over 70% contributed to the expansion of capital stock or to the unfinished construction” (POPOV, 2002).

<sup>15</sup> Popov (2010), by ignoring the issue of abundance or labor shortages, treats the issue as if it were only an irrationality of the planning system (this omission also invalidates its other conclusions about a supposed life cycle of the economy Planned, introduced in the same article).

the prolongation of the useful life of the capital did not make any sense. The average age of industrial equipment rose from 8.3 years to 10.3 years between 1970 and 1989. The proportion of equipment over 11 years old in total Soviet capital stock went from 29% in 1970 to 35% in 1980 And 40% in 1989 (Narkhoz in POPOV, 2010). This impaired productivity growth and aggravated the trend towards idle capacity in the new equipment, which were precisely the most efficient.

The chronic shortage of labor coupled with the maintenance of high rates of growth in fixed capital investment led to an increase in unwanted margins of idle capacity rather than proportionately increasing production. Popov (2010) reports estimates from Gosplan officials that:

[...] the excess capacities, not equipped with labor force, constituted in late 1980s about 1/4 of all capital stock in industry and 1/5 of capital stock in the entire economy. In the mainstream production of all industrial plants 25% of jobs were vacant, while in the mainstream production of machine-building plants - up to 45%. In machine-building there were only 63 workers per every 100 machines. The number of these machines exceeded that in the U.S. by a fraction of 2.5, yet each Soviet machine was actually operating twice less time in the course of a year than the American one [...]. Meanwhile, the shift coefficient (number of shifts a day) in Soviet industry declined from 1.54 in 1960 to 1.42 in 1970, to 1.37 in 1980, and to 1.35 in 1985. (POPOV, 2010, p. 9)

The limited incorporation of technological innovation in civilian industry was another problem of the Soviet system and an obstacle to the transition toward an intensive regime of accumulation. Scientific research was at a very advanced level in the USSR, but the scientific innovations were only partially incorporated to the production process, except in the military-industrial complex. This situation can be explained by the confiscation of innovations by the military industry, these innovations being 'released' for civilian purpose only after many years. There was not the 'spillover' that can be observed in the United States between military and civilian industries (MEDEIROS, 2004). Most advanced research was done in scientific institute instead of the universities and many general scientific breakthroughs were, if considered as potentially having any military application immediately considered classified and kept within the military industrial complex. This helps to explain why Soviet technology in civilian sectors usually lagged behind that of the West and why this technological gap used to widen during the period (AMANN & COOPER, 1982).

Beyond its negative effect on the diffusion of the technological innovations, the militarization of the economy was a burden in terms of investment. The *détente* and the *Ostpolitik* of the 1970s seemed to signal a relaxation of the Cold War tension but the situation worsened at the end of the decade after the Afghanistan conflict and the coming to power of Reagan in the United States. So, the expansion and the diversification of investment in the civilian sector were

considerably limited by the irreducible share of the surplus invested in the military industrial complex (MEDEIROS, 2011, p. 17).

The industrialization of Siberia also represented a significant economic burden for the USSR, hindering the intensification of the Soviet regime of accumulation. By the 1960s and the 1970s, giant civilian and military industrial projects were launched in the Siberia. The Soviet leadership intended to deepen the geographic dispersion of the industrial complexes in case of war<sup>16</sup>. But, the attempts were also to exploit the abundant natural resources in Siberia and to settle a scarcely occupied territory. The extreme climatic conditions in Siberia and particularly the cold<sup>17</sup> represented a huge loss in terms of labor and fixed capital productivity compared to the situation in temperate climate regions. The machines and equipment had to be adapted to resist to the extreme cold. Despite these efforts, the cost of repairs and maintenance of installed fixed capital was much larger in Siberia than in Western USSR. Soviet authorities had also to offer higher wages and expensive amenities to convince the workers to migrate to these inhospitable and remote regions. The remoteness of Siberia was also responsible for huge investments in transport infrastructure. The effort to build housing in the USSR also ended up concentrating from the 1970s onwards, because of the colonization of Siberia, in the colder areas of Russian territory (GADDY, 2003), with much higher costs than in the western part of the country. The industrialization of Siberia was really a heavy burden to USSR since:

“In the late 1960s, the extreme cold regions claimed 30 percent of all Soviet trucks, 37 percent of the bulldozers, 35 percent of the excavators, 33 percent of the tower cranes, 62 percent of the drilling equipment, and 64 percent of the tracked prime-movers. [...] Siberia claimed far more of its share of Soviet construction machinery than even its high rates of development would warrant”. (GADDY & HILL, 2003, p. 50).

These various problems show that despite the correct diagnosis of the loss of dynamism of the pattern of extensive accumulation, the USSR failed to move to the desired phase of intensive accumulation in the 1970s. On the contrary, as we have seen, the returns of investments in terms of growth were low for a number of interrelated reasons. These include rising costs of raw materials and energy, compounded by the costly replacement of oil by gas in industry and heating, with the aim of releasing oil for export (discussed later). In addition, the failure of large investments in

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<sup>16</sup> During the Second World War, the Western part of the USSR, where a considerable share of the productive potential of the country was concentrated, was occupied by the German troupes. It had dramatic consequences on the Soviet war effort and the USSR almost lost the war. As a consequence, the industrialization of Siberia was intensified.

<sup>17</sup> The average January temperatures in Siberia range from –15 to –45 degrees Celsius (GADDY & HILL, 2003, p. 50).

agriculture, labor shortages, and worsening labor discipline, coupled with the rigidity of the quantitative planning system, kept the labor force operating obsolete equipment. Finally, there were also the costs of the industrialization of Siberia and the difficulties of the central planning system to diffuse innovations in the non-military sector of the economy.

The main change in the Soviet system since the early 1970s was its commercial integration with the capitalist economies, which expanded substantially, motivated largely as a reaction to this failure and with the prospect of a less confrontational coexistence with the US and Countries.

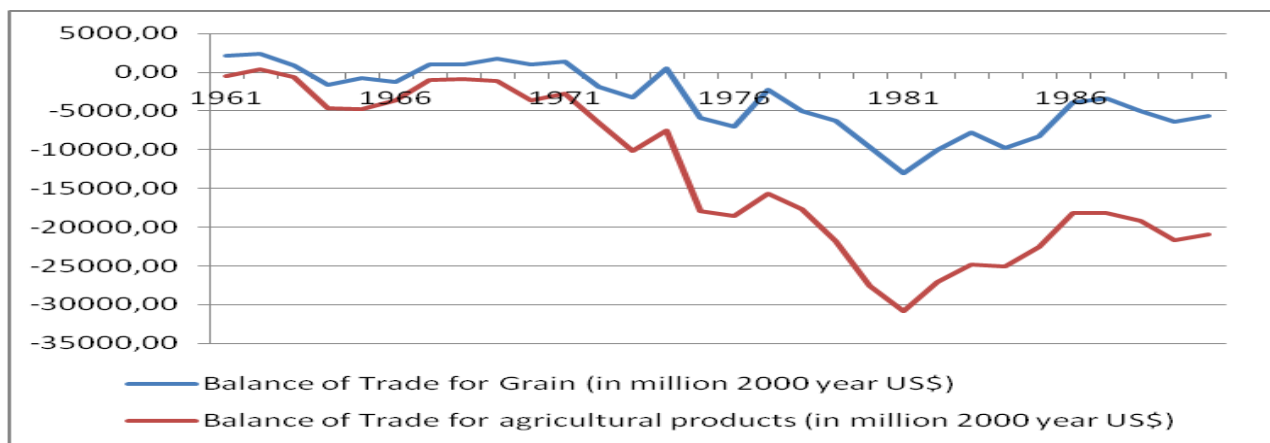
### **III.2. The change in the pattern of external insertion of the USSR**

The switch from oil to gas in the Soviet industry into increasing the oil export capacity also, phenomenon which be explained later. It represented also a huge cost for the USSR, 'consuming' a lot of investment without increasing the industrial production. On the contrary, it contributed to lower even more the fixed capital productivity (SAGERS & TRETYAKOVA, 1986).

Furthermore, central economic planning was increasingly complex and difficult to be directed, because of the proliferation of the large number and varieties of new products to be administered.

The attempt of Soviet leadership to move to an intensive regime of accumulation failed but, at the same time, life standards were increasing in the USSR with the urbanization of the population. Soviet demand for food and especially meat was rising much faster than the local supply, because of low agricultural productivity and stagnation in the production of grain. Despite rising income and increasingly costly agricultural production, food prices, controlled by the State, remained almost unchanged, at low level, which required larger and larger financial assistance for the agriculture and explains the rising demand (COOK, 1992, p.199). On the top of that, many cattle farms were created in the 1970s to attend the growing demand for meat. That meant a huge increase in the need for grain as livestock feed (GAIDAR, 2007, p.119). The only solution was to import these agricultural goods and it drove the USSR to become the largest importer of cereals in the world in the 1970s (GAIDAR, 2003). Besides, the balance of trade for grain and agricultural products worsened dramatically at the beginning of the 1970's (see figure 2).

**Figure 1: USSR balance of trade for grain and agricultural products (1961-1990).**

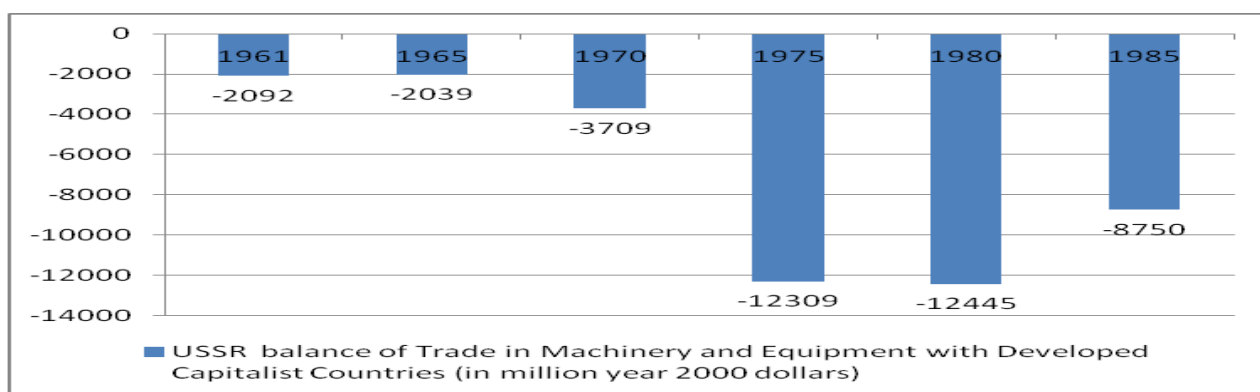


Source : FAO (2012) & COOK (1992, p. 196).

The Soviet population also wanted more consumption goods and consumer durables of better quality. But the cold war continued to require massive expenditure of resources in the military sector. At this stage several attempts to reorder priorities and reform the planning system to enable to increase the quantity and the quality of consumer goods, but they all failed. As local production was unable to fulfill entirely this demand, imports of these categories of product were necessary, especially from the West.

The Soviet Union had also to import technology and capital goods in the sectors of information technology, electronics and fine chemicals from the advanced industrial Western economies. Buying Western goods was also considered useful to break production bottlenecks and eliminate shortages of specific products (HANSON, 1981, p.135). Technological transfers were aimed at accelerating the creation of new industries, the modernization of old ones and the increasing of productivity. Moreover, they were an attempt to solve the problem of the lagging Soviet technological progress in the civilian industry analyzed above. So, the USSR had to rely increasingly on the imports of capital goods from the West into limiting the widening of the technological gap (see figure 2).

**Figure 2: USSR balance of Trade in Machinery and Equipment with Developed Capitalist Countries (1961–85).**

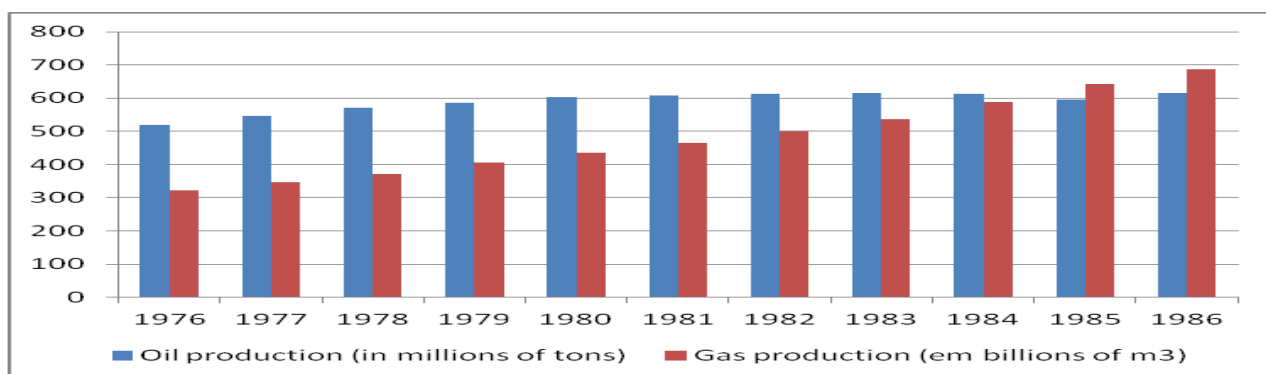


Source : GAIDAR (2007, p. 99).

Because of the necessity to import agricultural products (mainly grain), consumer goods, technology and capital goods, the pattern of external trade of the USSR had to change drastically during the 1970's. However, USSR problem was to find a way of financing the rising imports in hard currencies needed by the country. The 1973 oil crisis provided this opportunity, allowing a boom of Soviet foreign trade

Soviet foreign trade experienced a boom after the 1973 oil crisis, driven by exports of oil and gas, whose price were unprecedented high. A massive switching from oil to gas in internal Soviet energy supply (see figure 3) enabled to raise dramatically the volume of oil available for export (SAGERS, M. J. & TRETYAKOVA, 1986). The construction of gas pipeline mostly financed by foreign investment<sup>18</sup> was also a way to export gas and obtain more hard currencies from Western European countries<sup>19</sup>. Soviet weapons exports also benefited from the large amount of petrodollars in the hands of OPEC countries. Consequently, Soviet foreign trade averaged almost 20% of Soviet GDP in 1980. It means that USSR, a still autarkic country in 1950, had reached a level of trade openness almost equal to that of the United States at the end of the 1980's.

**Figure 3: Evolution of Soviet oil and gas production (1976-1986).**



Source: Joint Economic Committee (1987).

As a consequence of all this process, the profile of foreign trade partners also evolved. The annual Soviet trade with the OECD members jumped from less than 20 percent of USSR total trade in the 1960s, to 31 percent in the 1970s (JOINT ECONOMIC COMMITTEE, 1979, p. 52). Soviet exports to Western economies increased at an annual growth rate of 26 percent from 1970 to 1980 (SMITH, 1993). Soviet imports from the West also increased at a fast pace during the 1970s and the USSR incurred major trade deficits with its hard-currency trading partners. These deficits could be easily financed by foreign loans thanks to the context of abundance of liquidity (petrodollars) in the 1970s.

<sup>18</sup> The first agreement was signed with Germany in 1970.

<sup>19</sup> Western European country were eager for Soviet gas because the explosion of oil international price. All along the 1970's and the 1980's, they realized a gas for oil substitution (SAGERS, M. J. & TRETYAKOVA, 1986).

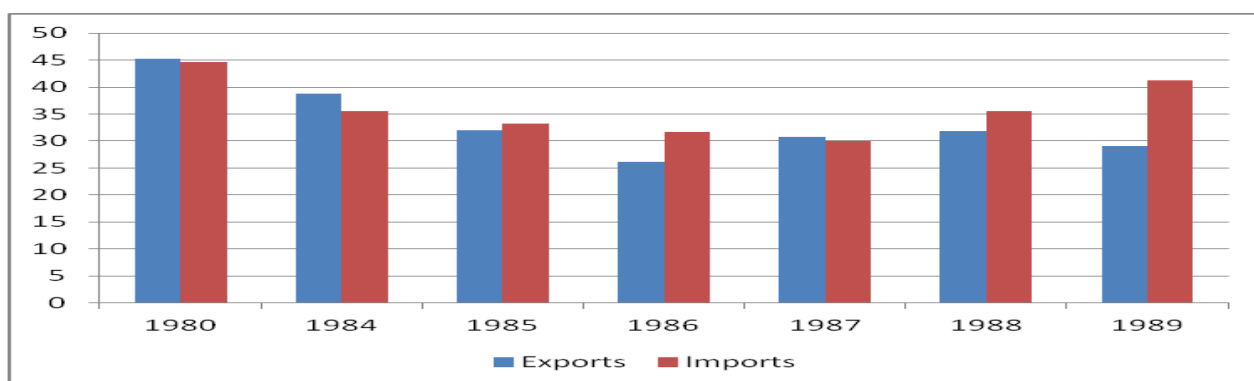
Another consequence was a deep change in the structure of Soviet foreign trade. The share of raw materials in the total exports of the USSR increased a lot, rising from 26% in 1970 to more than 50% in 1980 (FEDERAL STATE STATISTICS SERVICE – RUSSIA, 2012). So, the share of manufactured and capital goods was decreasing.

The new trend in the Soviet foreign trade created a situation of structural external vulnerability. First of all, the share of raw materials (mainly oil and gas) in the Soviet balance of trade was becoming higher and higher. This specialization in raw materials was a factor of vulnerability because the value of Soviet exports was depending more and more on the evolution of international prices, specially of energy (oil and gas), which are very volatile.

The structural external vulnerability was also reinforced by the vital and growing dependence of the USSR on the imports of such important goods that agricultural products, machines, equipments and technology. This situation was even more unusual and worrying if considering the fact that USSR was one of the two Superpowers of the world at the time.

Besides, when, after the peak of 1979, international oil prices began to decrease, the value of Soviet exports dropped. The international abundance of liquidity had finished after Paul Volker's decision to raise brutally the interest rates of the American Federal Reserve in 1979. So, Soviet imports from capitalist developed countries had also to be diminished in the beginning of the 1980s (see figure 4), which deepened shortages of meat and consumer goods. On the top of that, the United States and some of its allies decided to forbid the exportation to the USSR of many goods in retaliation of the Soviet intervention in Afghanistan<sup>20</sup>. It was part of a global strategy of the United States to weaken the USSR in the 1980s, using Soviet external dependency. Some analysts also consider that the drastic fall of international oil price in the MID 1980S, caused by a sudden massive increase in the exports of Saudi Arabia was part of this strategy (SCHWEIZER, 1994).

**Figure 4: Soviet trade with capitalist developed countries 1980-1989 (billion 2000 dollars).**



Source: GAIDAR (2007, p. 123).

<sup>20</sup> The number of goods which export to the USSR was forbidden raised from 125 in 1979 to 800 in 1982 (FERNANDES, 1992).

From the 1970s, the structural external vulnerability became a permanent feature of the USSR, and the very low price of oil from the mid 1980s had an important impact on the final collapse of the Soviet system in the following decade.

#### **IV. The *Perestroika*: the dismantlement of the Soviet economic system (1985-1991)**

The next phase, from 1985 to 1991, corresponds to a period of economic recession. The average per Capita GDP growth was -1,3 % (see table 1).

The accession of Mikhail Gorbachev in 1985 marked the beginning of the *Perestroika* (reconstruction in Russian) period. The economic reforms implemented were intended to deeply change the Soviet system. According to Gorbachev, the two main goals of the *Perestroika* reforms were to stop the slowdown trend of Soviet economy and to raise the life standards of the population. Soviet reformers considered that these two interconnected objectives could be achieved through the resolution of the problem of the 'relaxation of discipline' and a change in the means of coordination of the economic system. They thought that the rigid central economic planning must be softened, with a certain degree of decentralization was required and a direct participation of the workers to the management of the enterprises. But, the most radical change in the mode of functioning of the Soviet economy intended by the *Perestroika* was the creation of a private sector and the introduction of market mechanisms. Thus, Nuti (1990) wrote about the *Perestroika* in 1990 that:

“In the last five years the Soviet Union has introduced many measures of economic policy and radical reform intended to reduce the scope of central planning and to activate market mechanisms, in order to mobilize resources, increase their productivity directly and through greater integration of the Soviet economy into world trade, so as to resume and accelerate economic growth”.

A spate of laws and decrees was passed to implement the reform program. The Law on State Enterprise, which granted substantial autonomy to state enterprises, was adopted in 1987. The Law on State Enterprise defined that central plans were becoming indicative and not obligatory any more. Enterprises were given target for the value of their output by the central planning but detailed plans of inputs-outputs for each company were abandoned. Government contracts were substituting state orders and only a part of the production of enterprises was bought by the State. The remainder of enterprise output should be sold through wholesale trade directly between the companies. Thus, Soviet enterprises were free to determine the nature of part their output. The pricing system was not any more entirely controlled by the Gosplan. A growing number of prices could be set freely, even if the price of basic and strategic goods (energy, raw materials, health sector...) remained under State control.



Moreover, Soviet enterprises became free to choose the buyers of the remainder products. The self-financing of the enterprises, through retained earnings and bank loans, was also adopted (GOLDMAN, 1992).

The introduction of workers self-management in the Soviet enterprises, inspired by Yugoslavian experience, was intended to create a motivational system so as to solve the problem of the 'relaxation of discipline', even though quite the contrary happened. Labor Councils, elected by the employees in each enterprise<sup>21</sup>, were responsible for the discipline, the determination of the level of wages and for the distribution of profits between investment and incentive funds for employees (Kotz, 2007, p. 76-77).

The autonomy of the state enterprises had many negative consequences on the operation of the Soviet economic system. It disorganized the coordination of the economy previously ensured by the Gosplan, which was losing progressively its control over the Soviet Economy. It created bottlenecks and deepened the shortages (DI LEO, 1991). The Labor Councils took also advantage of the autonomy by increasing the share of profits going to the incentive funds at the expense of investment (see table 4). Thus, the share of profits retained by the enterprises going to incentive funds represented 82% in 1988 and almost 95% in 1989 (Narkhoz in ELLMAN & KANTOROVICH, 1992, p. 115). Most of the increase in incentive funds was used to raise wages. Thanks to the *Glasnost*<sup>22</sup>, strikes became allowed. It resulted in a wave of workers strikes which led to other wage increases (COOK L.J., 1992). Soviet system was more and more behaving like a capitalist economy. These words of Kalecki (1943 [1990], p. 351), quoted from the same text used in section IV show it clearly and happened to be premonitory:

“Under a regime of permanent full employment, the ‘sack’ would cease to play its role as a disciplinary measure. The position of the boss would be undermined and the self-assurance [...] of the working class would grow. Strikes for wage increases and improvements in conditions of work would create political tension”.

The accelerated increase of real wages, in a context of growing shortages, worsened the problem of excess demand in the USSR. It also contributed to the growing inflation in the country.

Before the Law of 1987, the Soviet State had had a total control over the enterprises, obtaining from them whatever revenues were required for the central budget. But, the situation totally changed with the adoption of the enterprise autonomy since the State could not collect any more whatever tax it need. Thus, the rising size of the incentive funds also meant that the share of profit paid to state budget was lowering. It aggravated the increasing state deficit.

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<sup>21</sup> The management of the enterprise, including the director, was also elected by the workers.

<sup>22</sup> The Glasnost ('openness' in Russian) established freedom of individual expression and opinion.

The freedom to determinate the prices of products out of the state contract disorganized the pricing system. The consumer goods enterprises, which had become profit-seeking because of their newly acquired autonomy, shifted their production from basic goods to 'new products', which embodied minor alterations to existing items and were more profitable. After all, these 'new goods', for which State controlled prices did not exist, were higher-priced and carried a larger markup. The effect of this enterprises strategy was a rising shortage of basic consumer goods. The activity of the illegal secondary markets was also growing fast, with 'backdoor channels' for people able to pay above fixed retail prices of basic goods (SMITH, 1993, p. 107-109; KOTZ, 2007, p. 79). So, many goods had, at the same time, a state price, a free-market price (for some very closed variant of the good) and a black market price. As State statistics did not take into account the 'new goods' and the products sold on the black market, they did not captured the hidden inflation and official records did not show the inflationary process in progress (SMITH, 1993, p.109). The prices depended also sharply on the place of residence (ELLMAN, 1990).

The Law on Individual Labor Activity, approved in 1986, had been a first step in the direction of the creation of a private sector in the USSR but its scope was very limited. However, the Soviet Law on Cooperatives, approved in 1988, represented the real birth of Soviet private sector. According to this law, the cooperatives could function as private enterprises and do not obey to the plan. Multiple memberships of production cooperatives by a single person were also allowed, which means the opportunity to create a new class of businessmen with activities in multiple sectors of the Soviet economy. Cooperatives had the right to engage in credit activities, i.e. they constituted the embryo of a system of private financial institutions. Cooperatives had access to foreign trade and they could retain part of their export earnings supposedly to finance their imports necessities. They also could participate in joint ventures. A cooperative could hire employees who were not members of the cooperative. It meant that private employment was introduced in the Soviet system. The size of earnings was not limited. Cooperatives can sell or lend their means of production. The markup was supposed to be controlled by central authorities. Actually, cooperatives were free to set their prices (NUTI, 1989).

The cooperatives were intended to be small-scale businesses providing goods and services which were not offered by big State enterprises. But, cooperatives had all kinds of activities and many of them became big companies and operated in trade and finance. So, the Law on Cooperatives gave birth to a lot of capitalist firms. The cooperative model was so successful that, by July 1989, barely one year after the approval of the law, almost three million people were working in cooperatives (JONES & MOSKOFF, 1989). At the end of 1991, they were more than 6,2 million (NOVE, 1992, p. 403). Many cooperatives were created by the managers and employees of the state companies. They usually bought goods produced by their own enterprise at state controlled prices,

processed them in the cooperative, usually without any significant alteration, and sold them at much higher free prices. These practices contributed to increase even more the shortage of consumer goods in the USSR. Furthermore, many State enterprise managers became real capitalists and accumulated huge wealth thanks to their ‘cooperative activity’.

This accumulation of wealth in the hands of State managers increased dramatically thanks to the decentralization of foreign trade, established by the decree “On the Foreign Trade Activity of State, Cooperative, and other Enterprises” in December 1988. This decree removed State controls over foreign trade. So, many cooperatives bought good (specially raw materials, metals, oil,...) at the low State domestic prices and sold them abroad for hard currency (GUSTAFSON, 1999, p. 27). It was very lucrative and some managers enriched themselves a lot, forming a group of wealthy capitalists for whom “proceeding to capitalism was essential to the survival of their new businesses” (KOTZ, 2007, p. 90). They played a central role in the collapse of the USSR by financing the pro-capitalist coalition and deepening the Soviet economy imbalances.

The partial freedom of State enterprises to set prices and the total one of Cooperatives disrupted the Soviet distribution system. State enterprises and cooperatives took advantage of the free price-setting to increase prices, which allowed higher profits. So, thanks to the increase in profitability and their autonomy, cooperatives and State enterprises could raise their employees’ wages. The consequence was a differentiation in wages in State enterprises depending on the extent of their free price-setting<sup>23</sup>. Though, cooperatives, which had an entirely autonomous price-fixing, could offer the highest wages. Besides, average wages were 2,5 higher in cooperatives than in State enterprises. All this process had been identified by Kalecki almost 40 years before Perestroika in a paper about ‘central price determination’. He wrote:

“Under the system of [autonomous] price-setting, enterprises may, despite everything, exploit various opportunities for unjustified price increases and thereby raise their profits. [...]

A further problem arising out of autonomous price-fixing by enterprises should be pointed out. This is the possibility that unwarranted differences in income between workers in different enterprises may arise, which may cause dissatisfaction” (KALECKI, 1958 [1992], p. 119).

The structural external vulnerability described in Section IV worsened during the Perestroika. World oil prices fell sharply in 1986 and remained very low so that Soviet current balance of payment deteriorated during the Perestroika. The situation became all the more unsustainable that the Soviet oil production began to fall in 1989 because of the overuse of the most

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<sup>23</sup> Typically, the bigger was the share of production for which the enterprise was free to set the prices (i.e. the smaller was price-controlled production), the higher were profits and wage rises.

productive deposits (GAIDAR, 2007, p. 166). As a consequence, official<sup>24</sup> oil exports dropped<sup>25</sup>, increasing the problems with hard currency. The deficit in the current account of the balance of payments also worsened because of the increasing domestic needs for consumer and agricultural goods due to the shortages. Finally, the exports dropped by 33% and the exports fell by 44% in value in 1991 compared to 1990 figures (SMITH, 1993, p. 174).

Moreover, the end of communism in Central and Eastern Europe marked the end of the Comecon, which had a very negative impact on Soviet foreign trade.

A consequence of the deterioration of the current balance of payments and of the internal economic difficulties was the fast degradation of the conditions of foreign financing. Thus, the terms of Western banks loan worsened with rising rates and shorter deadlines. As a result, foreign net debt rose from 14,9 billion dollars in 1985 to 45,4 billion dollars in 1991 (SMITH, 1993, p. 159). The USSR had to use its gold and hard currency reserves but they were insufficient to finance the long-term deficit of the balance of payments. Western private banks totally cut credit lines at the beginning of 1991. The USSR tried unsuccessfully to obtain loans from foreign governments from 1989 to 1991, promising political and diplomatic compromises in order to get them. The Soviet gold and hard currency reserves finally exhausted at the end of 1991 (ELLMAN & KONTOROVICH, 1992; GAIDAR, 2007).

Thus, in 1991, the USSR was in a dramatic economic situation. Unable to attend domestic needs for consumer and agricultural goods, central Soviet institutions had no more authority on the economic and political system. GDP per capita, which fell by 3,1% in 1990, dropped by 6,8% in 1991 (see figure 1). Inflation could not be kept under control. The price system was totally disorganized. The birth of a capitalist market had enabled the accumulation of a huge wealth by privileged groups of State managers. The Soviet distribution system had become very unequal. The aim of most of the political leaders was to realize the 'transition to a market economy'. The Perestroika had destroyed the Soviet system because "Gorbachev never had a coherent reform program. Perestroika was reactive and fragmented, each reform responding to pressures created by the previous stage of reform" (CLARKE, 2007, p.15).

Because of secessionist movements and the affirmation of local political leaders in the Republics, like Eltsin in Russia, the USSR had become increasingly ungovernable. The partial paralysis of inter-republican trade deteriorated even more the economic situation, multiplying the

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<sup>24</sup> Major quantities of oil, embezzled from the State enterprises by cooperatives, were negotiated abroad from 1988. These operations were generally illegal and did not appear in official records since hard currency payments were usually kept abroad.

<sup>25</sup> Official oil exports fell by almost 50% from 1989 to 1991 (NOVE, 1992, p. 413).

bottlenecks. The fast process of political and economical disintegration ended in 25 December of 1991 when the USSR officially disappeared.

## **VI. Conclusion**

The success of the Soviet extensive growth model in the 1950s and 1960s was undeniable. But, the depletion of the large reserves of underemployed rural work force and low cost natural resources were responsible for the exhaustion of this model. A phase of economic stagnation began in the 1970s. The attempt to move to a new regime of intensive accumulation with high productivity growth to overcome these new constraints failed. The deterioration of labor discipline, the militarization of the economy both in what regards large expenditures because of the cold war and the problems the industrial structure and diffusion of technical progress and the great difficulties with cold weather agriculture were all partly responsible. Given these difficulties the strategy was changed to a pattern of external trade based on commodities exports and the dependence on basic goods imports which created a situation of great external economic (and political) vulnerability. The attempt of Perestroika to build a 'market socialism' totally failed. Gorbachev's reforms disrupted the system of planning and distribution and provoked a large increase both in the chronic excess of domestic demand and in the needs for imports. The interaction of economic collapse and political crisis led to the end of the USSR.

It is interesting to observe how structural characteristics of the USSR economy influenced post-Soviet Russia. Thus, the predatory practices which begun thanks to the Perestroika reforms, became generalized during the period of 'transition' to capitalism in the 1990s. The wealth acquired by Soviet State managers during the Perestroika allowed them to take advantage of the Shock Therapy reforms in the 1990s. They are now known as Russian oligarchs. The current Russian economy is also characterized by a low productivity agriculture, growing dependence on raw materials and energy exports, a structural external vulnerability inherited from the Soviet times, to which virtually free short term capital mobility has been added.

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