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GROWTH AND CRISES IN THE PLANNED AND MARKET RUSSIAN ECONOMIES (THE END OF THE 1920s–2014)

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Russia is a country with a unique history. Its economy became strictly planned in 1928; then the turbulent processes of collectivization and industrialization took place; then the arduous years of the war with Nazi Germany came; then the Cold War with its armaments race started; then the USSR crashed and the transition from planned to market economy began in separated Russia; then the Russian economy was attached to the world economy and the world financial system; then came the period of sanctions and isolation of Russia… It's reasonable to think that all these processes strongly affected the Russian economic trajectory but it's not known exactly: a lot of the Soviet statistics (especially for the 1930s-1940s) were never published, and some of the indicators had serious distortions because of improper deflators.

Hence, our first aim was to construct statistical time-series which might be useful for describing the long-run trajectory of the Russian economy. Using previously unpublished data stored in Russian archives, we tried to make them as long as possible; in fact, most of them begin in the late 1920s.

Our second aim was to denote periods of growth and contraction in the Russian economy and to reveal the economic factors which determined the changes in the trajectory. Periods of contractions during the era of the planned economy were of special interest for us. Even now, many think that economic recessions generated for economic reasons are impossible in the planned economy. We checked this idea against the long-run statistical data for Russia and found that cycling does occur, not only in market, but in planned economies as well (of course, with a significant remark that crises in planned economies are much rarer but possibly more destructive).

Key words: economic history, economic crises, planned economy, Russia

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1. Introduction

"Russia is a country with an unpredictable past". This popular caustic remark points to the political winds which sometimes change the Russian historical landscape. But Russia is also a country with a poorly-known history, including its economic history. One of the main reasons for this amnesia is the unavailability of systematic and comparable historical time-series. This situation was caused by inherent features of the Soviet statistical system, especially: its focus on exotic indices which were important for communist propaganda but not for conventional economic analysis; very poor information on prices and deflators; a small number of indicators published continuously (as a consequence of a comprehensive regime of secrecy), etc.

The statistical system of Russia is much better now, but Rosstat (an official statistical agency) usually provides information only from 1991 onwards. More extended time series – mainly for the index of industrial production – were constructed by a few researchers; most of them are surveyed below. As they referred to only one (although very important) sector of the economy, they were not enough to reveal the historical pattern of the Russian economy. Hence, our first aim was to construct statistical time-series which might be useful for describing the long-run trajectory of the Russian economy. We tried to make them as long as possible; in fact, most of them begin in the late 1920s.

Our second aim was to denote periods of growth and contraction in the Russian economy, to estimate their quantitative parameters, and to reveal the economic factors which determined the changes in the trajectory. Periods of contractions during the era of planned economy were of special interest for us. Even now, many think that economic recessions generated for economic reasons are impossible in the planned economy. We checked this idea against the long-run statistical data for Russia and then compared our results with the picture of the market-oriented American economy.

2. The Data

2.1. Official annual data, since the end of the 1920s

The Russian Federation has existed as a sovereign country only since 1991; this territory was a part (the largest part) of the Soviet Union for about 70 years in the 20th century. During this period, a lot of detailed economic information was collected through the channels of centralised Soviet ministries; not all important statistical indicators were published (and even calculated) at regional levels. Thus, it's not an easy task to pick out historical information for present-day

Russia. It's fully impossible for such an indicator as GDP (many specially-designed statistical sources which didn't exist in the Soviet Union are needed) and for any high-frequency statistics (monthly and quarterly). Therefore, we had no choice but to use annual time-series for several *important* sectors of the Russian economy.

As the price statistics were very poor in the Soviet Union (there was an ideological dogma that inflation simply may not exist in a planned economy) we decided to limit ourselves to indicators in natural ('physical') units.[1] This decision caused an absence of long time-series for trade (retail and wholesale) and for fixed investments in our set of indicators. The only exclusion from this rule was the Y-o-Y tempos in industry; for this sector we used indices calculated from data with physical units and from official data in "fixed-year list-prices" as well (we give arguments for this below).

More specifically, we compiled the following time-series (see Table 1).

Table 1. Main Russian official macroeconomic indicators, by sectors of economy

Sectors of Economy	Units	Period
Industry		
Index of industrial production, official	1960 = 100	1929-2014
Agriculture		
Livestock inventory	Millions of heads	1927-2014
Grain production*	Millions of tons	1928-2014
Grain area planted	Millions of hectares	1925-2014
Transportation		
Railroads freight transportation	Millions of tons	1928-2014
Residential construction		
New completions, state organizations and establishments	Millions of sq. metres	1946-2014
New completions, population+	Millions of sq. metres	1980-2014

Notes: * – the method of estimation radically changed in 1953; + – workers and employees for 1946-1980.

Sources: See Appendix B for details.

[1] All prices in the Soviet Union were under strict government control. As the government very seldom decided to raise prices, one might even believe this dogma. But now the methodological trick is well known: the Soviet Central Statistical Administration (CSA) compared prices only for strictly unchanged products and services; as it was prohibited to raise prices without explicit government permission, the official statistics usually showed no price increases. But if a producer had made a modification (even slight) to its product, then the government considered this product as perfectly new; the State Price Committee permitted a new (usually higher) price, while the CSA didn't compare it with the price of the old (non-modified) product. Hence, there was some inflation in reality, but no inflation in statistics.

Our main sources were:

- databases from the official website (www.gks.ru) of Rosstat (since 1991);
- annual statistical yearbooks for the USSR (United Soviet Socialist Republics) and the RSFSR (Russian Soviet Federative Socialist Republic); different other (non-periodic) official statistical handbooks;[2]
- never-published documents by the Soviet Central Statistical Administration (CSA) and by other branches of the Soviet government; those documents are now stored in the Russian State Economical Archive (RSEA).

For all compiled time-series and their detailed sources, see Appendices A and B.

2.2. Alternative annual index of industrial production, since 1960

The alternative index of industrial production (1960 = 100) is calculated using the geometric means of Y-o-Y percent changes which in turn were calculated from base indices published by several independent (non-government) researchers (see Table 2). All of them estimated their indices as a weighted average of technical base indices, one index per one industrial product (its output in physical units). The authors used different weights and different sets of goods. Total number of products varied from one hundred to two hundred or more but all of them were non-military. Therefore, strictly speaking, the aggregated indices are not "total industry", but only non-military or civilian. The role of military production for the official index is unknown.

Table 2. Alternative annual indices of industrial production for Russia

Source	Time period	Number of products
Suhara (2000)	1961-1997	100
Ponomarenko (2002)	1961-1990	117
Alekseev (1994) and Alekseev et al. (1996)	1976-1994	222
Smirnov (2013a)	1981-1992	108
Baranov and Bessonov (1999)*	1990-2006	126
Baranov and Bessonov (1999)*	1995-2010	236

* – time-series were kindly supplied for our research by the authors.

[2] The scans of most of them are now found on the private website http://istmat.info/statistics.

3. Economic Dynamics in Russia, the End of the 1920s-2014

3.1. Trajectories of the Main Annual Indicators

The long run trajectories of the main macroeconomic indicators for Russia as well as their Y-o-Y % changes are shown in Appendix C. Of course, short comments are needed.

Industrial Production. The official index of industrial output begins with 1929 and ends with 2014; the alternative index begins with 1960 and ends with 2010. As the official Y-o-Y % changes are quite close to the alternative estimates in recent years, there is little interest in any alternative figures now (that is why our mean alternative index ends in 2010). But this was not the case for the period before 1991. At that time, the official Y-o-Y tempos were calculated using the list prices of some fixed year (initially, 1926/27 financial year, then 1953 calendar year, etc.). As in reality there was some permanent (unknown) inflation, the official industrial tempos were too high. A comparison with the mean alternative index for the 30 years from 1961 to 1990 gives an average overshoot of 2-2.5 percentage points. On the whole, the official index rose 5 times for this period, while the mean alternative index rose 2.5 times.[3] On the other hand, the two time-series of tempos moved more or less synchronically during this period (the pair correlation coefficient is equal to 0.94). It means that for distant periods, one may use not only alternative indices, but also the official index to date decelerations and accelerations of industrial dynamics.

The most definite declines of industrial production took place in 1942, 1945-46, 1979, 1989-1996, 1998, and 2009.

Agriculture. We used livestock inventory as a main indicator to characterize the total activity in the Russian agricultural sector.[4] Large declines in this inventory are clearly connected to the periods of "hard times" in Russian economic history. The most significant (more than 5% for the year) reductions of livestock inventory took place in:

- 1928-32: collectivization. The rural population slaughtered more than half of their private livestock. It's well known from a lot of "non-statistical" sources (including memories and witnesses) that the main driver of this drop was a strong unwillingness to present their private livestock to "collective farmers";[5]

[3] If one views the Soviet statistics as an "instrument of propaganda", he would agree that its effectiveness was quite high: for each "unit" of output produced by industrial establishments during 1961-1990, the statistical system created just another "unit". As a result, in 1990 the total "official" index was twice the (more realistic) "nonofficial".

[4] As supplementary indicators for agriculture we also used time-series on grain production and on grain areas planted. It is worth noting that the average harvest after 2000 (slightly more than 80 million tons) is roughly equal to the average harvests of the 1960s, while the areas planted are 1.7 times less. Does anyone need any other proof as to the non-effectiveness of the Soviet planned economic system?

[5] According to www.merriam-webster.com, a collective farm (or "kolkhoz", in Russian) is "a farm… formed from many small holdings collected into a single unit for joint operation under governmental (and the Communist Party's – *S.S.*) supervision." The collectivization in the USSR was a highly forced process.

- 1941-42: the first two years of the war between the USSR and Nazi Germany: a lot of Russian territory was temporarily lost;

- 1936, 1946, 1963, and 1975: the years of crop failures;[6] the number of pigs was the most volatile since their owners preferred not to feed them, but instead to eat them;

- 1987-2000: the prolonged transition period in the animal industry; the appearance of a great amount of meat imports which were never there before;

- 2003-2005: high exports of grain against the background of a low crop brought high fodder prices; low-producing livestock were slaughtered.

Railroads freight transportation. The volume of railroads freight transportation is definitely an indicator which is well synchronized with the level of economic activity in Russia[7]. Ordinarily its growth is highly monotonic; a decline in railroads freight transportation always indicates serious problems in the Russian economy.

Residential construction. In 1950, the average urban floor space in the RSFSR was only 6.4 square metres per capita. Evidently, there was a great need for housing. However, since in a planned economy any limit to production is set by supply rather than by demand, residential construction was at a very low level for years, until the special enactment devoted to the development of residential construction. It was approved by the Central Committee of the Communist Party and the Soviet Government in mid-1957 and had an immediate effect: by 1958, the Y-o-Y tempo of new residential completions made by workers and employees had exceeded 80%. In the succeeding years, the new completions made by state organizations and establishments and the new completions made by the total population (workers and employees up to 1980) usually moved in opposite directions. They became more or less synchronised only after 2000.

Crude oil prices. Many believe that the Russian economy is highly dependent on the international oil market (as well as that the Soviet economy was prior to 1991). The annual time-series of international prices for Russian oil ("Urals") began only in 1995 but the trajectory of the Russian oil price is very close to the trajectories of other sorts of oil even in small details. It means that we may use historical prices for international sorts of oil as a proxy for the Urals price. One may suppose that high or growing oil prices were positive for the Russian economy, while low or declining prices were negative.

The years of declines in absolute levels for all considered indicators are enumerated in Table 3. For clarity, they are shown by decades.[8]

[6] The 1963 crop failure was the first time grain was imported to the USSR in many decades.

[7] It may even be a leading one because the transportation of raw materials -- not of other goods -- is the main specialization of Russian railroads. Surely, the leading effect may not be observable with annual data, but can be seen by examining more frequent data (e.g., monthly). See (Smirnov, 2013b).

[8] Not very strictly. In some cases the continuous periods of drops cross the boundaries of decades; usually they are shown as a whole in one cell.

Table 3. Main Sectors of the Russian Economy: Years of Contractions, by Decades

Sectors of Economy	1920s-1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s
Industry								
Index of industrial production, official	-	1942, 1945-1946	-	-	-	-	1990-1996,1998	2009
Index of industrial production, alternative	NA	NA	NA	-	1979	-	1989-1998	2008-2009
Agriculture								
Livestock inventory	1928-1932, 1936, 1938-1939	1941-1942, 1946	1952	1963, 1967-1968	1972,1975, 1979-1981	1984-1985	1987-2000	2003-2005, 2008, 2010, 2013-2014
Transportation								
Railroads freight transportation	1933	1941-1942, 1945	-	-	1979	1982, 1987	1989-1998	2008-2009, 2013-2014
Residential construction								
New completions, state organizations & establishments	NA	NA	1955	1964	1976, 1978-1979	1981, 1984	1988-2000	2009
New completions, population*	NA	NA	NA	1961-1972	1974-1983	1985	1990-1992	2000, 2010
Crude oil prices								
Brent and others+	1927-1928, 1930-1931, 1933,1935, 1938-1939-	1945, 1949-1950	1957	1960-1961	1975	1981-1986, 1988	1991-1994, 1997-1998	2001,2009, 2013-2014
Urals	NA	NA	NA	NA	NA	NA	1997-1998	2001,2009, 2013-2014

Notes: * – workers and employees for 1946-1980; + – Brent since 1984; Arabian Light for 1945-1983; US Average through 1944.
Sources: Appendices A and B.

3.2. Overall Contractions in the Russian Economy

Unfortunately, it's impossible to reasonably combine all of the considered indicators in a single composite: a) the indices are available for different time periods and have different omissions (usually in the 1930s); b) some indices are flows (e.g. industrial output), others are stocks (e.g. livestock inventory); and, most importantly, c) there is no information about possible "weights" of the components; the only thing we may be aware of is that these weights have changed significantly since the end of the 1920s. Therefore, all we can do is to carefully trace the trajectories of all the indicators, look for their contractions and then – on the basis of qualitative analysis – try to reveal the years of overall contractions, or contractions of the whole economy.

As mentioned above, the end of the 1920s and the beginning of the 1930s were very destructive for Russian animal industries: livestock inventory in 1932 was only 46% of the 1927 level. On the other hand, the quantities produced by the Russian crops sector were not so bad. Total grain areas planted in 1932 were 12% higher than in 1928; grain production was only 5% lower. Despite this, there was strong starvation in Russia in 1932-1933, with up to several million victims.[9] As total grain production was not too low in 1931-1932, one may find the source for the starvation only in the Soviet government's decisions. The most popular idea (it's almost an "official" one) connects the requisition of crops from individual rural households with the needs of rapid industrialization (supposedly, the grain was exported and the earnings were spent for industrial equipment).[10] Indeed, the growth rates in the industries were very high during the first and the second economic plans (that is, in 1929-1937): always double-digit and sometimes around 20% or more per annum. Of course, the official figures were based on the list-prices of the 1926/27 financial year and may be overstated to an unknown extent. Anyway, they were usually high, but with one important exception: the growth rate was only 5% in 1933. It's a great contrast with the preceding and the subsequent years; it is also near the level of the differences between the official and the alternative industrial indices which were caused by inaccurate deflators in the official statistics and may be observed in the 1960s and later years.

Therefore, it's quite plausible that real industrial growth was near zero or even negative in 1933. The Russian railroads freight transportation also fell in 1933 (it had been a very rare event before WW2). So, we hypothesize that the total output in Russia declined in 1933 and the first

[9] The starvation was not less serious in the current territories of Kazakhstan and especially Ukraine, but here we focus on Russia only.

crisis in the Russian planned economy took place sometime in that year. The starvation in rural areas, the very low (or even negative) growth in industry, a drop in the railroads freight transportation – all these may be considered as arguments for this proposition. The roots of this crisis were in the Soviet government's economic policy concerning the agricultural sector, as well as the low world prices on raw Russian exports.[11]

The next economic contraction occurred in 1941-1942. Obviously it was related to destruction caused by the war and with temporary losses of territories (the Soviet statistics didn't account for economic outputs by the territories occupied by Germany). The agricultural sector was damaged the most: livestock inventory dropped by 25% in 1941 and by 19% in 1942; grain production by 18% in 1941 and by 47% in 1942.[12] Railroads freight transportation fell 3% in 1941 and 27% in 1942. Lastly, according to official data, industrial production grew by only 4% in 1941 and declined by 9% in 1942.[13] So, there is strong evidence that the total output of the Russian economy did contract in 1941, and especially in 1942.

During the next two years (1943-1944), strong economic growth was observed, as the territories previously occupied by Germany were returned to Soviet control and production of military goods expanded greatly. But by the end of the war and shortly after, a more or less ordinary post-war crisis began. A lot of military goods and ammunition became unnecessary, and their excessive production had to be cut. Therefore, industrial production dropped by 16% in 1945 and by 22% in 1946. The drought of 1946 dealt an additional negative blow to the Russian economy. Grain production fell by 17% in 1946 (after a 6% decline in 1945); livestock inventory by 6%. The railroads freight transportation grew by 5% in 1946, but there was a decline of 1% in 1945.

The post-war expansion which started in 1947 was long and pronounced. The tempos were very high in the end of the 1940s and in the first half of the 1950s (often around 15-20% per

[10] Some other researchers emphasize great losses while gathering the harvest due to the low level of agricultural technologies and high level of irresponsibility in newly appeared collective farmers. See (Zhuravlev, 2012).

[11] The Great Depression in the USA and some other industrialized countries hardly played an important role for the Soviet economy. By that time, the USSR had departed from the world economy to a great extent.

[12] And by an additional 18% in 1943. Total grain production in 1943 was only 36% of 1940.

[13] The growth of 1941 may be overestimated because of wrong deflators. On the other hand, this disturbance is probably less than usual because price control was evidently stricter in the war years. In any case, the industrial production of the RSFSR was much more dynamic than in the USSR as a whole (a drop by 2% in 1941 and by 21% in 1942). There are two reasons for this: a) the loss of territories for the USSR was much greater than for the RSFSR, as all the Soviet republics in the West of the USSR (Ukraine, Belarus, Moldova) were totally occupied, and their contribution to the total output of the USSR was equal to zero (a decline of 100%); b) a number of large industrial plants were moved from the Western regions of the USSR to the Eastern regions of the RSFSR in the first months of the war. Their output in the new locations enlarged the industrial production of the RSFSR.

annum for industrial production and railroads freight transportation). Then they began to slow and 25 years later they decreased to the level of 2-3%. It's possible that they could have slowed further quite quickly, but in 1974 the world prices for crude oil (the main export good of Russia) were raised 3.5 times by OPEC, from USD 3.3 to USD 11.6 per barrel. This price hike granted the Russian economy a respite, but only until the end of the 1970s.

In 1979, there was the second after-war crisis: industrial production fell by 0.4%;[14] livestock inventory by 0.2%; grain production by 33%; railroads freight transportation by 4%; and new residential completions by 6-7%. It may be said that the crisis of 1979 was a crisis of the planned Russian economy as a system. Firstly, some constraints had appeared on the supply side: up to this moment the main resources of the Russian economy had ceased increasing quickly (e.g., the ratio of urban population to total population had almost reached its "saturation point" and the growth of this – more productive than rural – labor force had dramatically slowed down; grain areas planted had been near their possible maximum, etc.). Secondly, there were no great incentives on the demand side. As a lot of relatively modern plants in chemical, electronic, automobile and other industries had been introduced during the previous two decades, there was no large additional demand for these products.[15] And lastly, there was little stimulus to have an active vital/business position for either individuals or establishments. Career advancement for individuals was very slow. For establishments, the largest part of their profits (not only taxes!) was withheld from them by the state. The Kosygin-Liberman reforms, which aimed to encourage private initiative and responsibility (they were implemented in 1965), had been exhausted by the beginning of the 1970s. By the end of the 1970s, any discussion about them was fully forgotten.

The crisis of 1979 was quite definite, but it wasn't too deep or too long. OPEC's raising oil prices 2.3 times (up to USD 31.4 per barrel) saved the Soviet planned economy at that time, but it never returned to rapid growth. As the price of oil was going down, military expenses for the war in Afghanistan were going up, and no structural problems of the planned economy were being

[14] Measured by the average alternative index. The official data gives +3% (the minimum for all years since 1947).

[15] Of course, one must keep in mind that there is some specificity in the concept of "demand" under the planned economy. For example, in 1971 the first conveyor line at the largest Soviet automobile plant was implemented; at the end of 1973 the whole plant was completed. Total production of autos in 1974 (1 million autos) turned to be roughly 4 times larger than in 1970 (0.26 million). Does it mean that the demand for autos was fulfilled? Of course not. The number of autos per capita in Russia was many times lower than in the USA or European countries; those who wanted to buy an auto had to wait for permission for two or three years or to buy one immediately in the black market. But there was no "demand" for production of more autos from those in the USSR who were responsible for investment decisions; they thought they had done "enough" for the population. The output of autos in the planned Russian economy never exceeded 1 million by more than 16%, while there was zero importing of autos.

solved, the Russian economy was fluttering in a long stagnation. From 1980 to1988, the growth rate of the alternative index of industrial production was never higher then 1.5-1.7%;[16] the average annual growth rate of railroads freight transportation was equal to only 1.3%; livestock inventory stopped increasing at all. After oil prices were halved in 1986 (to USD 14.4 per barrel), the situation became much worse and perspectives much more pessimistic. There was a burst of enthusiasm after the accession of Mikhail Gorbachev in 1985 but his reforms were poorly thought out and inconsequential; in some aspects they unsettled the Soviet financial system. An excessive amount of money emerged and a deficit of consumer goods worsened.

In 1989-1991, the first wave of the Great Russian Recession came. Industrial production decreased by 12% for these three years;[17] railroads freight transportation by 13%; livestock inventory by 10%; new residential completions made by state organizations and establishments by 30%, etc. The 1991 monetary reform was unsuccessful; the financial system became unbalanced and there was an overall deficit of consumer goods.

At the very end of 1991 the USSR as a unified whole collapsed and the Soviet planned economic system crashed. Russia began to exist as an independent state within the boundaries of the RSFSR. The new government started serious pro-market economic reforms. These reforms were based on ideas proposed by the IMF and included liberalization of prices, liberalization of foreign trade, privatization of state establishments, and several structural reforms. The reforms were not very consistent and easily accepted; there was a strong lobby against them.

The second wave of the Great Russian Recession (the so called "transition crisis" or the regeneration of a market economy) lasted from 1992 to 1996. For these five years, industrial production contracted by 50%;[18] livestock inventory by 48%; railroads freight transportation by 47%; new residential completions made by state organizations and establishments by 45%. Taken together, the two waves of the Great Russian Recession were much more damaging than the American Great Depression of the 1930s. For example, in the USA, the maximum decrease of industrial output (using annual statistics) was equal to 47% (from 1929 to 1932); in Russia, this indicator was equal to 56% (from 1988 to 1996).

[16] With only one exception: in 1986 it was equal to 2.8%.

[17] If measured by the alternative index. The official industrial index began to decrease in 1990; it fell by 8.1% during 1990-1991.

[18] Official statistics became much more reliable after the USSR; there is no need for alternative estimates after 1991.

There were three main reasons for this drop. The first was a distorted structure of the Russian economy. As it had been mutilated by the planning system, there were too-large outputs of military and some low quality products. In a market economy, without the only decision making (planning) center, there would be no reason to produce these goods in the same quantities. Therefore, the volumes of production of large numbers of goods had to be reduced. The second reason for the sharp decline was the low competitiveness of most parts of the Russian economy; strong competition from imported goods and services extruded large amounts of Russian ones (import competition was quite new to all Russian producers). Lastly, Russian owners and managers had no experience in seeking consumers and suppliers, exporting, receiving bank credit, setting prices for its own production, etc. In the planned economy, any establishment had all these parameters fixed by the Central Planning Agency. During the transition period Russians learned all these market wisdoms, but this learning was really very costly. Probably, an absence of market experience was the most important factor of the transition crisis; for this reason, output of non-military and highly competitive Russian goods also declined (e.g., oil production declined 49%, from 1988 to 1996).

During the transition period, the privatization of a large number of state plants was carried out; market laws were adopted; a new budget system and banking sector were built; economic agents accumulated initial market experience, and the risks of a Communist restoration diminished.[19] The Russian economy had hit rock bottom, and there was nowhere to go but up. Therefore, in 1997, after eight years of continuous decrease and the output of the Russian economy had been reduced by half, there was a short recovery.

This first recovery of the Russian post-planning era was fully disrupted in November, 1998. Firstly, the world crisis, which began at the end of 1997 in Southeast Asia, caused foreign capital outflow from all emerging markets, and Russia wasn't an exception. Secondly, as the world economy slowed down and the world demand for crude oil lessened, oil prices declined to USD 10-11 per barrel (much less than was needed to fulfill the Russian budget). Therefore, the international exchange reserves of the Russian Central bank were exhausted, and the federal budget couldn't service the government's debt. In these circumstances there were two important decisions: the Russian Government declared a default on its bills and bonds; and the Russian

[19] The political risk of a communist restoration and a return to a planned economy existed until the presidential election in the middle of 1996. Then Boris Yeltsin won a new 4-year term.

Central Bank stopped adhering to the regime of fixed exchange rate.[20] As a result, several of the largest Russian commercial banks went into bankruptcy, a lot of individuals as well as companies from the non-financial sector lost their money, and the Russian ruble devalued 4 times over a period of only months. In 1998, real GDP fell by 5.3%, industrial production by 4.8%, railroads freight transportation by 5.9%, etc. As the base level wasn't very high, the contraction in 1998 was much less than during the transition period: there was not very far to fall. In any case, at its lowest point, the total output of the Russian economy was thrown back to the levels of the early 1960s.

Strong devaluation of the ruble generated the process of substitution of imports with domestic goods and services. This factor became the most important driver for the recovery in 1999-2000. Later, the output of the Russian economy was forced by fast-growing oil prices and increasing oil exports. Since 2004, the main "locomotive" of the Russian economy has been a rise in household expenditures backed by fast-growing personal incomes, as well as a large expansion of personal credit. In 2007, oil prices were slightly under USD 80-90 per barrel, and domestic demand grew 10-12% per annum. High dependency of growth from skyrocketing oil prices and unsecured consumer credits gave grounds for a belief in an overheating of the Russian economy. The drastic decline of inventories during the Russian crisis of 2008-09 proved this hypothesis to be true.

The 2008-09 recession came to Russia through the world financial markets, which were shaken up by the Lehman Brothers' bankruptcy. From the end of 2007 to September 2008, there was an illusion that the Russian economy – with its enormous (more than half a trillion dollars) and still growing foreign exchange reserves, surplus federal budget, and oil prices more than USD 100 per barrel – might be a haven of stability for the storming world economy. Triple decrease of oil prices (to USD 38 per barrel in December, 2007), massive capital outflow, switching Russian banks and companies off the world financial markets (therefore, great problems for loaning them up) crashed this naive dream. Overheating of pre-crisis domestic demand and lack of skill in managing inventories resulted in a significant decline in production. In 2009, real GDP fell by 7.8%, industrial production by 9.3%, new residential completions made by state organizations and establishments by 14.6%, and railroads freight transportation by 15% (after a 3% decline in 2008).[21]

[20] To the regime of "crawling peg", according to the IMF's classification, to be precise.

[21] As the deep crisis in Russia began only in the end of the third quarter 2008 and there was an overheating before, there was not enough time to make the 2008 annual growth rates negative for most other indicators.

After the recovery in 2010-2011, it became clear that the old pattern of Russian growth, which was based on high and still-increasing oil prices, had become inappropriate. With nearly stable domestic oil production and nearly stable (and still very high!) world oil prices, no other driver for the Russian economy had appeared. Capital outflow remained high; competitiveness of goods (except crude oil and some other raw materials) remained low; most regional budgets fell into deep deficits; commercial banks got a high proportion of bad debts in their assets; (ineffective) government companies obtained an unreasonably swollen role; inflation stayed significant (6-8% per annum), which prevented the Central Bank from lowering the high interest rates; the investment climate for private businesses (foreign as well as domestic) became worse, etc. As a result, a dismal stagnation was observed in 2012-2013.

Since the spring of 2014, Western financial sanctions connected with the Ukrainian crisis, related Russian self/anti-sanctions and – several months later – a deep drop in oil prices have put the Russian economy on the threshold of a new recession (or rather stagflation, because inflation has risen to double-digit levels). Most experts predict a contraction of the real Russian GDP of up to 5% in 2015, and most probably a recession has already begun. It will hardly be deeper as huge amounts of inventories have not been accumulated, but the period without steady economic growth in Russia may really be very prolonged.

4. Does Central Economic Planning Matter to the Economic Cycle?

We do not pretend here to describe all aspects of the problem; we'll only try to construe our data in this context. [22] In Table 4, all eight recessions for the Russian economy for almost 87 years (1928-2014) are shown.[23]

In Russia, the drops in total economic activity were caused partly by internal economic reasons (1945-46, 1979, 1989-91), partly by external shocks (1941-42, 1998, 2008-2009) and partly by the decisions and actions of national authorities (1933). The latter factor was very important for the Russian economic trajectory during the 20th century. Of course, good or bad decisions made by monetary and non-monetary authorities are significant not only for Russia. For example, one may argue that a too-long period of low interest rates in the mid- 2000s caused the American Great Recession of 2008; one may even blame the FRS for this expensive misstep. But

[22] For those who do not believe in cycles in centrally planned economies, we refer them to Ickes (1986) as an excellent survey on this issue.

[23] Here we count two waves of the Great Russian Recession as separate recessions.

for the planned Soviet economy, the centralized decision-making process was of critical importance. In this context, one may remember not only the collectivization but also the industrialization in the 1930s, or the campaign for virgin lands development, initiated by Nikita Khrushchev (the Soviet leader in 1953-1964), or the construction of the Baikal-Amur Railroad (a 30-year project begun in 1972) and so on. Mega-projects were always the focus of the Central Planning Agency, and the track of the Soviet planned economy was determined by their success or failure to a much greater extent than in any market economy, with its millions of "decision-making centers". High centralization of decision-making, aspiration to concentrate production of any good at only a few giant establishments, and sometimes politically or ideologically (not purely economically) motivated decisions protected the Soviet economy from remarkable contractions for decades. But was not its far lower ability to self-adjust simply the other side of the same coin?

Table 4. Russian Crises and Their Causes, 1928-2014

Years of contraction	Causes of Crises
1933	Destruction of the agricultural sector caused by policy of "total collectivisation". Low world prices on raw Russian exports.
1941-42	Destruction of assets made by the war. Temporary losses of territories.
1945-46	Cuts of excessive military production. The drought of 1946.
1979	Exhaustion of extensive factors, including the conversion of rural population into (more productive) urban. Huge implementations of modern industrial equipment during two previous decades; no drive belts between final demand and investment decisions. Weak incentives to grow and to develop for individuals and establishments.
1989-91	The first wave of the Great Russian Recession (death throes of the planned economic system). All structural problems of the late Soviet planned economic system were aggravated by vague reforms and decrease of oil prices. Unbalanced financial system and overall deficit of consumer goods.
1992-96	The second wave of the Great Russian Recession (transition from planned to market economy). Total absence of "market experience", distorted structure of the economy, low competitiveness of Russian goods and services, and incompleteness of market reforms resulted in roughly halving the output of the Russian economy.
1998	The Russian economy was infected with the Southeast Asian financial crisis. Intensive foreign capital outflow and a decline of Russian oil prices to USD 10-11 per barrel, forced default on treasury bills and bonds, bankruptcy of several largest commercial banks, loss of money by many economic agents, contraction of total output by roughly 5%, and 4 times devaluation of the ruble.
2008-09	After the Lehman Brothers' bankruptcy in September 2008, Russian banks and companies were almost switched off the world financial markets, massive capital outflow began from Russia and other emerging markets, and oil prices fell 3 times. Overheating of pre-crisis domestic demand and lack of skill in managing inventories resulted in a significant decline in production.

Note: see Section 3.2 for details.

If we have a look at the deep and prolonged transition crisis of 1992-1996, we may suppose that the extremely long after-war period of growth of the Soviet planned economy, its final crash in 1991, and the ensuing extremely long period of contraction of the newborn market Russian economy were all highly interrelated. In a market economy, any economic agent will pay for his own (or someone else's) errors in the near future; mistaken actions will shortly have consequences. On the contrary, in a planned economy, the consequences of erroneous decisions may be contained through new commands and directives, but there will be an inevitable "default" in the end. If one does not correct one's errors regularly, then he will hardly be successful in a difficult new situation.[24]

Should one consider the transition crisis in Russia as a (very specific) phase of the Russian economic cycle? We think, yes. The peculiarity of this crisis was in a quantum transition from planned to market mechanisms, not simply in an elimination of some imbalances (the latter is typical for ordinary cyclical crises in market economies). But the roots of these phenomena were in the previous internal economic and political situation and the alterations strongly influenced subsequent Russian economic development. This allows us to estimate the total long-run volatility of output in Russia and to compare it with the volatility of a market economy with widely recognized cycles, such as the American one.

As mentioned above, there have been eight recessions in the Russian economy since 1928. According to the NBER, there were almost twice as many (fourteen) recessions in the American economy for the same period. However, the overall duration of the Russian recessions was 17 years, and there were 18 years in the USA with negative real GDP growth rates. Fewer recessions concurrent with almost the same overall duration means that the Russian economy may be characterized with rarer but more prolonged contractions.[25]

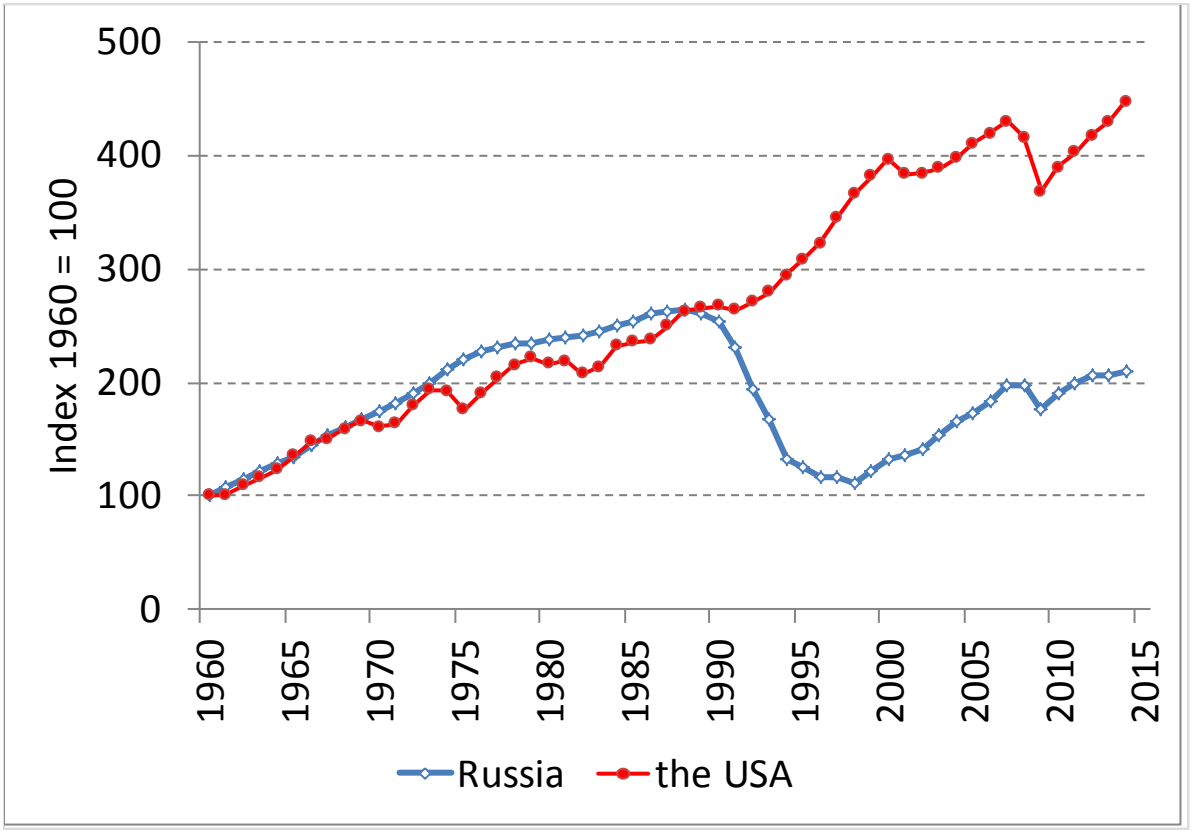
Unfortunately, there are no statistical data for Russia to estimate the depth of recessions throughout the whole period under consideration. The only thing we can do is to compare the yearly dynamic of industrial output in Russia and in the USA for 1960-2014 (there are no reliable Russian statistics for the years before 1960). Of course, industry is only one sector of the

[24] Of course, it is only one of the possible hypotheses. There is a huge amount of economic literature dedicated to this period of Russian economic history (e.g., see Aslund (2013) for its description). Clearly, it is a special issue, which can't be investigated here in detail.

[25] This conclusion should be taken with caution. The NBER counts recessions not at the yearly but at the monthly level, and only five American recessions have lasted more than 12 months since 1928. One may propose that the number of Russian recessions may become greater if we could investigate the monthly trajectory of the Russian economy.

economy, but it has a strongly pronounced cyclical dynamic, and may provide important information about cyclical volatility in both countries.

We constructed a compound index of industrial output in Russia using two portions of information: the alternative index for 1960-1991 and the official index for 1992-2014. For the USA, we took the annual industrial production index calculated by FRS. Both indices in 1960 = 100 form are shown in Figure 1.



Sources: Appendix A; US FRS.

Fig. 1. Indices of Industrial Output in Russia and the USA, 1960-2014

In Russia, the recession of 1979 was a shallow one, but the American industry was hit hard by the recessions in the middle of the 1970s and in the beginning of the 1980s. Thus, the planned Russian economy had a much smoother trajectory in these years. Then its driving force was exhausted, and the ensuing decade of stagnation gave the USA an opportunity to catch up with Russia just before the crash of the USSR. As a result, the total score for the Russian and the American industrial growth was almost exactly 1:1 for 1960-1988.

The next decade was a period of extraordinarily fast growth in the USA and of an extraordinarily fast fall in Russia. On the other hand, after hitting the bottom in 1998, the Russian

industry grew four times (on average) faster than the American, following the typical rebound pattern after a deep recession and supported with the prolonged rise of oil prices. The crises of 2007-2009 were of conventional depth in both countries. On the whole, during the last 54 years, (1961-2014) the American industrial output grew twice as much as the Russian one (in comparison with each's own 1960 basic level). The average annual contraction of industrial output for the years with negative growth rate was 7.7% in Russia and 4.4% in the USA.

Therefore, in the long run, there were fewer, but deeper and longer, recessions in Russia. We suppose that the rigidity of the Soviet central planning system (which existed for more than six decades until its end in 1991) was the main reason for this.

5. Conclusions

The historical trajectory of the Russian economy during the 20th century has been a *terra incognita*, in many respects, until now. There are at least three important reasons for this. First, many relevant indicators were either not measured, or were kept secret. Second, Russia was a part of the USSR, and statistics for Russia were much less available than for the USSR as a whole; historical changes to the Russian borders also needed special attention. Third, an ideological dogma existed about the absence of inflation in the planned Soviet economy; therefore, all deflators (if any) were underestimated, and all aggregates in constant and/or comparable prices were overestimated (and corresponding growth rates too). In this paper, we compiled several important annual time-series for Russia in physical units and corrected them for the territorial changes. This allowed us to trace the trajectory of the Russian economy from the end of the 1920s up to the current moment. Of course, we couldn't estimate anything like historical GDP for Russia; this is absolutely impossible as Russian data on trade and services are extremely incomplete and unreliable for the Soviet period, and data on foreign trade are completely absent. But by using information which had previously been stored in archives, we could discern periods of expansions of economic activity and years of its contraction.

There were eight recessions in the Russian economy (two of them merged as two successive "waves" of the Great Russian Recession – the first just before the crash of the USSR and the second immediately after). Four contractions took place during the 63-year period of the planned economy; one was a transition crisis (it lasted for 5 years); the last three occurred in the modern – more or less ordinary – market Russian economy during its 23 history. Evidently, contractions of output under the planned Soviet economy were rarer events than under market conditions. Up to

the very end they were also less profound, but we strongly believe that the main reason for the depth and endurance of the transition crisis in the first half of the 1990s was just an "ossification" of the Soviet planning system with all of its mechanisms and proportions: as there was never the political will to adjust it gradually, it finally broke off completely. Therefore, in our judgment, the deep drop during the two waves of the Great Russian Recession is totally on the "conscience" of the Soviet planning system. We consider a risk of a sharp decline after a long period of stable growth as a special risk for planned economies.[26]

The impact of the authorities' decisions on economic growth (positive as well as negative) – while not nonexistent in market economies – were more significant in the Russian planned economy. In certain cases, the decreases of output were most probably "handmade" (e.g., in 1933). The role of internal imbalances and external shocks (especially from world oil markets) were sometimes significant, especially as Russia became more open to the world not only through markets of goods but also through financial markets. The crises of 1998 and 2008-2009 were definitely provoked by external processes. The crises of 1933 and 1989-1991 were deepened by low oil prices and the crisis of 1979 was softened and even stopped by rising oil prices but the roots of all three of these crises were inside Russia, not outside (as well as the roots of the approaching recession of 2015).

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[26] Of course, it's just our hypothesis, which must be tested more carefully, but in Soviet Russia the period of extremely long (30-35 years) post-war expansion was followed by a prolonged (10 years) stagnation and then by a disastrous 8-year drop. Is it by chance?

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Appendix A. Main Russian Macroeconomic Indicators, 1928-2014

Years	Index of industrial output		Agriculture				Residential construction, new completions			Rail-roads
	Official	Alternative	Livestock inventory	Grain production, at granary	Grain production, in the field	Grain areas planted	State organizations & establishments	Total population	Workers & employees	Freight transportation
	Y-o-Y % change		Millions of heads	Millions of tons		Millions of hectares	Millions of square meters			Millions of tons
1928	na	na	108.0	50.0	50.0	61.4	na	na	na	88.6
1929	20.0	na	87.0	na	45.5	64.0	na	na	na	107.1
1930	22.0	na	68.0	na	52.5	67.2	na	na	na	133.7
1931	18.0	na	57.0	na	43.4	70.2	na	na	na	144.9
1932	15.0	na	50.7	47.5	47.5	69.0	na	na	na	151.2
1933	5.2	na	52.5	na	58.8	69.5	na	na	na	150.2
1934	19.2	na	62.1	na	65.1	71.9	na	na	na	na
1935	22.7	na	77.2	na	62.5	71.2	na	na	na	219.9
1936	28.7	na	72.2	na	48.9	70.8	na	na	na	na
1937	11.2	na	86.6	70.4	86.4	73.1	na	na	na	299.3
1938	12.1	na	86.6	na	63.0	71.4	na	na	na	295.3
1939	17.2	na	86.5	na	64.9	69.2	na	na	na	317.5
1940	10.5	na	91.1	55.6	73.0	70.1	na	na	na	333.9
1941	3.8	na	68.5	45.5	75.9	68.5	na	na	na	322.7
1942	-8.9	na	55.7	24.0	44.0	54.6	na	na	na	236.8
1943	17.5	na	59.5	19.8	36.3	51.4	na	na	na	265.7
1944	13.2	na	63.4	26.9	39.8	48.9	na	na	na	271.0
1945	-15.6	na	65.8	25.4	na	50.9	na	na	na	268.3
1946	-21.7	na	62.0	21.2	na	50.0	7.0	na	2.5	282.9
1947	19.3	na	67.6	35.7	na	53.3	7.3	na	3.3	302.1
1948	24.2	na	77.9	34.2	na	61.0	9.0	na	3.3	370.9
1949	18.7	na	87.9	38.9	na	63.2	9.8	na	3.3	439.3
1950	19.9	na	88.3	46.8	na	64.9	11.9	na	3.6	498.2
1951	15.4	na	98.3	47.5	na	68.2	14.1	na	4.3	547.9
1952	10.9	na	97.9	51.9	na	68.6	14.1	na	4.3	597.6
1953	11.2	na	101.5	48.2	na	68.2	16.5	na	4.3	638.7
1954	12.9	na	102.1	56.3	na	72.5	17.5	na	4.5	677.7
1955	11.7	na	105.1	54.7	na	76.2	17.1	na	4.7	761.7
1956	9.6	na	110.6	66.5	na	74.4	20.9	na	6.6	819.9
1957	9.0	na	117.9	54.9	na	72.7	26.6	na	7.7	891.5
1958	9.1	na	125.6	72.9	na	72.5	31.6	na	14.2	970.3

Years	Index of industrial output		Agriculture				Residential construction, new completions			Rail-roads
	Official	Alternative	Livestock inventory	Grain production, at granary	Grain production, in the field	Grain areas planted	State organizations & establishments	Total population	Workers & employees	Freight transportation
	Y-o-Y % change		Millions of heads	Millions of tons		Millions of hectares	Millions of square meters			Millions of tons
1959	11.0	na	132.2	64.9	na	69.1	36.3	na	14.5	1061.3
1960	8.8	na	133.1	72.6	na	71.4	36.7	na	14.6	1140.7
1961	8.1	8.2	143.3	70.3	na	74.5	36.9	na	12.4	1193.8
1962	9.0	6.3	150.6	83.1	na	79.2	38.4	na	10.6	1236.7
1963	8.1	5.3	124.9	62.8	na	79.4	39.4	na	8.4	1285.0
1964	6.0	5.6	130.8	83.2	na	81.6	37.7	na	7.7	1350.0
1965	7.2	5.2	139.1	66.3	na	77.6	40.2	na	7.3	1415.8
1966	8.4	6.7	141.5	95.6	na	76.1	41.3	na	7.1	1441.3
1967	9.9	6.2	139.6	84.8	na	74.9	42.6	na	6.8	1514.9
1968	8.1	5.1	138.7	103.8	na	74.3	43.6	na	5.9	1558.9
1969	6.9	4.2	140.2	83.9	na	73.5	45.9	na	5.4	1585.3
1970	8.0	4.4	151.8	107.4	na	72.7	48.1	na	5.0	1648.2
1971	7.6	4.2	156.5	98.8	na	71.8	49.5	na	4.6	1736.6
1972	6.4	4.3	152.7	86.0	na	73.1	50.3	na	4.4	1782.6
1973	7.3	4.9	157.0	121.5	na	76.6	51.9	na	4.6	1879.0
1974	7.8	5.7	161.7	105.1	na	76.5	52.5	na	4.3	1979.8
1975	7.2	4.5	151.5	72.4	na	77.0	52.9	na	4.0	2039.8
1976	4.9	3.2	152.9	119.0	na	77.2	52.0	na	3.3	2041.5
1977	5.4	1.8	159.5	101.6	na	78.4	52.7	na	3.3	2072.2
1978	4.5	1.4	162.2	127.4	na	77.0	52.4	na	3.1	2090.6
1979	3.0	-0.4	161.9	84.8	na	75.9	48.4	na	2.9	2010.2
1980	3.0	1.7	159.1	97.2	na	75.5	52.1	4.0	2.9	2047.9
1981	2.9	0.8	158.6	73.8	na	74.1	51.5	3.9	Na	2065.3
1982	2.7	0.7	161.4	98.0	na	72.0	52.7	3.9	Na	2032.9
1983	3.8	1.6	165.0	104.3	na	70.7	54.3	3.8	Na	2110.5
1984	3.8	1.6	163.2	85.1	na	69.7	53.2	3.9	Na	2134.8
1985	3.7	1.5	162.0	98.6	na	68.1	53.6	3.7	Na	2165.0
1986	4.8	2.8	164.8	107.5	na	67.5	57.4	3.9	na	2236.0
1987	3.6	0.8	161.9	98.6	na	66.7	63.8	4.2	na	2228.0
1988	3.8	0.6	161.8	93.7	na	66.0	62.6	5.2	na	2261.0
1989	1.4	-1.4	160.1	104.8	na	64.9	60.3	5.9	na	2205.0
1990	-0.1	-2.2	153.6	116.7	na	63.1	51.6	5.5	na	2140.0
1991	-8.0	-8.9	145.3	89.1	na	61.8	44.0	5.4	na	1957.3

Years	Index of industrial output		Agriculture				Residential construction, new completions			Rail-roads
	Official	Alternative	Livestock inventory	Grain production, at granary	Grain production, in the field	Grain areas planted	State organizations & establishments	Total population	Workers & employees	Freight transportation
	Y-o-Y % change		Millions of heads	Millions of tons		Millions of hectares	Millions of square meters			Millions of tons
1992	-16.0	-14.9	135.1	106.9	na	61.9	36.6	4.9	na	1640.1
1993	-13.7	-14.4	121.2	99.1	na	60.9	36.2	5.6	na	1347.8
1994	-21.6	-26.1	102.7	81.3	na	56.3	32.1	7.1	na	1058.2
1995	-4.6	-5.2	90.4	63.4	na	54.7	32.0	9.0	na	1028.0
1996	-7.6	-8.6	77.0	69.2	na	53.4	24.3	10.0	na	911.5
1997	1.0	0.1	67.6	88.5	na	53.6	21.2	11.5	na	887.2
1998	-4.8	-4.2	61.3	47.8	na	50.7	18.6	12.1	na	834.8
1999	8.9	9.2	61.2	54.6	na	46.5	18.3	13.7	na	947.4
2000	8.7	8.1	58.3	65.4	na	45.6	17.7	12.6	na	1046.8
2001	2.9	4.5	59.2	85.1	na	47.2	18.6	13.1	na	1057.5
2002	3.1	3.4	60.8	86.5	na	47.4	19.7	14.2	na	1083.7
2003	8.9	6.2	58.6	67.0	na	42.1	21.3	15.2	na	1160.9
2004	8.0	5.5	54.9	77.8	na	43.6	24.9	16.1	na	1221.2
2005	5.1	3.2	54.0	77.8	na	43.6	26.0	17.5	na	1273.3
2006	6.3	5.0	57.9	78.2	na	43.2	30.6	20.0	na	1311.6
2007	6.8	5.4	59.4	81.5	na	44.3	34.9	26.3	na	1344.6
2008	0.6	-0.8	59.0	108.2	na	46.7	36.7	27.4	na	1304.4
2009	-10.7	-9.9	59.9	97.1	na	47.6	31.3	28.5	na	1108.8
2010	7.3	9.5	59.0	61.0	na	43.2	32.9	25.5	na	1312.0
2011	5.0	na	60.3	94.2	na	43.6	35.5	26.8	na	1381.7
2012	3.4	na	62.9	70.9	na	44.4	37.3	28.4	na	1421.1
2013	0.4	na	62.9	92.4	na	45.8	39.8	30.7	na	1381.2
2014	1.7	na	62.8	103.8	na	46.1	45.8	35.2	na	1370.1

Note: na – not available.
Sources: see Appendix B.

Appendix B. Statistical Sources for the Main Russian Macroeconomic Indicators

Below we use the following translations from Russian into English:

- Динамика и география грузового движения на путях сообщения СССР – Dynamic and Geographical Distribution of Freight Transportation in the USSR.
- Народное хозяйство РСФСР (или СССР) – National Economy of the RSFSR (or the USSR).
- Посевные площади СССР (Статистический сборник) – USSR: Areas Planted. Statistical Digest.
- Российский статистический ежегодник – Russian Statistical Yearbook.
- Сельское хозяйство, охота и охотничье хозяйство, лесоводство в России – Agriculture, Hunting and Forestry in Russia.
- Сельское хозяйство СССР. Ежегодник – Agriculture in the USSR. Yearbook.
- Социалистическое строительство СССР. Статистический ежегодник – Socialist Construction of the USSR. Statistical yearbook.
- СССР – страна социализма. Статистический сборник – The USSR is a Country of Socialism. Statistical Digest.
- Транспорт и связь СССР (Статистический сборник) – Transportation and Communication in the USSR. Statistical Digest.
- Центральная база статистических данных (ЦБСД) – Centralized Base of Statistical Data (CBSD).
- Российский государственный архив экономики (РГАЭ) – the Russian State Economical Archive (RSEA).

The sources for each indicator are placed in a table – one table per indicator; there are also some methodological comments, if necessary.

Index of industrial production, official

The official index of industrial production (1960 = 100) is in fact not fully official. We calculated it using official Y-o-Y percent changes (if available) or Y-o-Y percent changes which in turn were calculated using official base indices (with different bases) or values of industrial production in list-prices (also with different bases). We took 1960 as a base to have a time-series comparable with the alternative index of industrial production.

Years	Source: Title / Archive and Code	Page(s)
1929-1932, 1946-1965	National Economy of the RSFSR in 1965	46-47
1933-1936*	National Economy of the USSR in 1963	110
1938-1945, ex. 1941	RSEA 1562-33-2903	59-60, 64
1941	RSEA 1562-329-1488	18-19
1966-1975	National Economy of the RSFSR in year 1975	45
1976-1980	National Economy of the RSFSR in year 1980	50
1981-1981	National Economy of the RSFSR in year 1985	55
1982-1985	Rosstat, CBSD	-
1986-1991	Russian Statistical Yearbook. 1994	296
1992-2014	Rosstat's website (section: Official statistics /Entrepreneurship/ Industrial production)	-

Note: * – as a rough estimate we used data for the whole USSR for these years.

Livestock Inventory

We added together the total number of cattle, sheep, goats and pigs. Almost continuous time-series, beginning with 1927, are published in only one source; more recent and fully comparable data may be taken from the CBSD, which is held by Rosstat. The only "holes" for almost 90 years are 1928 and 1938. We succeeded in patching the hole in 1928 and substituted the average of 1937 and 1939 for 1938.

Years	Source: Title / Archive and Code	Page(s)
1927-1989, ex. 1928 & 1938	Agriculture, Hunting and Forestry in Russia. 2013	90-91
1928*	RSEA 1562-41-66	297
1938+	Not availablea	-
1990-2014	Rosstat, CBSD	

Note: * – incl. Crimea & excl. the Karelo-Finnish Soviet Socialist Republic; + – we used the average for 1937 and 1939.

Grain production

According to the present methodology (in use since 1953) the garnered grain is counted (at granary, at net weight). According to the "old" methodology the harvest is estimated in the field (standing grain). It's not a surprise that the "old" methodology gave higher numbers than the "present"; it's a surprise that, according to Rosstat, for 1928 and 1932 both methodologies gave equal volumes. Therefore, one may doubt if Rosstat's re-estimations for the 1920s and the 1930s are made in a proper way; in practice, it also means that one can't use "old" data to interpolate the "new". For this reason we preferred to use both time-series in parallel (one for the "present" methodology, another – for the "old" one).

Years	Source: Title / Archive and Code	Page(s)
	Old methodology	
1928, 1932-1944	RSEA 1562-329-1409	1-2, 8
1929-1931	Agriculture in the USSR. Yearbook. 1935	270-271
	New methodology	
1928, 1932, 1937, 1940-2012	Agriculture, Hunting and Forestry in Russia. 2013	74
2013-2014	Rosstat, CBSD	

Grain areas planted

The grain areas planted were counted by the Soviet statistical system beginning in 1925. This indicator is more or less comparable through time. Some minor problems were connected with the changes of the RSFSR's borders (as a rule, these problems were easily solved, as the relevant regional information was usually available); and with corn grain of milky-wax ripeness, which was included in total grain for several years in the second part of 1950s, and excluded for all other years. We had to make our own estimation of this factor for 1956-1957 using information for the USSR as a whole; the correction was around 1.5% of the total areas planted in the RSFSR.

Years	Source: Title / Archive and Code	Page(s)
1925-1926*	Agriculture in the USSR. 1925-1928	220
1927	Socialist Construction of the USSR. Statistical yearbook. 1934.	178, 190
1928, 1932, 1945, 1950-1956[x]	USSR: Areas Planted. Statistical Digest. 1957. Vol. 1	20-21
1929-1931	Agriculture in the USSR. Yearbook. 1935	245-247
1933-1940	RSEA 1562-329-1409	1-2, 8
1941-1944	RSEA 1562-329-1490	157-158
1946-1949[+]	RSEA 1562-329-3871	90,316
1957[x]	National Economy of the RSFSR. 1958	223
1958-1965	National Economy of the RSFSR. 1965	190-191
1966-1969	National Economy of the RSFSR. 1969	152-153
1970-1974	National Economy of the RSFSR. 1975	164-165
1975-1980	National Economy of the RSFSR. 1980	134-135
1981-1984	National Economy of the RSFSR. 1985	116
1985-1989	National Economy of the RSFSR. 1990	418
1990-2014	Rosstat, CBSD	-

Notes: * – data are lowered 1.5% to be comparable with information from latter sources; + – areas planted in Crimea are estimated as 0.5 million of hectares (average for 1945 and 1950); x – 1955-1957 data are corrected for corn grain of milky-wax ripeness

Railroads Freight Transportation

Railroads statistics for the RSFSR were openly published up to the mid-1930s and after 1958; they were kept secret (and even top secret) for the more than 20 years in between. We found almost all of the necessary information in unpublished documents stored in archives. Unfortunately, at the moment we still have three holes: 1934 and 1936-1937. It makes it impossible to say anything reasonable about the dynamics of railroads freight transportation during the second 5-year plan (1933-1937).

Years	Source: Title / Archive and Code	Page(s)
1928-1931	Dynamic and Geographical Distribution of Freight Transportation in the USSR. 1928-1931	12-13
1932	Socialist Construction of the USSR. Statistical Yearbook. 1934	263-264
1933	Socialist Construction of the USSR. Statistical Yearbook. 1935	400-401
1934	NA	
1935	The USSR is a Country of Socialism. Statistical Digest. 1936	188-189
1936-1937	NA	
1938-1939	RSEA 1884-61-82	37,124
1940, 1945-1955	RSEA 1562-33-2515	31
1941-1944	RSEA 1562-33-3445	380
1956-1957	National Economy of the RSFSR. 1958	355
1958-1962	National Economy of the RSFSR. 1962	369
1963-1964	National Economy of the RSFSR. 1964	321
1965-1970	Transportation and Communication in the USSR. Statistical Digest. 1972	113
1971-1975	National Economy of the RSFSR. 1975	309
1976-1980	National Economy of the RSFSR. 1980	193
1981-1985	National Economy of the RSFSR. 1985	202
1986-1989	National Economy of the RSFSR. 1989	618
1990-2014	Rosstat, CBSD	-

New Residential Completions

Historical information on residential construction is less available than on other sectors of the Russian economy, at least those considered here. Publication of the RSFSR's data on new residential completions began in 1946; we couldn't find any older information, even in unpublished documents stored in archives. Our hypothesis relates this to the fact that the main goal of economic policy in the Soviet period was the creation of large scale industrial establishments, especially those which were specialized in producing machines and equipment (capital goods). The Communist and Soviet authorities paid far less attention to the production of consumer goods and to residential construction (it even seems that for years the Soviet statistics simply didn't count

the new houses built by collective farmers, which were the majority of the houses in rural areas). As the official figures for total new residential construction consist of different components for different years, we decided not to use them at all. Instead, we chose three time-series: one for state organizations and establishments, including non-agricultural cooperatives (it's roughly comparable for all years) and two for population: for workers and employees up to 1980 and for total population beginning with 1980 (we hope that the trajectories of the latter two are similar).

Years	Source: Title / Archive and Code	Page(s)
1946-1956	National Economy of the RSFSR. 1958	344
1957-1960	National Economy of the RSFSR. 1965	381
1961-1967	National Economy of the RSFSR. 1967	366
1968-1969	National Economy of the RSFSR. 1970	327
1970-1974	National Economy of the RSFSR. 1975	339
1975-1979	National Economy of the RSFSR. 1980	230
1980-1984	National Economy of the RSFSR. 1985	246
1985-1990	National Economy of the RSFSR. 1990	203
1991-2014	Rosstat, CBSD	-

Appendix C. Charts of the Main Russian Macroeconomic Indicators and Their Y-o-Y Tempos, 1928-2014

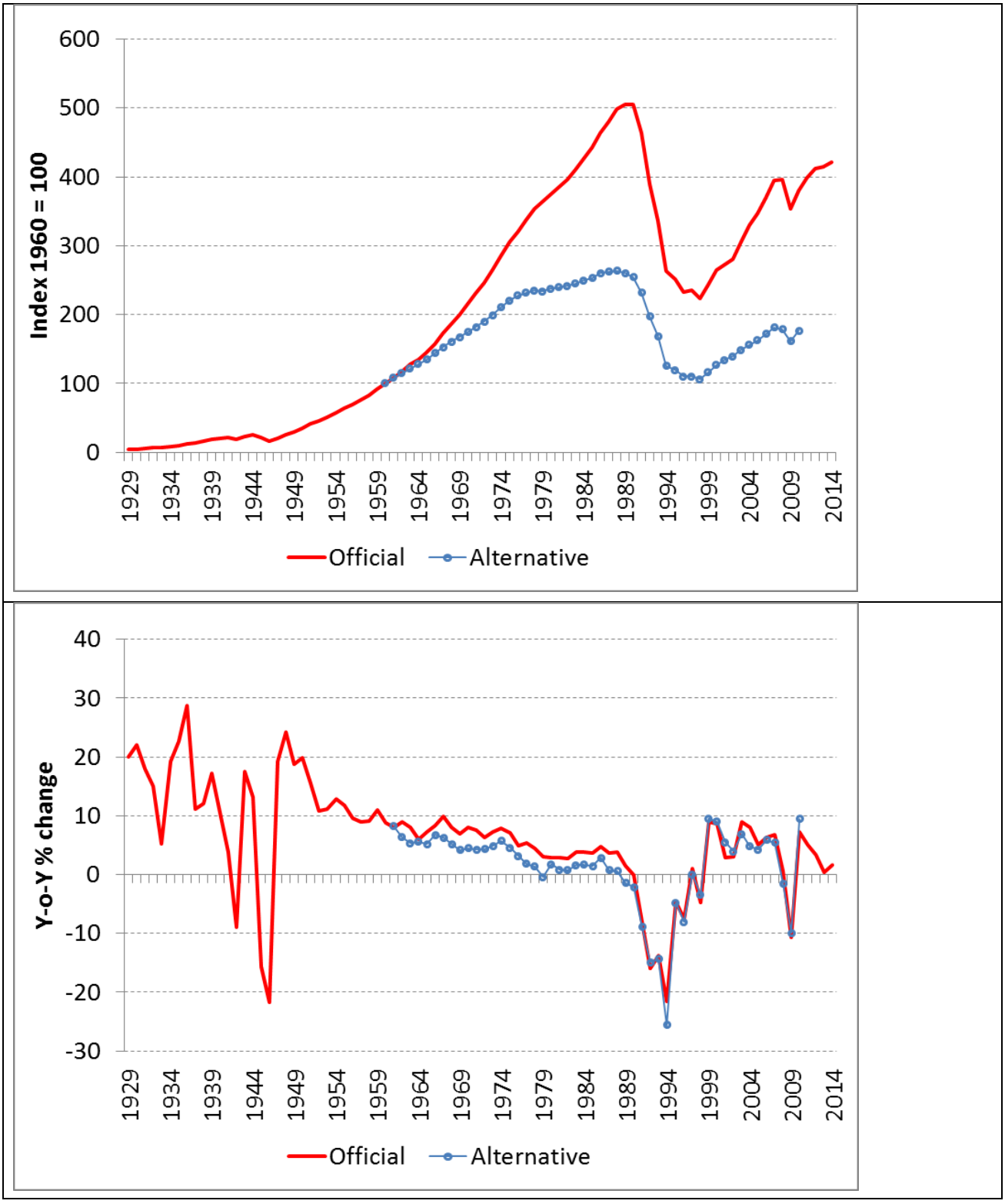


Fig. C-1. Industrial Production

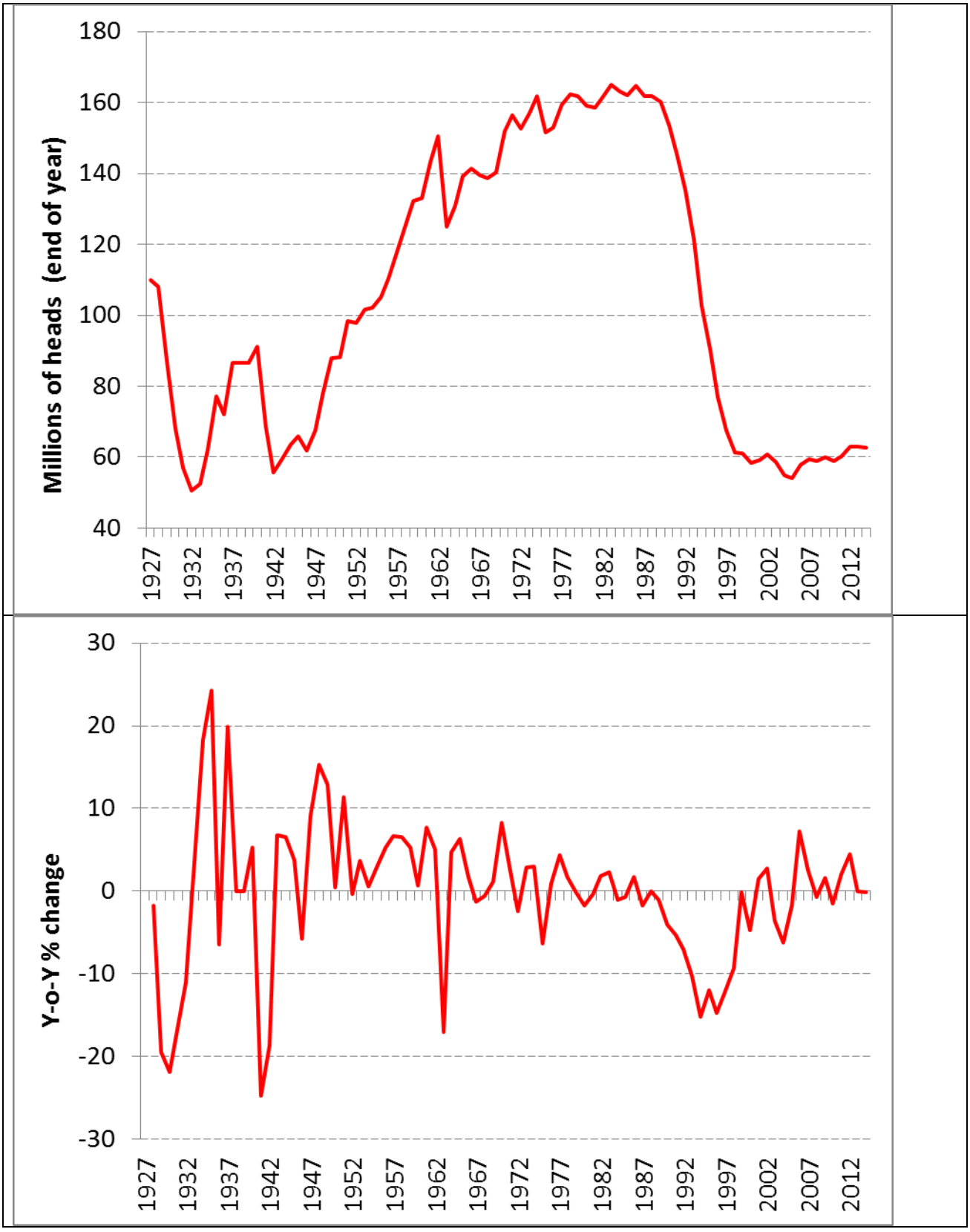


Fig. C-2. Flocks & Herds & Pigs

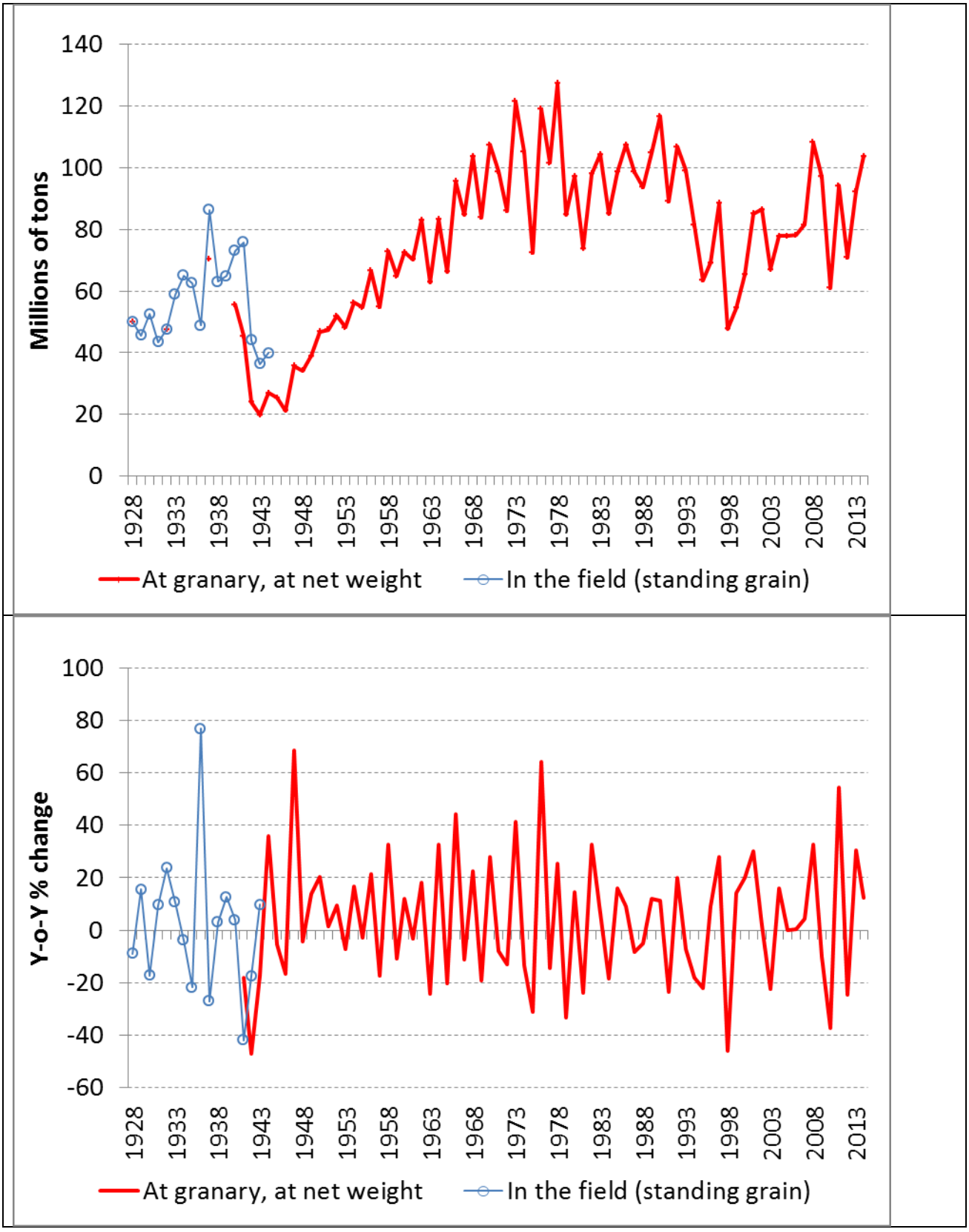


Fig. C-3. Grain Production

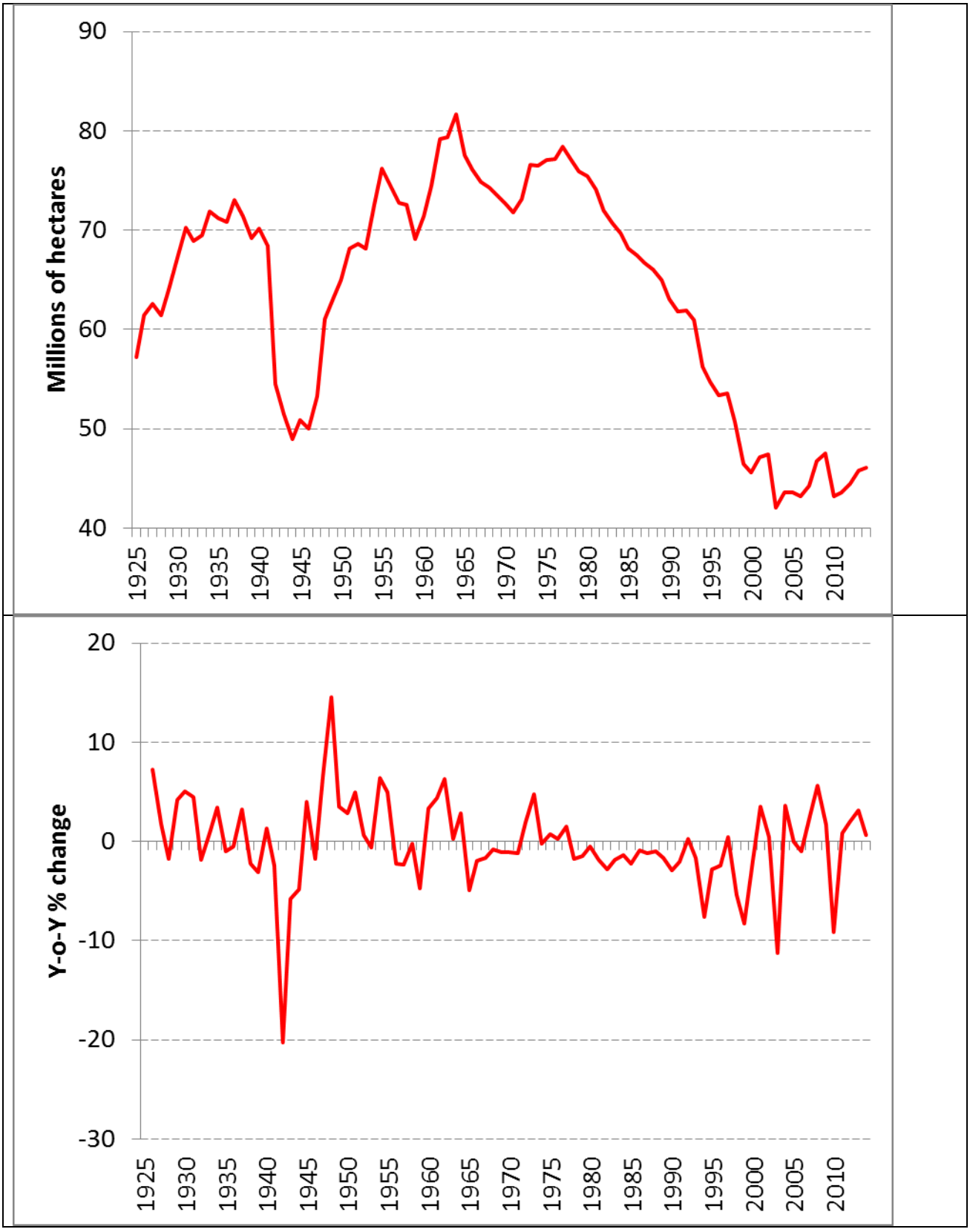


Fig. C-4. Grain Areas Planted

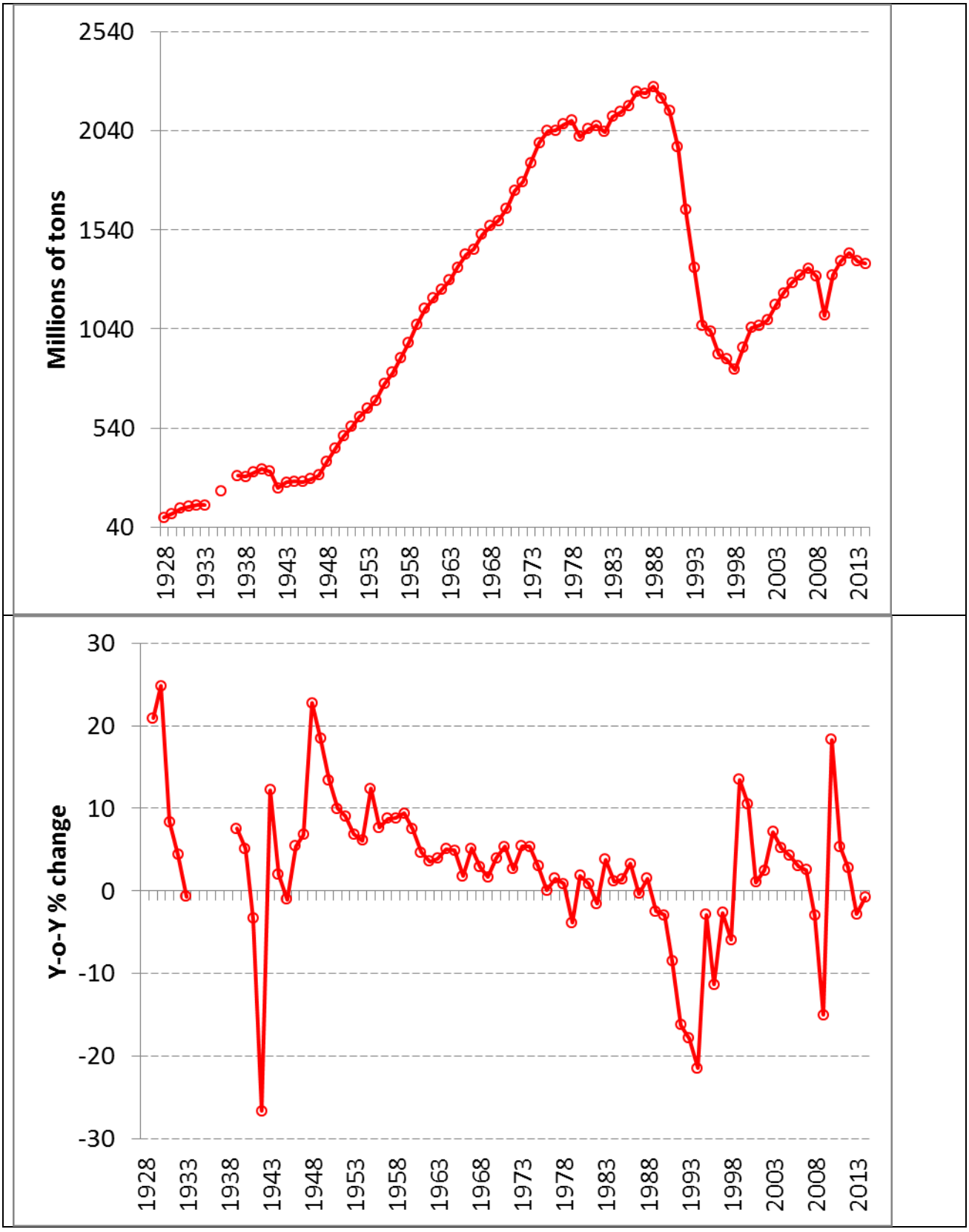


Fig. C-5. Railroads Freight Transportation

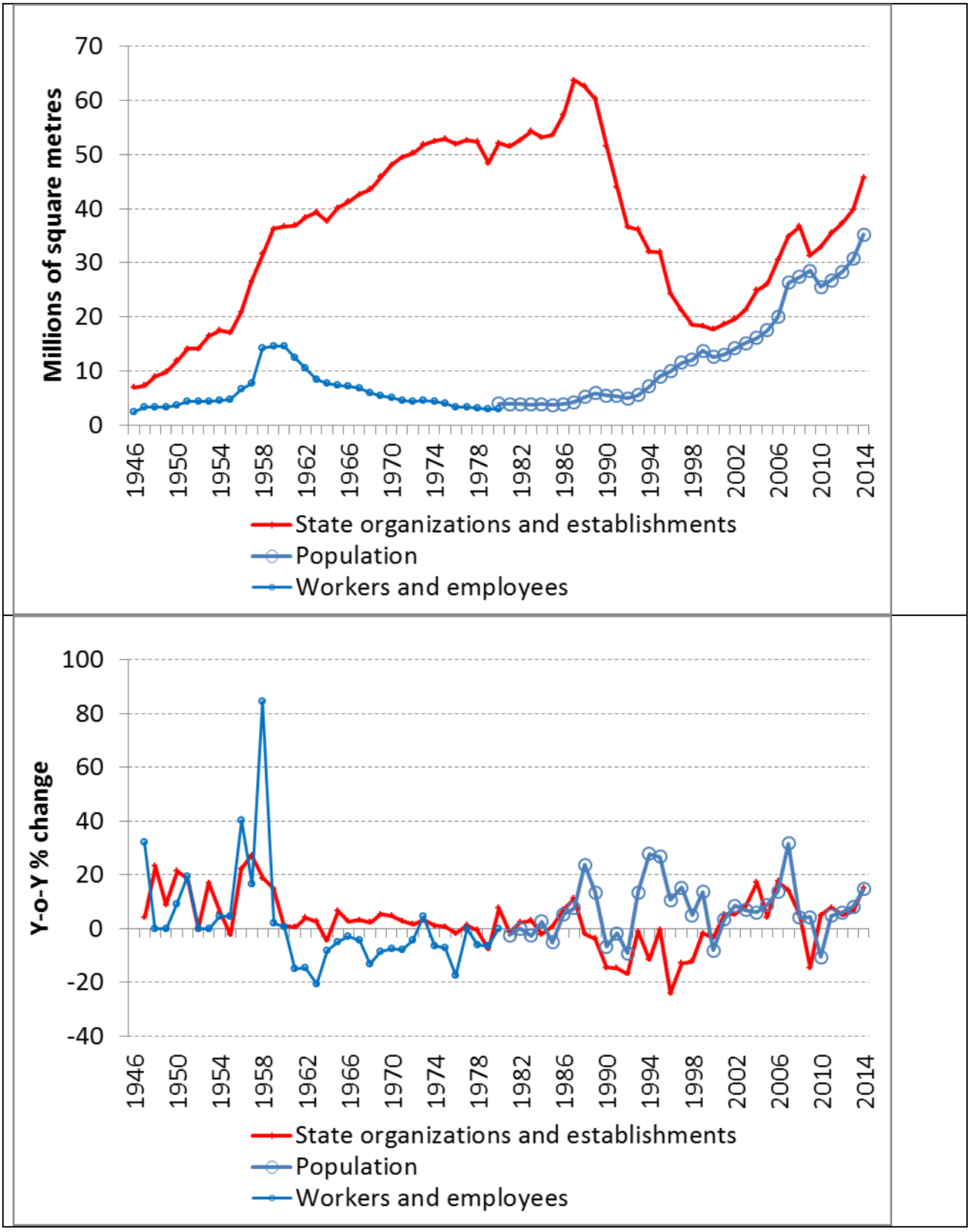
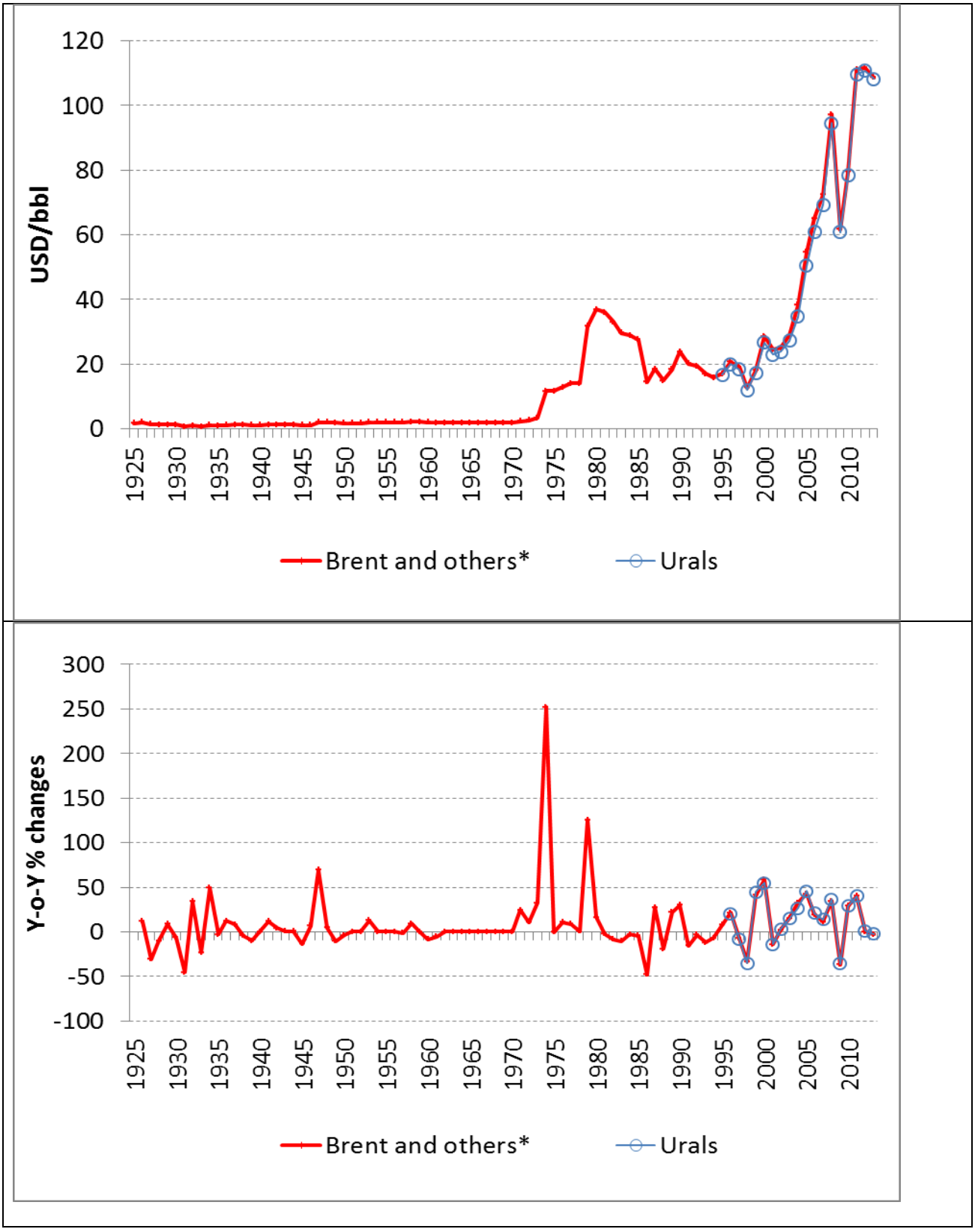


Fig. C-6. Residential Construction, New Completions



Note: * Brent since 1984; US Average through 1944; Arabian Light for 1945-1983.

Sources: BP; Reuters.

Fig. C-7. Average Oil Prices

Смирнов, С. В.
Экономический рост и экономические кризисы в России: конец 1920-х – 2014 г. [Электронный ресурс] : препринт WP2/2015/03 / С. В. Смирнов ; Нац. исслед. ун-т «Высшая школа экономики». – Электрон. текст. дан. (1 МБ). – М. : Изд. дом Высшей школы экономики, 2015. – (Серия WP2 «Количественный анализ в экономике»). – 38 с. (на англ. яз.)

Россия – страна с уникальной историей. Первой в мире ее экономика стала плановой; затем прошли бурные процессы коллективизации и индустриализации; затем были нелёгкие годы войны с нацистской Германией; затем началась «холодная война» с ее гонкой вооружений; потом распался СССР и в России начался переход от плановой экономики к рыночной; стала происходить постепенная интеграция российской экономики в мировую экономическую и финансовую систему; наконец, сейчас пришло время международных санкций и новой изоляции России… Логично предположить, что все эти процессы сильно влияли на динамику российской экономики, но наверняка это утверждать никто не может: большая часть советской статистики (особенно 1930 – 1940-х гг.) никогда не публиковалась, а некоторые из опубликованных показателей искажены использованием некорректных дефляторов.

Наша первая задача в данной работе – построить временные ряды, которые могут быть полезны для описания долгосрочной траектории российской экономики. Используя ранее неопубликованные данные, в том числе находящиеся в российских архивах, мы реконструировали ряды, которые начинаются с конца 1920-х годов.

Другой нашей целью было определение периодов роста и спадов российской экономики, а также тех факторов, которые стояли за изменениями траектории экономического развития. Особый интерес для нас представляли периоды спада, наблюдавшиеся в эпоху плановой экономики, поскольку по сей день распространено мнение, что рецессии возникают только в рыночной экономике и фактически невозможны в плановой. Согласно нашим данным, кризисы в плановой экономике случались реже, но в конечном итоге оказались более разрушительными.

Ключевые слова: экономическая история, экономический кризис, плановая экономика, Россия

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Количественный анализ в экономике

Смирнов Сергей Владиславович

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