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Career Concerns in a Political Hierarchy: A Case of Regional Leaders in Soviet Russia

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Abstract:

We study the nature of career concerns of regional leaders in Soviet Russia under Khrushchev and Brezhnev. We document a substantial over-time variation in career concerns associated with reforms of Soviet governing hierarchy. We demonstrate that Khrushchev's *"Sovnarkhoz"* system—a unique episode in Soviet history, when a traditional Soviet unitary-form (U-form) hierarchy was replaced by a multidivisional-form (M-form) organization—created yardstick competition in industrial performance of regional leaders. High-powered career incentives, however, did not result in faster industrial growth on average. We find that only two groups of regional leaders performed better in response to increased incentives. 1) Leaders appointed during *"Sovnarkhoz"* were able to learn new rules better. 2) Leaders with good connections to their neighbors were able to overcome negative inter-regional externalities, a common byproduct of M-form. The lack of success of the *"Sovnarkhoz"* system triggered the separation of regional units along production branch lines, which, as we show, led to a substantial decrease of industrial growth rates. The failure of Khrushchev's management reforms together with the U-form lobby contributed to his dismissal and reinstatement of the U-form hierarchy under Brezhnev.

JEL: D73, H7, J63, N44, P3

Keywords: career concerns, political hierarchy, yardstick competition, Soviet economy

1. **Introduction**

Career concerns are an important determinant of performance and stability of any political hierarchy. They, in turn, depend on the organizational form of the hierarchy. Starting with Chandler (1962) and Williamson (1975), an extensive theoretical economic literature considered incentive aspects of differences between M-form (multidivisional form) and U-form (unitary form) hierarchies. The form describes the organization of a hierarchy into divisions: the M-form hierarchy is comprised of a collection of fairly self-contained territorial divisions implementing the same tasks, whereas the U-form hierarchy is organized along functional lines and consists of a number of departments implementing complementary tasks on the same territory. Qian and Xu (1993) and Maskin, Qian and Xu (2000) argued that Soviet economy was a giant U-form hierarchy with political and economic orders directed via highly specialized sectoral ministries, while Chinese economy more closely resembles an M-form as it is comprised of relatively self-sufficient provinces. This economic literature highlighted tradeoffs between economies of scale, on the one hand, (arguably) better utilized by the U-form hierarchy, and power of career concerns created by yardstick competition (e.g., Holmstrom 1982 and Shleifer 1985) and flexibility (Qian, Roland and Xu 2006), on the other hand, characteristic of the M-form. Sociologists and political scientists also consider differences between organizational forms and argue that the U-form permits central authorities to limit involvement of lower-tier managers in strategic decision-making and maintain stability and order within the structure via personal control mechanisms better than the M-form (see, for instance, Palmer et al. 1993, Freeland 1996).

In this paper, we investigate the nature of career concerns of regional party leaders in Soviet Russia, the largest republic in the USSR. In particular, we study economic and political factors that influenced career mobility under Nikita Khrushchev and early Leonid

Brezhnev. We show that career concerns varied substantially over time. Specifically, we study the unique episode in the Soviet history when Nikita Khrushchev dismantled the U-form organization of Soviet industry and reorganized it along the lines of M-form hierarchy, namely, the "*Sovnarkhoz*" reform. Using panel data on regional performance and careers of regional leaders in Soviet Russia, we demonstrate that the reform created yardstick competition in industry among regional party leaders and that such competition was largely absent both before the reform and after its reversal. This finding contrasts with the premise of previous economic literature that treats Soviet system as a classic example of a U-form hierarchy and ignores substantial over-time variation associated with the "*Sovnarkhoz*" reform.

Did the high-powered career concerns, present during the "*Sovnarkhoz*" reform, positively affect the countries' industrial performance? Our analysis of the panel data on regional industrial growth show that career incentives during the "*Sovnarkhoz*" period did not result in faster industry growth on average. This seemingly puzzling fact sharply contrasts with the results of Soviet-Chinese comparison by Qian and Xu (1993). We address this puzzle by studying the variation in regional leaders' response to the change in incentives triggered by the organizational reform. We find that only two groups of regional leaders performed better in response to reform. First, leaders, who were appointed during "*Sovnarkhoz*" reform, were able to learn new rules better and adjust to them faster. This finding is consistent with the literature on the importance of the change in human capital to supplement incentives for economic transformation to take place (see, for instance, Barberis et al. 1996). Second, the leaders with good personal connections to their neighbors also exhibited higher growth performance in response to the reform. These leaders were better equipped to overcome negative inter-regional externalities, a common byproduct of

3

the M-form hierarchy (see, for instance, Musgrave 1969 and Oates 1972 in the context of federalism).

Our findings on the variation in responses of regional party leaders to incentives highlight two potential costs of organizational reform which switches to M-form from U form: transaction costs, associated with the need for new human capital, and inter-regional externalities. We argue that Khrushchev tried to address the initial failure of the M-form to deliver higher growth on average when he initiated his second organizational reform in late 1962. The undertaken modification of the *"Sovnarkhoz"* system consisted of two major changes: 1) the enlargement of territorial divisions to cover several regions instead of a single region each, which was supposed to mitigate inter-regional externalities; and 2) the separation of regional units along production branch lines (into agricultural and industrial regional divisions), which was supposed to create additional positions for newcomers and address the need for new human capital. The second reform, however, proved to be completely counter productive as it deprived Khrushchev of political support of regional leaders (who lost power because of the split of territorial divisions in two sub-units) and led to a sharp decline in industrial growth rates (due to disorganization created by this restructuring of territorial divisions). The failure of the two consecutive organizational reforms to deliver growth together with the political opposition of a powerful interest group, comprised of ministerial leaders who lost power in this reform, contributed to Khrushchev's dismissal and the reversal to the U-form traditional hierarchy under Brezhnev. Overall, the Soviet experience demonstrates the potential severe difficulties in overcoming costs associated with M-form hierarchy and underlines a potential threat to political stability of the system associated with organizational reforms; as they are bound to created powerful groups in opposition to reforms. Such potential threat to political stability

may have contributed to Brezhnev's reluctance to conduct organizational reforms in order to mitigate inefficiencies of Soviet economy throughout his leadership.

We also document that regional agricultural performance affected regional leaders' careers during the whole period under study. This finding is consistent with the fact that the management of agriculture, in contrast to industry, in the Soviet Union was always organized as an M-form. In addition, we show that personal connections to the central leadership were an important determinant of careers of regional party leaders throughout the whole period, as one would expect from any management structure that relies on bureaucratic appointments.

The paper proceeds as follows. The next section reviews related literature. In section 3, we provide stylized facts on the Soviet political hierarchy and overviews history of the "*Sovnarkhoz*" reform. In Section 4, we formulate our hypotheses. Section 5 describes the data. In Section 6, we present our findings. Section 7 concludes.

2. **Related literature.**

Our paper is related to several large strands of economic and economic history literatures. First, there is a large literature which studies agency problems of Soviet command economy. Starting with Berliner (1957) and Granik (1959), a large number of authors demonstrated that the command system of Soviet economy was inefficient due to the lack of transparency and excessive bureaucratization. To date, there is, however, little careful analysis of factors that allowed the system to work for such a long period of time despite all the inefficiencies (Gregory 2003).

The determinants of careers of regional party leaders and state officials in the Soviet Union have been studied by Sovetologists in the 1960s and 1970s (Armstrong 1959, Blackwell 1972, Blackwell et al. 1973, Brzezinski and Huntington 1964, Frank 1971,

Hodnett 1965, Hough 1969, McAuley 1974, Oliver 1973, Stewart et al. 1972). The literature offered two theories of career advancement. According to the first theory, i.e., "patron-client model" (e.g., Brzezinski and Huntington 1964 and Armstrong 1959), personal connections to the central leadership determined bureaucrats' vertical mobility in the hierarchy. According to the second view, i.e., the so-called "rational-technical explanation" (e.g., Hough 1969), the main reason for promotions was performance, i.e., the ability to fulfill the plan.

Most previous studies of career concerns of Soviet regional leaders relied on case-study evidence. To the best of our knowledge there have been only two attempts of statistical analysis of determinants of career advancement of Soviet regional leaders: Stewart et al. (1972) and Blackwell et al. (1973). Both papers used a pooled cross-section of selective cases of regional party leaders' turnover in attempt to test the "patron-client" vs. "rational-technical" model. Since econometric techniques used in these studies date back to the pre-PC epoch, their analyses suffer from intractability and biases from selection, omitted variables, and reverse causality. In contrast to these studies, we use the population of turnovers of Soviet regional party leaders collected from archival data and apply modern panel data econometrics to analyze these data.

Our paper is also closely related to the literature which links the success of China's development in the last 30 years to the presence of high-powered career concerns for promotion of Chinese provincial leaders to the higher-level positions within the Chinese Communist party hierarchy (Blanchard and Shleifer 2001, Qian and Xu 1993, and Maskin, Qian and Xu 2000). Li and Zhou (2005), Chen, Li and Zhou (2005), and Gang (2007) found empirical support to these arguments by showing that the main criterion of promotion and demotion of provincial government officials in China have been the

provincial growth performance relative to the average performance and to performance under the predecessor.

3. Regional leaders in Soviet Political Hierarchy: a Historical Background

    3.1. *Initial U-form hierarchy*

The Soviet Union, formally a federation, was in fact a very centralized state with a single center of decision-making and a strict top-down hierarchy of authority. Under *Nomenklatura* system, introduced in 1923, state officials at each level of the hierarchy were appointed by the higher-level officials (Levin 1997).

Since the beginning of five-year plans in 1928, Soviet industry was organized along production branch lines. Specialized ministries and departments managed all enterprises in corresponding sectors of the economy across all regions; one ministry was responsible for one production branch. There are at least two complementary reasons why the dictator (i.e., Stalin) chose such organizational form. First, it utilized better the economy of scales, on which Socialist industrialization of the 1930s relied heavily (Davies et al. 1994). Second, it ensured the dictator's control over resource allocation which was the key instrument of power in the political economy of the 1930s (Gregory 2003, Gregory and Harrison 2005). The top-down branch hierarchies did not allow regional elites to succeed in appropriating control over resource allocation (Harris 1999).

In the traditional Soviet hierarchy regional authorities played a secondary role. In the economy with industry paying the most important role, they were mainly responsible for the production of local public goods and agriculture, as there were no economies of scale in agriculture for technological reasons. Regional party leaders – first party secretaries – de facto were the top regional executives, despite the fact that formally state officials (governors) were the region heads. Governors were subordinated to their party bosses.

Recent historical research in declassified Soviet archives provides new details on factors influencing career mobility of regional leaders. Historical documents published in Denisov et al. (2004) demonstrate that the center carefully monitored regional leaders. Regional party organization had to report to the center at least once a year and regularly present information about performance of local managers (Denisov et al. 2004 document #18, 26/01/1953; document #21, 05/10/46). The volume describes several cases of local party secretaries' demotions after the Second World war; in several of them poor economic performance of regions was named by higher officials as an important reason of removals of regional leaders (see cases of Vladimir and Ivanovo 1947, Ryasan' 1948, Kursk 1950, Kirov 1952 etc.: documents # 76-78; 82; 119-121; 127-130 in Denisov et al. 2004). These cases suggest that the central government paid special attention to regional agricultural performance and, especially, to the fulfillment of area-under-crops plans.

There is some historical evidence that political connections were also important for regional leaders' careers (Khlevnuk 2003). For instance, in the 1920s Stalin used his position of the General Secretary of the Communist party to place his supporters to the key positions in the apparatus, including regional offices. Lazarev and Gregory (2004) provide a case-study of cars' allocation among party elites which demonstrates that the dictator also used his control over distribution of resources to maintain loyalty of the supports.

3.2. *Introduction of M-form: "Sovnarkhoz" reform*

Stalin's death in March 1953 triggered a power struggle among the closest Stalin's subordinates. This power struggle led to several consecutive reorganizations of the governing hierarchy (Ballis 1961, Swearer 1959). Table 1 overviews the main historical events in this power struggle and organizational reforms which were set off by it.

Table 1 somewhere here.

In March 1953 Khrushchev was not on the top of the list of the most likely Stalin's successors. The main candidate, Georgii Malenkov, inherited the post of the head of the Soviet government from the dictator, while Khrushchev became 'just' a party secretary, and was promoted to the first party secretary in September 1953 (the position did not exist before that). During the next four years Khrushchev and Malenkov were in a political battle. Malenkov, as the head of the Soviet government, had political support of the state apparatus, including production branch ministries. In contrast, Khrushchev, as the leader of the party, relied heavily on the party's political support, and, especially, on the regional party secretaries.

Khrushchev acquired the support of regional party leaders by means of canceling secret police monitoring of their work and granting them more authority in local decision-making (Khlevnuk et al. 2009). In addition, Khrushchev promoted many of his supporters to the key regional positions (Rigby 1984, Khelvnuk 2003). At the same time, however, Khrushchev publicly proclaimed on several occasions that the performance of regional officials was an important factor determining their carriers (Ballis 1961; Tomilina et al. 2009 vol. 2, p. 233). The apparatus of the party Central Committee continued to monitor activities of local officials including "their ability to realize the party policy in practice" (Khlevnuk et al. 2009 document # 33, 23.07.1955). Special archive with records of regional development was established in the central party apparatus (Khlevnuk et al. 2009 document # 32, 30.03.1955). Khlevnuk et al. (2009) published recently declassified historical documents which show that in many cases in those years the dismissal of regional leaders was caused by the poor performance of regions under their control (Bryansk 1954; Yaroslavl' 1954; Karelia 1955; Vologda 1955; Sverdlovsk 1955 etc. documents # 11-12; 13-15; 16; 17; 18).

In January 1955, Khrushchev managed to dismiss Malenkov from the Prime Minister position, but Malenkov remained a member of the Presidium of the Communist party (an official name of Politburo under Khrushchev) (Fursenko et al. 2004, p. 35, protocol of the Presidium/Politburo meeting on 22.01.1955). The power struggle reached culmination in 1957 when Khrushchev's initiated a major organizational reform of the economic and political hierarchy. In late January 1957, Khrushchev started the so-called *"Sovnarkhoz"* reform. The essence of the reform was in abolition of the production branch industrial ministries and establishment of the regional bodies, called *"Sovnarkhozes,"* i.e., literary Soviet councils of national economy, which were supposed to oversee and manage industry and construction in the regions (Fursenko et al. 2004 p. 221-223 protocol of the Presidium/Politburo meeting on 28.01.1955). Thus, the reform made regional officials responsible for industrial development of their regions. This meant a drastic reallocation of power from ministerial elite in the center to the regional elites, and, almost importantly, to regional party leaders. Publicly, Khrushchev explained the reform by the necessity to overcome negative elements of the ministerial system – narrow departments' interests and ministerial autarky (Hoeffding 1957; Swearer 1959).

The reform was implemented very fast. Central party committee approved the *"Sovnarkhoz"* initiative in February 1957 and a formal law introducing the system took force on May 10 of the same year. The ministerial lobby in the Presidium/Politburo tried to sabotage the reform (Fursenko et al. 2004 pp. 221-223, 236-241 protocol of the Presidium/Politburo meeting on 28.01.1957, 22.03.1957; Kovaleva et al. 1998 pp. 194 - 195). Moreover, having a majority in the Presidium/Politburo of the central committee of the Communist party, the ministerial lobby attempted to dismiss Khrushchev from his office in June 1957. In response, Khrushchev called a meeting of the Central committee, where regional secretaries constituted a majority, in which he managed to crush the

opposition (the so-called "anti-party group of Malenkov-Molotov-Kaganovich"). Soon Khrushchev became the undisputable leader of the country: in April 1958 he replaced Bulganin, who was discredited by his support of the 'anti-party' group, in the office of the head of the Soviet government. Khrushchev's victory also meant that the realization of the "*Sovnarkhoz*" system was put into practice during the second half of 1957. The decree, September 26 1957 detailed the reorganization procedure (Swearer 1959, p. 52).

The "*Sovnarkhoz*" system was built through a trial-and-error process during late 1957 – early 1958 years (Swearer 1961). Regional leaders lobbied for the widening of their authority (Swearer 1959 p. 56). Some of them went as far as suggesting to institute fiscal federalism (Churchward 1977). Khrushchev rejected these initiatives. The "*Sovnarkhoz*" reform did not mean decentralization of the Soviet political hierarchy; rather it meant reshaping its form (Hoeffding 1957, Swearer 1959, 1962a). Nonetheless, Khrushchev carefully took into account the interests of regional secretaries. Initially, Khrushchev envisioned few regional economic bodies ("*Sovnarkhozes")*, such that each "*Sovnarkhoz*" is responsible for several administrative regions. Regional officials, however, successfully lobbied for their own unshared "*Sovnarkhozes*" (Swearer 1959). As a result, 105 "*Sovnarkhozes*" were established in the USSR, 68 of them in Russian Federation.[1]

Each "*Sovnarkhoz*" got authority over industry and construction in the region under its control. "*Sovnakhozes*" had to prepare a draft of regional plan in cooperation with *Gosplan* – the Central State Planning Body. After the government's approval of the plan, they had to fulfill them. The center allocated resources for the realization of planned tasks. The power and responsibilities of *Gosplan* under "*Sovnarkhoz*" system greatly increased. It became the primary central authority, which defended national interests (Ballis 1961 pp. 160-163; Hoefding 1957 pp. 73-74; Swearer 1959 pp. 54-58).

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[1] There were 70 regions in Russian Federation at that time. North-west Sovnarkhoz that included Leningrad region, Novgorod region and Pskov region was the only exception.

The role of regional party leaders in that system enormously increased. "*Sovnarkhoz*" officials admitted their subordination to the regional party organization (Ballis 1961 p. 162; Swearer 1962b p. 34). Khrushchev publicly and repeatedly pointed to the responsibility of regional party leaders for regional economic development. He also emphasized that they are rewarded and punished depending on region's performance (Swearer 1962a p. 458; Swearer 1962b p. 37). In 1961, term limits and a turnover rule for party secretaries were added to the Party's statute (but neither was fully enforced).

3.2.1. Inter-regional externalities as a by-product of the "Sovnarkhoz" reform

The main drawback of the *"Sovnarkhoz"* system was 'localism' in the behavior of regional authorities, as it was described by the central officials. Regions tried to compose plans favorite for their local interests at the expense of national development. They illegally reallocated resources, which they got from the center, in favor of local projects, from which they benefited directly, and paid priority to intra-regional deliveries that often resulted in inter-regional deliveries failures. Contemporary Soviet press was full of examples describing such behavior which was heavily criticized (Swearer 1959 pp. 49, 51, 58). Recently declassified documents from the Soviet archives illustrate the magnitude of this phenomenon. So-called 'non-planned' investments – not included in the National plan and not authorized by the central planner – doubled after the introduction of the *"Sovnarkhoz"* system (Khlevnuk et al. 2009 document # 73, 28.11.1959). Narrow interests were a problem under Soviet ministerial system as well, but the magnitude of the effect of negative inter-ministerial externalities was presumably less than negative inter-regional externalities due to high level of vertical integration and autarky of production branch divisions (Gregory and Stuart 1998).

The central authority made an effort to mitigate the problem. A law prescribing the priority of inter-regional contracts appeared already in April 1958 (Swearer 1959 p. 59; Swearer 1 962a p. 468). In May 1958 the Presidium/Politburo of the Communist party discussed and blamed the practice of illegal resource allocation which followed by a national campaign (Fursenko 2004, p. 309, protocol of Politburo meeting on 06.08.1959). Administrative and criminal cases were opened against plan discipline violators (Swearer 1959 p. 59; Khlevnuk et al. 2009 document # 77, 15.09.1962). Strict restrictions were introduced to regulate the use of resources and investment funds by regional authorities (Swearer 1962b p. 33) In 1960 and 1961 bodies, which were prescribed to coordinate inter-regional economic development, were established: All-Russian, Ukrainian and Kazakhstan republican economic councils and councils for particular economic regions, like Urals, Central Asia etc.

3.2.2. The stages of the reversal of the 'Sovnarkoz' reform

In order to mitigate negative inter-regional externalities, Khrushchev initiated the second stage of *"Sovnarkhoz"* reform in September 1962 (Fursenko 2004 pp. 576-596; record of Khrushchev's speech at the Presidium/Politburo meeting on 20.09.1962). The reform was realized in November-December of the same year. So-called state production branch committees were established in Moscow; they had to coordinate planning in corresponding sectors of economy. The management of the construction industry, i.e. the control over investments funds, was moved from regional *"Sovnarkhozes"* to the national State construction committee. *"Sovnarkhoz"* divisions were enlarged to overcome parochial tendencies: new enlarged *"Sovnarkhozes"* typically managed several administrative regions (Mieczkowski 1965). Thus, each regional party unit, which covered a corresponding administrative region, covered only a part of the new *"Sovnarkhoz"*. In

practice this meant that several regional party secretaries had to supervise local economic activity and this created substantial disorganization.

In addition, trying to shape career incentives for party leaders, Khrushchev separated party units into separate industrial and agricultural party bodies in more than one half of the regions. Exceptions were made for autonomous national republics and regions with clearly pronounced agricultural specialization. Khrushchev stated that the new system would allow regional party secretaries to focus on a particular sector of the regional economy and help boosting economic performance (Fursenko 2004, pp. 576-596; record of Khrushchev's speech at the Presidium/Politburo meeting on 20.09.1962).

The separation of regional party organizations extended the number of available regional party secretaries' positions. This allowed some scholars to interpret the 1962 reform as Khrushchev's attempt to replace gradually the old regional elites in order to promote younger and more educated officials (Armstrong 1966).[2] The majority of 'old' regional party secretaries kept their jobs during the separation reform but lost one half of their power. Thus, they strongly opposed this reorganization.

Summarizing the changes caused by the 1962 reorganization, it should be noted that it substantially modified the 'pure' '*Sovnarkhoz*' system which existed between 1958 and 1962. In assessment of the results of 1962 reform, historians agree that the separation of party units caused a chaos in management and proved to be counter-productive (Hanson 2003).

Many writers name the separation of the party units as one of important reasons for the success of the coup against Khrushchev (Pikhoya 2000; Burlazkii 2008). The reason is that Khrushchev lost the political support of regional leaders who were members of the Central party committee. Importantly, only the 'old' secretaries were members of the

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[2] There are some pieces of evidence that regional party elite started to turn into a kind of close club, which consisted of the generation promoted by Stalin after the Great terror and during the 1940s (Pikhoya 2000; Khlevnuk et al. 2009).

Central party committee in 1964; and the 'new' secretaries promoted in 1962 were not.[3] In days after the dismissal of Khrushchev, Brezhnev re-united regional party organizations and fully restored the powers of the 'old' secretaries (Armstrong 1966).

The ministerial lobby in the center also played an important role in helping the Brezhnev's plot against Khrushchev. Once Khrushchev was removed in October 1964, Alexei Kosygin – an influential Soviet industrial top-manager - became the head of the government, as a part of duumvirate with Leonid Brezhnev. Brezhnev and his allies in Moscow apparatus stated that *"Sovnarkhoz"* system undermined the power of the center (Fursenko 2004, pp. 862-872 protocol of the Presidium/Politburo meeting on 13.10.1964; Vestnik … 2006, p. 32-43 Record of Brezhnev's speech at the meeting of Leningrad regional party organization on 12.07.1965). While the new government reintroduced production branch ministries almost in a year after the coup; Brezhnev and his allied planned this reform from the very first day in power (Tomilina 2009 p. 194; a draft of the Presidium/Politburo report to the Central party committee meeting on 13.10.1964). They arguably postponed the reform to ensure the support of regional elites for the coup's success. The reintroduction of production branch ministerial system deprived regional party secretaries of control over industry.

Historians agree that turnover in the Kremlin also meant a change in the personnel policy. Leonid Brezhnev relied heavily on political loyalty in his relations with subordinates (Pikhoya 2000). He promoted many of his former colleagues, e.g., Andrei Kirilenko, Nikolai Shchelokov and Vladimir Sherbitskii (*Dneproterovsk* clan, named at the city where Leonid Brezhnev was a regional party secretary in the Stalin's time). In the

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[3] The reform was planed and realized between the 22nd and 23rd Communist party congresses, occurred in 1961 and 1966 correspondingly. Only the congress formally could appoint the Central committee; and in 1961 future 'new' secretaries had too low political ranks to be elected into the committee.

relations with regional elite Brezhnev introduced the policy of "no-turnover of cadres" which postulated no demotions except in the extraordinary circumstances (Khlevnuk 2003).

4. **Hypotheses**

To formulate testable hypotheses we draw on stylized facts about career concerns of Soviet regional leaders before, during, and after the *"Sovnarkhoz"* reform.

The *"Sovnarkhoz"* reform displaced the U-form organization of Soviet industry and instituted the M-form organization; after the reversal of the reform, U-form organization was reinstituted. Our aim is to study the incentive effects of such a drastic organizational change. We expect that the reform created yardstick competition in industry for regional leaders, which was not there before the reform and which was eliminated after its reversal in 1965. Thus, we test for whether the industrial performance of the region was an important determinant of regional leaders' career advancement in the years between 1958 and 1964 and was not such before and after. To preview our results, we do find empirical support to this hypothesis.

A drastic change in incentives of regional leaders should have translated into the change in behavior. We test for the overall outcome of the reform. In particular, we test whether party secretaries delivered higher than average growth rates in the period of reform. Theoretically, the result is ambiguous, as the change in behavior, if such change occurred, may have resulted in higher effort to deliver growth but also regional policies with negative inter-regional externalities. We also address the question of whether the response to the career incentives varied among regional leaders depending on their individual characteristics. To preview, we find that the high-powered incentives did not result in faster growth on average and there is important variation in response to incentives among party secretaries; only two groups of regional leaders - leaders with new human

capital specific for the organizational reform and leaders with good connections to their neighbors - performed better in response to increased incentives. In addition, we investigate separately what were the outcomes of the first and the second organizational reforms conducted in 1957 and 1962.

Furthermore, we test whether political connections to the central leadership influenced regional leaders' careers. We expect political connections to be an important determinant of career concerns during the whole period of Soviet history.

The *"Sovnarkhoz"* reform did not formally affect governance of agriculture, management of which was always organized as an M-form with administrative regions being its territorial divisions. Thus, we also test for yardstick competition in agriculture throughout the whole period under study.

5.   **Data**

We combine three sets of sources. We collect data on regional party secretaries' turnovers, their profiles and regional economic performance. Archrival Politburo records organized by historians in a kind of data set (Denisov et al. 2004; Khlevnuk et al. 2009) contain data on regional party leaders' appointments. Politburo records also provide information about reasons and future jobs of removed secretaries that help to classify their moves between positions and distinguish upward shifts, downward movements and stays at the same level. Goryachev (2005) and Khlevnuk et al. (2009) present biographies of regional leaders. We extract data on economic performance from 1956-1968 annual official statistical volumes for Russian federation (*"Narodnoe khozyastvo RSFSR"*). The time span of our study is determined by data availability. The intersection of three sets cover the time period between 1953 and 1967 plus the year of 1950, i.e. 16 years all-together. The dataset unit is a party leader of a region in a year. The total number of region-year observations in the

sample is 1158. The total number of regions is 85, but only 72 regions per year on average due to a series of administrative-territorial reforms. The appendix provides details on our data management procedure.

The use of declassified archival information has the advantage of no gaps in data on appointments. The only appointments of first party secretaries which we did not include into our analysis are appointments of those secretaries who worked less than a year in their offices. There were 5 such secretaries in 1950 and between 1953 and 1967, one of whom died in his office. Table 2 summarizes the changes in career status of regional leaders. There were 72 cases of demotions, 55 cases of promotions and 1031 region-year observations with regional first party secretaries either kept his/her office for another year or transferred to a similar position either in the central apparatus or in other regions. There was only one region, Tuva, where the only leader – Salchak Toka - ruled during the whole period under study. In eleven regions there were no cases of regional leaders' upward or downward mobility: all transfers in these regions were lateral. In the remaining regions, there were on average three career transfers with an average tenure of slightly above four years.

Table 2 somewhere here

Figure 1 plots the frequencies of both promotions and demotions over time. The termination rate is more volatile than the promotion rate. In 1961 the number of terminations was three times larger than the average; nobody was demoted in 1964 and 1966. The promotion level was between two and four during the most part of the period. Monthly levels of both termination and promotion vary between zero and three with two exceptions. Waves of appointments occurred in the years following Stalin's death and Khrushchev's victory over 'anti-party' group: 7 terminations in January 1954 and 5 promotions in January 1958, accordingly.

Figure 1 somewhere here

227 different persons occupied offices of regional party leaders in Soviet Russia in 1950 and between 1953 and 1967. Using their biographies, we construct a number of variables describing their personal characteristics – age and tenure in office - and important facts in their careers.[4] We account for regional leaders' experience of work together with the country leaders before they occupied important position in the Kremlin.[5] We also register for their experience of work or study in Moscow, where officials could acquire important connections. Due to the same reasoning we construct a dummy for the graduates of the 'High Party School'. Table 3 presents summary statistics of these variables.

Table 3 somewhere here.

Our choice of variables on regional economic performance was determined by data availability. There are no data on regional GDP for the USSR or Soviet Russia. Regional industrial indexes are available, but there are no such aggregated variables for development of agricultural. We use a number of disaggregated variables instead – total area under crops, grain and meat production. Regional level data are missing for 1950 for the industrial growth rate variable and there no information on grain and meat production before 1957. Table 3 provides summary statistics on economic performance and table A1 of the appendix reports correlation matrix. All economic performance variables vary substantially both across and within regions: thus, within and overall standard deviations of the area-under-crops variable are 461.2 and 1124.2, correspondingly.

According to official records, Soviet industry grew at almost 10% in a year on average. Scholars agree that so high official rates of growth are the product of the Soviet methodology of aggregation that inflated growth rates. Considering that Soviet

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[4] We did not control for regional leaders' gender once we have only one lady (Ekaterina Furtseva) in out database.

[5] With Nikita Khrushchev for 1953 – 1964; and either with Leonid Brezhnev or Alexei Kosygin for 1965 – 1967. In 1950 nobody of regional leaders had experience of working with Stalin before he became the party leader in 1922.

disaggregated series in natural units were correct and not falsified – the assumption that

Soviet archives confirm (Harrison 2003) - Sovietologists invested huge efforts to produce

from them a 'true' aggregated series of Soviet industrial development; they estimated that

for the period 1953 - 1967 industrial growth was about 7.5 % (Bergson 1961, CIA 1990).

There are no such estimates at the regional level. For our purposes, the upward bias of

industrial rate figures is not a problem. The officials' figures are the only numbers which

the central government knew. We investigate whether reported figures on economic

performance influenced the appointment decisions.

6.   **Analysis**

6.1. The determinants of career concerns throughout the whole period under study

Our main dependent variable here is the indicator of career mobility of regional party

secretaries; in each region and each year, we code it as "-1" for demotion, "0" for staying at

the same level (keeping the same position or a lateral transfer) and "1" for promotion. We

use linear OLS regression model with fixed region and year effects. To be precise, we

estimate the following equation:

$$y_{it} = \beta' E_{it} + \gamma' P_{it} + \alpha' X_{it} + \varphi_i + \tau_t + \sum_g \delta_g t D_g + \varepsilon_{it} \tag{1}$$

where subscripts *i* and *t* index regions and years, respectively. *E* is a vector of independent

variables which reflect economic performance of a region. We employ current economic

performance variables because of 'permanent monitoring' principle formulated by Stalin as

early as in 1934 (see Stalin's speech at the 17th Party Congress – Hoover/RGANI

59/2/1/92[6]), according to which the center had to observe efforts and achievements of

subordinators permanently and to intervene immediately whenever necessary. Moreover,

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[6] Hoover/RGANI: "Archives of the Former Soviet State and Communist Party' from the Russian State Archives of Recent History (Moscow) at the Hoover Institution of War, Revolution, and Peace (Stanford, CA). Russian archival documents are numbered according to a standard system: collection, inventory, file, folio.

previous achievements could work in opposite direction in the Soviet economy due to the nature of the planning system which was based on the ratchet principle such that previous achievements are used as a benchmark for evaluation of future performance (Gregory and Stuart 1998). We employ agricultural variables in levels and industrial growth variable in rates because of clearly pronounced trend in industrial development. P is a vector of independent variables which are proxies for connections of a regional party secretary.

X is a vector of controls that includes annual regional population controls taken in logs and personal characteristics of the regional leaders, namely age and tenure in office. To account for potential non-linear influence of age onto career, we also include age square variable into our analyses. There is no retirement age problem due to the absence of forced retirement rules in the USSR. We need year dummies, φ, to control for time shocks such as macroeconomic shocks or waves of appointments and regional dummies, τ, to account for unobserved cross-sectional heterogeneity. Given the size of Russia, we also introduce linear trends for mega regions - like North-West, Volga, Center, North Caucasus, Urals, West Siberia, East Siberia and Far East - to control for different development movements for different parts of the country which the central government most likely took into account. D is a set of dummies for linear trends for such mega regions and δ_g are coefficients on the mega-region-specific linear trends tD_g. Finally, ε is an error term, assumed to be uncorrelated across regions, but not necessarily within regions (thus, we allow clusters at the level of regions).

Since our dependent variable is cardinal in nature, non linear models, such as ordered probit model, could potentially better fit data and give higher efficiency. Nonetheless, in our baseline specification, we employ linear regression model because fixed effects estimators for non-linear models can be severely biased due to incidental parameters

problem when time span of the panel is small (Fernandez-Val 2009). We, however, verified that all our results go through if we use the ordered probit instead of OLS.

Table 4 presents the estimation results for different specifications. Due to gaps in the data, changes in specifications cause shifts in periods under study. In the first column we report results of the specification, which includes only one variable on economic performance - area-under-crops - and covers the largest time span, namely the period between 1953 and 1967 and the year of 1950. An inclusion of the industrial growth rate variable (column 2) eases on 1950, and an inclusion of meat production variable limits the sample to the 1958-1967 period only.

Table 4 somewhere here.

Let us first consider the political connections and agriculture, which we expect to matter throughout the whole period. Estimated coefficients support our hypothesis on career determinants in the traditional Soviet hierarchy: coefficients on variables on agricultural performance and of political proxies have the predicted sign and they are significant in all specifications at least at ten percent level, with only two exceptions. When the meat production variable is included into the model together with the area-under-crops variable, coefficient on the former becomes insignificant (column 3 of table 4). That is because these two agricultural variables are highly correlated (0.755); they are jointly significant at five percent level. The second exception is the effect of the 'experience of work or study in Moscow', which is a rather crude proxy for political connections and may be subject to severe measurement error, which would bias the coefficient towards zero (see column 2 of table 4).

The coefficient on industrial growth rate variable is positive but insignificant in the second specification. It becomes significant when we add the meat production variable into the estimated model. An inclusion of the meat variable, however, also decreases the sample

22

period. In the last column of the table we report regression results estimated for the specification without 'meat' but under short time span. They show that industrial performance matters only when we reduce the sample. In other words, during the whole period party regional leaders as heads of corresponding regional subunits cared only about agricultural performance and not industrial performance.

Monitoring agricultural development, the central government evaluated first of all efforts which officials invested into agricultural development. In the specifications with grain production variable (not reported) its estimated coefficients are insignificant. Soviet government paid attention to grain inputs – area-under-crops, while climate conditions and accordingly harvest were out of their control. This finding is consistent with extensive character of Soviet agriculture, which heavily depended on weather.

Estimated coefficients on explanatory variables demonstrate that politics heavily affected regional party leaders' careers in the Soviet hierarchy. Coefficients in the specification with only area-under-crops as an explanatory variables on regional economic performance suggest that a regional leader without connections with Soviet leaders had to increase regional area-under-crops by more than two and a half (2.58) within region standard deviation (461.2) in order to have similar career perspectives. An increase of area-under-crops by a bit less than one within region standard deviation (0.92) compensated for lack of connections in Moscow.

The regressions also suggest that career perspectives worsened with age for younger cohorts of regional leaders, while improved after the age of fifty one. The coefficients on the age variable have negative sign and of the age squared have positive sign. This result is weak; estimated coefficients are significant at ten percent level only in the specification with area-under-crops as the sole variable on regional economic performance. The population controls (not reported) and the tenure variable are insignificant.

6.2. Did the "Sovnarkhoz" reform create yardstick competition in industry?

To test for the effect of the "Sovnarkhoz" reform on regional leaders career concerns we add interaction terms between variables measuring economic performance and political connections, on the one hand, and the dummies for the '*Sovnarkhoz*' reform period and two sub-periods before and after the 1962 modification, on the other hand. The reform time dummy is equal to one during the period 1958-1964. "*Sovnarkhoz*" were established in 1957 but the system started to operate in full degree only since 1958. Brezhnev re-established the ministerial system in September 1965, but the decision of "*Sovnarkhoz*' dismantling was taken already at the end of 1964. We employ the end of the 1962 year as a border between sub-periods because the actual reorganization occurred in November-December of that year. Only the coefficient on the interaction with industrial growth rates variable is significant; at the same time the industrial growth rate variable itself is insignificant. We report the results in table 5.

Table 5 somewhere here.

The results support our hypothesis that industrial performance was important for career advancements of regional leaders only under the "*Sovnarkhoz*" system. The coefficient on the interaction of the industrial growth variable with the time period of the *Sovnarkhozy* reform (column 1 of table 5) suggests that an increase of industrial growth rate by one standard deviation (namely, 0.07, once we consider only variation within region) is roughly equal to the effect of an increase of the area-under-crops by one standard deviation (461.2, also calculated within-region). These effects are 5.9 and 7.4 percentage point increases in probability of promotion, respectively. This is consistent with interpretation of the "*Sovnarkhoz*" system as an M-form hierarchal structure which brought

a yard-stick competition for regional leaders into industry. Our findings also show that the introduction of the 'Sovnarkhoz" system did not affect importance of political connections.

We report regression results estimated for the specification with the interaction of the industrial growth variable with the early years of the reform excluding late years of the reform in the second column and with separate interactions for the early and late years of the reform in the third column of table 5. The magnitude of estimated coefficients on the interactions for early years is larger than on the interaction with the whole 'Sovnarkhoz" period. This is consistent with the nature of the 1962 reform that complicated the task to evaluate achievements across regions. The effect of yardstick competition created by the reform was stronger before the 1962 modification.

6.3. *Did regional leaders respond to the change in incentives?*

To test whether the change in incentives resulted in the change in performance, we rely on overtime variation of industrial growth rates. Namely, we regress regional industrial growth rates on the dummy for the time of the reform controlling for the other variables that were found to affect regional leaders' career advancement. It is important to note that reliance purely on overtime variation permits alternative interpretation of the results, as they may have been other things going on at the same time. Thus, one has to exercise caution in interpreting these results. We consider both the whole period of the 'Sovnarkhoz' reform as well as sub-periods before and after the 1962 modification of 'Sovnarkhoz' system. Thus, we estimate the following specification

$$z_{it} = \eta R_t + \kappa A_{it} + \gamma' P_{it} + \alpha' X_{it} + \varphi_i + \sum_g \delta_g t D_g + \varepsilon_{it} \qquad (2)$$

where the dependent variable z stands for industrial growth rate; R is the dummy for "*Sovnarkhoz*" period (or sub-periods); A is an independent variables which reflect agricultural performance of a region (area-under-crops); η and κ are coefficients and other

variables are the same as in the equation (1). We report results in the first three columns of table 6.

Table 6 somewhere here.

If we consider the whole period, the '*Sovnarkhozy*' reform did not result in higher growth in industry. The estimated coefficient on the reform variable is negative and significant. However, these results are primary driven by two extremely bad years, namely 1963 and 1964, when separate agricultural and industrial regional party units operated. An exclusion of these two years changes the sign of the time dummy (see column 2 of table 6). Moreover, the results reported in the third column of the table suggest that regions, where party units were divided, demonstrated significantly worse results than the regions, where separation reform did not happen. The regions, where 'old' secretaries became industrial secretaries, reduced their industrial growth rate on 1.4 percents in 1963-1964 relative to average growth in other years (10.4 percents) and the regions, where 'old' secretaries became agricultural secretaries, reduced their industrial growth rate even more on 3.3 percents. These findings are consistent with writings of historians who agree in interpretation of 1962 Khrushchev's reorganization as a reform that produced an extremely negative shock (Hanson 2003).

The coefficient on 'pure' *"Sovnarkhoz"* system time dummy hints that the system operated better before the 1962 reform. We find that this is strong for two groups of regional leaders who improved their performance substantially in response to increased incentives: leaders appointed during "pure" *"Sovnarkhoz"* period and leaders, who graduated from the high party school. If we add dummy control for secretaries who were not appointed during the "pure" *"Sovnarkhoz"* period and interaction of this dummy with "pure" *"Sovnarkhoz"* period time dummy into our regression model, the estimated coefficient on 'pure' *"Sovnarkhoz"* period time dummy is positive and highly significant

(reported in the 4th column of table 6). Correspondingly, if we include party school graduation dummy and its intersection into our regression model, the estimated coefficient on 'pure' "*Sovnarkhoz*" period time dummy is also positive and highly significant (column 6). These results hold even if we exclude regions with separated party units which saw a negative shock in 1963-64 (columns 5 and 7). Lack of significant correlations between party school alumni and secretaries appointed under the 'pure' "*Sovnarkhoz*" system (-0.016) suggest that they represented two different groups of leaders who responded to the change in incentives.

Anecdotal evidence summarized in the historical section implies that the "*Sovnarkhoz*" system suffered heavily from the negative inter-regional externalities, a common byproduct of M-forms. Local officials had narrow interests that influenced harmfully onto development of other Soviet regions. We argue that regional leaders who graduated the party school acquired an important skill how to overcome this problem. They acquired officials from other regions during their study that gave them a chance to coordinate inter-regional issues directly and not to damage development of their neighbors. The majority of regional leaders spent a couple of years at the party school roughly at the same time, namely, in the late 1940s – early 1950s. This was a byproduct of Stalin's regional policy when the dictator used the party school as a tool against regional networks and corruption, regularly moving regional officials to Moscow for short terms (Denisov et al. 2003) It is doubtless that regional leaders learned an advanced management their, because ideological issues dominated in the party school's program (Khlevnuk et. al. 2009).

Our finding that recently appointed regional leaders worked better under "*Sovnarkhoz*" system points to the effect of positive transaction costs, associated with the need for new human capital, as another source of expenses generated by organizational

reform. It might be difficult for the old generation to learn quickly new rules of the game. The new system required new people who were able to adapt for radical reforms better; this phenomena has been also observed in Russia during the transition period forty year later (Barberis et al. 1996). Khrushchev's long search for a stable system and continues management reforms strengthened this effect. Managers had few incentives to learn and follow new rules if the system was under permanent revision.

6.4. Sensitivity tests.

We conduct several sensitivity tests to make sure how robust our findings on career concerns in Soviet political hierarchy are to alternative specifications and subsamples. First, we check how stable are our results relative to linear trends which we constructed for mega regions (like Volga, Urals etc.). We experiment either not accounting for such trends at all or allowing them to be non-linear. Second, we exclude observations of 1963 and 1964 years for the regions where party units were divided into separate agricultural and industrial regional committees. Third, we repeat our exercises for the dataset without regions where only lateral transfers of regional leaders occurred. Table A2 and A3 of the appendix reports results of our main specifications. The chief variables of interest - area-under-crops and 'leader' - are positive and significant at least at ten percent level in all specifications. Coefficients on the interaction are positive and significant in three of four specifications. The 'Moscow' variable is positive, but significant in only half of specifications.

Further, we test how sensitive our results are to the appointments occurred in Januaries. One can argue that such changes in offices were determined by previous year economic performance not the current one; due to two waves of January appointments their number is substantial in our dataset. Table A4 of the appendix reports the results estimated on the dataset where January appointments are excluded. The main variables of interest -

area-under-crops and 'leader' - are positive and significant at least at ten percent level in all specifications. Coefficients on the interaction are positive and significant.

To test whether the significance of industrial growth rate variable is driven by '*Sovnarkhoz*' reform we used a number of interactions of industrial rates with different time dummy variables shifting time spans up and down relative to the *"Sovnarkhoz"* reform. Table A5 of the appendix reports results of the specifications with such interaction terms. The coefficients on corresponding interaction terms are either insignificant or have higher corresponding p-values; their magnitude is also smaller in a half of cases.

Finally, we checked whether our results are sensitive to the functional form of the analyzed relationship between regional leaders' career mobility and its determinants, using ordered probit and ordered logit models, as well probit and logit models for promotion and demotion separately. All results hold (not reported).

7.   **Conclusions**

The main contribution of our analysis is to the empirical literature on the comparison of incentives of bureaucrats and outcomes in the U-form and M-form hierarchies. Previous economic literature – based primarily on cross-country comparisons – stresses the tradeoff between economies of scale (better realized in the U-form) and incentives (better realized in M-form). This literature agues that, in the absence of economies of scale, M-form produces better outcomes. In contrast to this literature, we study the change of organizational form within one country, namely, introduction and reversal of the *"Sovnarkhoz"* reform in the USSR. We use detailed annual regional-level panel data on political careers of regional party leaders, their background, and regional economic indicators to show that the *"Sovnarkhoz"* reform reorganized the management of Soviet Industry from U-form to M-form. This reform created yardstick competition between

regions and resulted in high-powered incentives for regional party leaders to deliver industrial growth.

Such a sharp change in incentives, however, did not translate into higher industrial performance on average. We find that only two groups of regional leaders responded with increased industrial growth of their regions to the reform: the leaders appointed during *"Sovnarkhoz"* period and the leaders with good connections to their neighbors. Our analysis highlights the following potential economic costs of switching from U-form to M-form hierarchy. First, there may be a need for new human capital to accompany the change in the organizational structure for an increase in incentives to translate into better outcomes (as leaders who were appointed before the reform were not able to adjust as well as newcomers). Second, yardstick competition under M-form may result in severe inter-divisional externalities not internalized by the agents in charge of the competing divisions (as regional *Sovnarkhoz* divisions favored autarky in preparation of their plans and allocation of resources).

Our analysis also confirms the result of the previous literature that personal connections are an important determinant of career advancement in bureaucratic hierarchies: during the whole period under study, regional party leaders' careers were substantially more successful if they had better political connection to the central leadership. We also show that growth in agricultural inputs significantly affected career concerns of Russia's regional leaders throughout the whole period under study; as agriculture, in contrast to industry, was always organized as an M-form in the Soviet Union.

The *"Sovnarkhoz"* reform episode of the Soviet political history also vividly demonstrates political challenges of a transition from U-form to M-form political hierarchy. Such reorganization undermines power of branch elites, who therefore, become

the main opposition to the reform. If, however, the dictator is strong enough and can mobilize the winners from the reform, i.e., regional elites, he may be able to crush the opposition. The history of the 1957 failed coup *d'état* against Khrushchev illustrates this point. The success of the subsequent 1964 successful coup against Khrushchev, lead by Brezhnev, suggests that the support of the regional elite is crucial for sustainability of reform. The political support to Brezhnev's plot came both from the central production branch elite and regional leaders who opposed the reorganization of M-form conducted by Khrushchev in 1962. We argue that the 1962 reform was a disaster from the organizational standpoint and show that it led to a sharp decline in industrial as well as agricultural growth. Right after the 1964 coup, Brezhnev reversed the reform and reintroduced the politically stable U-form hierarchy. The story of the fall of Khrushchev and his "*Sovnarkhoz*" reform provides an illustration for why inefficient—from the incentives' point of view—U-form hierarchies such as the USSR persist for a long time.

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Table 1. Political struggle and organizational reforms under Khrushchev and early Brezhnev

Date	Struggle for power	Organizational reforms
March 1953	Stalin's death	
September 1953	Khrushchev was elected the First Party Secretary	Khrushchev: 'local and regional party secretaries are responsible for agriculture'
January 1955	Malenkov was dismissed from the Prime Minister position, but remained a member of the Politburo of the CPSU	
February 1956	XX party congress: Khrushchev did not get a majority in the Politburo	Khrushchev: 'regional party secretaries have to supervise economy'
January - June 1957		Discussion and elaboration of the 'Sovnarkhoz' reform
June 1957	'Anti-party' group tried to dismiss Khrushchev	
Second half of 1957		Realization of the 'Sovnarkhoz' reform
April 1958	Bulganin retired from the Prime Minister position. Khrushchev combined the leadership of the party and the state apparatus	Law prescribing the priority of inter-regional contracts
May 1958		The Politburo blamed 'non-authorized' allocation of resources by regions
June 1960 - April 1961		Introductions of inter-regional bodies
October 1961		XXII party congress: limitation of the number of terms in offices for party secretaries (never realized)
November -December 1962		1962 reorganization of 'Sovnarkhoz' system: introduction of production branch 'state committees' (ministries), centralization of construction, separation of regional party committees and enlargement of economic regions
October 1964	Brezhnev dismissed Khrushchev in a party coupe	
November 1964		Reunification of party regional committees (reversal of the separation reform of 1962)
September 1965		Full restoration of the ministerial system

Table 2. Changes in career status

	1950, 1953-67		1953-67	
	frequency	%	frequency	%
Demotions	72	6.22	66	6.05
Stay in office or lateral transfer	1031	89.03	971	89
Promotions	55	4.75	54	4.95
Total	1158	100	1091	100

Source: Calculated using Denisov et al. (2004) and Khlevnuk et al. (2009)

Fig. 1. The time trend of Soviet regional leaders' career mobility, 1950 - 1967
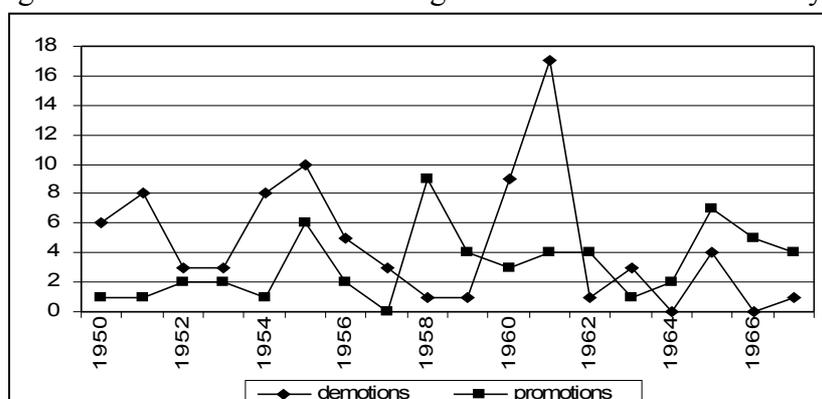
Source: Calculated using Denisov et al. (2004) and Khlevnuk et al. (2009)

Table 3. Regional economic performance and characteristics of regional leaders, 1950 and 1953-1967

	Obs	Mean	Std. dev.	Min	Max
Indrate (%)	1035	9.8	4.1	-12	31
Crops (area under crops in th. Ha)	1132	1048	1124.2	0	6066
Grain (in th. Tons)	842	1065	1322	0	7470
Meat (in th. Tons)	842	64.5	51	1.3	341
Party school	1154	0.35	0.48	0	1
Moscow	1154	0.7	0.46	0	1
Leader	1154	0.11	0.31	0	1
Age	1154	49.6	5.1	33	66
Age2	1154	2483.6	510.6	1089	4356
Tenure	1155	4.4	4.03	1	35

Source: Regional economic performance are calculated using Narodnoe khozyastvoe RSFSR v … Various issues, 1955-67; characteristics of regional leaders are from Denisov et al. (2004) and Khlevnuk et al. (2009)

Table 4. Determinants of regional leaders' career mobility: regression results (OLS with fixed effect)

Period	1 1950 & 1953-67	2 1953-67	3	4 1953 & 1958-67	5
Area-under-crops	0.00016	0.00019	0.00016		0.00017
	[0.00007]**	[0.00008]**	[0.00007]**		[0.00007]**
Indrate		0.49	0.87	0.85	0.88
		[0.31]	[0.35]**	[0.34]**	[0.35]**
Meat			0.0013	0.0016	
			[0.001]	[0.0009]*	
Leader	0.19	0.19	0.17	0.17	0.18
	[0.06]***	[0.06]***	[0.07]**	[0.08]**	[0.07]**
Moscow	0.07	0.07	0.09	0.08	0.09
	[0.03]**	[0.04]	[0.05]*	[0.05]*	[0.05]*
Age	-0.05	-0.06	-0.06	-0.07	-0.06
	[0.03]*	[0.04]	[0.04]	[0.04]	[0.05]
Age2	0.0005	0.0006	0.0006	0.0006	0.0006
	[0.0003]*	[0.0004]	[0.0004]	[0.0004]	[0.0005]
Tenure	-0.004	-0.003	-0.004	-0.006	-0.004
	[0.005]	[0.006]	[0.007]	[0.007]	[0.007]
Urban and rural population controls	Yes	Yes	Yes	Yes	Yes
Linear trends for mega regions	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Regional fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	1121	1000	741	741	741
Number of regions	80	77	74	74	74
R2 within	0.1	0.1	0.11	0.1	0.1

Standard errors in brackets;
* significant at 10% level; ** significant at 5% level; *** significant at 1% level

Table 5. Yardstick competition in industry under the 'Sovnarkhoz' system: regression results (OLS with fixed effect).

Period	1953-1967	1953-1962 & 1965-1967	1953-1967
Crops	0.00019	0.0002	0.00019
	[0.00008]**	[0.00008]**	[0.00008]**
Indrate	0.12	0.1	0.12
	[0.4]	[0.41]	[0.4]
Indrate*'Sovnarkhoz' reform (1958 – 1964)	0.84		
	[0.47]*		
Indrate*early years of 'Sovnarkhoz' reform (1958 – 1962)		0.97	0.93
		[0.53]*	[0.55]*
Indrate*late years of 'Sovnarkhoz' reform (1963 – 1964)			0.54
			[0.46]
Leader	0.19	0.21	0.19
	[0.06]***	[0.07]***	[0.06]***
Moscow	0.07	0.07	0.07
	[0.04]	[0.05]	[0.04]
Individual controls	Yes	Yes	Yes
Urban and rural population controls	Yes	Yes	Yes
Linear trends for mega regions	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Regional fixed effects	Yes	Yes	Yes
Observations	1000	864	1000
Number of regions	77	77	77
R2 within	0.1	0.11	0.1

Standard errors in brackets
* significant at 10% level; ** significant at 5% level; *** significant at 1% level

Table 6. Changes in industrial growth rate under the '*Sovnarkhoz*' system: regression results (OLS with fixed effect)

Period 1953-1967	1	2	3	4	5	6	7
'*Sovnarkhoz*' reform (1958-1964)	-0.005 [0.002]**						
Early years of '*Sovnarkhoz*' reform (1958-1962)		0.005 [0.003]*	0.0006 [0.003]	0.016 [0.004]***	0.009 [0.005]*	0.013 [0.005]***	0.009 [0.005]*
'1963-1964 agricultural party secretaries'			-0.032 [0.004]***				
'1963-1964 industrial party secretaries'			-0.014 [0.006]**				
'1963-1964 General party secretaries'			-0.005 [0.006]				
Secretaries not appointed under early years of '*Sovnarkhoz*' reform				0.013 [0.004]***	0.007 [0.005]		
Secretaries not appointed under early years of '*Sovnarkhoz*' reform * early years of '*Sovnarkhoz*' reform				-0.017 [0.006]***	-0.011 [0.006]*		
Not party school graduates						-0.004 [0.006]	-0.003 [0.006]
Not party school graduates * early years of '*Sovnarkhoz*' reform						-0.013 [0.006]**	-0.012 [0.006]**
Controls on agricultural performance and political connections	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Urban and Rural population controls (in logs)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Personnel controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are 1963-64 industrial and agricultural party secretaries included?	Yes	Yes	Yes	Yes	No	Yes	No
Regional fixed effects	Yes	Yes	Yes	Yes	No	Yes	Yes
Observations	1000	1000	1000	1000	916	1000	916
Number of regions	77	77	77	77	77	77	77
R2 within	0.09	0.09	0.13	0.1	0.07	0.1	0.07

Standard errors in brackets.
* significant at 10% level; ** significant at 5% level; *** significant at 1% level

Appendix.

We combine three sources of information to construct our dataset: (1) list of regional leaders' appointments from archrival Presidium/Politburo records (Denisov et al. 2004; Khlevnuk et al. 2009; also available at: http://www.socialsciences.manchester.ac.uk/disciplines/politics/research/SovietProvinces/archive/FirstSecretaries.htm); (2) biographies of regional leaders from Goryachev (2005) and Khlevnuk et al. (2009); (3) data on regional economic performance from 1956-1968 annual official statistical volumes for Russian federation (*"Narodnoe khozyastvo RSFSR"*).

Our dataset includes only autonomous republics, oblast's and kraies of Russian Federation, but not autonomous okrugs or autonomous oblsat's given different decision-making mechanisms on appointments of their leaders. The number of regions varied during the period under study as a result of series of administrative-territorial reforms. Several new regions like Belgorod (1954), Lipetsk (1954), Kalmikia (1957) etc. were established; others like Velikii Luki (1957), Kamentsk (1956), Balashev (1956) were divided between their neighbors; finally borders of several regions (Rostov, Volgograd, Saratov in 1956 or Pskov and Tver' in 1957) were changed. Regions from the later group enter as separate pre- and post-reform units into our dataset.

The only administrative reform, which we ignore in our dataset, is Khrushchev's 1962 separation reform. In 1963 – 1964 as a result of this reform, 43 regions had two regional party units (obkoms) and two first party secretaries instead of one: an industrial first secretary and an agricultural one. Party secretaries of former united party organizations ('old' secretaries) in their overwhelming majority became either agricultural party secretaries or industrial party secretaries. 'New' people were promoted to other positions ('new' secretaries). However, there was no turnover at all in the latter group during the two years, when the separated party units existed. Because of this we count only 'old' party

secretaries, matching them in our database with economic performance of corresponding regions despite the fact that these party secretaries were responsible only for agriculture in 30 cases and only for industry in 13 cases. Our results hold if we exclude 1963 and 1964 observations.

We employ the following classifying procedure, coding regional leaders' careers. We consider positions in the Politburo or the Politburo's Secretariat as promotions for regional leaders as well as posts of all-union ministers and their first-deputies, heads of Central party and State control commissions, heads of main departments in the Central Party Committee's apparatus and posts of first secretaries of union republics. Ambassadors in socialist countries, key officials in the central party apparatus are equal in our classification to the position of a regional first party secretary. Finally, we count transfers to positions of regional second party secretaries, heads of regional governments, plant directors, etc. as demotions. We code the single case of suicide as a demotion. We also code retirement as demotion due to the absence of forced retirement age in the USSR. (Full description of our codification is available from the authors by request.)

Table A1. Pair-wise correlation matrix.

	Indrate	Crops	Meat	Grain	Party school	Leader	Moscow	Age	Age2	Tenure	Change in career status
Indrate	1.0										
Crops	0.1**	1.0									
Meat	0.05	0.75***	1.0								
Grain	0.03	0.88***	0.81***	1.0							
Partyschool	0.02	-0.05*	-0.03	-0.05	1.0						
Leader	-0.02	0.0	0.09**	0.03	-0.11***	1.0					
Moscow	-0.05	-0.11***	-0.04	-0.08**	0.46***	-0.01	1.0				
Age	-0.07**	0.02	0.08**	0.04	-0.04	0.06**	0.01	1.0			
Age2	-0.08**	0.02	0.08**	0.03	-0.04	0.05*	0.01	0.99***	1.0		
Tenure	0.01	-0.1***	-0.14***	-0.11	-0.1***	-0.12***	-0.14***	0.35***	0.36***	1.0	
Change in career status	0.0	0.08***	0.09***	0.09**	-0.01	0.12***	0.03	0.05*	0.06**	-0.02	1.0

* significant at 10% level; ** significant at 5% level; *** significant at 1% level

Table A2. Robustness check on regional leaders' career concerns: regression results (OLS with fixed effect).

	1	2	3	4	5	6
Period	1950 & 1953-67	1953-67		1950 & 1953-67	1953-67	
Area-under-crops	0.00017	0.00020	0.00020	0.00014	0.00016	0.00016
	[0.00007]**	[0.00009]**	[0.00009]**	[0.00006]**	[0.00008]*	[0.00008]**
indrate		0.48	0.1		0.32	-0.13
		[0.33]	[0.4]		[0.31]	[0.41]
Indrate*'*Sovnarkhoz*' reform (1958 – 1964)			0.89			1.02
			[0.51]*			[0.5]**
leader	0.22	0.22	0.22	0.16	0.16	0.17
	[0.07]***	[0.07]***	[0.07]***	[0.06]***	[0.06]***	[0.06]***
Moscow	0.07	0.08	0.08	0.06	0.06	0.06
	[0.03]**	[0.04]*	[0.04]*	[0.03]**	[0.04]	[0.04]
Age	-0.05	-0.06	-0.07	-0.05	-0.06	-0.06
	[0.03]*	[0.04]	[0.04]	[0.03]	[0.04]	[0.04]
Age2	0.00	0.0006	0.0006	0.0005	0.0006	0.0006
	[0.0003]	[0.0004]	[0.0004]	[0.0003]	[0.0004]	[0.0004]
Tenure	-0.0034	-0.002	-0.002	-0.005	-0.003	-0.003
	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
Urban and rural population controls (in logs)	Yes	Yes	Yes	Yes	Yes	Yes
Are 1963-64 industrial and agricultural party secretaries included?	No	No	No	Yes	Yes	Yes
Linear trends for mega regions	Yes	Yes	Yes	No	No	No
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Regional fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1035	916	916	1121	1000	1000
Number of regions	80	77	77	80	77	77
R2 within	0.11	0.10	0.11	0.08	0.08	0.08

Standard errors in brackets
* significant at 10% level; ** significant at 5% level; *** significant at 1% level

Table A3. Robustness check on regional leaders' career concerns: regression results (OLS with fixed effect).

	1	2	3	4	5	6
Period	1950 & 1953-67	1953-67		1950 & 1953-67	1953-67	
Area-under-crops	0.00017	0.00023	0.00023	0.00017	0.00020	0.00020
	[0.00008]**	[0.00009]**	[0.00009]**	[0.00008]**	[0.00009]**	[0.00009]**
indrate		0.4	0.14		0.56	0.14
		[0.3]	[0.37]		[0.35]	[0.47]
Indrate*'Sovnarkhoz' reform (1958 – 1964)			0.55			0.93
			[0.52]			[0.53]*
leader	0.18	0.18	0.18	0.2	0.2	0.2
	[0.06]***	[0.07]***	[0.07]***	[0.06]***	[0.07]***	[0.07]***
Moscow	0.05	0.05	0.05	0.08	0.08	0.07
	[0.03]	[0.04]	[0.04]	[0.03]**	[0.05]	[0.05]
Age	-0.06	-0.06	-0.06	-0.05	-0.05	-0.05
	[0.03]**	[0.04]	[0.04]*	[0.03]	[0.04]	[0.04]
Age2	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
	[0.0003]**	[0.0003]	[0.0003]	[0.0003]	[0.0004]	[0.0004]
Tenure	[0.005]	-0.005	-0.005	-0.004	-0.003	-0.003
	0.012	[0.006]	[0.006]	[0.006]	[0.007]	[0.007]
Urban and rural population controls (in logs)	Yes	Yes	Yes	Yes	Yes	Yes
Linear trends for mega regions	No	No	No	Yes	Yes	Yes
Non-Linear trends for mega regions	Yes	Yes	Yes	No	No	No
Are regions with only lateral transfers included ?	No	No	No	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Regional fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1121	1000	1000	1000	887	887
Number of regions	80	77	77	69	66	66
R2 within	0.16	0.16	0.17	0.11	0.11	0.11

Standard errors in brackets
* significant at 10% level; ** significant at 5% level; *** significant at 1% level

Table A4. Robustness check on regional leaders' career concerns: regression results (OLS with fixed effect).

	1	2	3
Period	1950 & 1953-67	1953-67	
Area-under-crops	0.00017	0.00020	0.00021
	[0.00007]**	[0.00008]***	[0.00007]***
indrate		0.43	0.06
		[0.27]	[0.37]
Indrate*'*Sovnarkhoz*' reform (1958 – 1964)			0.81
			[0.43]*
leader	0.12	0.12	0.12
	[0.06]**	[0.06]*	[0.06]**
Moscow	0.06	0.07	0.07
	[0.03]**	[0.04]*	[0.04]*
Age	-0.04	-0.04	-0.04
	[0.02]	[0.03]	[0.03]
Age2	0.0004	0.0004	0.0004
	[0.0003]	[0.0004]	[0.0004]
Tenure	-0.004	-0.005	-0.005
	[0.005]	[0.005]	[0.005]
Urban and rural population controls (in logs)	Yes	Yes	Yes
Are January appointments included?	No	No	No
Linear trends for mega regions	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Regional fixed effects	Yes	Yes	Yes
Observations	1085	967	967
Number of regions	80	77	77
R2 within	0.08	0.08	0.08

Standard errors in brackets
* significant at 10% level; ** significant at 5% level; *** significant at 1% level

Table A5 Robustness check on the 'Sovnarkhoz' reform (OLS with fixed effect).

	1	2	3	4	5
Period			1953-1967		
Crops	0.00019	0.00019	0.00019	0.00019	0.00018
	[0.00008]**	[0.00008]**	[0.00008]**	[0.00008]**	[0.00008]**
Indrate	0.12	0.06	0.17	0.02	0.09
	[0.4]	[0.41]	[0.38]	[0.4]	[0.41]
Leader	0.19	0.19	0.19	0.19	0.19
	[0.06]***	[0.06]***	[0.06]***	[0.06]***	[0.06]***
Moscow	0.07	0.07	0.07	0.06	0.06
	[0.04]	[0.04]*	[0.04]	[0.04]	[0.04]
Indrate*'Sovnarkhoz' reform (1958 – 1964)	0.84 [0.47]*				
Indrate * 1956-1962 dummy		0.87 [0.52]*			
Indrate * 1957-63 dummy			0.74 [0.48]		
Indrate * 1959-1965 dummy				1.08 [0.62]*	
Indrate * 1960-1967 dummy					1.0 [0.7]
Individual controls	Yes	Yes	Yes	Yes	Yes
Urban and rural population controls	Yes	Yes	Yes	Yes	Yes
Linear trends for mega regions	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Regional fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	1000	1000	1000	1000	1000
Number of regions	77	0.10	77	77	0.10
R2 within	0.17	77	0.17	0.17	77

Standard errors in brackets
* significant at 10% level; ** significant at 5% level; *** significant at 1% level