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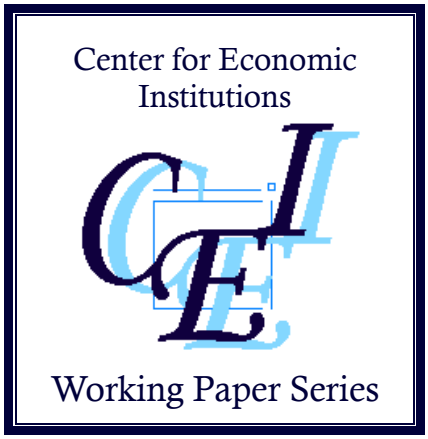

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Inter-Regional Population Re-distribution in Soviet Russia Revisited*

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[Abstract]

Discourses over interregional migration at the time of the Soviet era have shown that the government control on population redistribution was effective at the early Soviet period, but in the late Soviet era the effects of incentive mechanisms including national investment became limited. This certainly can be expectable, but it is also undeniable that such assertion was inconsistent with the phenomenon. Indeed the population influx was continuously seen in Far East or Extreme North regions even at the very end of the Soviet period, suggesting the possibility of effective governmental management on geographical redistribution of population.

This paper confirmed the effectiveness of the governmental control on population migration in the late Soviet era, using newly available data. It was suggested that the analytical unit utilized in previous studies (Economic Regions or cities) may involve problems, so that the effect of various factors could not be accurately grasped. This shows the necessity of further verification of the results that have been obtained during the Soviet era.

Keywords: Russia, Interregional Migration, Soviet Union, Origin-to-Destination Matrix

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1. Introduction

The aim of this study is twofold. First, a survey of studies on the interregional population migration during the Soviet Union era was conducted, focusing migration management systems as well. Second, analysis of the factors affecting migration patterns was attempted by using newly obtained data. Considering the critical importance of regional labor allocation in implementing the centrally planned economy, it was obvious that the idea of optimum production reallocation was emphasized in the former Soviet Union. However, it is undeniable that only a limited number of analysis on migration factors were performed during the Soviet era, even though numerous arguments were made on the normative aspects of planning regional developments. (Lewis, 1969)

In the former Soviet Union under the socialist regime, studies on population migration were mostly conducted based on descriptive statistics and quantitative method was rarely used. One of the main reasons behind this was the fact that even for domestic researchers the access to detailed quantitative data was limited during the Soviet era[1]. Another point was that most of the studies conducted by Soviet researchers were dominated by policy reviews or normative assertion. Some western researchers, however, utilized population census data and they offered quantitative analytical results in some aspects (Rowland, 1982: Mitchneck, 1991). Population migration studies in the Soviet Union were heavily inclined to the normative description to realize so-called optimum population redistribution, rather than to examine the factors determining migration patterns. Various political approaches were taken to implement population distribution patterns in accordance with the governmental aims. On the evaluation of the effectiveness of such measures, however, there are both arguments for and against on the issues.

This paper, using newly obtained closed materials of the Soviet era, re-examines the factors affecting population migration under Soviet regime and shows the points which follow the arguments in previous studies, as well as those which deny the results of researches conducted during the Soviet period. Focus is given to the points whether or not (1) one could see the population redistribution patterns in accordance with the Soviet government development priority and (2) political incentives implemented during the Soviet era worked effectively.

The paper is organized as follows. The next section argues population migration control systems of the Soviet Union, and the discussion on the effectiveness of governmental migration management presented in previous studies is examined. In section 3 the data this study obtained and the approaches taken will be explained, followed by the analytical results and their interpretation. The final section concludes and the tasks ahead will be noted.

Interregional population migration has been clearly one of the main issues in the fields of regional science and geographic research, and enormous analyses have been made on developing

[1] Russian Government Archive of Economics RGAE website, < http://rgae.ru/arkhiv-rgaeistoriya-arkhiva.shtml> (“The history of RGAE”), accessed on June 18, 2018.

countries or western countries (Greenwood, 2010). On the contrary, it must be said that only a very limited number of researches were made in the Soviet Union. As Lewis (1969) indicated, this fact was surprising, given that the Soviet Union had emphasized the importance of optimal regional resource allocation in order to implement the planned economy.

The limited access to the data has resulted in the limited number of previous studies. The majority of studies on population migration during the Soviet era were occupied by normative ones which discussed about optimal labor distribution among regions. Researches on causes and effects using statistical methods were limited and most of them were conducted by researchers in Western countries based on population census data. Main issues examined in such researches were, for example, effectiveness of implemented population re-allocation policy and the evaluation of the effectiveness of development priority policies led by the central government.

The points which were discussed during the Soviet period through limited information can be verified by newly obtainable data in some cases. Such verification has been, however, rarely conducted on the issue of interregional migration in Russia: hence, this paper tries to fill the gap in the field. Before that, a short review of migration control system in the Soviet Union and the discussion made by previous studies follows.

2. Population redistribution in the Soviet Union

2.1 Population migration management as a system

Migration between different regions in the Soviet Union was managed and recorded using domestic passports and the residence permit (Propiska[2]) system (Matthews, 1993). The domestic passport system was introduced in 1932, approximately 10 years after the establishment of the Soviet Union in 1922[3]. Passports, which were required for domestic movement, were distributed to urban residents. Domestic passports served as domestic personal identification cards, and presented the date of birth, place of birth, familial relationships (spouse and children), place of residence, work record, military service record, etc. of the holder.

The residence permit (Propiska) system was introduced for the purpose of restricting residence in cities. At the earliest stage, it was introduced mainly in large cities such as Moscow, Leningrad (name at the time), Kiev, and Minsk, but later the residence permit system was expanded to cover almost every city[4].

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[2] Registratsiya po mestu postoyannogo prozhivaniya.

[3] "Establishment of unified passports for the Soviet Union and obligation to obtain a residence permit," decision dated December 27, 1932 by the Central Executive Committee and the Council of People's Commissars of the Soviet Union. (Postanovlenie VtsIK i SNK ot 27.12.1932, «Ob ustanovlenie edinoi pasportnoi systemy po Soyuzu SSR i obyazatelnoi propiske pasportov»).

[4] Krechetnikov, A., Propiska: neperevodima i neistrebima, *BBC Moscow Website*, December 11, 2013.

People in the Soviet Union needed to carry a domestic passport to move into a city, and they also had to obtain a residence permit in their destination. When moving to a rural village, a residence permit was sometimes not required, and residence registration based on a residence permit was an essential condition for obtaining livelihood benefits such as pension benefits, medical services, and, depending on the situation, rations. The system allowed the government to gauge interregional population migration. However, it should be noted that in the Soviet Union there was no law providing for penalties for failure to complete residence registration. That being said, failure to register resulted in numerous disadvantages in terms of receiving services for residents, pension benefits, medical services, and so on. So it can be said that there was a strong incentive for people to register (Matthews, 1993).

Attention needs to be paid to the fact that it was not until 1974 that rural residents were issued with passports[5], and that until them it was generally not permitted for rural residents to move to cities. And until that time, it is likely that the government was not adequately aware of the extent of "rural area to rural area" migration and "city to rural area" migration[6]. In other words, it seems that data specifying both the origin and destination was limited to that pertaining to migration between different cities. It was therefore difficult to gauge the situation, and this significantly restricted possibilities for research.

In fact, apart from one or two exceptions, no quantitative analysis of interregional population migration within the Soviet Union that was based on records for each year was performed at the time the Soviet Union existed. And even this analysis only dealt with intercity migration or with data that broke down the entire Soviet territory into 19 regions (Mitchneck, 1991). The bulk of the analysis was based on statistics at the level of the republics that comprised the Soviet Union. In other words, the Russian republic, which covered an area more than 45 times that of Japan, was treated as a single region, and it has to be said that this was woefully inadequate as data for analyzing the actual situation. Despite facing such limitations, researchers at the time explored the potential for analysis using data such as lifetime migration data from population censuses or data on net migration data for each region that did not specify origins and destinations. However, such studies were almost completely limited to Western countries. As stated earlier, in the Soviet Union most of the studies comprised normative discourse or constituted policy reviews. In the next subsection the author will provide an overview of previous research on interregional population migration in the Soviet Union that was conducted in the Soviet Union itself and in Western

<https://www.bbc.com/russian/russia/2013/12/130304_russia_registration_ history.shtml>, accessed on June 30, 2018. (in Russian)

[5] "Rules and approvals concerning the passport system in the Soviet Union," Decision No.677, dated August 28, 1974, by the Council of Ministers of the Soviet Union. (Postanovlenie Sovmina SSSR ot 28 avgusta 1974 goda No.677 «Ob utverzhdenii polozheniya o pasportnoi sisteme v SSSR».)

[6] The author examined interregional population migration matrixes (paper documents) from the 1950s to the 1960s at the Russian State Archive of the Economy, and found that there were only documents on migration between cities. There were no statistics at all recording origins and destinations for other forms of migration.

countries.

2.2 Conclusions from previous research

The population redistribution policy that was advocated at the beginning of the Soviet era and was driven by policy objectives had a major impact on the geographical distribution of population, something that has been discussed heavily, most notably by Newth (1972). It left its mark most visibly in Siberia and the Far East, and especially in the "Far North[7]." For example, Perevedentsev (1966) describes how numerous cities were constructed in the Far North immediately after the establishment of the Soviet Union until the end of the Second World War. With regard to this, explanations have been seen stating that the cause was the high wages set by the government in the region during the Soviet era, but these explanations are inadequate. As Hill and Gaddy (2003) have detailed, we in the post-Soviet era are aware that the major underlying factor was city construction by prisoners from the gulags.

The impact of the Second World War on the change in population distribution from before the war until after the war cannot be overlooked. The effect is widely known, and as Newth (1964) and Pod'yachikh (1962) pointed out, during the war, which was partially fought in European Russia, numerous factories and workers relocated to other regions centered on the Urals. Furthermore, the massive loss of population that occurred during the war also left a big mark on the regional distribution of the Soviet population. This can be seen as follows: Figure 1A shows that the sharp decline in the industrial output of the Northwest (including Leningrad (name at the time)) that occurred in conjunction with the start of the war between Germany and the Soviet Union failed to recover even after the war and that the Urals, which had rapidly increased their share of industrial output during the war maintained a much higher share of industrial output than they had had prior to the war, though it did decline. Figure 1B, meanwhile, illustrates that the number of workers in the Urals increased more or less continuously from the middle of the war and that the North was severely affected by the war.

(Figure 1)

Development policy for remote regions in the Soviet Union involved the simultaneous tackling of two tasks: evening out the level of economic development of different regions, and building a core

[7] Regions located above in the Arctic and regions with similarly harsh living conditions. These regions received favorable treatment in the distribution of goods and wage conditions. See "Rules concerning benefits for persons working in the far north of the Russian republic," decision dated January 1, 1932 by the All-Russian Central Executive Committee of the Russian Soviet Federative Socialist Republic Council of People's Commissars. ("Postanovleniye VTSIK SNK RSFSR ot 10 maya 1932 goda «O vvedenii v deystviye s 1 yanvarya 1932 g. Polozheniya o l'gotakh dlya lits, rabotayushchikh v rayonakh Kraynego Severa RSFSR»".)

infrastructure to satisfy the need for national defense resulting from the clash with the United States which was a neighboring country for the Far North (Hill and Gaddy, 2003). As a result, investment in the East was conducted on a large scale relative to the population, and Pokshishevskii et al. (1964) and Ivanova (1973) pointed out that this seemed to be followed by an observable increase in the populations of the Far East and Siberia. In fact, Sagers and Green (1979) described how this led to a decline in the degree of centralization of industrial output when viewed at the level of the republics comprising the Soviet Union. Regarding this situation, Vorob'yev and Kozhukhovskaya (1973) and Rodgers (1974) argued that the government was dominant in determining the direction of interregional population migration in the Soviet Union, and that it occurred in an organized fashion. In addition to the fact that population migration data was difficult to obtain, if population migration patterns were determined based on policy, it can be said to be hardly surprising that little interest developed in analyzing the factors behind interregional population migration.

With the death of Stalin in 1953 and criticism of Stalin being voiced by Khrushchev in 1956, the scale of regional development carried out by gulag laborers declined sharply[8]. Measures that were instituted aggressively to take the place of forced labor included offering high wages in remote regions and allocating a certain proportion of jobs to fresh university graduates. Kuprienko (1972) pointed out that the incentive provided by the relatively high wages contributed to attracting the workforce needed to implement the development policy for remote regions, while Samarodov (1991) demonstrated that the allocation of jobs to university graduates had the same effect. Furthermore, Lukhmanov (1968) and Karavayev (1995) describe how targeted investment in remote regions occurred, and that in conjunction with this population inflows occurred in the regions that were subject to this investment. The same writers also explained that, in contrast, comparatively well-developed regions such as Russia and Ukraine experienced population outflows. Both these writers contend that even without coercion, it was possible to control population flows to some degrees using economic incentives.

However, Khodachek et al. (1974) point out there are limits to the management of interregional population migration. They described the volatility of population inflows and outflows in the Far North, and argued that it was difficult to ensure a stable labor force. Vorob'yev (1977), Nechemias (1980) and Powell et al. (1981) theorized that the following factors also affected population migration in the Soviet Union, and this was evident in the later years of the Soviet Union: people move based on differences in factors such as climate conditions and living standards, cities attract people, and there are other factors, such as the level of transportation infrastructure and the living environment, that typically influence interregional population migration. Ball and Demko (1978) and Rowland (1982) claimed that the fact that the Russian republic, which was relatively

[8] According to official Soviet documents, total gulag labor was predicted to peak at more than 2.5 million people in 1950. The figure remained higher than 1.32 million people in 1954, but had declined by more than a million people compared with 1953. (GARF, F-R9414, Op.1, D.1319, L.1-1ob., 4-4ob., 7-7ob., 10-10ob., 18-18ob., 21-21ob.)

well-developed, experienced a population outflow during the 1960s provided corroboration for it experiencing a continuous population inflow from the 1970s onwards, for Central Asia experiencing a population inflow despite having once been a backward region, and for all Central Asian regions experiencing a population outflow in the second half of the 1970s. However, researchers such as Ball and Demko (1978) and Rowland (1982) treated republics comprising the federation or vast regions called "economic regions[9]" as their units of analysis, so it cannot be denied that there was the problem of difficulty in identifying location characteristics.

Amid these circumstances, Mitchneck (1991) became the first researcher at a Western organization to apply a gravity model to the analysis of interregional population migration in the Soviet Union. She investigated migration "between economic regions" in the Soviet Union in the late 1960s (1968–1969) using population census data and "intercity" population migration, which occurred between Soviet republican capitals and other major cities, in 1985 using data (Vestnik statistiki) from the Central Statistical Administration of the Soviet Union, and attempted to identify the factors behind it. What Mitchneck (1991) showed was that regional population size, which is typically used with gravity models, obtained a stable and powerfully significant coefficient. There is nothing unusual about this, but in 1968–1969, on the other hand, state investment had a greater effect on population migration than the distance variable, while in 1985 state investment had hardly any impact at all. These findings are worthy of attention. They mean that management of interregional population migration by the state remained effective at the end of the 1960s, but no longer had any impact at the tail end of the Soviet Union in the 1980s. The conclusion was also reached that even in 1968–1969 state investment had no influence in Siberia and the Far East, which seems counterintuitive. This is because, on the contrary, the impact of state-led development would be expected to be especially strong in remote regions like these.

In addition, Cole and Filatotchev (1992) employed population census data to point out that the distance variable, which would normally play a decisive role, had limited influence, which is in tune with the findings of Mitchneck (1991) and may indicate that the Soviet Union was an unusual case. Furthermore, Cole (1990) and Romanenkova (1991) used data from the Soviet Union's final population census to examine the progress of urbanization in the Soviet Union, and claimed that the effectiveness of regulations concerning the inflow of population into large cities was limited. On the other hand, as was pointed out by Sallnow (1989) and Rowland (1989), attention needs to be paid to the possibility that the fact that there were population inflows into Siberia and the Far East until the end of the 1980s could be evidence that the management of population migration conducted in the Soviet Union was successful.

[9] "Economic regions" was a regional classification established for the purpose of economic planning and management in the Soviet Union. The Russian republic, which covered an area more than 45 times that of Japan's, contained 11 economic regions. In addition, the Ukrainian republic, which had a population of over 50 million and a land area 1.6 times that of Japan's at the end of the Soviet era constituted a single economic region.

Regarding the effectiveness of population migration management by the government and the impact of policy incentives, which we have looked at above through the examination of previous research on interregional population migration in the Soviet era, we find that it is claimed that while such factors played an extremely decisive role initially, toward the end of the Soviet era limitations to their effectiveness began to be observed. At the same time, because population inflows into regions with harsh living conditions, such as the Far East and the Far North, continued until the demise of the Soviet Union, it has been pointed out that population migration management maintained a great deal of influence even at the tail end of the Soviet era, so there have been mutually conflicting interpretations. Under the conditions at the time, when data was heavily restricted, it is likely to have been practically impossible to conduct any further investigations.

It also cannot be denied that even after the collapse of the Soviet Union complete statistics could still not be obtained. In the next section, however, the author will employ newly obtained, usable data to attempt to identify the specific characteristics of interregional population migration in the Soviet era. The author's attention will focus in particular on ascertaining whether, based on the insights gained from the previous research discussed in this section, regional socioeconomic circumstances did, after all, affect interregional population migration in the Soviet Union in a manner that would be intuitively expected, investigating whether the role of the distance variable was stable, and verifying the influence that state investment in the form of development incentives provided by the central government had on population redistribution.

3. Analysis

3.1 Method

Based on the previous research on interregional population migration in the Soviet Union that we looked at in section 2, as well as insights gained from population migration analysis that has been performed in numerous countries (Greenwood, 2010), the author will identify the variables that should be employed. As predicted by the gravity model for population migration, the population of a region will obviously have a positive effect on the scale of population migration. Furthermore, the distance between regions should, intuitively speaking, have a negative impact on population migration between them, yet the analysis by Mitchneck (1991) did not yield stable results for the distance variable, so this will need to be verified. In addition, as mentioned earlier, Vorob'yev (1977) and Nechemias et al. (1980) point out that the accumulation of descriptive statistics has revealed that factors such as climate conditions as well as the economic environment, wage level, and degree of infrastructure development in a region also have an effect, and it will need to be confirmed whether this also holds for the analysis of population migration in the Soviet era. And then, the task here will be investigate whether the degree of concentration of investment in each region affected population

flows between regions. In this paper, the author will perform his analysis using an extended gravity model of the like widely used in previous research involving the analysis of population migration (Greenwood, 2010; Guriev and Vakulenko, 2015).

$$M_{ij}=g*\frac{P_i^{\alpha}*P_j^{\beta}}{D_{ij}^{\delta}}*\left(\frac{Y_j}{Y_i}\right)^{\gamma}$$

Here M_{ij} denotes the scale of population migration (number of people) from region i to region j, P_i denotes the population of region i, P_j denotes the population of region j, and D_{ij} denotes the distance between region i and region j. In addition, Y_i denote characteristic of the origin region I, while Y_j denote an characteristics of the destination region j.

3.2 Data

Economic statistics for the Soviet Union are extremely limited. Even so, usable statistics need to be extracted, and the author will rely on official statistics from the Central Statistical Administration of the Soviet Union for all of them. These are the same statistics that were used in the previous research discussed above. However, regarding interregional population migration data for the Russian republic at the time, the author will use origin-to-destination tables, which are internal materials from the Russian Federal State Statistics Service (Rosstat) and only became available for use after the collapse of the Soviet Union. For the former, regional economic statistics, the author will use statistics that can be accessed by anybody, while for the former, the author will use data that he obtained from his own sources. The author will convert data on interregional population migration in the Russian republic to match the 83 regional divisions that existed as of 2016, and employ population migration matrixes that specify the origin and destination of migration.

If talking about the smallest regional units from among the population migration matrixes published in the Soviet era, and one would find that they were either the “economic regions” which were discussed earlier or “cities.” The author has already pointed out that the difficulty imposed by the fact that “economic regions” were determined by dividing the vast Russian republic into just 11 regions. Furthermore, the Soviet Union, which covered an area 60 times that of Japan’s, was split into only 19 regions, which included, for example, the “Central Asian economic region,” which contained all the Central Asian republics with the exception of what is now Kazakhstan. This was in no way adequate for analysis. In addition, the data did not even provide information on population migration, which would normally be subject of analysis. For example, it sometimes only recorded

lifetime migration[10]. Regarding migration between "cities," on the other hand, only records for migration between 53 regions in 1985 have been published, so the author was unable to surmount the data limitations when conducting his analysis[11].

The data employed in this paper is a matrix of population migration during the final three years of the Soviet Union (1989–1991), a period for which data could be obtained. It is a matrix of 83×83 regions in the Russian republic (6,889 elements). However, the Chukot Autonomous Okrug, and the Jewish Autonomous Oblast were not independent administrative subjects at the time, so data for them is completely absent. There is also no data for the republics of Chechnya and Ingushetia, which were affected by social turmoil. Furthermore, a number of regions that are deemed to be "republics" as of 2019 are treated as part of another oblast[12]. This means that the number of observations for each year is less than 6,889. However, no more detailed statistics on population migration in the Russian republic exist. The matrixes for 1990 and 1991 have been used by Oshchepkov (2007) and Kumo (2017), but the goal of Oshchepkov (2007) was not to identify characteristics of population migration in Soviet Russia, and it is completely impossible to gauge differences between the situations prior to and after the collapse of the Soviet Union. Kumo (2017) used the same unified explanatory variables for both the Soviet Union and modern Russia, but variables for factors such as the unemployment rate and income can only be obtained for modern Russia, so it is fundamentally impossible to investigate the huge systematic and statistical changes that occurred between the two periods. Here, therefore, the primary aim will be to shed light on the characteristics of phenomena in the Soviet Union by performing an analysis that is focused on these phenomena, and to then compare these characteristics with the results of previous research. Furthermore, 1989 population migration matrix data will, as far as the author can judge, be used for the first time, as it does not seem to have been used either in the West or in Russia itself.

What the author will do here is investigate what the determinants of interregional population in the Soviet Union were. Naturally, regional population size will be included in the analysis. The author will also examine the effect of distance between regions, a factor that is always

[10] The population censuses for 1926 and 1989 basically only recorded place of birth and current residence. Normally, population migration analysis covers movement between the previous residence and the current residence, and this other sort of migration, namely when the "place of birth" and the "current residence" differ, is called "lifetime migration." Lifetime migration cannot be explained in terms of short-term factors, so is unsuitable as a target for the type of analysis performed in this paper. Note also that the 1979 population census did not include any questions about interregional migration. See Demograficheskaya entsiklopediya, Tkachenko, A.A. ed., Izdatel'stvo Entsiklopediya: Moscow, 2013.

[11] This was used by Mitchneck (1991).

[12] At the time, the Nenets Autonomous Okrug was part of the Arkhangelsk Oblast, while the Republic of Karachay-Cherkessia was an autonomous oblast and included in the Stavropol Krai. Furthermore, the Republic of Adygea was an autonomous oblast in the Krasnodar Krai, and the Khanty-Mansi Autonomous Okrug and Yamalo-Nenets Autonomous Okrug were part of the Tyumen Oblast. The Republic of Altai was the Mountainous Altai Oblast, which was part of the Altai region, and the Republic of Khakassia was an autonomous oblast in the Krasnoyarsk Krai. All these autonomous okrugs and republics, which are now independent administrative zones (federal subjects) are treated as though they are part of the each oblast and region, and even this data could not allow records of interregional population migration to be obtained.

used with gravity models. The focus here will be on whether the distance effect is sufficiently stable. Mitchneck (1991) and Cole and Filatotchev (1992) pointed out that in most cases the distance variable is not significant, and that the distance variable is unrelated to the scale of population migration. The author will therefore investigate whether these claims are indeed justified. In addition, to explore the effectiveness of regional population redistribution policy in the Soviet era, the author will investigate whether it is possible to clarify the effect of state investment. And of course, the analysis will also employ variables used in previous research, such as regional socioeconomic conditions and the natural environment. It must also be borne in mind that for the Soviet era, data on incomes, inflation, unemployment, etc. either does not exist or no such statistics have been disclosed.

It was mentioned in the previous section that the Soviet Union government suppressed urbanization, so the author will include urbanization in the variables as a means of confirming the consequences of this. Furthermore, given that age structure also affects population migration rates, the analysis will employ the proportion of people who have not yet reached working age. As an approximation variable for income level, average expenditure on charged services per capita will be used[13], and as measures of the level of infrastructure, the author will use the total length of paved roads per unit of land area and the number of buses per resident. Similarly, the number of doctors per resident as an indicator of social infrastructure will be employed.

Consideration needs to be given to factors that were unique to the Soviet Union. Taking the impact of extreme climate conditions into account, the analysis will employ a dummy variable for administrative zones that were regarded as being in the Far North throughout the Soviet era. To serve a similar purpose, the average January temperature will be also used. The author will investigate whether population was allocated to the Far North, which contained numerous regions targeted for development, and if was whether this had any effect. Furthermore, as is the case with modern Russia, the Soviet Union was known as a produce of oil and gas, so to examine whether there are any differences between the Soviet Union and modern Russia in terms of population flows to resource-producing regions, a dummy variable to the top five regions for crude oil and natural gas output will be applied.

Finally, the amount of state investment per capita, which is actually the most important variable, will be introduced into the analysis. Nothing beats it as an indicator of the central government's commitment to regional development. Ball and Demko (1978), Rowland (1982), Cole (1990) and Romanenkova (1991) pointed out the limitations of management of population migration by the government, though Mitchneck (1991) actually argued that state investment was not significant. However, this is at odds with the phenomenon of a large-scale reversal of population

[13] "Expenditure on charged services" was an expenditure category that appeared frequently during the Soviet era. It refers to expenditure on transport, communication, education, travel, healthcare, cultural activities (museums, theatres, etc.).

migration flows, described by Kumo (2017), that occurred at around the time of the collapse of the Soviet Union, when net population migration toward the Far East and Siberia was replaced by a flow toward European Russia, so it will need to be investigated using newly available data. By doing this, the author wishes to examine whether the interregional population redistribution carried out by the government during the Soviet era was effective.

However, it must be mentioned that the figures for state investment are subject to major limitations. Figures relating to the years to which this study relates can only be obtained for 1990 and 1991 onwards. Furthermore, in 1992 the Soviet Union had already collapsed, so it would not be appropriate to use the figure for that year as a reference. In this paper, therefore, the author will extrapolate figures for 1988 and 1989 from the figures for 1990 and 1991. Needless to say, this is a secondary approach, but looking at the correlation with per-capita state investment by region in 1980 and 1985, figures for which were obtained separately, reveals a correlation of at least 0.9 between the figures for 1990 and 1991 and those for both 1980 and 1985 (See Appendix Table 1). This means that the regional allocation of state investment until the end of the Soviet era can be regarded as having been stable, so given that data does not exist, the approach employed in this paper is probably acceptable.

Another major problem is that the period that this study covers, namely 1989–1991, was right before the collapse of the Soviet Union, and it was also a time in which the macroeconomic conditions were unstable and the economic system was undergoing immense changes. The utmost care therefore needs to be taken when studying the final years the Soviet Union as opposed to a stable period like the 1960s and 1970s. And because it is naturally possible that changes in socioeconomic conditions resulted in real-time changes in interregional population migration patterns, the author will also try introducing year dummies, and keep the characteristics of the period in mind as one interprets the results.

For the analysis, regarding quantitative variables, the analysis will compute the ratios between figures for origins and destinations, and then perform a logarithmic transformation of them. The author will also take logarithms of the size of population migration (numbers), the distance between regions, and the populations of the origins and destinations. Therefore, regional pairs between which no population migration occurred will not be included in the sample. In addition, intraregional migration, where the distance is zero, will also be excluded from the analysis. Regarding dummy variables, those for both origins and destinations will be used as is. Following Andrienko and Guriev (2004) and Vakulenko et al. (2011), the analysis assigned a one-year lag to all the explanatory variables to avoid the problem of endogeneity. Definitions of, sources of, and descriptive statistics for all the variables are shown in Table 1[14].

[14] The types and number of explanatory variables used probably appear somewhat limited. However, this is due to the limitations imposed on research on the Soviet economy. In fact, very few economic statistics were published during the Soviet era, which has proved a hindrance to analysis. For example, Mitchneck (1991) asserted that the only

(Table 1)

4. Results

The results of the analysis are shown in Table 2. In Table 2-I, the analysis has used all observations, while in Tables 2-II to 2-V the analysis has extracted regional pairs between which migration on a large scale occurred, accounting for 90% to 60% of the total flow, extracting regions in the order of the scale of migration, and analyzing each data set. As was the case with Kumo (2017), this is significant for the following reason: This paper relies on macro variables to examine interregional population migration factors, but in the case of interregional migration on an extremely small scale, it would be appropriate to attribute this, depending on such factors, to the inability to identify this migration. For this reason, it is appropriate to extract and analyze the main migration patterns from all the migration data, though an issue is how to define "main patterns." When extracting such main population flows in fields such as geography, it can be said to be typical to use such categories as "50% of all migration" or "migration on a scale of at least 0.5% of all migration" (Ishikawa, 2001). However, such approaches do not allow criticism that they are arbitrary to be avoided. The author will therefore combine a number of subsets, analyze each one, and endeavor to extract more robustly significant variables. By doing that, the analysis will focus on whether it will be possible to obtain stable results even from small subsets. Regarding the method of analysis, there are elements that do not change diachronically, such as the distance between two regions, Far North region dummies, and oil/gas-producing region dummies, and because elements such as distance and Far North region dummies are vitally important for the analysis in this paper, the paper will focus on results from random effect models and pooled ordinary least squares.

It can be confirmed that the distance variable yields strongly and significantly negative coefficients. This is intuitively obvious, but Mitchneck (1991) and Cole and Filatotchev (1992) claimed that in the Soviet Union distance did not have a conspicuous impact, but the author wishes to emphasize that these sort of results were obtained here. It can be said that even in the Soviet Union, increasing distance served to reduce the scale of population migration, and this was an extremely commonly observed phenomenon. However, previous research such as Mitchneck (1991) have performed analyses based on "economic regions," which are far larger than states (called "federal subjects" after the collapse of the Soviet Union), so the reason may be that it was impossible to accurately grasp the effect of distance[15]. The fact that origin and destination population had a

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explanatory variables were population size, distance, state investment, and service expenditures. The analysis in this paper is exposed to the same limitations, and so it will only be possible to draw tentative conclusions.

[15] Here, whenever possible, it would be desirable to recompile the data in formats employed in Mitchneck (1991) and other previous research, such as "inter-economic-region migration," "inter-republic migration," or "intercity

significant impact on the scale of interregional migration can be said to have been an obvious finding.

The proportion of the population who live in cities was generally significant, and the fact that it was negative even when it was significant is a result that is unique to the Soviet Union, which deliberately attempted to limit the growth of the urban population. Cole (1990) and Romanenkova (1991) pointed out that the rise in the urban population as a proportion of the total population is indicative of the limited effect of efforts to manage population migration in the Soviet Union, but the government did intend for the number of residents to increase to a certain extent, and it may just be that it had a powerful suppressive effect. Average expenditure on charged services per capita, which was used as substitute variable for income, and the number of doctors per resident, which was used as an indicator of social infrastructure development, sometimes yielded positive and significant coefficients, but it cannot be said that stable results were observed. At present, it is impossible to obtain statistics for income itself, so there are limitations with respect to the substitute variable used, expenditure on services (not total expenditure), but in the Soviet Union, where an urban residence permit would only be issued after the person concerned had secured a stable place of employment (Matthews, 1993; Bayburin, 2017), if interregional migration did not occur based on the individual's wishes, there is nothing odd about obtaining these sorts of results. Regarding the density of paved roads and the number of buses per resident, which serve as indicators of the level of economic infrastructure, the latter was insignificant, but the former was stably positive and significant. This may not be indicative of personal preferences, but instead could be interpreted as evidence of the government's commitment to development. After all, it cannot be said that personal car ownership was typical in the Soviet Union at the time[16], so if paved roads are assumed to have been used basically for industrial purposes, such an interpretation can be said to be much more reasonable.

The Far North dummy tended to be positive and significant for both origins and destinations, but it is clear that when the destination was in the Far North, it was more stably significant, and the absolute value of the coefficient was always higher for the destination. This means that in the Far North, outflows and inflows were both heavy, but inflows were greater than outflows. It could be said that this was underpinned by the frontier development policy of the Soviet Union at the time. A significant coefficient was not obtained for average January temperature, but it

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migration," and then, by performing additional testing of the previous research, show how the impact of the distance variable changes in comparison. However, none of the "economic regions" in previous research are limited to Russia. They cover the entire Soviet Union, which had a land area that was 1.5 times and a total population that was almost twice that of Russia's, so they are not suitable for additional testing. When desirable results were obtained in accordance with the authors' claims, it can be said that the claims were reasonable, but on the other hand, when only unexpected results could be obtained, it is possible to cite the difference in the coverage of the analysis as a reason. The author therefore decided to wait until there is an opportunity to obtain relevant data for the Soviet Union as a whole, so for this paper the author abandoned this investigation.

[16] In 1985, more than 60% of Japanese households owned a car, and there were 223 cars for every 1,000 people. In the same year in the Russian Republic (as it was in the Soviet era), however, there were fewer than 45 cars for every 1,000 people. This is lower than the number of cars per 1,000 people in Japan in 1969. (See Goskomstat Rossii, *Pokazateli sotsial'nogo razvitiya Rossiyskoy federatsii i ee regionov*, 1993, p.367.)

is likely that the policy status given to Far North regions was more important than the physical factor of temperatures. On the other hand, the dummy for oil/gas producing regions showed that the inflow toward such regions was actually smaller. In modern Russia, the economy of which is mainly reliant on resource exports, the exact opposite results were obtained (Kumo, 2017). Furthermore, while the Soviet Union was the world's largest oil-producing nation at the time[17], this was probably not of standout importance domestically. What needs to be stressed is that compared with the early 21st century, during which oil prices have basically remained at high levels, at the end of the 1980s there was a time when the price of crude oil plummeted, and during this period the Soviet Union slashed the quantity of crude oil being produced. It can therefore be surmised that this resulted in a population outflow from oil/gas-producing regions.

Regarding per-capita state investment, the results were extremely stable. In other words, with all estimates, significantly positive coefficients were obtained. State investment in the Russian Federation following the collapse of the Soviet Union can be assumed to have played a compensatory role toward underdeveloped regions (Kumo, 2017), whereas during the Soviet era, it can be regarded has having spurred development (Mitchneck, 1991; Kumo, 2003). To avoid identifying it as an inverse flow, whereby investments are made in regions that are attracting more people, the analysis has assigned a one-year lag to the explanatory variables, as it was explained earlier, and here it will be shown that people flowed into areas that were targeted for state investment in the Soviet era. This means that it can probably also be assumed that during the Soviet era state investment functioned as an effective policy for attracting development. This state investment was referred to in the Russian language using a term meaning "basic investment" (*osnovnoy capital*) and caution needs to be exercised with regard to the fact that only investment that contributed to physical output was recorded under this heading (Goskomstat Rossii, 1996). Social investment, such as investment in welfare, commerce, education, etc. was not included, so it can be concluded that the orientation was toward regional development.

Mitchneck (1991) contended that state investment ceased to have an effect on population migration at the end of the 1980s, and the results she obtained from her analysis were actually insignificant in the case of every state investment specification. This may have been because there were problems with the analytical units of the data she used for this period. In fact, as it was mentioned earlier, the analysis of population migration at the end of the 1980s that was performed by Mitchneck (1991) only examined migration between cities. If cities had not been targets for development, it would have unsuitable to make state investment an explanatory variable. In fact, if the government's management of population migration had not been effective, it would be impossible to explain the fact that population flows, which had been toward the Far East and Siberia,

[17] *BP Statistical Review of World Energy 2015*, http://www.bp.com/genericsection.do?categoryId=92&contentId=7005893,http://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html, accessed on July 1, 2018)

were reversed toward European Russia following the Soviet collapse (Kumo, 2017).

Such results contrast with the general view that the Soviet planned economy had become dysfunctional (Ellman and Kontrovich, 1998). However, at least with regard to interregional population migration and the management of population distribution, results that are similar to the view obtained from this analysis can be seen in Kumo (2017). This is shown clearly in the population-census-based origin-to-destination table presented in the Appendix Table 2. In 1989, during the Soviet era, 1.2 million people who were living in the Siberian and Far East federal districts had been born in what is now, as of 2018, the Central Federal District. On the contrary, just over 760,000 people who were living in the Central Federal District had been born the Siberian or Far East federal districts. In 2002, however, over a decade after the collapse of the Soviet Union, the number of people who were living in the Siberian and Far East federal districts and had been born in the Central Federal District had shrunk to just over 600,000, while the number living in the Central Federal District who had been born in the Siberian or Far East federal districts had increased to over one million. In other words, people born in Siberia and the Far East had begun flowing into European Russia, and it can be surmised that the bulk of people who had been born in central Russia and had moved to Siberia or the Far East had returned to central Russia[18].

In contrast, under the aforementioned domestic passport system and the residence permit system, population was allocated to relatively undeveloped regions such as Siberia and the Far East, and the results show that this situation had still been maintained toward the end of the Soviet era. It is a fact that at the end of the Soviet era, economic circumstances began changing dramatically. However, all the year dummies employed to investigate these changes on a year-by-year basis were not significant[19]. To shed further light on this, the author performed estimates using least squares regression for each of the years, and as Table 3 shows, it is fair to say that the results were qualitatively identical. This finding, namely that extremely stable positive and significant coefficients were obtained for state investment presents a clear contrast with the analysis for the period after 1992 described in Kumo (2017). Furthermore, the analysis in Kumo (2017) shows that negative coefficients are obtained for interregional population migration in the case of state investment from 1992 onwards. This series of findings suggests that the collapse of the Soviet Union constituted a major turning point for patterns of interregional population migration.

However, conclusions like this, which point to the effectiveness of population migration management toward the end of the Soviet era, may appear odd in light of the social turmoil that was occurring at the time. That being said, this could be understood as follows: Day-to-day economic activity is dependent on short-term decision making, but the fundamental norms are not shaken. It is just a strategy for surviving each day, and various forms of subtle unlawful conduct, of a degree that

[18] This trend continued after that, with the 2010 population census revealing that flows toward the Central Federal District had become even more pronounced in relative terms (Kumo, 2017).
[19] The results are omitted here.

would not be subject to criminal punishment, can be expected to occur. However, interregional migration that covers distances of several hundred or several thousand kilometers is more the result of the underlying system, change at this degree does not occur without the change in the official power structure, and change cannot be expected to happen overnight. In fact, during the 1990s, when post-Soviet-collapse Russia was experiencing a transition to a new economic system, one can be said to have observed a system that behaved according to the law of inertia (World Bank, 2005). If that is the case, the results obtained in this paper, namely the view that the management of interregional population migration was also effective toward the end of the Soviet era, can probably be accepted.

As it was mentioned earlier, Ball and Demko (1978) and Rowland (1982) asserted that the fact that at the end of 1960s the Russian Republic switched from being a population-outflow region to a population-inflow region showed that there were limits to the effectiveness of population migration management, but here again the fact that the analytical units were "federal republics" could be a problem. At the beginning of the 1960s, high priority was placed on the development of central Asia, but it can be assumed that from the end of the 1960s onwards priority was given to the Far North and Far East regions, the entire territories of which were located within the Russian Republic (Perevedentsev, 1966). So as the analysis in this paper has shown, the final days of the Soviet era should probably be regarded as a period in which management of interregional population redistribution remained effective to a certain extent.

5. Conclusions

Discourse concerning interregional population migration during the Soviet era has contended that management by the government was effective initially, as it was also easy, for example, to redistribute people over long distances, but that in the latter part of the era, the effectiveness of attracting people through state investment became limited. While this could certainly be accepted as something that could have happened, it also cannot be denied that it is at odds with what actually happened. While it has alluded to the possibility that distance had little effect, given that population flows from regions that are extremely far away from European Russia, such as the Far North and the Far East, were seen on a continuous basis, the fact that this continued until the end of the Soviet Union also demonstrated that the potential for management of population migration by the government had not been exhausted.

The analysis conducted in this paper showed that the impact of the Far East dummy and the impact of state investment were both strongly significant even at the tail end of the Soviet era. The fact that the distance variable was negatively significant but inflows to Far North regions continued until the end of the Soviet Union may mean, for example, that inflows not from European Russia, but from regions that were relatively closer, occurred. On the other hand, results supporting

the effectiveness of state investment could indicate that there were problems with the samples used in previous research. Intercity migration, which has been analyzed in previous research, was subject to administrative control, so it was probably not an appropriate sample for judging the influence of state investment. However, the investigations at the time had to be performed under conditions in which no other data existed, and given the background to that period, it can be said that there was no other alternative. In that sense, the efforts the predecessors made amid these constraints are worthy of praise, and the author not criticizing such previous research. Even so, it can be said that with regard to analysis of the Soviet era, there still remains scope to perform investigations using more detailed data.

Issues like these also apply to the analysis conducted in this paper. In fact, it is undeniable that most of the explanatory variables used are substitute variables or estimates. Aside from variables for which it can be judged that no major problems will occur as a result of using estimates, such as the density of paved roads and the number of physicians per resident, for which sudden changes cannot occur, the constraint of being unable to use variables for income and wages is extremely severe. Another major problem is that variables for state investment, which was an important issue in this paper, were extrapolated from the figures for 1990 and 1991. This was because it was not until 1990 that figures for state investment in each region began to be published, but given that there are figures for interregional population migration, it is quite possible that information on state investment exists internally at Rosstat, and the archives there will need to continue to be pored over in the future. The author has described how research on interregional population migration during the Soviet era has progressed slowly due to the limited data, but the same also applies to the situation after the Soviet collapse, so numerous challenges exist.

References

Andrienko, Yu and S. Guriev (2004), Determinants of Interregional Mobility in Russia: Evidence from Panel Data, *Economics of Transition*, 12(1), pp.1-27.

Aslund, A. (1989), *Gorbachev's Struggle for Economic Reform*, Cornell University Press.

Bayburin, A. (2017), *Sovetskiy passport: Istoriya, struktura, praktiki*, Evropeyskiy universitet v Sankt-Peterburge, Saint-Petersburg. (in Russian)

Ball, B. and G.J. Demko (1978), Internal Migration in the Soviet Union, *Economic Geography*, 54(2), pp.95-114.

Cole, J.P. (1990), Changes in the Population of Larger Cities of the USSR, *Soviet Geography*, 31(3), pp.160-172.

Cole, J.P. and I.V. Filatotchev (1992), Some Observations on Migration within and from the Former USSR in the 1990s, *Post-Soviet Geography*, 33(7), pp.432-453.

Ellman, M. and V. Kontrovich (1998), *The Destruction of the Soviet Economic System: An Insider's History*, Routledge, Oxford.

Goskomstat Rossii (1996), Metodologicheskie polozheniya po statistike, Logos: Moscow. (in Russian)

Greenwood, M.J. (2010), Some Potential New Directions in Empirical Migration Research, *Italian Journal of Regional Science*, 9(1), pp. 5-17.

Guriev, S. and E. Vakulenko (2015), Breaking out of Poverty Traps: Internal Migration and Interregional Convergence in Russia, *Journal of Comparative Economics*, 43(3), pp.633-649.

Hill, F. and C. Gaddy (2003), *The Siberian Curse: How Communist Planners Left Russia Out in the Cold*, Brookings Institution Press: Washington D.C.

Ishikawa, Y. (2001), *Studies on Migration Transition*, University of Kyoto Press.

Ivanova, R. (1973), O razvitii vostochnykh rayonov i obespechenii ikh rabochey siloy, *Voprosy Ekonomiki*, No.1, pp.40-48. (in Russian)

Karavayev, V. (1995), Regional'naya investitsionnaya politika: rossiyskiye problemy i mezhdunarodnyy opyt, *Voprosy ekonomiki*, No.3, pp.135-143. (in Russian)

Khodachek, V.M. (1974), On the Formation of Population in Regions of the Far North of USSR, *Soviet Geography*, 15(5), pp.288-298.

Kumo, K. (2003), *Migration and Regional Development in the Soviet Union and Russia: A Geographical Approach*, Beck Publisher Russia: Moscow.

Kumo, K. (2017), Interregional Migration: Analysis of Origin-to-Destination Matrix, in T.Karabchuk, K.Kumo, E.Selezneva, *Demography of Russia: From the Past to the Present*, Palgrave Macmillan: London, pp.261-314.

Kuprienko, L. (1972), Vliyaniye urovnya zhizni na dvizheniye trudovykh resursov, *Voprosy ekonomiki*, No.3, pp.22-31. (in Russian)

Lewis, R.A. (1969), The Postwar Study of Internal Migration in the USSR, *Soviet Geography*, 10(4), pp.157-166.

Lukhmanov, D.N. (1968), Changes in the Distribution of Rural Settlement in Northern Kazakhstan from 1959 to 1963, *Soviet Geography*, 9(8), pp.699-710.

Matthews, M. (1993), *The Passport Society: Controlling Movement in Russia and the USSR*, Westview Press: Boulder, Colorado.

Mitchneck, B.A. (1991), Geographical and Economic Determinants of Interregional Migration in the USSR, 1968-1985, *Soviet Geography*, 32(3), pp.168-189.

Nechemias, C. (1980), Regional Differentiation of Living Standards in the RSFSR, *Soviet Studies*, No.3, pp.366-378.

Newth, J. (1964), The Soviet Population: War Time Losses and the Postwar Recovery, *Soviet Studies*, 15(3), pp.345-351.

Newth, J. (1972), The 1970 Soviet Census, *Soviet Studies*, 23(2), pp.201-222.

Oshchepkov, A.Yu (2007), Mezhregionalnaya migratsiya v Rossii, Higher School of Economics: Moscow, mimeo. (in Russian)

Perevedentsev, V. (1966), *Migratsiya naseleniya i trudovyye problemy Sibiri*, Nauka: Nobosibirsk. (in Russian)

Pod'yachikh, P (1962), *Naselenie SSSR*, Politicheskaya literatura: Moscow (in Russian)

Pokshishevskii, V.V., V.V. Vorob'yev, Ye.N. Gladysheva and V.I. Perevedentsev (1964), On Basic Migration Patterns, *Soviet Geography*, 5(10), pp.3-18.

Pokshishevskii, V.V. (1973), Geografiya Sovetskogo Soyuza: priroda, naselenie, khozyaystvo, Progress: Moscow. (in Russian)

Powell, D.E. (1981), The Rural Exodus, in *The Soviet Economy-Continuity and Change*, ed. Bornstein, M., Westview Press: Boulder, Colorado, pp.149-163.

Rodgers, A. (1974), The Location Dynamics of Soviet Industry, *Annals of the Association of American Geographers*, 64(2), pp.226-240.

Romanenkova, G. (1991), Rural -Urban Labor Migration in the USSR: Its Role in Redistributing Population and Labor Resources, *The New Soviet Labor Market*, ed. Standing, G., International Labor Office: Geneva, pp.165-175.

Rowland, R.H. (1982), Regional Migration and Ethnic Russian Population Change in the USSR (1959-79), *Soviet Geography*, 23(8), pp.557-583.

Rowland, R.H. (1989), National and Regional Population Trends in the USSR, 1979-89: Preliminary Results from the 1989 Census, *Soviet Geography*, 30(9), pp.635-669.

Sallnow, J. (1989), The Soviet Far East: A Report on Urban and Rural Settlement and Population Change, 1969-1989, *Soviet Geography*, 30(9), pp.670-683.

Sagers, M. and M.B. Green (1979), Industrial Dispersion in the Soviet Union: An Application of Entropy Measures, *Soviet Geography*, 20(10),pp.567-586.

Samorodov, A. (1991) Labor Market Problems and Developments in the Republics, in *The New Soviet Labor Market*, ed. Standing, G., International Labor Office: Geneva, pp.145-163.

Vakulenko E. S., N.V. Mkrtchyan and K.K. Furmanov (2011), Econometric Analysis of Internal Migration in Russia, *Montenegrin Journal of Economics*, 7(2), pp.21-33.

Vorob'yev, V.V. and N.F. Kozhukhovskaya (1973), Population Movements in the South of Krasnoyarsky Kray, *Soviet Geography*, 14(9), pp.551-563.

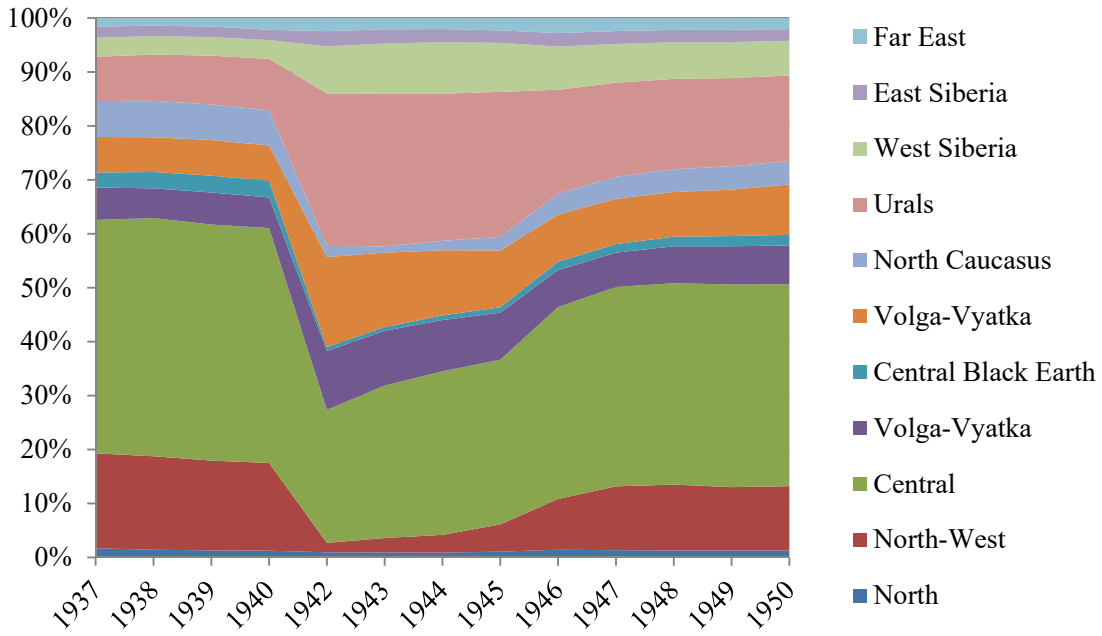
Vorob'yev, V,V. (1977), *Naseleniye vostochnoy Sibiri*, Nauka: Nobosibirsk. (in Russian)

World Bank (2005), *From Transition to Development: A Country Economic Memorandum for the Russian Federation*, World Bank.

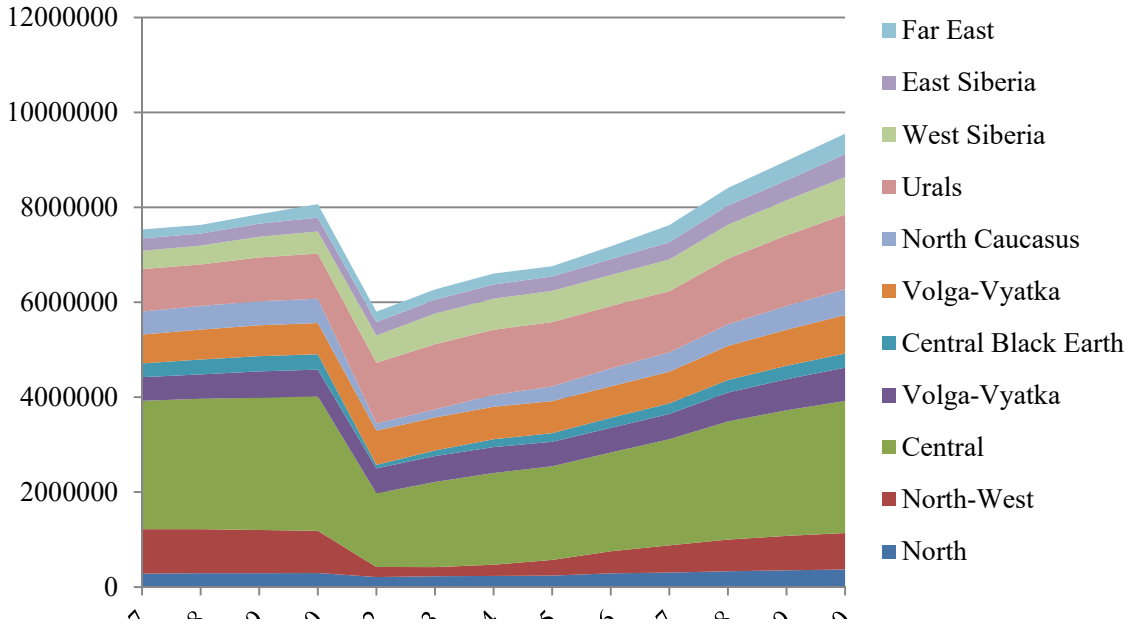
Figure 1

A. Percentage Share of Gross Regional Industrial Products

before and after the World War II by Region in Russia. (%)



B. The Number of Workers before and after the World War II by Region in Russia. (person)



Sources (for both A and B):

1937-1948: RGAE (rossiiskii gosudarstvennii arkhiv ekonomiki), Fond 1562, Opisi 329, Ed.Khr. 2903; 1949-1950: RGAE, Fond 1562, Opisi 329, Ed.Khr. 4145.

Table 1.

Variables Introduced, their Sources and Descriptive Statistics.

Variable	The Number of Observations	Average	Standard Deviation	Min	Max	Sources and Notes for Data
The number of migrants	15,598	344.1	783.3	1	22157	Material provided by Rosstat.
Distance between regions (km)	16,773	2327.4	1899.8	18	7683	Federalnaya sluzhba geodezii i kartografii Rossii (1998), INGIT (2002).
Population (in thousand)	16,773	1,950,992	1,511,321	54,500	8,970,000	TsSU, Narodnoe Khozyaystvo RSFSR (National Economy of the Russian Soviet Socialist Republic), various years.
Percentage Share of Urban Population	16,773	70.1	11.6	28.5	100	Sam as above
Percentage of the population below working age	16,773	25.5	3.79	19.7	37.4	Same as above. (under 15 y.o.)
Average Expenditure on Charged Service per capita (rubles)	16,773	2.53	0.76	1.1	6.3	Same as population
Number of doctors per 10000 people	16,773	43.8	11.2	30.7	105.9	Same as above
Kilometres of paved roads per square kilometre of land area (km/km2)	16,773	87.1	67.8	0	306	Same as above. As for the data for Moscow city and St. Petersburg city, the figures for Moscow oblast and Leningrad oblast are substituted because of the lack of data. Figures for 1988 and1989 are interapolated from figures of 1985 and 1990.
Number of Buses per 100000 people	16,702	98.9	28.7	0	185.3	Same as above. Figures for 1988 and1989 are interapolated from figures of 1985 and 1990.
Far North Dummy	16,773	0.14	0.34	0	1	Unity for regions classified as 'Far North', zero for others. Goskomstat RF (2004), Ekonomichekie Pokazateli Raionov Krainego Severa I Priravnennykh k Nim Mestnostei za yanvar'-mart 2004 goda, Moskva, 2004.
Oil/Gas Producer Dummy	16,773	0.076	0.27	0	1	Same as population. If a region is one of the top five crude-oil producing regions or one of the top five natural-gas producing regions in each year (many regions are both), it is given a value of 1. Otherwise it is given a value of 0. 1990 data substituted for 1989 and 1988.
Average January Temperature (Celsius)	16,773	13.9	7.23	-0.5	-39	Sevruka (2006).
Government Intestment per capita (rubles)	16,773	2.09	15.9	0.28	15.3	Same as population. Figures for 1988 and 1989 are extrapolated from figures of 1990 and 1991.

Source: Prepared by the author.

Table 2. Results

	I. All the Samples									II. 90% of Total Migration: Region pairs tiwh more than 147 migrants								
	Pooled OLS			Fixed Effect			Random Effect			Pooled OLS			Fixed Effect			Random Effect		
	Coefficient β	Standard Deviation	t-value	β	SD	t	β	SD	z	β	SD	t	β	SD	t	β	SD	z
Distance	-0.44	0.0079	**	(omitted)			-0.43	0.013	**	-0.38	0.0085	**	(omitted)			-0.37	0.013	**
Population (Origin)	0.4	0.0054	**	0.0059	0.025		0.37	0.0084	**	0.16	0.0068	**	0.065	0.026	*	0.16	0.0096	**
Population (Destination)	0.43	0.0054	**	0.12	0.025	**	0.39	0.0084	**	0.2	0.0068	**	0.2	0.025	**	0.21	0.0095	**
Urban Population	-0.076	0.022	**	-0.63	0.062		-0.091	0.031	**	-0.057	0.027	*	-0.059	0.05		-0.083	0.031	**
Under Working Age	-0.046	0.024	+	0.049	0.093		-0.068	0.035	+	-0.064	0.032	*	0.22	0.081	**	0.022	0.039	
Charged Service	0.031	0.014	*	-0.0058	0.01		-0.0069	0.0096		0.017	0.018		-0.023	0.014	+	-0.029	0.012	*
Doctors	-0.044	0.014	**	0.36	0.043	**	0.038	0.019	*	-0.019	0.016		0.41	0.044	**	0.071	0.019	**
Paved Road	0.057	0.0033	**	0.12	0.029	**	0.049	0.0048	**	0.035	0.0037	**	0.12	0.028	**	0.042	0.0049	**
Bus	-0.0089	0.011		-0.026	0.042		0.0054	0.017		-0.015	0.013		-0.089	0.038	*	-0.024	0.018	
Far North (Origin)	0.19	0.012	**	(omitted)			0.17	0.019	**	0.13	0.015	**	(omitted)			0.13	0.023	**
Far North (Destination)	0.19	0.012	**	(omitted)			0.19	0.019	**	0.14	0.016	**	(omitted)			0.16	0.023	**
Oil/Gas (Origin)	-0.065	0.013	**	(omitted)			-0.044	0.021	*	-0.029	0.013	*	(omitted)			-0.044	0.02	*
Oil/Gas (Destination)	-0.22	0.013	**	(omitted)			-0.16	0.022	**	-0.13	0.015	**	(omitted)			-0.12	0.021	**
Jan Temperature	0.00085	0.005		(omitted)			0.0042	0.0079		0.00013	0.0057		(omitted)			0.004	0.0078	
Government Invest	0.38	0.01	**	0.27	0.0079	**	0.29	0.0074	**	0.25	0.012	**	0.25	0.0076	**	0.25	0.007	**
Constant	-8.5	0.11	**	0.28	0.49		-7.54	0.17	**	-1.66	0.14	**	-1.43	0.49	**	-1.75	0.19	**
	Observation: 14,952 F(15, 14936) = 1307.51 Prob > F = 0.00 Adj. R-sq: 0.57			Observation: 14,952 Samples: 5,111 F(9, 9832) = 138.99 Prob > F = 0.00 R-sq: Within = 0.11 Between = 0.07 Overall = 0.073 Sargan Test statistic = 520.16; P-value = 0.00			Observation: 14,952 Samples: 5,111 Wald chi2(68) = 7902.5 Prob > chi2 = 0.00 R-sq. Within = 0.087 Between = 0.59 Overall = 0.56			Observation: 7,287 F(15, 14936) = 208.43 Prob > F = 0.00 Adj. R-sq: 0.30			Observation: 7,287 Samples: 2,842 F(9, 4436) = 147.30 Prob > F = 0.00 R-sq: Within = 0.23 Between = 0.04 Overall = 0.044 Sargan Test statistic = 120.28; P-value = 0.00			Observation: 7,287 Samples: 2842 Wald chi2(15) = 2472.2 Prob > chi2 = 0.00 R-sq. Within = 0.21 Between = 0.31 Overall = 0.30		

Source: Prepared by the author.

Table 2. Results

	III. 80% of Total Migrants: Region pairs with more than 250 migrants.									III. 70% of Total Migrants: Region pairs with more than 380 migrants.									III. 60% of Total Migrants: Region pairs with more than 561 migrants.								
	Pooled OLS			FE			RE			Pooled OLS			FE			RE			Pooled OLS			FE			RE		
	β	SD	t	β	SD	t	β	SD	z	β	SD	t	β	SD	t	β	SD	z	β	SD	t	β	SD	t	β	SD	z
Distance	-0.35	0.0099	**	(omitted)			-0.35	0.015	**	-0.31	0.012	**	(omitted)			-0.33	0.017	**	-0.27	0.014	**	(omitted)			-0.3	0.019	**
Population (Origin)	0.089	0.0083	**	0.069	0.031	*	0.097	0.011	**	0.06	0.0099	**	0.098	0.037	**	0.071	0.013	**	0.061	0.012	**	0.14	0.43	**	0.079	0.016	**
Population (Destination)	0.14	0.0081	**	0.19	0.032	**	0.16	0.011	**	0.087	0.0099	**	0.23	0.041	**	0.11	0.013	**	0.065	0.012	**	0.22	0.45	**	0.085	0.016	**
Urban Population	-0.055	0.032	+	-0.048	0.059		-0.066	0.037	+	-0.043	0.039		-0.041	0.071		-0.053	0.044		-0.067	0.045		-0.044	0.081		-0.068	0.052	
Under Working Age	-0.073	0.041	+	0.2	0.09	*	0.044	0.048		-0.037	0.052		0.16	0.1		0.048	0.059		-0.11	0.063	+	0.16	0.13		-0.009	0.072	
Charged Service	-0.0079	0.022		-0.039	0.017	*	-0.043	0.015	**	-0.001	0.027		-0.027	0.019		-0.035	0.017	*	0.00037	0.032		-0.0008	0.023		-0.009	0.02	
Doctors	-0.0072	0.019		0.3	0.05	**	0.055	0.022	*	0.0029	0.023		0.27	0.056	**	0.05	0.024	*	0.0038	0.027		0.19	0.066	**	0.023	0.029	
Paved Road	0.03	0.0044	**	0.091	0.031	**	0.039	0.0056	**	0.026	0.0051	**	0.08	0.036	*	0.036	0.0064	**	0.015	0.0059	*	0.078	0.039	*	0.029	0.0075	**
Bus	-0.014	0.016		-0.1	0.043	*	-0.034	0.021	+	-0.0057	0.019		-0.1	0.049	*	-0.032	0.024		0.0011	0.023		-0.15	0.054	**	-0.054	0.028	+
Far North (Origin)	0.049	0.018	**	(omitted)			0.055	0.026	*	0.045	0.022	*	(omitted)			0.054	0.031	+	0.04	0.025		(omitted)			0.034	0.036	
Far North (Destination)	0.12	0.019	**	(omitted)			0.14	0.028	**	0.087	0.023	**	(omitted)			0.12	0.033	**	0.058	0.028	*	(omitted)			0.069	0.039	+
Oil/Gas (Origin)	0.011	0.015		(omitted)			-0.002	0.023		0.02	0.017		(omitted)			0.002	0.026		0.016	0.019		(omitted)			-0.015	0.029	
Oil/Gas (Destination)	-0.091	0.017	**	(omitted)			-0.11	0.024	**	-0.071	0.02	**	(omitted)			-0.095	0.028	**	-0.058	0.024	*	(omitted)			-0.11	0.032	**
Jan Temperature	-0.001	0.0066		(omitted)			0.002	0.0085		-0.0017	0.0075		(omitted)			-0.002	0.0095		-0.0029	0.0085		(omitted)			-0.007	0.011	
Government Invest	0.23	0.014	**	0.25	0.009	**	0.24	0.0081	**	0.19	0.016	**	0.24	0.01	**	0.24	0.0093	**	0.17	0.019	**	0.26	0.012	**	0.25	0.011	**
Constant	0.31	0.16	*	-1.29	0.61	**	-0.1	0.22		1.56	0.18	**	-2.1	0.76	**	1.02	0.25	**	1.88	0.2	**	-2.53	0.86	**	1.34	0.29	**
	Observation: 4,674			Observation: 4,674			Observation: 4,674			Observation: 3,037			Observation: 3,037			Observation: 3,037			Observation: 1,977			Observation: 1,977			Observation: 1,977		
	F(15, 4658)=102.31			Samples: 1,889			Samples: 1,889			F(15, 3021)=55.26			Samples: 1,237			Samples: 1,237			F(15, 1961)=29.84			Samples: 797			Samples: 797		
	Prob > F =0.00			F(9, 2776)=104.64			Wald chi2(15)=1497.82			Prob > F=0.00			F(9, 1791)=81.12			Wald chi2(15)=1012.08			Prob > F=0.00			F(9, 1171)=67.07			Wald chi2(15) = 2472.2		
	Adj. R-sq: 0.25			Prob > F =0.00			Prob > chi2 = 0.00			Adj. R-sq: 0.21			Prob > F=0.00			Prob > chi2 = 0.00			Adj. R-sq: 0.18			Prob > F = 0.00			Prob > chi2 = 0.00		
				R-sq:			R-sq.						R-sq:			R-sq.						R-sq:			R-sq.		
				Within = 0.25			Within = 0.24						Within = 0.29			Within = 0.28						Within = 0.34			Within = 0.21		
				Between = 0.03			Between = 0.24						Between = 0.008			Between = 0.31						Between = 0.023			Between = 0.31		
				Overall = 0.028			Overall = 0.24						Overall = 0.0098			Overall = 0.21						Overall = 0.055			Overall = 0.30		
				Sargan Test statistic=57.31; P-value=0.00									Sargan Test statistic=48.75; P-value=0.00									Sargan Test statistic=58.89; P-value= 0.00					

Source: Prepared by the author.

Table 3. Results of the Analyses Conducted by Each Year

	I. All the Samples									II. 90% of all the migration OLS								
	1989			1990			1991			1989 (region pairs with more than 315 migrants)			1990 (region pairs with more than 289 migrants)			1991 (region pairs with more than 239 migrants)		
	β	SD	t	β	SD	t	β	SD	z	β	SD	t	β	SD	t	β	SD	t
Distance	-0.43	0.015	**	-0.44	0.016	**	-0.45	0.016	**	-0.34	0.019	**	-0.34	0.019	**	-0.37	0.019	**
Population (Origin)	0.42	0.009	**	0.41	0.009	**	0.39	0.009	**	0.08	0.015	**	0.087	0.015	**	0.082	0.014	**
Population (Destination)	0.41	0.009	**	0.42	0.009	**	0.43	0.009	**	0.13	0.015	**	0.13	0.015	**	0.13	0.016	**
Urban Population	-0.04	0.039		-0.051	0.037		-0.056	0.038		-0.057	0.059		-0.016	0.057		-0.044	0.062	
Under Working Age	-0.11	0.039	*	-0.084	0.041	*	0.075	0.044	+	-0.048	0.065		-0.037	0.071		-0.044	0.08	
Charged Service	0.051	0.029	+	0.062	0.028	*	-0.016	0.022		0.041	0.042		-0.029	0.041		-0.035	0.036	
Doctors	-0.064	0.024	*	-0.041	0.023	+	-0.062	0.022	*	-0.012	0.034		0.013	0.034		-0.004	0.032	
Paved Road	0.045	0.0062	**	0.048	0.006	**	0.074	0.0063	**	0.027	0.008	**	0.029	0.008	**	0.043	0.008	**
Bus	-0.002	0.019		-0.019	0.019		-0.062	0.019	*	0.0001	0.029		-0.002	0.029		-0.032	0.029	
Far North (Origin)	0.18	0.025	**	0.21	0.025	**	0.19	0.026	**	0.031	0.032		0.043	0.033		0.036	0.03	
Far North (Destination)	0.17	0.023	**	0.18	0.023	**	0.21	0.023	**	0.099	0.036	+	0.097	0.035	+	0.15	0.034	**
Oil/Gas (Origin)	-0.05	0.021	+	-0.065	0.021	*	-0.1	0.022	**	0.018	0.028		0.011	0.029		-0.018	0.029	
Oil/Gas (Destination)	-0.18	0.023	**	-0.19	0.022	**	-0.24	0.023	**	-0.071	0.031	*	-0.08	0.031	*	-0.12	0.034	**
Jan Temperature	0.002	0.009		-0.005	0.009		-0.027	0.009	*	0.011	0.012		-0.009	0.012		-0.016	0.012	
Government Invest	0.29	0.017	**	0.33	0.018	**	0.47	0.022	**	0.2	0.025	**	0.24	0.026	**	0.31	0.034	**
Constant	-8.4	0.19	**	-8.36	0.19	**	-8.4	0.019	**	0.69	0.29	*	0.56	0.29	+	0.65	0.29	*
	Observation: 4,898			Observation: 4,960			Observation: 5,386			Observation: 1,393			Observation: 1,404			Observation: 1,525		
	F(15, 4882)=389.63			F(15, 4944)=402.6			F(15, 4882)=442.83			F(15, 1377)=24.23			F(15, 1388)=24.07			F(15, 1509)=25.98		
	Prob > F =0.00			Prob > F =0.00			Prob > F =0.00			Prob > F =0.00			Prob > F =0.00			Prob > F =0.00		
	Adj. R-sq: 0.58			Adj. R-sq: 0.57			Adj. R-sq: 0.58			Adj. R-sq: 0.24			Adj. R-sq: 0.24			Adj. R-sq: 0.25		

Source: Prepared by the author.

Appendix Table 1.

Correlation Coefficients of Governmental Investment per capita

by year (1980, 1985, 1990 and 1991)

	1980	1985	1990	1991
1980	-	0.970	0.974	0.913
1985	0.970	-	0.979	0.902
1990	0.974	0.979	-	0.985
1991	0.913	0.902	0.985	-

Sources: Calculated by the author by Goskomstat Rossii, *Pokazateli sotsial'nogo razvitiya Rossiyskoy federatsii i ee regionov*, 1993, pp.100-102, and Goskomstat Rossii, *Rossiyskiy ststisticheskiy ezhegodnik 1994*, 1994, pp.721-723.

Appendix Table 2.

Distribution of Place of Birth and Place of Residence

seen from Population Censuses in 1989 and 2002. (in thousand)

Population Census 1989

Place of Birth	Place of Residence: Central	NorthWest	South	North Caucasus	Volga	Urals	Siberia	Far East
Central Federal District	31,623	1,565	769	161	978	555	***686***	***492***
North West FD	628	10,436	169	46	283	165	195	117
South FD	426	206	10,153	231	245	232	173	199
North Caucasus FD	154	80	306	6,258	82	123	68	71
Volga FD	1,473	759	635	146	27,447	1,872	943	493
Urals FD	266	158	171	49	443	9,180	365	162
Siberia FD	***496***	252	354	101	390	505	18,819	742
Far East FD	***268***	124	144	45	187	116	387	5,116

Population Census 2002

Place of Birth	Place of Residence: Central	NorthWest	South	North Caucasus	Volga	Urals	Siberia	Far East
Central Federal District	29,818	1,038	578	112	721	322	***397***	***232***
North West FD	662	9,768	163	43	249	102	123	64
South FD	431	166	9,930	192	208	130	116	93
North Caucasus FD	283	90	367	7,529	110	96	66	43
Volga FD	1,358	565	524	119	27,163	1,182	580	254
Urals FD	316	142	180	47	378	8,873	260	91
Siberia FD	***620***	241	346	95	369	363	16,707	480
Far East FD	***384***	133	183	45	199	98	316	4,758

Source: Calculated by the author by TSSU SSSR, *Itogi vsesoyuznoy perepisi naseleniya 1989 goda*, tom 12, Moskva, TSSU SSSR, and Rosstat, *Itogi Vserossiyskoy perepisi naseleniya 2002 goda*, Tom.10, Prodolzhitel'nost' prozhivavaniya naseleniya v meste postoyannogo zhitel'stva, Statistika Rossii, 2005.