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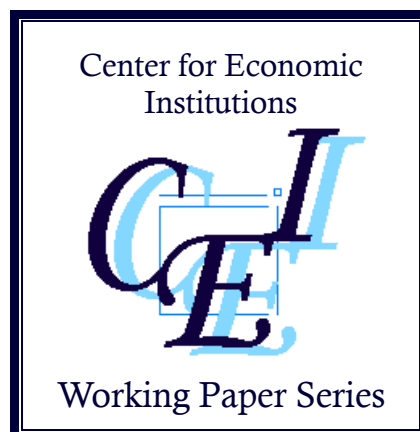# Working Paper Series

"Inter-regional Population Migration in Russia Revisited:

Analysis on Origin-to-Destination Matrix, 1990-2013"

Kazuhiro Kumo

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Inter-regional Population Migration in Russia Revisited:
Analysis on Origin-to-Destination Matrix, 1990-2013[*]

Kazuhiro Kumo[+]
Centre for Economic Institutions
Institute of Economic Research, Hitotsubashi University

Abstract

This paper examines regional economic conditions and their effects on interregional population redistribution patterns in Russia. After reviewing striking changes in population flows before and after the collapse of the former Soviet Union, an application of the gravity model on population migration in Russia is presented using a newly obtained interregional in- and out-migration flow matrix from 1990 to 2013, which were supplied by Rosstat (formerly Goskomstat). The analysis conducted comparison of factors affecting migration patterns between those in the Soviet era and in modern Russia, focusing on geographical factors, namely, the attractiveness of resource-mining regions. The analysis clearly showed major changes in the effect of governmental investment in determining migration flow before and after the collapse of the Soviet Union.

1. Introduction

In this paper the author will perform an analysis of the factors behind population migration between domestic regions in the area covered by the current Russian Federation during the almost quarter-century period between 1990 and 2013. This period began with the Soviet era, during which interregional migration was restricted under the domestic passport system and the resident permit system, followed by the turmoil of the government-system transition period after the collapse of the Soviet Union and the end of. The currency crisis of 1998 marked rock bottom for the

Russian economy, which recovered/grew steadily throughout the rest of the period. Interregional population migration plays an economic role in evening out the supply and demand for labour between regions as it constitutes the movement of factors of production, and a great deal of research has been conducted on it in both advanced countries and developing countries (Greenwood, 1991, 2010; Greenwood and Hunt, 2003). However, interregional population migration in regions under the former planned-economy system, which was characterized by the control of population migration, has attracted little interest. It is known that the Soviet Union controlled interregional migration through a system of domestic passports and that residency in large cities required a permit, not just registration (Matthews, 1993)[1]. If interregional population migration is determined by government policy, the factors behind it will obviously also be politically determined. However, verifying whether this was indeed the case has been extremely difficult because data was not made public during the socialist era. Data on interregional population migration since the collapse of the Soviet Union has also been heavily restricted, and in the 1990s in particular, research in a wide range of areas saw little progress.

The restrictions on data have begun to be eliminated recently. Although access to internal materials at Rosstat (the Russian Federal State Statistics Service) cannot be said to have become free, it is no longer impossible, and some studies, albeit a small number, employing them have started to appear (Andrienko and Guriev, 2004; Kumo, 2007; Vakulenko, Mkrtchyan and Furmanov, 2011; Guriev and Vakulenko, 2015). This analysis has been influenced by this situation, and in it the author has used a population migration matrix for origins and destinations at the federal subject division level, i.e. regional constituents of Russia, recorded for each year during the 24-year period from 1990 to 2013, to analyse determinants of interregional population migration patterns in a period that also includes the tail-end of the Soviet era.

As stated above, interregional population migration constitutes the movement of factors of production, and given Russia's vast land area and heavily-distorted spatial population distribution (Dmitrieva, 1996), it is highly significant. Hill and Gaddy (2003) showed that the policy of heavily developing remote regions through distributed resource development and industrial location, the construction of military bases, and so on, caused a distortion in the distribution of population. Because of this, the collapse of the Soviet Union and the transition to capitalism must have wrought major changes to

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[1] On 27 December 1932, the Central Executive Committee and the People's Commissar of the Soviet Union formalised "the establishment of a unified system of passports and the obligation to obtain residence permits" (Postanovlenie VtsIK i SNK ot 27.12.1932, «Ob ustanovlenie edinoi pasportnoi systemy po Soyuzu SSR i obyazatelnoi propiske pasportov»). Initially, the residence permit system was applied on a priority basis to the major cities of Moscow, Leningrad, Rostov, Kiev, Kharkov, and Minsk, but later it was introduced in almost every medium-sized and large city.

regional population distribution patterns. This phenomenon also hints at the advance of the transition process in Russia. To examine this, it is essential to perform a comparison using detailed population migration statistics not just for the new Russia but also for the Soviet era. Interregional population migration in the Soviet Union was thought to be affected by government incentives for development. On the other hand, other researchers have stressed the limitation of policy incentives. To discuss this, it is necessary to clarify whether factors regarded as policy incentives had an impact during the Soviet era, and whether that role was lost following the Soviet collapse. Until now, however, previous research performing that kind of analysis has not existed, and the purpose of this paper is to fill that gap.

2. Interregional population migration in the Soviet Union and Russia

It has been frequently pointed out that during the Soviet era the obligation to carry a domestic passport and the existence of a permit system rather than a registration system in urban areas affected regional population distribution (Matthews, 1993). By designating the work locations of new university graduates and setting high wage rates in specific regions (Ivanova, 1973), the Soviet government tried to distribute the labour force in a strategic fashion. This can be seen as having been fairly successful in terms of promoting resource development in the Extreme North[2] and Far East regions (Perevedentsev, 1966). Registration of residence is a condition for convenient living, and because of that the Soviet Ministry of Internal Affairs was aware of what was happening with interregional population migration[3]. The author will therefore use the Ministry's data in this paper.

[2] Refers to regions situated in the Arctic and other regions with similarly harsh living conditions. They were designated for the preferential allocation of resources and higher wages. Since the collapse of the Soviet Union the government has continued to provide assistance to Extreme North regions, but it is not of the type that would encourage the inflow of labour into these regions. In fact, the government has adopted policies that encourage the outflow of population from these regions (Thompson, 2005). There are many laws and regulations, but see the Russian Federal Law 'National Social Security and Subsidy Programs for Workers/Residents in Far North Regions and Similar Regions' (31 December 2014) («O gosudarstvennykh garantiyakh i kompensatsiyakh dlya lits, rabotayushchikh i prozhivayushchikh v rayonakh Kraynego Severa i priravnennykh k nim mestnostyakh (s izmeneniyami na 31 dekabrya 2014 goda) »).
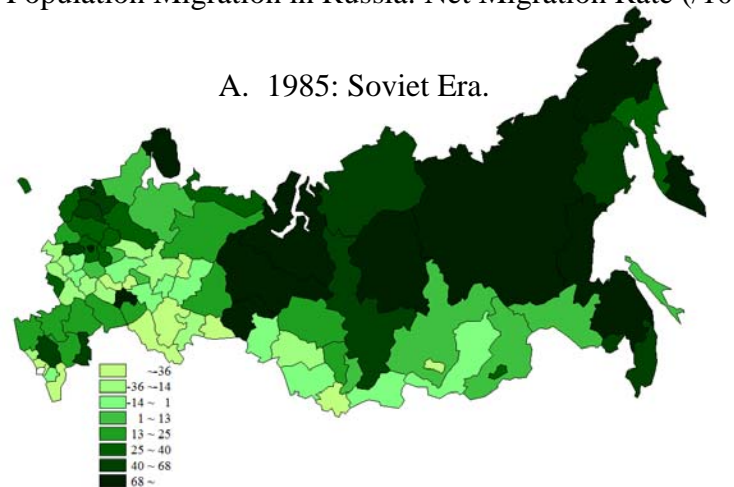
[3] However, it was only in 1974 that passports began to be issued to residents of farming villages. Until then such residents were basically not allowed to move to cities ('Approval of Rules Concerning the Passport System in the Soviet Union', Soviet Cabinet Decision No. 677, 28 August 1974) (Postanovlenie Sovmina SSSR ot 28 avgusta 1974 goda No.677 «Ob utverzhdenii polozheniya o pasportnoi sisteme v SSSR»). A look at the interregional population migration matrix (paper version) for the 1950s-60s from the Russian State Archive of the Economy (RGAE) shows that information about city-to-city migration was obtained, but adequate information about city-to-village, village-to-city, or village-village migration may not have been obtained. In 2007-08 the author studied archived materials at the RGAE, but only documents on city-to-city migration had been filed, and there were not even any statistics recording origins/destinations for other types of migration.

The collapse of the Soviet Union changed this situation. The constitution of the Russian federation afforded freedom of movement, and soon after the collapse of the Soviet Union a federal law abolishing the residence permit system was enacted[4]. First the author will examine what kinds of changes this brought to interregional population migration patterns. If a situation in which the distribution of population was determined by government policy was replaced by one of freedom of movement, a clear contrast in the direction of migration can be expected to have arisen. In fact, as Figure 1 shows, if interregional population migration patterns in 1985, during the final period of stability in the Soviet era, are compared with those following the collapse of the Soviet Union, the differences are clear. In other words, during the Soviet era population inflows occurred in the Far East and the regions in the Extreme North, most of which are located in the Arctic, which demonstrates to a great extent the impact of policy incentives (Figure 1A). Immediately after the collapse of the Soviet Union, however, there was a massive population outflow from the Far East and northern regions and a population inflow in the southern part of European Russia, which had experienced population outflows during the Soviet era (Figure 1B). In addition, during the 2000s, when the new Russia exhibited sustained economic growth, inflows into regions that are located relatively far north but produce oil, gas, and nonferrous metals (Tyumen Oblast, Khanty-Mansi Autonomous Okrug, Krasnoyarsk Krai, and so on) were once again observed (Figure 1C).
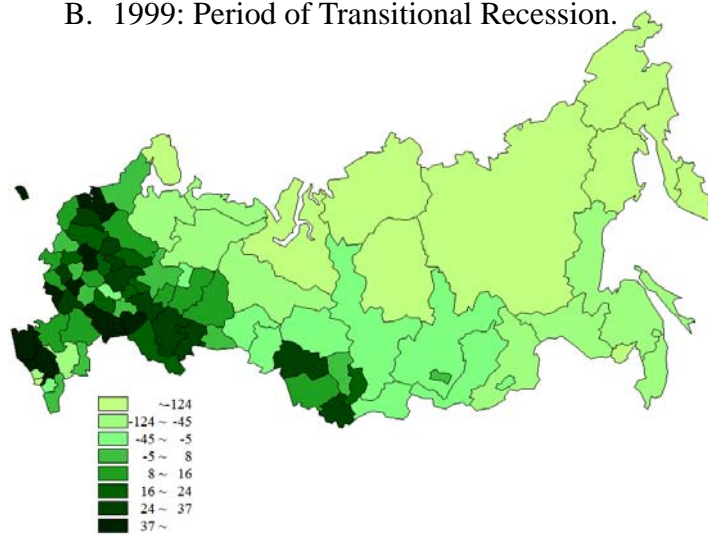
To examine this more closely, let the author look at the distribution of birthplaces (origins) and current places of residence (destinations) using 'federal districts', which are administrative divisions in modern Russia, at the times of the 1989 (nearly the end of the Soviet era), 2002, and 2010 censuses. This is not ordinary population migration data, which the author will use for the later analysis, but data that shows the results of life movement at each point in time. According to this data, in 1989, during the final phase of the Soviet era, there were more than 760,000 people living in the Central Federal District (the region centred on Moscow) who had been born in Siberia or the Far East. Conversely, 1.2 million people had been born in the Central Federal District but were now living in Siberia or the Far East (Table 1 Panel A). In

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[4] With the passage of 'Freedom of Movement and Rights Concerning the Selection of Resident Location within the Russian Federation by Citizens of the Russian Federation,' Russian Federal Law, 1 October 1993 (Zakon RF ot 1 oktyabrya 1993 «O prave grazhdan Rossiiskoi Federatsii na svobodu peredvizheniya, vybor mesta prebyvaniya i zhitelstva v predelakh Rossiiskoi Federatsii»), the residence permit system was formally abolished. This has been cited as a problem because authorities such as the city and oblast of Moscow have continued to require the registration of residence (*Moskovskie novosti*, March 25, 2005; *The Moscow Times*, January 17, 2013). At the same time, however, there are apparently numerous ways to avoid registration, and this paper will not consider the impact of the residence permit system in Russia after the breakup of the Soviet Union.

Figure 1

Inter-regional Population Migration in Russia: Net Migration Rate (/10000 person)

A. 1985: Soviet Era.

	~-36
	-36 ~-14
	-14 ~ 1
	1 ~ 13
	13 ~ 25
	25 ~ 40
	40 ~ 68
	68 ~

B. 1999: Period of Transitional Recession.

	~-124
	-124 ~ -45
	-45 ~ -5
	-5 ~ 8
	8 ~ 16
	16 ~ 24
	24 ~ 37
	37 ~

C. 2010: Period of Economic Growth.

	~-46.0
	-46.0 ~-31.0
	-31.0 ~-18.0
	-18.0 ~ -9.0
	-9.0 ~ 2.0
	2.0 ~ 8.0
	8.0 ~ 29.0
	29.0 ~
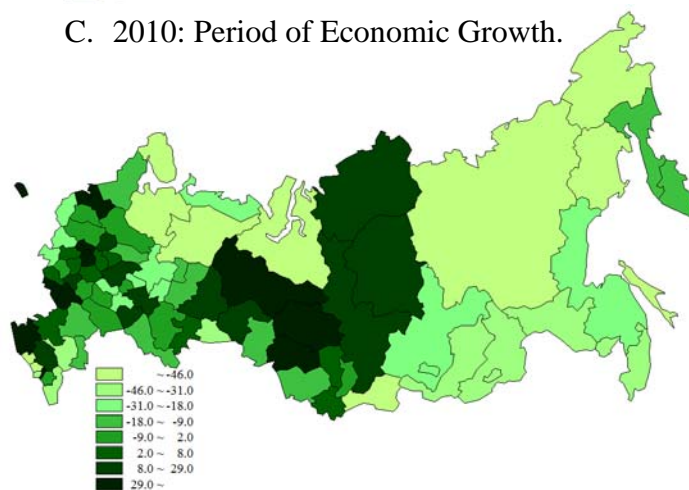
Source: Prepared by the author from Goskomstat/Rosstat, Regiony Rossii (Regions of Russia), various years.

Table 1

Distribution of the Place of Birth and the Place of Residence

by Population Census Data.

A. Census in 1989

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

B. Census in 2002

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

C. Census in 2010

Place of Birth	Place of Residence							
	Central	North-West	South	Caucasus	Volga	Ural	Siberia	Far East
Central Federal District	29,575	801	443	87	563	231	*266*	*150*
North-West Federal District	627	9,387	140	30	208	80	89	40
South Federal District	465	154	10,131	177	177	107	88	69
North-Caucasus Federal District	280	90	341	8,221	84	97	47	32
Volga Federal District	1,346	487	432	82	25,859	996	425	181
Ural Federal District	322	132	168	38	350	8,682	217	71
Siberia Federal District	*587*	207	297	68	292	319	16,061	391
Far East Federal District	*364*	122	169	35	170	82	273	4,613

D. Growth Rate between 1989-2002 (Average: *-12.14%*)

Place of Birth	Place of Residence							
	Central	North-West	South	Caucasus	Volga	Ural	Siberia	Far East
Central Federal District	*-5.71*	-33.72	-24.88	-30.00	-26.35	-42.04	-42.12	-52.97
North-West Federal District	*5.45*	-6.40	-3.49	-6.53	-12.11	-38.30	-36.72	-45.80
South Federal District	*1.07*	-19.54	-2.20	-16.89	-15.11	-44.18	-32.92	-53.15
North-Caucasus Federal District	*83.83*	12.79	19.90	20.31	33.67	-21.76	-2.43	-39.41
Volga Federal District	*-7.79*	-25.56	-17.47	-18.49	-1.03	-36.87	-38.51	-48.61
Ural Federal District	*18.85*	-10.10	5.38	-4.36	-14.67	-3.34	-28.91	-43.62
Siberia Federal District	*25.11*	-4.16	-2.13	-6.51	-5.44	-28.16	-11.22	-35.29
Far East Federal District	*43.09*	7.52	26.54	1.00	6.34	-15.38	-18.45	-7.00

E. Growth Rate between 2002-2010) (Average: *-14.64%*)

Place of Birth	Place of Residence							
	Central	North-West	South	Caucasus	Volga	Ural	Siberia	Far East
Central Federal District	*-0.81*	-22.78	-23.25	-22.97	-21.81	-28.14	-33.07	-35.20
North-West Federal District	*-5.28*	-3.90	-14.24	-28.50	-16.48	-21.40	-27.75	-37.85
South Federal District	*7.83*	-7.24	2.03	-7.87	-14.72	-17.38	-24.31	-26.27
North-Caucasus Federal District	*-0.92*	-0.50	-7.00	9.19	-23.57	1.17	-28.64	-26.40
Volga Federal District	*-0.91*	-13.79	-17.64	-30.75	-4.80	-15.70	-26.75	-28.43
Ural Federal District	*2.01*	-7.25	-6.57	-20.11	-7.34	-2.16	-16.51	-22.59
Siberia Federal District	*-5.37*	-14.23	-14.15	-28.64	-20.74	-12.14	-3.87	-18.58
Far East Federal District	*-5.01*	-8.42	-7.79	-22.72	-14.43	-16.77	-13.45	-3.04

Source: Prepared by the author by TsSU SSSR, *Itogi vsesoyuznoi perepisi naseleniya 1989 goda*, tom 12 (Results of All-Union Population Census in 1989, Vol.12), Moscow, TsSU SSSR; Rosstat, *Itogi vserossiiskoi perepisi naseleniya 2002 goda*, tom 10 (Results of All-Russian Population Census in 2002, Vol.10), Statistika Rossii, 2005; Rosstat, *Itogi vserossiiskoi perepisi naseleniya 2010 goda*, tom 8 (Results of All-Russian Population Census in 2010, Vol.8), Statistika Rossii, 2013. Recalculated based on the definition of regional units in 2010 by the author.

other words, the number of 'people born in Siberia or the Far East but living in European Russia' was far lower than the number of 'people born in European Russia but living in Siberia or the Far East'. By the time of the 2002 population census, the number of people born in Siberia or the Far East but living in the Central Federal District had reached one million, while the number of people born in the Central Federal District but living in Siberia or the Far East had shrunk to 600,000 (Table 1 Panel B). In the 2010 census, meanwhile, the number of people born in Siberia or the Far East but living in the Central Federal District was 950,000, while the number of people born in the Central Federal District but living in Siberia or the Far East was less than 420,000, meaning that the former figure had reached more than double the latter (Table 1 Panel C)[5]. In other words, it can be surmised that the opposite to what happened during the Soviet era occurred: People from Siberia and the Far East began moving to European Russia, while a signicant proportion of people from European Russia who had been living in Siberia or the Far East returned to European Russia. A comparison of origin-to-destination tables for federal districts reveals that between 1989 and 2002, and also between 2002 and 2010, reveals that only the Central Federal District was accepting people from all regions at a higher rate than the average rate of change for all regions or was keeping that decline lower than the average among all regions (Table 1 Panel D and Panel E). This indicates that the Central Federal District was attracting relative large numbers of people not only from Siberia and the Far East, but from all over Russia.

It is not difficult to interpret this. It has long been known that throughout the Soviet era, Russia's population and economy were concentrated in the European portion of the country (Figure 2; Dmitrieva, 1996). During the Soviet era, the socialist government was able, through its development policies, to encourage the flow of labour to remote regions such as the Far East and Siberia (Hill and Gaddy, 2003). However, after the collapse of the Soviet Union it can be inferred that the direction of the flow reversed, with people moving to the Central Federal District, which contains Moscow and surrounding parts of European Russia and was already a very densely populated region. During the Soviet era, regional economic disparities were curtailed through investment policies focused on income redistribution and surrounding regions, but after the beginning of transition to capitalism, a rapid increase in disparities occurred. Figure 3 shows that at the same time as the Soviet collapse (in 1991) there was a dramatic

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[5] Given that Russia's total population declined continuously from 1992 onwards, the fact that the number of people from Siberia and the Far East residing in the Central Federal District dropped between 2002 and 2010 is not in itself surprising. Given that the total number of people who left a federal district and moved from their birthplace to their current place of residence declined by an average of 14 per cent during this eight-year period (Table 1 Panel E), the key point must be that this number fell by a much lower rate than the trend for the population as a whole.

increase in regional disparities.

Figure 2 Population Distribution in Russia, 2002, in thousand.

= 1000.0
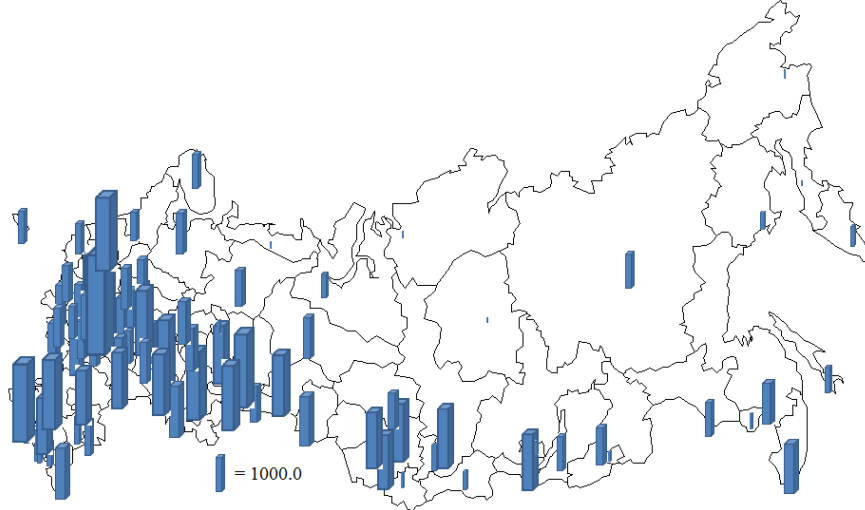
Prepared by the author by Rosstat, *Regiony Rossii* (Regions of Russia) 2004, 2005, Moscow.

Figure 3
Income Disparity and Gross Domestic Products per capita in Russia, 1980-2013.
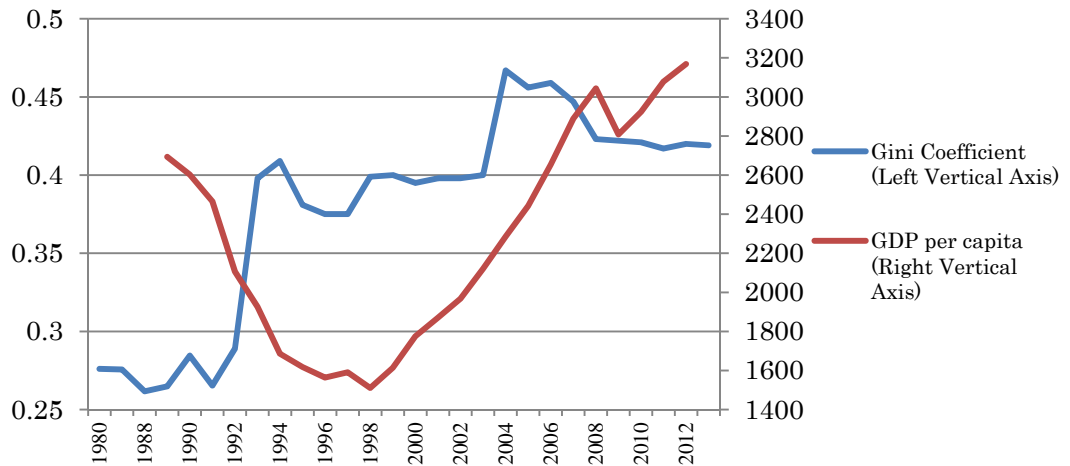
Source: Prepared by the author by Braithwaite (1995); Rosstat, *Sotsial'noe polozhenie i uroven zhisni naseleniya Rossii* (Social Situations and Living Standard of Population in Russia), various years; Rosstat, *Regiony Rossii* (Regions of Russia), various years.

It is possible to make inferences such as the above descriptively. However, the question of what kinds of changes in the determinants of interregional population migration during the Soviet era and interregional population migration in the new Russia following the collapse of the Soviet Union were seen has yet to be studied.

Therefore, in this paper the author will perform an analysis that is focused on this aspect.

Figure 4 Income per capita by region.

A. Average Monthly income per capita in 1990, in 1000 rubles.


```
        ~ 0.186
0.186 ~ 0.192
0.192 ~ 0.196
0.196 ~ 0.201
0.201 ~ 0.215
0.215 ~ 0.240
0.240 ~ 0.290
0.290 ~
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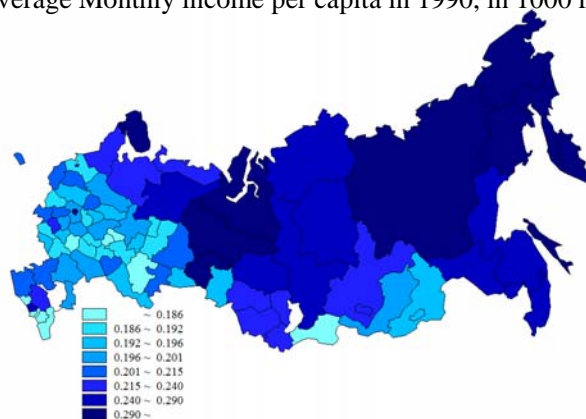
B. Average Monthly income per capita in 2004, in rubles.


```
        ~ 1638
1638 ~ 1831
1831 ~ 2025
2025 ~ 2271
2271 ~ 2476
2476 ~ 3087
3087 ~ 4559
4559 ~
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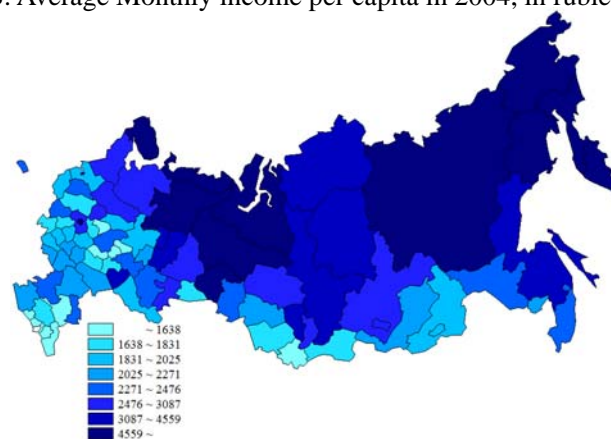
C. Average Monthly income per capita in 2009, in rubles.


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         ~ 10333
10333 ~ 11461
11461 ~ 12593
12593 ~ 13329
13329 ~ 14117
14117 ~ 16570
16570 ~ 22133
22133 ~
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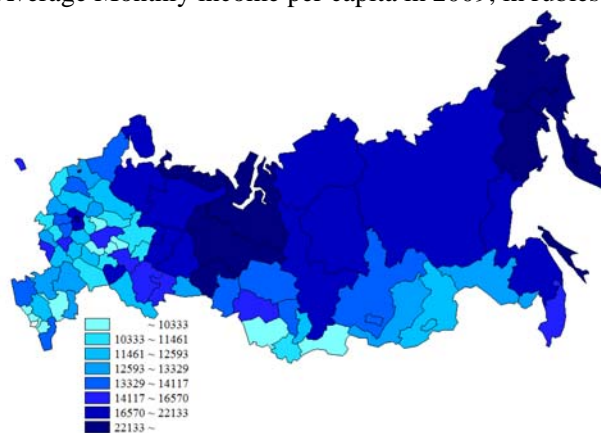
Source: Prepared by the author by Rosstat, *Regiony Rossii* (Regions of Russia) in 2010, 2011, Moscow.

However, it must be added that it is not the case that high-income regions are concentrated in European Russia. With the exception of the two largest cities in European Russia, namely Moscow and Saint Petersburg, the Extreme North and the Far East/Siberia actually contain regions with higher incomes. In fact, the distribution of high-income regions has not changed significantly since the Soviet era (Figure 4). Apart from Moscow and Saint Petersburg, all such regions are ones that produce a lot of energy resources such as oil and natural gas or nonferrous metals such as precious metals (Tyumen Oblast, Yamalo-Nenets Autonomous Okrug, Khanty-Mansi Autonomous Okrug, Krasnoyarsk Krai, Sakhalin Oblast, and Sakha Republic) or ones with extremely small populations (Magadan Oblast, Chukot Autonomous Okrug, Kamchatka Krai, Komi Republic, and Murmansk Oblast).

Because it is not simply the case that incomes are higher in the large cities, the explanation may become vague. However, if one compares Figure 1C with Figure 3C, which shows population flows in modern Russia and recent income levels, one would see that the population centres of Moscow and Saint Petersburg and resource-producing areas such as Tyumen and Krasnoyarsk are attracting people, whereas the Extreme Northern oblasts, which have traditionally had high nominal per-capita incomes but are situated in remote regions, have seen population outflows. The latter saw population inflows during the Soviet era (Figure 1A), but their high incomes were not indicative of the degree of economic development. Instead, it is more appropriate to view the high incomes as meaning that the government targeted them for development and took commensurate measures to attract workers to them (Perevedentsev, 1966; Hill and Gaddy, 2003). In modern Russia the government no longer manages population migration, so it is natural that Extreme North regions that do not possess resources would see population outflows.

However, things are not actually that simple. A point is the distribution of resources. Khanty-Mansi and Yamalo-Nenets autonomous okrugs in Tyumen Oblast, which produce more than 50 per cent of Russia's crude oil and over 80 per cent of its natural gas, are classified as Extreme North regions. At the same time, there are large labour outflows and inflows in such regions, so caution needs to be exercised when conducting an analysis.

3. Previous research

As it was stated at the beginning, the aim of this paper is to shed light on the determinants of interregional population migration in the modern Russian Federation, and to compare them with those during the Soviet era. Because not many previous studies have adopted such a perspective, it is possible to discuss them all. Here the

author will also mention general research on population migration in modern Russia[6].

Given that materials that would allow the 'from where to where', i.e. origins and destinations, to be specified at the oblast level have not been widely available, research in Russia itself has been conducted based on descriptive statistics. Many studies have attempted to explain interregional migration as being due to the labour market environment, the concentration of economic activity, the accessibility of regions, differences in the degree of infrastructure development, and the impact on the migration rate of the age structure, which results from differences in the propensity to migrate (Moiseenko, 2004; Eliseeva, 2006; Vishnevskii, 2014). However, research has been hindered by a lack of statistics, and very few studies in which quantitative analysis were performed in the period until 2000[7]. And even these studies have had to explain the net migration rate of each region amid an absence of data, and it has been impossible to classify factors in population migration as push factors or pull factors.

Brown (1997) showed that factors such as population size and average wage have a positive impact on net inflow but that factors such as the average temperature in January have a negative impact net outflow. Wages, however, were observed to have a positive impact on net population outflow. This was because although financial support for the Extreme North in the form of high wages was maintained after the collapse of the Soviet Union, this support is insufficient to compensate for the inferior living conditions, so it can be explained as resulting from a population outflow from this region. Gerber (2006) also studied net population migration rates, and showed that the population of the region and the average wage have a positive impact while the rate of unemployment and the average temperature in January have a negative impact. Gerber (2005) used microdata to analyse the determinants of the probability of deciding to migrate, and found that in Russia also a high level of education and a young age increased the migration rate.

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[6] Refer to Leiws (1969) and Kumo(2003), Chapter 3 for a survey relating to population migration research in the Soviet era.

[7] Quite a few studies have also pointed out the problem with the statistical record. This shows that the change in systems has had a major impact on migration statistics (Eliseeva, 2006; Vishnevskii, 2014; Shcherbakova, 2015). Refer to Figure A1. It shows total interregional population migration from the end of the Soviet era in 1990 to 2013, with the figures based on data from Rosstat. It appears that total population migration declined continuously following the Soviet collapse. In addition, from 2011 onwards this trend seems to have increased rapidly. However, the change in systems has played a role in this. The residence permit system in the Soviet Union, which the author has already mentioned several times, made it easy to grasp what was happening with interregional migration. However, after the collapse of the Soviet Union, the formal abolition of the residence permit system, inevitably reduced the proportion of identifiable cases of migration (Vishnevskii, 2014). Another point is that definitions used in migration statistics changed in 2011. Until then, a "migrant" was defined as someone who changed their "permanent domicile," i.e. a place in which they had resided for one year or more, but from the statistics for 2011, the period was changed to nine months or more (Shcherbakova, 2015). It needs to be borne in mind that because of this it is impossible to discuss the scale of total population migration.

Andrienko and Guriev (2004) were the first researchers to analyse both origins and destinations at the oblast level using data that was identified. They obtained origin-to-destination (OD) tables from Goskomstat Russia for 89 regions for the period 1992-99, and performed a panel analysis with the units being the 78 regions for which the data was complete. Their analysis found that a region's unemployment rate, population, and level of infrastructure affected population outflows and inflows in a way that would be intuitively expected. Regarding incomes, Russia was in a recession stemming from the transition to capitalism, and if income levels were extremely low, people got caught in a poverty trap, and a population outflow did not occur. They pointed out that later, as incomes rose, a population outflow from that region occurred. They also pointed out that if an analysis is performed on all samples, the results become vague, but that if income is divided into bands and an analysis is conducted for each, income gives results that match what would be intuitively assumed. In addition, distance variable obtained negative and significant coefficients.

Kumo (2007) conducted an analysis using oblast-level OD tables for 89 regions for the year 2003. These tables were obtained directly from an employee at Rosstat, the successor to Goskomstat and Russia's current statistical organization. Although it is a cross-sectional analysis for a single year, it showed that with the economy growing, the concentration of economic activity in resource-producing areas, the environs of Moscow, and so on, as well as regional factors such as the location of Extreme Northern areas, had a conspicuous impact on population fluidity. And like Andrienko and Guriev (2004), it confirms that the distance variable has a stable and negative impact on the scale of population migration. It seems likely that Vakulenko, Mkrtchyan and Furmanov (2011) made use of oblast-level OD tables from Rosstat for the period 2001-08[8]. The key finding from their analysis was that the socioeconomic variables were significant for migration between regions that were relatively close to each other, but that if the distance between regions was extremely large, these variables lost their explanatory power.

Oshchepkov (2007) obtained oblast-level OD tables from Rosstat for the period 1990, at the end of the Soviet era, to 2006, and analysed the causes of migration for 78 regions with complete data. The distance between regions takes a stable and significant negative coefficient for the scale of migration. It was also shown that factors such as the labour market environment (unemployment rate), climate conditions (average January temperature), and the degree of infrastructure development (paved road density) produced results that matched intuitive expectations concerning both outflows and

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[8] Scant explanation concerning the data was provided, making it difficult to know what sort of materials had been used. Because their analysis could not be conducted without the distance between regions, there can be no doubt that they used OD tables.

inflows. It was also pointed out that the absolute value of these coefficients becomes larger with the passage of time and that the impact of socioeconomic variables becomes stronger. Guriev and Vakulenko (2015) advanced the analysis conducted by Andrienko and Guriev (2004). They used oblast-level OD tables from Rosstat for the period from 1996 to 2010. Regarding the relationship between income and population migration, they showed that while high-income regions indeed saw population inflows, in the poorest regions increases in income resulted in population outflows. They showed that it is likely that in regions with an income level of less than USD 3,000, those classes that wished to move out did not have the capability to do so. In other words, like Andrienko and Guriev (2004), they showed that a geographical poverty trap existed.

Andrienko and Guriev (2004), Kumo (2007) and Oshchepkov (2007) showed that the distance variable had a significant negative impact on the scale of population migration. This is intuitively obvious and a stylized finding from population migration research in advanced countries (Greenwood, 2010). In the Soviet Union, however, there have been places that do not fit this description. In other words, as Mitchneck (1991) and Cole and Filatotchev (1992) have pointed out, in the Soviet Union distance did not exhibit a detrimental impact on population migration. Population migration on a larger scale than would be expected was observed even between areas that were far apart from each other. The fact that the distance variable was stably negative and significant can be said to indicate that compared with in the Soviet era, population migration patterns in Russia had changed.

However, it has to be said that a comparative study with the Soviet era has not been performed. In almost all the studies, data on the Soviet era has not been used and cannot be analysed. The only exception is Oshchepkov (2007), but in that study population migration data for 1990 to 2006 is pooled and the year to which the data relates is not specified. As a result, even though migration data for 1990 and 1991, which were during the Soviet era, is used, the analysis cannot make an interpretation of it. Although some statistics, such as the unemployment rate and the poverty rate, cannot be obtained for the Soviet era, given that complete time series data that includes the Soviet era exists, an analysis itself is not impossible. The factor of whether the region is a resource-producing one, which was used only by Kumo (2007), will also need to be subject to diachronic verification, not a cross-sectional analysis for a single year. In addition, none of the previous studies apart from Kumo (2007) have taken into account the scale of migration. In other words, regardless of whether there is only one interregional migrant or tens of thousands of them, an analysis has been performed with this as a single observation. As the author will explain later, this is unusual in the field of population migration research. In light of points such as these, in the next section the author will expand the period subject to the analysis and specify the data observation

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years, expand the explanatory variables, take account of the scale of migration, and so on.

4. Empirical analysis

The insights provided by the accumulation of general population migration research (Greenwood and Hut, 2003; Greenwood, 2010) and previous research on interregional population migration in Russia can provide hints on what variables should be used. In other words, the size of the population of the origin/destination probably has a positive impact on population flow. Furthermore, unlike in the Soviet era, the distance between regions probably has a stable and significant negative impact. It is also likely that various other socioeconomic variables are determinants of the scale of population migration. Therefore, like Andrienko and Guriev (2004), Kumo (2007) and Oshchepokov (2007), this paper will employ the expanded gravity model, which is widely used in the field of population migration research. The formula for this model is as follows:

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

where 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 denotes an attribute of the origin region I, while Y_j denotes an attribute of the destination region j.

4.1 Data

This analysis will employ regional data derived from official Soviet and Russian statistics and origin-to-destination (OD) tables for the period from 1990 to 2013, which are internal materials from Rosstat. For the former, regional economic statistics, the author will use statistics that can be accessed by anybody, such as ones that had either already been made available online or published in paper form by Rosstat or its predecessor organization. The latter require a little more explanation, as they have only been used by Russian researchers and the author of this paper.

Rosstat publishes 'Population and Population Migration in the year of **', which constitutes widely available population migration data. Until 1999, these statistics contained OD tables for the 11 'economic regions' in use at the time, while

from 2000 onwards they contained OD tables for the seven newly established 'federal districts'. From 2009 the number of federal districts increased to eight, so OD tables for these eight districts were contained in the statistics. However, if one takes account of the diversity seen within the vast area of each region, this regional division is not adequate for analysis, so it was not used for research. Therefore, oblast-level OD tables, which are internal materials of Rosstat and were obtained by the author, will be used. It is possible to obtain these materials directly from Rosstat employees, and it is likely that they can be acquired for a fee. For this analysis, however, the data was received from Rosstat via a joint researcher in Russia.

Kumo (2007) analysed the year 2003 based on a table that related to that year alone and had been obtained directly from Rosstat. The OD tables used in this analysis are for each year in the 24-year period between 1990 and 2013. Russia's regional divisions have been changed frequently, but the data has been adapted to match each of the 83 federal subject divisions that existed as of 2013. 83×83 regions -83 (intraregional migration) = 6,806 origins/destination pairs constitute the units of analysis. However, for the Yamalo-Nenets Autonomous Okrug, Khanty-Mansi Autonomous Okrug, Nenets Autonomous Okrug, Chukot Autonomous Okrug, and the Jewish Autonomous Oblast, data is often missing for certain years, particularly for the first half of the period of analysis, which includes the Soviet Union era, so it is often excluded from analysis. In addition, the Chechen Republic and the Republic of Ingushetia were heavily affected by a war that lasted from 1991 to 1997 and which then broke out again in 1999 before finally ending in 2009. There are also numerous gaps in the data for these republics. For these reasons, the author will exclude them from the analysis. The author should therefore mention that the number of observations is not as many as 6,806 × 24 years = 163,344. It is somewhat fewer than that. But even of such materials are lacking, at the time of writing no other studies that have employed such long-term data on interregional migration in Russia exist, and the significance of the fact that these materials can be used to perform a comprehensive analysis of interregional population migration in Russia for a period of approximately a quarter of a century from 1990, before the collapse of the Soviet Union, to 2013, should be emphasized.

The purpose of the analysis is to identify determinants of interregional population migration in Russia. However, that does not mean that it will simply back up the insights confirmed from previous research. It will identify changes in factors behind population migration that occurred between the Soviet era and the emergence of the new Russia, something that is only possible with the data obtained. As one can see from Figure 1, which appeared earlier, population migration patterns in Russia have changed a great deal. It can be expected that during the Soviet era controls and incentives implemented by the central government had an impact, but this ceased to function after

the collapse of the Soviet Union. To identify this, the author will use the amount of government investment as an explanatory variable as it shows indirectly the government's intentions concerning regional development priority under the socialist regime. The fact that during the Soviet era interregional population migration occurred in line with the development intentions of the government can be said to be visible in the population inflow that occurred in Siberia and the Far East in the 1960s and 1970s, which the author mentioned earlier. However, it is difficult to imagine that the same thing occurred in the new Russia. Until 1991, therefore, government investment had a positive impact on population migration in Russia, but after the collapse of the Soviet Union, that impact can be expected to have declined. To make this possible to specify, the author will use a cross term for year dummies and the amount of government investment. This government investment is described as 'basic investment' in the Russian language, and the concept of it is that it is capital used for production activities. It is not investment in nonproduction activities such as healthcare, so it can be expected to serve as one of the development incentives the author is assuming here.

In addition, a factor that is unique to Russia need to be taken into account. That is the peculiarity of the regions that produce resources such as crude oil and natural gas, but only Kumo (2007) has studied the impact of that on population migration patterns. In Russia, mineral resources account for between 50 and over 60 per cent of exports[9], and half of the country's tax revenue comes from taxes on energy resources[10]. Apart from urban areas such as Moscow, many high-income regions are resource-producing regions, and that probably has an effect on the flow of population migration. The analysis here will therefore use a dummy variable to specify regions that produce crude oil or natural gas. This will take account of the fact that regions that produce energy resources tend to attract people. The author also wants to explore the impact of Russia's frigid climate. In Kumo (2007), the dummy variable for 'Extreme North region' obtained a significant positive coefficient for both the origin and the destination, and the analysis in this paper will re-verify this. The author will also use the average temperature in January and investigate its coefficient. It is normal for people to move from places with harsh climates to places with mild climates (Greenwood, 1991), and the author will examine whether this is also a reasonable assumption for Russia. In addition, Russia experienced huge changes in the period from 1990 to 2013, and the author will employ the year fixed effect to control for this.

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[9] Rosstat, *Rossiiskii statisticheskii ezhegodnik* (Russian Statistical Yearbook), Moscow, various years. (in Russian)

[10] Ministerstvo finansov rossiyskoy Federatsii (2014), *«Byudzhet dlya grazhdan», k Federal'nomu zakonu o federal'nom byudzhete na 2015 god i na planovyy period 2016 i 2017 godov* (Ministry of Finance of the Russian Federation, Budget for the Citizens by the Federal Law on the Federal Budget for 2015 and the planned period for 2016 and 2017), Moscow. (in Russian)

Table 2 Descriptive Statistics

Variable	No. of observations	Mean	Standard deviation	Minimum	Maximum	Source of and remarks concerning data
Population migration (persons)	159,290	191.61	673.4	0	47464	Material provided by Rosstat
Distance (km)	159,408	2429.83	1907.59	18	7683	Using Federalnaya sluzhba geodezii i kartografii Rossii (1998), INGIT (2002), the author specified the latitude and longitude of the main city in each region and calculated the distance between regions. The distances are as the crow flies.
Population (persons)	159,327	1790504	1595602	40896	11856578	Rosstat/Goskomstat, Regiony Rossii (Regions of Russia)/Rossiiskii ststisticheskii edzegodnik (Statistical Yearbook of Russia), various years; TsSU, Narodnoe Khozyaystvo RSFSR (National Economy of the Russian Soviet Socialist Republic), various years; Unified Interdepartmental Statistical Information System of the Russian Federation, <https://www.fedstat.ru/indicators/start.do>.
Proportion of population who live in cities (%)	159,327	69.44	12.95	23.63	100	Same as above.
Proportion of population who have not reached working age (%)	159,408	21.07	5.03	11.34	38	Same as population. 15 years or younger.
Proportion of population who are of an age that they are eligible to receive a pension (%)	159,408	19.05	5.32	1.9	28.16	Same as population. 60 years or older for men and 55 years or older for women.
Average expenditure on charged services per capita (roubles)	159,327	9.88	13.85	0.00012	93.19	Same as population.
Average expenditure on services for living per capita (roubles)	159,327	1.02	1.32	0.000047	8.82	Same as above.
Consumer price index (%)	154,143	211.82	285.51	101.4	1997.1	Same as above. 1990 figure substituted for 1989.
Average income per capita (roubles)	155,925	29838.94	118879.9	123.2	1836500	Same as above. 1990 figure substituted for 1989.
No. of doctors per 10,000 people (persons)	156,492	44.81	10.26	5.7	105.9	Same as population.
No. of hospital beds per 10,000 people (beds)	156,816	120.09	124.96	29.8	586	Same as above.
Total length of railways per km2 of land area (km/km2)	159,165	154.46	124.96	0	586	Same as above. Figure for 1989 extrapolated from figures for 1985 and 1990.
Total length of paved roads per km2 of land area (km/km2)	159,084	116.24	103.82	0.01	695	Same as population. However, the figures for the cities of Moscow and Saint Petersburg are included in those for the oblasts of Moscow and Leningrad, so the figures for the oblasts of Moscow and Leningrad are used instead. As a result, the figures for these two cities are excessively small.
No. of buses per 100,000 people (buses)	157,221	69.81	32.39	0	276	Same as above. Figure for 1989 extrapolated from figures for 1985 and 1990.
Extreme North region dummy	159,408	0.159	0.365	0	1	Administrative districts (federal subjects) the entire area of which is defined as being in the 'Extreme North' are given a value of 1 while other districts are given a value of 0. Determined using Goskomstat Rossii (2004)
Oil/gas-producing region dummy	159,408	0.079	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. 2010 data substituted for 2011 and 2012.
Average January temperature (Celsius)	159,408	14.17	7.32	-0.5	-39	Sevruka (2006).
Population density per 1,000km2 of land area (persons/1,000km2)	157,464	181370.4	1074067	69.78	10800000	Same as population. Does not take account of the expansion of the city of Moscow and the reduction in the size of the Moscow Oblast that took place on 1 July 2012.
Government investment per capita (roubles)	159,327	475038.5	1104293	52.8	159089	Same as population. Figure for 1989 extrapolated from figures for 1990 and 1991.

Source: Prepared by the author.

To confirm the effectiveness of variables that have been used in previous research, the analysis here will also use them. To show economic conditions, the author will use average income per capita, average expenditure on charged services per capita, average expenditure on services for living per capita, and the consumer price index[11]. The author expects migration to occur from regions with lower incomes and expenditures to regions with higher ones. Migration can also be expected to occur from regions with a high price index to regions with a low one. The level of infrastructure is also expected to have an effect on population migration patterns. As measures of the level of infrastructure, the total length of railways, the total length of paved roads per unit of land area, and the number of buses per resident will be used. In addition, the analysis here uses the number of doctors per resident and the number of hospital beds per resident as indicators of social infrastructure. The analysis will also take account of population density. It can be assumed that regions with better infrastructure or regions that are more densely populated will attract people from regions with poorer infrastructure or regions that are less densely populated. Furthermore, previous research has pointed out the fact that population structure affects interregional population migration patterns, so the author will employ the proportion of people who live in cities, the proportion of people who have not yet reached working age, and the proportion of people who have reached the age at which they are eligible to receive a pension to confirm the effect that these variables have.

Just as Andrienko and Guriev (2004), Gerber (2006) and Vakulenko, Mkrtchyan and Furmanov (2011) did, the analysis here will avoid the problem of endogeneity by giving all the explanatory variables the values of one period (one year) before the interregional population migration. The variables will be ratios between origins and destinations of each indicator[12]. Regarding the population of regions, the author will employ the population of the origin and the population of destination separately. At the same time, the analysis will look at the dummy for Extreme North regions and the dummy for regions that produce oil or natural gas separately for the

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[11] 'Average expenditure on charged services per capita' and 'average expenditure on services for living per capita' are Soviet/post-Soviet categories of expenditure. The former involves expenditure on transport, communication, education, travel, healthcare, cultural activities (museums, theatres, and so on), and in the case of the latter they are expenditures on shoes, clothing, machine repairs, cleaning, home renovations, saunas, and so on. Variables that denote monetary amounts such as incomes and expenditure result in serious problems. Refer to Note 13 for more information on this.

[12] This is to avoid problems that could be generated by monetary indicators. In 1992-95 hyperinflation occurred, and no reliable deflator exists. In addition, a redenomination was carried out in 1998. To avoid such problems, Andrienko and Guriev (2004), for example, use the ratio of nominal income to 'minimum living expenses' as the income variable. In this paper, the author will employ the ratio of incomes in the origin and the destination and the ratio of the amount of government investment in the two regions directly as explanatory variables. By doing this, the author intends to eliminate problems stemming from the units of measurement.

origin and the destination. Variables other than dummy variables will be converted into logarithms. Therefore, regional pairs between which no population migration occurred, will not be included in the sample[13]. Definitions of, sources of, and the quantities of descriptive statistics for all the variables are shown in Table 2.

4.2 Results

The results of the analysis are shown in Tables 3A and 3B. In Table 3A, the author has used all observations (total migration: at least one person migrated), while in Table 3B the author extracted regional pairs between which migration on a certain scale occurred[14]. In other words, with the latter, the analysis used interregional migration that accounts for 90, 80, 70, and 60 percent of the total flow, extracting regions in the order of the scale of migration, and analysed each data set. This is significant because of the following reasons. The data is used here is regional level data, but the analysis is attempting to explain the scale of population migration using macro indicators. Therefore, supposing one or two people migrated between two regions, it would probably not be appropriate to explain that using macro data. If interregional migration arises due to differences in the level of economic development, it is difficult to imagine that the volume of migration would be on such a small scale, so it can be said that it is likely that such migration is due to factors that cannot be identified using macro variables. Such migration therefore needs to be excluded, with the analysis only being performed for the main types of migration. However, regardless of the criteria that are applied, there is a risk of criticism that they are arbitrary. The author will therefore set a number of criteria and perform an analysis for each of them. By doing that, the author intends to identify variables that will yield more stable results. The analysis will therefore focus more on Table 3B than Table 3A, and in the latter the author will focus

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[13] As methods for dealing with these missing figures, previous research has set the population migration figure as 1 or 0.5 (Guriev and Vakulenko, 2015). This cannot escape criticism as being arbitrary. Regardless of whether 1 or 0.5 is set for the number of migrations for calculation purposes for the regional pairs with zero migrations (a total of 8,824), the results of analysis for the entire sample were qualitatively the same as when zero migrations was treated as a missing value (when excluded from the sample; as shown in Table 3A).

[14] Total interregional migration (excludes migration within regions) was more than 30.53 million persons in 159,290 regional pairs over the 24 years. 58,308 regional pairs saw migration of 91 people or more, and these regional pairs accounted for migration of 27.47 million people (90 per cent of the total). Similarly, a total of 34,477 regional pairs saw migration of 178 people or more, and these regional pairs accounted for migration of 24.43 million people (80 per cent). 21,207 pairs saw migration 305 people or more, and these regional pairs accounted for 21.37 million people (70 per cent). Finally, 13,202 regional pairs saw migration of 484 people or more, and these accounted for 18.32 million people (60 per cent). These were the subsets of each analysis. However, even if migration of at least one person occurred, there were cases in which the other data was missing, so the actual number of observations used in the analysis was smaller than this. Refer to Table 3B.

Table 3A Results based on all observations.

	All the Samples								
	Pooled OLS			Fixed Effect Model			Random Effect Model		
	Coefficient	SD	t	Coefficient	SD	t	Coefficient	SD	z
Distance	-0.47	0.0033	**	(omitted)			-0.45	0.016	**
Population (origin)	0.43	0.0021	**	(omitted)			0.52	0.0089	**
Population (destination)	0.42	0.002	**	1.33	0.033	**	0.502	0.0096	**
Population in cities	-0.12	0.0087	**	0.11	0.032	**	0.046	0.025	+
Population not reached working age	-0.33	0.016	**	0.02	0.031		-0.031	0.028	
Population eligible to receive a pension	-0.02	0.011	+	-0.049	0.016	**	-0.036	0.014	*
Expenditure on charged services	-0.0033	0.0052		0.0058	0.0047		0.0058	0.0047	
Expenditure on services for living	0.0076	0.0026	**	0.016	0.0023	**	0.016	0.0023	**
Price index	-0.036	0.013	**	-0.014	0.064	*	-0.014	0.0064	**
Average income	0.061	0.0058	**	0.047	0.0063	**	0.045	0.0062	**
No. of doctors	-0.054	0.0046	**	-0.038	0.0086	**	-0.048	0.0086	**
No. of hospital beds	-0.078	0.0079	**	0.048	0.083	**	0.046	0.0082	**
Total length of railways	0.0067	0.0019	**	0.0023	0.0079		0.018	0.0057	**
Total length of paved roads	0.021	0.0024	**	-0.028	0.0044	**	-0.014	0.004	**
No. of buses	0.016	0.0021	**	0.0038	0.0024	+	0.004	0.0024	+
Extreme North (origin)	0.32	0.0059	**	(omitted)			0.46	0.025	**
Extreme North (destination)	0.3	0.0054	**	(omitted)			0.31	0.022	**
Oil/Gas (origin)	0.038	0.0048	**	-0.031	0.0083	**	-0.028	0.0079	**
Oil/Gas (destination)	0.11	0.0051	**	0.035	0.008	**	0.039	0.0074	**
January temperature	0.0064	0.00026	**	(omitted)			0.0016	0.0012	
Population density	0.016	0.0014	**	-0.61	0.022	**	0.042	0.0042	**
Government investment	0.072	0.0093	**	0.046	0.0061	**	0.052	0.0059	**
(baseline for interaction terms: Government investment * 1989 year dummy)									
Government investment*1990	-0.017	0.014		-0.022	0.0042	**	-0.019	0.0041	**
Government investment*1991	-0.036	0.013	**	-0.039	0.0054	**	-0.038	0.0053	
Government investment*1992	-0.062	0.012	**	-0.058	0.0054	**	-0.058	0.0053	**
Government investment*1993	-0.091	0.011	**	-0.083	0.006	**	-0.086	0.0059	**
Government investment*1994	-0.074	0.012	**	-0.075	0.0065	**	-0.079	0.0064	**
Government investment*1995	-0.068	0.012	**	-0.061	0.0067	**	-0.065	0.0066	**
Government investment*1996	-0.086	0.011	**	-0.061	0.0066	**	-0.066	0.0065	**
Government investment*1997	-0.091	0.011	**	-0.061	0.0065	**	-0.066	0.0064	**
Government investment*1998	-0.083	0.011	**	-0.061	0.0064	**	-0.068	0.0063	**
Government investment*1999	-0.058	0.011	**	-0.036	0.0065	**	-0.043	0.0064	**
Government investment*2000	-0.035	0.011	**	-0.021	0.0065	**	-0.028	0.0064	**
Government investment*2001	-0.046	0.011	**	-0.024	0.0065	**	-0.03	0.0064	**
Government investment*2002	-0.046	0.011	**	-0.026	0.0064	**	-0.032	0.0063	**
Government investment*2003	-0.039	0.011	**	-0.021	0.0065	**	-0.027	0.0064	**
Government investment*2004	-0.046	0.011	**	-0.22	0.0066	**	-0.028	0.0065	**
Government investment*2005	-0.042	0.011	**	-0.014	0.0067	*	0.02	0.0066	**
Government investment*2006	-0.051	0.011	**	-0.025	0.0068	**	-0.032	0.0066	**
Government investment*2007	-0.045	0.012	**	-0.0096	0.0069		-0.018	0.0068	**
Government investment*2008	-0.032	0.012	**	-0.0045	0.007		-0.014	0.0069	*
Government investment*2009	-0.041	0.011	**	-0.012	0.0069	+	-0.019	0.0068	**
Government investment*2010	-0.021	0.011	+	0.0028	0.0069		-0.0052	0.0067	
Government investment*2011	-0.034	0.011	**	-0.0066	0.0069		-0.014	0.0007	*
Government investment*2012	-0.039	0.011	**	-0.01	0.0071		-0.019	0.0069	**
Year fixed effect (base: 1989)	Yes. All were negative and significant.			Yes. All were negative and significant.			Yes. All were negative and significant.		
Constant	-8.56	0.039	**	-16.85	0.48	**	-10.98	0.2	**

Pooled OLS	Fixed Effect Model	Random Effect Model
Observations: 126,987	Observations: 126,987	Observations: 126,987
F(68,126918) = 3025.25	Samples: 5,700	Samples: 5,700
Prob > F = 0.0000	F(63,5699) = 636.56	Wald chi2(68) = 50100.97
R-sq: 0.62	Prob > F = 0.0000	Prob > chi2 = 0.0000
	R-sq:	R-sq.
	Within = 0.48	Within = 0.487
	Between = 0.055	Between = 0.64
	Overall = 0.053	Overall = 0.61
	Sargan Test statistic = 865.96; P-value = 0.0000	

Source: Prepared by the author.

	I. 90 % of Total Migraion: Region pairs with more than 91 migrants.						II. 80 % of Total Migraion: Region pairs with more than 178 migrants.					
	FE			RE			FE			RE		
	Coefficient	SD	t	Coefficient	SD	z	Coefficient	SD	t	Coefficient	SD	z
Distance	(omitted)			-0.39	0.015	**	(omitted)			-0.38	0.015	**
Population (origin)	1.19	0.047	**	0.3	0.011	**	(omitted)			0.21	0.012	**
Population (destination)	(omitted)			0.65	0.011	**	1.19	0.058	**	0.29	0.012	**
Population in cities	0.039	0.049		-0.092	0.029	**	-0.013	0.062		-0.16	0.033	**
Population not reached working age	-0.0017	0.043		-0.026	0.037		0.0048	0.05		-0.0069	0.042	
Population eligible to receive a pension	0.032	0.022		0.032	0.018	+	0.062	0.028	*	0.056	0.021	+
Expenditure on charged services	-0.02	0.0059	**	-0.022	0.0059	**	-0.016	0.008	+	-0.021	0.0078	**
Expenditure on services for living	0.019	0.0031	**	0.018	0.0031	**	0.018	0.041	**	0.017	0.0041	**
Price index	-0.016	0.006	**	-0.018	0.0061	**	-0.021	0.0079	**	-0.022	0.0081	**
Average income	0.085	0.008	**	0.081	0.008	**	0.01	0.0098	**	0.099	0.0099	**
No. of doctors	-0.056	0.013	**	-0.069	0.012	**	-0.034	0.016	*	-0.062	0.016	**
No. of hospital beds	0.031	0.011	**	0.021	0.011	+	0.011	0.016		0.0041	0.016	
Total length of railways	0.023	0.012	+	0.019	0.0071	**	0.035	0.015		0.025	0.0077	**
Total length of paved roads	-0.031	0.0063	**	-0.011	0.0054	*	-0.03	0.0081	**	-0.0071	0.0066	
No. of buses	0.021	0.0039	**	0.02	0.0039	**	0.025	0.0049	**	0.028	0.0049	**
Extreme North (origin)	(omitted)			0.36	0.025	**	(omitted)			0.28	0.026	**
Extreme North (destination)	(omitted)			0.31	0.024	**	(omitted)			0.29	0.028	**
Oil/Gas (origin)	-0.045	0.013	**	-0.029	0.012	*	-0.053	0.016	**	-0.019	0.014	
Oil/Gas (destination)	0.033	0.013	**	0.043	0.011	**	0.031	0.015	*	0.043	0.012	*
January temperature	(omitted)			0.0041	0.001	**	(omitted)			0.0042	0.001	**
Population density	0.74	0.036	**	0.028	0.0046	**	-0.39	0.038	**	0.015	0.005	**
Government investment	0.054	0.0064	**	0.052	0.0062	**	0.061	0.0074	**	0.054	0.0072	**
(baseline for interaction terms: Government investment * 1989 year dummy)												
Government investment*1990	-0.023	0.0039	**	-0.019	0.0037	**	-0.027	0.0044	**	-0.021	0.0042	**
Government investment*1991	-0.031	0.0048	**	-0.026	0.0047	**	-0.033	0.0055	**	-0.024	0.0054	**
Government investment*1992	-0.063	0.0054	**	-0.059	0.0052	**	-0.071	0.0061	**	-0.064	0.0059	**
Government investment*1993	-0.085	0.0063	**	-0.082	0.0061	**	-0.089	0.007	**	-0.082	0.0069	**
Government investment*1994	-0.085	0.0068	**	-0.084	0.0066	**	-0.089	0.0077	**	-0.086	0.0075	**
Government investment*1995	-0.059	0.0068	**	-0.061	0.0067	**	-0.065	0.0079	**	-0.066	0.0078	**
Government investment*1996	-0.062	0.0068	**	-0.064	0.0066	**	-0.064	0.0078	**	-0.065	0.0077	**
Government investment*1997	-0.063	0.0067	**	-0.064	0.0065	**	-0.065	0.0078	**	-0.066	0.0077	**
Government investment*1998	-0.065	0.0066	**	-0.066	0.0064	**	-0.071	0.0077	**	-0.07	0.0075	**
Government investment*1999	-0.034	0.0068	**	-0.034	0.0066	**	-0.042	0.008	**	-0.039	0.0078	**
Government investment*2000	-0.019	0.0068	**	-0.02	0.0066	**	-0.025	0.008	**	-0.023	0.0078	**
Government investment*2001	-0.028	0.0069	**	-0.028	0.0067	**	-0.037	0.0083	**	-0.034	0.0081	**
Government investment*2002	-0.026	0.0067	**	-0.026	0.0066	**	-0.036	0.0079	**	-0.031	0.0078	**
Government investment*2003	-0.021	0.0068	**	-0.019	0.0066	**	-0.036	0.0082	**	-0.029	0.0079	**
Government investment*2004	-0.025	0.0069	**	-0.024	0.0067	**	-0.04	0.0082	**	-0.034	0.0079	**
Government investment*2005	-0.016	0.0072	**	-0.015	0.0069	*	-0.032	0.0085	**	-0.025	0.0082	**
Government investment*2006	-0.015	0.0075	+	-0.012	0.0072	+	-0.031	0.009	**	-0.023	0.0087	**
Government investment*2007	-0.007	0.0078		-0.0041	0.0074		-0.022	0.0094	*	-0.013	0.0087	
Government investment*2008	0.00032	0.0078		0.0034	0.0074		-0.014	0.0095		-0.0055	0.0089	
Government investment*2009	-0.00062	0.0077		0.0023	0.0073		-0.0057	0.0094		0.003	0.0089	
Government investment*2010	0.0098	0.0076		0.014	0.0073	+	0.0041	0.0091		0.014	0.0086	
Government investment*2011	-0.014	0.0078	+	-0.0093	0.0075		-0.022	0.0092	+	-0.0093	0.0088	
Government investment*2012	-0.022	0.0081	**	-0.019	0.0077		-0.03	0.0096	**	-0.021	0.009	*
Year fixed effect (base: 1989) Constant	Yes. Negative and significant in 1990-2010; Positive and significant in 2011-12.			Yes. Negative and significant in 1990-2011. Not significant in 2012.			Yes. Negative and significant in 1990-2010; Positive and significant in 2011-12.			Yes. Negative and significant in 1990-2010; Positive and significant in 2011-12.		
Constant	-15.03	0.69	**	-5.77	0.25	**	-14.55	0.84	**	-3.54	0.26	**

I. 90 % of Total Migraion		II. 80 % of Total Migraion	
FE	RE	FE	RE
Observation: 49,862	Observation: 49,862	Observation: 29,237	Observation: 29,237
Sample: 3,701	Sample: 3,701	Sample: 2,553	Sample: 2,553
F(63,3700) = 309.94	Wald chi2(68) = 20719.96	F(63,2552) = 219.04	Wald chi2(68) = 13476.38
Prob > F = 0.0000	Prob > chi2 = 0.0000	Prob > F = 0.0000	Prob > chi2 = 0.0000
R-sq.	R-sq.	R-sq.	R-sq.
Within = 0.55	Within = 0.53	Within = 0.55	Within = 0.53
Between = 0.045	Between = 0.24	Between = 0.003	Between = 0.16
Overall = 0.037	Overall = 0.29	Overall = 0.013	Overall = 0.24
Sargan Test statistic = 3773.3; P-value = 0.0000		Sargan Test statistic = 2817.98; P-value = 0.0000	

Source: Prepared by the author.

Table 3B Results based on Subsets. (cont.)

	III. 70% of Total Population: Region pairs with more than 305 migrants.						IV. 60% of Total Population: Region pairs with more than 484 migrants.					
	FE			RE			FE			RE		
	Coefficient	SD	t	Coefficient	SD	z	Coefficient	SD	t	Coefficient	SD	z
Distance	(omitted)			-0.37	0.017	**	(omitted)			-0.35	0.02	**
Population (origin)	(omitted)			0.17	0.014	**	(omitted)			0.13	0.016	**
Population (destination)	1.14	0.07	**	0.23	0.013	**	1.01	0.079	**	0.19	0.015	**
Population in cities	0.0035	0.079		-0.12	0.039	**	-0.12	0.083		-0.17	0.044	**
Population not reached working age	-0.039	0.056		-0.029	0.047		0.013	0.059		0.012	0.051	
Population eligible to receive a pension	0.039	0.034		0.025	0.026		0.056	0.042		0.053	0.031	+
Expenditure on charged services	-0.014	0.01		-0.019	0.0098	*	-0.013	0.013		-0.021	0.012	+
Expenditure on services for living	0.016	0.0052	**	0.014	0.0053	**	0.015	0.0064	*	0.014	0.0065	*
Price index	-0.0063	0.0096		-0.012	0.0099		-0.023	0.01	*	-0.032	0.011	**
Average income	0.102	0.012	**	0.098	0.012	**	0.12	0.014	**	0.11	0.014	**
No. of doctors	-0.024	0.018		-0.055	0.019	**	-0.0095	0.019		-0.039	0.021	+
No. of hospital beds	0.0091	0.02		0.0018	0.021		-0.013	0.023		-0.013	0.024	
Total length of railways	0.056	0.021	*	0.025	0.0089	**	0.063	0.029	*	0.028	0.011	**
Total length of paved roads	-0.019	0.01	+	0.0042	0.0084		-0.022	0.011	+	-0.0042	0.0097	
No. of buses	0.026	0.0059	**	0.028	0.0063	**	0.029	0.0067	**	0.029	0.007	**
Extreme North (origin)	(omitted)			0.23	0.029	**	(omitted)			0.19	0.034	**
Extreme North (destination)	(omitted)			0.24	0.034	**	(omitted)			0.22	0.041	**
Oil/Gas (origin)	-0.046	0.017	**	-0.01	0.016		-0.046	0.016	**	-0.0059	0.015	
Oil/Gas (destination)	0.049	0.018	**	0.065	0.014	**	0.043	0.022	*	0.053	0.016	**
January temperature	(omitted)			0.0032	0.001	**	(omitted)			0.0033	0.001	**
Population density	-0.36	0.048	**	0.0033	0.0056		-0.29	0.057	**	0.0021	0.0062	
Government investment	0.055	0.0087	**	0.042	0.0084	**	0.042	0.011	**	0.03	0.01	**
(baseline for interaction terms: Government investment * 1989 year dummy)												
Government investment*1990	-0.033	0.0052	**	-0.023	0.0049	**	-0.032	0.0061	**	-0.023	0.0058	**
Government investment*1991	-0.038	0.0063	**	-0.023	0.0063	**	-0.027	0.0071	**	-0.017	0.0073	*
Government investment*1992	-0.065	0.0069	**	-0.052	0.0068	**	-0.059	0.0081	**	-0.048	0.0078	**
Government investment*1993	-0.083	0.008	**	-0.07	0.0079	**	-0.066	0.0091	**	-0.055	0.0089	**
Government investment*1994	-0.082	0.0088	**	-0.073	0.0087	**	-0.065	0.01	**	-0.057	0.01	**
Government investment*1995	-0.059	0.0091	**	-0.054	0.0091	**	-0.046	0.011	**	-0.043	0.011	**
Government investment*1996	-0.055	0.0089	**	-0.05	0.0088	**	-0.044	0.011	**	-0.04	0.011	**
Government investment*1997	-0.057	0.009	**	-0.052	0.0088	**	-0.049	0.011	**	-0.045	0.011	**
Government investment*1998	-0.068	0.0091	**	-0.061	0.0087	**	-0.064	0.011	**	-0.059	0.011	**
Government investment*1999	-0.044	0.0095	**	-0.036	0.0091	**	-0.041	0.012	**	-0.035	0.011	**
Government investment*2000	-0.027	0.0096	**	-0.018	0.0092	*	-0.022	0.012	+	-0.015	0.011	
Government investment*2001	-0.037	0.01	**	-0.028	0.0096	**	-0.033	0.012	**	-0.023	0.011	*
Government investment*2002	-0.039	0.0095	**	-0.027	0.0091	**	-0.033	0.012	**	-0.021	0.011	*
Government investment*2003	-0.042	0.0098	**	-0.028	0.0093	**	-0.035	0.012	**	-0.021	0.011	+
Government investment*2004	-0.042	0.0099	**	-0.028	0.0094	**	-0.035	0.012	**	-0.022	0.011	*
Government investment*2005	-0.041	0.01	**	-0.026	0.0096	**	-0.032	0.013	*	-0.018	0.011	
Government investment*2006	-0.04	0.011	**	-0.024	0.01	*	-0.033	0.014	*	-0.018	0.013	
Government investment*2007	-0.031	0.011	**	-0.013	0.01		-0.027	0.014	*	-0.01	0.012	
Government investment*2008	-0.017	0.012		-0.00007	0.011		-0.018	0.014		-0.0021	0.013	
Government investment*2009	-0.0062	0.012		0.01	0.011		-0.0066	0.014		0.0077	0.013	
Government investment*2010	-0.0018	0.011		0.017	0.01		0.00092	0.014		0.017	0.012	
Government investment*2011	-0.018	0.011	+	0.0019	0.01		-0.014	0.013		0.008	0.012	
Government investment*2012	-0.024	0.011	*	-0.0057	0.011		-0.016	0.014		0.0045	0.013	
Year fixed effect (base: 1989) Constant	Yes. Negative and significant in 1990-2010; Positive and significant in 2011-12.			Yes. Negative and significant in 1990-2010; Positive and significant in 2011-12.			Yes. Negative and significant in 1990-2010; Positive and significant in 2011-12.			Yes. Negative and significant in 1990-2010; Positive and significant in 2011-12.		
Constant	-13.71	1.02	**	-1.87	0.27	**	-11.64	1.16	**	-0.73	0.29	*
	Observation: 17,953			Observation: 17,953			Observation: 11,143			Observation: 11,143		
	Samples: 1,670			Samples: 1,670			Samples: 1,084			Samples: 1,084		
	F(63,3700) = 155.76			Wald chi2(68) = 9228.77			F(63,2552) = 125.57			Wald chi2(68) = 7352.83		
	Prob > F = 0.0000			Prob > chi2 = 0.0000			Prob > F = 0.0000			Prob > chi2 = 0.0000		
	R-sq:			R-sq.			R-sq:			R-sq.		
	Within = 0.56			Within = 0.52			Within = 0.59			Within = 0.57		
	Between = 0.033			Between = 0.12			Between = 0.0009			Between = 0.071		
	Overall = 0.018			Overall = 0.22			Overall = 0.022			Overall = 0.19		
	Sargan Test statistic = 2173.47; P-value = 0.0000						Sargan Test statistic = 1495.59; P-value = 0.0000					

Source: Prepared by the author.

more on cases in which the sample size is smaller (an analysis that specialises in regional pairs with large-scale migration).

Regardless of what criteria for the scale of migration are used to make the partitions, it is shown that fixed-effect models should be chosen. However, to view the impact of factors that do not change over time, such as the distance between regions, the author will refer to the results of random-effect models. The distance variable stably obtains a significant negative coefficient, and population size stably obtains a significant positive coefficient for both origin and destination. These match the findings of Andrienko and Guriev (2004), Kumo (2007) and Oshchepkov (2011), and the impact of these variables on population migration patterns could be confirmed. Differences are therefore shown with the results that were observed throughout the Soviet era (Mitchneck, 1991; Cole and Filatotchev, 1992). Income and expenditure on services for living obtain significant positive coefficients throughout the period, while the price index obtains a significant negative coefficient. These findings are also in line with expectations. The former may indicate that the poverty trap pointed out by Andrienko and Guriev (2004) has been eliminated. The results for the value of consumption of charged services were unstable or obtained a negative coefficient, and this may mean that the price of services is high in regions that are sparsely populated.

Stable results for the number of doctors and hospital beds could be obtained in the case of Table 3A but not in Table 3B. Attention probably needs to be paid to the fact that the highest numbers for both the number of doctors per capita and the number of beds per capita were observed in regions with extremely small populations[15].

Although these indicators have been used as variables in the economic analysis of the Soviet Union and Russia for many years (Andrienko and Guriev, 2004; Oshchepkov, 2008; Guriev and Vakulenko, 2015), it may be worth re-examining their usefulness as explanatory variables. Regarding railway density and the number of buses per resident, though not the case in Table 3A, in most cases in Table 3B, a significant positive coefficient was obtained, which is what was expected. The density of paved roads was strongly correlated with the density of railways (r=0.73), and this may be the reason that results could not be obtained. The Extreme North dummy obtained a positive and significant coefficient for both origins and destinations, which is the same finding as in Kumo (2007). The fact that it is not significant for the origin alone may mean that resource-producing regions in the Extreme North play a certain role not only

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[15] For example, in 2008 the regions with the most hospital beds per capita were the Chukot Autonomous Okrug, Magadan Oblast, Tyva Republic, Sakhalin Oblast, Jewish Autonomous Oblast, and Murmansk Oblast. Regarding the number of doctors, the city of Saint Petersburg was at the top throughout the period, followed by the Chukot Autonomous Okrug and the city of Moscow. These were followed by regions that are far away from European Russia, namely the Republic of North Ossetia, Tomsk Oblast, Astrakhan Oblast, and Amur Oblast.

in sending people but also in receiving them. This may be a coincidence with the fact that the coefficient for the average temperature in January was significant and positive. In other words, it may match the fact that people migrate to colder places[16]. The same explanation may be used for fact that similar results were found for population density. Regarding population structure, stable results could not be obtained for the proportion of people living in cities, the proportion of the population who were children, and the proportion of the population of an age that is eligible to receive a pension. Moiseenko (2004) pointed out the effect of age structure on population migration, namely the fact that in Russia the propensity to migrate is higher the younger the people are, possibly, this is a factor that ought to be taken account of at the individual level. Alternatively, because resource-producing regions, many of which are situated in the Extreme North, attract people, the proportion of the population that is of working age and the proportion of the population that are children is high. On the other hand, remote regions in the Extreme North such as Magadan Oblast and the Chukot Autonomous Okrug have experienced large population outflows. Such diversity among regions may also lead to ambiguous findings such as these.

Now let the author look at the dummy for oil/gas-producing regions, which the analysis employed to find out about conditions unique to Russia, and per-capita government investment, which takes account of changes that have occurred since the collapse of the Soviet Union. The dummy for oil/gas-producing regions, obtains a significant and positive coefficient for the destination with every sample. For the origin, meanwhile, although it is insignificant in some cases, in cases where it is significant, it always obtained a negative coefficient. This matches the predictions made before the analysis, and demonstrate a result that is even clearer than Kumo (2007), the only previous study to have employed similar indicators. As the author mentioned earlier, from the 1990s to 2010, minerals accounted for between 40 per cent and over 60 percent of the value of exports. In addition, 50 per cent of federal government revenue came from oil and natural gas. As a result, there is no question that mineral and resource production affects the Russian economy as a whole (Kuboniwa, 2014). Furthermore, these results show that it also affects the direction of interregional population migration.

Per-capita government investment exhibited clear results. With the explanatory variable for 1989 (which is supposed to explain interregional migration patterns in 1990) as the base, it can be seen that the coefficient was significantly smaller, or that it was negative, throughout the 1990s. This means that interregional population migration patterns at the end of the Soviet era were significantly different from those following the collapse of the Soviet Union. During the Soviet era, the main targets of government

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[16] No region had an average January temperature of more than zero degrees Celsius.

investment and the direction of migration matched each other, and this probably indicates that government investment was effective as an incentive for regional development. At the same time, although Sonin (1980) Milovanov (1994) have pointed out that during the Soviet era people were seen to migrate in a manner that was unrelated to government policy, this can also be said to suggest that the regional allocation of population through policy incentives was effective to a certain extent. It also shows that during the 1990s, after the collapse of the Soviet Union, government policy was no longer significant as policy incentive in the context of regional development[17].

The changes that occurred during the 2000s need to be mentioned here. Whichever results are used, in the middle of the 2000s at the latest, the interaction term of the amount of government investment with 1989 as the base and the year dummy ceased to be significant. In other words, as was the case in the Soviet era, regions that were intensively targeted for government investment and the direction of population migration tended to match each other. However, it should be borne in mind that this does not mean that the same phenomena that occurred during the Soviet era had re-emerged. This is because there was a big difference between the regional distribution of per-capita government investment in the Soviet era and in the new Russia (see Table A1). In other words, even if government investment in the Soviet era was implemented as a development incentive for remote areas in regions such as the Extreme North, it is likely that the regional allocation of government investment in the new Russia was conducted in such a way that a conclusion like that cannot be drawn. If, from the 2000s onwards, money was allocated with more of a focus on resource development, such a change would obviously have occurred. Note that government investment as used here refers to 'basic investment'. It generally denotes capital for production purposes. It should therefore be borne in mind that the above interpretation is consistent with the

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[17] There are a number of problems with the data used here. First, some of the explanatory variables for 1989 are estimates (see Table 2 for details). The figure for the amount of government investment in 1989, in particular, was extrapolated from the figures for 1990 and 1991. The author also performed an analysis based on data for 1990, the oldest year for which actual figures could be used. According to that, either the interaction term of government investment and the year dummy ceased to be significant at an early stage (from the beginning of the 2000s or the end of the 1990s) or a positive and significant coefficient is obtained depending on subsets that limit the number of observations. However, a similar explanation can be made when the estimated 1989 data is used as the base. Furthermore, it is difficult to imagine that during the Soviet era development policy changed all that much from year to year, and the regional distribution of government investment in 1989, for which the figure is an estimate, government investment in 1990, and government investment in 1991 are all highly correlated with each other (see Table A1). As a result, rather than excluding the data for 1989 from the analysis, the author emphasises the use of interregional population migration in 1990, during the Soviet era, which is rare data. Second, as the author mentioned in Note 7, there is the problem that in 2011 the definitions used in population migration statistics changed. With regard to this point, the author performed an analysis using only migration data for the period to 2010 and confirmed that the results were qualitatively similar.

nature of that investment.

5. Conclusions

As had been confirmed in previous research (Andrienko and Guriev, 2004; Oshchepkov, 2008), the analysis in this paper showed that for the analysis of interregional population migration patterns in Russia, normal techniques can be adequately applied. Regions with higher populations and income levels attract people. This is obvious, but it needs to be stressed that during the Soviet era it was not the case (Mitchneck, 1991). Outflows from remote regions and inflows into resource-producing regions situated in the Extreme North occurred simultaneously. Therefore the results are not straightforward, but the overall trends   can be said to be understandable generally. It could be assumed that because Russia possesses a wealth of mineral and energy resources, oil/gas-producing regions attract people from other regions. Kumo (2007) also pointed out that interregional migration patterns in Russia are partially shaped by such regions, but in this paper the author was able to confirm that using a much broader set of data. On the other hand, it can perhaps be said that the fact that climatic conditions did not yield any marked results is indicative of a phenomenon unique to Russia, namely that resources are located in regions with harsh climate conditions. Government investment affected population migration patterns in the Soviet era, but its impact waned conspicuously after the collapse of the Soviet Union. Either that or it ceased to function as an explanatory variable. That phenomenon was in itself predictable, but the analysis conducted in this paper has been the first one to employ data from the Soviet era to show that change clearly.

Nevertheless, the analysis in this paper remains insufficient. Materials relating to economic variables in the Soviet era are still impossible to obtain fully, so some of the analysis is based on estimates. Furthermore, it was in 1987 that the Gorbachev administration, the final government of the Soviet era, implemented the perestroika (restructuring) reforms. Turmoil followed, and the Soviet Union was dissolved on 25 December 1991. In light of that, in order to compare the Soviet era with modern Russia, it is necessary to use interregional migration statistics dating back to before 1990. Efforts need to be made to secure additional data. In addition, when analysing Soviet and Russian economic dynamics diachronically, it is usual to come up against inconsistent definitions of indicators, so it will be necessary to try to identify convincing variables.

In the introduction of the paper the author pointed out that one of the issues with interregional population migration would be whether it would result in a narrowing of disparities between regions in terms of the level of economic development.

Vakulenko (2014) studied the relationship between population migration and the narrowing of disparities but did not obtain clear results. In light of the findings of this paper, namely that population migration patterns in Russia have become similar to those seen in other countries, long-term inflows into regions with higher levels of economic development could serve to narrow regional economic disparities. However, if the concentration of population in Moscow continues, that may result in a short-term increase in disparities, and this confusing situation may have led to the unclear results. The usability of the data has been confirmed to some extent, and from now on it would be desirable if efforts are made to deepen the analysis.

Appendix Table and Figure.

Figure A1

Inter-regional Migration and Migration within Regions in Russia, 1990-2013.

Internal Migration (Sum of inter-regional migration and migration within regions)

Of them inter-regional migration only
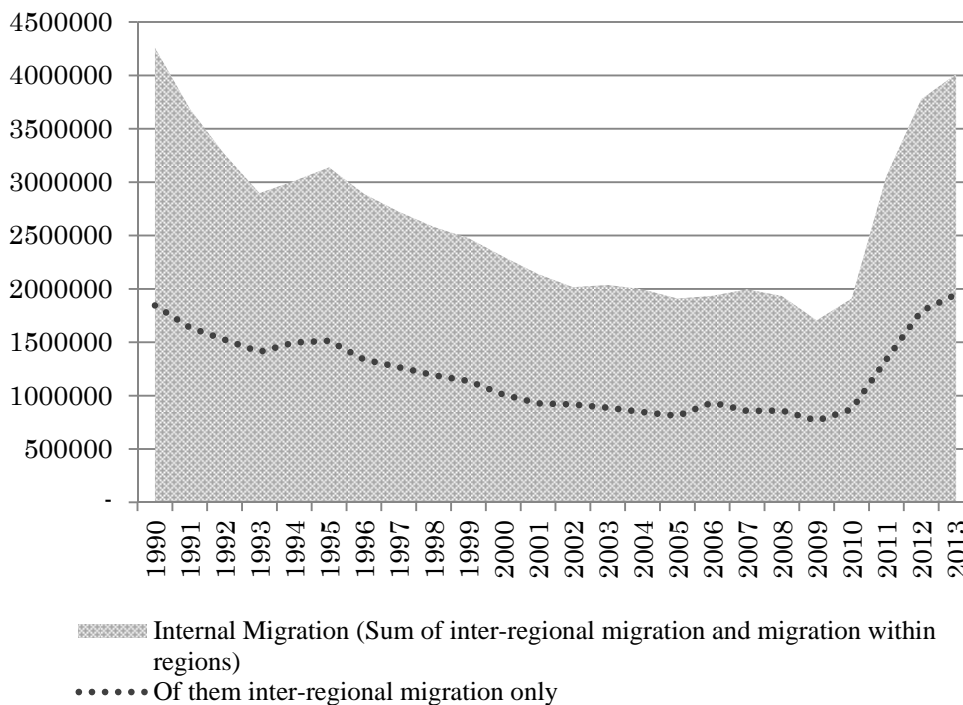
Source: Prepared by the author by the Internal Material offered by Rosstat.

Table A1

Changes in Regional Distribution of Governmental Investment per capita

(Based on 84 Regions)

Correlation Coefficients

	1989	1990	1991	1993	1995	1997	1999	2001	2003	2005	2007	2009	2011
1989	-												
1990	0.97	-											
1991	0.86	0.95	-										
1993	0.88	0.93	0.89	-									
1995	0.77	0.8	0.76	0.8	-								
1997	0.77	0.77	0.7	0.78	0.85	-							
1999	0.5	0.49	0.44	0.45	0.57	0.59	-						
2001	0.41	0.44	0.43	0.34	0.46	0.47	0.54	-					
2003	0.26	0.28	0.28	0.2	0.27	0.34	0.33	0.86	-				
2005	0.3	0.33	0.32	0.24	0.32	0.39	0.38	0.88	0.99	-			
2007	0.37	0.38	0.35	0.28	0.39	0.49	0.5	0.86	0.89	0.92	-		
2009	0.33	0.34	0.32	0.24	0.38	0.38	0.52	0.86	0.85	0.87	0.89	-	
2011	0.35	0.37	0.35	0.25	0.35	0.33	0.41	0.73	0.71	0.74	0.74	0.84	-

Spearman's Rank Correlation Coefficients

	1989	1990	1991	1993	1995	1997	1999	2001	2003	2005	2007	2009	2011
1989	-												
1990	0.92	-											
1991	0.69	0.91	-										
1993	0.65	0.71	0.67	-									
1995	0.59	0.57	0.48	0.71	-								
1997	0.56	0.54	0.43	0.64	0.69	-							
1999	0.55	0.48	0.35	0.51	0.56	0.64	-						
2001	0.56	0.57	0.51	0.51	0.59	0.6	0.75	-					
2003	0.48	0.45	0.36	0.45	0.53	0.57	0.66	0.77	-				
2005	0.51	0.48	0.42	0.44	0.44	0.55	0.66	0.71	0.78	-			
2007	0.31	0.27	0.25	0.24	0.28	0.39	0.54	0.59	0.66	0.66	-		
2009	0.37	0.33	0.28	0.3	0.41	0.37	0.59	0.69	0.66	0.66	0.67	-	
2011	0.43	0.42	0.39	0.4	0.51	0.39	0.51	0.62	0.68	0.7	0.58	0.72	-

Source: Prepared by the author by Rosstat official data.

References

Andrienko, Yu and S. Guriev (2004), Determinants of Interregional Mobility in Russia: Evidence from Panel Data, *Economics of Transition*, Vol.12, No.1, pp.1–27.

Braithwaite, J. (1995), *The Old and New Poor in Russia: Trends in Poiverty*, ESP Discussion Paper Series No.21227, World Bank.

Brown, A. N. (1997), *The Economic Determinants of the Internal Migration Flows in Russia During Transition*, William Davidson Institute Working Paper No. 89.

Cole, J.P. and I.V. Filatotchev, (1992), Some Observations on Migration within and from the Former USSR in the 1990s, *Post-Soviet Geography*, Vol.33, No.7, pp.432–453.

Dmitrieva, O. (1996), *Regional Development: The USSR and After*, Palgrave Macmillan, London.

Eliseeva, I.I. (2006) ed., *Demografiia i statistika naseleniia* (*Demography and Statistics of Population*), Finansy i statistika, Moscow. (in Russian)

Federal'naia sluzhba geodezii i kartografii Rossii (1998), *Geograficheskii atlas Rossii* (Geographical Atlas of Russia), Roskartgrafiya, Moscow. (in Russian)

Gerber, T.P. (2005), Individual and Contextual Determinants of Internal Migration in Russia: 1985–2001, University of Wisconsin, Madison, https://www.researchgate.net/publication/228375599_Individual_and_Contextual_Determinants_of_Internal_Migration_in_Russia_1985-2001. (mimeo)

Gerber, T.P. (2006), Regional Economic Performance and Net Migration Rates in Russia, 1993–2002, *International Migration Review*, Vol.40, No.3, pp.661–697.

Goskomstat Rossii (1996), *Metodologicheskie polozheniia po statistike* (*Methodological Situations in Statistics*), Logos, Moscow. (in Russian)

Goskomstat Rossii (2004), *Ekonomicheskie pokazateli raionov krainego severa i prirazhnennykh k nim mestnostei za yanvar–mart 2004 goda* (*Economic Indicators of Extreme North Regions and Equivalent Regions from January to March in 2004*), Moscow. (in Russian)

Greenwood, M.J. (1991), New Directions in Migration Research: Perspectives from Some North American Regional Science Disciplines, *Annals of Regional Science*, Vol.25, No.4, pp.237–270.

Greenwood, M.J. (2010), Some Potential New Directions in Empirical Migration Research, *Italian Journal of Regional Science*, Vol.9, No.1, pp.5–17.

Greenwood, M.J. and G.L. Hunt (2003), The Early History of Migration Research, *International Regional Science Review*, Vol.26, No1, pp.3–37.

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

Vol.43, No.3, pp.633-649.

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

INGIT (2002), *Vse goroda Rossii 2002: Bol'shaia entsiklopediia geograficheskikh kart* (*All the Cities in Russia: Encyclopedia of Geographical Maps*), INGIT, St. Petersburg. (in Russian)

Ivanova, P. (1973), O rzavitii vostochnykh raionov i obespechenii ikh rabochei siloi (On the Development of East Regions and the Maintenance of its Labor Power), *Voprosy ekonomiki* (*Problems of Economics*), No.1, pp.40–48. (in Russian)

Kuboniwa, M. (2014), A Comparative Analysis of the Impact of Oil Prices on Oil-Rich Emerging Economies in the Pacific Rim, *Journal of Comparative Economics*, Vol.42, No.2, pp.328–339.

Kumo, K. (1997), Economic System Conversion and Migration Transition in Russia, *Review of Urban and Regional Development Studies*, Vol.9, No.1, pp.20–36.

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

Kumo, K. (2007), Inter-regional Population Migration in Russia: Using an Origin-to-Destination Matrix, *Post-Communist Economies*, Vol.19, No.2, pp.131–152.

Lewis, R. A. (1969), The Postwar Study of Internal Migration in the USSR, *Soviet Geography*, Vol.10, No.4, pp.157–166.

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

Milovanov, E.V. (1994), Voprosy ekspruatatsiia Dal'nego Vostoka (Problems in Exploitation of the Far East), *Ekonomicheskaia zhizni Dal'nego Vostoka*, Vol.3, pp.37–41. (in Russian)

Mitchneck, BA. (1991), Geographical and Economic Determinants of Interregional Migration in the USSR: 1968–1985, *Soviet Geography*, Vol.32, No.3, pp.168–189.

Oshchepkov, A.Iu (2007), *Mezhregional'naia migratsiia v Rossii* (*Inter-regional Migration in Russia*), Higher School of Economics, Moscow. (mimeo) (in Russian)

Perevedentsev, (1966), *Migratsiia naseleniia i trudovye problem Sibiri* (*Population Migration and the Labor Problems in Siberia*), Nauka, Novosibirsk. (in Russian)

Sevruka, M.A. (2006), *Rossiia: federal'nye okruga i region (geografiia, nedra, istoriia, naselenie, religiia, vlast', ekonomika, sotsial'naia sfera, dostoprimechatel'nosti, strategiia razvitia). Entsiklopediia* (*Russia: Federal Districts and Regions* (*Geography, Soils, History, Population, Religion, Politics, Economy, Social Sphere, Attraction,*

Development Strategy). *Encyclopedia*), Sodruzhestvo, Moscow.

Shcherbakova, E. (2015), Demograficheskie itogi i polugodiia 2015 goda (Demographic Consequences of the First Half of 2015), *Demoskop Weekly*, No.655–656. (in Russian)

Sonin, M (1980), *Razvitie narodonaseleniia* (*Population Development*), Statistika, Moscow. (in Russian)

Thompson, N. (2005), Migration and Resettlement in Chukotka: A Research Note, *Eurasian Geography and Economics*, Vol.45, No.1, pp.73–81.

Vakulenko, E. S., N.V. Mkrtchyan and K.K. Furmanov (2011), Econometric Analysis of Internal Migration in Russia, *Montenegrin Journal of Economics*, Vol.7, No.2, pp.21–33.

Vakulenko, E.S. (2014), *Does Migration Lead to Regional Convergence in Russia?* Higher School of Economics Research Paper No.WP-BRP-53/EC/2014, Moscow.

Vishnevskii, A.G. (2014) ed., *Naselenie Rossii 2012* (Population of Russia in 2012), Izdatel'skii dom Vysshei shkoly ekonomiki, Moscow. (in Russian)

Wegren, S. and A.C. Drury (2001), Patterns of Internal Migration during the Russian Transition, *Journal of Communist Studies and Transition Politics*, Vol.17, No.4, pp.15–42.