

Gang, Ira N.; Stuart, Robert C.

**Working Paper**

## The Political Economy of Russian City Growth

Working Paper, No. 1999-08

**Provided in Cooperation with:**

Department of Economics, Rutgers University

*Suggested Citation:* Gang, Ira N.; Stuart, Robert C. (1999) : The Political Economy of Russian City Growth, Working Paper, No. 1999-08, Rutgers University, Department of Economics, New Brunswick, NJ

This Version is available at:

<https://hdl.handle.net/10419/94296>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

## The Political Economy of Russian City Growth\*

**Ira N. Gang**

Department of economics  
Rutgers University  
75 Hamilton Street  
New Brunswick, New Jersey 08901-1248  
+1 732-932- 7405  
+1 732-932-7416 (fax)  
[gang@economics.rutgers.edu](mailto:gang@economics.rutgers.edu)

and

**Robert C. Stuart**

Department of economics  
Rutgers University  
75 Hamilton Street  
New Brunswick, New Jersey, 08901-1248  
+1 732-932-8841 (7265)  
+1 732-932-7416 (fax)  
[stuart@economics.rutgers.edu](mailto:stuart@economics.rutgers.edu)

March 2, 1999

JEL Codes: J6, P20, R23

Keywords: cities, city growth, Russia, migration, urbanization

**Abstract:** This paper examines the political economy of Russian city growth. For the 1980s, we model the growth of 168 Russian cities located in 71 Russian provinces (oblast level). We examine the role of both general socio-economic characteristics and specific state controls. Our goal is to understand the extent to which state controls on city growth actually limited city growth, controlling for the usual types of forces used to explain the attractiveness of different cities. We find that even with considerable variation of model specification, direct controls remain important as a factor explaining the growth of Russian cities in the immediate pre-transition era.

\*This paper was presented at the CEPR Conference: Metropolitan Economic Performance, Lisbon, Portugal, October 1998 and Association for Comparative Economic Studies, NY, January 1999. We thank conference participants for their comments and Debajoyti Chakrabarty and Myeong-Su Yun for research assistance. We thank the Rutgers University Research Council for financial assistance.

## **The Political Economy of Russian City Growth**

### **I. Introduction**

Patterns of city growth in Russia during the plan era have always been of interest to researchers, in large part due to the unusual circumstances surrounding this growth experience. In a spatially large and diverse country over a long span of time, a variety of both market and especially non-market mechanisms were utilized by the State to influence the nature of the urbanization process and city growth patterns. The outcomes were ambiguous, controversial, and often difficult to analyze. While there is a significant body of economic theory which can be used to understand city growth patterns in market settings, developing a similar understanding of city growth patterns in the administrative command economy has been difficult.

In this study, we limit ourselves to Russia (formerly the Russian Republic) focusing on city growth rather than the more general process of urbanization. Our interest in Russia in part derives from its large size and political and economic importance in a global setting. Of greater interest to economists, however, is the fact even during the immediate pre-transition era, control mechanisms continued to play an important role in determining the outcomes of the urbanization process (Gang and Stuart 1998). Indeed, even in the transition era, the general issue of controls influencing population movement remains important and controversial (Brown 1997).

Although the available statistical evidence has made it possible to characterize the general mechanics of city growth during the plan era with reasonable accuracy, the paucity of regional data on socioeconomic variables has always limited our ability to model, and hence to understand, the impact of potentially critical socioeconomic forces.

Moreover, direct and rigorous administrative controls on migration into selected cities were in place by 1956. We combine our knowledge of the mechanics of city growth during the contemporary plan era with available (if limited) evidence on spatial patterns of socioeconomic variation. We develop the underpinnings of a political economy story of city growth during the latter years of the plan era, specifically during the 1980s. It is in this era that Soviet controls on city growth have been found to matter (Gang and Stuart 1998). Here we examine whether the specific state administered restrictions on mobility actually reduced mobility, once we account for the role a broad set of traditional socioeconomic and geographic variables influencing city growth.

In Section II, we provide a brief survey of the literature. In Section III, we present a simple model of Soviet city growth along with a discussion of the variables relevant for our estimations. In Section IV, we present our findings and an analysis of those findings. Finally, in Section V, we offer some conclusions and suggestions for further investigation.

## **II. Russian City Growth During the Plan Era: Defining Characteristics**

A great deal of attention has been paid to analyzing the spatial aspects of economic activity in the Soviet Union. Our interest in this paper is a narrow subset of these issues, specifically patterns of growth in Russian medium and large cities in the 1980s. Many authors have examined Soviet city growth. For example, a number of studies (Bater 1980, Harris 1972, Morton and Stuart 1984, Lewis and Rowland 1979) characterize the general nature of Soviet cities as part of a broader urban experience. In addition, a more focused approach to understanding city growth through the examination of migration patterns has emerged (Buckley 1995, Clayton and Richardson 1989, Mitchneck 1990,

Stuart and Gregory 1978, Grandstaff 1980) along with attempts to understand the peculiar features of the administrative command economy (Loeber 1984, Matthews 1993, Zaslavsky) and how these features influenced observed patterns of city growth.

In recent years, there has been a continuing interest in the issue of controls and the extent to which a variety of controls peculiar to the administrative command economy may or may not have affected city growth. Investigations of these issues have focused on the resulting size structure of cities (Harris 1972, Clayton and Richardson 1989), on the nature of the controls themselves (Loeber 1984, Matthews 1993, Zaslavsky 1979), and finally on the effectiveness of controls in the sense of whether or not these controls in fact limited the growth of cities (Buckley 1995, Gang and Stuart 1998).

Unfortunately, even those attempts directed at modeling the migration process to help understand patterns of city growth (Stuart and Gregory 1978, Gang and Stuart 1998) were severely limited by the absence of data. While many scholars working on the experiences of the command economies could make such a complaint, it is important to understand how fundamental such a complaint is in the present case. Thus while most models of city growth proceed by examining the relative benefits of cities vis-à-vis the nature of sending regions, even the most basic data, such as information on incomes, non-monetary social benefits and cost of living differences have generally been unavailable. Past attempts to understand Soviet city growth necessarily paid only limited attention to the critical underlying economic forces. In this paper we address the economic issues underlying Russian city growth.

We argue that the analysis of Russian city growth must account for the impact of two broad sets of forces. First, Russia is a geographically large and diverse setting, in which,

over a period of many years industrial/agricultural development and modernization has taken place. In such a setting the growth of cities can be partially explained by the traditional sorts of forces associated with explanations of city growth, that is the argued advantages of urban agglomeration. The growth of industrial and related commercial and service activities contributed actively to the growth of Russian cities over a long span of time.

Second, a major set of forces influencing the growth patterns of Russian cities (both large cities and small cities) has been what we broadly term socialist policy objectives, generally implemented through a set of non-market controls typical of more general resource allocation procedures used in the administrative command economy. The presence of these socialist policies and related control mechanisms help us to understand why we might expect patterns of Russian city growth to differ from patterns found in market economic systems. Moreover, socialist policies and controls themselves exhibited diversity from one case to another. For example, attempts might be made to limit the absolute size of a city in conformity with socialist policy objectives, while the basic *raison d'être* for the city, a steel mill developed under a different ministry, might actually be encouraging expansion of the city based upon, for example, labor requirements. Even in these cases, the policies and the mechanisms used for their implementation might seem to give mixed signals (Ofer 1976). While the basic demand for labor would be created by the state, partially dictated by factor proportions requirements and related service sector requirements, the supply of labor would be influenced through a mix of mechanisms. Formal programs of organized recruitment (*orgnabor*) might be used, while at the same time, wage differentials and newly constructed housing often owned by enterprises would

be used as a market-type attraction. Thus any modeling of city growth in the Russian context must account for both traditional and non-traditional policies and mechanisms. Indeed, the relevance of controls for understanding the growth of Russian cities can be seen in Table 1. While the percentage of the urban population living in restricted cities declined slightly between 1959 and 1989, a share over forty percent is an important component of the overall urban population. Moreover, as a share of total Russian population, the share living in restricted cities increased considerably between 1959 and 1989. The statistical importance of these controls will be evident when we examine the results of our analysis.

Our analysis proceeds on the basis of a contemporary post-Soviet body of information which both expands our knowledge of the allocation mechanisms (and hence the relevant variables for our models) and improved regional data, even if only for the final decade or so of the Soviet experience. New information allows us to proceed farther than has been the case in the previous studies cited above, and yet as we will note, there remain limitations on the sorts of data available and especially the specific years for which data are available.

### **III. Russian Cities and Socialist Controls: Modeling Growth Patterns**

Cities in Russia grew for three major reasons. First, in earlier years, there was a significant amount of re-classification, as small urban-type settlements became cities under Soviet definitions of what was an urban agglomeration.<sup>1</sup> Second, there was net internal growth where birth rates exceeded death rates. Finally, there was significant net migration (from both rural areas and from one city to another city). Both administrative

re-classification and net internal expansion (city births minus city deaths) have declined in importance over time as contributors to Russian city growth. Net migration (arrivals minus departures) has grown in importance as a source of city growth.<sup>2</sup>

To understand city growth in the plan era, we ideally should examine the forces influencing the net expansion of the cities under examination. Specifically, we would want to examine forces influencing net internal expansion and net migration. A problem of endogeneity arises in that city growth is a function of net internal growth and net migration, while these two components of growth are themselves a function of a variety of at least somewhat related forces. Here we follow tradition and presume that these forces differ. In addition to this traditional specification issue, during the plan era the growth of Russian cities was influenced by a wide variety of state policies and state controls, all of which must be considered.

We assemble a data base on 168 cities and the provinces in which they are located. A detailed description of the data can be found in Appendix A. Our analysis in this paper is limited in two important dimensions. First, we examine city growth in terms of the net migration of population, adjusting for net internal expansion (births minus deaths), but ignoring administrative reclassification (which is of reduced importance in contemporary times). Second, a more complex limitation of our analysis relates to the issue of the dispersion of cities of Russia. While we have a sample of 168 cities whose net migration can be examined, we do not know whether the source of this migration is from a different

---

<sup>1</sup> Although the definition of what is urban has varied over time, basically any population settlement over 5,000 persons would be considered urban. The cities examined in this paper would be medium and large cities. For a discussion of classification issues see Lewis and Rowland, 1979.

<sup>2</sup> For a discussion of the sources of city growth, see (Morton and Stuart, 1984, Chapter 2).



city or from a rural area. Moreover, as we will see in detail later, the regions of Russia, whatever the level of aggregation in classification, differ considerably one from another.

We focus on the expansion of medium and large Russian cities.<sup>3</sup> Relying upon traditional theoretical explanations (Brown 1997, Stuart and Gregory 1978, Grandstaff 1980, Mitchnek 1990) we argue that city growth (from net migration) is influenced by the attractiveness of the city.

We view the growth of Russian cities (from net migration) as the result of both “**carrot**” and “**stick**” forces, reflecting in a rough manner economic (market-type) and administrative (control-type) forces. As we emphasized above, both types of forces influenced population movement in Russia. However, while the dichotomy between the two types of forces is important, in fact the state role in influencing these forces was broad and inclusive. For example, wage differentials which we characterize as a market-type mechanism were in fact determined in large part by the state and could in theory be set to achieve desired policy objectives. On the other hand, even to the extent that there was wage setting by the state, this type of indirect control differed substantially from specific and direct state controls. A specific element of state controls was the administrative restriction of entry into some (though not all) Russian cities by means of the *propiska*.<sup>4</sup> There were two main types of this restriction: total restriction and expansion restriction. A number of scholars (Lewis and Rowland 1979, Matthews 1993,

---

<sup>3</sup> We analyze a sample of 168 cities. These are all non-secret cities having a population of 50,000 or more as of 1959.

<sup>4</sup> Controls in Russia during the command era were much more pervasive than those pertaining to city growth. For example, there was a system of required placement of university graduates, and a widely used system of organized recruitment for labor (*orgnabor*) redistributing labor from surplus to deficit regions. At the same time, there were market-type incentives, for example regional wage differentials, to which members of the population could and did respond. Many of these arrangements were difficult to examine during the Soviet era, when official state policy presumed to have largely eliminated regional differentials, for example, in levels of well being.

Buckley 1995, Gang and Stuart 1998) have examined the impact of these restrictions on city growth with varying results. Of the 168 cities we include in this study, 29 were subject to a total restriction, while 16 were subject to an expansion restriction.<sup>5</sup> Thus 45 of out 168 cities were administratively controlled in some fashion. Another type of administrative control is the administrative role a city plays. Seventy of our 168 cities were capitals of the regions in which they were located.

The formal administrative restrictions are for us the “stick” of migration controls and are the essential elements of socialist (non-market) mechanisms. In addition to specific administrative controls on the growth of Russian cities, a number of control variables, which we characterize as **seriously state** variables, directly influenced city growth since the variables themselves, as noted for the case of wage differentials, were controlled directly by the state. These we view as the “carrots” of migration controls. Among these state controlled variables, we include the expansion of housing, the expansion of industry (both directly controlled by the state) and finally, budget transfers, a variable that requires additional comment.

During the Soviet era, the budgetary system of Russia was described as a consolidated budget, in the sense that there was a single federal budget that included the budgets of local political units (provinces and cities). In addition to the generation of local revenues, localities were required to contribute to the federal budget, some localities receiving net contributions from the federal budget, while others made net contributions to the federal budget. These differences we describe as budget transfers, an indicator of state (regional)

---

<sup>5</sup> Specific controls to limit the growth of some (though not all) Soviet cities were mostly put in place in 1956. For a discussion of these controls, see (Buckley 1995; Lewis and Rowland 1979, Gang and Stuart, 1998).

priorities. For example, the Moscow region was a major net recipient of financial resources in the budget transfer process (Dmitrieva 1996).

While the state directly controlled access to many cities and at the same time indirectly controlled forces influencing movement into cities (for example, housing), there were other forces, less directly controlled by the state which influenced population movement. Put differently, even in a setting of significant direct and indirect controls, there remained forces to which individuals might respond, influencing population mobility. We describe these as economic variables.

Among the economic variables, we include access to higher education, availability of medical care measured by presence of doctors, rural-urban differences capturing the attractiveness of employment in the city vis-à-vis employment in a rural setting measured by the rural-urban wage differential. We also include per capita retail trade measuring the availability of consumer goods, the share of labor in industry, budget transfers as a measure of state priority assigned to different cities, divorce rates and convictions for crimes, both measures of social stability and finally, temperature differences.

Our tripartite grouping of forces influencing city growth is in part arbitrary, since all of these variables were influenced in varying degrees by the state. However, as data permits, an understanding of how these variables differ from a theoretical perspective will facilitate a better understanding of how city growth process functioned in reality.

Our analysis thus far has focused on understanding the growth of Russian cities by examining their attractiveness as measured by a range of forces, some state controlled and some more typical of market settings. Our concept of attractiveness reflects

differences in these allocational influences across our sample of cities vis-à-vis the (regional) sources from which our sample cities have received net migration.

Unfortunately, our data does not permit a direct pairing of sending and receiving regions, an approach desirable in migration studies. To address this issue, we have emphasized the importance of characterizing the relative attractiveness of our cities. Even here we have difficulties. While some data are available at the city level, much of the data by which we characterize cities are available only for the urban sector at the provincial (oblast) level.

For the cities in our sample, we compute the growth occurring in 1985 from net migration.<sup>6</sup> In addition to city specific population data, we also have other city-specific data, for example, climatic variation. For the right hand side variables that are potentially endogenous we use as proxies urban data for the province (oblast) in which our target city is located.<sup>7</sup> Finally, to capture the influence of a variety of other forces (for example, broad regional differences, locational issues relating to raw materials etc.), we use dummy variables to characterize the twelve major regions (Kaliningrad, North, North-West, Centre, Volga-Viatka, Central Black Earth, Volga, North Caucasus, Urals, West Siberia, East Siberia, Far East) in which our provinces and their cities are located.

---

<sup>6</sup> We first calculate the annualized rate of population growth by using a cubic spline interpolation based on the cities population as reported in the 1979 and 1989 censuses. From this, we subtract the annualized rate of natural increase or net internal growth (internal births minus internal deaths). This gives us the city specific net migration rate.

<sup>7</sup> The city specific variables are: net migration rate, expansion restriction or not, total restriction or not, population, oblast capital or not, city's share of oblast's urban population, temperature, and economic region. The other variables are at the oblast level and refer to the urban part of the oblast. Dustmann and Preston (1998) argue that using province level data instead of city level data on variables that are potentially endogenous is desirable. See also Bound, Jaeger and Baker (1995).

In the case of Russia, much of the regional data is specified for the 71 provinces (or oblasts).<sup>8</sup> Our knowledge of these regions consists of data on the cities that we examine, (168), other cities in the regions which we don't examine (those with population less than 50,000 in 1959), the urban population of the region and finally the rural population.

In addition to the matter of how we proxy city-specific characteristics with inherent data limitations, we must also pay attention to the time dimension of the instruments used in this study. First, having examined city growth data, we have concluded that variations from year to year within the general time span of our interest are insufficient to warrant a more complex measurement of growth, for example, a combined time-series and cross-section analysis. Moreover, the 1980s is a useful decade in which to examine Russian city growth. Although the economy was weakened, the Gorbachev era was in its infancy, and earlier evidence suggests that controls were important (Gang and Stuart 1998).

Most important, we assume that within reasonable bounds, the variables that we use to capture the attractiveness of our sample cities are time invariant. Thus we do not consider specific leads and lags. Thus, for example, we may argue that city A is more attractive for potential in migration in 1985 compared to city B, not because factory construction in period 1 creates a sudden and immediate demand for labor in city A in period 2. Rather, we argue that city A may exhibit a general growth pattern that exceeds that of city B, such that ceteris paribus, city A is more attractive than city B for potential in migration.

---

<sup>8</sup> It is well known that during the transition era there have been ongoing changes in the nature of the regions (province or oblast level) in Russia. While some of our data pertains to 1990 at which time there were 89 provinces, in a number of cases we have combined smaller sub-regions into their larger parent region to conform to administrative arrangements for the 1980s, the period we examine in this study.

Thus far, we have emphasized the importance of controls in our examination of Russian city growth. We are able to characterize the impact of controls by the nature of the restriction (total restriction versus expansion restriction) and the administrative functions of the city. For the year of our cross-section analysis (1985), these descriptive statistics (see Table 2) support the view that restrictions mattered.

As we emphasized above, Russia is a large and extremely diverse landmass. In Table 3 we present the net migration rate for the 12 major geographic-economic regions of Russia. It is evident that the net migration rate (1985) into our sample cities varied considerably from one region to another, even when migration is weighted by population. As we model the migration process, the importance of these regional differences will be evident. Indeed, the descriptive statistics presented in Table 3 demonstrate differences generally in conformity with anticipated patterns; for example, higher rates of net migration in areas where economic activity (industry and agriculture) are important such as the North and the Central Black Earth region.

In Table 4 we present some statistics for our seriously state and economic variables. Although it is difficult to generalize about these results, some interesting patterns emerge. For example, among the seriously state controlled variables, while there is little difference in industry growth, there are clear differences in the growth of new housing, and considerable variability in the extent to which different city types contribute to the central budget. Similar variability can be observed among the economic variables. There are for example, systematic differences between these variables in totally restricted cities when compared to other cities.

Our formal analysis is presented in four variants. In all cases, our dependent variable is the net migration into 168 Russian cities located in 71 provinces (oblasts) in 1985.<sup>9</sup> In variant I, our right hand variables are the population of each city, population squared (to account for non-linearities), the importance of the each city as a share of the total urban population of its region, oblast capital, and finally, the presence of controls. In this first variant, we are interested in the statistical relationship between controls (“stick” variables) and the growth of our sample cities, excluding seriously state (“carrot” variables) and economic variables.

In variant II, we repeat the exercise of variant I but now include dummy variables for the 11 major regions in which our sub-regions (oblast) are located. The 12<sup>th</sup> region, the Central, is omitted. Thus our results are derived with respect to the central region which contains the Russian capital, Moscow. As we analyze these results, it will be evident that in a country as large and diverse as Russia, there are crucial and general regional differences that we expect to be important in explaining city growth, that is beyond the specific forces attracting people to particular cities.

In variant III, we repeat exercise II but now include the seriously state variables. Our goal is to understand the basics of city growth in a controlled setting, including regional differences expected in the 11 major regions, and finally including seriously state variables. The latter are those forces controlled directly by the state in an effort to shift population to those cities where economic expansion was envisaged.

---

<sup>9</sup> Using available population data, we are able to calculate annualized rates of population growth as well as the rate of natural increase (birth rate-death rate). To interpolate, we use the method cubic splines available in SAS-IML (1996). The net migration rate was computed by subtracting the rate of natural increase (birth rates and death rates by province) from the annualized growth rate of the population.

Finally, in variant IV, we include all of the variables included in variant III and add economic variables. Again, it must be emphasized that while our distinction is soft, nevertheless we believe that even under controls and the manipulation of those control variables to achieve desired (state) outcomes, there would still be the possibility of population response to “attractiveness” variables representing perceived standard of living differences.

#### **IV. Results**

The results of our analysis are presented in Tables 5 and 6. Table 5 contains the bulk of our results, while Table 6 contains the regional coefficients estimated in the same regression. Our variant I model examining the impact of controls in isolation from other variables suggests that controls matter. While an expansion restriction did not matter, a total restriction had an understandably negative and significant impact upon net migration in 1985. At the same time, being an oblast capital had no impact, contrary to the suspicion that being an administrative center generated special pressures for expansion (for example, expansion of the labor force required for the provision of public services) even when allowing for the existence of formal expansion controls.

In variant II we introduce dummy variables for the major geographic-economic regions. The results are strikingly similar, and statistically stronger than variant I where major regional differences are excluded.

In variant III we include the variables we have described as seriously state variables. These are the variables which are directly controlled by the state (especially industrial expansion and budget transfers) to implement state regional policies. In this variant,



although being an oblast capital does not matter, controls remain important, and the expansion of housing is marginally significant. Most interesting is the fact that including these important state control variables to improve our specification, none are statistically significant.

Finally, in variant IV, we have argued that in addition to direct state controls and those variables that are seriously state controlled, there are other economic factors, to some degree influenced by state behavior, to which individuals may respond in their decision to migrate. Most of these variables are traditional factors thought to capture the attractiveness of the cities in our sample, though none are statistically significant.

Throughout our discussion in this paper, we have emphasized the importance of regional differences in the Russian setting. While some of the location specific differences are captured in the variables that we have chosen, the broad differences between, for example, the Western part of Russia and Siberia and the East, are important.

In Table 6 we show, from the same regression analysis as in Table 5, whether the net migration rates for 11 major regions differed from the central region (the omitted region). In light of a long history of Soviet regional policies, for example, those dedicated to the expansion of industrial centers in regions where raw materials were located, it is not surprising that we see positive and significant differences in the migration rates in areas such as the Urals and the Far East. Regional policies remained operative in the mid-1980s. It is striking that once we include all of the economic variables (variant IV) the regional effects disappear.

## V. Summary and Conclusions

Modeling the economic activity of the Russian economy during the plan era has always been complicated by a variety of factors. In addition to data limitations, the unusual economic system in which elements of state control, decentralized response to those controls, and responses to other general socioeconomic forces all potentially influenced outcomes.

Past studies of city growth have been limited, such that we have not been able to examine the impact of state controls while at the same time accounting for the traditional socioeconomic forces influencing population mobility. In the present study, we have moved beyond traditional analyses to examine the impact of state controls while at the same time controlling for other forces which we expect will have an impact upon population mobility.

Our results are both surprising and robust. Our most important finding is the fact that even when other state and economic variables are included in our specification, restrictions matter. *Ceteris paribus*, cities that were ever restricted grew less rapidly than would otherwise have been the case.

Second, our finding of the importance of broad regional differences is important and understandable. As we noted above, the major regions of Russia differ significantly one from another in a wide variety of natural and man made dimensions. The fact that the geographic differences become insignificant when the economic variables are included in the analysis suggests that these economic variables are in fact capturing the impact of regional differences as individuals respond to those differences in their locational decisions.

While the models in this study shed further light on the issue of controls and city growth in Russia, there are nevertheless a number of issues to be addressed. Apart from mechanical issues of data and time, probably the most complex issue is that of the endogeneity of at least some of our variables. It is in this sense that our classification is basic. For example, while it is true that housing, for example, was directly controlled by the state, the population could respond to changes in housing availability (as they did), an argument that could also be made for variables such as higher education. While there was some freedom to enter or not to enter higher education, both entrance requirements and the capacity of this sector were, after all, controlled by the state.

## References

- Armstrong, George M. 1982. "Control of Mobility of Labor in the Soviet Union," *Journal of International and Comparative Law* 3, 173-92.
- Bater, James H. 1980. *The Soviet City* (Beverly Hills).
- Bound, John; Jaeger, David A; Baker, Regina M. 1995. "Problems with Instrumental Variables Estimation When the Correlation between the Instruments and the Endogenous Explanatory Variable Is Weak," *Journal of the American Statistical Association* 90, 430 (June) 443-50.
- Brown, Annette M. 1997. "The Economic Determinants of Internal Migration in Russia During Transition," *The Davidson Institute, Working paper #89*, July 1997.
- Buckley, Cynthia 1995. "The Myth of Managed Migration: Migration Control and Market in the Soviet Period," *Slavic Review* 54, 4 (Winter).
- Chinn, Jeff 1977. *Manipulating Soviet Population Resources* (New York: Holmes & Meier).
- Clayton, Elizabeth and Thomas Richardson 1989. "Soviet Control of City Size," *Economic Development and Cultural Change* 38, 1 (October), 155-65.
- Dmietreva, Olga 1996. *Regional Development: The USSR and After* (New York: St. Martins Press).

Dustmann, Christian and Ian Preston, "Attitudes to Ethnic Minorities, Ethnic Context and Location Decisions," CEPR, working paper, June 1998.

Gang, Ira N. and Robert C. Stuart 1996. "Urban to Urban Migration: Soviet Patterns and Post-Soviet Implications," *Comparative Economic Studies* 38, 1 (Spring), 21-36.

Gang, Ira N. and Robert C. Stuart. 1998. "Mobility Where Mobility is Illegal: Internal Migration and City Growth in the Soviet Union," *Journal of Population Economics*, Forthcoming.

Grandstaff, Peter J. 1980. *Interregional Migration in the USSR: Economic Aspects, 1959-1970*. Durham, N.C. Duke University Press.

Harris, Chauncey 1972. *Cities of the Soviet Union* (Chicago: Rand McNally).

Lewis, R.A. and R.H. Rowland 1979. *Population Redistribution in the USSR: Its Impact on Society, 1987-1977* (New York: Praeger Publishers).

Loeber, Dietrich Andre 1984. "Limitchiki: On the Legal Status of Migrant Workers in Large Soviet Cities," *Soviet Union* 2,3, 301-8.

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

Mitchnek, Beth A. 1990. "Geographical and Economic Determinants of Interregional Migration in the USSR, 1967-1985," dissertation, Columbia University.

Morton, Henry W. 1979. "The Soviet Quest for Better Housing -- An Impossible Dream?" in U.S. Congress, Joint Economic Committee, *Soviet Economy in a Time of Change* vol. 1 (Washington D.C.: U.S. Government Printing Office), 790-810.

Morton, Henry W. and Robert C. Stuart 1984. *The Contemporary Soviet City* (Armonk: M.E. Sharpe).

Nash, Edmund, 1966. "Recent Changes in Labor Controls in the Soviet Union," in U.S. Congress, Joint Economic Committee, *New Directions in the Soviet Economy* (Washington, D.C.: U.S. Government Printing Office), 849-61.

Ofer, Gur 1976. "Industrial Structure, Urbanization, and the Growth Strategy of Socialist Countries," *Quarterly Journal of Economics* 90 (May), 219-44.

Ofer, Gur 1977. "Economizing on Urbanization in Socialist Countries: Historical Necessity or Socialist Strategy ?" in Alan A. Brown and Egon Neuberger (eds.), *Internal Migration: A Comparative Perspective* (New York).

Rowland, Richard H. "Metropolitan Population Change in Russia and the Former Soviet Union, 1897-1997," *Post-Soviet Geography and Economics*, 39, 5 (1998), 271-96.

Shaw, Denis J.B. (ed). 1995. *The Post-Soviet Republics: A Systematic Geography* (New York: John Wiley & Sons).

SAS-IML 1996. Release 6.1, SAS Institute Inc., Cary NC.

SHAZAM User's Reference Manual Version 8.0 1977, McGraw-Hill.

Shelly, Louise 1981. "Internal Migration and Crime in the Soviet Union," *Canadian Slavonic Papers* 23, 1 (March), 77-87.

Stuart, Robert C. 1984. "The Sources of Soviet Urban Growth" in Morton and Stuart, *The Contemporary Soviet City*, 25-41.

Stuart, Robert C. and Paul R. Gregory 1979. "A Model of Soviet Rural-Urban Migration" *Economic Development and Cultural Change* 26 (October), 81-92.

Zaslavsky, V. and Y. Luryi 1979. "The Passport System in the USSR and Changes in Soviet Society, " *Soviet Union* 6, 2, 137-44.

**Table 1**  
**The Structure of Population in Russia**

	<b>1959</b>	<b>1970</b>	<b>1979</b>	<b>1989</b>
Population in (000)	117,534	130,079	137,551	147,400
<b>Proportion of Population Living in Restricted Cities</b>				
% of Urban	43.9	43.9	43.8	42.8
% of Total	23.0	27.3	30.4	31.8
<b>Sample of 168 Cities</b>				
Population	37,355	50,069	60,324	68,308

Sources: From Soviet handbooks on population (Naselenie SSSR), the annual statistical handbooks (Narodnoe khoziaistvo SSSR), the census volumes (Itogi vsesoiuznoi perepisi naseleniia) and the Soviet statistical journal (Vestnik statistiki). Cities are all known cities with a population over 50,000 in 1959. Proportion of population living in restricted cities is from Buckley (1995), Table 2.

**Table 2**  
**Sample Description - Administrative Controls**

		<b>Net Migration Rate 1985, (weighted)<sup>1</sup></b>	<b>Number of Cities in Sample</b>	<b>Number Totally Restricted</b>	<b>Number Expansion Restricted</b>
<b>Overall Measure</b>	Russia	.66 (.70)	168	29	16
<b>Restrictions</b>	Total	.52 (.33)	29		
	Expansion	.72 (.52)	16		
	None	.85 (1.06)	123		
<b>City Size (000)</b>	< 250	.83 (1.21)	102	0	1
	250-500	.81 (.65)	40	10	10
	500-1000	.41 (.36)	17	11	4
	> 1000	.59 (.27)	9	8	1
<b>Administrative Function of City</b>	Oblast Capital	.60 (.41)	70	25	12
	Others	.82 (1.22)	98	4	4

Sources: See Table 1. Standard deviations in parentheses. Weighted by population. Net migration rates are calculated for each city as the (population growth rate - rate of natural increase). Rates are annualized percentages, calculated using a cubic spline interpolations available in SAS-IML (1996). The rate of natural increase used in this calculation is the rate of natural increase for the Province (Oblast) the city is in. For a discussion of the possible bias this introduces, see the text, footnote 9. For a discussion of the possible bias this introduces, see Gang and Stuart (1998), footnote 9.

**Table 3**  
**Sample Description - Geographic Regions**

		<b>Net Migration Rate 1985, (weighted)<sup>1</sup></b>	<b>Number of Cities in Sample</b>	<b>Number Totally Restricted</b>	<b>Number Expansion Restricted</b>
<b>Overall Measure</b>	Russia	.66 (.70)	168	29	16
<b>Geographic Region</b>	Severnyi	.89 (.72)	8	2	
	Severo-Zapadnyi	(.66) (1.11)	5	1	
	Tsentrал'nyi	.74 (.32)	34	6	1
	Tsentrал'no- Chernozemnyi	.85 (.75)	8	1	1
	Povolzhskii	.64 (1.00)	19	5	3
	Severo- Kavkazskii	.75 (.34)	19	3	
	Ural'skii	.38 (.48)	25	5	2
	Zapadno- Sibirskii	.70 (1.36)	17	2	5
	Vostochno- Sibirskii	.34 (.85)	13		2
	Dal'nevostochnyi	.73 (.46)	11	3	
	Kaliningradskaia oblast'	1.02 (0.00)	1		
	Volgo-Viatskii	.75 (.59)	8	1	2

Sources: See Tables 1 and 2. Standard deviations in parentheses. Weighted by population.



**Table 4**  
**Sample Description - Seriously State Variables and Economic Variables**

	<b>All Cities</b>	<b>Totally Restricted</b>	<b>Expansion Restricted</b>	<b>Never Restricted</b>
<b>Seriously State Controlled Variables</b>				
Budget Transfers	-17.06 (25.69)	-16.77 (21.47)	-32.18 (24.78)	-11.89 (29.46)
Industry Growth	133.53 (12.60)	131.67 (12.09)	135.85 (12.45)	135.49 (12.96)
New housing (sq. meters per person)	2.96 (3.00)	1.95 (1.89)	3.72 (2.45)	4.20 (3.89)
<b>Economic Variables</b>				
Share of Labor in Industry	31.96 (6.29)	32.64 (5.46)	33.24 (7.68)	30.45 (6.59)
Retail Trade (Roubles per person)	1.48 (2.04)	1.04 (1.70)	1.58 (1.15)	2.10 (2.55)
# in Higher Education (per capita)	.003 (.006)	.002 (.006)	.003 (.002)	.004 (.007)
Industry to Agricultural Wage Ratio	1.01 (.15)	.98 (.14)	1.06 (.18)	1.05 (.17)
Doctors per 10,000 population	36.42 (9.59)	36.59 (9.93)	33.78 (3.19)	37.14 (10.43)
Divorce Rate	4.23 (.80)	4.11 (.77)	4.25 (.66)	4.40 (.86)
Convictions per capita	8.02 (8.41)	5.15 (4.48)	9.74 (7.14)	11.74 (11.32)
Temperature (°C, Nov. 15, 1998)	-4.69 (6.76)	-3.72 (4.95)	-8.64 (7.79)	-4.71 (8.38)
<b>Other Variables</b>				
Urban Share	.24 (.22)	.22 (.22)	.27 (.19)	.24 (.23)

Sources: See Tables 1 and 2. Standard deviations in parentheses. Weighted by population.

**Table 5**  
**Effect of Restrictions on Net Migration to Cities in Russia**  
 (OLS, White Standard Errors)  
 dependent variable = net migration rate in 1985, n = 168

	Controls	Controls & Regions	Carrot & Stick	Carrot & Stick and Economic Determinants
Constant	1.02	.94	2.27	3.87
Expansion Restriction	-.09 (.16)	-.14 (.22)	-.20 (.22)	-.13 (.20)
Total Restriction	-.37* (.15)	-.32** (.17)	-.41* (.18)	-.43* (.19)
Population/1000 (1980)	-.27 (.24)	-.44** (.24)	-.47* (.25)	-.46 (.33)
Population Square/1000 <sup>2</sup>	.04 (.03)	.06* (.03)	.06* (.03)	.06** (.04)
Oblast Capital	-.01 (.14)	.02 (.12)	.01 (.15)	.03 (.17)
City's Share of Oblast's Urban Population	-.29 (.28)	-.26 (.28)	.23 (.31)	.09 (.32)
Budget Transfers			-.00 (.00)	-.01 (.03)
Industry Growth			-.01** (.01)	-.01 (.01)
New Housing (sq. meters per person)			-.02 (.02)	-.14 (.09)
Share of Labor in industry				-.03 (.02)
Retail Trade (R per person)				.20 (.17)
# in Higher Education (per capita)				-3.78 (4.06)
Industry to Agricultural Wage Ratio				-.24 (.71)
Doctors per 10,000 populaton				.01 (.01)
Divorce Rate				-.10 (.13)
Convictions per capita				.02 (.02)

Temperature (°C, Nov. 15, 1998)				.01 (.02)
11 Regional Dummies Included (Central Region Excluded)	no	yes see Table 6	yes see table 6	yes see Table 6
p-value joint population test	.02	.01	.01	.01
p-value joint restrictions test	.04	.17	.08	.08
p-value joint carrots test			.37	.10
p-value joint economics test				.36
p-value joint regions test		.00	.00	.19

Source: Authors' calculations using Shazam 8.0. See also sources for Tables 1 and 2.

Notes: \*significant at .05 level. \*\*significant at .10 level.

**Table 6**  
**Geographic Variation in Net Migration Rates**  
 (OLS, White Standard Errors)  
 dependent variable = net migration rate in 1985, n=168

		<b>English Translation</b>	<b>Controls &amp; Regions</b>	<b>Carrot &amp; Stick</b>	<b>Carrot &amp; Stick and Economic Determinants</b>
<b>Geographic Region</b>	Dal'nevostochnyi	Far East	.08 (.18)	.16 (.19)	-.05 (.29)
	Kaliningradskaia oblast'	Kaliningrad Province	.28** (.15)	.25 (.16)	.13 (.36)
	Povolzhskii	Volga	.35 (.23)	.41** (.24)	.32 (.31)
	Severnyi	North	.31** (.18)	.29 (.18)	.29 (.28)
	Severo-Zapadnyi	North-West	.16 (.33)	.17 (.34)	-.04 (.45)
	Tsentrāl'no-Chernozemnyi	Central-Black Earth	.27 (.33)	.28 (.32)	.15 (.27)
	Tsentrāl'nyi	Central	omitted reference group		
	Ural'skii	Urals	-.17 (.19)	-.16 (.19)	-.23 (.21)
	Volgo-Viatskii	Volgo-Viatka	.33** (.18)	.40* (.20)	.24 (.23)
	Vostochno-Sibirskii	East Siberia	-.39 (.31)	-.34 (.32)	-.32 (.38)
	Zapadno-Sibirskii	West Siberia	.51 (.54)	.46 (.54)	.54 (.49)
	Severo-Kavkazskii	North Caucasus	.76* (.18)	.74* (.18)	.27 (.43)

Sources: Based on results generating Table 5, reported separately here for clarity.

Note: \*significantly different from Tsentrāl'nyi at the .05 level. \*\*\* significantly different from Tsentrāl'nyi at the .10 level.

## **APPENDIX A: Data Definitions and Sources**

Net Migration Rate – This is the population growth rate minus the rate of natural increase. Here we calculate the rate per 100. We first calculate the annualized rate of population growth by using a cubic spline interpolation based on the cities population as reported in the 1979 and 1989 censuses. From this, we subtract the annualized rate of natural increase or net internal growth (internal births minus internal deaths). This gives us the city specific net migration rate. Source: see city population, below.

Controls: Expansion and Total Restrictions – Specific controls to limit the growth of some (though not all) Soviet cities were mostly put in place in 1956. For a discussion of these controls, see (Buckley 1995; Lewis and Rowland 1979, Gang and Stuart, 1998).

City Population, Oblast Capital, Province, Regions – Cities are all known cities with a population over 50,000 in 1959. We use census year data and interpolate using a cubic spline interpolation. Sources: From Soviet handbooks on population (Naselenie SSSR), the annual statistical handbooks (Narodnoe khoziaistvo SSSR), the census volumes (Itogi vsesoiuznoi perepisi naseleniia) and the Soviet statistical journal (Vestnik statistiki).

Urban share – City population/urban population of region (1989 census).

Share of Labor in Industry – the percentage of the actual labor force (people working) in industry in 1990 in the region. Source: Goskomstat Rossii, Trud i zaniatost' v Rossii (Labor and Employment in Russia) Moscow: Goskomstat, 1996, pp. 228-316.

Divorce Rate – divorces per 1,000 urban population of the region Source: Goskomstat Rossii, Demograficheskii ezhegodnik Rossii, the Demographic yearbook of Russia (Moscow: Goskomstat, 1996), Chapter 3.

Industry to Agricultural Wage Ratio – the average monthly money (ruble) wage in 1990 in the region in industry divided by the same in agriculture. Source: Goskomstat Rossii, Trud i zaniatost' v Rossii, Labor and Employment in Russia, (Moscow: Goskomstat, 1996), pp. 317-407.

Industry Growth – growth of industrial output – index of 1988 over 1980. Source: Goskomstat RSFSR, Narodnoe khoziaistvo RSFSR v 1988 g., The National Economy of the RSFSR in 1988, (Moscow: Finansy i statistika, 1989), 328-31. We also examined a physically based index of the growth of industrial production – 1990 over 1985, finding no real differences over the industry growth index. For the index of physical output, our source was: Goskomstat Rossii, Rossiiskaia Federatsiia v 1992 g., The Russian Federation in 1992, (Moscow: Respublikanskii informatsionno-izdatel'skii tsentr, 1993), 368-72.

Retail Trade – The volume of retail trade by region in 1980 measured in millions of rubles, prices of 1980 – per capita basis (region population). Source: Goskomstat RSFSR, Narodnoe khoziaistvo RSFSR v 1988 g. The National Economy of the RSFSR in 1988 (Moscow: Finansy i statistika, 1989), 82-84.

Number in Higher Education – the number of students enrolled in institutions of higher education during the academic year 1980-1981 – per capita basis (region population). Source: Ed80/81 – Goskomstat RSFSR. Narodnoe khoziaistvo RSFSR v 1988 g., The National Economy of the RSFSR, (Moscow: Finansy i statistika, 1989), 182-84.

New Housing – the volume of new housing space (square meters) brought into use in the particular region (urban and rural) during the period 1981 to 1985 – per capita basis (region population). Source: Goskomstat RSFSR, Narodnoe khoziaistvo RSFSR v 1988 g., The National Economy of the RSFSR in 1988, (Moscow: Finansy i statistika, 1989), 137-40.

Doctors – number of doctors per 10,000 population in the region (urban and rural) in 1980. Source: Goskomstat RSFSR, Narodnoe khoziaistvo RSFSR v 1988 g., The National Economy of the RSFSR in 1988, (Moscow: Finansy i statistika, 1989), 224-26.

Convictions per capita – number of convictions in courts by region (rural and urban) – per capita basis (region population). Source: Goskomstat RSFSR, Narodnoe khoziaistvo RSFSR v 1988 g., The National Economy of the RSFSR in 1988 (Moscow: Finansy i statistika, 1989), 260-62.

Budget Transfers – The extent to which the regions budgetary expenditures are different from the regions budgetary revenues in 1988 – described as the net balance of budget transfers – the number is a percent – if expenditures are greater than income, the region is a net recipient ( $Budtran < 0$ ); if expenditures are less than revenues, the region is a net donor; ( $Budtran > 0$ ) if expenditures and revenues are the same, then the region is neutral. Source: Oksana Dmitrieva, Regional Development: The USSR and After (New York: St. Martin's Press, 1996), Chapter 2.

Temperature – °C, Nov. 15, 1998, 13:00 UT. Source:  
<http://www.wunderground.com/global/RS.html>