

# The political economy of structural change in Russia

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## Abstract

The Russian Federation provides a valuable laboratory to study the impact of political forces on the process of structural reform. We examine changes in the industrial structure of employment across Russian regions and assess the importance of legacy factors, political factors, and success factors in explaining this process. We discuss the problems introduced by federalism in the transition process. We find that initial conditions such as natural resource potential, climate, and industrial specialization explain more of the variation in industrial restructuring than political variables. JEL Classification: P2, R1, H7.

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## 1. Introduction

One of the central aspects of transition is the process of structural reallocation of production among sectors of the economy and industries. The structure of planned economies differed significantly from market economies, primarily in the emphasis of heavy over light industry, and industry over services. Shifts in industrial structure should thus be one important indicator of progress in transition. One of the key hopes of transition is that liberalization and organizational changes such as privatization and marketization – including reform of the labor market – will induce these structural changes. The idea is that industrial structure moves in the direction consistent with market economies of similar levels of economic development as the transition proceeds. Many jobs must be created and at least as many must be destroyed. This is the process that most associate with the transition process.

Contrary to expectations, more than 10 years into the Russian transition the degree of structural change is less than might have been expected or desired. For example, the number of lossmaking enterprises in Russia is today actually larger than in 1994 and 1995,<sup>1</sup> and part of it must be explained by the fact that many enterprises continue to produce the wrong products, with too many workers and in the wrong place.<sup>2</sup> This suggests that the pace of structural change has been less than optimal. In this paper we examine the patterns of change in the industrial structure of employment in Russia and its regions with special emphasis on the political economy of this process. We are especially concerned with the factors that determine its pace. Special attention is directed to the interaction between the geographical distribution of production with the industrial structure,<sup>3</sup> both before the transition and as part of it.

Transition induces major shifts in demand and supply conditions. Demand shifts away from defense, investment and public consumption to private consumption, governed by consumer instead of planner's choice. Price distortions are reduced and production functions change as enterprises restructure. The replacement of central planning with market forces creates demand for many consumer, as well as producer services. External liberalization creates new export opportunities but also results in greater import competition. All these adjustments involve changes in employment, not just between jobs, but also between locations. Because of this, structural adjustment directly impacts on welfare. Moreover, it creates political pressures to limit or direct structural adjustment. The purpose of this paper is to examine these linkages.

Most studies on industrial structure deal with countries but in this paper we concentrate on Russia's regions. The underlying theme of this paper is that Russia's size and federal structure have a special impact on the process of structural change in transition.<sup>4</sup> Our strategy is to exploit the fact that Russia has 89 regional units to undertake a comparative analysis in one country. Russia is a unique laboratory because of its wide variation in terms of size, distance to markets, climate, and natural resource endowments, and because of the fact that the initial allocation of economic activity (i.e., that inherited from the Soviet period) was so misallocated. Regions within a country are also

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<sup>1</sup> See, for example, Ickes, von Hagen and Traistaru (2003).

<sup>2</sup> Another part is explained by weak internal restructuring

<sup>3</sup> In this paper we work primarily with the one-digit industry classifications, except for the industrial specialization index, which is calculated at the two-digit level.

<sup>4</sup> Although our specific emphasis in this paper is on the evolution of industrial structure of employment, we would argue that Russia's size and federal structure have an important impact on structural change in general.

much more open than countries as a whole, and this requires some methodological adjustments to the analysis that we discuss below.

The paper draws on a number of diverse literature sources. The literature on the relationship between industrial structure and economic development goes back to Clark (1937), Kuznets (1966) and Chenery and Syrquin (1975). This literature and the many papers that follow established the link and regularity between structure and development, where shifts in demand and technology and productivity drive both changes simultaneously. In his seminal work on changes in the industrial structure and modern economic growth, Simon Kuznets decided to exclude discussion on the socialist countries due to their completely “different institutional and political structure...” (Kuznets 1966, p. 508). This gap was filled in by Ofer (1973, 1976, 1987) who documented the differences in economic structure of the socialist countries from market economies, and explained the sources of these differences in terms of the nature of the social system and its growth strategy.

This literature has emphasized mainly two anomalies of the socialist industrial structure: first what has been termed “overindustrialization” (Ofer, 1980, p. 151),<sup>5</sup> including the bias toward heavy industries and second, the small share of services and their bias against market and consumer services.<sup>6</sup> When the transition dawned renewed interest emerged in what will happen to the industrial structure, would the structural anomalies correct themselves and converge to the ‘normal pattern’, in what way and how fast? The interesting question is how much of the old structures will remain and for how long? An early entry into this problem was Easterly de Melo and Ofer (1994). Recently this question has been analyzed by Raiser, Schaffer and Schuchhardt (RSS, 2003) in a paper that covers the entire group of transition economies.<sup>7</sup> The main tool of analysis used all along in the study of market economies and then in the comparisons of “normal” structural patterns with those of socialist and then transition economies was that of “benchmarking”, comparing structures at “similar levels of development”. We come back to this issue below. The present paper adds a new layer to this literature by studying the changes in the industrial structure inside Russia, among the different “federal subjects” or states.

The study of the transition-induced changes across regions within a single country, in this case Russia, draws on two additional literature streams: the first is the vast literature on the relationship between the nature of economic activity and location, in general and in Russia in particular. The main recent general studies on the role of geography in economic development are Krugman (1991) and Gallup, Sachs and Mellinger (1998), and there is a very recent survey by Burgess and Venable (2003). All concentrate mainly on two geographical attributes, one “distance” from the “market” and position on a major transportation facility or junction; and the second, the agglomeration and scale effect of concentration of economic activities in cities. Studies on the geographical aspects of the various Russia regions use these two criteria and show how the socialist system deviated from ordinary patterns of population distribution and urbanization. These papers

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<sup>5</sup> Ofer (1980, p.151) also referred to this phenomenon as “over-convergence of industrialization.” We should be grateful that overindustrialization has become the commonly used term.

<sup>6</sup> These anomalies corresponded to anomalies in the distribution of product by end use: higher shares of investment and of government consumption including defense and public services and lower share of private consumption (See Ofer, 1987).

<sup>7</sup> Other recent papers in a similar vein include Ofer (2001). Brown and Earle (2003) study structural changes in Russia and Ukraine inside manufacturing and find acceleration of job reallocation during the transition. Among the papers dealing with other aspects of industrial structural change in transition economies see Konning, Kupitts and Lehman (2003), Warner (2002), Jurajda and Terrel (2002), Zalewska-Mitura, and Mickiewicz (2002). The main emphasis in these papers is on the connection between different aspects of privatization and private sector development and the growth of services.

also discuss the negative economic consequences of locating abnormal amount of economic activities in “cold” areas that cover a wider area than just Siberia and the Northern regions (Gaddy and Ickes, 2002, 2003a and Mikhailova, 2004). We incorporate this literature in the paper as forming the inherited distortions and thus the conditions that determine the initial distorted structure and influence the dynamics of expected changes.

Innumerable papers used the diversity of Russian regional data in order to understand the transition process. Some of these studies try to link initial conditions, policies, and political economic variables in order to understand differential rates of growth (indeed of decline and then recovery). There is a series of papers by Berkowitz and Dejong (the latest, 2003 includes many of the others as references), which usually finds that good liberalization policies explain growth and successful transition. Hanson (2000) comes to the opposite conclusion, i.e. that initial conditions and circumstances dominated the policies of both the regional and the Federal governments. Popov (2001) shows that initial conditions and institutional factors explain more of the variation in regional output than do reform policies, but that reform policies explain differences in incomes across regions.<sup>8</sup> Dolinskaya (2002) documents the increasing inequality across Russian regions, and finds that differences in initial conditions (natural resource endowments, primarily) explain most of this differentiation, as opposed to policy.<sup>9</sup>

Another strand of the literature on regions studies fiscal federalism. For example, Zhuravskaya and others (a recent paper is Slinko and Zhuravskaya, 2003, see more references therein) discuss many aspects of fiscal federalism and political economy inside the regions. They show how Federal transfers, and the policies of the regional governments and legislators are geared to protect the old production structures of the regions and thereby suppress growth, structural changes and private sector (small business) development. Narayan (1999) studies fiscal transfers across Russia’s regions and shows how the pattern can be explained by initial conditions and structural characteristics. Sonin (2003) shows how the anti-reform policies are related to initial conditions in regions. He shows that these policies are more likely the less competitive is the region. Gavrilin (2000) and the OECD study on regional trade policies (2003) come to similar conclusions through the study of different aspects of the policies of regional governments that are anti-reform.

The problem with the political economy considerations is that in many cases they are indeed endogenous to the initial conditions of the region and to its inherited production structure and distortions.<sup>10</sup> In the paper we follow and find support to this line of thought.

## 2. Conceptual framework

There are several dimensions to the distortions that must be undone in transition. Some of these are common to all transition economies. Others are more specific to Russia, primarily because of its size and climate. We discuss them in turn.

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<sup>8</sup> The difference between income and output variation is due to financial flows across regions, both private and public.

<sup>9</sup> This paper is, in a sense, closest in spirit to ours, though it explains differences in regional incomes as opposed to differences in the rate of industrial structure change. Indeed, most of the papers that have examined Russian regions have studied the variation in income levels or output levels. We are unaware of any papers that have examined the pace of change in industry structure.

<sup>10</sup> Gaddy and Ickes (2002, p. 225-232 and appendix F) present a discussion of reform that places regions at the forefront of the problem and relates this to initial conditions in the regions and the inherited industrial structure.

First, there are the standard factors that would exist without any spatial aspect:

- Overindustrialization and distorted internal structure of industry, and;
- Underinvestment in services, distribution and finance

The second dimension of distortions is spatial.<sup>11</sup> Investment decisions were not based on market considerations with regard to location. Because transportation costs were ignored and because of political preferences for regional development, industries and enterprises in the Soviet Union were located far from existing markets. The location of economic activity developed differently from that of a similar market economy.<sup>12</sup>

Under central planning there was no clear advantage to big cities. This is partly because planners ignored agglomeration externalities. Moreover, those benefits that could arise were suppressed and/or ignored by heavy subsidies to transport costs. Bureaucratic hierarchies seem not to benefit from (intermediate) concentration (that is possibly except from the main center). Soviet planning was excessively autarkic internally. Most of the links were vertical down the hierarchies of individual industries with very limited lateral connections. Planning also paid very little attention to the spatial proximity of suppliers and of buyers of inputs.<sup>13</sup> Organizational affiliation was much more important than distance. On the service side, central planning didn't need market services for enterprises and the small financial and banking sector was virtually part of the bureaucracy and thus had also a strong vertical orientation. There was a very small network of supply to enterprises. As to consumer services, the Soviet system was notorious in trying to minimize the investment of resources in such networks. Moreover, scale advantages were small, especially given their poor technological levels (no supermarkets and shopping centers etc). As a result the Russia had only 2 really large cities, and many medium size ones (just a bit over one million each), mostly with low level of services.<sup>14</sup>

Market services on the other hand (trade networks, financial services, others) typically enjoy scale advantages and serve mostly lateral links and networks. Therefore they tend to benefit from concentration in big cities (See Burgess and Venable, 2003). This suggests that as the structural distortion is reduced (from industry to services) there will be some correction in city size. This would come about through the growth of some cities at the expense of others, especially (in addition to Moscow and St. Petersburg) some of the best strategically situated medium size cities. However, part of the structural shift to services will come from dismantled, loss making, manufacturing enterprises inside existing cities – intra-city change. Still further growth of cities will come from movement from small towns and the countryside to cities if and when there would be a balancing of

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<sup>11</sup> Even if the causes of some of these distortions are common across transition economies, the impact is much larger in Russia due to its sheer size.

<sup>12</sup> This statement would be true even without the decision to move industry and population to the east during WW2. For an analysis, see Mikhailova (2004) for a comparison of Russia's economic geography with a counterfactual analysis based on the assumption Russia had remained a market economy after 1914.

<sup>13</sup> See, for example, Brown, Ickes, and Ryterman (1994). Hewett (1988, p.173) describes an extreme case of this: "Minergo (Energy and Electrification), for example, ships sawn timber produced by construction firms at the Bratsk and Krasnoyarsk hydroelectric stations in Siberia 3,000-5,000 kilometers away to its enterprises in the European USSR. Simultaneously Minlesbumprom (timber, pulp, paper, and wood) ships sawn timber to Siberia from its enterprises in the European USSR."

<sup>14</sup> See Ickes (2003) for a discussion of city size in Russia and the violation of Zipf's Law.

technology between agriculture and manufacturing (modernizing agriculture), and an improvement in its lagging productivity, which is, however not likely at the moment.<sup>15</sup>

An entirely new set of distortions arises from the fact of extreme climate. Russia has many large population centers that are located in regions with extremely severe climates. This is true not only of such extreme locations as Norilsk which lies north of the Arctic Circle, but of many cities in the Urals – Perm, for example, has an average January temperature of  $-12.5^{\circ}\text{C}$ .<sup>16</sup> Such extreme temperatures increase the cost of business. Under Soviet planning many of these costs were shifted onto the rest of the economy. For example, cold regions used equipment at much higher rates than the rest of the Soviet Union,<sup>17</sup> but these costs were absorbed by the center – cold regions simply received more inputs to make up for the costs. Similarly, workers in very cold climates are much less efficient than in normal climates.<sup>18</sup> Hence, labor productivity was lower in these regions than in the rest of the economy. This allocation of resources was possible because of Soviet control and a combination of subsidies and coercion. Capital was directed to regions based on political decisions, as was labor.<sup>19</sup>

In the transition, *if subsidies were withdrawn*, these costs of extreme climate would have to be borne by the producers and residents of these regions, in terms of losses, salary or employment. If production is more costly in cold climates this is a barrier to new investment. Without wage premia and other subsidies for the cold, and with greater freedom to move, workers who can find jobs elsewhere will. This means that skilled labor will be harder to find in such regions. Of course this interacts with the spatial dimension, but it is not just distance or not being a transportation hub (like a port) that matters, but the fact that the climate is so poor for investment and productive activity as well as to live.<sup>20</sup>

One key factor that governs the pace of structural change in general, and the evolution of industrial structure in particular, is the interaction of these shifts with the geographical distribution of economic activity. The severe locational distortions introduced in the Soviet period mean that movements to an industrial structure of a market economy also mean in many cases shifts in the *location* of economic activity and a major overhaul of transportation and trade networks.

It is this interaction between structural and locational distortions and the required shifts that is at the heart of the political economy of structural change in Russia. The new regional

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<sup>15</sup> For a number of reasons, including “saving on urbanization” the Soviet planners directed capital intensive (including human capital) technologies to manufacturing and kept agriculture in a labor intensive technological state. See Ofer, 1967, 1976, 1980.

<sup>16</sup> This is the average monthly temperature in Perm during 1994-2002. The coldest ten percent of days had temperatures below  $-22.7^{\circ}\text{C}$ . For Omsk, a city with over one million inhabitants, the comparable figures are  $-16.8^{\circ}\text{C}$  and  $-27.2^{\circ}\text{C}$ . See Gaddy and Ickes (2003) for a general discussion and Mikhailova (2002).

<sup>17</sup> According to Victor Mote, in the late 1960s, the extreme cold regions claimed “30 percent of all Soviet trucks, 37 percent of the bulldozers, 35 percent of the excavators, 33 percent of the tower cranes, 62 percent of the drilling equipment, and 64 percent of the tracked prime-movers.” Mote notes that these percentages undoubtedly went up in the 1970s and into the 1980s. See Mote (1983, p. 22-33).

<sup>18</sup> Again see Mote (1983, p. 23): “There is a noticeable drop in labor productivity for outdoor work when temperatures fall below  $0^{\circ}\text{C}$ . ... Once the temperature drops to  $-20^{\circ}\text{C}$ , warm-up breaks of 10 minutes per hour for each seven-hour work day are imposed, which may result in work losses of up to 73 percent. In an average year, total losses to cold comprise 33 percent of all possible working time in the Soviet North.”

<sup>19</sup> Wages were often augmented for climate, but these premia came out of central budget funds, not from the revenues of the enterprises that employed the workers.

<sup>20</sup> It is also the case that most of these cities are in the interior, far from markets, ports, and coastlines – factors emphasized as crucial in the modern literature on cities, (e.g., Burgess and Venables (2004)).

governments in Russia,<sup>21</sup> with much more independence and power than under the old regime face the dilemma between protecting the existing production structure from closing down and/or moving elsewhere, or vote for the needed changes at the cost of initial unemployment and disorganization and the eventual decline (retreat?) of their regions. Moves that enhance efficiency on an economy-wide level may not be in the interests of regional leaders and electorates. In Russia and in the FSU there is a role played by the ability to raise external support and the way it is being used. In a federal regime this has important impacts on politics. We show that the initial conditions of transition in Russia – severe structural and locational imbalances – imply that federalism may play a role of postponing the needed spatial and industrial structure changes, and thereby delay needed economic reforms.

### 2.1. *Pure adjustment hypothesis*

It is useful to begin with a theory of how adjustment in transition would take place in a pure neoclassical environment. We identify adjustment as the speed in which the gap in industrial structure is closed. Suppose that we define this as the difference in structure (say, the employment share of industry) between region  $j$  and the average for Russia.<sup>22</sup> Assume that we have an estimate of the gap for 1990. Let  $\gamma_j^{90}$  be the gap for region  $j$  in 1990. Then the question is how rapidly that gap is closed. What should we expect here?

One hypothesis is that the pace at which the gap is closed is proportional to the size of the gap. This suggests that the more distorted a region is, the more rapidly adjustment takes place. The idea is that it is more costly to maintain the current structure of production in a region that is very inefficient than in one that is mildly inefficient. In a pure system without political economy effects – we denote this the pure adjustment hypothesis – the cost of doing business is higher with inappropriate industrial structure – e.g., lack of services in a region or the cost of excessive cold. This adjustment occurs both via capital mobility across regions and labor mobility.<sup>23</sup>

We can then estimate the size of the gap in 1995 ( $\gamma_j^{95}$ ) and in 2001 ( $\gamma_j^{01}$ ) for each region  $j$ . If the pure adjustment theory is correct then the reduction in the size of the gap (e.g.,  $\lambda_j = \gamma_j^{90} - \gamma_j^{95}$ ) should be a function of the size of the initial distortion. In particular, one would expect – under the pure adjustment hypothesis – that the change in the gap will be proportional to its initial level.

The pure adjustment hypothesis is, of course, an ideal type.<sup>24</sup> We suspect – and the whole field of transition economics presupposes – that we will find the opposite. The question is why does

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<sup>21</sup> A similar phenomenon, on a somewhat larger scale, occurs at the level of former Soviet republics. We do not analyze this in this paper, however.

<sup>22</sup> How to calculate the appropriate benchmark is an important question. We discuss it below (see section 5).

<sup>23</sup> Notice that labor mobility could be very sensitive to differences in TFP across regions. If regional differences in TFP are large then movements of labor to higher TFP areas will create larger increases in income than movements of capital in the opposite direction. We ought to expect such large TFP differences across regions if the cost of doing business in cold climates is very high (indeed we could think of the cold as a proxy for TFP). Moreover, just as in developing economies, poor regional government can cause these differences.

<sup>24</sup> It is important to emphasize that this is not necessarily the optimal adjustment. Rather, it is simply a prediction of what we would expect to observe if liberalization and subsidies are removed from an economy that was previously distorted. The optimal speed of adjustment may differ from this. Our concern in this paper, however, is with positive predictions about adjustment, and how this might differ across regions.

performance depart from this type? Given that we are interested in political economy factors that affect adjustment it is first important to discuss other reasons why the predictions of the pure adjustment hypothesis will not be observed.

## 2.2. *Alternatives to pure adjustment*

The pure adjustment hypothesis predicts that the change in the gaps is proportional to the initial distortion. Yet there are reasons to believe that the opposite is more likely to be observed. One major reason relates to the political economy of adjustment, but we save those considerations until the next section.

It is important to recall that adjustment in this context has both structural and geographical characteristics. Without the latter, adjustment could take the form of industry contracting and services growing *within* the same region. Such adjustment would necessarily avoid some of the costs associated with inter-regional mobility of labor. Hence, such adjustment would be much easier. Perhaps this is one reason why we see more adjustment in highly diversified Moscow than in other parts of Russia.

One reason why we might suspect that disadvantaged regions would adjust at a slower pace is the role of transaction costs. The cost of moving to a new region may be prohibitively costly. Potential migrants are deterred both by the difficulty of selling assets and obtaining finances for the move (these are factors of the host location),<sup>25</sup> and by restrictions on immigration in destination locations.<sup>26</sup> It is clear that these factors play an important role in slowing down the pace of adjustment in Russia. The question, however, is whether these factors have a greater impact on more disadvantaged regions, hence over-turning the prediction of the pure adjustment hypothesis.<sup>27</sup>

A more important factor in slow adjustment may be industrial specialization. If disadvantaged regions are also more specialized, then any structural adjustment *within* a region becomes much more difficult. In a specialized region inter-sectoral adjustment is quite likely also inter-regional.<sup>28</sup> If the disadvantaged regions are more specialized then they face a greater differential burden. Note that this would not be important if distances were small – in Singapore inter-sectoral and intra-sectoral mobility involve the same costs in terms of labor mobility, movements within the city. Russia is the extreme opposite end of the spectrum, especially given the high degree of industrial specialization.

It could be argued that one factor that causes a differential impact on disadvantaged regions is the fact that the Soviet allocation was non-economic. Administrative decisions about investment

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<sup>25</sup> The importance of these costs is highlighted in Andrienko and Guriev (2004) who find that up to a third of Russia's regions are locked in poverty traps. In such regions a rise in income increases out-migration by slackening liquidity constraints.

<sup>26</sup> Of course these restrictions reflect political considerations in the destination location.

<sup>27</sup> We can break the cost of moving to a new destination into two parts: those dependent on the home location, and those dependent on the destination location. We assume that the latter costs are independent of the location from which the immigrant started. So the question of whether transaction costs are larger in depressed regions focuses on the issue of home location costs.

<sup>28</sup> It may be possible for new industries to develop *de novo* in disadvantaged regions. But it seems implausible that this will be the case if the region is far from markets and is already in a disadvantaged location.

and labor allocation mean that many regions are far from viable in the liberalized regime. The disadvantaged regions may be particularly impacted, especially if they are in locations with inhospitable climates. Yet, this effect should lead to faster adjustment from these regions. If there are no subsidies and no inhibitions to adjustment these regions should experience a more rapid shift in economic structure. If they do not this must be because of factors ignored in the pure adjustment theory.

Of course one factor that may slow down adjustment is the perception that changes are only transitory. If it is perceived that structural adjustment processes will reverse themselves agents will be reluctant to move. But where does such a perception come from? Perhaps this could arise from the promises of regional political officials. It is hard to see why this effect would be larger in the more disadvantaged regions, exclusive of the induced political effect.

### 3. Political economy and Russian federalism

Analysis of structural change across Russian regions is often treated solely in terms of economic efficiency. But Russia is a federal state and this has consequences for the pace and direction of structural change.<sup>29</sup> There are two important considerations here. First, the existence of regional decisionmakers alters the focus from countrywide efficiency to region-specific.<sup>30</sup> Second, the arbitrary nature of regional boundaries means that many regions are not economically viable in a meaningful sense (we explain this below).

The very fact of a federal state means that regional governors are important economic players. Independent of their preferences or attitudes towards reform, regional decisionmakers must take local conditions into account. The closing of a large enterprise in a relatively small oblast may be politically unacceptable even for a pro-reform governor. At the very least, the governor may require transfers from the federal government to allow the closing of such an enterprise. When these are not forthcoming there is a conflict between the interests of the region and that of the country as a whole. This acts as an impediment to structural change. More importantly, such effects will be largest in regions that require the most adjustment. Hence, this force would act in the opposite direction of the pure adjustment hypothesis.

The role of federalism is enhanced further once it is recognized that the importance (or status) of a governor depends on the viability of their regions. Policies that lead to the shrinking of a region – via emigration, for example – weaken the authority and prestige of a governor.<sup>31</sup> There is a political conflict between the importance of being a governor and economic reform in a depressed region.

Notice that there is in Russia a conflict between two key goals of reform: democratic federalism and economic efficiency. The reason is that Soviet federal regions did not evolve solely as a result of economic activity. Rather they are primarily the result of administrative efforts at

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<sup>29</sup> See Ericson (2000) for an important analysis of Russia's industrial feudalism.

<sup>30</sup> Presumably one could design a system of cross-regional transfers to induce governors to internalize the nation-wide effects. In practice, however, the system of taxes and transfers does not have this result. If transfers are based on population, for example, then governors prefer to have citizens stay put rather than emigrate to faster growing regions. Similarly, if they are means-tested.

<sup>31</sup> See Gaddy and Ickes (2003b) for a discussion of *market-impeding federalism* that focuses on the implications of "loser regions" on reforms in a federal structure. They show that efficiency-enhancing reforms may not be undertaken in a federal system with "loser regions."

occupation and control (by the Russian Empire), and Soviet efforts to invest independent of cost considerations. The Soviets achieved a balance of economic activity across regions through pricing and subsidies (though hidden by the circus mirror of Soviet pricing). So there is a systematic regional bias in terms of economic efficiency. The relative economic advantages of regions are not randomly distributed across the federation. They are almost perfectly correlated with cold and distance, which are also highly correlated to each other..

Note that regions were not key economic entities – the system was centrally organized. There was no economic integration at the regional level. When liberalization took place in Russia the systematically biased nature of political boundaries becomes critical. Now, in the absence of subsidies, the costs must be borne by the regions, in contrast to the past when it was borne by the center.<sup>32</sup> To offset this governors seek subsidies to support their regions, and these subsidies have continued to be important more than ten years into transition. Because each unit has an equal vote, and because regions are heavily skewed towards inefficiency the median region votes for pretense and subsidies.

One of the key economic contributions of federalism is a diversification and insurance mechanism. There clearly are gains from trade across regions. When shocks to the system are idiosyncratic redistributive transfers across regions reduce the volatility of consumption. If the shocks are not systematic, then over time transfers balance out. It is very different, however, when shocks are consistently systematic.<sup>33</sup> In this case, there is a conflict between economic efficiency and democratic federalism. Insurance requires a veil of ignorance as to the incidence of shocks. If outcomes are known it is not insurance, but subsidization. The more economically specialized are regions, the more likely shocks will be idiosyncratic. In an economy with diversified regions economic shocks are less likely to require transfers to smooth shocks. Fiscal federalism is thus most needed in an economy with highly specialized regions; Russia is perhaps the paramount example. But insurance does not work if the risks are systematic and predictable.<sup>34</sup> In this case, fiscal federalism generates tensions that threaten the system, or you get chronic fiscal transfers that contradict reform.

Because the Soviet system scattered industry across regions lots of fictitious capital remains in regions that happen to be the median voter -- the cold distant regions. It would be much less of a problem if these regions were just poor (Mari El's); in that case income transfers would be the response. But because these regions have fictitious capital specific types of subsidies – such as low energy and transport costs – end up wasting even more resources. These subsidies make regions

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<sup>32</sup> Of course in actuality liberalization did not lead to the elimination of subsidies and transfers. Most importantly, subsidized energy and transport continued through the operation of the federal natural monopolies, *Gazprom*, *UES*, and *MPS*. See Gaddy and Ickes (2002, p. 34-36). The key question is why these federal subsidies and transfers remain important long after liberalization. Our explanation is that governors play a key role in maintaining them.

<sup>33</sup> As opposed to systemic. Systemic shocks treat all regions alike. Systematic shocks treat regions differently but consistently.

<sup>34</sup> We see this effect in the United States where the federal system results in perpetual agricultural subsidies (primarily due to each state having two senators). These would not survive if states voted according to population or if state boundaries were re-drawn to account for changes in relative economic importance. Notice, however, that US states did not form for arbitrary reasons. Territories were settled because they offered residents some advantages over other locations, including economic advantages. In Russia regional boundaries reflect decisions concerning administration, not settlement.<sup>34</sup> Because regions in Russia originated in decisions regarding centralized administration, and not economic activity, it is not surprising that systematic inefficiency arises. Hence, in Russia the median governor is very far from the reform end of the spectrum.

appear to be viable, or at least less disadvantaged than they actually are, and lead to more production rather than the shutting down of enterprises and economic activity.

One reason why observed industrial change will be slower than that predicted by the pure adjustment hypothesis is that loser regions will want to subsidize high cost industry to prevent an outflow of capital and labor. This is the industrial feudalism type argument we have been discussing. It is important to recognize, however, that rich regions may also have an incentive to support such policies. Rich regions may prefer to prevent the movement from poorer regions; just as rich countries impose barriers on labor flows from poorer countries. If you calculated the social planner's solution to the adjustment problem for Russia, labor would move from the loser regions where TFP is low. Total income would be much higher if Moscow and similar regions were much bigger. But the gain in the workforce would be accompanied by a fall in wages in the winner regions. Hence, governors of rich regions also choose to restrict the movement of labor. Rather than allow immigration, they provide (support) the subsidies that the loser regions want to maintain their political authority.

This migration channel is important in a federal region. It could happen across transition economies only to a much smaller level because labor flows across regions are impeded by barriers to immigration, both legal and cultural. But within a country such barriers are limited. Hence, the importance of this channel is greater.

#### 4. Adjustment hypotheses compared

What are the alternative predictions that the various hypotheses imply? It is important to clarify the alternative predictions so that the results of the empirical analysis are easier to interpret. In this section we discuss the predictions of three hypotheses about structural change in a federal system: the *pure adjustment* hypothesis, the *politics drives adjustment* hypothesis, and the *inefficient federalism* hypothesis.

The *pure adjustment process* predicts that the pace of structural change across regions depends directly on the initial level of distortions. Regions with the highest levels of initial distortions will display the highest rates of structural change. This hypothesis has strong predictions because it focuses on only economic behavior.

An alternative hypothesis is that *politics drives the speed of adjustment*. That is, the pace of structural change is explained by attitudes of voters in various regions. If political attitudes in the region are pro-reform there will be a greater degree of structural change. Of course this then begs the question of how attitudes are determined. There are two important cases for our purposes: (i) political attitudes are uncorrelated with regional distortions, and; (ii) political attitudes are perfectly correlated with regional distortions. One might suspect that regions that are most advantaged will be pro-reform (negative correlation). Hence, in this case adjustment will be correlated with political attitudes.

A third hypothesis is *inefficient federalism*. According to this hypothesis regions that are most disadvantaged actively prevent adjustment. This hypothesis is the opposite of the pure adjustment hypothesis. The problem arises when the costs of adjustment are so severe that local governments impose barriers to adjustment regardless of their political color. Thus, according to this hypothesis,

it is not the political attitudes but the political cost to any regional authority of structural adjustment that determines its pace.

Suppose that the first case is true. Let  $y_i$  be a measure of structural change, our dependent variable, let  $x_i$  be a measure of initial distortions by region, and let  $p_i$  be some measure of political attitudes by region, such that higher values of  $p_i$  represent greater preferences for adjustment. Then if we run the following regression:

$$y_i = \beta_0 + \beta_1 x_i + \beta_2 p_i + \varepsilon_i \quad (4.1)$$

the pure adjustment hypothesis is true we should observe  $\hat{\beta}_1 > 0$ , while if the *inefficient federalism* hypothesis is true we expect  $\hat{\beta}_1 < 0$  and  $\hat{\beta}_2 = 0$ ; political attitudes should not explain adjustment. If the political attitudes hypothesis is true we should observe  $\hat{\beta}_2 > 0$ .

A problem arises only if the inefficient federalism hypothesis is true and if pro-reform attitudes are positively correlated with distortions. It may not be federalism that is the problem, but just the faster adjustment due to pro-reform political attitudes.<sup>35</sup> Then we cannot infer from (4.1) whether the negative coefficient on initial conditions is due to inefficient federalism or political attitudes. If pro-reform attitudes are negatively correlated with distortions we have no problem because the two hypotheses make opposite predictions.

## 5. Changes in the Russian industrial structure and benchmarking

Table 1 summarizes some of the basic changes in the industrial structure of employment in Russia between 1990 and 2001. We use employment shares instead of production (GDP) shares (as RSS do), since the latter are infested with distorted prices at the outset of transition. Moreover, transition involves changes in relative prices and these add noise to measurement of structural change. Employment shares and changes thereof are, of course biased due to differences in technologies (labor/capital ratios) across countries over time. For our present purposes this seems a lesser problem. Table 1 shows a significant decline in manufacturing and in construction, and large increases in all services, trade, housing and personal services and “other” services.<sup>36</sup> This last category includes, unfortunately both ‘public administration’ and financial and other business services and hence the overall category shows a more modest increase.<sup>37</sup> There was almost no change in the share of transportation and communications (the former probably declined somewhat and the latter which is much smaller than transportation expanded very significantly) and there was a very modest decline in the share of agriculture.

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<sup>35</sup> In the empirical work we are faced with the problem of how to identify political attitudes. The political variables we use – such as voting behavior – represent not just attitudes but also the impact of economic adjustment. They are endogenous to the changes taking place in Russia. In principle, one could solve this problem by employing a two-stage process. First, regress political variables on initial conditions and success variables. Then use the *unexplained* portion of political variables as the exogenous attitudes.

<sup>36</sup> These are the categories that *Goskomstat* reports for regional data.

<sup>37</sup> Data obtained by Raiser, Schaffer and Schuchhardt (RSS, 2003), is divided between ‘market’ and non market services and show (RSS, Table 4) an increase of the first category over a similar period of time from 16.7 to 25.1 percent of the employed and a modest increase of the employed in the non-market type services. Notice that both categories of services, but especially that called non-market services, include publicly as well as privately provided services. The share of the latter in both categories increased over the period.

[Table 1 here]

The key questions for transition are: are these changes in the right direction? Are they large (small) enough? Before one can turn to these questions, however, it is necessary to understand how to evaluate the initial structural distortions. As mentioned above these are estimated for countries by comparing the industrial structure of TEs on the verge of the transition with those of market economies “at the same level of economic development.” The latter is represented in most studies by the level of GDP per capita, estimated on the basis of purchasing power parity. While the application of this income benchmark to TEs may be problematic, as claimed by Kuznets, it can be justified now that these countries are adopting market systems. Still a question remains about what is the appropriate income concept and level to be used in order to estimate the extent of the initial distortions. In general one should look for incomes that represent longer-term production potential levels (see below). At this point we are persuaded that the initial level of GDP *per-capita* at the start of transition (prior to the ensuing output fall) is the minimum acceptable level, and the best available among alternatives. As this is a purchasing power equivalent, it represents the value of production in accordance with the objective function of the decision makers at the time. This level, however, was still below the long-term potential of these economies at that point, given the deep inefficiencies of the system.<sup>38</sup> Therefore we may have some bias in the estimate of the distortions (mostly, the distortion in services will be underestimated).<sup>39</sup> A recent estimate of the extent of the initial distortions for TEs along these lines is included in the RSS paper (Table 4 and the Appendix) recalculated here for Russia in Table 2. The initial distortions shown are very similar to those discussed above.

Table 2 around here

Coming back to the evaluation of the extent of changes in the industrial structure, we claim that the application of income benchmarking (as indeed presented by RSS) for the early transition period is inappropriate. The main reason for this is that all TEs suffered from sharp declines in income, which pushed them far below their longer-term production capacities. These income declines make TEs look less distorted than they really are. As economies develop (as GDP per capita rises) the share of employment in industry falls. The starting point for all TEs is over-industrialization, especially compared to their long-term potential. The transitional recession causes their incomes to fall. Then with no structural change these economies will look less distorted than before. This is evident in figure 1, where the initial distortion is given by the distance AB. With a fall in GDP per-capita, the distortion falls to CD even though the share of industry has not changed.<sup>40</sup> By conventional benchmarking it appears the economy is less distorted. But clearly this is an invalid inference. The decline in GDP per-capita is a temporary feature of transition, and it is out of line with the ‘normal’ process of economic development. Thus, it seems clear that the evaluation of the

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<sup>38</sup> The level of GDP *per capita* for Russia in 1990 (according to RSS) was approximately 25% of the US level at that time, a proportion that was considered acceptable when the Soviet Union collapsed, and much below most estimates from prior to the collapse.

<sup>39</sup> An interesting exercise, for example, would be to benchmark income in 2000 based on what GDP would be if Russia were on its long-run growth path. Of course, this would presume that we know what that path would be. We do not perform this exercise in this paper.

<sup>40</sup> There is a related question: to what extent one should expect a complete, or at least a rapid adjustment of the industrial structure of TEs to that of market economies? Should one expect the socialist period to leave some structural imprints for an extended period of time? Just as a speculation, could it be that some over-industrialization will (and should) stay, given that it already was developed?

extent of the structural changes during the first decade of the transition, cannot be made by aligning them to parallel changes in income.<sup>41</sup>

Our concern in this paper is, of course, the different patterns of structural change among the 89 regions of Russia. Here there is an added difficulty related to benchmark-type estimates of the structural distortions. This arises because regions in one country are much more specialized than countries. Russia (and the other CIS states as well) presents an even more extreme case since the initial specialization of regions included also the other 14 republics, which became independent states. Specialization cannot be ignored in this case, contra to RSS. The very low level of agriculture in Russia is one example of the impact of this former specialization. For the Soviet Union as a whole and in an earlier period we have estimated that the employment share of agriculture was higher rather than lower than normal (Ofer, 1987). It is therefore quite fortunate that we found relatively little use for benchmarking against income levels during the transition period.

Given all these considerations we decided to start with the initial industrial structure and distortions inherited from the old regime and to study the changes during the first decade with no specific attribution to any income benchmark. The relative income levels of the *oblasts* and the changes thereof during the 1990s will serve as independent variables together with other initial conditions and specific characteristics of the individual *oblasts*.<sup>42</sup> Such variables (see below) will also control for inter *oblast* structural differences not explained by “level of development”, creating a more even ground for inter *oblast* comparisons

## 6. Changes in the industrial structure: Russia and the regions

Table 3 contains data on the changes in the industrial structure of 4 key sectors, Agriculture, Industry, Construction and Trade<sup>43</sup> for Russia and for 11 “*districts*” according to the old administrative divisions.<sup>44</sup> This is a summary table of a bigger one including the same data for all (or most of) Russia’s 89 Federal Subjects, the *oblasts*. The data for the larger districts are shown in order to provide a general impression of the variance across Russia in the initial structure and in the extent of change during the first decade of the transition. The *oblasts* as Federal Subjects have their own parliaments and governments so here is where one can test the political economy impact on industrial changes. Data on *oblasts* thus constitute the main observations of the statistical analysis.

[Table 3 here]

Two general observations emerge from the table: First, that all districts (and indeed all *oblasts*) experienced, with few exceptions, a similar process of industrial change: Industry and construction declined quite sharply in all, agriculture didn’t change much and trade exploded. The second observation is that there is quite a significant variance among the districts (and the *oblasts*) in the

<sup>41</sup> This method – was used by RSS – and produced some very strange results (see their Table 4). To give just one or two examples: For one, in order to become ‘normal’ TEs must substantially increase their agricultural sectors, unlikely to ever happen. Or another, the CIS countries, despite very poor transition record “managed” to close the large service gap.

<sup>42</sup> Actually there are 89 subjects of the Russian Federation, including *oblasts* (49), republics (21), *krais* (6), one autonomous *oblast*, ten autonomous *okrugs*, and two federal cities. For simplicity, we refer to all subjects as *oblasts*, unless specifically stated.

<sup>43</sup> Trade is included as the best available representative of the fast growing sector of “market services”. As explained in footnote 41 above, there is no regional data for a breakdown of “other services” into “market” and “non market” services. There is enough anecdotal evidence that the other “market” or business services move in tandem with Trade.

<sup>44</sup> Again we note that changes are measured over the period from 1990 to 2001 unless otherwise stated.

extent of these changes (as manifested in the relative deviations from the average Russian level, shown in the third column for each branch). We also note the significant increase in the share of agriculture in the North Caucasus district, reminiscent of the same phenomenon in the bordering CIS states, and the small decline in Construction in the Central (Moscow) and the Northwest (St. Petersburg) districts. Indeed this small decline is a net outcome of an initial sharp decline in construction everywhere, reflecting the decline in investments and in defense expenditures and a later recovery in fast growing *oblasts*, reflecting the construction of new housing: a beautiful manifestation of the shift in the structure of demand, and the elimination of priority treatment for defense and investment that prevented proper development of housing in the past. We will come back to differential changes in the decline in industry and the expansion of trade.

As we already noted, the analysis in this paper concentrates on manufacturing, and on trade, the latter representing the entire (market) service sector. The dependent variables (*DEP*) are thus the relative (percentage) deviations, from the Russian national averages, of the changes in the employment shares for manufacturing (*M*) and trade (*T*) of the individual *oblasts*. These variables are constructed as ratios relative to the Russian average. For example, let  $m_{i,k}$  be the share of manufacturing employment in oblast *i* in year *k*. Then we measure the change in manufacturing for oblast *i* as:

$$M_i = \frac{m_{i,2001}}{m_{i,1990}} \bigg/ \frac{m_{Russia,2001}}{m_{Russia,1990}},$$

where we have normalized by using the change in manufacturing employment for Russia as a whole. Hence, if manufacturing employment has changed at the same rate in oblast *i* as for Russia as a whole, then  $M_i = 1$ , while if structural change is slower than the national average this will be less than one. A third dependent variable (*SUM*) is the sum of the absolute value of these two changes ( $T + M$ ), denoting the extent or essence of the entire structural change.<sup>45</sup>

Our fundamental assumption is that the distortions in industrial structure are represented in excessive levels of manufacturing employment and a deficit of trade. Hence, we measure structural adjustment by the change in these variables during the transition. We recognize that regions are not identical in their endowments. Hence, we should not expect them to exhibit identical manufacturing and trade shares. We attempt to control for this with variables that explain initial conditions (described below).

As independent variables we use four clusters or vectors of variables:

- The natural resource potential of the *oblast*, *NR* is used as a control for differences in the level of manufacturing resulting from differences in endowment and therefore specialization and not from differences in over-industrialization.<sup>46</sup> We assume that in natural resource rich *oblasts* the degree of over-industrialization is lower for a given level of employment in manufactures. We therefore include *NR* in all the regressions.
- Variables representing initial (i.e., 1991 levels) or constant conditions in the *oblasts*: *IC*'s

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<sup>45</sup> Most *Oblast* data on population, labor force and other variables with no specific citation come from *Russian Regions*, various years as appear in the database of CEFIR. This database is also the source of some of the other variables without specific references in this draft

<sup>46</sup> This index was produced by the World Bank, and was used by Dolinskaya (2002) who generously supplied this to us.

- The initial employment share of manufacturing,  $IM$
  - The rate of urbanization:  $UR$
  - The specialization of industry in a region:  $SP^{47}$
  - Average January (1997) temperature:  $TEMP$
- Variables representing the economic performance – success – of the *oblast*:  $SUC$ 
    - Change in population:  $DP$
    - Change in the number of employed:  $DEMP$
    - Change in the number of small enterprises:  $DSEs$
    - Change in gross regional product per capita:  $DGRPPC$
    - FDI per 1000 employed in 2001:  $FDI$
    - Change in the crime rate (crimes per ‘1000 people):  $CG$

All "changes" are for 1991 – 2001 or a near year unless otherwise stated.

- Variables representing the nature and quality of the political and institutional environment and inclination:  $POL$ 
  - A democracy index (Petrov):  $DEM^{48}$
  - Legislative quality (Rank):  $LEG^{49}$
  - Political environment (Rank):  $POL$
  - Social environment (Rank):  $SOC$
  - Vote for various parties and candidates for president, 1996, 1999, 2000<sup>50</sup>

The estimated equations are of the form:

$$DEP = f(NR, IC's, SUC, POL) \quad (6.1)$$

We also estimate the equations in subsets, always including  $NR$ . Thus, we estimate (6.1) with just the  $IC$ 's, with just the  $SUC$ , and with just the  $POL$ .

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<sup>47</sup> The specialization index we use is inspired by Krugman (1991) and taken from the work of Narayan (1999). Let  $s_{ij}$  denote the share of industry  $i$  in total production employment for region  $j$ . Similarly employment shares of industries for the federation as a whole are calculated ( $S_i$ ). The index ( $SP$ ) is then calculated as  $SP \equiv \sum_{i=1}^n |s_{ij} - S_i|$ , i.e., as sectoral

share differences between the region and the federation summed across  $n$  sectors. This index would take a value of zero if the region had an industrial structure identical to the federation. If the region has an industrial structure that is very different from the federation, we would get a value close to 2 (since the federation contains all the regions the index can never be exactly equal to 2). These shares are calculated using 1989 data, so this index represents specialization prior to the start of transition.

<sup>48</sup> This index was developed by N. Petrov of the Moscow Carnegie Center. It reflects information on ten categories of regional governments, including: the regional political system; openness of political life in a region; how democratic are elections; pluralism of parties; independence of media in the region; corruption; economic liberalization; civil strife in a region; diversity of elites; and independence of local governments within the region.

<sup>49</sup> LEG, POL, SOC, are ranking variables representing elements in an evaluation of the investment environment in the *Oblasts*, prepared by *Expert*, in Moscow for 2001/2002.

<sup>50</sup> CEFIR database, compiled from various sources.

In another set of equations we used dummies for the 11 districts mentioned above, *DDIS*, as fix effect variables to represent in a more general form the initial conditions and the characteristics of their respective *oblasts*. These equations are of the following form:

$$DEP = f(DDIS, SUC, POL) \quad (6.2)$$

What do we expect to find in the data? Based on the pure adjustment hypothesis one would predict that changes in the industrial structure will be larger (all else equal):

1. The poorer the region is in natural resources
2. The more extreme are the initial distortions and the more difficult the initial conditions.

Alternatively, if reform policies are the driving force we might expect that: changes in the industrial structure will be larger

3. The more dynamic are the reforms and economic growth.
4. The more liberal and pro-reform are the population and the government

In Table 4 we present the results of regressions on the initial condition variables (including the natural resource potential index). We present separate estimates for the change in industry, the change in trade, and *SUM*. This is just estimation of equation 6.1 without the political and success variables. It is apparent that changes in industrial structure are positively associated with temperature and negatively associated with natural resource potential and the degree of industrial specialization. Temperature does not seem to explain changes in trade – urbanization and initial industry levels play a more important role here. The results for the *SUM* variable resemble those for industry, suggesting that the variation in the change in industry variable is greater than for trade.

[Table 4 here]

In Tables 5-6 we present the results of regressions (of equation 6.1) with the *SUC* and *POL* variables included. There are many possible success and political variables to use. We report only the regressions where such variables are statistically significant. It is evident from these tables that relatively few of these variables are statistically significant, and rarely in combination. Thus while (only) a few *SUC* variables bring about more dynamic changes, they are only significant when the *ICs* and the *POL* variables are excluded. It is also apparent that while a few “pro-reform” *POL* variables seem to encourage larger sectoral changes in the expected direction, they are statistically significant only when they stand alone in the regressions. All combinations that include all or subsets of all three vectors in one regression ended up with a clear “victory” of the *ICs*.<sup>51</sup> The initial conditions and the basic characteristics of the *oblasts* explain a significant share of the structural changes and drive away (almost) all the other explanations. They are, in almost all the estimates made, the initial share of industry (*II*), (and sometimes as a substitute also the initial level of urbanization, *UR*), the natural resources potential (*NR*), the specialization level of industry (*SP*), and the average January temperature (*TEMP*). The important thing to note from this set of regressions is

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<sup>51</sup> Suppose we estimate the impact of success and political variables on our dependent variables and find some statistically significant relationships. Including initial conditions variables in the regression typically wipes out the explanatory power of the success and political variables (except the few cases reported in tables 5 and 6). The reverse is not true, however. Including success and political variables does not reduce the explanatory power of the *ic*'s.

that these estimates all indicate slower adjustment in regions where distortions are larger, rather than the opposite.

[Table 5 here]

In figures 2-5 one can clearly observe the negative relationship between structural changes and the average January temperature (*TEMP*) across the (11) old administrative districts of Russia (Figures 2-4) and a scatter of the relationship between *TEMP* in the *oblasts* and structural changes (Figure 5).

[Table 6 here]

The (statistically) significant results in tables 5 and 6 show that a smaller decline in total employment, the rate of growth of small enterprises and less crime influence some of the structural variables in the right direction. It is very noteworthy that changes in regional income per capita were insignificant in the estimates for *SUM* and *T*, and only marginally significant in the *M* regression.<sup>52</sup> The level of democracy (*DEM*) Voting for Yavlinsky and Yabloko and “against all candidates” (!) in various elections since 1996, do support faster industrial changes, especially the growth of trade.<sup>53</sup> Regions that voted for Putin, on the other hand, had slower changes (Table 6).

In tables 5 and 6 we presented results for political and success variables with only the natural resource variable as an initial condition. What happens if we use the entire vector of initial condition variables? The general answer is that all the political and success variables become statistically insignificant. An exception arises when we use the 2000 vote for Putin. With the appropriate combination of success variables we obtain table 7.

[Table 7 here]

The signs on the initial conditions variables are similar to those in table 4. What table 7 indicates is that the vote for President Putin does explain changes in trade. It is important to note, however, that this result is fragile. Were we to exclude the statistically insignificant success variables in the estimate for *SUM*, for example, the vote for Putin would no longer be statistically significant, while the initial condition variables would still remain. Given that there are hundreds of combinations of regressions that can be run using the assorted political and success variables the fact that we find one (or even a few) combination that produces a significant result one should not attach to much weight to this finding. Random chance with that many regressions should produce such results. The important finding is that the initial conditions variables are almost always significant. Hence, that is the robust finding. That is why we stated above that in competition among the vectors the initial condition variables always win.<sup>54</sup>

Two, maybe three, main lines of reasoning can explain our findings.<sup>55</sup> First, high distortions and difficult living environments impose difficulties on the ability to change that offset the

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<sup>52</sup> If income growth were significant we would then be faced with a thorny problem of causation: are structural changes associated with income growth because the latter causes the former, or *vice versa*.

<sup>53</sup> Of course, this could be the result of reverse causation. Those regions that were least disadvantages saw the most positive changes and voted in a “pro-market” way.

<sup>54</sup> The same statement holds for trade and industry estimates.

<sup>55</sup> In addition, we must admit that these results could result from the fact that our political variables are not the correct ones. Perhaps the lack of association reflects our use of the wrong variables to represent political forces. In our defense

incentives created by the removal of the subsidies and the freedom to move. The transaction costs in such cases may be too high. There are large potential efficiency gains from structural changes, but these do not occur because labor cannot afford the costs associated with these moves.

Second, it seems likely that in highly distorted and economically difficult areas, it is much more difficult to implement proper economic reforms, and that a government, no matter of what political color, find it mandatory to “protect” its population by lobbying for continued federal support, and by taking steps to preserve the old production capacity even when it is making losses. The idea is simply that the necessary corrections in industrial structure are politically unacceptable, and that regional governors work actively to prevent them, independent of their political affiliations. It is clear, for example, that low energy and transportation costs have been preserved throughout this period. This may be due to political exigencies; it certainly reduces the pressure for structural change. One way to check this hypothesis directly is to look at the relationship between the levels of net transfers to *oblasts* and changes thereof over time and the clusters of dependent and independent variables.

A third explanation is that correcting the industrial structure variables by the natural resource endowment didn't completely “clean” the *ICs* (that is, it did not control for all the justified differences in the initial shares of manufacturing). That means that some actual decline in manufacturing (*M*) in some *oblasts* must be considered unwarranted from an economic development point of view, and not the elimination of over-industrialization. Such unwarranted declines could have been caused by bad policies, and by the economic disorganization during much of the decade. This hypothesis may be supported by the fact that the failure of various *SUC* variables to explain the changes in *M*, was greater than with regard to trade.

### 6.1 Endogeneity

A natural concern is that the political and success variables may be endogenous. Political attitudes as we measure them are not innate, but rather are influenced by both the initial conditions that characterize regions and the extent of success of reform. And success variables clearly depend on the initial situation of regions. Does this vitiate our analysis? We strongly believe it does not. The important reason is that our essential thesis is precisely that initial conditions drive the choices of regional political leaders. Hence, initial conditions *should* cause variation in political variables and success variables.

The important point about this endogeneity is what to conclude. The invalid inference would be that political choices do not impact success. We are not arguing, or showing, that political decisions are irrelevant to success. Rather, we are showing that initial conditions are the dominant factor explaining relative success. To assess the importance of political choices in generating success we would have to control for the impact of initial conditions and then check the marginal impact of political choices on the *unexplained* variation in performance. This is an interesting exercise, but it is a different paper.

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we would note that we tried many other political variables than the ones reported in the text (these were the variables that displayed the strongest associations). This leaves a challenge for researchers to come up with better measures of political factors that could explain structural change.

## 7. Conclusions

During the first decade of transition Russia went through quite radical changes in its industrial structure. These changes corrected some of the extreme distortions in the structure created during the communist period, particularly with regard to over-industrialization and the low level of activity in services. Most significantly, Russia has experienced a marked decline in the share of manufacturing and (in most places) construction and even a stronger trend on increase in the share of trade services (and most likely other private market services too). These changes, which are apparent at the aggregate level, are the result of changes in industrial structure at the regional level.

In this paper we have focused on changes in the industrial structure of employment, and the differentials thereof across the 89 federal subjects of the Russian federation. Allocation of economic activities across the regions under the old regime was also spatially distorted in terms of urbanization, distance to markets and living conditions. This means that untangling the distortions in industry and in location are intertwined.

A rigidly neoclassical approach to the problem of structural change would predict that regions with larger distortions would adjust the fastest following the elimination of subsidization and coercion. Structural distortions would provide a big push to change. We have found that the opposite is actually the case. Regions that have the most disadvantageous initial conditions were the slowest to adjust. Our preferred explanation for this finding is that political economy factors played a key role, through the intervention of regional governments in trying to preserve the old structure through the preservation of the old support system.

The empirical analysis demonstrated that initial conditions (distortions) are the best explanatory variables for (slower) changes in our structural variables, and that political variables that can also explain (though less significantly) similar trends are driven away from the regression by the initial conditions, probably because they are endogenous to the entire process. While a pure neoclassical approach may appear to suggest that push factors predominate, we find no support for this. The regions that adjust most rapidly are those that are most advantaged. This could be due to the importance of political factors in *preventing* or slowing structural changes, and this phenomenon could be exacerbated by Russia's federalist system. The irony for Russia is that these regional (*oblast*) governments were created and given powers in the name of democracy and economic decentralization, the sister arm of the economic reform, liberalization and marketization.

There are still several important directions for further research. First, more work is needed on the theory of industrial structure, how it changes during periods of transition, and its relationship with benchmarking by income or "development levels." Second, further analysis is needed of the relationship between the depth of the initial distortions and the speed of adjustment. And we need to invest more effort in understanding the relationship between changes in the industrial structure and potential explanatory variables such as growth and other reform and "success variables" and political economy forces on the regional level. It would also be important to study changes in the industrial structure at a more disaggregated level, at least one level down to the 2-digit classification for industries, and to incorporate other divisions of total product: by end use and by the private/public mix. A separate study has to be conducted on the changes in the urbanization patterns in Russia.

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**Table 1: Changes in the Industrial Structure of Employment in Russia: 1990-2001 (%)\***

<i>Sector of the economy</i>	<i>1990</i>	<i>2001</i>	<i>% Change</i>
Agriculture and forestry	13.8	12.7	-8.1
Manufacturing	30.3	22.7	-25.1
Construction	12	7.8	-35.4
Transportation and Communications	7.7	7.7	0.6
Trade and catering	7.8	15.4	98
Housing and personal services	4.3	5	17.3
Health, Sport, Social security	5.6	7	25
Education, Science, Culture	13.8	12.7	-8.1
Other Services <sup>56</sup>	5.3	9	68.9

\*source: *Russia's Region*, various years.

**Table 2: Russia according to RSS et al\***

	1989-1990	2000
GDP PC	7039	4313
Shares (%)		
A: Actual	13.2	13.4
Benchmark	~ 26	~35.7
<b>Gap</b>	<b>~ - 13</b>	<b>~ -30</b>
M: Actual	42.3	30.4
Benchmark	~ 25	~ 23
<b>Gap</b>	<b>~ 17</b>	<b>~ 25</b>
MS: Actual	16.7	25.1
Benchmark	~ 27	~ 23
<b>Gap</b>	<b>~ -10</b>	<b>~ - 2</b>
NMS: Actual	25.3	29.5
Benchmark	~ 22	~ 19
<b>Gap</b>	<b>~ 3</b>	<b>10</b>
“Distortion” <sup>*57</sup>	<b>20.8</b>	<b>19.3</b>

\* source: RSS, Table 4 and Appendix table 2 and own calculations

<sup>56</sup> Public Administration, banking and finance, other (business) services.

<sup>57</sup> Defined as half the sum of the absolute gaps. The figures are RSS's and as you can see my rough estimates are very similar. The benchmark is based on a sample of 50 non-transition countries. See, RSS pp. 24-26.

**Table 3: Industrial Structure by Administrative Regions**

	Agriculture			Industry			Construction			Wholesale and Retail		
	1990	2001	<i>change relative to Russia</i>	1990	2001	<i>change relative to Russia</i>	1990	2001	<i>change relative to Russia</i>	1990	2001	<i>change relative to Russia</i>
<b>Russia</b>	<b>0.12</b>	<b>0.13</b>		<b>0.31</b>	<b>0.23</b>		<b>0.12</b>	<b>0.08</b>		<b>0.08</b>	<b>0.15</b>	
North	0.07	0.07	0.84	0.32	0.27	1.12	0.13	0.06	0.75	0.09	0.15	0.85
NorthWest	0.06	0.06	0.94	0.33	0.22	0.88	0.11	0.10	1.42	0.08	0.19	1.20
Central	0.08	0.07	0.87	0.32	0.21	0.89	0.11	0.10	1.46	0.08	0.17	1.09
Volgo-Vyatka	0.15	0.15	0.96	0.36	0.28	1.07	0.11	0.05	0.80	0.07	0.14	1.02
CentralChernozem	0.20	0.23	1.08	0.28	0.21	1.00	0.11	0.06	0.82	0.08	0.15	0.97
Povolzhye	0.15	0.15	1.00	0.31	0.24	1.03	0.13	0.07	0.87	0.07	0.15	1.05
NorthCaucasus	0.19	0.23	1.14	0.26	0.17	0.90	0.12	0.07	0.90	0.08	0.15	0.99
Ural	0.12	0.13	1.02	0.35	0.28	1.06	0.11	0.07	1.02	0.07	0.13	0.91
WestSiberia	0.12	0.13	1.00	0.27	0.22	1.08	0.15	0.08	0.86	0.08	0.14	0.89
EastSiberia	0.11	0.11	0.94	0.27	0.22	1.11	0.14	0.07	0.73	0.08	0.15	0.94
FarEast	0.08	0.08	0.91	0.25	0.20	1.08	0.15	0.06	0.66	0.10	0.18	0.98

**Table 4: Impact of Initial Conditions****Panel A Dependent Variable: Industry**

Explanatory variable	<i>Coefficient Estimate</i>	<i>Standard* Error</i>	<i>t Statistic</i>	<i>p Value</i>
Constant	1.31	0.06	20.77	0.00
Temperature	0.01	0.00	2.66	0.01
Natural Resource Potential	-0.07	0.03	-2.28	0.03
Specialization of Industry	-0.20	0.06	-3.48	0.00
Urbanization Rate	0.00	0.00	0.44	0.66
Initial Industry	-0.25	0.32	-0.78	0.44

Adjusted R<sup>2</sup> .334

**Panel B Dependent Variable: Trade**

Explanatory variable	<i>Coefficient Estimate</i>	<i>Standard* Error</i>	<i>t Statistic</i>	<i>p Value</i>
Constant	0.78	0.11	6.99	0.00
Temperature	0.00	0.00	1.42	0.16
Natural Resource Potential	-0.03	0.03	-0.91	0.37
Specialization of Industry	-0.30	0.07	-4.11	0.00
Urbanization Rate	0.00	0.00	2.53	0.01
Initial Industry	0.57	0.29	1.94	0.06

Adjusted R<sup>2</sup> .327

**Panel C Dependent Variable: SUM = Trade + Industry**

Explanatory variable	<i>Coefficient Estimate</i>	<i>Standard* Error</i>	<i>t Statistic</i>	<i>p Value</i>
Constant	0.09	0.15	0.61	0.54
Temperature	0.01	0.00	2.21	0.03
Natural Resource Potential	-0.11	0.06	-1.85	0.07
Specialization of Industry	-0.49	0.12	-4.25	0.00
Urbanization Rate	0.00	0.00	1.12	0.26
Initial Industry	0.65	0.63	1.04	0.30

Adjusted R<sup>2</sup> .373

\*Standard Errors are White heteroskedasticity consistent.

**Table 5: Success Variables**

Dependent Variable:	SUM*	Trade	Industry		
<i>Specification:</i>	(1)	(2)	(3)	(4)	(5)
<i>Explanatory Variables</i>					
Constant	0.09 (1.38)	1.00 (24.37)	0.95 (11.53)	1.15 (26.10)	1.10 (36.33)
Natural Resource Potential	-0.15 (-2.39)	-0.04 (-1.05)	-0.12 (-4.20)	-0.11 (-3.99)	-0.10 (-3.52)
Enterprise Growth	0.22 (2.38)	0.15 (2.33)			
Income Growth			0.15 (1.85)		
Crime Growth				-0.08 (-1.89)	
Population Growth					0.01 (4.04)
Adjusted R <sup>2</sup>	0.193	0.084	0.210	0.229	0.290

\*t-statistics in parentheses. White Correction for Heteroskedasticity

**Table 6: Political Variables**

Dependent Variable:	SUM*				Industry		Trade					
	<i>Specification:</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>Explanatory Variables</i>												
Constant	-0.004 (-0.056)	0.419 (2.755)	-0.042 (-0.493)	-0.002 (-0.028)	1.05 (28.89)	1.21 (22.48)	0.93 (19.39)	1.28 (0.11)	0.89 (13.97)	0.92 (22.36)	0.76 (8.06)	
Natural Resource Potential	-0.19 (-2.966)	-0.2 (-2.96)	-0.182 (-2.77)	(-0.21) (-3.09)	-0.11 (-4.07)	-0.096 (-3.34)	-0.06 (-1.97)	-0.07 (.034)	-0.06 (-1.67)	-0.08 (-2.33)	-0.07 (-2.28)	
Vote for Yavlinsky in 2000	2.57 (2.85)				0.74 (1.62)		1.98 (2.41)					
Vote for Putin in 2000		-0.557 (-2.09)						-0.47 (0.21)				
Vote Against in 2000			9.15 (2.51)						7.49 (2.05)			
Political Risk				0.002 (2.84)							0.01 (3.23)	
Vote Against 1996						-2.51 (-2.63)						
Democracy Index												0.01 (2.96)
Adjusted R <sup>2</sup>	0.201	0.166	0.194	0.2	0.204	0.27	0.12	0.07	0.19	0.14	0.13	

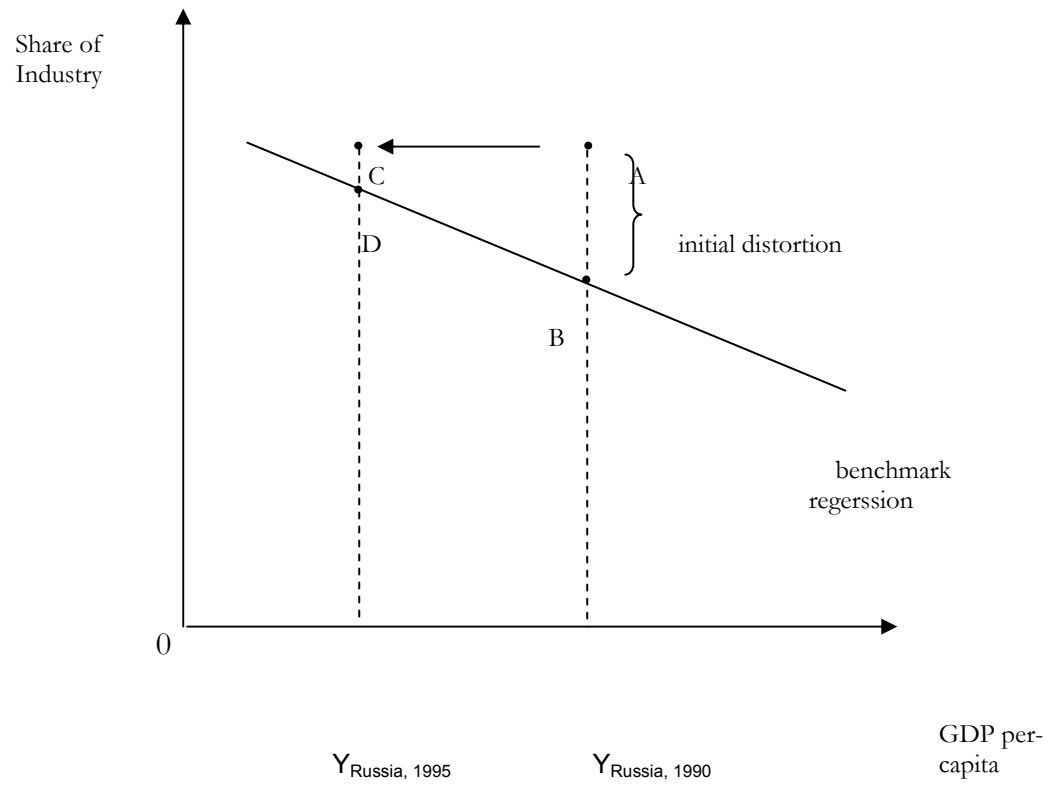
\*t-statistics in parentheses. White Correction for Heteroskedasticity

**Table 7: Vote for Putin**

	Sum	Industry	Trade
Constant	.458 (1.81)	<b>.541</b> (3.83)	<b>1.11</b> (6.62)
Vote for Putin 2000	<b>-.598</b> (-2.11)	0.16 (0.98)	<b>-0.43</b> (-2.22)
Natural Resource Potential	<b>-.12</b> (-2.41)	<b>.102</b> <b>(3.36)</b>	-.03 (-.98)
Temperature	<b>.01</b> (2.38)	<b>-.006</b> (-2.41)	<b>.006</b> (2.31)
Specialization of Industry	<b>-.47</b> (-3.48)	<b>.215</b> (2.72)	<b>-.28</b> (-2.98)
Crime Growth	-0.13 (-1.70)	0.09 (.03)	-.02 (-.294)
Urbanization Rate	.003 (1.44)	0 (.03)	<b>.006</b> (3.87)
Adjusted R <sup>2</sup>	0.47	0.34	0.39

(boldface signifies significant at 5%)

White Correction for Heteroscedasticity



**Figure 1: Problems with Benchmarking**

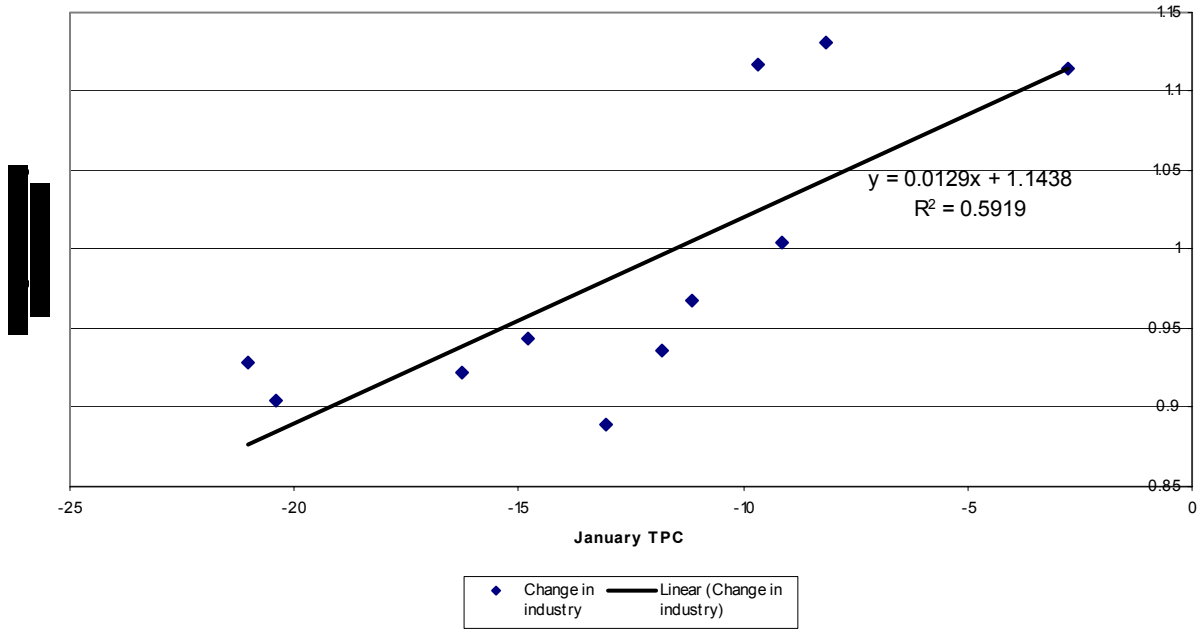


Figure 2: Change in Industry and Temperature (January mean) in 11 Russian Districts

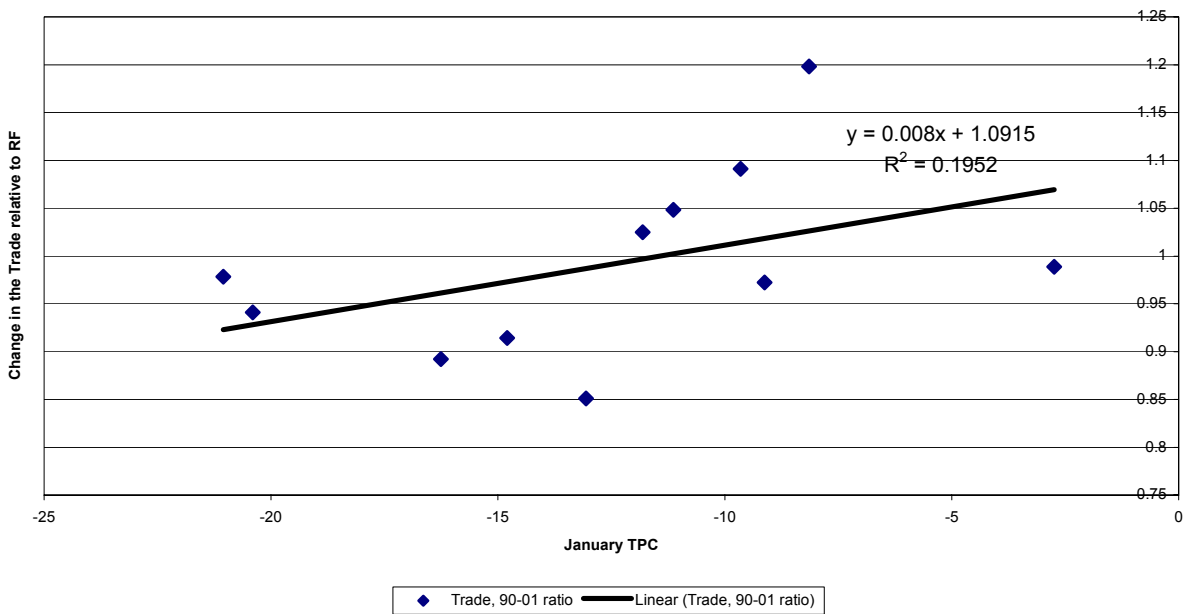


Figure 3: Change in Trade and Temperature (January mean) in 11 Russian Districts

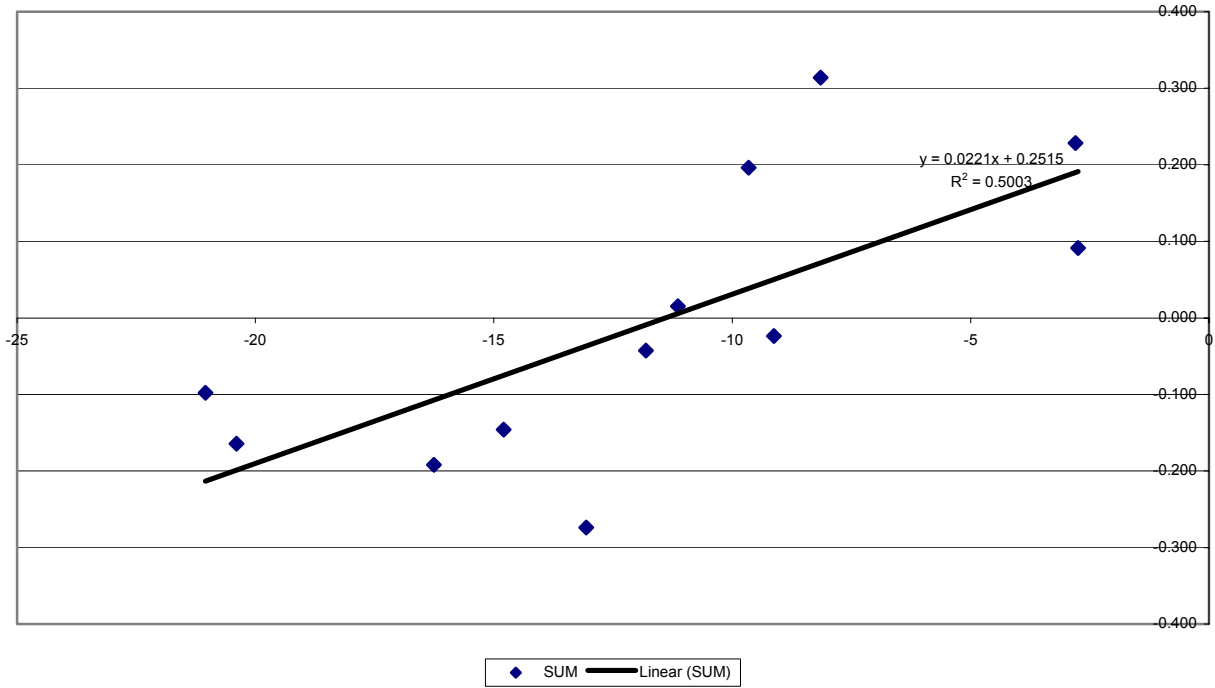


Figure 4: Trade – Changes in SUM and Temperature in 11 Russian Districts

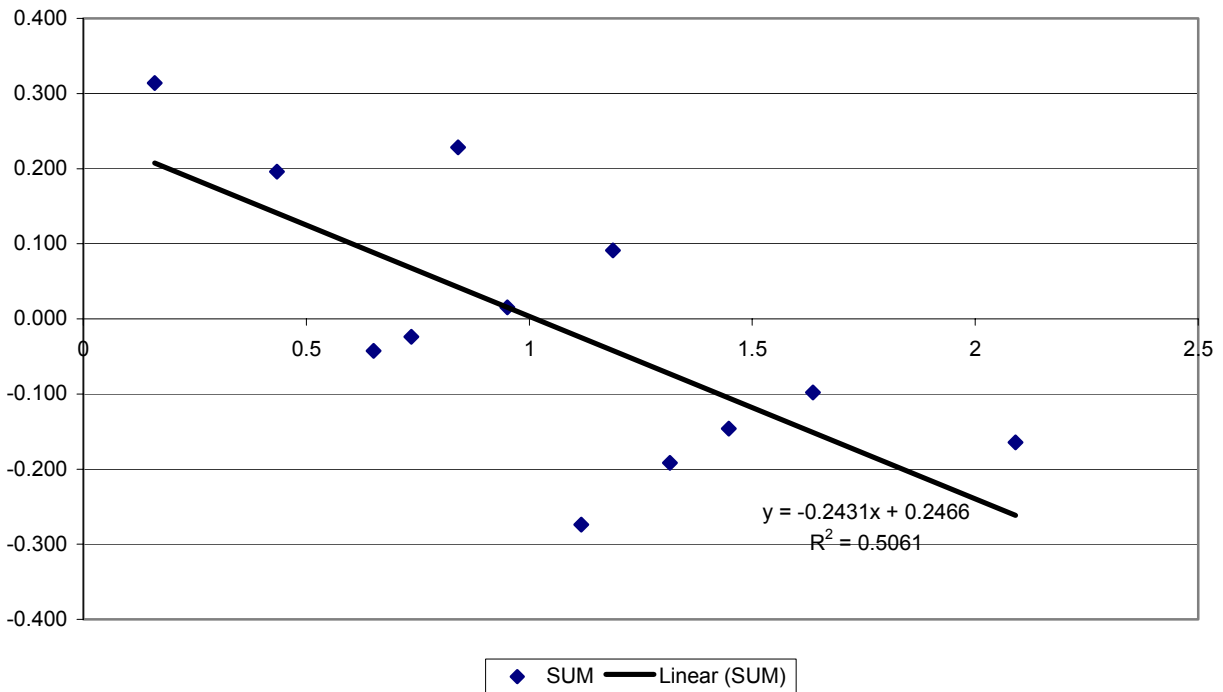


Figure 5: Changes in SUM and Natural Resource Potential in 11 Districts

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