

Entrepreneurship and Post-Socialist Growth

By: Daniel Berkowitz and David N. DeJong

William Davidson Working Paper Number 406
October 2001

Entrepreneurship and Post-Socialist Growth

Daniel Berkowitz and David N. DeJong*

Department of Economics, University of Pittsburgh, Pittsburgh, PA 15260

dberk@pitt.edu; dejong@pitt.edu

October 2001

Abstract

A growing body of national-level survey evidence indicates that small-scale entrepreneurial activity has been an important engine of growth in post-socialist economies. Here we use a rich regional data set to obtain a statistical characterization of the relationship between entrepreneurial activity and economic growth within post-Soviet Russia. Russia is a useful laboratory for evaluating links between entrepreneurial activity and growth because of the striking variation in initial conditions, the adoption of policy reforms, and entrepreneurial activity observed across its large number of regions in the early stages of transition. Russia has also experienced striking regional variation in subsequent growth. Conditional on variations in initial conditions and policy reform measures, we find that regional entrepreneurial activity exhibits a strong and enduring relationship with subsequent growth.

JEL Codes: O4, P3, R1

Keywords: economic transition; small legal enterprises

*We are indebted to Jean-Francois Richard for useful comments; we are also grateful to Konstantin Glushchenko for his help with the construction of our data set. This research was partially funded by the National Council for Eurasian and East European Research under contract #811-12.

1. Introduction

A growing body of national-level survey evidence indicates that entrepreneurial activity is a critical source of growth in post-socialist economies. Entrepreneurs operating small businesses have managed to rapidly fill niches that were ignored under socialism in industries ranging from construction, trade, commerce, small-scale manufacturing and services. In many post-socialist cities, entrepreneurs have thrived even though their plants and equipment have been poorly protected; their contracts have been poorly enforced; their taxes have been high and the regulations they face have been burdensome; they have routinely been forced to make extra-legal payments to local mafias and government organs for protection; and they have had limited sources of external finance (Frye and Shleifer, 1997; Johnson, McMillan and Woodruff, 2001).

The view that entrepreneurial activity is an important engine of growth emerges from the observation that post-socialist economies that have experienced relatively robust patterns of entrepreneurial development have tended to enjoy relatively high rates of economic growth. For example, synthesizing a large body of work focusing on the experiences of Poland, China and Russia, McMillan and Woodruff (2001) conclude that the robust economic growth enjoyed by Poland and China is attributable in large part to the substantial entrepreneurial development they have experienced, while the economic stagnation Russia has endured during its transition has as a root source its record of relatively sluggish entrepreneurial development.¹

The positive experiences of Vietnam and Hungary, contrasting with the negative experience of Ukraine, provide additional examples. Economic reforms implemented in Vietnam in 1986 led to the rapid resurgence of a virtually defunct private sector; seven years later small private firms servicing demands for clothing, footwear and manufactures such as metal- and wood-working accounted for an estimated 29% of national output (McMillan and Woodruff 1999; Ronnas and Bhargavi 2001). Regarding Hungary, the relatively well-developed small-scale private sector that was in place prior to transition (operating primarily in manufactures, retail and trade) has also seen a substantial increase in market share during transition (Webster 1993; Kornai 2000). In both cases, economic

¹ Evidence on Poland is provided by Dabrowski, Gomulka and Rostowski (2000) and Djankov and Nenova (2001); evidence on China is provided by Qian and Xu (1993) and Che and Qian (1998); evidence on Russia is provided by Richter and Schaffer (1996) and Broadman (2000).

growth has been robust during transition. In contrast, the experience of Ukraine mirrors that of Russia: the development of its entrepreneurial sector has been limited, and it has suffered economic stagnation during transition (World Bank, 1999).

We complement these existing studies here by using a rich regional data set to obtain a statistical characterization of the relationship between entrepreneurial activity and economic growth within post-Soviet Russia. Despite the relatively modest development of entrepreneurial activity experienced in Russia and the economic stagnation it has endured at the aggregate level, Russia provides an excellent laboratory for econometric analysis because it contains a large number of regions that exhibited striking variation in initial conditions, the adoption of policy reforms, and entrepreneurial activity in the early stages of its transition. It has also experienced striking regional variation in subsequent growth.

The data we analyze cover 70 of Russia's 89 regions. To quantify entrepreneurial activity, we measure the number of legally registered small private enterprises in place in each region as of December 1995. These enterprises consist of small-scale start-up firms and private spin-offs from previously state-run enterprises. Growth is measured as the average annual growth in real per capita income observed between 1993:IV and 1997:IV, and between 1993:IV and 2000:IV (the former sub-period is analyzed for comparison with results we presented in Berkowitz and DeJong, 2002, which we discuss below).

In our evaluation, we seek to account for factors that may have had a joint impact on entrepreneurial activity and growth. We also seek to control for potential problems arising from the possibility that the entrepreneurial activity we measure in part reflects optimism regarding prospects for subsequent growth. Given these concerns, we quantify a broad range of initial conditions and policy reform measures; the variables we use to do so predate our measures of entrepreneurial activity and growth. Our analysis then proceeds in three steps. First, we regress growth on the complete set of variables we have compiled. The variables that fail to enter significantly in this regression at the 20% significance level are earmarked for use as instruments for entrepreneurial activity in the second step of our analysis; the remaining variables are withheld for exclusive use as conditioning variables in subsequent growth regressions. Second, we estimate the relationship between entrepreneurial activity and growth using a two-stage least-squares

procedure. In the first-stage regression, we obtain a fitted version of entrepreneurial activity using the instruments identified in step one. In the second-stage regression, we regress growth on the fitted version of entrepreneurial activity and the conditioning variables selected in step one; our conclusions regarding the relationship between entrepreneurial activity and growth are based on this second-stage regression. Third, we conclude by regressing entrepreneurial activity on the full range of additional variables we compiled. We do this to evaluate the explanatory power of the variables that were excluded as instruments for entrepreneurial activity in the second step of our analysis.

Our results indicate that regional entrepreneurial activity has had a strong and enduring relationship with growth. Specifically, our estimates indicate that a one-standard-deviation increase in regional entrepreneurial activity (reflecting an additional 1.76 legally registered enterprises per 1000 inhabitants as of December 1995) is associated with an increase in real economic growth of 1.52 annual percentage points over the period 1993:IV – 1997:IV, and 1.07 percentage points over the period 1993:IV – 2000:IV. Among the variables we use as instruments for entrepreneurial activity, educational attainment (measured as the share of the regional population fifteen years old and higher that completed high school and received at least some post-secondary training) has the strongest explanatory power. This finding is complementary to the results of Earle and Sakova (1999), who studied household-level determinants of entrepreneurship in post-socialist economies. We also find that regions with relatively strong pro-reformist political orientations (measured as the share of the population that voted for pro-reformist candidates in the December 1993 parliamentary elections) experienced relatively robust entrepreneurial activity.

Previous work of ours (Berkowitz and DeJong, 2002) focused on the relationship between the regional implementation of policy reforms and subsequent economic growth within Russia. Measuring growth over a subset of the regions considered here (48 rather than 70) and over a shorter time horizon (1993:IV – 1997:IV), we found a general pattern of indirect links between the implementation of policy reforms and growth, with entrepreneurial activity serving as a critical conduit. This finding prompted the more comprehensive analysis of the relationship between regional patterns of entrepreneurial activity and economic growth presented here. The broader range of regions we are now

able to study, and the longer time period over which we can measure growth, leaves us better equipped to characterize this relationship while controlling for potential problems arising from simultaneity. We proceed in the next section with a description of our data set; we then describe our estimation procedure and present our results in Section 3, and conclude in Section 4.

2. Data Summary

Our data set contains regional measures of real income growth, entrepreneurial activity, initial conditions, and initial policy reform measures. By “initial”, we mean measurements taken as close to the beginning of Russia’s transition period as possible. Most variables are measured as of 1993; none are measured later than 1994. Our purpose in compiling initial measurements is to use them either as instruments for our measure of entrepreneurial activity, or as conditioning variables in growth regressions, thus the importance of obtaining measurements early in the transition process.

The data set covers 70 of Russia’s 89 regions. Most of the excluded regions are now-autonomous Oblasts, Okrugs and Krai that were part of then-conglomerate regions early in Russia’s transition process, and thus for whom separate measurements of “initial” variables are unavailable. The war-torn Chechen Republic is also excluded for lack of data. The 70 regions covered in our data set represent all eleven of Russia’s geographic territories.

2a. Growth and Entrepreneurship

We measure economic growth by computing the real purchasing power of income per capita at three dates (1993:IV, 1997:IV, and 2000:IV), and then computing the average annual growth rate observed between 1993:IV and 1997:IV, and between 1993:IV and 2000:IV (source: unpublished Goskomstat data). We denote these measures as GROWTH.

To measure entrepreneurial activity (denoted as ENT), we use the regional registry of small private enterprises per thousand inhabitants as of December 31, 1995 (source: Goskomstat Rossii, 1996). These enterprises are comprised primarily of legally registered start-ups and small spin-offs from former state-owned enterprises that first

began to emerge in the Former Soviet Union during the perestroika reforms in the late 1980s (Aslund, 1997). This measure provides an accurate characterization of overall regional entrepreneurial activity, since as noted in the introduction, the bulk of legal entrepreneurial activity in Russia has been concentrated in small start-ups and spin-offs. Ideally, we would work with an earlier measure of this activity to reduce potential problems associated with simultaneity, but accurate and consistent measures do not exist prior to this date (Aslund, 1997). This lack of prior data availability serves as the primary motivation for the 2SLS estimation procedure we employ in Section 3.

As Table 1 indicates, Russia has experienced substantial variation in economic growth and entrepreneurial activity. Through 1997, the average annual regional growth rate was 1.46%, and the standard deviation of was 4.75 percentage points. Average growth through 2000 fell to -7.31% , with a standard deviation of 3.25 percentage points. One reason for this striking drop is the financial crisis Russia suffered in August of 1998. Regarding ENT, it ranges from a low of 1.71 (enterprises per thousand inhabitants) in the Kursk Oblast to 16.61 in Moscow; its average is 4.19, and its standard deviation is 2.29.

2b. Initial Conditions

We control for six initial conditions that summarize regional population, industrial and locational characteristics. Regarding population characteristics, one variable we consider is the share of the population fifteen years old and higher as of 1994 that completed high school and received at least some post-secondary training (EDU). This variable was collected in the 1994 Russian household micro-census (Goskomstat, 1995). Second, we consider the initial reformist orientation of the population (REF), which is measured as the share of the population that voted for pro-reformist candidates in the December 1993 parliamentary elections (source: Clem and Craumer, 1993). Third, we measure regional initial standards of living (INITIAL) by computing the average ratio of money income per capita to the cost of a uniform basket of 25 food goods during 1993:IV (source: unpublished Goskomstat data). Because there are striking price differentials for similar goods within Russia, it is important to convert initial per capita incomes to a purchasing-power measure that is comparable across regions. The purchasing power of per capita money income in terms of food is an attractive measure

because food purchases accounted for more than half of household expenditures in the 1990s (Goskomstat 2000, p.167), and we have a uniform measure of a food basket that covers all of Russia's regions; 1993:IV marks the earliest date for which comprehensive food-basket prices and household money-income data are available.

We use two variables to quantify initial regional industrial characteristics. The first is a measure of initial production potential (IO); the second is a measure of the regional importance of the defense industry (DEFENSE). To compute IO for a given region, we multiplied the industry's labor share (source: Gaddy, 1996) by its value added, net of labor costs (this is the intermediate shadow-profit rate based on world-market prices and computed by Senik-Leygonie and Hughes, 1992); we then summed the resulting products. This measure is limited to industries that produce tradable goods, and is meant to quantify the competitiveness of a region's industrial structure on world markets prior to transition. The oil and gas industries have the highest value added, while food processing has the lowest (in fact, negative) value added. DEFENSE is measured in each region as the number of workers employed in the defense industry per thousand employed workers in 1985 (source: Gaddy, 1996). As emphasized by Gaddy (1996), DEFENSE is a potentially important conditioning variable since the defense industry served as a significant attractor of skilled workers, and gave regional elites close connections to powerful defense industries in Moscow. Moreover, the defense industry continues to be an important and relatively stable sector in Russia's otherwise chaotic industrial environment.

Finally, in order to take into account the potential impact of location, we measure the log of a region's transport distance from Moscow (LNDIST). Moscow was the major source of commercial, political, transport, cultural, educational, and financial activity in the Former Soviet Union, and still continues to command this important status within Russia. Thus, transport distance is a potentially useful measure of a particular region's access or lack thereof to critical activity within Russia.

As Table 1 indicates, we generally observe substantial regional variation in these measures of initial conditions. For example, the voting shares quantified under REF range from 13% (Dagestan) to 61% (St. Petersburg), with a mean of 33.3% and standard

deviation of 10.16%. EDU is somewhat exceptional in this regard: it is relatively tightly dispersed, with a mean of 13.73% and a standard deviation of only 3.69%.

2.3. Initial Policy Implementation

We use two variables to quantify regional variations in the implementation of policy reforms early in Russia's economic transition: the extent of small- and large-scale privatization. As background, the transition began in January 1992 with the implementation of rapid price, trade and financial-market liberalization initiatives. Privatization began in 1993, when the government allocated all state-owned enterprises to the property funds operated by the federal government, and the governments located in Russia's 89 regions (including the primary regional governments, and the subordinate local governments in cities, city districts, settlements, etc.). Local governments typically gained control over small shops and enterprises that operated in trade and retail markets, and sold off these enterprises for cash in the small-scale privatization program. The federal government obtained control over the larger state enterprises in sectors such as manufacturing, heavy industry, energy and communications. The federal government was then instructed to work with relevant regional governments to form a plan consistent with the dictates of the large-scale privatization program. In a successful large-scale privatization, the federal government and associated regional governments sold off ownership shares to insiders at a discount, and then allowed groups of outside investors to purchase equity in the enterprise using vouchers. The vouchers were equity claims that that Russian federal government had issued to its entire population before proceeding with the privatization.

We measure small- and large-scale privatization (SPRIV and LPRIV) using the number of enterprises privatized by local and federal governments in 1993 per thousand inhabitants in each region (source: Goskomstat, 1994). These measures exhibit substantial regional variation. For example, while the secessionist Republics of Bashkortostan, Sakha and Tatarstan had no large privatizations in 1993, Magadan, Tyumen, Ivanovo and Pskov Oblasts rapidly privatized their large state enterprises. As reported in Table 1, the (mean, standard deviation) of SPRIV is (0.20, 0.12), and for LPRIV is (0.05, 0.04).

From a theoretical perspective, the prospective empirical relationship between privatization, entrepreneurial activity and economic growth is unclear. In their influential book on Russia's reform, Boycko, Shleifer and Vishny (1995) argue that an immediate and massive privatization of state-owned enterprises would provide an incentive to local and regional governments to support market reforms because they would receive revenues from sales. Moreover, rapid privatization of large enterprises would make reform irreversible because politicians would not be able to use these enterprises to promote their political objectives. Thus rapid privatization would be good for entrepreneurship because politicians would no longer have an incentive to harass new small businesses in an effort to protect state enterprises. However, Kornai (1990, 2000) and Black, Kraakman and Tarassova (2000) argue that the discounted ownership positions and privileged access made available to insiders in Russia (workers and managers in enterprises undergoing privatization) encouraged politicians and insiders to collude in an effort to gain privatization rents. A potential manifestation of this collusion is that local politicians would have an incentive to harass small-scale entrepreneurs competing with the large privatized enterprises. Boycko et al. (1995) also argue that the efficiency gains from privatization would enhance growth, while Kornai (1990, 2000) and Black et al. (2000) argue that insider privatization creates a corrupt environment that potentially inhibits growth.

3. Results

As noted, our analysis of the relationship between small private enterprise formation and growth is based on two measures of regional growth: that observed between 1993:IV and 1997:IV; and that observed between 1993:IV and 200:IV. In part, we consider the former measure to illustrate how our 70-region analysis compares with our previous 48-region analysis (Berkowitz and DeJong, 2002). Also, we are interested in learning whether the relationship between small private enterprise formation and growth has changed appreciably over time.

In examining this relationship, there is clearly a need to guard against problems arising from potential simultaneity. Thus our analysis is based on a two-stage least squares (2SLS) estimation procedure in which we use as instruments for small private

enterprise formation a subset of the variables introduced above that quantify regional differences in initial conditions and reform policies. Although each variable seems to qualify as a valid instrument *a priori*, we only use a subset of the variables as instruments in the analysis presented below to guard against the possibility of over-fitting small private enterprise formation in our first-stage regression. Of course, the use of only a subset of available instruments entails a certain loss of efficiency. As we note below, results obtained using the full set of instruments indicate a somewhat stronger link between small private enterprise formation and growth than do the results we report in full here; footnote 3 provides details.

We begin by selecting the instruments to be used for small private enterprise formation. This is done by regressing growth measured through 1997:IV on each of the additional variables included in our data set. To be conservative, variables whose coefficients are statistically insignificant at the 20% level in this regression are selected as instruments in our two-stage procedure. OLS estimates of this regression are reported in Table 2. (Standard errors reported throughout the paper are heteroskedasticity consistent, following White, 1980.) The R^2 statistic we obtain in this regression is 0.476, indicating that our variables have reasonable explanatory power in accounting for regional variations in growth. Four initial variables are statistically significant at the 5% level: INITIAL, IO, DEFENSE, and REF. Each is also significant quantitatively. To characterize quantitative significance, we report in the seventh column of the table the impact on annual growth of a one-standard-deviation increase in each of the independent variables. For the four statistically significant variables, this impact ranges from 0.757 (INITIAL) to 1.235 (REF) annual percentage points. The estimated quantitative significance of ENT is also substantial (1.008), but this estimate is of course potentially tainted by simultaneity bias, and the 2SLS estimates reported below assign much greater quantitative significance to ENT than does this estimate. Finally, the remaining initial variables (EDU, LNDIST, LPRIV, and SPRIV) are statistically insignificant, and are thus chosen as instruments in our 2SLS analysis.²

² P values associated with the individual t statistics for these variables are no lower than 0.294 (EDU), and the $\chi^2(4)$ test of the joint insignificance of these variables yields a test statistic of 2.395, which has a p value of 0.664.

The application of our 2SLS analysis to growth measured through 1997:IV is presented in Table 3. The first-stage regression of ENT on (EDU, LNDIST, LPRIV, and SPRIV) produces an R^2 statistic of 0.589, despite the fact that only EDU is significant either statistically or quantitatively. Second-stage estimates were obtained by regressing GROWTH on the fitted version of ENT and the variables identified as statistically significant in the growth regression reported in Table 2 (INITIAL, IO, DEFENSE, and REF). Note, then, that the variables used as first-stage instruments were excluded from the second-stage growth regression: these exclusion restrictions serve to identify the model. To evaluate the validity of these restrictions, we added each instrumental variable to the list of explanatory variables in the second-stage regression, one at a time, and re-estimated the model. In no case did the included instrument turn out to be statistically significant at the 20% level in the re-estimated growth regression, thus the exclusion restrictions seem valid empirically.

As Table 3 indicates, each variable included in the second-stage growth regression is statistically significant at the 5% level, and is quantitatively significant as well. Notably, a one-standard-deviation increase in small private enterprise formation corresponds with 1.52 percentage point increase in annual growth. While non-trivial, this figure is substantially lower than the estimate of 2.19 obtained in the 48-region analysis of Berkowitz and DeJong (2002). However, this difference is due in large part to our use in this analysis of a relatively limited set of instruments, a point we return to in footnote 3 below. The quantitative significance of the remaining variables ranges from 0.824 (DEFENSE) to 1.453 (REF).

Next, we apply our 2SLS analysis to growth measured through 2000:IV; these results are reported in Table 4. (The first-stage regression is precisely that reported in Table 3, and is not replicated in Table 4.). Two versions of the second-stage growth regression are reported in this case. Version 1 was obtained using the same set of exclusion restrictions employed in Table 3. However, in this case when we sequentially augmented this regression to include each of the excluded instruments (again, one at a time), the coefficients on LPRIV and SPRIV each turned out to be significant at the 20% level individually. Thus we also report in Table 4 a second version of the model that includes these additional variables as regressors.

Comparison of the estimates obtained using Version 1 of the model with their counterparts reported in Table 2 obtained using growth measured through 1997:IV yields the following observations. First, the statistical and quantitative significance of INITIAL is no longer evident measuring growth through 2001:IV: the regional divergence in income observed through 1997 seems to have been subsequently reversed. A similar reversal is found for DEFENSE. Second, the significance of IO is virtually unchanged across time periods (its measure of quantitative significance drops only slightly, from 0.907 to 0.851). Finally, REF and NEWENT remain statistically significant, although their quantitative significance is lower over the longer time horizon (REF's measure falls from 1.453 to 0.695; NEWENT's falls from 1.522 to 1.03).

The estimates obtained using Version 2 of the growth equation are similar to those obtained using Version 1 in most respects, although some differences are worth noting. With the exception of INITIAL, the statistical and quantitative significance of the variables included in both specifications are roughly comparable (e.g., the quantitative significance measure obtained for NEWENT is 1.074 in this case). The coefficient on INITIAL roughly doubles under Version 2, but remains statistically insignificant (with a p value of 0.6). The addition of LPRIV and SPRIV under Version 2 yields an increase in R^2 from 0.279 to 0.321, and their coefficients are marginally significant both statistically (corresponding p values are 0.221 and 0.155) and quantitatively (-0.432 and -0.374).

A clear picture that emerges from this analysis is that the regional pattern of small private enterprise formation that had been established in Russia by the mid-1990s has had a substantial and enduring relationship with subsequent economic growth. It is therefore of considerable interest to understand how regional variations in the adoption of policy reforms may have influenced small private enterprise formation. Since our measures of policy reforms were compiled very early in Russia's transition, we can offer only a limited but revealing characterization of this influence here.

As noted, we conducted the preceding 2SLS analysis using a limited subset of instruments in order to avoid over-fitting small private enterprise formation in the first stage. In Table 5, we present an OLS regression of small private enterprise formation on the entire set of initial and policy variables in order to provide a better characterization of the importance of these variables. Comparing the first-stage estimates reported in Table

3 with the estimates in Table 5, the inclusion of the full set of variables yields an increase in the R^2 statistic by 10 percentage points (from 0.589 to 0.689). Of the four variables excluded in the original new-enterprise regression, only DEFENSE enters the augmented regression insignificantly. The quantitative significance of the remaining previously excluded variables are as follows: one-standard-deviation increases in IO, INITIAL and REF correspond with -0.27, 0.482, and 0.596 additional new enterprises per thousand inhabitants. The quantitative significance of LPRIV and SPRIV is once again modest in the augmented regression, and each remains statistically insignificant. Finally, the strong link between EDU and ENT remains evident here, as illustrated by the quantitative significance measure of 1.229.³

In sum, it appears that regions with relatively well-educated citizens sympathetic to the adoption of economic reforms have enjoyed relatively high levels of small private enterprise formation, which has exhibited a strong and lasting relationship with economic growth. We have found little direct evidence here that privatization activity has had substantive economic effects, but since our measures of these activities were compiled in an early stage of the transition process, caution should be taken in basing general conclusions on this finding (see Berkowitz and Holland, 2001, for a broader exploration of the impact of privatization activity on small enterprises).

4. Conclusion

Exploiting the rich regional variation in entrepreneurial activity and initial conditions that existed within Russia early in its transition, in addition to the regional variation in subsequent growth it has realized, we have found a strong and enduring relationship between entrepreneurial activity and growth. This intra-national evidence thus complements evidence of the importance of entrepreneurial activity for growth that has emerged from international comparisons of transitional economies. The fact that we

³ Use of the fitted version of small private enterprise formation obtained in this unrestricted regression in the second-stage growth regressions reported in Tables 2 and 3 yields systematically higher estimates of the quantitative significance of small private enterprise formation. In Table 3, the estimate of 1.522 increases to 1.91 (thus comparing closely to the estimate of 2.19 obtained by Berkowitz and DeJong, 2002); in Table 4, the Version 1 estimate of 1.03 increases to 1.275; and the Version 2 estimate of 1.074 increases to 1.334.

observe such a strong statistical relationship in this case is particularly noteworthy given Russia's relatively poor showing in these international comparisons.

References

- Aslund, Anders (1997), "Observations on the Development of Small Private Enterprises in Russia," *Post-Soviet Geography and Economics* 38: 191-206.
- Berkowitz, Daniel and David N. DeJong (2002), "Policy Reform and Growth in Post-Soviet Russia", University of Pittsburgh mimeo dated July 2001, forthcoming in the *European Economic Review*.
- Berkowitz, Daniel and Jonathan Holland (2001), "Does Privatization Enhance or Deter Small Enterprise Formation", University of Pittsburgh mimeo dated June 2001, forthcoming in *Economics Letters*.
- Black, Bernard. Reinier Kraakman, and Anna Tarassova (2000), "Russian Privatization and Corporate Governance: What Went Wrong?" *Stanford Law Review* 52, 1731-1808.
- Broadman, Harry G. (2000), "Reducing Structural Dominance and Entry Barriers in Russian Industry," World Bank paper, forthcoming in *Review of Industrial Organization*.
- Boycko, Maxim., Andrei Shleifer, and Robert Vishny (1995), *Privatizing Russia*, MIT Press: Cambridge, MA.
- Che, Jiahua and Yingyi Qian (1998), "Institutional Environment, Community Government, and Corporate Governance: Understanding China's Township Village Enterprises," *Journal of Law, Economics and Organization* 14(1): 1-23.
- Clem, Ralph S. and Peter R. Craumer (1993), "The Politics of Russia's Regions: A Geographical Analysis of the Russian Election and Constitutional Plebiscite of December 1993," *Post-Soviet Geography and Economics* 36(2): 67-86.
- Djankov, Simeon, and Tatiana Nenova (2001), "Constraints to Entrepreneurship in Kazakhstan," World Bank mimeo dated March 2001.
- Earle, John and Zuzana Sakova (1999), "Entrepreneurship from Scratch: Lessons on the Entry Decision into Self-Employment from Transition Economies," IZA Discussion Paper No. 79.
- Frye, Timothy and Andrei Shleifer (1997), "The Invisible Hand and the Grabbing Hand," *American Economic Review Papers and Proceedings* 87: 354-358.
- Gaddy, Clifford (1996), *The Price of the Past*, Brookings Institute: Washington, DC.
- Goskomstat Rossii, (1995), *Obrazovanie Nasilenie Rossii (po dannim mikroperepisi nasileniya 1994 g.)*. Goskomstat Rossii, Moscow.

- Goskomstat Rossii (1994, 1996, 2000), *Rossiyskiy Statisticheskii Yezhegodnik*. Goskomstat Rossii: Moscow.
- Johnson, Simon, John McMillan and Christopher Woodruff (2001), "Property Rights, Finance and Entrepreneurship," mimeo, Stanford University Business School, August, 2001.
- Kornai, Janos (1990), *The Road to a Free Economy. Shifting from a Socialist System: The Example of Hungary*. W.W. Norton: New York.
- Kornai, Janos (2000), "Ten Years After 'The Road to A Free Economy': The Author's Self-Evaluation", World Bank 'Annual Bank Conference on Development Economics – ABCDE'", dated April 18-20, 2000.
- McMillan, John and Christopher Woodruff (1999), "Interfirm Relations and Informal Credit in Vietnam," *Quarterly Journal of Economics*, 114: 1285-1320 .
- _____ (2001), "Entrepreneurs in Economic Reform," Stanford University Business School, dated July 26, 2001.
- Qian, Yingyi and Chenggang Xu (1993), "Why China's Economic Reforms Differ: The M-Form Hierarchy and Entry/Expansion in the Non-State Sector," *Economics of Transition*, June 1993, 1(2), pp. 135-170.
- Richter, Andrea and Mark Schaffer (1996), "The Performance of *De Novo* Private Firms in Russian Manufacturing," in Simon Commander et al., eds., *Enterprise Restructuring and Economic Policy in Russia*. World Bank: Washington, D.C.
- Ronnas, Per and Bhargavi Ramamurth, eds. (2001), *Entrepreneurship in Vietnam: Transformation and Dynamics*. Nordic Institute of Asian Studies.
- Senik-Leygonie, Claudia and Gordon Hughes (1992), "Industrial Profitability and Trade Among the Former Soviet Republics", *Economic Policy* (15), October: 354-386.
- Webster, Leila M. (1993), "The Emergence of Private Sector Manufacturing in Hungary: A Survey of Firms." World Bank Technical Paper Number 229, the World Bank, Washington, D.C.
- White, Halbert (1980), "A Heteroskedasticity-Consistent Covariance Matrix Estimator and Direct Test for Heteroskedasticity," *Econometrica* (48): 817-838.
- World Bank (1999), *Ukraine: Restoring Growth With Equity*. World Bank: Washington, D.C.

Table 1: Summary Statistics

Variable	Timing	Average	Median	Standard Deviation	Minimum	Maximum
Growth	1993:IV-1997:IV	1.46%	1.54%	4.75%	-8.18%	22.06%
Growth	1993:IV-2000:IV	-7.31%	-7.70%	3.25%	-14.63%	3.49%
Small Private Enterprises	Dec. 31, 1995	4.19	3.87	2.29	1.71	16.61
Education	1994	13.73%	12.70%	3.69%	9.20%	33.40%
Initial Income	1993:IV	8.80	8.11	2.64	3.29	19.57
Reformist Voting	Dec. 1993	33.30%	32.40%	10.16%	13.00%	61.00%
IO	1985	5.11	7.19	14.45	-71.74	42.30
Defense	1985	0.23	0.22	0.13	0.00	0.57
Distance from Moscow (ln)		7.04	7.07	1.37	0.00	9.37
Large-Scale Privatization	1993	0.05	0.05	0.04	0.00	0.16
Small-Scale Privatization	1993	0.20	0.20	0.12	0.00	0.78

Table 2: Growth Regression, OLS

Explanatory Variable	Coefficient Estimate	Standard Error	t statistic	p value	Standard Deviation of Variable	Quantitative Significance
Constant	-10.840	3.931	-2.757	0.006	0.000	0.000
Initial Income	0.286	0.132	2.165	0.030	2.643	0.757
IO	0.066	0.030	2.191	0.028	14.446	0.953
Defense	0.064	0.031	2.067	0.039	12.930	0.828
Education	0.229	0.218	1.049	0.294	3.695	0.847
Distance (ln)	-0.093	0.352	-0.265	0.791	1.375	-0.128
Large-Scale Privatization	-1.279	11.593	-0.110	0.912	0.036	-0.046
Small-Scale Privatization	-1.708	3.170	-0.539	0.590	0.118	-0.202
Reformist Voting	0.122	0.053	2.310	0.021	10.163	1.235
Small Private Enterprises	0.440	0.307	1.435	0.151	2.290	1.008
R ² : 0.476						

Note: Standard errors are heteroskedasticity consistent (White, 1980). “Quantitative Significance” indicates the estimated impact of a one-standard-deviation increase in the indicated independent variable on the dependent variable. The $\chi^2(4)$ test of the joint insignificance of the coefficients on Education, Distance, and Large- and Small-Scale Privatization yields a test statistic of 2.395, which has a p value of 0.664.

Table 3: Two-Stage Least Squares Estimates, Growth Measured Through 1997

Small Private-Enterprise (ENT) Regression

Explanatory Variable	Coefficient Estimate	Standard Error	t statistic	p value	Standard Deviation of Variable	Quantitative Significance
Constant	-1.515	1.269	-1.195	0.232	0.000	0.000
Education	0.458	0.063	7.299	0.000	3.695	1.693
Distance (ln)	-0.127	0.161	-0.786	0.432	1.375	-0.174
Large-Scale Privatization	4.873	7.373	0.661	0.509	0.036	0.175
Small-Scale Privatization	0.337	1.981	0.170	0.865	0.118	0.040
R ² : 0.589						

Growth Regression, 1993 - 1997

Explanatory Variable	Coefficient Estimate	Standard Error	t statistic	p value	Standard Deviation of Variable	Quantitative Significance
Constant	-11.778	1.937	-6.081	0.000	0.000	0.000
Initial Income	0.349	0.112	3.112	0.002	2.643	0.924
IO	0.063	0.029	2.175	0.030	14.446	0.907
Defense	0.064	0.031	2.030	0.042	12.930	0.824
Reformist Voting	0.143	0.045	3.176	0.001	10.163	1.453
Small Private Enterprises (fitted)	0.866	0.376	2.303	0.021	1.758	1.522
R ² : 0.448						

Table 4: Two-Stage Least Squares Estimates, Growth Measured Through 2000

Version 1

Explanatory Variable	Coefficient Estimate	Standard Error	T statistic	p value	Standard Deviation of Variable	Quantitative Significance
Constant	-12.915	1.531	-8.435	0.000	0.000	0.000
Initial Income	0.032	0.127	0.253	0.800	2.643	0.085
IO	0.059	0.018	3.283	0.001	14.446	0.851
Defense	0.013	0.027	0.476	0.634	12.930	0.164
Reformist Voting	0.068	0.038	1.803	0.071	10.163	0.695
Small Private Enterprises (fitted)	0.586	0.221	2.657	0.008	1.758	1.030
R ² : 0.279						

Version 2

Explanatory Variable	Coefficient Estimate	Standard Error	t statistic	p value	Standard Deviation of Variable	Quantitative Significance
Constant	-11.934	1.514	-7.882	0.000	0.000	0.000
Initial Income	0.067	0.127	0.525	0.600	2.643	0.176
IO	0.057	0.018	3.110	0.002	14.446	0.820
Defense	0.011	0.026	0.417	0.677	12.930	0.139
Large-Scale Privatization	-11.995	9.790	-1.225	0.221	0.036	-0.432
Small-Scale Privatization	-3.171	2.230	-1.422	0.155	0.118	-0.374
Reformist Voting	0.065	0.040	1.620	0.105	10.163	0.662
Small Private Enterprises (fitted)	0.611	0.202	3.019	0.003	1.758	1.074
R ² : 0.321						

Note: The regression model used to obtain fitted values of small private enterprise formation is that reported in Table 2.

Table 5: Unrestricted Small Private Enterprise Formation Regression

Explanatory Variable	Coefficient Estimate	Standard Error	t statistic	p value	Standard Deviation of Variable	Quantitative Significance
Constant	-2.284	1.532	-1.490	0.136	0.000	0.000
Initial Income	0.183	0.100	1.819	0.069	2.643	0.482
IO	-0.019	0.008	-2.230	0.026	14.446	-0.270
Defense	-0.003	0.010	-0.270	0.787	12.930	-0.036
Education	0.333	0.056	5.932	0.000	3.695	1.229
Distance (log)	-0.228	0.135	-1.696	0.090	1.375	-0.314
Large-Scale Privatization	5.726	4.848	1.181	0.238	0.036	0.206
Small-Scale Privatization	-0.881	1.692	-0.521	0.603	0.118	-0.104
Reformist Voting	0.059	0.019	3.138	0.002	10.163	0.596
R ² : 0.689						

DAVIDSON INSTITUTE WORKING PAPER SERIES - Most Recent Papers

The entire Working Paper Series may be downloaded free of charge at: www.wdi.bus.umich.edu

CURRENT AS OF 11/29/01

Publication	Authors	Date
No. 406: Entrepreneurship and Post-Socialist Growth	Daniel Berkowitz and David N. DeJong	Oct. 2001
No. 405: Policy Reform and Growth in Post-Soviet Russia	Daniel Berkowitz and David N. DeJong	Oct. 2001
No. 404: Social Policies and Structures: Institutional Frictions and Traps in the Czech Republic after 1989	Jiří Večerník	Nov. 2001
No. 403: Investment, Efficiency, and Credit Rationing: Evidence from Hungarian Panel Data	Mathilde Maurel	Nov. 2001
No. 402: Subduing High Inflation in Romania. How to Better Monetary and Exchange Rate Mechanisms?	Daniel Daianu and Radu Vranceanu	Aug. 2001
No. 401: The Gender Wage Gap in Bulgaria: A Semiparametric Estimation of Discrimination	Dean Jolliffe	July 2001
No. 400: Do External Auditors Perform a Corporate Governance Role in Emerging Markets? Evidence from East Asia	Joseph P. H. Fan and T.J. Wong	Oct. 2001
No. 399: Financial Conditions and Investment during the Transition: Evidence from Czech Firms	Lubomír Lízal and Jan Svejnar	Oct. 2001
No. 398: Accessible Pareto-Improvements: Using Market Information to Reform Inefficiencies	Michael Mandler	May 2001
No. 397: The Making of an Integrated National Grain Market in China	Wubiao Zhou	Oct. 2001
No. 396: Corruption and Resource Allocation: Evidence from China	Wei Li	June 2001
No. 395: Government Shareholding and the Value of China's Modern Firms	Lihui Tian	Apr. 2001
No. 394: Labor Hoarding in Russia: Where Does it Come from?	Rouslan Koumakhov and Boris Najman	June 2000
No. 393: Ownership Structure, Corporate Governance, And Firm Value: Evidence from the East Asian Financial Crisis	Michael Lemmon and Karl Lins	Apr. 2001
No. 392: Marshall and Labour Demand in Russia: Going Back to Basics	Jozef Konings and Hartmut Lehmann	Aug. 2001
No. 391: Economic Transition and Elections in Poland	John E. Jackson, Jacek Klich, and Krystyna Poznańska	June 2001
No. 390: Effects of Bank Insolvency and Strategic Uncertainty on Corporate Restructuring in Transition Economies	Christa Hainz	Aug. 2001
No. 389: Mark-Up Pricing In Bulgarian Manufacturing	Rumen Dobrinsky, Boyko Nikolov, and Nikolay Markov	June 2001
No. 388: Globalization and Firms' Financing Choices: Evidence from Emerging Economies	Sergio Schmukler and Esteban Vesperoni	May 2001
No. 387: The Distributional Impacts of Indonesia's Financial Crisis on Household Welfare: A "Rapid Response" Methodology	Jed Friedman and James Levinsohn	Sept. 2001
No. 386a: Corporate Financial Policies and Performance Around Currency Crises	Arturo Bris, Yrjö Koskinen, and Vicente Pons	Oct. 2001
No. 385: Ownership and Productive Efficiency: Evidence from Estonia	Derek C. Jones and Niels Mygind	Aug. 2001
No. 384: Forthcoming in: <i>Journal of Economic Perspectives</i> , "Institutional Determinants of Labor Reallocation in Transition" Vol. 16, No. 2, Feb. 2002.	Tito Boeri and Katherine Terrell	June 2001
No. 383: Deindustrialisation and Structural Change During the Post-Communist Transition	Tomasz Mickiewicz and Anna Zalewska	June 2001
No. 382: Markets and Growth	Štěpán Jurajda and Janet Mitchell	July 2001