Entrepreneurship and Post-Socialist Growth

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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 statistically and quantitatively significant relationship with subsequent economic growth.

JEL Codes: O4, P3, R1

Keywords: economic transition; small legal enterprises

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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, 2002).

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 (2002) 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, in the adoption of policy reforms, and in 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 (relative to the regional population). 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, 2003, 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 objectives, 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. We then proceed with a two-stage regression analysis to assess the relationship between entrepreneurial activity and growth. In the first stage, we assess the extent to which the initial conditions and policy reform measures help account for regional variation in entrepreneurial activity. In the second stage, we regress growth on a fitted version of entrepreneurial activity obtained in the first stage along with subsets of the initial

conditions and policy reform measures we have compiled. Our conclusions regarding the relationship between entrepreneurial activity and growth are based on these second-stage regressions.

Our results indicate the existence of a statistically and quantitatively significant relationship between regional entrepreneurial activity and subsequent economic growth. Specifically, our estimates indicate that a one-standard-deviation increase in regional entrepreneurial activity (reflecting an additional 1.7 legally registered enterprises per 1000 inhabitants as of December 1995) is associated with an increase in real economic growth in the neighborhood of 2.5 annual percentage points over the period 1993:IV – 1997:IV, and 1.5 annual percentage points over the period 1993:IV – 2000:IV. In addition, we find that two variables are particularly important in quantifying regional patterns of entrepreneurial activity. The first is 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). The second is a measure of pro-reformist political orientation (measured as the share of the population that voted for pro-reformist candidates in the December 1993 parliamentary elections). Both variables exhibit a strong positive relationship with regional entrepreneurial activity. The importance of educational attainment is consistent with results obtained by Earle and Sakova (1999), who studied household-level determinants of entrepreneurship in post-socialist economies.

Previous work of ours (Berkowitz and DeJong, 2003) 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 regression results in Sections 3 and 4; and conclude in Section 5.

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 Krais 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: Goskomstat data on monthly nominal household income and regional CPIs). 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 two-stage estimation procedure we employ in Section 3.

As Table 1a 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.

Moscow is exceptional both in terms of the entrepreneurial activity it has fostered and the economic growth it has experienced. Annualized growth in Moscow through 1997 was an astounding 22.06%, and 3.49% through 2000 (due in large part to the financial crisis of 1998, all other regions in the sample had negative growth rates through 2000). Thus in the context of the regression analysis that follows, Moscow warrants particular attention as having the potential to exert undue influence on our results. Indeed, standard regression-diagnostic measures (e.g., Cook's 1997 distance statistic) confirm this potential. We deal with this issue in the regression analysis that follows in two ways. First, we employ least absolute deviations (LAD) estimators rather than ordinary least squares (OLS) estimators. Second, we report two sets of results: those obtained using the full sample of regions; and those obtained given the exclusion of Moscow. With one important exception, the two sets of results turn out to be similar qualitatively.[2]

2b. Initial Conditions

We control for six initial conditions that summarize regional population, industrial and locational characteristics. Regarding population characteristics, one

[2] In a previous version of this paper, we conducted an analysis similar to that presented here which was based entirely on ordinary least squares estimates. We thank Jonathan Temple for leading us to the analysis of the present paper.

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 basket of 25 food goods (using the same goods and weights for all goods across all regions) during 1993:IV (source: 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 meaningful 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). The IO variable is designed to measure the profitability of the industrial capital stock in place in each region as of 1985. To compute it, 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 it 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 1a 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 1a, 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 encourage 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 mangers 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.

2.4. Correlation patterns

Table 1b reports correlation patterns measured among the variables we have compiled. Note that most variables are more weakly correlated with growth measured through 1999:IV than through 1997:IV, although since both measures are closely correlated (0.769), correlation patterns in general are similar across growth measures. The strongest patterns of correlation with growth are concentrated among three variables: entrepreneurial activity, educational attainment, and reformist voting patterns. These three variables are also closely correlated with each other (0.5, at least). Thus not only is there considerable regional variation in the measures we have compiled: the variation is also fairly systematic. We now turn to an analysis of conditional correlation patterns: i.e., a regression analysis.

3. Regression Analysis, Stage 1: Accounting for Entrepreneurial Development

In examining the relationship between entrepreneurial development and subsequent economic growth, there is clearly a need to guard against problems arising from potential simultaneity. Thus our analysis is based on a two-stage estimation procedure. What is slightly unusual in this case is that we have intrinsic interest in the first stage: factors that have influenced entrepreneurial development are of interest in their own right. Thus we begin with a detailed discussion of these factors.

Table 2 presents six sets of LAD estimates obtained by regressing ENT on the measures of initial conditions and policy variables described above. The first three sets were obtained using the full set of regions included in the sample (Table 2a); the second three sets were obtained given the exclusion of Moscow from the sample (Table 2b). As noted above, we consider this exclusion due the Moscow's potential to exert undue influence on our estimates.

For both samples, we obtained three sets of estimates as follows. We first regressed ENT on the entire set of explanatory variables. Second, we used a stepwise procedure to eliminate insignificant variables from the regression model, in the spirit of

the general-to-specific modeling strategy advocated, e.g., by Hendry (2000). Beginning with the fully specified model, the procedure involves eliminating the variable whose corresponding t statistic (associated with the null hypothesis of a zero regression coefficient) has the largest p value, so long as this value exceeds 0.2, and continuing this process until the remaining set of variables have p values no greater than 0.2. Finally, we regressed ENT only on EDU and REF, the two variables with which it is most closely correlated.

We consider these latter sets of estimates for two reasons. First, we wish to guard against the possibility of over-fitting ENT in our first-stage regression. Second, we lack clear *a priori* grounds for imposing the exclusion restrictions needed to conduct second-stage regressions for any of the variables that serve as potential instruments in the first stage. Thus we have an interest in obtaining fitted values of ENT in the first stage using a small subset of available variables.[3]

Consider first the full-sample results presented in Table 2a. Using the full set of variables, no variable other than EDU and REF is estimated as statistically significant at even the 30% level. In contrast, EDU and REF are significant both statistically (at the 1% and 5% levels, respectively) and quantitatively. Regarding quantitative significance, a one-standard-deviation increase in EDU (REF) translates into an additional 1.46 (0.83) new small private enterprises per 1000 regional inhabitants. Under the stepwise regression, INITIAL and IO enter in as statistically significant (5% level). However, note from the final regression that eliminating these additional variables results in a reduction in the pseudo-R^2 statistic of only 0.02 (from 0.30 to 0.28). Thus EDU and REF are clearly important in accounting for regional patterns of entrepreneurial activity, while the marginal explanatory power of the remaining variables is minimal.

A similar pattern of results is obtained when Moscow is excluded from the sample (Table 2b). Once again, only EDU and REF are estimated as statistically significant in the regression involving the full set of variables (at the 10% and 1% levels, respectively). Under the stepwise regression, INITIAL and IO once again enter in as significant, and in this case LNDIST and LPRIV do so as well. Finally, eliminating all variables other than

[3] We note in passing that unlike in many analyses involving instrumental variables, we do not face problems associated with weak instruments here (recall, e.g., the strong correlation patterns reported in Table 1b).

EDU and REF results in a somewhat greater decline in the pseudo-R^2 statistic (0.06 in this case, from 0.28 to 0.22). However, it remains the case that EDU and REF are most important in accounting for regional patterns of entrepreneurial activity. The most significant implication of excluding Moscow from the sample regards the quantitative-significance measure obtained for EDU, which drops to 0.41 (from 1.46) using the full set of variables, and to 0.75 (from 1.17) using only EDU and REF.

Given these results, and our interest in keeping the set of first-stage instruments small, we proceed to the second-stage growth analysis using fitted values of ENT (ENTHAT, hereafter) associated with the restricted regressions involving only EDU and REF. However, results obtained in this way closely match those obtained using broader sets of instruments.

4. Regression Analysis, Stage 2: Accounting for Growth

As noted, our analysis of the relationship between entrepreneurial development 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 2000: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, 2003). Also, we are interested in learning whether the relationship between small private enterprise formation and growth has changed appreciably over time.

There are 16 sets of estimates to report, eight for each growth measure. Table 3 reports results for growth measured through 1997:IV; Table 4 reports results for growth measured through 2000:IV. The "a" versions of each table report full-sample results; the "b" versions report results obtained given the exclusion of Moscow. Then there are four sets of results in each version of each table: two sets of results obtained given the exclusion of REF from the growth regression for the purpose of identification; and two sets obtained given the exclusion of EDU for the purpose of identification. In each case, the first set of results is based on the inclusion of the full set of remaining potential explanatory variables as regressors; and the second set is based on a stepwise regression (using the algorithm described in Section 2). Again, all reported estimates were obtained using LAD regressions.

Consider first Table 3a: growth measured through 1997:IV, full sample. Using all available variables besides REF as explanatory variables, three variables enter significantly in the regression: DEFENSE (5% level); LNDIST (10% level); and ENTHAT (5%). Under the stepwise regression, LNDIST drops out of the regression, in favor of INITIAL and IO. The quantitative significance of these variables is substantial. A one-standard-deviation increase in ENTHAT corresponds with an increase in growth of 2.49 annual percentage points; the figures for INITIAL, IO and DEFENSE are 0.97, 1.11, and 0.87.

Remaining in Table 3a, the exclusion of EDU rather than REF for the purpose of identification yields an important difference in the regression involving all available variables: ENTHAT becomes statistically insignificant (its p value is 0.35 in this case). However, this difference disappears in the stepwise regression. In fact, the stepwise regression turns out to be identical, as the same set of variables ends up surviving the selection algorithm in both cases. The sensitivity of the significance of ENTHAT to the exclusions imposed under the stepwise regression seems to reflect several factors, including the considerable degree of correlation observed among many of the explanatory variables, and the large number of total available explanatory variables relative to sample size. But given the low marginal explanatory power of the excluded variables (the reduction in pseudo-R^2s their exclusion entails is 0.02 in this case, from 0.24 to 0.22), the restrictions imposed under the stepwise algorithm seem defensible.

The impact on these results of dropping Moscow is indicated in Table 3b. Relative to the results of Table 3a, there are three notable differences for the case in which REF is the excluded variable: LPRIV now enters significantly in the regression involving all variables (10%); LPRIV and LNDIST now survive the stepwise selection algorithm; and the quantitative significance of ENTHAT is reduced relative to the full-sample estimate (in the stepwise regression, the reduction is from 2.49 down to 1.64 annual percentage points). For the case in which EDU is the excluded variable, these same three differences are evident in the regression involving the full set of variables. And once again, the exchange of EDU for REF as the excluded variable has no impact on the stepwise regressions, as the same set of variables survive the selection algorithm in either case. Thus while Moscow exerts considerable influence on inferences regarding

the quantitative significance of entrepreneurial development using growth measured through 1997:IV, the quantitative significance of this variable remains readily apparent given Moscow's exclusion.

We now turn to the results obtained in measuring growth through 2000:IV. In Table 4a (full sample), note that using either REF or EDU as the excluded variable, when all remaining variables are used as explanatory variables, *none* enter significantly at even the 20% level. However, two variables survive the stepwise elimination algorithm: IO (with p value 0.129) and ENTHAT (with p value 0.028). The quantitative significance of ENTHAT is 1.46 annual percentage points: lower by roughly a full percentage point relative to growth measured through 1997:IV, but substantial nevertheless. Once again, the sensitivity of the significance of ENTHAT to the exclusions imposed under the stepwise regression seems to reflect factors such as the considerable degree of correlation observed among many of the explanatory variables, and the large number of total available explanatory variables relative to sample size.

The exclusion of Moscow from the sample (Table 4b) produces the single instance in which we find that results are sensitive to whether we use REF or EDU as the excluded variable. In the stepwise regressions, given the initial exclusion of REF, IO and ENTHAT end up surviving the elimination algorithm, just as was the case given the inclusion of Moscow. Interestingly, the quantitative significance of ENTHAT is actually higher in this case: 2.16 annual percentage points, up from 1.46. However, given the initial exclusion of EDU, ENTHAT is eliminated as a regressor, being displaced by REF. This last result is clearly a manifestation of the close correlation observed between ENT and REF (0.57), and lends a cautionary note to our overall findings. Taken as a whole, however, the results of our analysis provide further indication of the critical role played by entrepreneurial activity in the development process in post-socialist economies.

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

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Table 1a: 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 1b: Correlation Matrix

	Growth: 93-97	Growth: 93-2000	Small Ents	Edu	Init Inc	Ref. Voting	IO	Def	Dist	Small Priv	Large Priv
Growth: 93-97	1.000										
Growth: 93-2000	0.769	1.000									
Small-Ents	0.536	0.397	1.000								
Education	0.492	0.415	0.760	1.000							
Initial Income	0.334	0.168	0.343	0.156	1.000						
Reformist Voting	0.496	0.378	0.567	0.506	0.207	1.000					
IO	0.214	0.241	-0.109	-0.144	0.182	0.0289	1.000				
Defense	0.185	0.086	0.004	0.080	-0.076	-0.061	0.086	1.000			
Dist from Moscow (ln)	-0.215	-0.170	-0.258	-0.246	-0.040	-0.003	-0.237	-0.163	1.000		
Large-Priv	0.021	-0.116	0.118	0.043	0.143	-0.040	0.042	-0.049	-0.034	1.000	
Small-Priv	-0.076	-0.194	-0.046	-0.107	0.070	0.068	-0.109	-0.033	0.156	0.360	1.000

Table 2a: First-Stage Estimates, Full Data Set Dependent Variable: Small-Enterprise Formation			
Specification	(1)	(2)	(3)
Initial Income	0.125 se: 0.128 p: 0.335 qs: 0.330	0.129 se: 0.052 p: 0.016 qs: 0.342	X
IO	-0.014 se: 0.021 p: 0.492 qs: -0.206	-0.017 se: 0.006 p: 0.012 qs: -0.239	X
Defense	-0.114 se: 2.652 p: 0.966 qs: -0.015	X	X
Distance (log)	-0.205 se: -0.205 p: 0.448 qs: -0.282	X	X
Education	0.395 se: 0.112 p: 0.001 qs: 1.460	0.230 se: 0.042 p: 0.000 qs: 0.850	0.317 se: 0.060 p: 0.000 qs: 1.171
Large-Scale Privatization	4.360 se: 10.222 p: 0.671 qs: 0.158	X	X
Small-Scale Privatization	0.488 se: 3.166 p: 0.878 qs: 0.057	X	X
Reformist Voting	0.081 se: 0.040 p: 0.040 qs: 0.825	0.076 se: 0.015 p: 0.000 qs: 0.772	0.075 se: 0.022 p: 0.001 qs: 0.761
Pseudo R^2:	0.319	0.298	0.279
P values for F-tests of exclusions			
Compared to unrestricted specification (1)		0.929	0.895
Compared to restricted specification (2)			0.006

Notes: Each cell reports point estimates, then, se (standard error), p (p value) and qs (quantitative significance). The constant term has been estimated but is not reported.

Table 2b: First-Stage Estimates, Moscow excluded from Data Set **Dependent Variable: Small-Enterprise Formation**			
Specification	(1)	(2)	(3)
Initial Income	0.074 se: 0.072 p: 0.313 qs: 0.190	0.108 se: 0.055 p: 0.054 qs: 0.279	X
IO	-0.014 se:0.013 p: 0.283 qs: -0.208	-0.013 se: 0.010 p: 0.182 qs: -0.192	X
Defense	0.009 se: 1.390 p: 0.995 qs: 0.001	X	X
Distance (log)	0.244 se: 0.182 p: 0.185 qs: 0.265	0.246 se: 0.133 p: 0.069 qs: 0.267	X
Education	0.143 se: 0.076 p: 0.065 qs: 0.405	0.163 se: 0.055 p: 0.004 qs: 0.463	0.264 se: 0.067 p: 0.000 qs: 0.750
Large-Scale Privatization	6.186 se: 5.386 p: 0.255 qs: 0.225	7.563 se: 3.781 p: 0.050 qs: 0.275	X
Small-Scale Privatization	0.768 se: 1.552 p: 0.662 qs: 0.090	X	X
Reformist Voting	0.069 se: 0.020 p: 0.001 qs: 0.670	0.074 se: 0.016 p: 0.000 qs: 0.719	0.077 se: 0.019 p: 0.000 qs: 0.746
Pseudo R^2:	0.290	0.283	0.225
P values for F-tests of exclusions			
Compared to unrestricted specification (1)		0.885	0.227
Compared to restricted specification (2)			0.005

Table 3a: Second-Stage Estimates, Full Data Set Dependent Variable: Growth 93:IV-97:IV				
Specification	(1)	(2)	(3)	(4)
Identification Strategy	Reformist voting is excluded		Education is excluded	
Initial Income	0.219 se: 0.171 p: 0.205 qs: 0.580	0.367 se: 0.183 p: 0.050 qs: 0.969	0.219 se: 0.171 p: 0.205 qs: 0.580	0.367 se: 0.183 p: 0.050 qs: 0.969
IO	0.045 se: 0.039 p: 0.249 qs: 0.652	0.077 se: 0.037 p: 0.045 qs: 1.108	0.045 se: 0.039 p: 0.249 qs: 0.652	0.077 se: 0.037 p: 0.045 qs: 1.108
Defense	10.037 se: 4.022 p: 0.015 qs: 1.298	6.740 se: 4.120 p: 0.107 qs: 0.872	10.037 se: 4.022 p: 0.015 qs:	6.740 se: 4.120 p: 0.107 qs: 0.872
Distance (log)	0.776 se: 0.413 p: 0.065 qs: 1.067	X	0.776 se: 0.413 p: 0.065 qs: 1.067	X
Education	-0.347 se: 0.382 p: 0.367 qs: -1.283	X		
Large-Scale Privatization	18.966 se: 14.026 p: 0.181 qs: 0.689	X	18.966 se: 14.026 p: 0.181 qs: 0.689	X
Small-Scale Privatization	-4.045 se: 3.945 p: 0.309 qs: -0.475	X	-4.045 se: 3.945 p: 0.309 qs: -0.475	X
Reformist Voting			0.082 se: 0.090 p: 0.367 qs:	X
Small Enterprises (Fitted)	1.628 se: 0.808 p: 0.048 qs: 2.748	1.474 se: 0.334 p: 0.000 qs: 2.489	0.532 se: 0.569 p: 0.354 qs: 0.898	1.474 se: 0.334 p: 0.000 qs: 2.489
Pseudo R^2:	0.243	0.222	0.243	0.222
P values for F-tests of exclusions				
P-values for F-tests	Specification (2) compared to (1)		Specification (4) compared to (3)	
	0.182		0.182	

Table 3b: Second-Stage Estimates, Moscow is Excluded from Data Set Dependent Variable: Growth 93:IV-97:IV				
Specification	(1)	(2)	(3)	(4)
Identification Strategy	Reformist voting is excluded		Education is excluded	
Initial Income	0.204 se: 0.139 p: 0.147 qs: 0.527	0.253 se: 0.171 p: 0.145 qs: 0.651	0.204 se: 0.139 p: 0.147 qs: 0.527	0.253 se: 0.171 p: 0.145 qs: 0.651
IO	0.036 se: 0.030 p: 0.241 qs: 0.522	0.058 se: 0.033 p: 0.080 qs: 0.843	0.036 se: 0.030 p: 0.241 qs: 0.522	0.058 se: 0.033 p: 0.080 qs: 0.843
Defense	9.766 se: 3.185 p: 0.003 qs: 1.272	11.861 se: 3.644 p: 0.002 qs: 1.545	9.766 se: 3.185 p: 0.003 qs: 1.272	11.861 se: 3.644 p: 0.002 qs: 1.545
Distance (log)	0.940 se: 0.411 p: 0.026 qs: 1.020	0.744 se: 0.456 p: 0.108 qs: 0.807	0.940 se: 0.411 p: 0.026 qs: 1.020	0.744 se: 0.456 p: 0.108 qs: 0.807
Education	-0.287 se: 0.286 p: 0.319 qs: -0.817	X		X
Large-Scale Privatization	18.965 se: 11.078 p: 0.092 qs: 0.690	17.819 se: 12.127 p: 0.147 qs: 0.649	18.965 se: 11.078 p: 0.092 qs: 0.690	17.819 se: 12.127 p: 0.147 qs: 0.649
Small-Scale Privatization	-4.754 se: 3.041 p: 0.123 qs: -0.558	X	-4.754 se: 3.041 p: 0.123 qs: -0.558	X
Reformist Voting			0.084 se: 0.083 p: 0.319 qs: 0.812	X
Small Enterprises (Fitted)	1.653 se: 0.643 p: 0.013 qs: 2.527	1.070 se: 0.290 p: 0.000 qs: 1.636	0.564 se: 0.549 p: 0.308 qs: 0.863	1.070 se: 0.290 p: 0.000 qs: 1.636
Pseudo R^2:	0.257	0.240	0.257	0.240
P values for F-tests of exclusions				
P-values for F-tests	Specification (2) compared to (1)		Specification (4) compared to (3)	
	0.271		0.271	

Table 4a: Second-Stage Estimates, Full Data Set Dependent Variable: Growth 93:IV-2000:IV				
Specification	(1)	(2)	(3)	(4)
Identification Strategy	Reformist voting is excluded		Education is excluded	
Initial Income	0.194 se: 0.410 p: 0.639 qs: 0.511	X	0.194 se: 0.410 p: 0.639 qs: 0.511	X
IO	0.061 se: 0.067 p: 0.367 qs: 0.875	0.062 se: 0.040 p: 0.129 qs: 0.896	0.061 se: 0.067 p: 0.367 qs: 0.875	0.062 se: 0.040 p: 0.129 qs: 0.896
Defense	2.304 se: 8.321 p: 0.783 qs: 0.298	X	2.304 se: 8.321 p: 0.783 qs: 0.298	X
Distance (log)	-0.076 se: 0.712 p: 0.916 qs: -0.104	X	-0.076 se: 0.712 p: 0.916 qs: -0.104	X
Education	0.197 se: 0.809 p: 0.809 qs: 0.727	X		
Large-Scale Privatization	-22.878 se: 31.593 p: 0.472 qs: -0.831	X	-22.878 se: 31.593 p: 0.472 qs: -0.831	X
Small-Scale Privatization	-0.798 se: 8.275 p: 0.923 qs: -0.094	X	-0.798 se: 8.275 p: 0.923 qs: -0.094	X
Reformist Voting			-0.046 se: 0.191 p: 0.809 qs:	X
Small Enterprises (fitted)	0.562 se: 1.753 p: 0.749 qs: 0.949	0.863 se: 0.384 p: 0.028 qs: 1.456	1.183 se: 0.988 p: 0.236 qs: 1.997	0.863 se: 0.384 p: 0.028 qs: 1.456
Pseudo R^2:	0.127	0.104	0.127	0.104
P values for F-tests of exclusions				
P-values for F-tests	Specification (2) compared to (1)		Specification (4) compared to (3)	
	0.984			

Table 4b: Second-Stage Estimates, Moscow is Excluded Dependent Variable: Growth 93:IV-2000:IV				
Specification	(1)	(2)	(3)	(4)
Identification Strategy	Reformist voting is excluded		Education is excluded	
Initial Income	-0.165 se: 0.353 p: 0.642 qs: -0.426	X	-0.165 se: 0.353 p: 0.642 qs: -0.426	X
IO	0.056 se: 0.048 p: 0.254 qs: 0.808	0.063 se: 0.037 p: 0.096 qs: 0.870	0.056 se: 0.048 p: 0.254 qs: 0.808	0.059 se: 0.030 p: 0.056 qs: 0.963
Defense	3.024 se: 6.798 p: 0.658 qs: 0.394	X	3.024 se: 6.798 p: 0.658 qs: 0.394	X
Distance (log)	0.455 se: 0.871 p: 0.603 qs: 0.494	X	0.455 se: 0.871 p: 0.603 qs: 0.494	
Education	-0.390 se: 0.576 p: 0.501 qs: -1.110	X		
Large-Scale Privatization	12.679 se: 27.600 p: 0.648 qs: 0.462	X	12.679 se: 27.600 p: 0.648 qs: 0.462	X
Small-Scale Privatization	-4.872 se: 6.619 p: 0.465 qs: -0.572	X	-4.872 se: 6.619 p: 0.465 qs: -0.572	X
Reformist Voting			0.114 se: 0.168 p: 0.501 qs: 1.103	0.129 se: 0.058 p: 0.029 qs: 0.835
Small Enterprises (Fitted)	1.625 se: 1.275 p: 0.207 qs: 2.484	0.968 se: 0.432 p: 0.028 qs: 2.161	0.146 se: 1.165 p: 0.900 qs: 0.224	X
Pseudo R^2:	0.110	0.068	0.110	0.072
P values for F-tests of exclusions				
P-values for F-tests	Specification (2) compared to (1)		Specification (4) compared to (3)	
	0.003		0.955	