Entrepreneurship and the evolution of income distributions in Poland and Russia

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Differences in the evolution of Polish and Russian income distributions in the post-socialist era can be attributed to different rates of entry of new enterprises. Using regional differences during early privatization as instruments to estimate the impact of this entry, we find that a one-standard-deviation increase in the share of the workforce in new or small enterprises increases the share of income earned by the lowest forty percent of the population by 1.4% and by 1.25% in Polish and Russian regions, respectively. Poland's greater success in de novo firm entry contributes to its more equitable income distribution during the transition. *Journal of Comparative Economics* **34** (2) (2006) 338–356. University of Pittsburgh, WWPH 4711, Pittsburgh, PA 15260, USA; Department of Political Science, University of Michigan, 7766 Haven Hall, Ann Arbor, MI 48109, USA.
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1. Entrepreneurship and the evolution of income distributions in Poland and Russia

Income inequality increased in the transitional economies in Central and Eastern Europe and the former Soviet Union (CIS) according to UNICEF (2001) and World Bank (2000). The more

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successful transitional economies in Central and Eastern Europe experienced relatively modest increases in inequality of about 0.05 in their Gini coefficients from 1987–1989 to 1997–1999 with coefficients still at or below the OECD average of 0.31 by the end of the 1990s. In contrast, the CIS countries, which are regarded as having less successful transitions, had average increases in their Gini coefficients of 0.17 during the same period so that, with the exception of Belarus, all of these countries have Gini coefficients well above the OECD average. These observations raise the intriguing issue of whether the relatively rapid and successful creation of a capitalist market economy has a salutary impact on income distribution. In this paper, we investigate the increased inequality by examining the relationship between the rates of creation and growth of new and small private enterprises and the changes in the income share of the bottom two quintiles within regions in Poland and Russia.

Russia and Poland illustrate two quite different transition experiences. Poland's real GDP increased annually beginning with the third year of the transition and exceeded its pre-transition level by the sixth year. According to UNICEF data, the Gini coefficient measuring income inequality increased from 0.28 to 0.33 between 1987–1989 and 1997–1999 in Poland.[1] However, Russia experienced a major contraction from 1991 to 1998 and, by 2003, real GDP was still below the pre-transition level despite significant growth after 1998. Accompanying this fall in income is a considerable increase in inequality. According to the UNICEF data, the Gini coefficient for income increased from 0.27 to 0.47 between 1987–1989 and 1997–1999 in Russia.[2] We use these contrasting experiences to test propositions about how entry and growth of new small firms is related to changes in the distribution of income. In the next section, we present arguments for why increased small enterprise growth flattens the income distribution and benefits those in the lower quintiles. Section 3 describes the regional variations in income distributions and the size of the small enterprise sector in Poland and Russia. In the following section, we discuss our estimation methods, which recognize the endogeneity of new firm creation and growth, and present the statistical results. In the concluding section, we draw on our comparison of the Polish and Russian experiences to suggest why Poland did not have the large increase in income inequality that occurred in Russia.

2. New firm entry and changes in income distribution

The entry of small enterprises consists of the creation of de novo firms, spin-offs from state enterprises, and small scale privatization of state firms. In all three situations, we expect higher rates of small enterprise creation to promote a more equitable income distribution. First, new small enterprises were the sole source of job creation in many transitional economies and offset layoffs resulting from the introduction of hard budget constraints, privatization, and restructuring of state-owned firms. Bilsen and Konings (1998) provide evidence from Romania, Bulgaria and Hungary; while Jackson et al. (2005) demonstrate this for Poland and Jurjada and Terrell (2001) provide evidence from the Czech Republic and Estonia. The wages earned in these jobs increase incomes at the lower end of the income distribution because they are greater than unemployment benefits.

Second, based on the Schumpeterian notion of creative destruction, new small enterprises will exhibit higher productivity than the firms that they are replacing. Using a detailed sample of 24

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[1] Keane and Prassad (2002) provide an overview of the dynamics of the income distribution in Poland during the 1990s.
[2] Luttmer (2002) provides a comparison of the income distributions in Poland and Russia.

countries, Bartelsman et al. (2004) document that, in the post-socialist transition economies, new firms are primarily small and the firms that they are replacing are large state enterprises. These authors show that productivity gains from entry and exit are highest in transition economies. Klapper et al. (2004) corroborate this finding. Comparing new and old manufacturing firms in Slovenia, De Loecker and Konings (2006) find that the net entry of de novo private firms is an important determinant of the growth in total factor productivity. Using longitudinal data on cohorts of new and old enterprises in Poland, Jackson et al. (2005) find that both survival and growth are strongly related to average sales per worker within new firms indicating that the most productive firms are employing a larger share of the workforce. These authors also show that wage growth among surviving firms in a cohort is strongly related to sales per worker and to sales growth. Moreover, their analysis indicates that wage growth is tied more closely to productivity growth in the surviving small enterprises than in state-owned and former-state-owned firms. In the short run, regional incomes depend on factors other than the number and growth of new firms, e.g., unemployment.[3] However, in the longer run, the equilibrium wage in a competitive labor market will reflect this higher level of productivity in the surviving new firms.

Finally, a high rate of entry and survival of new firms increases the competitiveness of product and labor markets so that monopoly rents are eliminated over time, as McMillan (1995) discusses. Johnson et al. (2002) argue that, during the first years of transition, small de novo and spin-off firms in Poland and Russia entered sectors that had been dominated by large state enterprises under socialism, such as consumer goods, light manufacturing, trade and services. The inefficiencies of the state enterprises created considerable profit opportunities for initial entrants in these sectors. Over time, the continued entry of firms reduced profits. Johnson et al. (2002) show that rents decreased as competition increased in Poland starting in 1995. However, McMillan and Woodruff (2002) argues that the slow development of supporting institutions and lower rates of firm entry led to the persistence of high profits in Russia.[4] Frye and Shleifer (1997) present evidence that, by 1996, small firms in Warsaw were operating in a more competitive market than their counterparts in Moscow. Thus, the small enterprise sector provides employment through job creation and also boosts productivity. If the entry of small enterprises is accompanied by the reduction of monopoly rents because of increased competition and if distortionary regulations are removed gradually, we expect payments to labor to reflect more accurately the marginal productivity of labor over time so that the entry of small enterprises leads to higher wages. These arguments predict a positive association between the rate of new and small firm creation and the equality of the income distribution in transitional economies. The remaining sections test this prediction by relating changes in the income share of the lowest two quintiles to the size and growth of the de novo firm sector in regions in Poland and in Russia.

3. Income distribution and new firm creation in Poland and Russia

Our estimates of regional income distributions and of the size of the small enterprise sector in Poland come from specialized data collections. The Polish Central Statistical Office does not

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[3] Jackson (2003) and Tichit (2006) discuss the relationship between wages and unemployment in transition economies.

[4] An additional explanation given for the elimination of monopoly rents in Poland and their persistence in Russia is that Poland became more open to foreign trade. However, from EBRD (2003, pp. 178 and 186), we calculate the share of trade in GDP during years seven through ten of transition, i.e., 1996 to 1999 in Poland and 1998 to 2001 in Russia, to be 42.2% in Poland and 54.0% in Russia. Furthermore, the share of trade with non-transition countries during these years is 35.2% in Poland, which is less than the comparable share of 37.4% in Russia.

disseminate publicly data on the regional distribution of income. The Institute for Social Studies at the University of Warsaw has conducted the Polish General Polish Social Survey (PGSS) since 1992, as discussed by Cichomski and Morawski (2002). This survey contains a nationally representative random sample of about 1600 households in 1992, 1993, and 1994 and about 2300 households in 1997 and 1999.[5] One of the questions asks for total monthly family income. The 1992, 1993, and 1994 samples are pooled and family incomes in 1993 and 1994 are adjusted to 1992 price levels using the consumer price index. These data constitute the 1993 sample. Similarly the 1997 and 1999 surveys are pooled and 1999 incomes are adjusted to 1997 levels. These data make up the 1998 sample. Each sample is disaggregated by region, i.e., voivodship, of which there are forty-nine.

Measures of income distribution, or inequality, are computed for each region based on the respondents residing in that region. These measures are the income shares of the lowest and the lowest two quintiles in both 1993 and 1998 and the changes in these shares between 1993 and 1998. Table 1 provides descriptive statistics for the means and ranges of these measures among voivodships with the Warsaw region omitted. The average income share of both the first and second quintile is essentially equal in 1993 and 1998 at about 22%. The average share for the first quintile is also comparable across the periods at about 8%. The standard deviation of regional shares of the first two quintiles increased between 1993 and 1998 while the range decreased by 2.5%. For the first quintile, both the standard deviation and the range of income shares increased between 1993 and 1998. The stability of mean income shares between 1993 and 1998 disguises substantial variation in changes in the shares. The range of these changes is large, from −9.8% to +12.2%, with a standard deviation of 4.3% for the first and second quintiles combined. These statistics indicate considerable regional variations in the change in shares; our interest is to investigate whether these changes are related to the size and growth of the small enterprise sector.

Table 1
Descriptive measures of income distributions and survey sample sizes for Poland

Variable	1993 Shares	1998 Shares	ΔShares
1st Quintile income shares			
Regional mean	7.9%	8.1%	0.1%
Regional median	7.9%	7.8%	0.1%
Regional st. deviation	1.1%	1.5%	1.7%
Regional minimum	5.3%	5.9%	−3.6%
Regional maximum	10.34%	14.7%	4.7%
1st and 2nd Quintile income shares			
Regional mean	21.7%	21.9%	0.2%
Regional median	21.4%	21.8%	0.3%
Regional st. deviation	2.6%	3.0%	4.3%
Regional minimum	15.7%	17.1%	−9.9%
Regional maximum	28.8%	27.8%	12.2%
Sample sizes			
National	4569	4151	
Regional mean	95.2	86.5	
Regional median	81	73.5	
Regional minimum	22	21	
Regional maximum	542	428	

Note: the Warsaw region is omitted from all statistics.

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[5] A study was made in 1995 but we do not include it in our analysis.

The lower half of Table 1 shows the regional sample sizes on which these distributional statistics are calculated. Two important considerations must be given to the evaluation of these statistics. First, their accuracy relative to the population values in the regions is a function of sample size. In our statistical analysis, we weight by these sample sizes to adjust for sampling errors. The alternative strategy of combining regions with smaller sample sizes presents two problems. It reduces the degrees of freedom in our analysis relating changes in regional income shares to the de novo sector. In addition, regions with small samples are not contiguous so that any aggregation is arbitrary. For these reasons, we keep the regions intact and weight by sample size. Second, the PGSS study is a representative sample for the nation but not for each voivodship. Hence, our measure of a region's income distribution may be calculated from a non-representative subset of a region's population.

Given the available data, we have no option but to use these regional income distributions despite this potentially serious problem. To discern its likely severity, we compare the sample sizes in each voivodship with the corresponding populations and conjecture that the greater is the proportional difference the less likely is the voivodship to be represented adequately in the PGSS sample. The simple correlation of the sample size and population variables is 0.93. The ratio of the regional sample size to the voivodship population divided by ten is 1.19 with a standard deviation of 0.37; the log of this ratio has a mean of 0.13 and a standard deviation of 0.32. We correlated this ratio and its log with a series of variables characterizing each voivodship, e.g., population, average salary, and the rates of creation of both de novo firms and jobs. None of the individual correlations is close to being statistically significant with the lowest p-level at 0.25. The multiple regression in which all the variables are included has an adjusted R-squared of -0.13 and an F-statistic of 0.51 with eleven and thirty-six degrees of freedom, which implies a p-level of 0.88. Based on these comparisons, we conclude that the regional sample sizes and populations are highly correlated and we find no systematic variation in the deviations from this ratio. Thus, with corrections for sampling error, we expect to obtain good estimates of the relationship between small enterprise creation and income inequality and to have reliable estimates of their uncertainty.

Measuring the size and growth of the small enterprise sector in transitional economies is a daunting task. However, we have access to a dataset developed by the Economics and Statistics Research Office of the Polish Central Statistical Office (GUS) that enables us to focus on small de novo firms and spin-offs as opposed to small privatized firms in Poland. The GUS created longitudinal data tracking individual firms from annual reports filed by individual enterprises that measure the entry, survival, and growth of new firms for the period 1990 through 1997, as Jackson et al. (1999, 2005) describe. The filings are linked to follow the survival and employment growth of small firms that existed in 1990 and the entry, survival, and growth of new firms that entered after 1990. From these data, we calculate the number of firms in each region in 1997 that were small in 1990 or had entered since then along with their total employment. These numbers for employment and firms are denominated by the size of the workforce and by population, respectively. Hence, we take the density of these firms per capita, their employment share in 1997, and the change in their employment share from 1993 to 1997 as measures for the size of the small enterprise sector in each region. Table 2 reports the summary statistics for these variables.

One limitation of these data is that the GUS did not require firms with five or fewer employees to report. Consequently, the very smallest sector is omitted. Another agency collects data on firm registrations by region but their data for firms with five or fewer employees overstate considerably the number of de novo firms. Hence, these data are not reliable and we do not use them in this

Table 2
Description of Poland's de novo economy

Variable	1990[a]	1993	1997
Firms/thousand population			
Mean	0.32		1.92
Median	0.30		1.69
St. deviation	0.13		0.79
Minimum	0.13		0.79
Maximum	0.73		4.42
New employment/workforce			
Mean	0.01	0.05	0.11
Median	0.01	0.04	0.10
St. Deviation	0.01	0.02	0.05
Minimum	0.00	0.02	0.04
Maximum	0.04	0.10	0.23
Δ*New employment/workforce, 1993–1997*			
Mean			0.07
Median			0.06
St. deviation			0.03
Minimum			0.02
Maximum			0.15

Notes. Entries for 1990 refer to firms with six to one hundred employees.

[a] Warsaw region omitted.

study.[6] Jackson et al. (2005) compare the GUS and registry data for firms of all sizes and find no evidence of systematic regional differences or biases between the two data sources. These authors conclude that the GUS data provide more reliable estimates of local de novo firms and spin-off activity because they track both growth and exit. Hence, we use these data despite the omission of very small firms. The GUS data have several advantages over the usual data that measure the size of the small and medium enterprise (SME) sector or that track the registration of new firms. First, in the conventional data on SMEs, the most successful new firms will no longer by classified as SMEs as they grow over time. Hence, the more successful is a region in promoting entry and growth of a small enterprise sector, the more likely is the SME data to understate its size and importance. Second, most data on the size of the private sector do not separate de novo and spin-off firms from privatized firms. The latter may have a quite different impact on promoting the competition and growth needed for a healthy market economy than the former group. In summary, we conclude that the GUS data are the best available information on the size and growth of small de novo and spin-off firms in Poland so that we use them to measure the number and employment of the most successful of these firms on a regional basis.

The Warsaw region is dropped from the Polish sample because it is an outlier whose inclusion would influence the results unduly. As the capital city, Warsaw has a very high proportion of government employees, whose wages are not determined by market forces but are more reflective of political interests. Warsaw also had a large de novo private sector by 1997 and received the dominant share of foreign investment, which accounted for about half of all employment in new

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[6] Some registrations are for tax purposes solely and the agency responsible for these data does not record exits. Both of these considerations lead to overstatements of the size of this sector. Including these data for firms with five or fewer employees with our data on those with over five employees would imply more job creation than job loss during the transition, which is inconsistent with the ten percent unemployment rate in 1997.

foreign owned firms. Hence, Warsaw has the largest proportion of workforce in de novo private domestic and foreign firms of any region. Nonetheless, Table 2 indicates the substantial variation in the size of the de novo sector across regions.

For Russia, we use published regional data supplied by the official Russian statistical agency in Goskomstat Rossii (1996, 2001, 2002) to characterize the income distribution and small enterprise formation. These data contain representative regional surveys of household income, regional registries of small enterprises, and data on the number of employees and sales in these new enterprises. The regional income distribution is reported in 1995, 2000 and 2001 and the methodology does not change over time. Russia contains 89 regions; the 1995 national survey covers 75 of the regions and the 2001 survey covers 77 of them. We match data from the national sample with our regional data set, which includes early privatization data and other regional covariates, and obtain a sub-sample of 66 regions in 1995 and 2001. The cities of Moscow and St. Petersburg are excluded.

Table 3 reports the share of income held by the bottom 20-percent and the bottom 40-percent of the regional income distribution in 1995 and 2001 and illustrates several patterns. First, income distribution within Russian regions becomes slightly more inequitable during this time period measured by either the national mean or the regional mean. Households in the bottom 40-percent of the income distribution lose, on average, one percentage point of their share of overall income; households in the bottom 20-percent lose about a half percentage point. Hence, the changes in the Russian income distribution from 1995 to 2001 are considerably different from the relatively stable income distribution in Poland from 1993 to 1998 reported in Table 1.

Second, comparing Tables 1 and 3, we see that the income distribution exhibits less variation over time in Russia than in Poland. The standard deviation in regional income shares in Russia decreases from 2.7% in 1995 to 1.7% in 2001, whereas in Poland it increases from 2.6% in 1993 to 3.0% in 1998. The changes in income shares within regions are also more stable in Russia between 1995 and 2001 than in Poland between 1993 and 1998. For the lowest two quintiles, the

Table 3
Descriptive measures of income distributions and survey sample sizes for Russia

Variable	1995 Shares	2001 Shares	∆Shares
1st Quintile income shares			
National mean (full sample)	7.6%	7.1%	
Regional mean (analyzed sub-sample)	7.7%	7.2%	−0.5%
Regional median	8.0%	7.3%	−0.7%
Regional st. deviation	1.3%	0.9%	1.2%
Regional minimum	4.7%	4.7%	−3.3%
Regional maximum	10.1%	8.5%	2.5%
1st and 2nd Quintile income shares			
National (full sample)	20.0%	19.0%	
Regional mean (analyzed sub-sample)	20.1%	19.1%	−1.0%
Regional median	20.9%	19.4%	−1.4%
Regional st. deviation	2.7%	1.7%	2.5%
Regional minimum	13.9%	13.9%	−6.5%
Regional maximum	24.8%	21.8%	5.2%
Sample sizes (number of regions)			
National (full sample)	75	77	
Regional (analyzed sample)	66	66	
Actual number of regions	89	89	

Note: the cities of Moscow and St. Petersburg are omitted from all statistics.

standard deviation of the change in income shares is smaller in Russia than in Poland at 2.5% and 4.3%, respectively, and the range of the changes is smaller in Russia than in Poland, i.e., −6.5% to 5.2% compared to −9.9% to 12.2%. Nevertheless, we have sufficient variation in the change in Russian regional income shares to estimate the relationship between income shares and the size and growth of the small enterprise sector.

We use small enterprise employment as a share of the regional workforce and the registry of small enterprises per 1000 people as measures of small enterprise development. Legally registered small enterprises include spin-offs from state enterprise and start-ups as well as privatized small state enterprises. Thus, we can not separate small de novo and spin-off firms from small privatized firms in Russia as we did in Poland. Before 1996, small enterprises were defined by employment ceilings in that, over the course of a year, a small enterprise could hire no more than 200 workers on average and employment ceilings varied across branches, e.g., 100 in scientific services and 15 in retail trade. However, starting in 1996, small enterprises have been defined by both ownership structure and employment in Russia. Regarding ownership, no matter how small an enterprise may be, it is not legally defined as a small enterprise if it has an outside owner, e.g., a large company, a charitable organization, or a social or religious organization, that owns at least 25% of the initial enterprise capital. In addition, employment ceilings have changed and become smaller; for example, the highest ceiling is 100 applying to industry, construction and transport while the ceiling for retail trade has been increased to 30 employees on average per year. Because the definition of a Russian and Polish small enterprise is different, our data cannot be used to compare the penetration of small enterprise in these two countries.

Table 4 reports data on the evolution of small enterprises in Russia for pairs of years in which the definitions are comparable and for which data are available. Remarkably, the number of small enterprises per capita and the share of the labor force employed in small enterprises decreases over time. Employment shares increase in only one region in our sub-sample, namely, Nizhni Novgorod. The cities of Moscow and St. Petersburg are outliers because the increase in the labor force employed in small enterprises in these cities is three to four standard deviations above the

Table 4
Description of Russia's small enterprises

Variable	1996	2001
Firms/population (1000)		
Mean	3.84	2.34
Median	3.76	2.18
St. deviation	1.41	1.02
Minimum	1.71	1.09
Maximum	9.40	5.98
Small employment/workforce	1995	2001
Mean	0.13	0.07
Median	0.13	0.07
St. deviation	0.02	0.03
Minimum	0.08	0.02
Maximum	0.20	0.14
Δ *Employment share, 1995–2001*		
Mean		−0.06
Median		−0.06
St. deviation		0.03
Minimum		−0.15
Maximum		0.01

median region in our sub-sample and one to two standard deviations above Nizhny Novgorod. Moscow is 4.6, 2.6, and 4.8 standard deviations above the mean and St. Petersburg is 4.5, 3.5, and 5.2 standard deviations above the mean for the 2001 small enterprise employment share, the 1995 to 2001 change in small enterprise employment share, and in 2001 enterprises per capita. Moreover, the extent of foreign activity in Moscow and St. Petersburg sets these two regions apart from the rest of Russia. In 2001, they attracted 48% of foreign investment. Moscow and St. Petersburg have the highest and second highest proportions of the regional workforce employed in foreign joint enterprises that are also small enterprises. Hence, we exclude these two cities from our analysis. However, even if we were to include Moscow and St. Petersburg in the sample, small enterprise development would remain much more dynamic over time in Poland than in Russia.

4. The empirical results

In this section, we present the empirical analysis of the influence of small enterprise development on income distribution in Poland 1998 and Russia 2001. We begin with the following equation:

$$\Delta DIST_t = \alpha + \beta SMENT + \gamma X + \delta DIST_{t-1} + \varepsilon_t, \tag{1}$$

where $\Delta DIST_t$, $DIST_{t-1}$, $SMENT$, and X denote respectively the change in income distribution measured as the share of income going to the bottom 40-percent of the distribution in a region between periods t and $t-1$, the income distribution in period $t-1$, small enterprise development, and a vector of regional covariates. In this vector, we include log population to capture the extent of the market and education because both of these variables are important determinants of income distribution and small enterprise development. The primary measure for small enterprise development, denoted $SMENT$, is the employment share of the sector in 1997 in Poland and in 2001 in Russia. This variable is also measured by the number of de novo private firms per thousand people and by the change in the de novo firm share of private employment from 1993 to 1997 for Poland and from 1995 to 2001 for Russia.

Estimating Eq. (1) is complicated by the possibility of reverse causality. Using formal models, Gabszewicz and Thisse (1980) and Shaked and Sutton (1982) show that the entry of new firms in markets characterized by monopolistic competition is related to the distribution of income. Empirical studies argue that more equitable income distributions are associated with higher rates of economic growth. Aghion et al. (1999) provide a summary of this research and Forbes (2000) gives a contrary view. Keane and Prassad (2002) report a strong negative correlation between GDP growth and inequality for fourteen transition countries during the first eight years of the transition. If GDP growth is related to the growth of de novo firms as we hypothesize, our measures of small enterprise development will be endogenous.

To address this potential endogeneity problem, we use early privatization and initial conditions as instruments that should provide consistent estimates for the relationship between new enterprise development and changes in income equality. Because of differences in data availability and in their approaches to reforms, the precise variables differ in each country. For Russia, the two instruments are large and small scale privatizations in 1993, defined as the number of privatized firms in each category per 1000 of the population, as reported in Goskomstat Rossii

(1994).[7] In Poland, data for only large scale privatization, defined as the proportion of the 1993 workforce employed in firms privatized to that time, are available. Additional relevant initial condition variables are the proportion of the 1990 non-farm workforce employed in state-owned enterprises and the proportion of the workforce employed in private enterprises with fewer than one hundred employees.[8]

The first requirement for our instruments is that they be related to the size of the de novo enterprise sector. McMillan (1995) argues that early privatization leads to the emergence of a regulatory environment that enhances the entry and development of small enterprises. If properly implemented, privatization weakens the political connections of the controllers of formerly state owned enterprises. Hence, both national and local governments would have no incentive to use tax and regulatory policy to protect state-owned enterprises against entry by small enterprises. Furthermore, governments can expand their tax base and enhance the standard of living by developing a pro-small-business regulatory environment. Alternatively, if privatization fails to eliminate these political connections, the old situation in which governments have an incentive to protect the large enterprises remains. Berkowitz and Holland (2001) find strong positive relationships between new firm registrations and federal and regional privatization in Russia, but small negative relationships for local privatization. Hence, we conclude that the greater is the degree of capture of government agencies by the privatized firms and the smaller is the separation of these firms from the government, the weaker will be the relationship between privatization and new firm entry.

Poland and Russia have quite different privatization experiences. Poland proceeded very slowly with large scale privatization while Russia privatized very rapidly. Alexeev (1999), Berkowitz and Li (2000), Black et al. (2000), Frye and Shleifer (1997), Hellman (1998) and Shleifer and Vishny (1993) argue that early Russian privatization led to a corrupt regulatory environment that persisted through at least the mid-1990s, while early Polish privatization had the opposite effect. Johnson et al. (2002), Hellman et al. (2003) and Karatnycky et al. (2001) and Transparency International (1996) document far less corruption in Poland than in Russia, while Hellman et al. (2003) reports relatively less governmental capture in Poland. We expect these differences to produce a stronger association between large scale privatization and new firm growth in Poland than in Russia.

Initial conditions are important to the development of the Polish de novo private sector. Poland had a nascent small private sector and a varied mix of state-owned, collective, and large domestic and foreign enterprises at the beginning of the transition, the concentration of which varied substantially by region. Given the importance of agglomeration, learning, and political effects, the presence of a significant number of small private enterprises at the beginning of the transition gives a region a substantial advantage in expanding its de novo sector as the transition proceeds. Moreover, we expect the presence of state-owned enterprises at the beginning of the transition to depress the entrepreneurial process and, as a result, decrease the growth and ultimately the size of the de novo sector. These enterprises pay higher wages, raising labor costs and reducing labor supply for new enterprises. Even within the less-corrupt Polish environment, large firms are able to exert undue influence on institutions ranging from financial organizations to governments

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[7]   Regional privatization combined voucher and cash privatization of large and medium-sized companies. To avoid potential problems associated with over-identification, we do not include early regional privatization in Russia.

[8]   For the equation with new firms per thousand of the population as the measure for *SMENT*, the variables representing initial conditions are the proportion of the 1990 non-farm workforce employed in state-owned enterprises and the number of small firms per one thousand people in 1990.

and obtain preferential treatment and various subsidies, which create an unfavorable climate for enterprise creation. Finally, empirical evidence from the US and Poland in Jackson and Rodkey (1994) and Jackson and Marcinkowski (1999) indicates that both individuals residing in regions dominated by large organizations, independent of the size of their own employer, and employees in large organizations express less support for entrepreneurs and are less likely to say they would undertake entrepreneurial activity. Considering these three factors, we expect to find a negative relationship between a region's density of state-owned enterprises and the development of its de novo sector in Poland. However, these initial conditions are relatively unimportant in explaining the development of the de novo sector in Russia due to the lack of a small private sector and the fact that virtually all employment was in state-owned firms at the beginning of the transition.

A second requirement for our instruments is that they are not related systematically to the change in the income share of the bottom two quintiles after controlling for new firm entry, lagged income shares, education and population. In other words, the effect of an instrument on income shares is only through its relationship to new firm creation and growth. To validate empirically this identifying assumption, we take a two-step approach. First, we control for the influence of the initial income distribution in the estimating equation. Initial conditions and early privatization are determined prior to our measure of initial income shares so that, if these variables affect inequality directly, their strongest effects should be on this variable and not on the subsequent change in income. Second, we validate our exclusion restrictions by employing over-identification tests based on Hansen (1982) and Baum et al. (2003). These tests examine whether the identifying variables are correlated individually or jointly to the changes in the income distribution conditional on firm entry and the other covariates in Eq. (1). If we cannot reject the null hypothesis of no correlation, we find statistical corroboration for the validity of this requirement.[9]

Based on these propositions the first stage regression used to identify the impact of *SMENT* on $\Delta DIST$ is:

$$SMENT = \alpha_1 + \beta_1 PRIV + \beta_2 COND_0 + \gamma_1 X + \varepsilon_1, \tag{2}$$

where *PRIV* denotes privatization during 1990 to 1993 for Poland and small and large privatization in 1993 for Russia and $COND_0$, which applies only to Poland, is the 1990 employment in small private and in state-owned firms.[10] Therefore, we use the variables in *PRIV* and in $COND_0$ as over-identifying restrictions in estimating Eq. (1) for either Poland or Russia.[11]

Table 5 contains the empirical results of estimating Eqs. (1) and (2) for Poland.[12] In panel A, we report 2SLS estimates of Eq. (1) and, in panel B, we provide test statistics to check for

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[9] As in all conventional statistical tests, a failure to reject the null hypothesis does not mean we can accept it. However, the higher is the probability of getting our statistical results by chance under the null, the more likely the null is to be correct.

[10] Privatized employment in 1993 and state-owned employment in 1990 are measured by the non-farm workforce because we are using these variables to measure the concentration of industrial and commercial activity in these firms. For the small private and de novo sectors, we are seeking variables to assess the level of participation of the entire workforce in these enterprises.

[11] Hahn and Hausman (2002) and Chao and Swannson (2006) show that over-identification can create bias when two stage least squares (2SLS) is used. Simulation results in Chao and Swannson show that one way to offset this bias is to use limited information maximum likelihood estimation (LIML). Because the difference between our 2SLS and LIML estimates are negligible, we report only the 2SLS results but the LIML results are available upon request.

[12] We also estimated the equations with Warsaw included. In each first-stage estimation, the dfits statistic for Warsaw is about six times larger than both the next largest value and the conventional threshold for concluding that the observation may be problematic. Hence, we report the results with Warsaw excluded.

Table 5
Income distribution and small enterprises in Poland

Measure of small enterprise development	Employment share of workforce, 1997	New enterprises per capita, 1997	Δ Employment share, 1993–1997
A. Second stage 2SLS estimates dependent variable is share of income going to bottom 40-percent			
Small enterprise development, (instrumented)	30.6* (10.7) QS: 1.44	2.00* (0.79) QS: 1.58	57.3* (24.6) QS: 1.72
Log population, 1998	−1.01* (0.45)	−1.14* (0.54)	−1.32* (0.58)
Education, 1998	−1.35** (0.77)	−1.46** (0.85)	−1.36** (0.80)
Income share, 1993	−1.50* (0.22)	−1.50* (0.21)	−1.50* (0.23)
Centered R^2	0.64	0.64	0.63
B. Over-identification tests for 2SLS estimates: t-statistics			
Employment in private firms in 1990 per 1000 workforce (*p*-value)	−0.62 (0.54)		−0.09 (0.93)
1990 private employment per 1000 population (*p*-value)		−0.42 (0.68)	
Employment in state-owned firms, 1990 (*p*-value)	0.01 (0.99)	0.09 (0.93)	0.34 (0.74)
Employment in firms privatized 1990–1993 per 1000 workforce (*p*-value)	0.76 (0.45)	0.50 (0.62)	0.49 (0.63)
J-test for joint exclusion of privatization variables (*p*-value)	0.54 (0.76)	0.25 (0.88)	0.19 (0.91)
C. OLS estimates of the second stage			
Small enterprise development, 1998	22.2* (8.70) QS: 1.25	1.27* (0.42) QS: 2.15	34.6* (13.1) QS: 1.3
Log population, 1998	−0.72 (0.49)	−0.71 (0.43)	−0.78 (0.49)
Education	−1.17 (0.71)	−1.18 (0.72)	−1.09 (0.69)
Share, 1993	−1.51* (0.22)	−1.51* (0.21)	−1.51* (0.22)
Centered R^2	0.65	0.65	0.65
D. First stage reduced form OLS regression (dependent variables is small enterprise development, 2001)			
Privatization variables (excluded instruments)			
Employment in private firms in 1990 per 1000 workforce	3.64* (0.92)		1.56* (0.73)
Per 1000 population		2.76* (0.69)	

Table 5 (*continued*)

Measure of small enterprise development	Employment share of workforce, 1997	New enterprises per capita, 1997	Δ Employment share, 1993–1997
Employment in state-owned firms, 1990	−0.16[*]	−2.98[*]	−0.14[*]
	(0.08)	(1.39)	(0.06)
Employment in firms privatized 1990–1993 per 1000 workforce	0.51[*]	10.76[**]	0.38[**]
	(0.21)	(5.80)	(0.19)
Log population, 1998	0.05[*]	0.91[*]	0.04[*]
	(0.01)	(0.22)	(0.01)
Education, 1998	0.01	0.14	0.00
	(0.01)	(0.17)	(0.01)
Income share, 1993	−0.001	−0.02	−0.001
	(0.002)	(0.03)	(0.002)
F-statistic for excluded instruments	13.1	7.51	5.15
p-value of F-statistic	0.000	0.000	0.004
Partial R^2 of excluded instruments	0.52	0.44	0.35

Notes. (1) The standard errors of the point estimates are reported in parentheses. (2) The standard errors in the second stage have a small sample correction; first and second stage standard errors are corrected for heteroskedasticity. (3) QS denotes quantitative significance, which is the impact of a one-standard-deviation difference in small enterprise development, using the actual sample, on income distribution. (4) Small private firms in 1990 have fewer than 100 employees.

[*] Significance at the 5% level.
[**] Idem, 10%.

the validity of our instruments. Panel C contains corresponding Ordinary Least Squares (OLS) estimates and panel D presents the first stage estimates of the influence of early privatization and initial conditions on small enterprises.

Small enterprise development in 1997 in Poland, whether measured by employment share, enterprises per capita, or change in employment share, has the expected positive impact on the change in income distribution between 1993 and 1998 and is always significant at the 5 percent level. To gauge the quantitative significance (QS) of small enterprises, we compute the impact of a one-standard-deviation increase in small enterprise development on income distribution. These values for all three measures are about one half of a standard deviation of income going to the bottom 40-percent in 1998, which is 3% in our sample. Panel B provides two sets of tests to check the validity of excluding early privatization from the 2SLS estimates in Eq. (1). First, we provide t-statistics and associated p-values to test the null hypothesis that each instrument can be excluded separately from the second stage. For example, the t-statistic for employment in private firms in 1990 divided by the workforce reported in the first regression column tests the null hypothesis that this variable's coefficient is not statistically different from zero if only it is included in the second stage while using the identifying restriction that the other instruments are excluded. In the nine cells for the three regression columns, the lowest p-value associated with these t-statistics is 0.45 indicating that the null hypothesis for an individual test can be rejected. Second, we report the J-statistic to test the null hypothesis that the three privatization instruments are not jointly correlated with the error term in the second stage estimates, as suggested by Hansen (1982) or Baum et al. (2003). All the p-values are above 0.75 indicating that the null hypothesis cannot be rejected for the joint tests. Hence, we conclude that the variables characterizing early privatization and initial conditions are valid instruments.

Panel C reports OLS point estimates of the impact of small enterprises on income distribution. In all three cases, the 2SLS points estimate are higher suggesting that the 2SLS procedure has corrected for some simultaneity bias. Panel D reports the first-stage OLS estimates of the impact of early privatization and employment in state-owned enterprises on small enterprise development. In each case, early privatizations have strong positive and statistically significant coefficients and the concentration of state-owned enterprises has a significant negative impact on subsequent small enterprise development. The F-statistic to test for excluded instruments indicates that the early privatization measures and the initial concentration of state enterprise cannot be jointly excluded from the first stage. The partial R^2 measures the share of the variance explained by these instruments and corroborates the considerable strength of these instruments.

Table 6 is arranged similarly to present the results for Russia.[13] Panel A shows that all three variables measuring small enterprise employment have a positive and statistically significant impact on income distribution in 2001. The quantitative significances of all three variables are substantial compared to the 2.2 percent standard deviation in regional income distribution. As in Poland, the entry of new firms and the consequent employment created is strongly and positively related to the increases in income share of the lower two quintiles. The t-test statistics and J-test statistics in panel B provide validation for using early large and small privatization as instruments. The OLS estimates of the impact of these variables on income distribution in Panel C are positive and substantially lower than the corresponding 2SLS estimates. Panel D indicates that early privatization is always positively associated with subsequent small enterprise devel-

Table 6

Income distribution and small enterprises in Russia

Measure of small enterprise development	Employment share of workforce, 2001	New enterprises per capita, 2001	Δ Employment share, 1995–2001
A. Second stage 2SLS estimates			
Small enterprise development	38.9*	1.46*	76.5**
(instrumented)	(10.5)	(0.59)	(38.4)
	QS: 0.98	QS: 1.49	QS: 2.30
Log population, 2001	−0.82*	−0.85*	−2.29*
	(0.26)	(0.39)	(0.76)
Education, 1994	−0.19*	−0.47*	−0.16
	(0.09)	(0.20)	(0.16)
Income share, 1995	−0.79*	−0.80*	−0.98*
	(0.08)	(0.10)	(0.17)
Centered R^2	0.64	0.44	0.16
B. Over-identification tests for 2SLS estimates: t-statistics			
Large privatization, 1993	0.08	0.60	0.90
(*p*-value)	(0.94)	(0.55)	(0.37)
Small privatization, 1993	−0.08	−0.48	−0.41
(*p*-value)	(0.94)	(0.63)	(0.68)
J-test for joint exclusion of privatization	0.01	0.35	0.64
variables (*p*-value)	(0.94)	(0.55)	(0.42)

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[13] Although we exclude Moscow and St. Petersburg because of their potential to exert undue influence, our results are robust to their inclusion if we use small enterprise shares to measure new enterprises. However, the results are somewhat noisier if we use the small enterprises per capita or the change in employment shares with these cities included. A table similar to Table 6 with Moscow and St. Petersburg included is available upon request from the authors.

Table 6 (*continued*)

Measure of small enterprise development	Employment share of workforce, 2001	New enterprises per capita, 2001	Δ Employment share, 1995–2001
C. OLS estimates of the second stage			
Small enterprise development, 2001	21.5[*]	0.20	7.94
	(6.67)	(0.26)	(7.29)
	QS: 0.54	QS: 0.20	QS: 0.24
Log population, 2001	−0.70[*]	−0.60[*]	−0.74[**]
	(0.27)	(0.30)	(0.37)
Education, 1994	−0.13	−0.10	−0.06
	(0.08)	(0.09)	(0.08)
Income share, 1995	−0.76[*]	−0.73[*]	−0.75[*]
	(0.08)	(0.08)	(0.08)
Centered R^2	0.66	0.63	0.63
D. First stage reduced form OLS regression (dependent variable is small enterprise development)			
Privatization variables (excluded instruments):			
Large privatization, 1993	0.22[*]	3.61	0.05
(firms per 1000 population)	(0.07)	(2.24)	(0.08)
Small privatization, 1993	0.09[*]	2.88[*]	0.06[*]
(firms per 1000 population)	(0.02)	(1.31)	(0.03)
Log population, 2001	0.009[*]	0.29[**]	0.024[*]
	(0.003)	(0.16)	(0.00)
Education, 1994	0.003[*]	0.27[*]	0.001
	(0.001)	(0.06)	(0.001)
Income share, 1995	0.003[*]	0.09[*]	0.004[*]
	(0.001)	(0.03)	(0.001)
F-statistic for excluded instruments	28.8	4.86	3.11
p-value of F-statistic	0.000	0.011	0.052
Partial R^2 of excluded instruments	0.40	0.22	0.09

Notes. (1) The standard errors of the point estimates are reported in parentheses. (2) The standard errors in the second stage include a small sample correction; first and second stage standard errors are corrected for heteroskedasticity. (3) QS denotes quantitative significance, which is the impact of a one-standard-deviation difference in small enterprise development, using the actual sample, on income distribution.

[*] Significance at the 5% level.
[**] Idem, 10%.

opment. The early small privatization measures are statistically significant in all 3 models and the early large scale privatization variable is significant in one model. The F-test for excluded instruments and the partial R^2 values show that these instruments are strongest in the equation for employment share in 2001 and weaker for the other two measures.

In Table 7, we compute the indirect quantitative significance of early privatization on income distribution in a two-step approach. First, we multiply a one-standard-deviation change in one of the early privatization measures by its impact on small enterprise formation and obtain the quantitative significance of a particular form of early privatization on small enterprises. Second, we take this statistic and multiply it by that impact of small enterprises on the subsequent income distribution. Regardless of whether we use employment, the number of small firms, or the change in employment as the measure of early small enterprise development in Poland, early privatiza-

Table 7
Indirect quantitative significance of early privatization on income distribution

A. Poland

Measure of small enterprise development	Employment share of workforce, 1997	New enterprises per capita, 1997	Δ Employment share, 1993–1997
Early privatization			
Employment in private firms in 1990	0.686		0.549
Private firms in 1990		0.718	
Employment in firms privatized 1990–1993	0.335	0.467	0.465
State-owned employment 1990	−0.431	−0.513	−0.707

B. Russia

Measure of small enterprise development	Employment share of workforce, 2001	New enterprises per capita, 2001	Δ Employment share, 1995–2001
Early privatization:			
Large privatization, 1993	0.31	0.19	0.15
Small privatization, 1993	0.41	0.48	0.50

Note. Indirect quantitative significance is computed as a one-standard-deviation increase in the early privatization variable times the impact of that early privatization variable on small enterprise formation times the impact of the small enterprise variable on income distribution.

tion is associated with a 0.6 to 0.7 percentage point increase in the income shares of the bottom 40-percent of the distribution. Privatizations from 1990 to 1993 are associated with only about a 0.3 to 0.5 percentage point increase in shares while increases in the employment in state-owned enterprises in 1990 are associated with a 0.4 to 0.7 percentage point decrease in these income shares. In Russia, a one-standard-deviation change in small and large privatization is associated with about a 0.45 and 0.20 percent increase in the income shares of the lowest two quintiles.

Hence, evidence from both countries indicates that early small privatization is relatively more important than privatization and initial employment in state-owned firms for income distribution. Moreover, as the table indicates, the impact of early privatization on income distribution is much stronger in Poland than in Russia. Therefore, we conclude that early privatization through its impact on small enterprise development has been a more powerful force for promoting an equitable income distribution in Poland than in Russia.

5. Conclusion

In our empirical work, we find a strong positive relationship between the size and the growth of the de novo sector and the income share of the bottom two quintiles of the distribution in both Poland and Russia. The average impact of a one-standard-deviation increase in any measure of new enterprise activity on the income share of this group is approximately 1.6%. Finding consistent evidence for these two countries having two quite different transition experiences lends credibility to the proposition that new firm creation leads to a more equitable distribution of income in post-socialist countries. In addition, Berkowitz and DeJong (2005) find that a one–standard-deviation increase in the size of the small firm sector is associated with a one and a half percent increase in annual income growth from 1993 to 2000 in Russia. In a similar analysis for Poland, we find that each measure of de novo firm activity used in this paper is significantly related to income growth with a one-standard-deviation increase associated with a one percent

higher annual income growth rate.[14] Taken together, these results indicate that new firm creation is associated with both larger income and a larger portion of income distributed to the lower quintiles, making the members of this group better off in both absolute and relative terms. These results also suggest that a positive association between per capita income and income distribution is due in part to small enterprise activity. In addition, according to United Nations (2005), overall growth in Russia since 2001 is associated with some improvement in the income distribution. Investigating these interesting issues requires additional data and sophisticated systems tests so that we leave it to future research.

Our empirical work allows us to make inferences about the strikingly different changes in the income distributions in Poland and Russia during the first decade of their respective transitions. A critical aspect of the differences in the experiences of the two countries is the rate and character of new private firm creation. Kornai (2000) considers Poland's transition to be based on a high level of organic de novo firm creation and of spin-offs from old state firms in contrast with Russia where the emphasis was on privatization with much lower rates of de novo creation and of spin-offs. Our Polish and Russian data are not comparable because the former measures new firm creation and their employment growth while the latter measures the size of the small enterprise sector, although most of this activity is likely to be new firms. However, the evidence presented in this paper demonstrates strong growth of the de novo sector in Poland by 1997. Employment in these firms more than doubled between 1993 and 1997 and the most successful regions exhibit very dynamic de novo sectors. In contrast, the small enterprise sector in Russia actually decreased between 1995 and 2001. Hence, our data indicate that the small private enterprise sector is a much more dynamic part of the Polish transition relative to Russia, as Kornai contends. Our empirical results show that these new firms are also crucial to promoting aggregate economy growth, to creating an economic middle class, and to maintaining a relatively equitable income distribution. Hence, we conclude that the different experiences with the creation of new small firms are a major reason why the income distributions in Poland and Russia diverged so dramatically during the 1990s.

Acknowledgments

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[14] A table of the statistical results is available upon request from the authors.

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