ENTRY, GROWTH, AND THE BUSINESS ENVIRONMENT:

A COMPARATIVE ANALYSIS OF ENTERPRISE DATA FROM THE US AND TRANSITION ECONOMIES

An NCEEER Working Paper by

John Earle
George Mason University and Central European University
and
J. David Brown
US Bureau of the Census

NCEEER
National Council for Eurasian and East European Research
University of Washington
Box 353650
Seattle, WA 98195
info@nceeer.org
http://www.nceeer.org/

TITLE VIII PROGRAM

Project Information*

Principal Investigator: **John Earle**

NCEEER Contract Number: **825-14**

Date: **January 31, 2012**

* The work leading to this report was supported in part by contract or grant funds provided by the National Council for Eurasian and East European Research, funds which were made available by the U.S. Department of State under Title VIII (The Soviet-East European Research and Training Act of 1983, as amended). The analysis and interpretations contained herein are those of the author.

Executive Summary

What role does new firm entry play in economic growth? Are entrants and young firms more or less productive than incumbents, and how are their relative productivity dynamics affected by financial constraints and the business environment? This paper uses comprehensive manufacturing firm data from seven economies (United States, Georgia, Hungary, Lithuania, Romania, Russia, and Ukraine) to measure new firm entry and the productivity dynamics of entrants relative to incumbents in the same industries. We contrast hypotheses based on "leapfrogging," in which entrants embody superior productivity, with an "experimentation" approach, in which entrants face uncertainty and incumbents can innovate. The results imply that leapfrogging is typical of early and incomplete transition, but experimentation better characterizes both the US and mature transition economies. Improvements in financial markets and the business environment tend to raise both the entry rate and productivity growth, but they are associated with negative relative productivity of entrants and smaller contributions of reallocation to growth among both entrants and incumbents.

1. Introduction

The belief that business entry contributes strongly to economic growth is practically an article of faith among many economists and policymakers. Entrants are supposed to be more productive, innovative, and rapidly growing than incumbent firms operating in the same industries. The belief is particularly strong among observers of the transition economies in the 1990s, where the incumbents inherited from the socialist period face extreme difficulties restructuring and adjusting to a market environment.[1] Policies and reforms are frequently adopted in both transition and non-transition economies in order to improve conditions for entrepreneurship and small firms, although size and youth are imperfectly correlated characteristics at the firm level. Better functioning financial markets, lower costs of adjustment, and a favorable business environment are all thought to benefit entering firms. International financial institutions have even proposed that the size of the new private sector in transition economies represents a principal measure of "progress in transition," and they have advocated extensive market liberalization to improve conditions for the entry sector (e.g., EBRD, 1999; World Bank, 2002).

However, these widely accepted propositions are neither unambiguous theoretically nor are they supported by a substantial body of empirical evidence. On the theoretical side, the belief in entrant superiority is related to vintage capital and leapfrogging in growth theories, whereby technological improvements are embodied in the new capital of entrants, while the capital of incumbents becomes obsolete (e.g., Kaldor and Mirrlees, 1961; Aghion and Howitt, 1992). An alternative view, which we develop below, is rooted in theoretical models of industry dynamics that allow for uncertainty and heterogeneity among producers (e.g., Jovanovic, 1982;

[1] Kornai (1990) and Murrell (1992) were perhaps the earliest to emphasize the difficulties of restructuring old firms and the crucial importance of new firm growth to economic transition. Johnson and Loveman (1995) examine case studies in Poland, and McMillan and Woodruff (2002) and McIntyre and Dallago (2003) provide overviews.

Hopenhayn, 1992), and for innovation by not only entrants but also incumbents (Ericson and Pakes, 1995). According to this view, experimentation by entrants may result in a lower average productivity of entrants relative to incumbents, and together with experimentation and investment by incumbents may yield a positive age-productivity correlation.

On the empirical side, while there have been some transition-economy studies finding that small private firms tend to outperform old enterprises, the data sets are generally small in both the cross-section (number of firms) and time series (length of period) dimensions.[2] Research on developed market economies has had access to better data – sometimes universal panel data on manufacturing firms – and has returned more ambiguous results on the age-productivity correlation.[3] In both the transition and non-transition contexts, the literature on relative productivity of entrants and on the learning and selection processes that affect post-entry productivity dynamics is, it seems fair to say, in its infancy.

Moreover, there has been almost no comparative analysis of differences in these patterns that might illuminate the impacts of policies, reforms, and institutions. Bartelsman, Haltiwanger, and Scarpetta (2004) analyze meta-data from several countries and find a positive entrant-incumbent productivity gap for transition economies in the mid-1990s. But there are problems in measuring entry and post-entry dynamics in these data, the time series are short and contain numerous gaps, and cohorts of entrants are not followed over time. The period of the mid-1990s, coming immediately after the fall of communism may be unusual, and the data do not permit an

[2] See, e.g., Earle, Estrin, and Leshchenko (1996), Richter and Schaffer (1996), Bilsen and Konings (1998), Winiecki (2002), Grogan (2003), and Hellman, Jones, and Kaufmann (2003). None of these papers examines data containing more than a few hundred observations and 2-3 years of information, and their non-random samples provide no information on firm turnover.

[3] For the US and UK, respectively, see Foster, Haltiwanger, and Krizan (2001) and Disney, Haskel, and Heden (2003), both of which report lower initial productivity of entrants relative to incumbents and post-entry growth in relative productivity. These results, like nearly all others, rely on revenue rather than physical productivity. Using data on physical quantities in several homogeneous goods industries, Foster, Haltiwanger, and Syverson (2008) find the reverse: initially, entrant productivity exceeds incumbents' but it tends to fall over time.

evaluation of changes within countries over time. Finally, the previous research contains no attempt to relate the patterns explicitly to policies and institutions that vary over time and across countries.

Our purpose in this paper is to carry out such an analysis, systematically measuring the within-industry relative productivity of entrants initially and following cohorts as they age. We analyze the sources of different productivity dynamics among entrant cohorts relative to incumbents by decomposing the productivity growth of each group into components associated with learning and selection processes. We also further decompose the selection, or reallocation, component into three underlying characteristics: the volume of reallocation, the dispersion of productivity, and the quality of reallocation targeting. Our comparative analysis includes the US as a benchmark and six transition economies, including observations from just after the collapse of central planning until recently. We relate cross-country differences in entrant productivity dynamics to measures of the policy and business environment, including the functioning of financial markets, and we interpret the results in the light of models of industry dynamics.

The data we analyze are nearly ideal for these purposes. They cover nearly all registered manufacturing firms in seven economies, and long time series permit us to track cohorts and productivity dynamics over time. Distinguishing genuine entrants from reorganizations and spurious changes is always a difficult measurement (and conceptual) problem, and a disadvantage of the data we analyze here is that they do not contain detailed information about reasons for reregistration and the antecedents of the firm. Such data are quite unusual (but see Brown and Earle, 2003, for such a database). To identify entrants as accurately as possible, however, we carefully link the data longitudinally, and we use the full length of the time series to account for gaps in the records. In analyzing the transition economies we exploit ownership

information to distinguish entry of new private firms from any state organizations, which represent re-organizations rather than start-ups in the usual sense. All of these procedures distinguish our approach from previous research.

After a discussion in Section 2 of conceptual approaches to entry and productivity dynamics, as well as their implications for transition economies, Section 3 contains a fuller description of the data. Section 4 reports our analysis of the relative productivity of entrants by cohort. For compatibility with available US data, which we use as a benchmark, we report results for firms aged one, six, and eleven years. Section 5 contains the results of an analysis of the sources of productivity growth among entrants compared with incumbents. In both cases, we examine the patterns over time and in relation to change in financial development and the business environment.

2. Entry and Productivity Dynamics: Hypotheses

The belief that new businesses are systematically more productive than incumbents is consistent with a "vintage capital" approach to economic growth, in which entrants embody the latest – presumably superior (leaving aside goods such as violins and wine) – technology and methods. Incumbents are locked into previous vintages of physical and organizational capital, and for institutional and governance reasons they find it difficult to adopt better methods when they become available; thus, they are "leap-frogged" by entrants. The transition in Eastern Europe and the former Soviet Union seems a particularly apt case. For decades there had been essentially no entry and little innovation in most (non-defense) industries (e.g., Kornai, 1992). The adoption of wide-ranging reforms from about 1990 liberalized both the entry of new businesses and the adoption of new technologies and practices. The more extensive this

liberalization process, the greater should be the success of the new businesses.

A more nuanced picture is suggested by theories of industry dynamics with uncertainty, heterogeneous firms and costs of entry and other types of adjustment (e.g., Jovanovic, 1982; Hopenhayn, 1992; Hopenhayn and Rogerson, 1993; and Ericson and Pakes, 1995). All the models assume that profit-maximizing firms have heterogeneous productivity given by $q = q(k, l; \varphi, \alpha)$, where q is a homogeneous output, k is capital services, l is labor services, φ is an idiosyncratic disturbance, and α is an adjustment cost for changes in factor utilization. In the Jovanovic (1982) model, φ represents a signal of true productivity, about which firms gradually learn, while in Hopenhayn (1992), φ is a firm-specific shock with the distribution function $F(\varphi_{t+1}|\varphi_t)$ strictly decreasing in φ_t, so that future productivity tends to be increasing in current productivity. Entering firms pay sunk cost C_e and receive an initial productivity draw from $G(\varphi)$. Incumbents may choose to exit, paying C_x, which includes transaction costs of shutdown (e.g., bankruptcy proceedings) and benefits in the form of savings on fixed operating costs and realizations of scrap values for capital and outside opportunities of other factors. With the addition of an investment possibility, as in Ericson and Pakes (1995), a firm may try to improve its productivity by incurring cost C_I to obtain a new distribution of productivity outcomes F' that stochastically dominates F. Finally, changes in factors Δk and Δl incur an adjustment cost $\alpha(\Delta k, \Delta l)$, which reduces current period output (Hopenhayn and Rogerson, 1993).[4]

These assumptions yield predictions for relative productivity levels: both entrants and exiting firms should have lower average productivity than incumbent survivors. They also have implications for the pace of reallocation among continuing firms and through firm turnover (entry and exit), for the cutoff level of productivity for firms to continue operating, φ^*, and for

[4] The precise form of these adjustment costs (convex, linear, lumpy) is not the essential issue here, but see the discussion of cost structure in Hamermesh and Pfann (1996).

the effects of changes in costs on reallocation and productivity differentials. Increases in C_e and C_x tend to reduce entry, exit, φ^*, and the mean φ of surviving firms. An increase in C_I reduces productivity growth and reallocation, as firms are less likely to incur the higher cost of investment which would result in an expected productivity increase and growth greater than that of noninvestors. An increase in α raises exit but reduces reallocation and productivity of survivors. Increases in the noisiness of productivity signals, expanding the variance of F, raise the value of staying in the market and reduce φ^*, exit, and the mean φ of surviving firms.

While these theoretical models contain a number of unrealistic assumptions, e.g., stationary equilibrium, we can use their basic insights in an analysis of the level of entry and the dynamics of productivity of entrants relative to incumbents. Because lower C_e tends to reduce the relative productivity of entrants, it may decrease the contribution of entry even at higher entry rates. Lower C_x (higher fixed cost of operating) raises φ^* and the relative productivity of exiting firms and may therefore decrease the contribution of exit. Lower α makes factor adjustments cheaper, implying that firms are likely to engage in more frequent but smaller changes that each result in a smaller productivity gain, and possibly thus a lower contribution to aggregate productivity growth. Lower C_I extends downward the upper tail of the firm distribution that invests and grows, resulting in an average lower productivity in the growing segment and a lower contribution of between firm reallocation. Lower uncertainty reinforces each of these relationships as it makes firms less reluctant to incur the corresponding sunk costs (of entry, exit, investment, or factor changes), because the adjustment is less likely to be reversed and is therefore more likely to take place.

In the transition context, reforms and policies affect adjustment costs, which can be viewed as a function of the macroeconomic and business environment. Observers have

frequently suggested that, despite rapid liberalization, continued government intervention during the transition may stifle reallocation. Direct subsidization and other forms of support for weak and failing enterprises (soft budget constraints) may reduce fixed operating costs and impede exit, while discriminatory taxes, bureaucratic interference, poor contract enforcement, and uncertain property rights protection may raise entry and investment costs, thus hindering entrepreneurship and growth of more successful firms (e.g., Frye and Shleifer, 1997; Åslund, Boone, and Johnson, 1996). The transition economies could be subject to "sclerosis" (Caballero and Hammour, 1996), in which less productive matches fail to dissolve due to market imperfections and government policies, while the creation of more productive matches of resources and enterprises is impeded.

In order to evaluate the evidence on entry and post-entry dynamics, we rely on data from the US and six transition economies of Eastern Europe and the former Soviet Union. The transition countries cover the spectrum of transition policy strategies, at least as conventionally measured in evaluations of "progress" in reform and transition by international organizations such as the European Bank for Reconstruction and Development (EBRD) and the World Bank. The World Bank's (1996) four-group classification of 26 transition economies, for example, puts Hungary in the first group of leading reformers, Lithuania and Romania in the second group, Georgia and Russia in the third, and Ukraine in the fourth. Similarly, the EBRD's annual indicators of "progress in transition" invariably place Hungary at or close to the top of all transition economies; its average score across the price liberalization, foreign exchange and trade liberalization, small-scale privatization, large-scale privatization, enterprise reform, competition policy, banking sector reform, and non-banking sector financial institutions indicators has been the highest or close to it among all transition economies since 1994. The other countries started

their major reforms later, implemented them more gradually, and have still not bridged the gap with Hungary. Georgia and Ukraine started most slowly, but they rapidly converged with Romania and Russia in the late 1990s.[5] Figure 1 contains the EBRD evaluations.

Regardless of the exact figures, which are certainly subject to measurement errors and disputes, the clear policy differences in the six transition economies suggest an interesting set of comparative hypotheses. On the one hand, the leapfrogging approach suggests that more effective reforms should stimulate the volume and quality of entrants, and Hungary's ambitious policy should be reflected in the fastest increase in the entry rate and the highest relative entrant productivity. By the end of the period, Hungary's entrants should look fairly similar to those of the US. Entry behavior in Romania and Lithuania should be next fastest, partially converging to Hungary by the early 2000s. Entry may be slowest to emerge in Georgia, Russia, and Ukraine, but it should partially catch up to Romania and Lithuania towards the end of the period.

On the other hand, an alternative possibility suggested by the models of experimentation and industry dynamics is that a reduction in entry costs leads to a lower average productivity among entrants compared to incumbents. Moreover, as the business environment and availability of finance improve, competition may become more intense, so that the entry rate actually declines. The US, with the lowest entry costs, may have the largest negative productivity gap and the lowest entry rate, and the transition economies may converge towards the US as their institutions improve. Our empirical analysis provides evidence on these hypotheses.

[5] Success in macroeconomic stabilization followed a similar pattern, with Hungary experiencing the smallest cumulative output decline before recovering (15 percent), followed by Romania (21 percent), Russia (40 percent), Lithuania (44 percent), Ukraine (59 percent), and Georgia (78 percent). Hungary never experienced annual inflation over 35 percent, while the other countries' inflation rates exceeded 100 percent in some years, and Georgia, Russia, and Ukraine's rates did not fall below that level until 1996 (World Bank, 2002).

3. Data and Methods

3.1 Sources, Samples, and Variables

The paper uses annual census-type data for manufacturing firms in each of the seven countries. Though the data sources and variables are similar, we have taken steps to make them sufficiently comparable to justify cross-country comparisons.

The basic sources for the Hungarian and Romanian data are balance sheets and income statements associated with tax reporting: to the National Tax Authority in Hungary and the Ministry of Finance in Romania. All legal entities engaged in double-sided bookkeeping report, with the exception of Hungary before 1992—when only a sample consisting of all firms with at least 20 employees and some smaller firms is available. The Romanian data are supplemented by the National Institute for Statistics' enterprise registry and the State Ownership Fund's portfolio and transactions data. The Hungarian data are annual from 1986 to 2005, and the Romanian data from 1992 to 2006. The sum of employment across all firms in the database is similar to the statistical yearbook number in both countries.

The other four countries are former Soviet Republics. Their data come from their national statistical offices, the descendants of the former State Statistical Committee (*Goskomstat*), and therefore tend to be quite similar to one another. The Georgian and Lithuanian data cover most firms outside the budgetary and financial sectors in 1995-2005 (Lithuania) or 2000-2004 (Georgia). The Georgian and Lithuanian databases include roughly three-fourths of total manufacturing employment reported in the yearbooks.

The main sources in Russia and Ukraine are industrial enterprise registries from their

national statistical offices, supplemented by balance sheet data.[6] The data span 1985-2004 for Russia, and 1989 and 1992-2006 for Ukraine. The Russian registries are supposed to include all industrial firms with over 100 employees as well as those that are more than 25 percent owned by the state and/or legal entities that are themselves included in the registry. In practice, it appears that once firms enter the registries, they continue to report even if these conditions no longer hold. The Russian data can therefore be taken as corresponding primarily to the "old" firm sector (and their successors) inherited from the Soviet period. The 1992-1996 Ukrainian registries contain all industrial firms producing at least one unit of output, where a unit is defined differently depending on the product. All legal entities outside the budgetary and financial sectors are included in the 1997-2006 registries. The Ukrainian coverage is fairly complete. The Russian data cover nearly all activity through 1994; then the coverage declines to about 75 percent in more recent years as the de novo sector has grown.

The US data come from the establishment-level Censuses of Manufactures (CM) in 1977, 1982, 1987, 1992, 1997, 2002, and 2007. We have aggregated the data to the firm level to be comparable with the other countries. We use the universe of establishments mailed the Census survey. Very small single-establishment firms (typically fewer than five employees) are excluded from the mail universe, and we omit them here since their output and capital stock are often imputed. Information on firms' birth and death years comes from the US Census Bureau's annual establishment-level Longitudinal Business Database (LBD).[7]

[6] The units of observation in these data are firms, except for multi-plant entities where individual plants are listed as "subsidiaries" (*dochernye predpriyatiya* or "daughter companies") in the Russian registries. Apparently most but not all cases of multiple plants are treated individually in Russia: the 1993 registry contains a variable indicating the number of plants, which equals 1 in 99.91 percent of the 18,121 nonmissing cases. To avoid double-counting, we have dropped the consolidated records of entities with subsidiaries from the analysis.

[7] The firm birth year for the US is defined as the birth year of the oldest establishment owned by the firm in the first year the firm appears in the data, and its death year is the death year of the last establishment to exit from among establishments owned by the firm in the last year the firm appears in the data.

Some truncation was necessary to make the samples comparable across countries. The data in all countries are limited to manufacturing (NACE 15-36). We exclude the tobacco industry (NACE 16) due to insufficient observations in four of the seven countries and the recycling industry (NACE 37) because of noncomparability with the classification system used until recently in Russia and Ukraine. Following the previous literature on productivity growth decompositions, we analyze reallocation and productivity within industries, avoiding problems of comparisons across industries with very different technologies. Ideally one would prefer to use industries disaggregated to the level of product markets, so as to compare firms only to their competitors. On the other hand, since the productivity decompositions rely on deviations from the industry average, it is important to have sufficient numbers of firms in each sector to ensure reliable estimates. We have compromised by dividing manufacturing into 19 sectors, which are 2-digit NACE industries (except that 23 and 24 are combined, as are 30 and 32).

These data have been extensively cleaned to remove inconsistencies and to improve missing longitudinal linkages due to change of firm identifier from one year to the next (associated with reorganizations and changes of legal form, for instance). The inconsistencies were evaluated using information from multiple sources (including not only separate data providers, but also previous year information available in Romanian balance sheets and Russian and Ukrainian registries). The longitudinal linkages were improved using all available information, including industry, region, size, multiple sources for the same financial variables, and some exact linking variables (e.g., firm names and addresses in all countries except Georgia, Hungary, and Lithuania, where this information was not available) to match firms that exited the data in a given year with those that entered in the following year. For Hungary we also used a database with direct information on longitudinal linkages: if a firm changed its identification

number for some reason (and it appeared in the data as a new entry or an exit), the database indicated whether it had a predecessor or successor and, if so, that firm's identification number. Longitudinal links in the US data have been constructed by the US Census Bureau's Center for Economic Studies using multiple administrative and survey sources.

In Russia and Ukraine we have excluded firms in regions that are completely missing in the data in one of the two adjacent years, and those in industries with implausibly high entry or exit rates in that year (suggesting a change in sample coverage).[8] Entry and exit associated with firms that were members of Soviet-era production associations or that belong to multi-establishment firms were also excluded in Russia.[9]

Variables are defined as follows: Employment in the transition economies is the average annual number of all registered employees, except in Russia, where it excludes personnel working in non-industrial divisions. Output or sales refers to sales in Georgia, Hungary, Lithuania, Romania, and post-2003 Ukraine, and to value of production in Russia, pre-2004 Ukraine, and the US (for the US this is calculated as sales + ending inventories of finished goods – beginning inventories of finished goods). Capital stock is the book value of fixed assets. Output or sales and capital stock are expressed in constant final-year prices (thousands of 2004 GEL for Georgia, millions of 2005 HUF for Hungary, thousands of 2005 LTL for Lithuania, millions of 2006 ROL for Romania, millions of 2004 RUB for Russia, and millions of 2006 UAH for Ukraine), except in the US, where they are in thousands of 1987 USD (using output

[8] The size-related exclusions amount to no more than 0.3 percent of the sample in any country. The changes in industry and regional coverage result in the exclusion of about 2 percent of observations in Russia and Ukraine.

[9] The reason for excluding production association entry and exit during the Soviet period and multi-establishment firm entry and exit during the transition period is that many of these firms report inconsistently in the data. In one year a consolidated entity may appear, in the next each of the establishments may report separately, or vice versa. These exclusion rules result in a conservative bias. Of course some production associations may be starting new establishments or closing others down, and there may be some true entry and exit in industries with implausibly high rates and in regions that enter and exit the dataset.

deflators from the National Bureau of Economic Research and book value of capital stock deflators from the Bureau of Economic Analysis).

3.2 Measures and Decompositions

Entry in this paper is measured as the first appearance in the data of a private firm with no state ownership and no antecedent in any previous year. This measure differs from most previous research in excluding state-owned firms, which may reorganize but do not enter in the same sense as an entrepreneur starting or an existing private firm spinning off a new venture. The basis for exclusion is not majority, but *any* state ownership share, as even a small minority stake almost certainly reflects a previous privatization process – which was usually, at least initially, partial, leaving some residual state shares (e.g., Frydman et al., 1993a, b). And it makes use of the full times series of data at our disposal, including annual data in the transition economies, where instances of gaps in time series are not rare and may lead to errors in measuring entry.

Our approach also differs from previous research in handling an important (but little recognized) problem in measuring the initial size and productivity of entering firms. The first year in a firm's life may be quite noisy, as factors are acquired and the operational methods are established. Moreover, in annual data it is possible that flow data (for instance, on output or sales) refer to only part of the year, and thus they are mismeasured relative to end of year capital or average-year employment. Finally, while the data contain instances of firms that appear for one year, but then disappear forever, such behavior more likely reflects miscodings or experiments that were never fully carried out rather than genuine entry. For these reasons, we measure the entry rate, employment, and productivity for one-year-old firms, when they have

become slightly more established. Birth-year observations are excluded from the analysis.

We compute multifactor productivity (MFP) as the residual from an industry-specific Cobb-Douglas production function of gross output (or sales) in capital and labor (using 19 manufacturing sectors). Because this measure does not distinguish firm-level quantity and price variation, which are unavailable in the data, it conflates technical efficiency and firm-specific price variation, thus representing revenue productivity.[10] For our purposes, this is not necessarily a disadvantage, particularly if variation in firm-specific prices reflects quality differences.

For the purpose of understanding the sources of productivity growth among entrants versus incumbents, the productivity values are aggregated into a constructed productivity index for each year and industry, and then the aggregates are decomposed using methods that have become standard in the literature. We then further decompose the effect of reallocation on productivity growth into productivity dispersion, reallocation volume, and the correlation between reallocation and productivity differentials. It bears emphasis that the decomposition approach allows an examination only of direct contributions of reallocation to productivity growth, ignoring any indirect effects, for example entrants as a source of market pressures on incumbents.[11]

We employ a method of decomposing aggregate productivity growth for entrants and incumbents based on Haltiwanger (1997) and Foster, Haltiwanger, and Krizan (2001), hereafter referred to as FHK. Construction of aggregate productivity measures involves summing firm-level measures to the aggregate level:

[10] See Eslava, Haltiwanger, Kugler, and Kugler (2004) and Foster, Haltiwanger, and Syverson (2008) for analyses of firm-specific revenue and physical productivity.

[11] The indirect effects of entry on incumbent productivity is an important area for future research that we plan to pursue using microdata. For a region-level analysis of the impact of entry on overall regional growth, see Berkowitz and DeJong (2005).

$$P_t = \sum_i S_{it} \sum_e S_{eit} P_{eit} \qquad (1)$$

where P_t is aggregate productivity in year *t*, S_{it} is the employment share of industry/sector *i* in year *t*, S_{eit} is the employment share of firm *e* in industry *i* and year *t*, and P_{eit} is the productivity of enterprise *e* in sector *i* in year *t*.[12]

FHK's "method I" decomposition expresses the change in aggregate sectoral productivity over a period of length *k* (thus from year *t-k* to year *t*), ΔP_{it} (where $P_{it} = \sum_e S_{eit} P_{eit}$), as follows:

$$\Delta P_{it} = \sum_{e \in C} s_{et-k} \Delta p_{et} + \sum_{e \in C} \left(p_{et-k} - P_{it-k} \right) \Delta s_{et} + \sum_{e \in C} \Delta p_{et} \Delta s_{et} - \sum_{e \in X} s_{et-k} \left(p_{et-k} - P_{it-k} \right). \qquad (2)$$

The first term in (2) measures the average change in firm productivity holding composition constant at its base year (*t-k*) structure, in order to distinguish average productivity growth from composition effects. This term may reflect firm restructuring and deterioration as well as mismeasured price and quality changes. The second term measures the between-firm (within-sector) reallocation effect, the covariance of share changes with the base year deviation of enterprise productivity from the industry mean. The third term measures the intrasectoral covariance of productivity and compositional changes, the "cross" effect, while the fourth represents the contribution of exit (X). Because we calculate this decomposition separately for entrants and incumbents, there is no separate entry term. We calculate the total reallocation contribution as the sum of the between and exit effects.[13]

The sources underlying the total reallocation contribution can be further decomposed into three factors: the volume of reallocation, the dispersion of productivity, and the correlation of

[12] All our two-digit sectoral results are aggregated to the all-manufacturing level using sectoral employment shares as of age one for the entry cohort. Entrant employment shares in Figures 2-3 and Table 1, however are not calculated at the two-digit level, but are at the all-manufacturing level from the beginning.

[13] The cross term could partly be thought of as a reallocation contribution as well, though it is ambiguous how much of it is reallocation versus a within-firm effect.

reallocation and productivity differentials. Measured as the standard deviation of employment share changes, the standard deviation of relative productivity, and the correlation between share change and relative productivity, respectively, the relationship of these factors with the reallocation contribution between sectors (or countries or time periods) *i* and *j* can be expressed through the following decomposition:

$$\begin{aligned}
&\sum_{e}(p_e - P_i)\Delta s_{et} - \sum_{f}(p_f - P_j)\Delta s_{ft} = \\
&.5\times\{Corr(\Delta s_{et}, p_e - P_i) + Corr(\Delta s_{ft}, p_f - P_j)\}\times[.5\times\{N_i\sigma_{\Delta s_{et}} + N_j\sigma_{\Delta s_{ft}}\}\{\sigma_{p_e - P_i} - \sigma_{p_f - P_j}\}] \\
&+.5\times\{Corr(\Delta s_{et}, p_e - P_i) + Corr(\Delta s_{ft}, p_f - P_j)\}\times[.5\times\{\sigma_{p_e - P_i} + \sigma_{p_f - P_j}\}\times\{N_i\sigma_{\Delta s_{et}} - N_j\sigma_{\Delta s_{ft}}\}] \qquad (3) \qquad + \\
&.5\times\{N_i\sigma_{\Delta s_{et}}\sigma_{p_e - P_i} + N_j\sigma_{\Delta s_{ft}}\sigma_{p_f - P_j}\}\times\{Corr(\Delta s_{et}, p_e - P_i) - Corr(\Delta s_{ft}, p_f - P_j)\},
\end{aligned}$$

where relative productivities $p_e - P_i$ and $p_f - P_j$ are measured in period *t-k* for all incumbents and in period *t* for entrants. The first term in this equation is the productivity dispersion component. Gaps in productivity across firms create the potential for productivity-enhancing reallocation – without these gaps, reallocation can have no productivity effect. Productivity dispersion can thus be considered a measure of "cleansing potential" as well as of the extent of experimentation, particularly among entrants. The employment share change dispersion component is the second term. Ceteris paribus, the more reallocation occurs across firms, the more it can affect productivity growth. This can be thought of as reallocation intensity or volume. The third term is the reallocation-productivity correlation component. A positive correlation is essential for reallocation to be productivity-enhancing. The stronger the correlation, the more precise is the targeting of reallocation from less productive toward more productive firms. We calculate each of these factors to better understand the relative productivity dynamics of entrants and incumbents.

We consider two aspects of the policy and institutional environment that may influence

the pace and productivity dynamics of entry: financial development and other aspects of the business environment. To estimate the relationships with financial development, we regress each of our measures on the EBRD finance (average of banking and nonbank institution measures) index and its square, using the country-year observations for the transition economies. To estimate the relationships with nonfinancial aspects of the business environment, we use an EBRD measure of other institutions (average of large privatization, small privatization, price liberalization, trade and foreign exchange, competition policy, enterprise restructuring, and infrastructure indicators) in a separate set of regressions. The EBRD indices are measured in the birth year of the respective entry cohort.

4. Results

We begin the analysis with the employment share of the new sector (firms entering after the beginning of the transition with 100 percent private ownership) in transition economies, shown in Figure 2. Hungary experiences the fastest growth in the new sector and consistently has a much higher share than the other economies, except Georgia.[14] The new sector grows quite slowly in comparison in Russia and Ukraine, and its share is not more than half that of the new sector in Hungary at the end of the period. Appendix 1 shows that the relationship between the new sector share and both EBRD indices is positive and highly statistically significant.

The new sector numbers combine entry cohorts. We next distinguish entry rates by individual cohorts, measured as the share of firms (Table 1) and employment share of firms (Table 2 and Figure 3) at age one as a percentage of total manufacturing firms and employment age one or older, respectively. Hungary experiences a burst of entry at the beginning of the

[14] The Georgian new sector share is likely to be an overestimate, since there are few years in the data in which to find antecedents, and the first year is well after the beginning of the transition. The Russian new sector share may be an underestimate, since the dataset has incomplete coverage of new private firms.

transition, followed by a sharp decline. In contrast, the Russian and Ukrainian entry rates are quite modest in the early transition and rise slowly (Russia) or sharply (Ukraine) as the transition progresses. Romania's entrant share of firms starts high and declines, while its share of employment starts low and rises, suggesting that initial size rose over time. All of the transition economies have higher entrant employment shares than the US during most of the period, and all but Russia have higher entrant firm shares, possibly reflecting the greater uncertainty and thus possibilities for experimentation in the formerly centrally-planned economies. As shown in Appendix 1, entrant employment shares are positively related to both financial and other institutions, but the relationships are statistically insignificant at conventional levels.

We then investigate the extent to which entrants survive and grow relative to older firms. If entrants are superior to incumbents, and the business environment does not discriminate against entrants, one might expect to see entrants to survive at higher rates and take market share away from older firms. If many entrants are unproductive, representing failed experiments, the cohort may lose market share as the less productive firms decline and exit. Table 1 shows that most entry cohorts in all countries have lower shares of firms their age or older at age six (and eleven where available) than at age one, suggesting that entrants are exiting at a higher rate than older firms. The main exception is early-transition entry cohorts in Hungary, which survive at a greater rate. Russia and Ukraine start the transition with the lowest entrant survival rates relative to older firms, but their rates move closer together as the transition progresses. US entrant relative survival rates are among the lowest of all the countries.

The employment share of the entry cohort in total manufacturing employment of firms that age or older is significantly higher at age six (and eleven where available) than at age one in Hungary, Lithuania, and especially Romania (Figure 4 and Table 2). Entrants often lose

employment share in Russia, Ukraine, and the US. We suspect the reasons for entrants' decline are different in Russia and Ukraine vs. the US, the former due to a business environment shielding incumbents from entrant competition, and the latter to highly competitive incumbent firms (forcing less productive entrants to exit). Taken together, the firm share and employment share results suggest that entrants grow significantly more relative to surviving incumbents for nearly all entrant cohorts across countries. The entrant growth advantage is especially high in Romania.

There is an inverse-U-shaped relationship between the EBRD indicators and the change in entrants' employment share between age one and age six. The finance indicator is much closer to being statistically significant. Young firms may be shut out of formal credit markets when financial institutions are poorly developed, making it difficult for them to survive and grow.

We measure the relative multifactor productivity (employment-weighted) of the new firm sector compared to the old firm sector, in the same two-digit industries. As shown in Figure 5, Hungarian new firms are initially much more productive than old firms, but this advantage falls rapidly and completely disappears by 2004. Similar patterns are found in Romania and Lithuania, though the new firm advantage has not been fully dissipated. Russia and Ukraine's new firm sectors, though, are initially less productive and become more productive than incumbents. Georgia's new firms are also much more productive. The relationship with the EBRD indicators is an inverse-U shape, which is statistically significant for finance. Leapfrogging appears to be dominant in the middle of the transition, but not in more advanced stages. This does not necessarily reflect deterioration in the quality of entry cohorts. Rather, the old firm benchmark may become higher: as institutions improve, new

owners take control, budget constraints tighten, and competition increases, old firms are forced to raise productivity or exit.

To help distinguish between these possibilities, we turn to an analysis of individual entry cohorts. The Hungarian cohorts entering during the first three years of the transition have a productivity advantage at age one over older firms, but later entry cohorts have a disadvantage, as shown in Figure 6 and Table 3. A similar declining trend is found in Romania, though only the two most recent cohorts have a productivity disadvantage. All Lithuanian cohorts are more productive, though with a declining advantage. By contrast, the Georgian, Russian, and Ukrainian entry cohorts tend to be positive but display no clear trends. In further contrast, most of the US entry cohorts are less productive than incumbents. Entrant relative productivity has an inverse-U-shaped, but statistically insignificant relationship, with the EBRD indicators.

Table 3 shows the productivity differentials for entry cohorts at age six and eleven as well. The large productivity advantage at age one is diminished as cohorts age in Lithuania and Romania. Russian entrants, on the other hand, become more productive relative to incumbents as they age. Hungarian and Ukrainian entrants exhibit no systematic pattern. Five of the six US entrant cohorts we are able to track at ages one and six have a much smaller productivity disadvantage at age six than at age one or switch from a disadvantage to an advantage. They are significantly less productive than older firms even at age eleven, however, suggesting that the US positive productivity-age profile extends to an advanced age.

Table 4 shows the productivity growth of entrants and incumbents over five-year periods covering age one to six for the entrant cohorts. The relative productivity growth of entrants versus incumbents is consistent with Table 3 above. Most entry cohorts experience large

productivity growth, even many of those where entrants' productivity advantage is diminished over time. This suggests that the deterioration in the new sector productivity advantage in the advanced transition economies is not due to a reduction in the quality of new sector firms over time, but rather to drastically improved old sector productivity. Figure 7 shows the difference between entrant and incumbent five-year productivity growth – more often than not, incumbent growth is higher. The relationship with EBRD indicators is an inverse-U shape, and it is statistically significant at the 10 percent level for the other EBRD indicator.

Productivity grows via learning (within-firm productivity growth) and selection (expansion of high-productivity firms and contraction and exit of low-productivity firms). If firm productivity relative to its industry is highly persistent over time, one might expect selection to occur most intensively when cohorts are young. Once failed entrepreneurs are weeded out, further productivity growth is likely to be primarily through within-firm improvements (e.g., with investment). If, on the other hand, firms of any age experience substantial idiosyncratic productivity shocks, significant selection could occur at an advanced age as well. To explore the relative strength of learning and selection with age, we calculate productivity growth decompositions separately for entrants and incumbents in Table 4 and show the differences between entrants and incumbents in Figures 8-12.

Three of the six US entrant cohorts experience lower within-firm productivity growth than incumbents, while five of the six have higher reallocation contributions (between + exit) than incumbents, suggesting that the importance of learning increases and selection declines with age in the US.[15] In the transition countries, however, whichever group experiences more productivity growth overall tends to have more of both learning and selection. In the advanced

[15] The sometimes higher US incumbent within-firm productivity growth is consistent with Cooper et al. (1999)'s finding that US manufacturing firms' investment propensity is increasing with the time since their last major investment. Young firms invest at start-up and may not need to invest again for a while.

reformers – Hungary, Lithuania, and Romania – older firms usually have higher within-firm and reallocation contributions, while in Russia (and often in Ukraine) entrants do.

The relationship between the entrant-incumbent within-firm growth differential and the EBRD indicators is statistically insignificant. The between, exit, and overall reallocation relationships with EBRD indicators are negative and usually significant, especially with the EBRD indicator representing nonfinancial aspects of the business environment, so entrant selection is less important than that among older firms in the more advanced transition economies. The cross relationship is positive and significant, suggesting that in economies with better institutions, entrants have a greater tendency to improve productivity via market share expansion, while incumbents are more likely to improve with contraction.

To see whether the growth processes differ over a longer time period, in Table 5 we display productivity growth decompositions over a ten-year period. The patterns are broadly similar to those in the five-year periods.

The finding that entrant selection is relatively less important than incumbent selection in advanced transition economies is surprising, given that the opposite holds in the US. To delve further into these reallocation contribution patterns, we decompose the reallocation contribution to productivity growth into its component parts (cleansing potential, reallocation volume, and reallocation targeting), as shown in equation (3) above. Table 6 and Figures 13-15 display the results. In most cases entrants have higher productivity dispersion than incumbents, which could reflect entrepreneurial experimentation, while incumbents have already undergone some selection and have relatively persistent productivity. The intensity of reallocation, however, is frequently higher among incumbents, especially in the more advanced transition economies and the US (Figure 14). Reallocation targeting is also often better among incumbents (though not in

the US).

There is no single explanation for the differing patterns across countries. The contrasting US versus Hungarian and Romanian entrant-incumbent reallocation contribution differentials can be explained by greater entrant targeting in the US and worse in Hungary and Romania. The difference between the US and Lithuania, however, is that Lithuania's entrants have less cleansing potential (lower dispersion) than incumbents, while US entrants have higher potential. The poor entrant targeting in Hungary and Romania and the low Lithuanian entrant productivity dispersion are puzzles.

5. Tentative Conclusions and Future Research

Firms play a central role in theories of economic growth, a major preoccupation of economists. In some theories (e.g., Solow, 1959), the role is largely implicit, represented merely by a production function, but recent theories have recognized the potential importance of firm heterogeneity and turnover. Indeed, some views focus on new firm entry as the chief source of economic growth due to improvements in technology. Different theories contain different implications for design of economic policies. Yet there has been relatively little effort to confront the theories with appropriate firm-level data.

In this paper, we have organized an analysis of entry and productivity dynamics around two stylized frameworks underlying some recent growth theories. In one framework, new firms embody technology and methods at the frontier, which is assumed to be continuously improving. In the other, the frontier may move, but ex-ante uncertainty among entrants leads to many new firms finding themselves within the frontier ex-post, and investment by incumbents represents an alternative source of growth. Both of these theories could be classified as "Schumpeterian," and

although they place different emphases (as did Schumpeter at various stages of his career), strictly speaking they are not mutually exclusive. But their emphases are different, and they may imply differences in policy choices.

The post-communist transition has offered an especially interesting battleground for these viewpoints. The lack of entry over previous decades would seem to have created great scope for successful entrants to push out the frontier, and the development and ossification of organizational complementarities between state-owned enterprises and the central planning regime might have resulted in a complete inability of incumbents to adapt to the new environment. This argument led some observers to advocate policies that favored new firm development and constrained incumbents, who were assumed capable only of rent-seeking. Many governments, however, put considerable resources into privatization, corporate governance, and restructuring, which might be expected to improve incumbent productivity disproportionately.

While our research is still in its early stages, and conclusions are necessarily tentative, our findings contain results that are consistent, and some that are inconsistent with each camp. On the one hand, entry rates are quite high through the transition in all the economies we study, frequently much higher than in the US. The relationship is positive over most of the observed range of the EBRD business environment indicators, with some concavity implying that the biggest effects of reform come from the initial liberalization, rather than later improvements. Entry cohorts also grow more in their first six years in the transition economies compared to the US, and the relationship displays still greater concavity, particularly with respect to development of financial institutions. Moreover, the relative productivity of the new sector – the cumulation of all surviving entrants – is usually reckoned to be positive in the transition economies. And the

relative productivity of entrants at age one is also frequently positive in the transition sample.

Other findings are inconsistent with a simple leapfrogging story of "new is better," however. Relative productivity growth of surviving entrants is frequently negative in the transition economies, while it is generally positive in the US. Average entrant productivity converges to incumbent productivity in both cases, but while in the US it converges from below, in transition it converges from above![16] Moreover, the patterns of relative entrant productivity across countries and over time suggest further nuances. One-year-old relative productivity is positive and large in Hungary at the very beginning of transition, but then it falls during the early to mid-1990s, converging to the negative level of the US. Relative entrant productivity in Lithuania and Romania shows similar behavior: high initially, then falling gradually. Meanwhile, the pattern in Russia and Ukraine is the reverse: starting from negative levels at the beginning of transition, relative entrant productivity rises through most of the observation period. Consistent with these patterns in the panel data, the relationship of relative productivity with the EBRD indicators is strongly concave. It peaks about halfway through reforms (about 2.5) and is similarly shaped for both finance and other aspects of the business environment.

The leapfrogging model, therefore, seems to apply only to the early stages of the reform process, while experimentation including substantial adaptation by incumbents, is a more appropriate characterization for more mature transition as well as for the US economy. It may surprise some observers, but it seems to be a robust result, which is also consistent with studies of privatization, that incumbents do have significant possibilities to differentiate themselves and to improve their performance, when conditions improve sufficiently.

[16] Analyzing physical productivity in a few US industries, Foster, Haltiwanger, and Syverson (2008) find a positive relative productivity among entrants in their first year, followed by downward convergence to the industry average in a few years. The downward convergence is difficult to understand in a stable institutional environment with vintage capital, but it could reflect measurement error in the first year followed by mean reversion or it could result from new vintages that raise average industry productivity rapidly enough to render entrants' advantages in this time span obsolete.

The analysis suggests a number of potentially fruitful avenues for future research. Our approach has been to examine appropriate firm-level data for consistency with reduced-form implications of the theoretical models. Alternatively, one could develop the theoretical models structurally to enable more explicit testing. For this purpose, it would be useful to combine the two approaches into a single model, so that hypotheses would be tested in a unified framework. We could also consider implications of the theories for the competitive interactions of entrants and incumbents, as so far we have treated them as independent. Yet the main effect of entry may not be to implement frontier-expanding technologies, but to stimulate incumbents, through market pressures, to do so.

On the empirical side, our results on entrants have been restricted to certain firm ages (zero, six, and eleven years old) for consistency with available US data, but we could exploit the annual data available for other economies to analyze growth and productivity dynamics on a higher frequency (annual) basis. As data becomes available, we could also add more countries to the analysis, both from transition and nontransition situations, although the latter could not be used together with the time-varying EBRD indices we examine in this paper. A direction we fully intend to pursue exploits within-country variation in entry behavior. We can extend the Rajan-Zingales (1998) analysis of cross-sectional inter-industry variation relative to a US norm in financial dependence to the productivity dynamics and panel approach in our paper. We may also carry out an empirical analysis of the competitive interactions of entrants and incumbents on a reduced form basis, even in the absence of the structural model mentioned above. The availability of firm-level data provides the basis for much greater understanding of both theories and empirical regularities of economic growth.

References

Aghion, Philippe, and Peter Howitt, "A Model of Growth Through Creative Destruction." *Econometrica*, Vol. 60(2), 323-351, March 1992.

Åslund, Anders, Peter Boone, and Simon Johnson, "How to Stabilize: Lessons from Post-Communist Countries." *Brookings Papers on Economic Activity*, 217-291, 1996.

Bartelsman, Eric J., John Haltiwanger, and Stefano Scarpetta, "Microeconomic Evidence of Creative Destruction in Industrial and Developing Countries." IZA Working Paper No. 1374, October 2004.

Berkowitz, Daniel, and David N. DeJong, "Entrepreneurship and Post-Socialist Growth." *Oxford Bulletin of Economics and Statistics*, Vol. 67(1), 25-46, 2005.

Bilsen, Valentijn, and Jozef Konings, "Job Creation, Job Destruction, and Growth of Newly Established, Privatized, and State-Owned Enterprises in Transition Economies: Survey Evidence from Bulgaria, Hungary, and Romania." *Journal of Comparative Economics*, Vol. 26(3), 429–445, September 1998.

Brown, J. David, and John S. Earle, "The Reallocation of Workers and Jobs in Russian Industry: New Evidence on Measures and Determinants," *Economics of Transition*, Vol. 11(2), 221-252, June 2003.

Caballero, Ricardo J., and Mohammad L. Hammour, "On the Timing and Efficiency of Creative Destruction." *Quarterly Journal of Economics,* Vol. 111(3), 805-851, 1996.

Cooper, Russell, John Haltiwanger, and Laura Power, "Machine Replacement and the Business Cycle: Lumps and Bumps," American Economic Review, Vol. 89(4), 921-946, 1999.

Disney, Richard, Jonathan Haskel, and Ylva Heden, "Restructuring and Productivity Growth in UK Manufacturing." *Economic Journal*, Vol. 113, 666-694, July 2003.

Earle, John S., Saul Estrin, and Larisa Leshchenko, "Ownership Structures, Patterns of Control, and Enterprise Behavior in Russia." In S. Commander, Q. Fan, and M.E. Schaffer (eds.), *Enterprise Restructuring and Economic Policy in Russia*. Washington: World Bank-EDI, 1996.

Ericson, Richard, and Ariel Pakes, "Markov-Perfect Industry Dynamics: A Framework for Empirical Work." *Review of Economic Studies*, Vol. 62, 53-82, 1995.

Eslava, Marcela, John Haltiwanger, Adriana Kugler, and Maurice Kugler, "The Effects of Structural Reforms on Productivity and Profitability Enhancing Reallocation: Evidence from Colombia." *Journal of Development Economics*, Vol. 75(2), 333-371, 2004.

European Bank for Reconstruction and Development (EBRD), *Transition Report 1999: Ten Years of Transition*. London: EBRD, 1999.

Foster, Lucia, John Haltiwanger, and C.J. Krizan, "Aggregate Productivity Growth: Lessons from Microeconomic Evidence." In E. Dean, M. Harper, and C. Hulten (eds.), *New Developments in Productivity Analysis*. Chicago: University of Chicago Press, 303-372, 2001.

Foster, Lucia, John Haltiwanger, and Chad Syverson, "Reallocation, Firm Turnover, and Efficiency: Selection on Productivity or Profitability?" *American Economic Review*, Vol. 98(1), 394-425, March 2008.

Frydman, Roman, Andrzej Rapaczynski, and John S. Earle, et al., *The Privatization Process in Central Europe*. London: CEU Press, 1993*a*.

Frydman, Roman, Andrzej Rapaczynski, and John S. Earle, et al., *The Privatization Process in Russia, Ukraine, and the Baltic States*. London: CEU Press, 1993b.

Frye, Timothy, and Andrei Shleifer, "The Invisible Hand and the Grabbing Hand." *American Economic Review Papers and Proceedings*, Vol. 87(2), 354-358, May 1997.

Grogan, Louise, "Worker Flows in the Russian Transition." *Economic Development and Cultural Change,* Vol. 51(2), 399–425, 2003.

Haltiwanger, John, "Measuring and Analyzing Aggregate Fluctuations: The Importance of Building from Microeconomic Evidence." *Federal Reserve Bank of St. Louis Economic Review,* 55-78, May/June 1997.

Hamermesh, Daniel S., and Gerard A. Pfann, "Turnover and the Dynamics of Labor Demand," *Economica*, Vol. 63, 359-368, 1996.

Hellman, Joel S., Geraint Jones, and Daniel Kaufmann, "Seize the State, Seize the Day: State Capture and Influence in Transition Economies." *Journal of Comparative Economics*, Vol. 31(4), 751-733, December 2003.

Hopenhayn, Hugo, "Entry, Exit, and Firm Dynamics in Long Run Equilibrium." *Econometrica*, Vol. 60(5), 1127-1150, September 1992.

Hopenhayn, Hugo, and Richard Rogerson, "Job Turnover and Policy Evaluation: A General Equilibrium Analysis." *Journal of Political Economy*, Vol. 101(5), 915-938, October 1993.

Johnson, Simon, and Gary Loveman, *Starting Over in Eastern Europe: Entrepreneurship and Economic Renewal*. Boston: Harvard Business School Press, 1995.

Jovanovic, Boyan, "Selection and the Evolution of Industry." *Econometrica*, Vol. 50(3), 649-670, May 1982.

Kaldor, Nicholas, and James A. Mirrlees, "A New Model of Economic Growth." *Review of Economic Studies*, Vol. 29, 174-190, 1961.

Kornai, Janos, *The Road to a Free Economy*. New York: W.W. Norton, 1990.

Kornai, Janos, *The Socialist System: The Political Economy of Communism*. Princeton: Princeton University Press, 1992.

McIntyre, Robert J., and Bruno Dallago, (eds.), *Small and Medium Enterprises in Transitional Economies*. Basingstoke, UK: Palgrave MacMillan, 2003.

McMillan, John, and Christopher Woodruff, "The Central Role of Entrepreneurs in Transition Economies." *Journal of Economic Perspectives*, Vol. 16(3), 153–170, Summer 2002.

Murrell, Peter, "Evolution in Economics and in the Economic Reform of the Centrally Planned Economies." In Christopher C. Clague and Gordon Rausser (eds.), *Emerging Market Economies in Eastern Europe*. Cambridge: Basil Blackwell, 1992.

Rajan, Raghuram G., and Luigi Zingales, "Financial Dependence and Growth." *American Economic Review*, Vol. 88(3), 559-586, June 1998.

Richter, Andrea, and Mark E. Schaffer, "The Performance of De Novo Private Firms in Russian Manufacturing." In S. Commander, Q. Fan, and M.E. Schaffer (eds.), *Enterprise Restructuring and Economic Policy in Russia*. Washington: World Bank-EDI, 1996.

Solow, R.M., "Technical Change and the Aggregate Production Function." *Review of Economics and*

Statistics, Vol. 39, 312-320, 1957.

Winiecki, Jan, "The Polish Generic Private Sector in Transition: Developments and Characteristics." *Europe-Asia Studies*, Vol. 54(1), 5-29, 2002.

World Bank, *From Plan to Market: World Development Report 1996*. Oxford: Oxford University Press, 1996.

World Bank, *Transition, The First Ten Years: Analysis and Lessons for Eastern Europe and the Former Soviet Union*. World Bank, 2002.

Figure 1: Overall Transition Progress (Average EBRD Indicator)

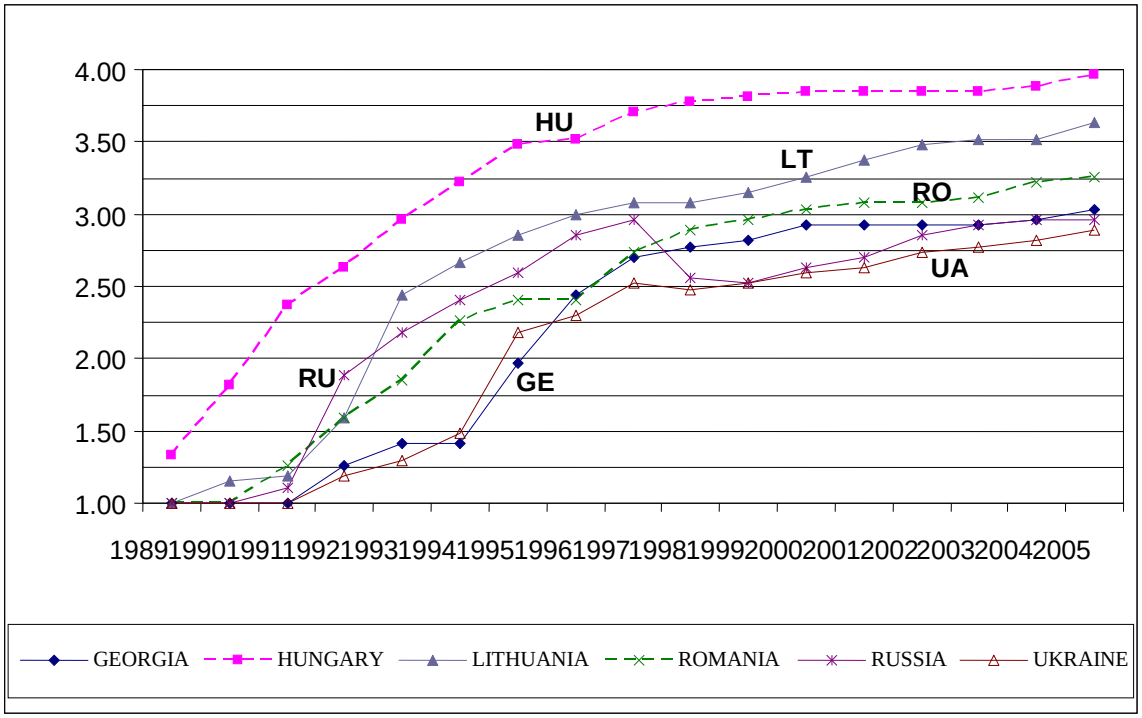

Figure 2: New Sector Employment Share

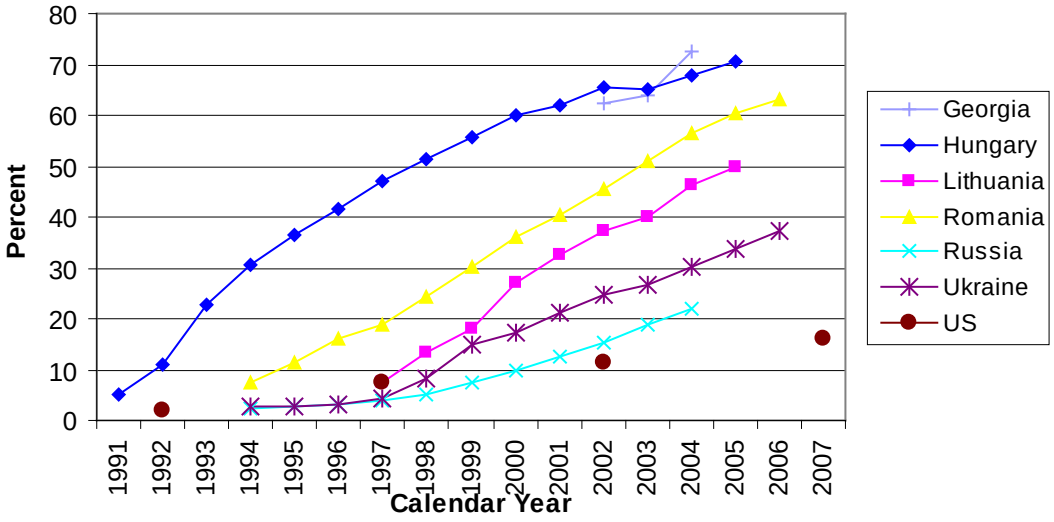

Figure 3: Entrant (Age=1) Employment Share

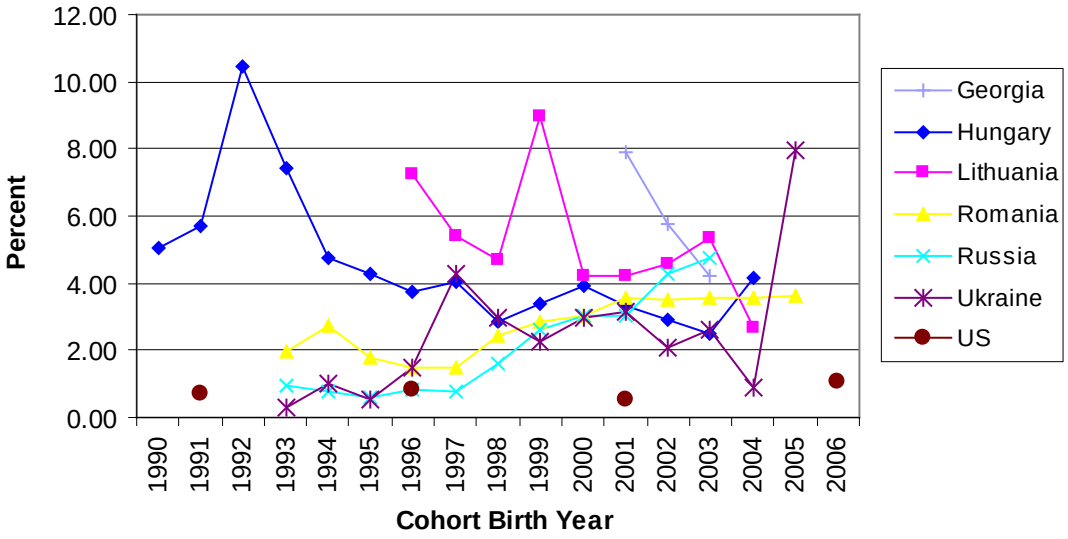

Figure 4: Ratio of Age Six to Age One Employment Share

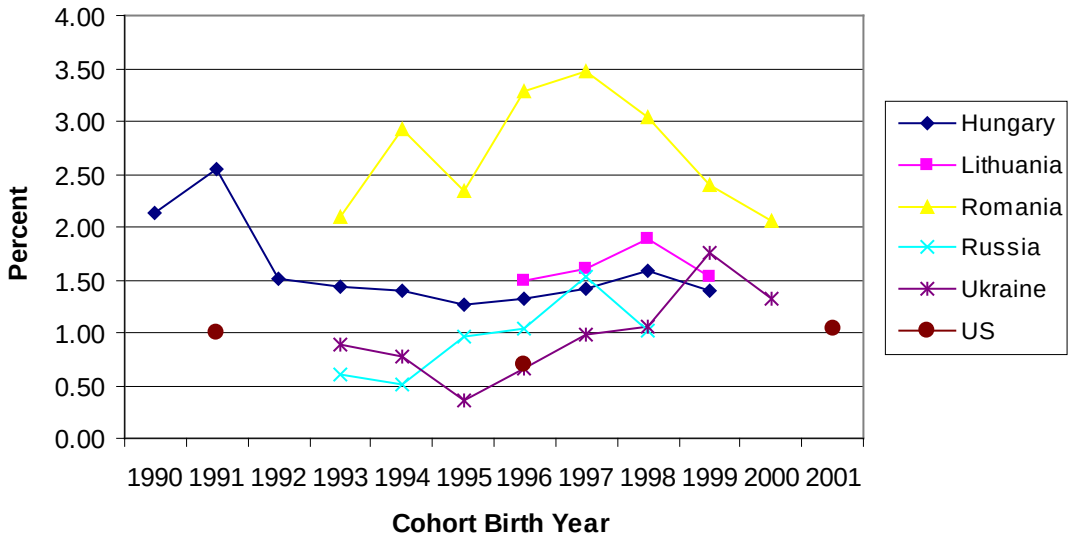

Figure 5: New vs. Old Productivity

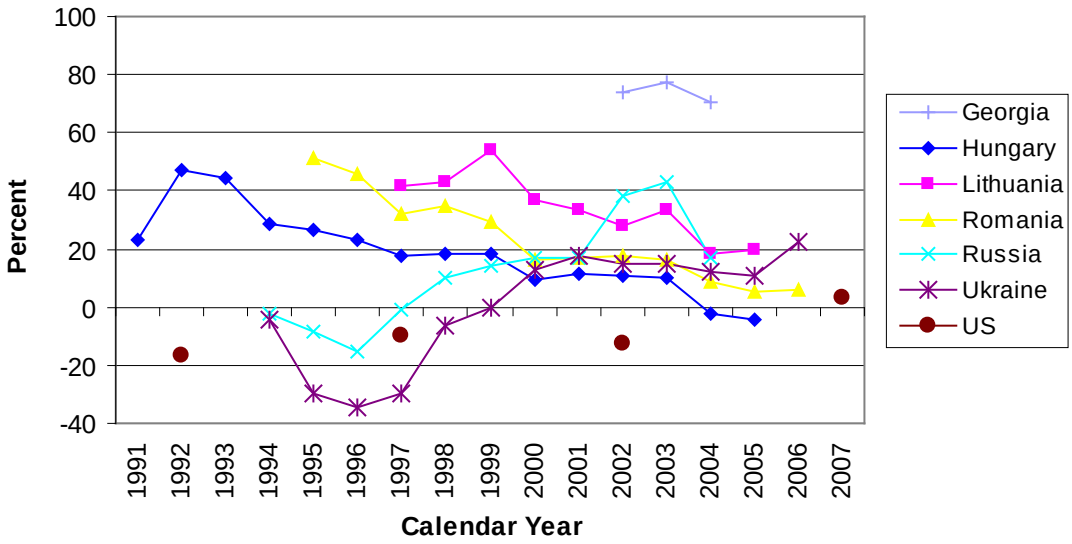

Figure 6: Entrant (Age=1) vs. Incumbent Productivity

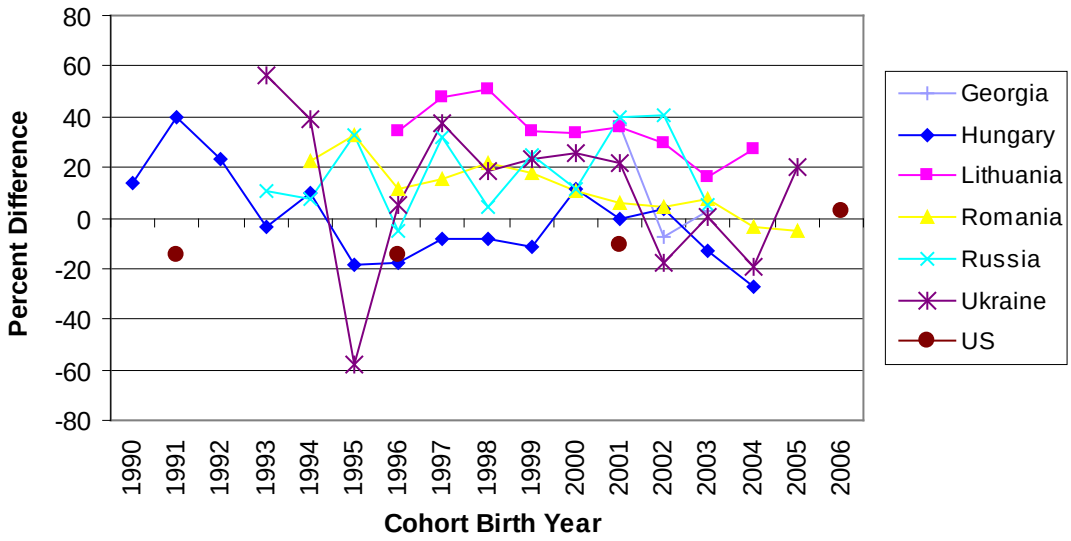

Figure 7: Entrant vs. Incumbent Five-Year Productivity Growth

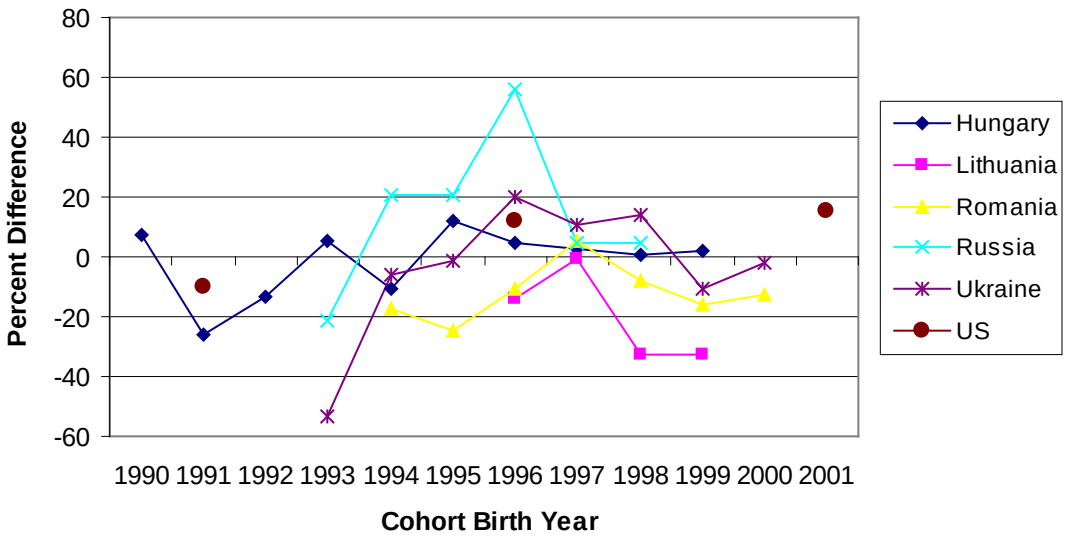

Figure 8: Entrant vs. Incumbent Within Contribution

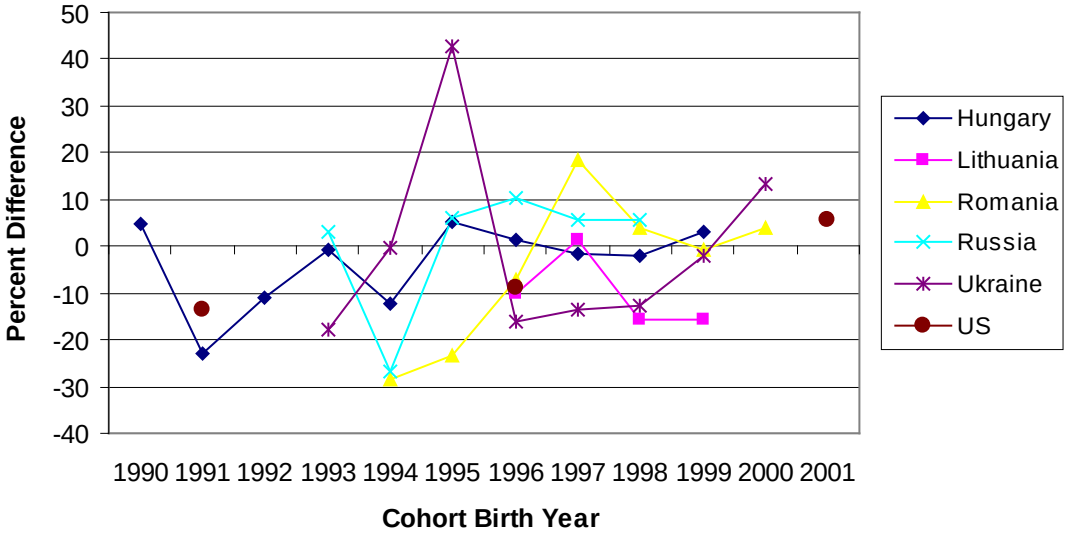

Figure 9: Entrant vs. Incumbent Between Contribution

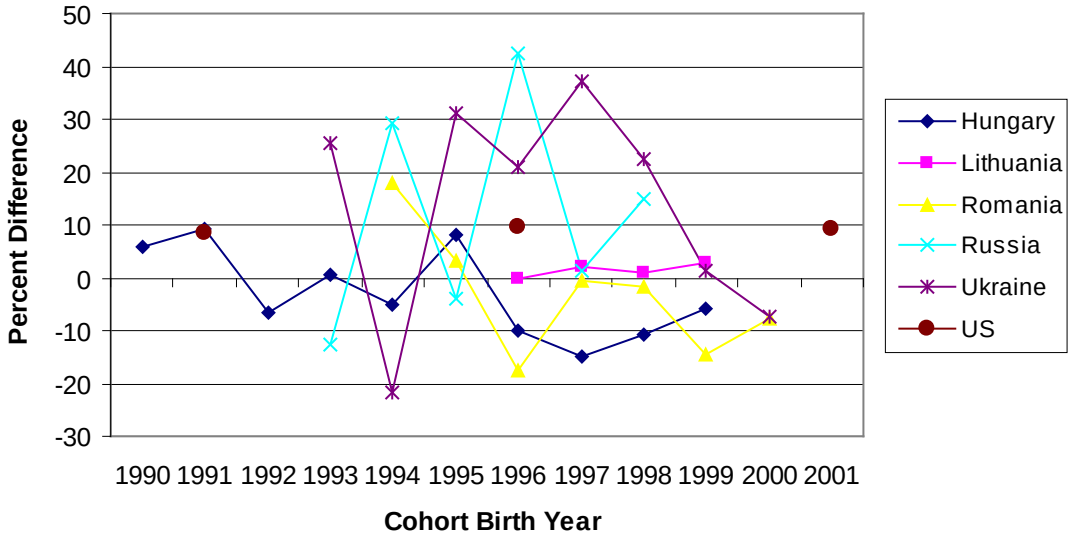

Figure 10: Entrant vs. Incumbent Cross Contribution

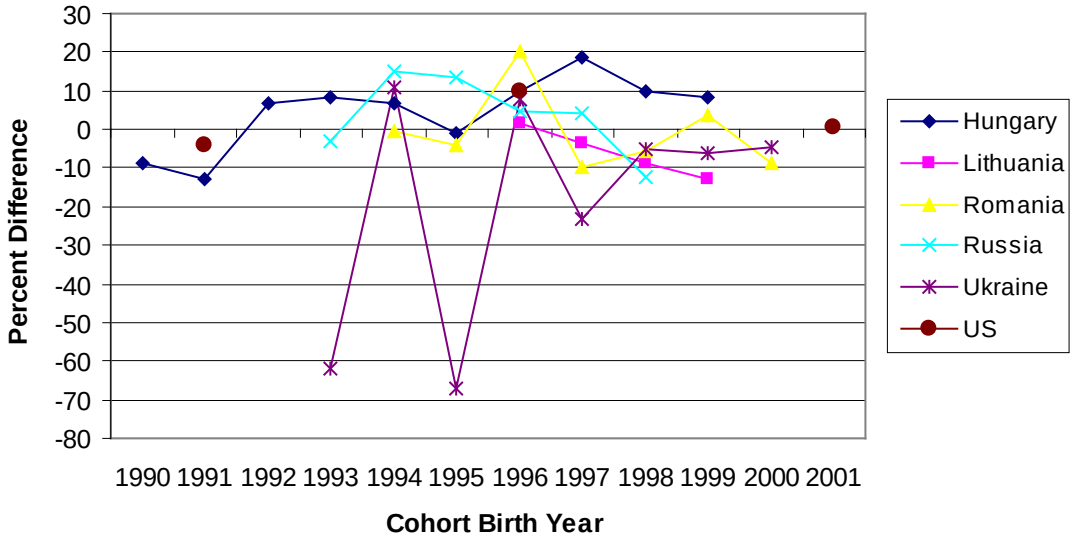

Figure 11: Entrant vs. Incumbent Exit Contribution

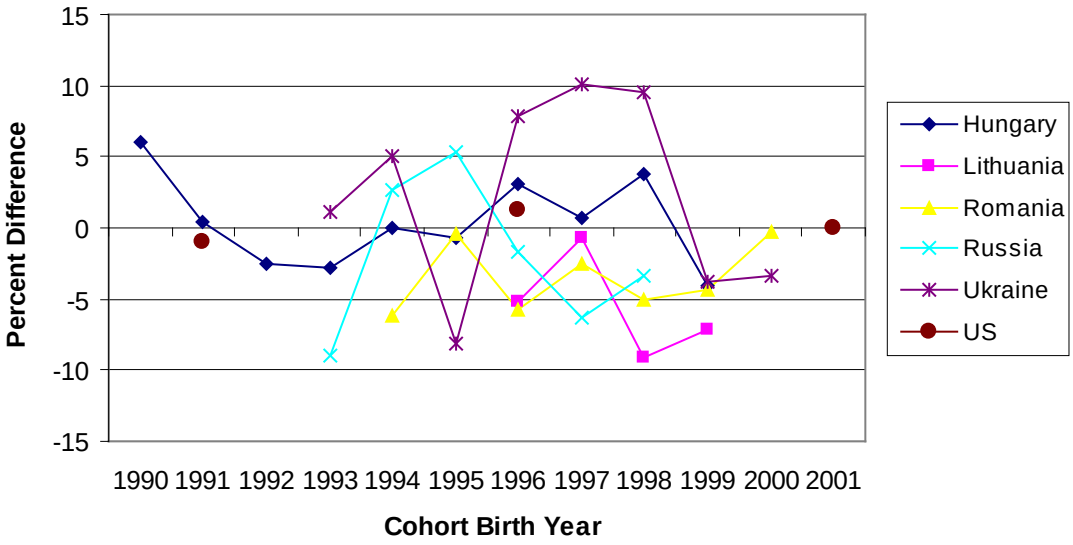

Figure 12: Entrant vs. Incumbent Reallocation Contribution

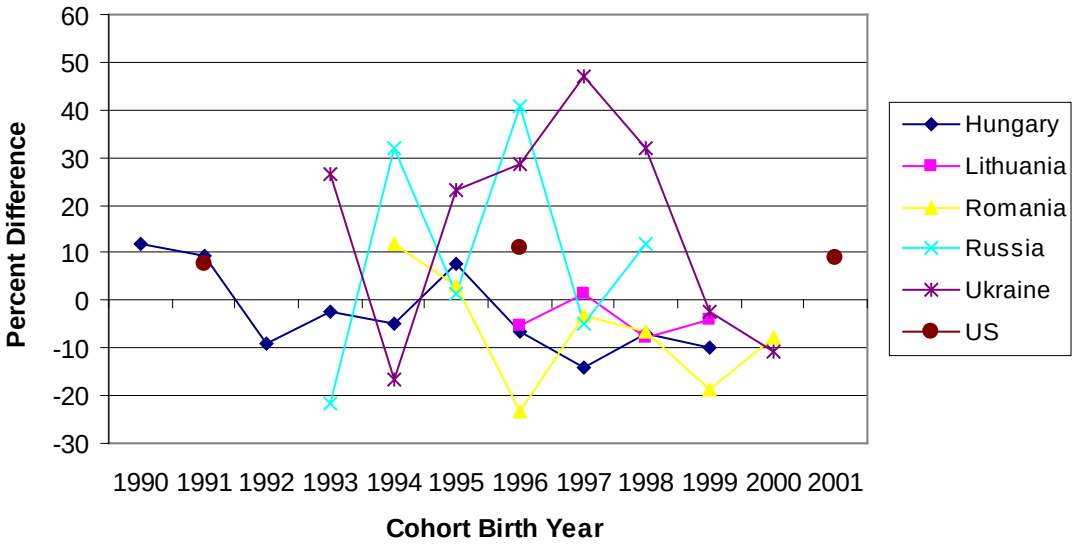

Figure 13: Entrant vs. Incumbent Productivity Dispersion

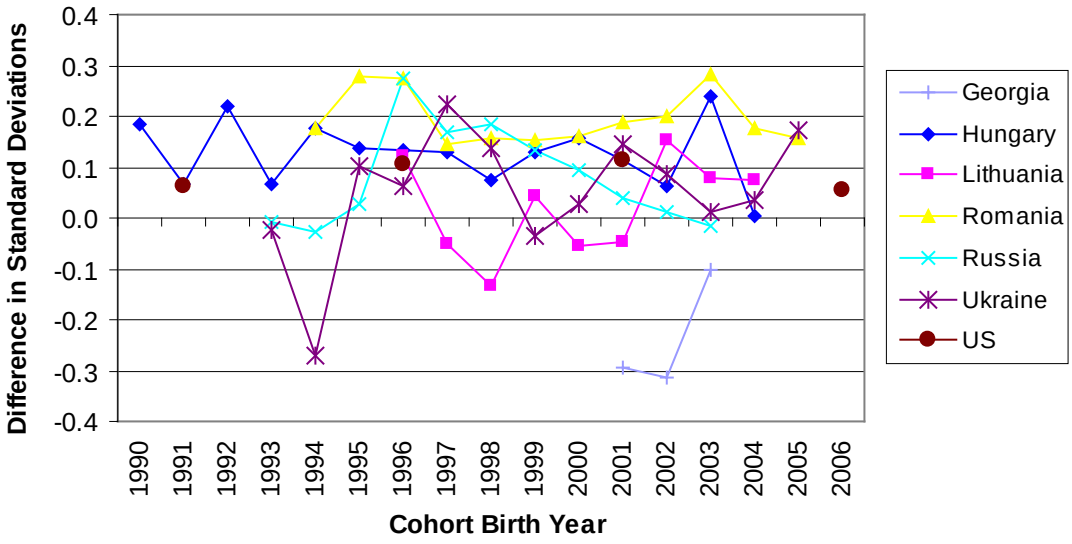

Figure 14: Entrant vs. Incumbent Employment Share Change Dispersion

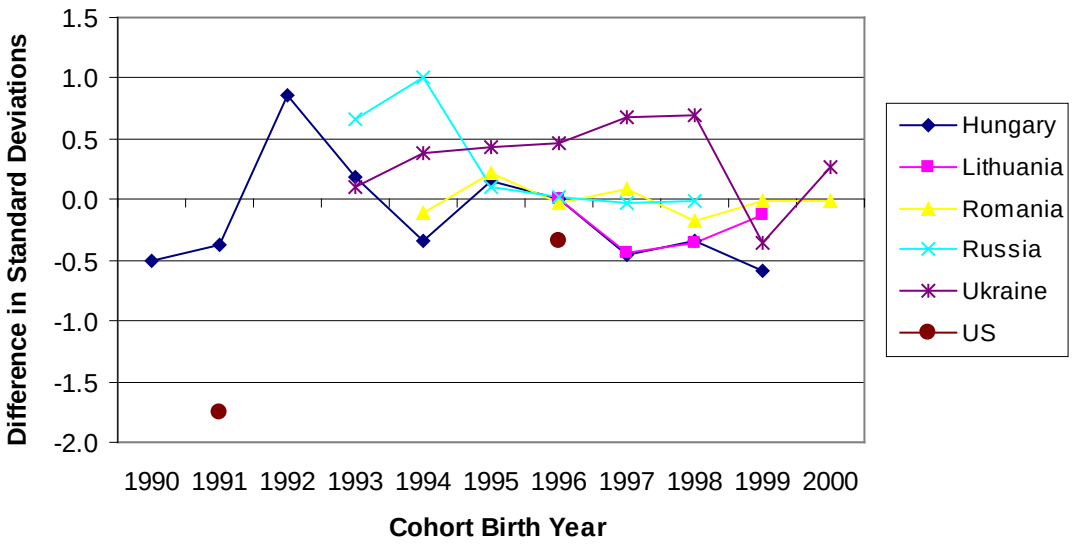

Figure 15: Entrant vs. Incumbent Initial Productivity-Employment Share Change Correlation

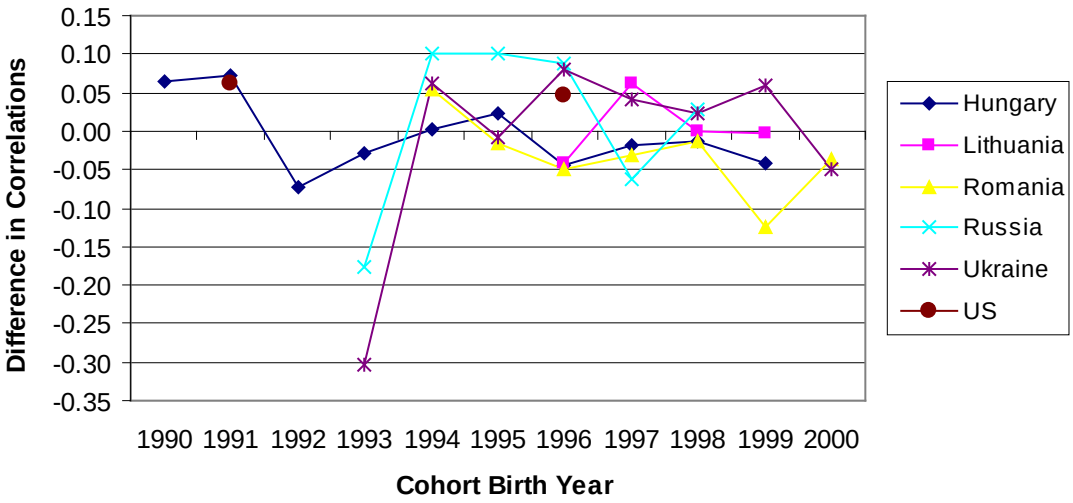

Table 1: Entrant Shares of All Firms

Entrant Cohort Birth Year	Age One Firm Share	Age Six Firm Share/Age One Firm Share	Age Eleven Firm Share/Age One Firm Share
Georgia			
2001	13.32		
2002	10.21		
2003	9.15		
Hungary			
1990	19.93	1.33	1.42
1991	17.91	1.22	1.23
1992	49.64	1.00	1.03
1993	17.46	0.93	0.93
1994	14.39	0.93	0.93
1995	12.28	0.89	
1996	13.89	0.93	
1997	14.29	0.90	
1998	9.32	0.94	
1999	7.25	0.89	
2000	9.31		
2001	10.65		
2002	8.83		
2003	9.52		
2004	24.09		
Lithuania			
1996	23.37	0.98	
1997	16.64	1.05	
1998	14.08	1.06	
1999	23.80	0.98	
2000	11.48		
2001	9.59		
2002	13.19		
2003	12.43		
2004	7.67		
Romania			
1993	28.00	0.52	1.09
1994	24.91	1.00	0.99
1995	13.14	0.91	0.89
1996	6.83	0.91	
1997	7.24	0.91	
1998	7.54	0.93	
1999	7.56	0.97	
2000	8.16	0.93	
2001	8.61		
2002	9.92		
2003	13.71		
2004	13.76		
2005	11.47		

Entrant Cohort Birth Year	Age One Firm Share	Age Six Firm Share/Age One Firm Share	Age Eleven Firm Share/Age One Firm Share
Russia			
1993	3.61	0.41	0.33
1994	2.63	0.39	
1995	1.68	0.60	
1996	2.00	0.63	
1997	2.17	0.77	
1998	2.56	0.73	
1999	3.01		
2000	4.41		
2001	3.59		
2002	6.33		
2003	6.31		
Ukraine			
1993	0.49	0.45	0.50
1994	2.29	0.74	0.63
1995	1.39	0.59	0.50
1996	2.56	0.81	
1997	12.58	0.88	
1998	11.73	0.93	
1999	2.67	1.21	
2000	11.00	0.95	
2001	8.70		
2002	6.67		
2003	7.14		
2004	2.24		
2005	17.79		
US			
1976	5.90	0.62	0.57
1981	5.99	0.53	0.47
1986	4.59	0.58	0.50
1991	4.74	0.53	0.44
1996	4.65	0.49	0.44
2001	2.29	0.73	
2006	5.65		

Note: The age one (six, eleven) share is the percentage of firms one (six, eleven) year(s) or older that are one (six, eleven) year(s) old.

Table 2: Entrant Employment Shares

Entrant Cohort Birth Year	Age One Employment Share	Age Six Share/Age One Employment Share	Age Eleven Share/Age One Employment Share	Age One Employment Share/Age One Firm Share
Georgia				
2001	7.91			0.59
2002	5.78			0.43
2003	4.22			0.41
Hungary				
1990	5.05	2.13	3.35	0.25
1991	5.69	2.55	3.39	0.32
1992	10.45	1.51	1.87	0.21
1993	7.40	1.43	1.78	0.42
1994	4.76	1.39	1.58	0.33
1995	4.30	1.27		0.35
1996	3.76	1.32		0.27
1997	4.05	1.41		0.28
1998	2.83	1.59		0.30
1999	3.41	1.39		0.47
2000	3.95			0.42
2001	3.35			0.31
2002	2.92			0.33
2003	2.52			0.26
2004	4.17			0.17
Lithuania				
1996	7.26	1.49		0.31
1997	5.40	1.60		0.32
1998	4.70	1.88		0.33
1999	8.95	1.53		0.38
2000	4.24			0.37
2001	4.22			0.44
2002	4.59			0.35
2003	5.36			0.43
2004	2.70			0.35
Romania				
1993	1.96	2.10	2.42	0.07
1994	2.71	2.92	5.72	0.11
1995	1.76	2.35	4.74	0.13
1996	1.49	3.28		0.22
1997	1.48	3.47		0.20
1998	2.44	3.04		0.32
1999	2.86	2.40		0.38
2000	3.05	2.05		0.37
2001	3.55			0.41
2002	3.50			0.35
2003	3.54			0.26
2004	3.56			0.26
2005	3.63			0.32

Entrant Cohort Birth Year	Age One Employment Share	Age Six Share/Age One Employment Share	Age Eleven Share/Age One Employment Share	Age One Employment Share/Age One Firm Share
Russia				
1993	0.95	0.61	0.86	0.26
1994	0.78	0.51		0.30
1995	0.57	0.97		0.34
1996	0.83	1.04		0.42
1997	0.76	1.54		0.35
1998	1.61	1.03		0.63
1999	2.61			0.87
2000	3.02			0.68
2001	3.05			0.85
2002	4.28			0.68
2003	4.72			0.75
Ukraine				
1993	0.32	0.88	0.62	0.66
1994	1.01	0.78	0.64	0.44
1995	0.53	0.36	0.42	0.38
1996	1.49	0.65		0.58
1997	4.29	0.98		0.34
1998	2.94	1.07		0.25
1999	2.25	1.76		0.84
2000	2.96	1.32		0.27
2001	3.06			0.36
2002	2.07			0.31
2003	2.42			0.36
2004	0.78			0.40
2005	5.63			0.45
US				
1976	0.80	0.89	0.99	0.14
1981	0.87	0.73	0.85	0.14
1986	0.81	0.90	1.05	0.18
1991	0.72	1.00	0.89	0.15
1996	0.83	0.69	0.67	0.18
2001	0.54	1.03		0.23
2006	1.08			0.19

Note: The age one (six, eleven) employment share is the percentage of employment in firms one (six, eleven) year(s) or older that is in firms that are one (six, eleven) year(s) old.

Table 3: Weighted Multifactor Productivity Differentials

Between Entrants and Incumbents

Entrant Cohort Birth Year	Age One vs. Age One and Older	Age Six vs. Age Six and Older	Age Eleven vs. Age Eleven and Older
Georgia			
2001	36.74		
2002	-7.85		
2003	2.43		
Hungary			
1990	13.93	21.21	10.59
1991	39.53	13.39	-5.05
1992	22.99	9.59	4.60
1993	-3.35	2.16	7.13
1994	10.22	-0.70	2.43
1995	-18.59	-6.56	
1996	-17.60	-12.92	
1997	-8.37	-5.46	
1998	-8.48	-7.86	
1999	-11.35	-9.44	
2000	11.13		
2001	-0.38		
2002	3.41		
2003	-13.19		
2004	-27.04		
Lithuania			
1996	34.48	20.63	
1997	47.94	47.26	
1998	51.13	18.62	
1999	33.93	1.58	
2000	33.49		
2001	35.73		
2002	29.88		
2003	15.99		
2004	27.51		
Romania			
1994	22.40	5.18	-1.01
1995	32.81	7.90	-8.81
1996	11.65	1.04	
1997	15.37	20.91	
1998	22.05	13.80	
1999	17.73	1.98	
2000	10.96	-1.48	
2001	6.30		
2002	4.03		
2003	7.32		
2004	-3.25		
2005	-5.30		

Entrant Cohort Birth Year	Age One vs. Age One and Older	Age Six vs. Age Six and Older	Age Eleven vs. Age Eleven and Older
Russia			
1993	10.84	-10.68	-2.16
1994	7.73	28.27	
1995	32.37	53.07	
1996	-5.04	50.90	
1997	31.56	36.38	
1998	4.67	9.57	
1999	24.85		
2000	11.15		
2001	40.09		
2002	40.50		
2003	5.00		
Ukraine			
1993	56.21	2.99	55.35
1994	39.16	32.84	25.86
1995	-57.97	-59.34	-10.59
1996	5.29	25.51	
1997	37.64	48.29	
1998	18.18	32.08	
1999	23.02	12.56	
2000	25.98	24.05	
2001	21.37		
2002	-17.68		
2003	0.23		
2004	-19.65		
2005	20.06		
US			
1976	-11.83	-6.42	-4.90
1981	-14.56	-2.08	-7.75
1986	-8.53	5.20	-7.95
1991	-10.04	-20.14	-20.35
1996	-6.57	5.51	-1.37
2001	-5.21	10.13	
2006	2.60		

Note: These are percent differences.

Table 4: Five-Year Entrant and Incumbent Multifactor Productivity Decompositions

		Total	Within	Between	Cross	Exit
Hungary						
1991-1996	1990 Entrants	33.51	17.17	8.60	1.82	5.92
	Incumbents	26.23	12.57	2.92	10.80	-0.06
1992-1997	1991 Entrants	15.69	-0.40	14.68	-1.71	3.12
	Incumbents	41.83	22.40	5.59	11.17	2.67
1993-1998	1992 Entrants	23.74	12.09	1.18	9.34	1.12
	Incumbents	37.14	23.26	7.71	2.52	3.64
1994-1999	1993 Entrants	20.59	8.51	7.27	4.90	-0.10
	Incumbents	15.07	9.18	6.63	-3.48	2.74
1995-2000	1994 Entrants	6.92	-2.43	4.52	2.83	2.00
	Incumbents	17.84	10.01	9.55	-3.74	2.02
1996-2001	1995 Entrants	31.61	18.07	15.13	-1.42	-0.17
	Incumbents	19.58	12.68	6.92	-0.51	0.50
1997-2002	1996 Entrants	21.97	12.49	-4.93	11.66	2.74
	Incumbents	17.28	10.97	4.89	1.76	-0.34
1998-2003	1997 Entrants	20.11	13.51	-9.20	16.27	-0.47
	Incumbents	17.20	15.09	5.60	-2.36	-1.13
1999-2004	1998 Entrants	20.06	15.26	-7.00	9.80	2.00
	Incumbents	19.44	17.41	3.83	0.02	-1.82
2000-2005	1999 Entrants	23.71	20.40	0.12	7.00	-3.81
	Incumbents	21.80	17.14	5.86	-1.39	0.19
Lithuania						
1997-2002	1996 Entrants	28.58	16.26	16.59	-2.28	-1.98
	Incumbents	42.43	26.20	16.83	-3.80	3.20
1998-2003	1997 Entrants	31.96	22.10	17.72	-11.35	3.48
	Incumbents	32.64	20.55	15.59	-7.64	4.14
1999-2004	1998 Entrants	19.00	13.63	19.67	-12.32	-1.99
	Incumbents	51.50	29.30	18.60	-3.49	7.10
2000-2005	1999 Entrants	21.31	13.93	21.49	-15.94	1.84
	Incumbents	53.66	29.55	18.49	-3.32	8.95
Romania						
1995-2000	1994 Entrants	5.53	-16.92	28.01	0.91	-6.48
	Incumbents	22.75	11.59	10.04	1.38	-0.25
1996-2001	1995 Entrants	-10.15	-18.78	16.69	-7.45	-0.61
	Incumbents	14.77	4.71	13.36	-3.12	-0.19
1997-2002	1996 Entrants	-2.29	-14.84	-3.58	21.06	-4.93
	Incumbents	8.32	-7.53	13.91	1.07	0.86
1998-2003	1997 Entrants	27.67	15.89	13.94	-4.30	2.14
	Incumbents	22.13	-2.49	14.42	5.51	4.69
1999-2004	1998 Entrants	23.42	15.56	14.98	-5.21	-1.91
	Incumbents	31.67	11.64	16.70	0.20	3.13
2000-2005	1999 Entrants	1.66	1.94	0.72	-0.35	-0.65
	Incumbents	17.41	2.67	15.11	-4.04	3.67
2001-2006	2000 Entrants	10.71	8.50	8.14	-9.24	3.32
	Incumbents	23.16	4.46	15.70	-0.57	3.56

		Total	Within	Between	Cross	Exit
Russia						
1994-1999	1993 Entrants	-14.13	-2.16	-2.14	-4.99	-4.84
	Incumbents	7.39	-5.35	10.67	-2.11	4.18
1995-2000	1994 Entrants	36.95	-21.45	38.27	14.38	5.75
	Incumbents	16.41	5.15	8.92	-0.70	3.04
1996-2001	1995 Entrants	57.18	25.97	8.55	11.31	11.36
	Incumbents	36.48	20.03	12.65	-2.19	6.00
1997-2002	1996 Entrants	52.69	7.60	55.60	-16.98	6.48
	Incumbents	-3.25	-2.88	13.15	-21.72	8.20
1998-2003	1997 Entrants	48.29	32.92	13.16	0.59	1.62
	Incumbents	43.47	27.30	11.74	-3.54	7.97
1999-2004	1998 Entrants	41.35	20.00	31.37	-15.75	5.73
	Incumbents	36.44	14.39	16.39	-3.40	9.05
Ukraine						
1994-1999	1993 Entrants	-88.54	-69.67	30.78	-54.99	5.34
	Incumbents	-35.32	-51.94	5.29	7.12	4.20
1995-2000	1994 Entrants	-45.87	-47.95	5.35	-9.17	5.91
	Incumbents	-39.54	-47.50	27.15	-20.10	0.90
1996-2001	1995 Entrants	-13.39	14.46	47.69	-73.53	-2.01
	Incumbents	-12.03	-28.14	16.38	-6.37	6.10
1997-2002	1996 Entrants	32.00	-22.95	42.99	-0.46	12.42
	Incumbents	11.78	-6.82	22.10	-8.14	4.63
1998-2003	1997 Entrants	54.61	2.55	65.05	-30.76	17.78
	Incumbents	43.96	15.98	27.95	-7.71	7.74
1999-2004	1998 Entrants	78.69	15.71	61.95	-16.89	17.91
	Incumbents	64.79	28.48	39.62	-11.75	8.43
2000-2005	1999 Entrants	78.87	46.56	30.59	-1.44	3.17
	Incumbents	89.33	48.44	29.16	4.79	6.94
2001-2006	2000 Entrants	131.67	103.30	17.88	6.53	3.96
	Incumbents	133.60	89.81	25.21	11.22	7.37
US						
1977-1982	1976 Entrants	3.69	2.48	3.78	-2.56	-0.01
	Incumbents	-1.72	-2.36	1.55	-1.48	0.57
1982-1987	1981 Entrants	22.53	8.61	10.76	1.44	1.73
	Incumbents	10.05	9.13	2.42	-2.23	0.73
1987-1992	1986 Entrants	21.25	5.09	-25.74	38.72	3.18
	Incumbents	7.52	5.67	2.46	-1.54	0.94
1992-1997	1991 Entrants	6.72	7.05	10.67	-10.91	-0.10
	Incumbents	16.82	20.56	2.10	-6.71	0.86
1997-2002	1996 Entrants	23.67	4.95	15.16	1.46	2.10
	Incumbents	11.59	13.68	5.52	-8.47	0.86
2002-2007	2001 Entrants	18.29	9.82	11.59	-3.98	0.87
	Incumbents	2.96	4.02	2.53	-4.51	0.92

Notes: These numbers are percent growth over the entire period. Incumbents are firms older than the respective entrants in the previous row.

Table 5: Ten-Year Entrant and Incumbent Multifactor Productivity Decompositions

		Total	Within	Between	Cross	Exit
Hungary						
1991-2001	1990 Entrants	48.20	20.00	8.20	16.01	4.00
	Incumbents	51.55	19.84	3.15	28.49	0.12
1992-2002	1991 Entrants	18.44	-4.25	18.36	1.44	2.89
	Incumbents	63.02	27.53	8.71	24.45	-0.34
1993-2003	1992 Entrants	32.56	10.71	4.87	13.17	3.81
	Incumbents	50.94	31.22	12.20	5.28	-1.40
1994-2004	1993 Entrants	45.39	16.27	3.76	20.61	4.75
	Incumbents	34.91	22.87	11.81	-0.91	-1.60
1995-2005	1994 Entrants	25.32	10.61	8.32	5.35	1.04
	Incumbents	33.11	20.13	11.09	0.72	-0.85
Romania						
1995-2005	1994 Entrants	18.66	-21.35	37.96	7.92	-5.87
	Incumbents	42.07	15.14	14.39	10.83	1.97
1996-2006	1995 Entrants	-2.31	-43.91	10.27	24.47	6.86
	Incumbents	39.31	11.27	20.26	4.70	3.28
Russia						
1994-2004	1993 Entrants	26.29	12.03	1.89	16.16	-3.80
	Incumbents	39.29	15.79	16.08	1.44	1.80
Ukraine						
1994-2004	1993 Entrants	16.37	19.23	46.61	-53.02	3.53
	Incumbents	17.22	-0.84	14.43	-2.33	1.76
1995-2005	1994 Entrants	31.50	15.24	-4.31	19.02	1.55
	Incumbents	44.80	6.07	28.61	-3.60	12.82
1996-2006	1995 Entrants	168.49	40.89	52.02	67.61	7.98
	Incumbents	121.11	54.78	24.96	30.27	5.00
US						
1977-1987	1976 Entrants	15.27	5.56	8.15	1.15	0.41
	Incumbents	8.33	6.84	2.26	-1.66	0.90
1982-1992	1981 Entrants	22.15	5.25	7.53	8.15	1.22
	Incumbents	15.34	13.10	3.64	-2.17	0.77
1987-1997	1986 Entrants	22.55	4.17	-23.31	38.67	3.01
	Incumbents	21.97	25.35	2.60	-7.14	1.16
1992-2002	1991 Entrants	19.92	8.15	12.06	0.51	-0.80
	Incumbents	30.23	33.60	4.27	-8.78	1.14
1997-2007	1996 Entrants	21.20	5.16	13.76	0.74	1.55
	Incumbents	16.00	13.79	6.88	-6.12	1.44

Notes: These numbers are percent growth over the entire period. Incumbents are firms older than the respective entrants in the previous row.

Table 6: Components of Five-Year Entrant and Incumbent Reallocation Contributions to Multifactor Productivity Growth

		Standard Deviation of MFP	Standard Deviation of Employment Share Change	Correlation between Initial MFP and Employment Share Change
Hungary				
1991-1996	1990 Entrants	0.91	1.45	0.09
	Incumbents	0.72	1.96	0.03
1992-1997	1991 Entrants	0.91	1.31	0.14
	Incumbents	0.85	1.68	0.07
1993-1998	1992 Entrants	1.10	2.36	0.01
	Incumbents	0.88	1.50	0.08
1994-1999	1993 Entrants	1.01	1.81	0.04
	Incumbents	0.94	1.62	0.07
1995-2000	1994 Entrants	1.12	1.63	0.05
	Incumbents	0.94	1.97	0.05
1996-2001	1995 Entrants	1.07	2.02	0.06
	Incumbents	0.93	1.86	0.04
1997-2002	1996 Entrants	1.05	1.90	-0.02
	Incumbents	0.91	1.90	0.03
1998-2003	1997 Entrants	1.02	1.93	0.01
	Incumbents	0.89	2.37	0.02
1999-2004	1998 Entrants	0.97	1.97	0.01
	Incumbents	0.89	2.31	0.02
2000-2005	1999 Entrants	1.05	1.75	-0.01
	Incumbents	0.92	2.34	0.04
Lithuania				
1997-2002	1996 Entrants	1.05	1.39	0.11
	Incumbents	0.93	1.39	0.16
1998-2003	1997 Entrants	0.86	1.28	0.20
	Incumbents	0.91	1.73	0.14
1999-2004	1998 Entrants	0.86	1.20	0.17
	Incumbents	0.99	1.56	0.17
2000-2005	1999 Entrants	1.40	1.42	0.13
	Incumbents	1.35	1.54	0.14
Romania				
1995-2000	1994 Entrants	1.11	1.89	0.11
	Incumbents	0.94	2.00	0.06
1996-2001	1995 Entrants	1.20	1.94	0.07
	Incumbents	0.92	1.72	0.08
1997-2002	1996 Entrants	1.22	2.13	0.03
	Incumbents	0.95	2.16	0.08
1998-2003	1997 Entrants	1.15	2.10	0.06
	Incumbents	1.01	2.01	0.09
1999-2004	1998 Entrants	1.19	1.80	0.08
	Incumbents	1.03	1.97	0.10

		Standard Deviation of MFP	Standard Deviation of Employment Share Change	Correlation between Initial MFP and Employment Share Change
Romania				
2000-2005	1999 Entrants	1.14	2.02	-0.03
	Incumbents	0.99	2.04	0.10
2001-2006	2000 Entrants	1.16	1.97	0.06
	Incumbents	1.00	1.99	0.09
Russia				
1994-1999	1993 Entrants	0.95	1.95	-0.05
	Incumbents	0.96	1.29	0.13
1995-2000	1994 Entrants	0.95	2.31	0.21
	Incumbents	0.98	1.30	0.11
1996-2001	1995 Entrants	1.08	1.35	0.25
	Incumbents	1.03	1.32	0.14
1997-2002	1996 Entrants	1.42	1.74	0.20
	Incumbents	1.15	1.72	0.11
1998-2003	1997 Entrants	1.37	1.32	0.07
	Incumbents	1.20	1.34	0.13
1999-2004	1998 Entrants	1.45	1.47	0.17
	Incumbents	1.27	1.48	0.14
Ukraine				
1994-1999	1993 Entrants	0.75	1.01	-0.16
	Incumbents	0.79	0.86	0.14
1995-2000	1994 Entrants	0.70	1.28	0.21
	Incumbents	1.00	1.15	0.18
1996-2001	1995 Entrants	1.15	1.62	0.18
	Incumbents	1.05	1.19	0.18
1997-2002	1996 Entrants	1.24	1.58	0.28
	Incumbents	1.17	1.12	0.20
1998-2003	1997 Entrants	1.49	1.93	0.27
	Incumbents	1.27	1.26	0.22
1999-2004	1998 Entrants	1.74	2.38	0.20
	Incumbents	1.60	1.68	0.17
2000-2005	1999 Entrants	1.57	1.36	0.19
	Incumbents	1.60	1.72	0.13
2001-2006	2000 Entrants	1.60	1.78	0.08
	Incumbents	1.58	1.52	0.13

		Standard Deviation of MFP	Standard Deviation of Employment Share Change	Correlation between Initial MFP and Employment Share Change
US				
1977-1982	1976 Entrants	0.53	2.15	0.03
	Incumbents	0.49	2.43	0.02
1982-1987	1981 Entrants	0.58	2.53	0.08
	Incumbents	0.50	3.23	0.02
1987-1992	1986 Entrants	0.62	2.66	0.01
	Incumbents	0.53	2.61	0.02
1992-1997	1991 Entrants	0.64	2.07	0.08
	Incumbents	0.58	3.83	0.02
1997-2002	1996 Entrants	0.70	3.72	0.07
	Incumbents	0.60	4.06	0.03
2002-2007	2001 Entrants	0.69	2.02	0.08
	Incumbents	0.58	3.50	0.02

Note: Incumbents are firms older than the respective entrants in the previous row.

Appendix Table 1: EBRD Index Regressions

	Coefficient	Standard Error	F Test P Value	N
	New Sector Employment Share			
Finance	24.337	19.578	0.002	63
Finance Squared	-0.112	3.404		
Other	-24.252	42.759	0.000	63
Other Squared	9.990	7.515		
	Entrant (age=1) Employment Share			
Finance	3.994	2.460	0.256	35
Finance Squared	-0.631	0.482		
Other	2.143	4.399	0.327	35
Other Squared	-0.198	0.861		
	Age Six/Age One Employment Share			
Finance	2.641	1.299	0.169	35
Finance Squared	-0.478	0.254		
Other	1.395	1.338	0.597	35
Other Squared	-0.247	0.257		
	New vs. Old Productivity			
Finance	0.963**	0.340	0.060	63
Finance Squared	-0.170**	0.056		
Other	1.209	0.667	0.276	63
Other Squared	-0.192	0.111		
	Entrant (age=1) vs. Incumbent Productivity			
Finance	69.292	54.701	0.432	35
Finance Squared	-13.837	10.198		
Other	64.283	57.672	0.521	35
Other Squared	-11.966	11.886		
	Entrant vs. Incumbent Five-Year Productivity Growth			
Finance	24.193	55.539	0.900	35
Finance Squared	-4.450	10.736		
Other	94.817	60.572	0.101	35
Other Squared	-16.337	11.778		
	Entrant vs. Incumbent Within Contribution			
Finance	-11.943	14.726	0.738	35
Finance Squared	2.256	2.819		
Other	23.236	21.455	0.551	35
Other Squared	-3.733	3.838		
	Entrant vs. Incumbent Between Contribution			
Finance	11.380	26.240	0.059	35
Finance Squared	-3.797	5.233		
Other	14.823	19.960	0.030	35
Other Squared	-4.178	3.802		

	Coefficient	Standard Error	F Test P Value	N
	Entrant vs. Incumbent Cross Contribution			
Finance	30.553	31.857	0.003	35
Finance Squared	-3.728	5.294		
Other	67.390	34.888	0.107	35
Other Squared	-10.072	6.090		
	Entrant vs. Incumbent Exit Contribution			
Finance	-5.798	8.951	0.622	35
Finance Squared	0.818	1.612		
Other	-10.631	5.453	0.035	35
Other Squared	1.646	1.181		
	Entrant vs. Incumbent Reallocation Contribution			
Finance	5.582	33.707	0.136	35
Finance Squared	-2.979	6.645		
Other	4.191	20.809	0.069	35
Other Squared	-2.532	4.111		
	Entrant vs. Incumbent Productivity Dispersion			
Finance	0.310	0.494	0.828	35
Finance Squared	-0.056	0.090		
Other	0.148	0.366	0.922	35
Other Squared	-0.025	0.063		
	Entrant vs. Incumbent Employment Share Change Dispersion			
Finance	-0.294	0.940	0.059	35
Finance Squared	-0.006	0.167		
Other	0.930	0.620	0.116	35
Other Squared	-0.231	0.111		
	Entrant vs. Incumbent Initial Productivity-Share Change Correlation			
Finance	0.262	0.172	0.316	35
Finance Squared	-0.051	0.034		
Other	0.310	0.160	0.215	35
Other Squared	-0.056	0.029		

* = significant at the 10 percent level, ** = significant at the 5 percent level, and *** = significant at the 1 percent level. The F tests are for joint significance of the regressors. Separate regressions are run for finance and other indices.