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The Effects of Privatization on Productive Efficiency: Evidence from the Baltic Republics*

by

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Abstract:

While the Baltic Republics began transition from substantially similar starting points, diverse patterns of enterprise ownership soon emerged. This provides an unusual context in which to test competing theories on the productivity effects of alternative ownership structures, including the propositions that outside ownership is more efficient than insider ownership and that managerial ownership is preferred over employee ownership. New and unusual data sets for large samples of firms in Estonia, Latvia and Lithuania enable comparable production functions specifications to be estimated for all three countries for varying years during the period 1993-1996. The main findings are: (i) the effects of majority ownership varies over time within a country; (ii) the effects of majority ownership varies across countries; (iii) majority employee ownership has either positive or zero effects upon productivity. Findings thus provide only weak support for the conventional wisdom.

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1. Introduction.

The need for more reliable empirical evidence on which forms of enterprise ownership are more efficient is especially acute in transition economies where the privatization process often has led to the largely unexpected growth of widespread insider ownership (Nuti, 1997; Uvalic and Vaughan-Whitehead, 1997). In the main, theorists (e.g. Boycko et al. 1993) argue that economic efficiency in post communist economies demands that the vast bulk of firms in the socialized sectors should be privatized. The other key matter concerns the preferred ownership structure for privately owned firms -- whether they are insider or outsider controlled and, if insider controlled, whether the controlling group are managers or workers (Bim et al., 1994). For reasons including easier access to capital markets and ease in solving the agency problems of governments that try to control firms, the dominant view is that firms with outside ownership are expected to be more efficient than firms owned by insiders (e.g. Boycko et al. 1996). In addition, primarily because of allegedly providing superior ways of resolving agency issues within the firm, the most efficient form of insider ownership typically is argued to be manager (rather than employee) ownership (e.g. Earle and Estrin, 1996). However, in fact theory is more ambiguous on some of these matters. For example, in the literatures on the economics of participation and transition a number of arguments have been developed as to why insider ownership (especially when broadly based) may be more conducive to enhanced organizational performance. (e.g. Ben-Ner, 1993.)

In helping to resolve these debates the empirical evidence for transition economies is quite slim. While there have been some important early attempts to portray patterns of ownership and corporate governance [1] usually, as noted by Aghion and Carlin (1997), many studies suffer from problems including difficulties in obtaining data for large samples and a tendency to focus only on selected cases, usually Russia and the Visegrad countries. In this paper, by drawing on rich new enterprise-level data sets for more than 1,250 firms in Estonia, Latvia and Lithuania, we report findings relevant to a broader group of countries and a larger number of firms than hitherto has been available. Diverse patterns of enterprise ownership have emerged. Hence, since the Baltic Republics began transition from substantially similar starting points, in examining the effects of different ownership structures on enterprise performance, the case of the Baltic Republics potentially is especially informative. The structure of the paper is as follows.

In the next section we briefly review relevant theory. Next our firm-level data are used to

to provide one of the most comprehensive portraits of changing ownership structures in transition economies. In the main part of the paper, by estimating similar specifications for the three Baltic Republics, our unusual data enable us to examine competing hypotheses on the effects of different ownership structures in newly privatized firms upon productive efficiency.

II Predictions from Economic Theory

Since ours is not a theoretical contribution, in this section we survey key themes in the literature, which examines the relationship between enterprise productivity and enterprise ownership. Given its importance in transition economies, our focus is on employee ownership. In helping to clarify key issues it is helpful to review some typologies of firm types.

From the corporate governance literature, firms are often classified by ownership. An *open joint-stock company* issues publicly traded ownership shares and the company's assets are owned by individuals in proportion to their share holdings, and the firm is controlled by those who own a controlling packet of shares. A *closely held firm* is owned and operated by a person or group closely attached to the firm as owner(s) and/or manager(s).

In the case of open joint stock companies, with respect to the exercise of effective control over enterprise operations, two alternative possibilities may be distinguished: ownership (which is often used to indicate control) by *insiders* or *outsiders*. Insiders include all the people working in the enterprise. An insider-controlled firm may be effectively controlled by its managers, by its workers (either directly or indirectly, e.g .via a workers' council), or by some combination of the two. Outsiders include those whose attachment to the enterprise is based on an ownership stake rather than on work within the enterprise. Outsiders may be individual owners or shareholders, or they may be institutional shareholders (i.e. financial intermediaries such as investment trusts.)

In the human resource management practices (HRMPs) literature (e.g. Lewin et al. 1997) and the literature on the labor managed firm (e.g Bonin et al. 1993), typically a broader tack is taken. For example, Ben-Ner and Jones (1995) develop a typology of firms that is based on different packages of HRMPs. In particular this typology distinguishes for different economic agents the extent of participation in *control* versus participation in economic *returns*. Also, some authors stress other aspects of ownership. For example, Mygind (1992,1997) emphasizes the importance of the *distribution* of ownership when classifying enterprises.

By referencing these typologies competing hypotheses concerning the relationship

between enterprise productivity and employee participation in ownership may be generated. In the first classification, the case for *open joint-stock companies*--and an active capital market in company shares--rests mainly on the putative advantages of such a system in raising capital funds, in allocating those funds flexibly among competing enterprises and in disciplining managers. Outsider control means that enterprise decisions will be guided primarily by the objective of maximizing returns on investors' capital. The justification for this approach is that only outsiders can be expected to proceed rapidly with enterprise restructuring, not hesitating to liquidate unprofitable assets and to dismiss redundant workers; moreover, outsiders are more likely to be able to mobilize new resources to invest in the enterprise and less likely to be able to evoke and to rely on soft government budget constraints.

The outsider-control model has several variants depending on the locus of effective control and the terms on which shares are made available to buyers. On the one hand, there could be open sale of shares in corporatized state enterprises in the hope that a "strategic (core) investor" will take over control, or in the expectation that an active stock market will discipline management even in a context where share ownership is widely dispersed among many small investors. On the other hand, there could be established strong financial intermediary institutions (holding companies, mutual funds, etc.) which are expected to buy controlling packets of shares in companies and proceed to restructure and monitor them. There also exists, however, the possibility of a different outcome in the event that no external strategic investor takes over control (because shares are diffused to many small investors, or because the bulk of the shares can't be sold and remain in the hands of state property agencies), and no appropriate financial intermediary institutions emerge, and no well-functioning capital market develops. This default outcome is that the locus of effective control over the "privatized" state enterprises really does not change -- it continues to be run by previous managers, influenced by workers, with government authorities continuing to take a strong interest in the enterprise.

Critics question whether stock markets actually perform such function effectively, especially in the formerly centrally planned economies with very underdeveloped capital market institutions. In addition, many hypothesize that firms owned by their workers will have inferior economic performance. It is argued that the perceived interests of enterprise workers are likely to conflict in important respects with the long-run interests of their enterprise. It is held that workers will underinvest in capital equipment, that productivity will be low as worker-owners

expend little effort and that layoffs will be resisted. The conventional wisdom is that significant employee ownership will have detrimental effects on enterprise performance and undermine the ability of newly-privatized firms to undertake meaningful restructuring (e.g. Boycko et al. (1996.)

However, some types of insider-owned structures, i.e. companies owned and operated by their former managers, with a strong voice for workers, can be justified on several grounds (Ben-Ner, 1993). This is especially the case when insider-ownership co-exists with participatory HRMPs (Ben-Ner and Jones, 1995). Advocates of *closely held* firms argue that such firms are more likely to be characterized by a focussed, tightly-knit, flesh and blood ownership group with a strong stake in enterprise performance--as compared with the alternative of external ownership of joint stock companies. In *insider controlled* firms, the security and stability of the enterprise and its work force will weigh more heavily in decision-making.

Arguably insider ownership and insider control is more conducive to enterprise stability and long term employment relationships and thus may contribute to better economic performance in a number of ways. In turn, this is especially likely to be the case when insider control is broadly distributed, with non-managerial employees owning more shares than do managers (Mygind, 1996.) The closer alignment of the goals of the different economic agents within firms may better motivate workers to join in restructuring efforts and to better use their accumulated experience and firm-specific knowledge. In particular, a direct and positive effect of ownership by non-managerial employees (as well as managers) may result from enterprise success being reflected in a higher stock price. In such cases, the interest of the firm is more aligned with the interest of its employees. For several reasons, these interest alignment effects can be expected to be more significant in firms in which the precise institutional arrangements enable broad participation by employees (and are not restricted to executives) and in which employee ownership constitutes a significant part of the average employees' wealth.

Goal alignment effects of employee participation via information sharing (e.g. small group activities) are more subtle (but not necessarily weaker) than effects through ownership. Small group activities may provide valuable opportunities for both management and labor to learn about each other in a cooperative atmosphere, and thus to develop stronger trust. With stronger trust, sharing vital business information with labor will help convince labor that it is in their interest to improve productivity and firm performance. Also, greater enterprise stability may encourage more salvaging of still useful capital stock, and it may help to avoid a cascade of business failures due to

the shutdown of one key enterprise in a productive structure still characterized by an inflexible network of input sources and output outlets.

III Privatization and Ownership Structures in the Baltics

Since our econometric work hinges on the way that ownership structures and choices differ by country, it is important to provide information on the varying institutional arrangements as well as stylized facts on the issues under consideration. In particular we consider key aspects of the differing legal arrangements and formal institutional structures (especially ownership structures) that have emerged in the independent Baltic Republics in the 1990s. We give special consideration to employee ownership and privatization.[2]

Many of the institutions that characterized industrial relations during Soviet times have either disappeared or have had their functions changed considerably. Thus while the old state trade unions have been succeeded by new independent and plural unions, in all countries these appear to be quite weak.[3] Also, the usual panoply of enterprise level arrangements that potentially provided for employee participation, such as production committees, brigades and the work collective, existed in the past in the Baltic Republics. However, these appear to have virtually disappeared (e.g. Shteinbuka, 1995, for Latvia), though it is less clear what mechanisms today do govern the employment relationship.

Turning to the new ownership arrangements, compared to the Russian case (and also those in Eastern and Central Europe), unsurprisingly not only have the Baltic States received much less attention, but also much less is known about them.[4] What is known is sometimes quite surprising. Thus in Lithuania, privatization has proceeded even faster than in the Czech Republic and, as in Russia, the privatization program apparently has resulted in the development of extensive employee ownership. Moreover, this outcome has been consciously and consistently encouraged by a favorable political climate with legislation introducing devices including concessional shares for employees (and not encouraging foreign ownership.) Also, while vouchers have been used, they had limited rights of transferability. Consequently, it appears that the bulk of enterprises in Lithuania are majoritarian employee owned (Mygind, 1997.)

By comparison, in Estonia, while initially there was some mild support for employee ownership, best represented by the nurturing of a handful of "people's enterprises", the privatization legislation did not convey special advantages to employees. Yet concerning the

privatization of small firms, some advantages were given to employees -- e.g. through concessional shares. Hence the employee ownership that has emerged apparently has largely occurred in spite of legislation and a political climate which mainly had other objectives. Thus there has been limited use of vouchers for privatization of enterprises and the bulk of the privatization of big firms has come through mechanisms resembling those used in the former East Germany -- with a Treuhand-like privatization agency soliciting tenders for state firms. A core investor model has been encouraged and foreign ownership has been aggressively and fairly successfully sought.

In Latvia soon after separation from the USSR there was an active debate on employee ownership. While the details are sketchy it appears that the law on large-scale privatization does not provide for any special advantages for employees. However, in practice, it appears that insiders have been favored. In some cases, this appears to have resulted from a management and/or an employee buyout after a leasing plan had initially been introduced. But large scale privatization has proceeded rather slowly in Latvia.[5]. However, small scale privatization has proceeded faster and often, in part because of the influence of local authorities in the privatization process, it appears that insiders have been favored.

While the discussion thus far suggests that there are believed to be very different patterns of *ownership* emerging across and within the three Baltic Republics, at the same time, the data available at enterprise level with which to gauge what is actually happening, are often quite limited. For example, the pioneering study of privatization in the Baltics by Frydman et al. (1993) does not contain much enterprise-level information.

To begin to provide concrete information on some of these processes in the survey countries, we draw on new survey data.[6] So far as ownership is concerned, in many respects we have data that are comparable in coverage across countries and also cover many areas, including information on the extent of ownership amongst employees, managers, key groups of outsiders and the state. Thus if we define "control" as a group owning a *majority* of the voting shares, this enables us to identify which group is the *majority* owner in each firm. That information, together with key economic averages for our more than 1250 sample firms, is reported in Table 1.

Perhaps the most interesting data are for Estonia. The sample is large -- 655 firms in 1993, falling to 566 firms by 1996-- and representative of the underlying population. For Estonia there is evidence both of considerable heterogeneity in majority ownership as well as of substantial shifts

in ownership configurations during 1993-1996. Thus whereas the most common form of majority ownership is always state ownership, the importance of majority state ownership falls markedly, with such firms accounting for 39% of the sample in 1993 but only 28% by 1996. Also while there are always firms that are majority employee owned, their numbers fall dramatically–from 12% of the sample in 1993 to about 6% in 1996. By contrast cases of majority ownership by managers become more common as do instances of majority outside ownership by both foreigners and domestic citizens.

Compared to the Estonian case the data for Lithuania reveal very different patterns of majority ownership though, as in Estonia, ownership configurations that often are quite fluid. In Lithuania majority ownership by foreigners is always unimportant with by far the most important type of majority ownership being ownership by domestic citizens. Compared to Estonia, majority ownership by insiders is less important though the trends are consistent --between 1994 and 1995 more firms became majority owned by managers and there were fewer firms in which employees have the majority stake. Also in Lithuania often ownership is quite dispersed -- in more than one-in-four firms no clear majority owner can be identified.

Turning to Latvia, the situation is quite different from the other Baltic Republics. In both years, ownership by insiders is much more pronounced and accounts for at least half of sample firms (compared with about 20% in Estonia and 12% in Lithuania.) While data are available only for two consecutive years, nevertheless they suggest that ownership configurations are much more stable in Latvia. For example, while the percentage of firms that are majority owned by employees falls in all three countries, the decline is much slowest in Latvia.

IV Estimating Framework

In designing our empirical strategy, we note that relatively little empirical work on the effect of ownership structures on enterprise behavior is available for former communist countries. Moreover, partly in response to the unusual difficulties that confront applied researchers in transition countries - for example, the large measurement errors in key variables such as capital - much work has been of an exploratory character.[7] In this paper, by drawing on the huge literature that has examined similar matters for firms in western countries and which is grounded in a well-established conceptual framework, we adopt a different tack.[8]

In estimating the impact of various ownership structures on productive efficiency, for each

country we therefore estimate equations of the general form:

$$Q = F(K, L, H, Z) \qquad (1)$$

Where Q denotes a measure of output, K and L are a measure of total capital stock and total employment; H is a vector of variables representing the effects of ownership structures; and Z is a vector of control variables such as industry and labor quality. To see how the ownership variables enter equation (1) consider the Cobb Douglas case when the effects of ownership structures are disembodied. In logarithmic form this becomes:

$$\ln Q = Å_0 + Å \ln K + Æ \ln L + \%_i à_i H + \%_i ã_i Z. \qquad (2)$$

In this paper, we estimate (1) by using the new enterprise-level data sets for each of the three Baltic Republics. Typically these data sets are derived by combining information contained in two sources: (i) special ownership surveys (for which we have presented information on ownership patterns in the previous section); (ii) information provided by the statistical authorities on standard balance sheet and income statement variables, such as sales and capital stock and information on employment and wages.[9] Since our data are typically available only for a short period of time, and also because when multiple years of data are available we are interested in comparing the influences on productive efficiency across countries , we emulate a strategy that has been widely used in early empirical studies of transition economies (e.g. Estrin and Earle, 1996) and estimate OLS cross sectional regressions.[10]

In addition, the available data allow us to devise variables in the H vector that are identical across countries. Specifically we always include a vector of five majority ownership variables -- whether the majority owners are employees, managers, domestic outsiders, or foreigners or whether there is no majority (the omitted case is state majority ownership.)

For all countries, and unlike many other studies of transition economies, the measure of enterprise production we use is the conceptually preferable value added. For control variables, Z, always our data allow us to include industry dummies, and one or more dummies that capture an important regional dimension (e.g. in Estonia, location in Tallinn or otherwise.)

Another important aim of our analysis is to identify the most appropriate form of the production function, in case the effects attributed to the ownership variables when a single functional form is imposed are in fact due to misspecification of technology. We therefore estimate diverse specifications and, after estimating forms including the generalized Cobb-Douglas and translog production functions, the production function that is best supported by the

data is selected on the basis of appropriate test statistics.[11]

Findings for the three countries are contained in Tables 2- 4. Before discussing the findings concerning ownership for individual countries we first make some general observations. We see that in all estimates we see that the augmented production functions display reasonably good fits for cross section estimation, with adjusted R^2 of between 0.40-0.75. Also, in general the coefficients on the factor inputs are precisely estimated at plausible levels. For example, in 1995 in Latvia (Table 4) the CD factor weights indicate that, on average, Latvian firms operate with a 0.78 labor share and a capital share of about 0.21, thus indicating that there are essentially constant returns to scale. So far as the choice of technology is concerned, ordinarily on the basis of specification tests it is the translog form that proves to be the best choice and thus it is that functional form of technology that is reported (in all cases except for Latvia in 1995.) Also, for all countries and for all years we find that F tests reject the hypothesis that the joint effect of the set of industry dummies upon productive efficiency is nil while support for the effects of regional variables is much more mixed.

We begin first by looking at the results for Estonia. The effects of majority ownership are shown in the vector of five-majority ownership dummy variables -- MAJFOR thru NOMAJ. (The omitted category is MAJSTA, where the state is the dominant owner). The effects of these ownership dummy variables upon performance hinge on their joint significance. F tests indicate that in 1993, the joint effect of these ownership variables on productive efficiency is nil. However, one might expect that the effects of employee ownership at least would not be evident until the new structures had been in place for some time.[12] Consistent with this view, when the exercise is repeated for 1994 then an F test on the joint exclusion of the vector of ownership variables leads us to *reject* the hypothesis that the various forms of ownership, taken together, do *not* affect productivity. A similar finding emerges when the exercise is repeated in 1995-- again we cannot exclude the H vector from the preferred specification. Moreover, in those years, this conclusion holds when specifications using other technology (e.g. Cobb Douglas) are estimated. In other words, the statistically significant effects of the included ownership variables upon productive efficiency do not depend on the particular functional form adopted to describe production technology. However, by 1996 the effects of ownership had waned - the H vector can be excluded from the preferred specification.

In addition, often the coefficients on particular forms of majority ownership are

statistically significant. This is most apparent in 1994 when, relative to the omitted category of majority state ownership, majority ownership by foreigners, employees or domestic individuals enhances productive efficiency. Sometimes the size of the effect is quite large. Indeed the coefficient estimates indicate that, relative to state ownership, majority ownership by foreigners leads to performance that is at least 74% higher in both 1994 and 1995. According to these estimates in both 1994 and 1995, there is support for the hypothesis that, compared to state ownership, foreign ownership leads to less X inefficiency in Estonian firms and that majority ownership by foreigners is the most efficient form of private ownership. However, in 1994, contrary to the conventional wisdom, majority ownership by employees is found to be the superior form of insider ownership. In addition, the estimates indicate that the pattern of findings does not persist. Thus in 1996, no form of majority private ownership has effects on productive efficiency that are statistically significant and the coefficients for both forms of outsider ownership are negative. In other words from the reported specifications for 1996 (and 1993) there is no evidence that other forms of ownership are more or less productive than state firms.[13]

In addition, relative to majority state ownership, ownership without a clear majority has a positive effect upon business performance in 1994 and 1995. The size of the effect is also surprisingly large during these years (and especially in 1994.).

Thus most of the time the results for Estonia may be interpreted as providing reasonably strong support for the beneficial effects of privatization. Concerning the preferred ownership form, the findings provide mild support for the hypothesis that outsider ownership produces diverse benefits that result in better organizational performance (compared to state ownership). Also, employee ownership produces more interest alignment and more involvement of employees and, in turn, better organizational performance (compared to majority ownership by managers as well as state ownership). Equally the beneficial effects of new forms of private ownership are found to be slow in coming (none are found in 1993) and, either are soon dissipated (no benefits are found for 1996) or, the state firms subsequently exhibit faster productivity growth. Finally, the findings on the sometimes-beneficial effects of not having a clear majority owner suggest that corporate governance problems in transition economies may not always be best addressed by having a clear majority owner.

Turning to Lithuania (Table 3), when the common specification is estimated, the effects of majority ownership upon productive efficiency are very different than in Estonia. F tests indicate

that in both years the joint effect of the vector of five majority ownership dummy variables upon productive efficiency is nil. Moreover, in both years there are no cases in which, relative to majority state ownership, the effect of any individual form of private ownership is statistically significant. In other words from the reported specifications for Lithuania there is no evidence that other forms of ownership are more or less productive than are state firms. In turn, these findings also provide no support for hypotheses on the preferred form of private ownership.

The results for Latvia are given in Table 4. The hypothesis that the joint effect of the vector of majority ownership variables upon productive efficiency is nil is rejected in 1994 but accepted in 1995. By inspection of individual ownership coefficients it is majority ownership by domestic individuals that has the largest (and statistically significant) effect upon productive efficiency. Thus in 1994 majority ownership by domestic individuals enhances performance by a huge 75%. As such these findings reject the hypothesis that the preferred form of private ownership is foreign ownership. However, for 1994 (though not for 1995), from the perspective of the impact upon business productivity, these findings do provide support for the view that the preferred form of insider ownership is majority ownership by managers (and not by employees.) Finally, for 1994, compared to majority state ownership, the ownership structure that does best is when there is no clear majority. Moreover the effect is an extraordinary 86% effect.

V. Conclusions

In this paper we report some of the first findings relating to the nature and effects of new forms of enterprise ownership that are emerging in the post communist Baltic economies. These findings are derived from new enterprise-level data for more than 1,250 firms in Latvia, Estonia and Lithuania and are especially rich in details of ownership structures.

On the nature and scope of employee ownership, in all Baltic Republics insider (including employee) ownership is quite prevalent. In many firms, insiders are the dominant owners. Also the available data indicate that on average, most insiders are owners. Second, we see that there are, substantial differences in ownership patterns within and across countries. Third, as is most clear from Estonia where the data on dynamics are more extensive, ownership patterns are not stable but are evolving. Importantly there is evidence of growing ownership by managers and diminishing instances of majority ownership by employees.

To examine the potentially changing effects of ownership on enterprise productivity

during transition, we estimate cross sectional production functions using identical specifications for all three Baltic Republics. In these findings, perhaps the most interesting result is that the effects of majority ownership vary enormously over time and across the three countries. Thus whereas in Estonia and Latvia, there is evidence that privatization matters, findings for Lithuania indicate that the performance of state and privatized firms is not statistically significantly different. And in Estonia, the effects of different ownership structures are much more apparent in 1994 and 1995 than in 1993 and 1996.

The evidence is quite mixed concerning hypotheses on the effects of particular ownership configurations. Perhaps the strongest support for the conventional wisdom is found in Estonia where in two years it is majority ownership by foreigners that is found to have the largest impact on productive efficiency. At the same time, relative to state ownership, there is always evidence of either positive or zero effects of employee ownership upon productivity. Moreover, in some instances (e.g. Estonia 1994) majority ownership by employees is found to deliver better business performance than does majority ownership by managers. Also, results for Latvia sometimes point to ownership by domestic outsiders as the preferred form of outside ownership.

Since the Baltic Republics began transition from starting points that were quite comparable in important respects, it is perhaps surprising to uncover evidence of considerable differences in the effects of ownership (including employee ownership) on productivity across countries. However, studies that typically have used other empirical approaches to investigate the effects of ownership in other transition countries have failed to uncover consistent findings.[14] In addition, there is abundant evidence for other western experiences that the productivity effects of particular forms of ownership, for example employee ownership, differ markedly from one institutional setting to another (e.g. Bonin, Jones and Putterman, (1993); Doucouliagos, 1995). Hence it is likely that in accounting for differences in findings across countries that some of differences in the institutional settings as well as differences in policies will be playing a part.

However, it must be stressed that, for a variety of reasons, our results must be considered as preliminary. There is an acute need for additional research in this dynamic area. Always we are able to examine for only some of the sets of ownership and participation variables which theory suggests are pertinent. (In particular we have no good measures of employee influence or of other HRMPs that may interact with ownership to influence productive efficiency and decisions on employment levels.) Also, to enable common specifications to be estimated across countries and

over time, our multivariate analysis is based on cross sectional estimates that have many potentially well-known problems. Also some of our samples may also suffer from selection biases. What this means is that much additional work remains to be done. Some of this can only be sensibly done by gathering additional data, by searching for the preferred specification for each country and by employing alternative empirical approaches.[15]

However, were these results to be corroborated in subsequent work they would have several implications. In particular, they may inform the often-heated debates on privatization that has been accompanied by an unexpected amount of insider, especially non-managerial worker ownership in many countries, not only in the Baltics but also in other transition economies, for example Russia.

Table 1: Descriptive Statistics Means (Standard Deviations)

	Estonia		Lithuania		Latvia	
	1993	**1996**	**1994**	**1995**	**1994**	**1995**
Value Added	4445	8537	4698	4623	887873	1043451
	(17946)	(18245)	(7166)	(9999)	(1537911)	(1640613)
Fixed Assets	8258	18245	8939	12302	233614	268494
	(44955)	(93433)	(19570)	(32246)	(583898)	(616905)
Employment	152	130	552	352	121	115
	(513.8)	(506.7)	(737.8)	(467.8)	(211.9)	(177.6)
MAJFOR (#)	83	88	4	7	11	13
	(13%)	(16%)	(1%)	(2%)	(8%)	(9%)
MAJDOM (#)	122	134	123	195	34	35
	(9%)	(24%)	(38%)	(43%)	(25%)	(24%)
MAJMAN (#)	62	90	6	33	36	38
	(10%)	(16%)	(2%)	(7%)	(26%)	(26%)
MAJEMP (#)	80	36	29	24	35	32
	(12%)	(6%)	(9%)	(5%)	(25%)	(22%)
NOMAJ (#)	58	60	93	121	8	12
	(9%)	(11%)	(29%)	(27%)	(6%)	(8%)

MAJSTATE (#)	255	158	70	72	16	14
	(3%)	(28%)	(22%)	(16%)	(12%)	(10%)
n	655	566	325	452	138	144

Note: 1. Value variable are in current prices and in thousands of units of the local currency.

Table 2: Estonia Production Functions, 1993-1996

	1993	1994	1995	1996
Constant	1.8451*	1.8702*	2.8940*	3.6163*
	(0.5755)	(0.5531)	(0.6478)	(0.7658)
Ln FA	0.1876***	0.1331	0.1145	0.2486
	(0.1126)	(0.1317)	(0.1367)	(0.1918)
Ln EMP	0.8344*	1.2590***	0.9101*	0.7583
	(0.0017)	(0.2256)	(0.2479)	(0.3173)
Ln FASQ	-0.0167	-0.0352*	-0.0223***	-0.0479***
	(0.0110)	(0.0138)	(0.0124)	(0.0171)
Ln EMPSQ	-0.0247	-0.0905***	-0.0735***	-0.1000**
	(0.0431)	(0.0500)	(0.0450)	(0.0563)
Ln EMP*Ln FA	0.0370	0.0802***	0.0876**	0.1394*
	(0.0338)	(0.0462)	(0.0396)	(0.0494)
MAJFOR	-0.2098	0.7445*	0.7907**	-0.0781
	(0.2556)	(0.2226)	(0.2955)	(0.3132)
MAJDOM	0.2238	0.5420*	0.1086	-0.0976
	(0.1881)	(0.1841)	(0.2567)	(0.2800)
MAJMAN	0.1584	0.2268	0.0323	0.0122
	(0.2546)	(0.2240)	(0.2745)	(0.2934)
MAJEMP	0.3516	0.4405***	0.2152	0.3420
	(0.2351)	(0.2526)	(0.3259)	(0.4017)
NOMAJ	0.3592	0.7034*	0.361**	0.1483
	(0.2631)	(0.2404)	(0.215)	(0.3263)
INDDUM	Yes*	Yes***	Yes**	Yes*
Tallinn	0.4401**		0.1747	0.1172
-0.0770				
	(0.1499)		(0.1457)	(0.1584)
(0.1927)				
n	531	620	511	443
R^2	0.51	0.46	0.52	0.41

Notes: * significant 1% level; ** significant 5% level; *** significant 10% level.

Table 3: Lithuania: Production Functions 1994-1995

	1994	1995
Constant	-4.566*	-5.946
	(5.9906)	(11.947)
In FA	2.7168*	1.7244
	(0.7976)	(1.7525)
In EMP	-2.1208*	1.6701
	(0.1107)	(2.2503)
In FASQ	-0.1720*	-0.0572
	(0.0339)	(0.0838)
In EMPSQ	-0.3092*	- 0.1459
	(0.1107)	(0.2062)
In EMP * LnFA	0.4482*	0.0452
	(0.1084)	(0.2467)
MAJFOR	0.5089	0.9830
	(0.9221)	(1.607)
MAJDOM	-0.1090	-0.0397
	(0.3016)	(0.5508)
MAJMAN	-0.0654	0.3373
	(0.7846)	(1.5811)
MAJEMP	0.2186	0.7073
	(0.4284)	(1.0451)
NOMAJ	0.0412	-0.3616
	(0.3058)	(0.5936)
INDDUM	Yes*	Yes**
REGION	Yes***	Yes
n	295	318
$\overline{R}^2$	0.44	0.19

Notes: * significant 1% level; ** significant 5% level; *** significant 10% level.

Table 4: Latvia: Production Functions 1994-1995

	1994	1995
Constant	9.0849*	7.2064*
	(1.0705)	(0.5158)
In FA	-0.2693	0.2096*
	(0.3197)	(0.0502)
In EMP	1.0779***	0.7846**
	(0.6083)	(0.1059)
In FASQ	-0.0030	
	(0.0206)	
In EMPSQ	-0.1897***	
	(0.0719)	
In EMP * lnFA	0.1200	
	(0.0762)	
MAJFOR	0.4838	0.3567
	(0.320)	(0.2978)
MAJDOM	0.7500*	0.3986***
	(0.2435)	(0.2190)
MAJMAN	0.4183***	0.1630
	(0.2538)	(0.2477)
MAJEMP	0.3295	0.3535
	(0.2424)	(0.2485)
NOMAJ	0.8613**	0.4488
	(0.3786)	(0.3170)
INDDUM	Yes*	Yes*
REGION	0.0096	0.2073
	(0.1856)	(0.1623)
n	128	132
$\bar{R}^2$	0.70	0.65

Notes: * significant 1% level; ** significant 5% level; *** significant 10% level.

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Notes

1. Most studies are for Russia (e.g. Blasi et al. (1997), Earle and Estrin (1996) and Jones (1998.) For Visegrad countries see Frydman et al. (1998) and Pohl et al. (1997). For general reviews see World Bank (1996) and Aghion and Carlin (1997.)

2. Our account draws heavily on (Mygind, 1996). We do not consider the fading days of communism and, for example, attempts at reform by leasing.

3. See Mygind (1996) and for the case of Estonia, see Jones (1996).

4. For accounts of these countries which also document the substantial differences in policies besides privatization, see the country reports of the World Bank and Mygind (1996).

5. By mid 1994 it was estimated that only 85 of 698 large firms had been privatized (EBRD, 1994) See also EBRD (1998) for more recent data.

6. These ownership surveys were designed by Mygind in collaboration with local teams in each of the Baltic Republics. For further information see Mygind (1996).

7. The main approach is to estimate cross sectional regressions in which the dependent variable is a measure of performance and ownership and other controls (often including a lagged value of the dependent variable) are the regressors (e.g. Earle and Estrin, 1996). See alsoFrydman et al., (1997) in which key variables are measured in privatization (rather than in calendar) time and performance is an average (a growth rate) over a period of time (rather than for a single year).

8. For reviews of work that often uses a production function or an efficiency frontier approach see Ben-Ner et al. (1996), Doucouliagos (1995) and Blinder (1990). Also see Jones (1993) for evidence on the effects of employee ownership in Polish firms during the planning period and Jones et al. (1998) for evidence for Bulgarian firms during early transition.

9. In this process we lose some observations. However, based on two sample mean t tests, there do not appear to be any significant differences in the nature of the samples that are used for the econometrics (reported in Tables 2-4) and the descriptive exercises (Table 1).

10. Eventually we plan to use panel data to estimate various other specifications of Eq. (1), including using fixed and random effects methods. However, since it is also important to examine for the potentially changing impact of firm characteristics during this period of systemic change, cross sectional estimates are also a useful strategy.

11. In unreported results we also estimated specifications using other forms of production technology, including Kmenta's approximation to the constant elasticity of substitution (CES). Depending upon the specification and the year the production function best supported by the data always is either CD or translog. However, the key coefficients of interest are not affected by the form of production technology.

12. For Japanese firms Jones and Kato (1995) find that employee ownership affects enterprise performance after a considerable lag.

13. Similar findings emerge from two sets of unreported regressions in which we use: (i) continuous measures of ownership; (ii) continuous measures of voting strength (based on differing ownership levels).

14. For reviews see Aghion and Carlin (1997.) Upon closer inspection, even the evidence for the proposition that finds most support -- that foreign ownership has beneficial effects upon firm performance -- is not overly strong. (e.g. Frydman et al. (1998).

15. For the case of Estonia see Jones and Mygind (1998.)