E C O N O M I C S B U L L E T I N

Firm Performance and Foreign Direct Investment: Evidence from Transition Economies

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We would like to thank John Nasir and Fabiano Bastos for their helpful data suggestions.
Citation: Yasar, Mahmut and Catherine J. Morrison Paul, (2007) "Firm Performance and Foreign Direct Investment: Evidence from Transition Economies." *Economics Bulletin,* Vol. 15, No. 21 pp. 1-11
Submitted: August 27, 2007. **Accepted:** October 10, 2007.
URL: http://economicsbulletin.vanderbilt.edu/2007/volume15/EB-07O50003A.pdf

Firm Performance and Foreign Direct Investment:

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Abstract

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Keywords: transition economies, Eastern Europe and Central Asia, firm performance, foreign direct investment, spillovers

JEL Classifications: F10, F14, D21, L60

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1. **Introduction**

Early studies such as Vernon (1966) and Caves (1974) suggested that multinational firms are more productive than their domestic counterparts and that the presence of multinational firms has a positive impact on domestic firms' performance. Foreign direct investment (FDI) by multinational firms has since been advocated as a primary source of technology diffusion and economic growth for developing countries. In addition to having positive impacts on trade, employment and capital, FDI has therefore been viewed as a key channel for transferring knowledge, skills, and technology, especially from industrialized to developing countries (Blomström and Kokko, 1998).

Such positive externalities or spillovers diffuse to the domestic economy through interactions between domestic and foreign firms, which facilitate the adoption of and investment in advanced technologies and the accumulation of knowledge and skills to effectively utilize the technology by domestic firms. These spillovers thus may have important impacts on the efficiency, productivity and competitiveness of firms, industries, and countries – particularly for middle- and low-income countries.

Empirical evidence of this phenomenon has, however been limited and conflicting. Most empirical studies (e.g., Blomström and Wolff, 1989, for Mexico, Haddad and Harrison, 1994, for Morocco, Aitken and Harrison, 1999, for Venezuela, and Girma, 2002, for the U.K.), have not found evidence of increases in domestic firm productivity from the industry presence of foreign firms. However, some industry level studies (e.g., Caves, 1974, for Canada and Australia, Globerman, 1979, for Canada, and Blomström, 1986, for Mexico), as well as firm level studies (e.g., Kokko et al., 1996, for Uruguay, Dimelis and Louri, 2002, for Greece, and Karpaty and Lundberg, 2004, for Sweden), do find evidence of spillovers to the domestic economy.

Further, Sjöholm (1999) finds for Indonesia that productivity spillovers are greater when the degree of competition in an industry is higher and the technology gap among firms is larger. Similarly, Kokko (1994), who finds no evidence of spillovers from foreign-owned firms for Mexico in high technology industries, suggests that spillovers depend on the complexity of the technology being transferred by foreign-owned firms and the (labor) productivity gap between domestic and multinational firms.

Although the impact of FDI on the performance of the domestic firms has not been examined for most of the countries in our dataset, some studies have considered this issue for Poland. For example, Konings (2001) examines the impact of foreign direct investment on the performance of domestic firms in Bulgaria, Romania and Poland, and finds that in Poland – the most advanced of the three countries – foreign firms perform better than their domestic counterparts. However, he finds no evidence of spillovers to domestic firms, and concludes that it may take time for ownership effects to influence domestic firms' performance due to restructuring lags. Damijan et al. (2001) obtain similar results to those obtained by Konings (2001).[1] Barell and Holland (2000) examine

[1] See Navaretti and Venables for the literature review of foreign direct investment.

the effect of FDI for 11 manufacturing industries in Hungary, Poland and the Czech Republic, and find that FDI increases the labor productivity in most industries.

The objective of this paper is to provide further empirical evidence on the performance effects of foreign ownership, from the perspective of firms in five Eastern Europe and Central Asian countries. We use cross section survey data collected by the World Bank for garment and food processing firms in Poland, Moldova, Tajikistan, Uzbekistan, and the Kyrgyz Republic – industries in which the complexity of the technology is relatively low although their capital intensity is increasing. We first estimate proportional differences in performance indicators for foreign versus domestic firms in the data. We then examine whether the presence of foreign-owned firms in an industry increases the productive performance of domestic firms.

We find that firms with a foreign ownership share are more productive than their domestic counterparts, and that a greater foreign share implies higher productivity. Such firms are also larger, pay more, hire more, and have a greater export share of sales and import share of materials. Further, we find that industry presence of foreign affiliates of multinational firms leads to performance improvements for domestic firms; that is, spillovers from foreign firms benefit domestic firms.

2. Plant Performance of Firms with Foreign Direct Investment

We first examine the relationships between foreign ownership and firm performance by measuring proportional differences between performance characteristics (P_i) of firms that have and do not have – or have a greater – foreign share, by estimating the equation:

$$\ln P_i = \alpha_o + \beta_{FDI} FDI_i + \beta_{EMP} EMP_i + \beta_{IND} IND + \sum_{c=1}^{C-1} \beta_c D_c + u_i \quad . \qquad (1)$$

Our P_i variables include a variety of production characteristics related to economic performance: levels of total factor productivity (*TFP*), labor productivity (*LP*),[2] output (*Y*), capital input (*K*), capital input per worker (*KI*), average wage per worker (*WI*), average skilled worker wage (*WSI*), average unskilled worker wage (*WUSI*), employment (*EMP*), managerial workers (*MW*), professional workers (*PW*), skilled production workers (*SP*), and unskilled production workers (*USP*). Additional P_i variables in our data are the share of sales exported (*EXPS*), the share of materials imported (*IMPS*), whether the firm developed/upgraded a new major product line or introduced a new technology (*INNOV*), and whether the firm regularly used the internet or email in its interactions with clients and suppliers (*INT*).

[2] Labor productivity (*LP*) is defined as *ln LP = ln Y – ln L*. Total factor productivity, *ln TFP = ln Y-ln X*, where *X* stands for capital, labor, energy and materials inputs, is calculated using output elasticities estimated from a Cobb-Douglas production function, including industry and country dummies and skilled labor share. We pooled the data but interacted the dummy variables with the inputs to test whether the coefficients varied by industry and country, which they did not.

Summary statistics for these data and other data relied on are reported in Table 1. The "BEEPS II – Business Environment 2002" data was collected by the World Bank through the 2003 *Investment Climate Survey* for five transition countries: the Kyrgyz Republic, Moldova, Poland, Tajikistan, and Uzbekistan. A sample of one hundred firms was drawn randomly from all size categories in each country. The questions used in the survey were identical in each country and interviewers conducted face-to-face interviews with firms' managers and bookkeepers or accountants.[3] Although over 500 firms were surveyed, because of the missing variables we ended up with 437 firms. The numbers of firms are 76, 96, 88, 99 and 78 for Poland, Moldova, Tajikistan, Uzbekistan, and Kyrgyz Republic, respectively. For the productivity measure, due to missing capital data, the numbers of observations are 66, 55, 57, 85 and 66 for Poland, Moldova, Tajikistan, Uzbekistan, and Kyrgyz Republic, respectively.

TABLE 1 HERE

The independent variables include a size measure (*EMP*, the natural log of employment, representing differences in the production technologies of different size firm)[4], an industry dummy (*IND*=0 for food and *IND* =1 for garment manufacturers), and country dummies (D_C, where Moldova is the base).[5] The variable of primary interest, *FDI*, is alternatively measured as a dummy variable indicating whether the firm has any foreign share, and as the foreign ownership share. According to the OECD, foreign direct investment is defined as the ownership or control of 10 percent, or more, of assets by a foreign company. In our sample, the lowest (positive) share is 18 percent, which thus becomes the ownership threshold of direct investment in our sample. The firms are therefore defined as at least partially foreign owned if foreign interests control 18 percent or more of the assets.

The β_{FDI} coefficient on the *FDI* dummy thus indicates the average percentage difference in P_i (the premium in terms of the performance characteristic P_i) between the firms with and without a foreign share, conditional on size, industry and country dummies. The β_{FDI} estimate for the foreign share is similarly interpreted as the percentage difference in P_i if the foreign share increased. Such estimates avoid the potential endogeneity problems often thought to plague production function estimation (Bernard et al., 2003), and have been shown to be consistent with other methods that directly address such econometric issues by Yasar and Paul (2007a,b). The resulting estimates are presented in Table 2.

[3]The "BEEPS II – Business Environment 2002" data was collected by the World Bank through the 2003 *Investment Climate Survey*. See Bastos and Nasir (2004) for a detailed explanation of the data.

[4] This is omitted when the dependent variable is based on overall employment or on a per employee basis.

[5] We tried other control variables, such as *EXPS*, *IMPS*, *INT*, and *INNOV*, but the results are very similar to those reported here. We also interacted the industry and country dummy variables with the *FDI* variable to test whether the coefficients varied across the industries and countries. The regression coefficients did not, however, differ significantly by industry and country.

TABLE 2 HERE

All of the estimated coefficients are significant and positive, indicating that firms with a foreign share have greater productivity levels, capital intensity, size, payscales, and labor force. This is consistent with Yasar and Paul (2007a), who find similar performance effects for Turkish manufacturing plants using both production function and premia estimation, and Yasar and Paul (2007b) who use matching methods.[6] These firms also export, import, introduce new products or technologies, and take advantage of the internet more than the domestic firms. The estimated effects are consistent, but even stronger, when estimated in terms of the share rather than presence of foreign ownership.

3. Spillover Effects

Second, we evaluate productivity spillovers to the host economy as the effect of the extent of foreign presence in the industry on the performance of the domestic firms. We use two measures as indicators of foreign presence, *FDINS*, for each country: the share of foreign firms in an industry's employment, and the share of foreign firms in an industry's sales. Our estimating equation is:

$$\ln PM_i = \alpha_o + \beta_{FDIS} FDINS_i + \beta_{EMP} EMP_i + \beta_{EXP} EXP_i + \beta_{IMP} IMP_i + \beta_{IN} INNOV_i + \beta_{INT} INT_i + \beta_{IND} IND + \sum_{c=1}^{C-1} \beta_c D_c + u_i \quad , \qquad (2)$$

where the performance measures PM_i include total factor productivity, labor productivity, capital input per worker, average wage per worker, and the percent of sales exported. A significant coefficient on the *FDIS* variable, β_{FDIS}, therefore indicates spillovers from foreign-owned to domestic firms. *EMP*, *EXPS* (except when it is the dependent variable), *IMPS*, *INNOV*, *INT*, and industry and country dummy variables are the control variables.[7]

The results presented in Table 3 show positive impacts of relative foreign presence on domestic firm performance, or industry spillover effects. For example, when foreign presence is measured by the foreign firm employment share (the second column), the estimates show that an increase of 0.1 in *FDINS* is associated with 0.14 percent higher total factor productivity, 0.52 percent higher labor productivity, 0.77 percent higher capital intensity, 0.48 percent higher average wage, and 0.15 percent higher export share. When the foreign sales share is instead used as in indicator of foreign presence, the estimates in the third column again show a positive impact of foreign presence on domestic firm performance for all indicators.

[6]The production function in this case was estimable by instrumental variables because it was based on time series data, and the premia estimation is often used to avoid such problems (see Bernard et al., 2003). The matching methods used by Yasar and Paul (2007b) provide a direct counterfactual and thus imply causality.

[7] We also interacted the industry and country dummy variables with the variables for the degree of foreign presence and found that the coefficients do not significantly differ by industry and country; the results are available upon request.

TABLE 3 HERE

4. Conclusions

For our data on garment and food manufacturers in transition economies we find that foreign owned firms perform better according to a number of indicators than their domestic counterparts. Controlling for size, industry and country, they exhibit higher productivity, capital intensity, wages, employment, export share of sales, import share of materials, and innovation. One would thus expect positive spillovers from such firms to benefit domestic firms in these developing countries, which are also evident from our data. As the industry foreign share increases the performance of domestic firms in terms of productivity, export share, and capital and average wage per worker is enhanced.

These findings support the hypothesis that foreign companies bring with them technology and skills, access to foreign markets, and new employment opportunities that enhance the performance of host country firms. This in turn suggests that connections with foreign owned firms should be encouraged by policies regarding foreign presence to enhance firm and industry productivity and competitiveness in transition economies.

References

Aitken, B., and A. Harrison (1999) “Do Domestic Firms Benefit from Foreign Direct Investment? Evidence from Venezuela” *American Economic Review* 89, 605-618.

Barrell R., and D. Holland (2000) "Foreign Direct Investment and Enterprise Restructuring in Central Europe” *Economics of Transition* 8(2), 477-504.

Bastos, F., and J. Nasir (2004) “Productivity and the Investment Climate: What matters Most? World Bank Policy Research Working Paper 3335.

Bernard, A.B., Eaton, J., Jensen, J. B., and S. Kortum (2003) “Plants and Productivity in International Trade” *American Economic Review* 93,1268-1290.

Blomström, M. (1986) “Foreign Investment and Productive Efficiency: The Case of Mexico *Journal of Industrial Economics*15, 97-110.

Blomström, M., and A. Kokko (1998) “Multinational Corporations and Spillovers” *Journal of Economic Surveys*12, 247-277.

Blomström M., and E. N. Wolff (1989) “Multinational Corporations and Productivity Convergence in Mexico” NBER Working Paper 3141.

Caves, R. E. (1974) “Multinational Firms, Competition and Productivity in Host Country Markets” *Economica* 41,176-93.

Damijan, J. P., M. Knellb, B. Majcenc, and M. Rojecd (2003) "The role of FDI, R&D Accumulation and Trade in Transferring Technology to Transition Countries: Evidence from Firm Panel Data for Eight Transition Countries" *Economic Systems* 27 (2), 189-204.

Dimelis, S., and H. Louri (2002) “Foreign Ownership and Production Efficiency: A Quantile Regression Analysis” *Oxford Economic Papers* 54, 449-469.

Girma, S. (2002) “Adaptive Capacity and Productivity Spillovers from FDI: a Threshold Regression Analysis” GEP Research Paper 2002/08.

Globerman, S. (1979) “Foreign Direct Investment and Spillover Efficiency Benefits in Canadian Manufacturing Industries” *Canadian Journal of Economics*12, 42-56.

Haddad, M., and A. Harrison (1993) “Are there Positive Spillovers from Direct Foreign Investment? Evidence from Panel Data for Morocco” *Journal of Development Economics* 42, 51-74.

Karpaty, P. and L. Lundberg (2004) “Foreign Direct Investment and Productivity Spillovers in Swedish Manufacturing” Örebro University Working Paper Series 2.

Kokko, A. (1994) "Technology, Market Characteristics and Spillovers" *Journal of Development Economics* 43, 279-93.

Konings J. (2001) "The Effects of Foreign Direct Investment on Domestic Firms: Evidence from Firm-Level Panel Data in Emerging Economies" *Economics of Transition* 9(3), 619-33.

Navaretti, G. B., and A.J. Venables (2005) *Multinational Firms in the World Economy*, Princeton University Press.

Sjöholm, F. (1999) "Technology Gap, Competition and Spillovers from Direct Foreign Investment: Evidence from Establishment Data" *Journal of Development Studies* 36, 53-73.

Vernon, R. (1966) "International Investment and International Trade in the Product Cycle" *The Quarterly Journal of Economics* 106, 190-207.

Yasar, M., and C.J. Morrison Paul, C.J. (2007a). "International Linkages and Productivity at the Plant Level: Foreign Direct Investment, Exports, Imports and Licensing." *Journal of International Economics* 72(1), 373-388.

Yasar, M., and C. J. Morrison Paul (2007b) "Technology Transfer and Productivity: Evidence from a Matched Sample." *Journal of Business and Economic Statistics*, forthcoming.

Table 1: Mean Values of the Variables

	Poland (76)	Moldova (96)	Tajikistan (88)	Uzbekistan (99)	Kyrgyz R. (78)
Natural log of					
Output, *Y*	6.405	4.921	2.797	3.751	4.081
Output per worker, *LP*	3.190	1.295	0.582	0.410	0.519
Capital, *K*	5.041	3.666	2.592	3.295	3.312
Materials, *M*	5.868	4.074	2.013	3.027	3.346
Energy, *E*	4.039	2.644	0.428	1.687	1.826
Average wage, *W*	4.613	3.242	1.266	1.710	2.601
Average skilled wage, *SW*	7.222	5.283	4.681	4.248	4.789
Average unskilled wage, *USW*	5.530	3.469	3.058	2.587	3.076
Employment, *EMP*	3.343	3.701	2.216	3.319	3.581
Managerial workers, *MW*	0.604	1.011	0.276	0.535	0.675
Professional workers, *PW*	1.293	1.402	1.247	1.266	1.793
Share of					
Skilled production workers, *SPW*	2.637	3.013	1.538	2.965	2.937
Unskilled production workers, *USPW*	2.077	2.588	1.309	2.043	2.352
Export share, *EXPS*	0.032	0.235	0.008	0.023	0.090
Import share, *IMPS*	0.224	0.412	0.051	0.055	0.136
Foreign share, *FDIS*	0.032	0.059	0.011	0.134	0.063
Innovation, *INNOV*	0.579	0.746	0.636	0.290	0.671
Internet, *INT*	0.692	0.534	0.034	0.140	0.354

Notes: Numbers of observations are in parentheses in the first row. For the productivity measure, due to missing capital data, the numbers of observations are 66, 55, 57, 85 and 66.

Table 2: Differences between Foreign Owned and Domestic Firms

	FDI Dummy	FDI Share
ln TFP	0.137	0.190
	(0.039)***	(0.051)***
ln LP	0.686	0.793
	(0.133)***	(0.179)***
ln Y	2.177	2.427
	(0.272)***	(0.378)***
ln K	1.737	2.017
	(0.282)***	(0.390)***
ln K/L	0.633	0.871
	(0.200)***	(0.268)***
ln W	0.470	0.543
	(0.104)***	(0.139)***
ln SW	0.227	0.300
	(0.112)**	(0.146)**
ln USW	0.391	0.552
	(0.108)***	(0.143)***
ln EMP	1.695	1.934
	(0.235)***	(0.317)***
ln MW	0.753	0.712
	(0.137)***	(0.187)***
ln PW	0.739	0.881
	(0.196)***	(0.260)***
*ln SPW*s	1.574	1.665
	(0.257)***	(0.348)***
ln USPW	0.865	0.950
	(0.267)***	(0.363)***
EXPS	0.269	0.368
	(0.036)***	(0.048)***
IMPS	0.089	0.135
	(0.046)**	(0.061)**
INNOV	0.184	0.288
	(0.078)**	(0.103)***
INT	0.235	0.339
	(0.068)***	(0.090)***

Note: * denotes significant at the 10% level, ** at the 5% level, and ***significant at the 1% level.

Table 3: Spillover Effects

Dependent Variables	**Employment Share**	**Sales Share**
ln TFP	0.014 (0.007)**	0.007 (0.004)*
ln LP	0.052 (0.025)**	0.042 (0.015)***
ln K/L	0.077 (0.035)**	0.049 (0.020)***
ln W	0.048 (0.020)***	0.028 (0.011)***
EXPS	0.015 (0.004)***	0.025 (0.004)***