GLOBALIZATION AND HUMAN CAPITAL FORMATION: EMPIRICAL EVIDENCE FROM EASTERN EUROPEAN AND CIS COUNTRIES

by

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Abstract

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This paper examines the effects of economic globalization on the human capital development in the transition countries using recent data from the *Business Environment and Enterprise Performance Survey II* which contains an up-to-date and extensive set of variables. Concentrating on the activities of multinational corporations as one of the central phenomena of globalization process, the paper evaluates the effect of foreign ownership on the probability of personnel training separating the effect for five categories of employees. The analysis is performed in the context of the model of enterprise training employing a conventional set of variables as the determinants of training. A binomial probit is used to estimate the model. Obtained results are consistent both with economic intuition and findings of earlier studies and generally support theorized correlations. The model is able to capture the effects of such factors as competition, firm performance and innovativeness, and labor force characteristics, which are shown to be important determinants of training. The main finding of the paper is that the foreign-owned firms are indeed more likely to provide training to their personnel facilitating human capital accumulation in the recipient countries.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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ABBREVIATIONS

BEEPS The Business Environment and Enterprise Performance Survey

CIS Commonwealth of Independent States

FDI Foreign direct investment

HRM Human resource management

MLE Maximum likelihood estimator

MNC Multinational corporation

R&D Research and development

SME Small and medium enterprises

TNC Transnational corporation

Chapter 1

INTRODUCTION

Among the features of contemporary world economy the one of particular importance is the existence and activities of multinational corporations (MNCs). In a comparatively short period after their emergence MNCs have become widely recognized as powerful world-scale players. "In international competition MNCs with annual turnover of more than hundred billion dollars play the decisive role." (Dergachev, 2002). At the same time, as Stiglitz (2002) stresses, "when foreign businesses come in they often destroy local competitors, quashing the ambitions of the small businessmen who had hoped to develop homegrown industry." Ultimately, country's policymakers should be aware of the true impact of transnationalization on economic development.

An important and widely discussed issue in the context of transnationalization (and globalization) is technology transfer by MNCs from their homes to foreign affiliates in the host countries. The activities of MNCs could have radically different effects on host countries ranging from substituting domestic investment and eroding technology to providing hosts with modern technologies and skills they do not yet possess. As it is usually argued, when firms create their foreign affiliates and become multinational, they bring with them some amount of proprietary technology to compete successfully with local enterprises. They also force local firms to protect their market shares, which in turn generates various types of spillovers (or external effects) that lead to productivity increases in local firms (Blomström and Kokko, 1998). Even if a MNC exits the local economy, its activities could have resulted in benefits since technology has some characteristics of a public good.

Furthermore, there is a quite interesting way of technology transfer from MNCs to their affiliates, namely through the training of the affiliates' local employees. As recent evidence shows, multinationals provide various types of training for their employees in host countries especially in the presence of low quality public education in the developing countries (which among others become hosts for multinationals). These may be on-the-job training, seminars or even overseas education; and the range of employees may include all kind of levels from simple operatives to top managers. Eventually, those skills and knowledge obtained while working for a MNC affiliate may be of use when the employees move to other firms, or set their own businesses. Consequently, employees' training in the MNCs may spill over to local enterprises.

Anticipating the possibility of spillover effect from personnel training I concentrate on the determinants of the firms' decisions to train their employees. While considering a broad range of factors influencing training decisions my main interest is, naturally, in the effect of foreign ownership. Under a broad definition, a firm with shares owned by foreign company/organization may be considered as an affiliate of the multinational corporation. Furthermore, as foreign direct investment is a primary feature of the (economic) globalization process; foreign ownership could be used to investigate the effects of transnationalization on host countries' welfare.

It must be stressed here that although widely discussed, the determinants of training are not well defined and the process of training within the enterprise remains relatively unexplored (Smith and Hayton, 1999). One important observation here is that the only data sources which allow investigating training incidence and determinants are ad hoc surveys and/or case studies. This limits the scope of research introducing several methodological problems including reliability of survey data. Furthermore, the particulars of the survey determine the

set of factors available to researchers leading to problems of model specification. Nevertheless, existing empirical literature employing a 'conventional' set of variables finds fairly robust relationships between training and firm-specific, industry-specific, labor force, and other factors. Finally, to the best of my knowledge there is little research concerning enterprise training in the Ukraine. This allows opportunities for further investigation in this sphere.

As discussed below, there are some reasons to expect that foreign-owned firms will engage in more training activities than domestic-owned. Furthermore, it can be hypothesized that MNCs personnel training in host countries has a positive effect on performance of indigenous enterprises due to spillovers of technical and management skills, diffusion of know-how, and so on. In the final analysis, the existence of the effect of foreign ownership on firms' training decisions could be consequently referred to as supporting the significance of the impact of globalization on human capital in transition countries.

The paper proceeds as follows: in the second chapter I provide a survey of the recent literature concerning determinants, incidents, and effects of enterprise training linking it to the possibility of spillover effects. The third chapter of the paper proceeds with a description of the survey data used in the present study and with a discussion of the variables. The construction of the model dependencies follows naturally in this chapter as well. Results of fitting a binary response models to the data are presented in the fourth chapter. Finally, in the fifth chapter I present general empirical and theoretical conclusions and provide policy recommendations.

C h a p t e r 2

LITERATURE REVIEW

> *"Today it is global finance and corporate capital, rather than states, which exercise decisive influence over the organization, location and distribution of economic power and wealth."*
> *(Held and McGrew, 1999)*

The above hyperglobalists' view exaggerating the power of global markets, though questioned by skeptics, introduces an important and widely discussed problem in the context of global economic development. Nowadays, the operations of multinational corporations integrate national and local economies into global and regional production networks. As Held and McGrew (1999) aptly note "the boundaries between domestic matters and global affairs become increasingly fluid." While a huge range of studies in economics of globalization looked for the future prospects of the worldwide integration processes auguring either failure or success, there is an extensive literature discussing implications of globalization for welfare of involved states. In my present study I join the latter debates accenting the impact of foreign direct investment associated with activities of multinational corporations on the human capital accumulation in recipient countries. The following literature overview comes up with determinants of enterprise training and the way they are affected by the activities of foreign companies.

Even a glance at the recent literature reveals that the questions of existence and future development of multinational (transnational[1]) corporations (MNCs)

[1] There is some, though not systematic, distinction in using terms transnational and multinational in current research. I will use those terms synonymously while abbreviating usually as MNC rather then TNC.

are being raised rather systematically. There are thorough theoretical articles dealing with multinationals, their emergence, evolution and perspectives in the context of the global economy. Among authors to mention here are, for example, John Dunning who analyzes globalization issues and the phenomena of MNCs, Diecken (1994) who evaluates the place of MNC in the global economy, Ernst and Ozawa (2002) who analyze features of triumvirate world economy where transnational economy is being considered together with national and world economies.

Among the studies done in Ukraine Yakubovsky (2002) analyses the concept of international production and the theory of transnational corporations, and investigates mostly foreign direct investment (FDI) in different regions (South America, Asia, Central and Eastern Europe, and former USSR). He provides an analysis of legislative base and historical review of FDI structure and dynamics in selected countries. In his recent work concerning MNCs Plotnikov (2004) deals with financial management in MNC.

The multinational corporations are usually argued to operate in a different environment than national firms. This stratified economy is believed to have specific characteristics and, thus, should be studied separately. In their recent study Ernst and Ozawa (2002) state that "the world economy needs to be conceived as a triumvirate interactive system composed of the national sovereign economy, the global market economy, and the transnational corporate economy." This classification introduces a powerful framework of the analysis of MNCs' activities. Another useful concept for the purpose of my analysis is the dual economy framework in which MNCs and national firms are considered as two distinct constituents of the economy. For instance, Kapler (1999) empirically depicts the US as a dual economy given the results of his analysis based on firm-

level panel data. The empirical evidence provides support for the view that MNCs form the dominant group of firms within a dual economy.

Most studies that deal with transnationalization and multinationals address the issue of foreign direct investment flows across countries. Ultimately, it is the only comprehensive variable available. A few studies also analyze mergers and acquisitions, and firm-level data. Thus, in their review Blomström and Kokko (1996) come to the conclusion that foreign direct investment "may promote economic development by contributing to productivity growth and exports in their host countries. However, the exact nature of the relation between foreign multinationals and their host economies seems to vary between industries and countries." Therefore, the benefits of accepting FDI are not as straightforward as it might be tempting to argue. For example, empirical analysis of Yakubovsky (2002) shows a negative influence of an increase in FDI on Ukraine's trade balance. The author concludes that "FDI inward flows into the country decrease Ukraine's international competitiveness due to their negative impact on trade, services and income from foreign investment balance."

There are several papers analyzing the impact of FDI in countries of the Commonwealth of Independent States (CIS) including Ukraine. Summarizing the policy recommendation of most domestic studies it becomes clear that CIS and Ukrainian economists recommend the government to implement measures aimed on further FDI attraction. A few examples to be mentioned are as follows. Yelizavetin (2003) examines the reasons of retardation of foreign direct investment inflows into Russia by analyzing their structure and dynamics. He consecutively suggests how to accelerate FDI inflows. Osetsky (2003) shows the results of econometric modeling which reveal interrelations between institutional investment and GDP growth. The results of his model are considered as confirming the necessity of government intervention with special emphasis on

establishing favorable conditions for institutional investment. Zgryvets (2002) analyses advantages and disadvantages of accepting foreign direct investment into the host country and proposes governmental measures to stimulate FDI inflows.

Within this study I am interested in activities of multinational corporations to the extent they are able to produce external effects or spillovers. There are a lot of studies explaining various types of spillovers due to foreign direct investment and technology transfer from multinational corporations to their affiliates in host countries through machinery, equipment, patent rights and so on (a good review of those studies is given in Blomström and Kokko, 1996). Empirical research revealed significant spillover effect from FDI in Ukraine. Particularly, Talavera (2001) looks for spillovers of FDI inflows into Ukraine. He found statistical evidence that the level of FDI in a certain region-industry increases non–FDI firms' performance measured by labor productivity and volumes of export. The results of Konchenko (2003) revealed that the effect of FDI on the performance of Ukrainian milk enterprises is significantly positive. Furthermore, Sobko (2004) presents a good analysis of technology transfer via the production linkages between firms and reports a strong relationship between the level of technology transfer and firms' production linkages. In his study Alston (2002) addresses the issue of spillovers from public agricultural research investment to the agricultural sector and concludes that internalization of spillovers contributes significantly to total agricultural productivity growth. Hu (2004) presents empirical evidence of positive productivity spillovers from the activities of MNCs in Singapore via the demonstration effect. Based on the analysis of patent citation data, Singh (2004) presents empirical evidence on significant bi-directional knowledge flows between multinationals and their host countries.

In the presence of such a huge variety of (empirical) studies concerning spillovers from MNCs activities, it is not surprising that research based on

existing papers has been done. Thus, in their meta-study Gorg and Strobl (2001) analyze collected information from a sample of papers on productivity spillovers. They conclude that the empirical results are quite mixed, though in most studies addressed, a positive effect of the presence of MNCs on productivity spillovers to local firms was found. In my own analysis, I will rely on the evidence of the significant positive spillover effects from MNCs activities while deducing welfare implications of training in foreign-owned companies.

An important prediction related to my hypothesis is that under several natural assumptions domestic- and foreign-owned firms will choose different optimal behavior with respect to personnel training. As Parker and Coleman (1999) conclude based on a simple model with profit-maximizing firms, if both domestic- and foreign-owned firms have the same training intensity, the latter will optimally choose higher quality training. This, in turn, implies that foreign owned firms are likely to accumulate higher quality human capital suggesting possibility of higher positive spillovers to host country.

In the studies investigating spillovers from employees training, several approaches were used, among them the analysis of detailed career data of manufacturing firm managers, MNCs' incidence of undertaking training and their training expenditures, mobility of R&D personnel and effects on the host country's technological capability, and other methods (see Blomström and Kokko, 1998, for a review of those studies).

Naturally, most empirical studies were based on the data obtained from ad hoc surveys. For instance, Monteiro et al. (2004) addressed the question why some subsidiaries are isolated from the knowledge transfer activities within the MNC. Although not directly related to my topic, this study might be interesting for its methodology. Data collection for the study consisted of three phases. Firstly, a qualitative pilot study of transfers of best practices in the European

operations of US based MNCs was conducted. Secondly, they put together a draft questionnaire that was presented, discussed, and tested at the MNCs. At the third phase of the research they approached six large MNCs to take part in the research. The main survey consisted of two parts. The first was sent to subsidiary managers of the participating firms (about 204 marketing subsidiaries of the six participating MNCs). In addition, corporate managers in the MNCs answered a separate questionnaire. As survey data might often be suspicious it is important to compare several studies used survey methodology in the analyzed sphere, and so do I considering the above paper.

Unlike spillovers, the problem of personnel training by multinationals along with that by national firms has been raised more systematically in the economics literature. Though the evidence is mixed, several studies have found a positive relationship between foreign ownership and training arrangements. For instance, Yadapadithaya (2001) evaluated corporate training and development programs in Indian private, public, and multinational enterprises via an ad hoc survey covering 252 firms including 26 multinationals. Data were collected using a written questionnaire mailed to the respondents. The evidence shows that MNCs in India provide much more intensive training for their employees than local firms. Thus, the percentage of employees trained in MNCs per year increased from 27% in 1990 to 69% in 1999, average training hours per employee increased from 3.5 to 6 hours during the period, and the percentage of payroll spent on training increased from 0.6% to 1.6%. Of course, this evidence does not imply the presence of external effects from personnel training, but at the same time, this gives us some reasons to expect possible knowledge spillovers. Ultimately, I introduce a similar hypothesis in this paper, namely, that firms with foreign ownership provide more intensive training to their employees than do domestically-owned ones.

The studies on human resource management (HRM) in MNCs often present material closely related to our discussion on spillovers. For example, the primary aim of the paper by Walsh (2001) is to examine large-scale survey evidence on the human resource policies and practices of multinational companies operating in Australia drawing on data from the Australian Workplace Industrial Relations Survey (AWIRS). The central finding of this study is that foreign-owned establishments in Australia were associated with a higher take-up of human resource policy and practice than their domestic counterparts. Another study by Bangert and Poor (1993) provides some evidence on employees training in Hungarian affiliates of MNCs. Identifying the determinants of training, the authors notice that training needs arose from the introduction of the parent company's management system in the field of marketing, controlling, operations, finance, computer utilization or HRM. Often the need is satisfied by in-company training.

The effect of training is also of great importance as it stimulates (or discourages) companies to undertake training expenditures. At the same time, company performance should naturally depend on training as it is basically the goal of investing in the development of company's human capital. Thus, Aragon-Sanchez et al. (2003) present empirical evidence of a positive relationship between employees training by firms and performance of those firms. This study is also interesting because of its methodology. The authors used data obtained from a questionnaire sent to 6000 small and medium enterprises (SME) in some countries of the EU. They included both training and result variables which are described in the paper. The former set of variables includes training methods, training characteristics, training activities and other variables. Although the authors faced a very low response rate (less than 9%), they still collected about 500 valid questionnaires for the dataset. Therefore, I will introduce a firm's

performance as a factor influencing training decisions expecting positive effect in accordance with both presented evidence and common sense.

Along with empirical studies, several theoretical models have been proposed to explain the basic relationship among the categories of interest. It is interesting to note here that Campbell and Vousden (2003) addressed the issue of technology transfer from MNCs to developing economies via training of local workers by the MNCs. They developed a simple theoretical two-period model describing the behavior of a MNC in allocating its production between a high-wage home country and a low-wage host country in order to be able to sell its product to an export market (in a third country). The crucial result of the model is that for the workers in the host country to be able to produce the good, the MNC has to train them.

Furthermore, several theoretical predictions were developed concerning factors that determine the probability of spillover effects from enterprise training. Analyzing a model with endogenous technological spillovers in the human-capital markets Gersbach and Schmutzler (2003) present conditions at which spillovers will occur. The general conclusion is that spillovers are more likely when they increase total industry profits. Furthermore, several different setups are analyzed; for instance, it was shown that if under Bertrand competition only one firm is successful, spillovers will not occur, but if both firms are successful, asymmetric spillovers will take place.

Most interesting for my discussion is, however, the model developed by Fosfuri et al. (2001) who present a theoretical framework which rationalize the importance of spillovers from personnel training by MNCs uncovered in numerous empirical studies. The basic idea behind the model is that a particular MNC possess a certain advantageous technology or other relevant information and uses it to produce goods and services. The MNC sells its product in the

foreign market and therefore decides on whether to export or to establish an affiliate in the local country via FDI. If chosen, FDI requires the MNC to transfer its technology to the host country subsidiary, which is done through oral communication or on-the-job training. Consequently, the MNC hires a local worker and trains her either at the subsidiary, or at the parent company. The trained worker then participates in the MNC production during the first period (the MNC writes a one-period contract with the worker). In period two both the MNC and a local enterprise (which could sell the product if it knew the technology) compete for the hiring of the trained worker. If the MNC will hire the worker, it will continue to earn monopoly profit; otherwise, it will earn duopoly profit in the second period. Eventually, if the MNC hires the worker and pays her higher wage, a pecuniary spillover emerges; if the worker moves to a local firm, a technological spillover occurs.

In a very simplified manner the basic outcomes of the model can be summarized as at figure 1. So, the possibility of technological spillovers increases if the MNC and the indigenous firm are not direct competitors. If competition is low and technology could be easily transferred, knowledge spillovers are likely to occur. If competition is high, the local firm would get low profits from hiring the trained worker and the MNC would retain the worker by paying a small additional wage. Thus, pecuniary spillovers would occur. Finally, there is a region where it is more efficient for the MNC to export rather then to do FDI in order not to dissipate its technology.

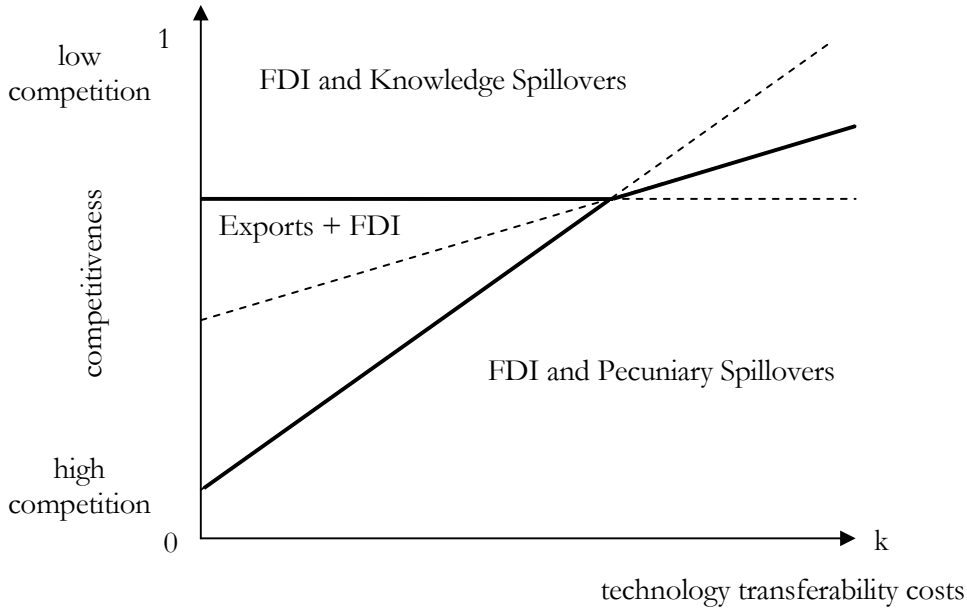

FIGURE 1. THE EQUILIBRIUM OUTCOME OF THE MODEL

Source: Fosfuri et al. (2001), p. 213

Even though the authors do not test their model empirically, several important predictions could be inferred as to the determinants of the training decisions. The most obvious one is that the necessity of training is determined by the low quality of the workforce in the host countries. Hence, the lower is the perceived quality of workers in the country the more training should be provided by the foreign firm to match skills of its employees to requirements of existing technology. At the same time, Blomström and Kokko (2003), stressing the importance of labor force quality in the host country as a determinant of training provided by the company, notice that if local workers are highly qualified it is less costly to train them further so that the employer will benefit from providing training more than if its employees are unskilled. Yet another study by Frazis et al. (2000) provides empirical support for the fact that education is positively related to the receipt and intensity of formal training. However, this may not be as

contradictory as it seems if one distinguishes between the general quality of the workforce in the country and the quality of employees at a particular enterprise. While the former should be negatively related with training, the latter is likely to influence receipt of training positively. Arguably, formal qualifications (education) which proxy cognitive skills and ability should signal the possibility of higher return of training at lower costs since training and general education are considered to be complementary activities (Harris, 1999).

Furthermore, competition is nothing less than the most important factor driving enterprise training. Firms in the competitive market must maintain their positions by advancing the production process, particularly, by developing productive skills of their personnel. On the contrary, firms that are protected from competition are less likely to engage in training which is costly. It is also important to note that domestic and international competitions are likely to affect firms' decisions via different channels suggesting another determinant of training – export/domestic marketing orientation of the firm. Export-oriented firms are more likely to be affected by international competitors, non-export-oriented ones − by domestic competitors. In short, the more competitive the market is the more a firm has to train its employees in order to survive.

Presenting a theory of training Acemoglu and Pischke (1997) argue that a firm's interest in personnel training is driven by the possibility to extract a part of an increased marginal product of trained workers. Distinguishing between general and firm-specific training the authors show that firms should pay not only for the latter but also for the former form of training. As the study suggests, "in order to explain firms' investments in general skills, some labor market imperfections must exist so that the mobility of workers is restricted and that employers can earn rents on trained workers". Finally, it is natural to suggest that labor market conditions in general should influence enterprise training arrangements. As

Blomström and Kokko (2003) summarize, the amount of training provided to MNCs' employees "vary depending on industry, mode of entry, size and time horizon of investment, type of operations, and local conditions."

To conclude this review I look as a matter of course at empirical studies investigating determinants of enterprise training. Most of the evidence comes from survey data which is often not specifically constructed in a way that best suits the desirable model specification. Therefore, researchers are forced to operate with available data which often determines the choice of variables. As it works out, there is a set of 'conventional' factors which is used to specify a model. Based on ad hoc survey data Yadapadithaya (2001) presents evidence from the Indian economy on major driving forces of corporate training and development. In the study he defines seven factors influencing training decisions, namely

1. Increased domestic competition
2. Global competition
3. Changing business strategies
4. Pressure for increased quality, innovation, and productivity
5. Need to change corporate culture
6. Demands and directives of top management
7. Needs, wishes and demands of employees

The survey structure classifies respondent firms into three categories, namely, private, public, and multinational corporations. As the data reveals, 100% of the respondents in the MNCs group consider global competition and pressure for increased quality, innovation, and productivity as driving forces for providing personnel training. Demands and directives of the top management are of lesser importance for private and multinational corporations while needs, wishes and demands of employees are not as significant for private and public corporations.

Ultimately, above factors are marked as important by a reasonable number of respondents in each category.

Characteristics of the workplace were used as determinants of training in an empirical study by Sutherland (2004) analyzing the 1998 *Workplace and Employee Relations Survey* (US). The results confirm that, among others, such factors as age, educational qualifications, occupation, and the size of the workplace are important determinants of the probability that an individual receives training.

In literature, the size of the firm is usually positively associated with training. A possible reason is that training implies economies of scales; and early empirical studies had found relatively little training in small firms with less than 50 employees (Frazis et al., 2000). Also, as Harris (1999) notices, "large employers actually take a different approach to small employers with regard to the riskiness of investing in their employees," so that large firms tend to provide more training.

Smith and Hayton (1999) developed, probably, the best grounding for their survey concerning enterprise training in Australia. Based on case-studies of forty-two individual enterprises in five industry sectors and covering local, national, and multinational firms the authors defined a set of factors that were perceived as important for firms when making decisions on personnel training. Based on these preliminary results they constructed a survey of Australian enterprises covering all industries in the private sector. They found, for instance, that the size of the organization and industry sector have a strong positive relationship with training, investments in new products or technology influences training positively but to a smaller extent while enterprise ownership (Australian versus multinational enterprise) turns out to have no significant effect.

Having identified the determinants of enterprise training I further proceed with the empirical part of my study which tests the effects of foreign ownership

on the probability of training, thus analyzing the possibility of human capital spillovers as a result of economic globalization process.

Chapter 3

MODEL CONSTRUCTION AND DATA

"Available data on job training suffer from poverty amidst plenty" (Frazis et al., 2000)

Following the discussion of the previous chapter I identify a set of factors that are expected to affect firm training decisions. The potential determinants of training are summarized in the table below.

TABLE 1. KEY DETERMINANTS OF TRAINING

No	Factor	Expected relationship with training
1	Ownership of a firm (foreign vs. domestic)	Positive (foreign-owned)
2	Performance of a firm	Positive
3	Competition at the market	Positive
4	Innovativeness of a firm	Positive
5	General quality of the country's labor force	Negative
6	Quality (education) of the firm's personnel	Positive
7	Marketing orientation of a firm (export share)	Positive
8	Size of the workplace (number of employees)	Positive
9	Labor market conditions	Varies

The main factor in the model is the ownership type of a firm. The relevant question of the survey asks what percentage of the firm is owned by private foreign company/organization, private domestic company/organization, and government/State (I refer readers to Appendix 1 for the formulations of selected questionnaire items relevant to my study). My interest lies in foreign ownership

which I expect to influence the probability of providing personnel training by the firm positively. The summary of the distribution of respondents by type of ownership is presented in table 2. As can be seen, there are 1077 firms that have their shares owned by a foreign company/organization. The percentage of foreign-owned shares varies from 0 to 100% with mean value of 13%. The coefficient of variation is 2.34. As illustrated in figure 2, the data exhibit the usual pattern for survey responses – a large mass is concentrated near round numbers like 50 and 100% (kernel density estimate is presented for non-zero observations; estimates of bounds are biased but are of little interest for the purpose of this discussion). Therefore, the percentage of foreign-owned shares has enough variability across the sample, making it a reliable independent variable in the model.

TABLE 2. OWNERSHIP TYPE OF RESPONDENT FIRMS.

The number of firms that has shares owned by:	**# obs**	**% (out of 6667)**
Private foreign company/organization	1077	16.2
Private domestic company/organization	4860	72.9
Government/State	1133	17.0

To measure competition, I use three distinct variables. First of all, I introduce a dummy variable capturing a monopolistic/oligopolistic position of the firm and taking the value one whenever a firm faces either none or 1-3 competitors in the major product line. Furthermore, I use subjective characteristics of the firm's technology − comparable to that of the main competitor − to proxy for the competitive position of a firm's technology on the market. Finally, I introduce the importance of competition from imports in the market for a firm's main product line or main line of services in the domestic market. This variable aims to distinguish between global and domestic

competition. All these variables measure different aspects of the phenomenon of competition − and the correlations between them are rather low.

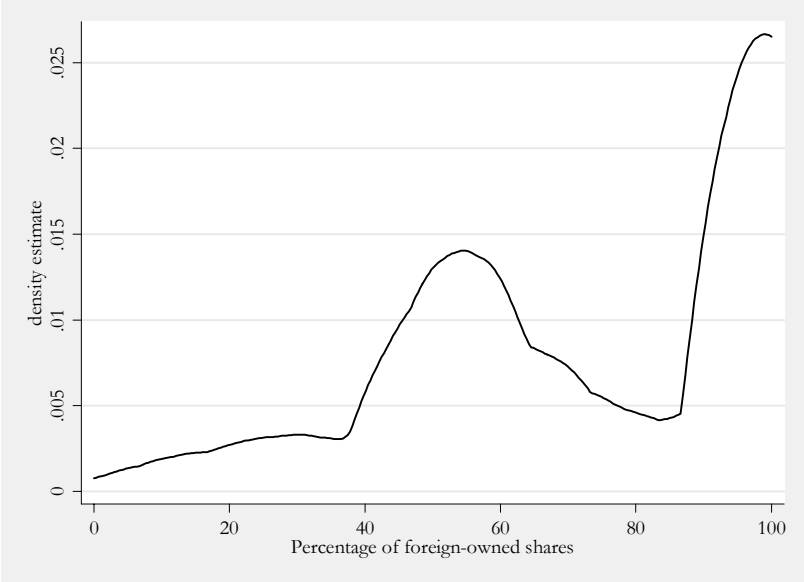

FIGURE 2. KERNEL DENSITY PLOT OF PERCENTAGES OF FOREIGN-OWNED SHARES OF RESPONDENT FIRMS

Innovativeness of a firm is measured by its progress in undertaking a number of initiatives as defined in question 85 of the questionnaire (see Appendix 1). For the purpose of analysis, I separate two measures of innovativeness which are expected to influence training positively and should not introduce the problem of endogeneity into the model since the decisions of such major innovations should come prior to the decisions to train workers (in order to utilize an innovated technology). The first measure is a dummy variable which is equal to one whenever a respondent firm was involved in developing a major new product line and/or introduced new technology. The second measure is a dummy variable for opening a new plant. Again, those measures are distinctive, and correlation between them is low.

The general quality of a country's labor force is proxied by the subjective measure of skills and education of available workers. Respondents were asked to rank the importance of this factor for the operation and growth of the business on the "no obstacle − major obstacle" scale. If respondent consider skills and education of available workers as a moderate or major obstacle, the dummy for low general labor force quality takes the value of one.

Furthermore, education of the existing workers is an important factor that is likely to influence training activities of firms. It proxies for the quality of employees at a particular enterprise.

The summary of the dataset with respect to workers' education is presented in table 3. Under the proposed classification, about half of the workers at an average firm have secondary school diploma at most; those with university degree or higher constitute a top quartile of the distribution.

TABLE 3. AVERAGE DISTRIBUTION OF THE WORKFORCE EDUCATION LEVELS AT SAMPLED FIRMS

Education level	**%**
Did not complete primary school	0.5
Primary schooling	6.0
Some secondary school	10.9
Secondary school diploma	50.2
Some university	7.2
University degree or higher	25.2

The effect of the average education level on training activities of the firm, however, may not be that simple as it might be tempting to suggest. The low level of personnel education may correspond to the technological process where non-qualified work is required. Therefore, the analysis has to control for the industry

effect and the relative importance of education for the firm. These control variables are discussed later.

The next factor that is of interest in my model is the firm's orientation in trade (domestically-oriented versus export-oriented). The relevant survey question asks about the distribution of firms' sales across domestic selling and exporting. The relevant statistics are presented in table 4. I expect that the bigger is the share of a firm's sales that is exported, the more training is provided.

TABLE 4. DOMESTIC-EXPORT DISTRIBUTION OF FIRMS' SALES

The route	**# obs**	**% (out of 6667)**
Sold domestically	6513	97.7
Exported directly	1614	24.2
Exported indirectly through a distributor	400	6.0

The size variable which is used as a factor in my model measures the number of full-time and part-time employees. There are two corresponding questions in the survey which defines workplace size using the following sub-classification (with respect to full-time workers): 2-49 workers, 50-250, and more than 250 workers. A similar sub-classification is used to determine the number of part-time employees. I introduce dummy variables to capture the size effect with small-size enterprises considered as reference group.

General labor market conditions are mostly used to control for effects not captured by the factors previously discussed; however, they are paid special attention as the suggested relationship could have important policy implications per se. I introduce a subjective measure of labor market obstacles as a factor indicating general labor market conditions. This is measured by a relative ranking attached to labor regulations as an obstacle for the operation and growth of the

business. Respondents were asked to choose an appropriate level at the scale ranging from no obstacle to major obstacle.

The factor which is paid special attention here is the performance of a firm. It is tempting to argue that high-performance firms will devote more resources for R&D and, thus, will be involved in more personnel training. There is, however, an obvious endogeneity problem arising with the performance variable included in the model. As a firm trains its employees more, it is likely to improve on its performance (otherwise, there should have been no reason to spend on training at all). The endogeneity issue should, therefore, be tackled with an appropriate econometrics technique, and I use two-stage estimation as discussed in the next chapter. To proxy for firm performance I use the percentage change in sales (in real terms) over the period 1998 - 2001.

Eventually, the dependent variable is personnel training in the firm. The relevant question from the survey asks whether the firm offers formal training to its employees in each category, where categories are defined as 'Managers', 'Professionals', 'Skilled workers', 'Unskilled workers', and 'Support workers'. (See appendix 1 for a detailed description of selected survey questions). This variable could readily be recoded as a binary response variable omitting the "Don't know" category as irrelevant (it might be problematic to find a set of factors influencing respondents' awareness of the issue). Thus, an appropriate model for a binary outcome dependent variable may be fitted, and the obvious one is a simple logit or probit model.

Summarizing the above discussion, I can formally represent the model as follows.

$$\Pr(Y = 1) = F(\alpha + \mathbf{X} \cdot \overline{\beta} + \mathbf{C} \cdot \overline{\gamma}),$$

with **F**( ) being the cumulative probability density function (I use normal for the reasons discussed later);

X being the matrix of factors as specified in table 1 and discussed above, and

C being the matrix of control variables as defined below.

There is a familiar set of control variables included into the model, which in turn can be subdivided into several groups as follows:

- Country
- Legal organization of a firm
- Industry
- Characteristics of firm's personnel

The legal organization of the sample companies is summarized in Appendix 3. For the purpose of the analysis I am interested in whether an enterprise is privately owned or state owned. There is no direct variable that defines the industry in which a firm operates, but this can well be measured by the variable that gives a firm's sales structure across several sectors. The proposed classification defines the following sectors of the economy:

- Mining and quarrying
- Construction
- Manufacturing
- Transport storage and communication
- Wholesale, retail, repairs
- Real estate, renting and business services
- Hotels and restaurants
- Other

Characteristics of a firm's personnel include the structure of permanent workforce across the different categories of employment (namely, managers, professionals, skilled workers, unskilled workers, and support workers). This classification corresponds to the classification of training and each group uses, therefore, its own control variables.

To close the discussion in this chapter I provide a summary of the dataset used in this study. The data are taken from *The Business Environment and Enterprise Performance Survey* (BEEPS) II jointly conducted by the European Bank for Reconstruction and Development (EBRD) and the World Bank. It is a survey among managers and owners of firms. The second round of the survey (BEEPS II) was conducted in 2002 and I use the results of this second round here. There are 6667 observations available in total. Selected questionnaire items are presented in Appendix 1.

The geography of data covers countries of Eastern Europe, the former Soviet Union, and Turkey (27 countries in total). The distribution of observations across countries is given in Appendix 2. There are 463 observations for Ukraine, which constitutes 6.94% of all observations. Availability of the country's attributes in the data allows me to control for the country-specific effects in the model.

Chapter 4

ESTIMATION RESULTS

To estimate the specified models, I use a normal probability model for binary choice dependent variables (probit). It must be stressed here that the choice of normal distribution versus logistic or, say, Weibull distribution nests in the fact that in terms of predictions those models are essentially the same (I do not consider a linear probability model for it is knowingly unreliable (Green, 2000). Even though the logit and probit models make different assumptions about the variance of the residuals, these differences are absorbed in the relative magnitudes of the coefficients. As Long and Freese (2003) notice, "in terms of predictions there is little reason to prefer either logit or probit. If your substantive findings turn on whether you used logit or probit, we would not place much confidence in either result". Therefore, I have compared estimates from both logit and probit models, and found them similar enough to consider only one of them.

An important issue to be discussed here is the above mentioned potential endogeneity in the relationship between training and firm performance. To deal with this problem, I use a two-stage testing and estimation procedures formally discussed in Appendix 5. To instrument firm performance, I use the set of variables which include measures of firm size and a subjective measure of optimality of employment (see Appendix 4 for description of variables). As a result of the testing procedure, the hypothesis of no endogeneity was rejected at the 5% level of significance for two out of five regressions, namely, for managers and professionals training models. In the models for training of skilled, unskilled, and support workers the hypothesis of no endogeneity was not rejected at the 5%

level. This is quite intuitive. So I proceed further with estimating constructed models instrumenting for endogeneity in the models for managers and professionals training. For comparison Appendix 7 presents an Amemiya Generalized Least Squares (AGLS) estimators for probit with endogenous regressors (the endogenous regressors are treated as linear functions of the instruments and the other exogenous variables). There is, obviously, some though not very big difference between above estimators but the main properties are consistent across two methods.

The results of the probit models are presented in Appendix 6. In order to proceed with presentation of estimation results I will discuss several measures of goodness of fit statistic and robustness tests. At this point it is important to notice that measures of goodness of fit for binary response models are often flawed and, as Green (2000) stresses, "the important element to bear in mind is that the coefficients of the estimated model are not chosen so as to maximize this [predictive ability of the model versus naïve predictor] (or any other) fit measure, as they are in the linear regression model". Furthermore, "there is no convincing evidence that selecting a model that maximizes the value of a given measure of fit results in a model that is optimal in any sense other than the model's having a larger value of that measure" (Long and Freese, 2003).

Having above cautions in mind, the goodness of fit statistics presented in table 5 whow that all five models introduce significant explanatory power compared to the model with only an intercept term included. McFadden's R^2 (or McFadden's likelihood ratio index) is different from zero indicating, basically, that all slopes in the model are jointly different from zero. Although it has been suggested that McFadden's R^2 increases as the fit of the model improves, the exact values of this measure between 0 and 1 has no natural interpretation

(Green, 2000). Some of the other measures of fit presented here[2] are Cragg and Uhler's R^2 (which is an alternative relative index to maximum likelihood R^2), McKelvey and Zavoina's R^2 which is an attempt to measure model fit as the proportion of variance accounted for, Efron's R^2 (yet another model fit index based on the proportion of variance accounted for), Count R^2 which is the proportion of correctly classified observations, and Adjusted Count R^2 which is the proportion of correct guesses beyond that by guessing the largest marginal (and thus an improvement to Count R^2 which can often be misleading).

TABLE 5. SCALAR MEASURES OF FIT FOR PROBIT MODELS

Measure	Dependent variable – training for defined categories of employees				
	Managers	**Profess.**	**Skilled**	**Unskilled**	**Support**
Log-Lik Intercept Only	-2795.760	-2921.191	-2926.238	-1326.677	-1516.204
Log-Lik Full Model	-2286.358	-2345.762	-2444.444	-1108.950	-1213.852
LR(51)	1018.805	1150.858	963.588	435.454	604.705
Prob > LR	0.000	0.000	0.000	0.000	0.000
McFadden's R^2	0.182	0.197	0.165	0.164	0.199
McFadden's Adjusted R^2	0.164	0.179	0.147	0.125	0.165
Craig & Uhler's R^2	0.200	0.227	0.190	0.109	0.145
McKelvey and Zavoina's R^2	0.328	0.373	0.309	0.273	0.321
Efron's R^2	0.210	0.235	0.196	0.142	0.186
Count R^2	0.752	0.731	0.726	0.892	0.874
Adjusted Count R^2	0.177	0.259	0.189	0.040	0.060

Apart from the conclusion of the models' significance, what can be inferred is that the model for professionals training has the best fit and the model for managers training is approximately as good in the sense of fit as the one for professionals. At the same time, one must be cautious when attempting to argue

[2] See http://www.gseis.ucla.edu/courses/ed231c/notes3/fit.html for an overview of those measures

that the other three models fit worse. Ultimately, there is some support (neither weak nor strong) for significance of all five models considered.

Finally, a special emphasis should be made on possible heteroscedasticity problems in the residuals of the model. Even though for the simple least square estimators heteroscedasticity results in inefficiency while the estimators remain unbiased and consistent, for probit (and logit) models the drawbacks are much more severe. If the disturbances in the underlying regression are heteroscedastic, the ML estimators are inconsistent (Green, 2000). To test for heteroscedasticity in the models, I implement a likelihood ratio test as discussed in Green (2000). Fortunately, for reasonable assumptions of possible heteroscedasticity the tests fail to reject the null hypothesis of homoscedastic disturbances at conventional confidence levels.

To conclude with the analysis of regressions properties, I present ML estimates with robust variance estimator (i.e. the Huber/White/sandwich estimator of variance) for the reason of correcting for arguable misspecification problems as discussed in Sribney (1998). The estimates are presented in Appendix 8. There is really little difference between standard errors of coefficients estimated with the robust variance estimator and the usual ML variance estimator.

Now let me proceed with a discussion of the results. The coefficients of the probit model do not show the change in the probability of the dependent variable being equal to one due to a unit change in the relevant explanatory variable. This probability is given by the marginal effect of the explanatory variable[3]. The estimated marginal effects for the probit models are reported in Appendix 9. One should note, however, that in case when an explanatory variable is postulated to change by an amount that is not infinitesimal, the marginal effect

[3] Which is the partial derivative of the expression for prob($y=1$) with respect to the factor.

computed in a conventional way may be misleading. Relevant changes should be calculated as a difference in the estimated probabilities.

The main question of interest in this study is to estimate whether foreign ownership matters for the probability of enterprise training incidence. The relevant statistics are presented in table 6. At conventional confidence level s, the effects of foreign ownership are significant for all but unskilled workers' training. This supports my expectations based on the previous discussion.

TABLE 6. ESTIMATED EFFECTS OF FOREIGN OWNERSHIP ON THE PROBABILITY OF ENTERPRISE TRAINING

Dependent variable: training provided to a certain group of employees	**Marginal effect**	**Changes in predicted probabilities of training incidence as percentages of firms' shares owned by foreign company/organization increase from 0% to**			
		25%	**50%**	**75%**	**100%**
Managers	0.0015268***	0.0382	0.0790	0.1219	0.1666
Professionals	0.0009338***	0.0234	0.0473	0.0718	0.0968
Skilled workers	0.0005688**	0.0142	0.0287	0.0435	0.0585
Unskilled workers	0.0001892	0.0048	0.0097	0.0149	0.0203
Support workers	0.0004881***	0.0122	0.0257	0.0404	0.0566

legend: * p<.1; ** p<.05; *** p<.01

Keeping in mind that marginal effects are computed at the means of all explanatory variables (although there is a possibility to compute it at some specific values, this is of little importance for the current purpose), they may not represent the true change of probability, when a factor changes substantially. Therefore, I also present changes in the predicted probabilities of training incidence evaluated as the explanatory variable changes from 0 to 25, 50, 75, and 100 percent. The interpretation is as follows: as the percentage of firm's shares owned by a foreign company/organization increases from 0% to, say, 50%, the probability that a firm will provide training to its managers increases by 7.9%, and so on. It is important to note that the highest effect of foreign ownership is on

the probability of managers training. Completely foreign-owned firms are 16.7% more likely to train their managers than do domestically-owned ones. The effect of foreign ownership on professionals training is somewhat smaller though still substantial. Foreign-owned firms have a 9.7% higher probability of training their professional workers than their domestically-owned counterparts. The effect on training skilled and support workers is smaller and the corresponding probability increase constitutes 5.9% and 5.7% respectively.

It is interesting to note that the effect of foreign ownership on training is almost linear, that is, an incremental change of the probability of training as a percentage of firms' shares increase from 0 to 25% is approximately the same as for the change from 75 to 100% (actually, the effect is curved but the curvature is very small). This feature is most evidently illustrated by figure 3.

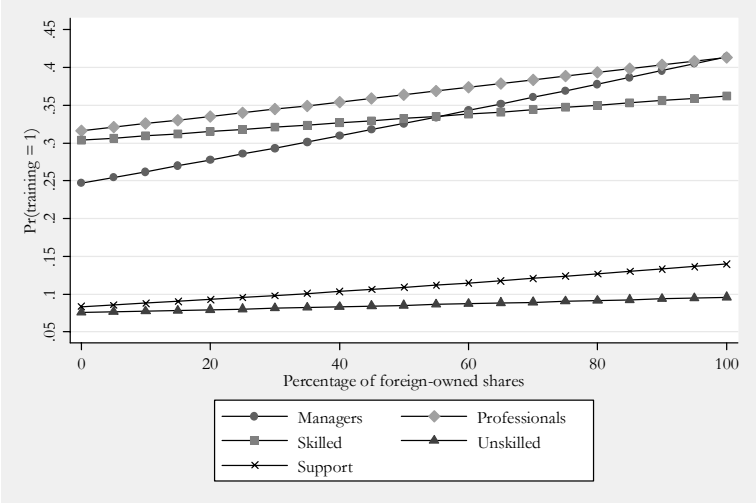

FIGURE 3. EFFECT OF FOREIGN OWNERSHIP ON THE PROBABILITY OF ENTERPRISE TRAINING

Notably, figure 3 reveals another characteristic of enterprise training, namely, the range of predicted probabilities. While for managers, professionals, and skilled workers training predicted probabilities change within the range of

approximately 25-43%, the predicted probabilities of training support and unskilled workers are extremely low – less than 15%. Ultimately, this observation is consistent with economic intuition behind the phenomenon of training.

Apart from the effect of foreign ownership, the models capture several other interesting dependencies between training and the factors included. I will present those which are most interesting for the analysis. Firm performance, proxied as a percentage change in firm's sales during the period 1998-2001 (in real terms), is also a significant factor that influences firms' decisions on training. The effect is illustrated in figure 4.

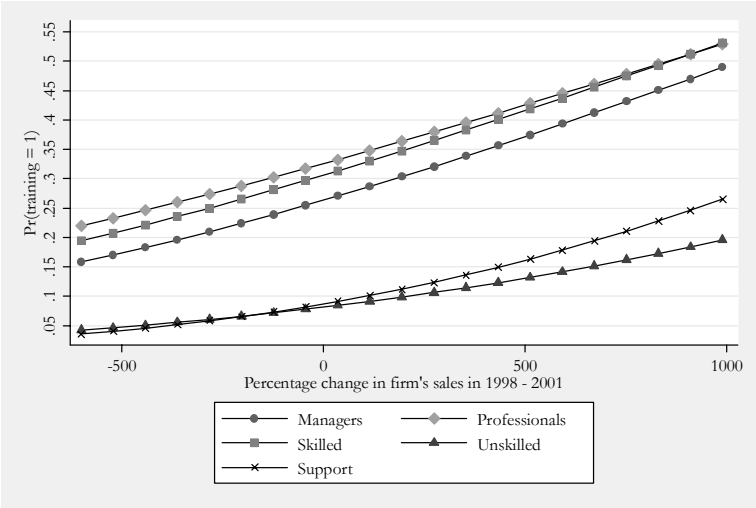

FIGURE 4. EFFECT OF PERFORMANCE (CHANGE IN SALES) ON THE PROBABILITY OF TRAINING

Again, the effect of performance on managers, professionals, and skilled workers training is close to linear and corresponding marginal effects are significant at the 5% level of significance (see Appendix 9). The effect of performance on training of unskilled workers is insignificant; on training of support workers – significant and more curved: firms with higher performance

increase their training incidence to a greater extent as their performance improves further.

The pattern of the effects of different measures of competition on training is more dispersed. The relevant marginal effects (which are calculated as a change in probability of undertaking training following a change of the dummy variable from zero to one) are presented in table 7. The effects associated with three different measures of competition constitute three columns of the table.

TABLE 7. ESTIMATED EFFECTS OF COMPETITION ON THE PROBABILITY OF ENTERPRISE TRAINING

Dependent variable: training provided to a certain group of employees	**Marginal effects[1] of different measures of competition**		
	Monopolistic / Oligopolistic position of a firm	**Subjective superiority of firm's technology**	**Competition from imports**
Managers	0.0534659***	0.0645538***	0.0266188*
Professionals	0.0209673	0.0561215***	0.0247919
Skilled workers	0.0418012**	0.076292***	0.0250755
Unskilled workers	0.005184	0.004923	-0.0028339
Support workers	-0.0056481	0.0376229***	0.0111284

legend: * p<.1; ** p<.05; *** p<.01

[1] for discrete change of dummy variable from 0 to 1

As it turns out, competition from imports (a subjective measure of importance of competition from imports in the market for the firm's main product) has no significant impact on firms' decisions on training. Also, firms' decisions on training unskilled workers do not depend on any of the above measures of competitive position. At the same time, enterprises that are either monopolists at the market (i.e. answered having no competitors in the major product market) or operate at an oligopolistic market are more likely to provide training to their managers and skilled workers. An increase in probability of training is, respectively, 5.3 and 4.2%. Finally, the most significant among the

three measures is a perceived superiority of firm's technology compared to the technology of the main competitor. Therefore, if firm's relative competitive position in technology is high, the probability of this firm providing training to its managers increases by 6.5%, to professionals – by 5.6%, to skilled workers – by 7.6%, and to support workers – by 3.8%.

Innovativeness of a firm is an important factor determining the probability of training. As illustrated at table 8, for the two proposed measures of innovativeness almost all estimated effects are highly significant. The results are generally in accordance with a priori expectations. The effect of development of a new product line and/or introduction of a new technology on the probability of training managers, professionals, and skilled workers is particularly high – around 12%. The impact of opening a new plant is significant only for the probability of training managers, professionals, and unskilled workers.

TABLE 8. ESTIMATED EFFECTS OF INNOVATIVENESS ON THE PROBABILITY OF ENTERPRISE TRAINING

Dependent variable: training provided to a certain group of employees	**Marginal effects[1] of different measures of innovativeness**	
	Developing a major new product line and/or introducing new technology	**Opening a new plant**
Managers	0.116103***	0.0693599***
Professionals	0.1235106***	0.0772838***
Skilled workers	0.1322378***	0.0207646
Unskilled workers	0.0376928***	0.0403151***
Support workers	0.0436499***	0.0187529

legend: * p<.1; ** p<.05; *** p<.01

[1] for discrete change of dummy variable from 0 to 1

Yet another interesting feature of the model is that it is able to capture the effect of labor force quality proxied by education of the existing personnel and by the subjective measure of skills of available worker in general (Table 9).

TABLE 9. ESTIMATED EFFECTS OF THE QUALITY OF THE LABOR FORCE ON THE PROBABILITY OF ENTERPRISE TRAINING

Dependent variable: training provided to a certain group of employees	Marginal effects		
	Skills of available workers being an obstacle for business[1]	Education of the firm personnel[2], % with	
		secondary schooling	university education
Managers	0.0308446*	0.0001021	0.0031093***
Professionals	0.0392711**	0.0009094	0.0030499***
Skilled workers	0.0562408***	0.0009374*	0.0017835***
Unskilled workers	0.010353	-0.0001835	0.0002549
Support workers	-0.0003588	-0.0002114	0.0007516**

legend: * p<.1; ** p<.05; *** p<.01

[1] For discrete change of dummy variable from 0 to 1

[2] Reference group: primary schooling or less

As discussed in Chapter 2, there are indeed two different effects of labor force quality. On the one hand, the general skills of a country's labor force are negatively related to the probability of training. In the figures this is as follows: if the skills and education of available workers (proxying for quality) are considered by the respondents as a moderate or major obstacle for business (that is, the perceived quality of a country's labor force is low), firms are more likely to provide training to their employees. The corresponding probability increases by 3.1, 3.9, and 5.6% for managers, professionals, and skilled workers respectively.

On the other hand, the quality of the existing personnel relates positively to the probability of training. Even though the marginal effects of having a higher percentage of employees with secondary schooling are generally insignificant, the impact of university education is highly significant for all categories of employees but unskilled workers. For illustrative purposes, the effects of university education are shown in figure 5. Since the relationships are reasonably close to linear, the marginal effect should serve as a good approximation. The highest marginal effect is that for the probability of training managers: once the percentage of firm personnel with university education increases by 1%, the firm

is 0.3% more likely to train its managers and professional workers, 0.2% more likely to train skilled, and 0.1% - support workers.

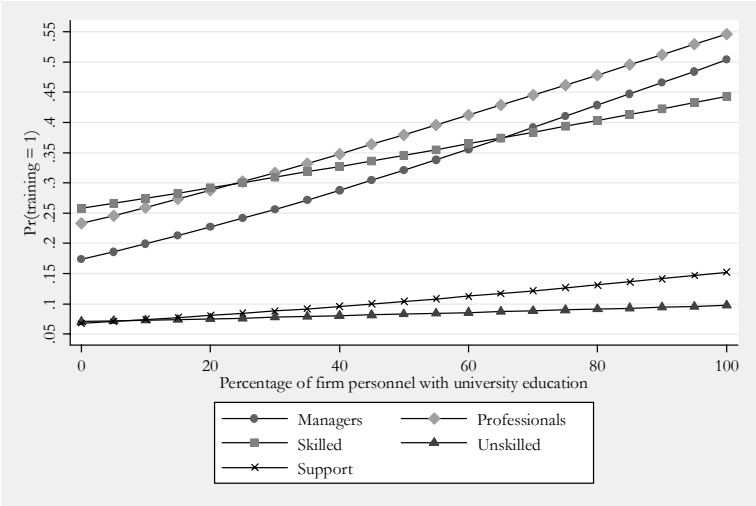

FIGURE 5. EFFECT OF PERSONNEL (UNIVERSITY) EDUCATION ON THE PROBABILITY OF ENTERPRISE TRAINING

Finally, as it was observed in most empirical studies discussed in Chapter 2, the size of a firm measured as the number of employees is an important factor determining the probability of personnel training. As the marginal effects estimated here confirm, the bigger the number of a firm's full-time employees, the higher is the probability that a firm will provide training to all considered categories of workers (see Appendix 9). At the same time, the effect of firm size measured by part-time workers has no significant influence on the underlying probability.

As for the remaining two factors – firm's trade orientation (percentage of exported sales) and effects of labor regulations – they have generally no significant impact on the probability of enterprise training. I refer the reader to Appendix 9 for the information on the significance of the control variables. The

pattern is varying, but broadly speaking, the major part of the country dummies is significant while the industry control variables are rarely significant.

Ending this presentation of estimation results, it is interesting to look at some ideal types of firms comparing their probabilities of employees training. As can be seen in Appendix 9, the coefficients for the dummy variable that controls for Ukraine-specific effects are highly significant and negative, thus indicating a lower probability of enterprise training in Ukraine[4]. Therefore, I look at two ideal Ukrainian private firms: 100% domestically-owned versus 100% foreign-owned. Predicted probabilities are reported in table 10.

TABLE 10. ESTIMATED EFFECTS OF THE FOREIGN OWNERSHIP ON THE PROBABILITY OF ENTERPRISE TRAINING FOR TWO IDEAL TYPES OF FIRM

Dependent variable: training provided to a certain group of employees	**Prob(training = 1) for the ideal firm type**		**Difference**
	Ukrainian domestically-owned private firm	**Ukrainian foreign-owned private firm**	
Managers	0.1979	0.3506	0.1527
Professionals	0.2596	0.3498	0.0902
Skilled workers	0.2306	0.2824	0.0518
Unskilled workers	0.0435	0.0569	0.0134
Support workers	0.0298	0.0569	0.0271

Notably, the foreign-owned firms in Ukraine are much more likely to provide training to their employees (with a difference of 15.3% for managers). At the same time, the predicted probabilities of training for Ukrainian firms are very low per se. I proceed with further discussion of the initial hypotheses and policy recommendations.

[4] Note that reference group is Poland.

Chapter 5

DISCUSSION AND CONCLUSIONS

Using the recent data of the *Business Environment and Enterprise Performance Survey*, I have tested the hypothesis that enterprises which have their shares owned by foreign companies/organizations have a larger probability of providing training to their employees than domestically-owned firms. As a binomial probit model reveals, the hypothesis is supported with a reasonably high confidence level for all but one category of enterprise employees. That is, the data suggest that foreign-owned firms are more likely to train their managers, professional, skilled and support workers than are domestic firms in the countries of the CIS and Eastern Europe. This very finding could have important implications per se. First of all, this to some extent supports the duality framework in that foreign-owned firms have indeed distinct operational characteristics from national enterprises. Moreover, it is worth recalling the theoretical prediction that foreign-owned firms choosing higher quantity of personnel training are likely to choose also higher quality of training. Based on the assumption that foreign-owned establishments in the recipient countries do usually possess more advanced technology as indigenous producers do, this prediction could be regarded as credible. Ultimately, the study supports the idea that foreign-owned firms tend to invest significantly more resources in accumulation and development of human capital.

It is important to mention that the model of enterprise training developed here is able to capture several other interesting effects. The results generally agree with the findings of earlier studies on enterprise training. For example, the study supports that such factors as competition, firm performance, innovativeness of a

firm, and size of the workplace are important determinants of firms training decisions. This is consistent with previous empirical studies and theoretical predictions concerning enterprise training, thus suggesting reliability of the estimated model.

Coming back to the effect of foreign ownership, a range of further linkages can be identified. First of all, as the central phenomenon of globalization is the multinational corporation, it is often tempting to measure the very process of economic globalization by the volume and spatial allocation of a foreign direct investment emanating trough the operations of multinationals outside their home countries. While the nation states remain their economic sovereignty they care about their welfare being affected by the intensive FDI flows transferring technology and modern knowledge which spill over to recipient industries. Associating foreign-owned firms with subsidiaries of MNCs in the host countries (which is true under a broad definition of multinationals), it becomes arguable that foreign ownership in the national economy is a reflection of economic globalization thought of as a process of intensification of worldwide interconnectedness. Taking into account the empirical evidence in support of positive spillovers from cross-national capital flows, the effects of foreign firms operations in the host countries are perceived as beneficial for the welfare of the recipients.

The findings of this paper support the hypothesis that globalization reflects in increasing human capital accumulation in the developing countries hosting foreign-owned companies. Policy recommendations, however, are not directly deducible and might be questioned from different points of view. It might be tempting to argue, hastily, that nation states should pursue an open-door policy with respect to global capital flows hoping for positive spillover effects. But it is imperative that the ability of the recipient economy to internalize externalities

generated by the operations of foreign-owned enterprises depends crucially on the local capability and competition alongside at least technological and human capital transferability. Furthermore, issues of national economic security and sovereignty may become yet other concerns of state policy towards economic integration bringing political motives into the decision making process. In the final analysis, it is the state economic doctrine which should encompass the number of prerequisites necessary for the deduction of policy implications from the findings of this paper.

Alerting the reader against frantic conclusions and taking into account the recent changes in Ukraine's external policy and military doctrine, I suggest the Ukrainian government to facilitate foreign companies coming into Ukraine as they were shown to improve on human capital accumulation within the state.

Finally, this is the area that merits further investigation using data that more directly approaches the issues of spillovers from employees training by MNCs in host countries. This constitutes a research agenda for economists investigating transition countries and foretells my unfolding study.

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APPENDICES

Appendix 1. Selected questionnaire items

S.1a In what year did your firm begin operations in this country?

S.2 What is the legal organization of this company?

S.4c What percentage of your firm is owned by**:**
Private foreign company/organisation %
Private domestic company/organisation %
Government/State %

Q.2 What percentage of your sales comes from the following sectors in which your establishment operates?
Mining and quarrying %
Construction %
Manufacturing %
Transport storage and communication %
Wholesale, retail, repairs %
Real estate, renting and business services %
Hotels and restaurants %
Other %

Q.14a What percentages of your firm's sales are:
Sold domestically %
Exported directly %
Exported indirectly through a distributor %

Q.18a Thinking of your firm's major product line or main line of services in the domestic market, how many competitors do you face?
None
1-3
4 or more

Q.19 How important is competition from imports in the market for you main product line or main line of services in the domestic market?
Not important
Slightly important
Fairly important
Very important

Extremely important
These products cannot be imported
Don't know

Q.80 Can you tell me how problematic are these different factors for the operation and growth of your business?

Factors/Categories	Labour regulations	Skills and education of available workers
No obstacle		
Minor obstacle		
Moderate obstacle		
Major obstacle		
Don't know		

Q.81 Since 1998, how have the following changed (increased/decreased) and what is the percent of change for your company, in real terms (i.e., after allowing for inflation):

	Increase	Decrease	No change	% change
Sales				

Q.82 For classification purposes please could you tell me:

The estimate of your firm's total sales in 2001	The estimate of the replacement value of the physical production assets used by your firm (land, building, equipment) in 2001:

Ranges:
Under $10.000
$10- $19,000
$20- $49,000
$50- $99,000
$100- $249,000
$250- $499,000
$500-999,000
$1-1.99 million
$2-4.99 million
$5-9.99 million
$10-19.99 million
$20-49.99 million
$50 million or more

Q.85 Has your company undertaken any of the following initiatives since 1998?

IF "YES": And how important in retrospect was this initiative for the survival and/or growth of your company over that period? *Not important: 1, Slightly important: 2, Fairly important: 3, Very important: 4, Extremely important: 5, Don't know: 6*

Initiative	Undertaken	
	Yes	No
Developed successfully a major new product line		
Upgraded an existing product line		
Introduced new technology that has substantially changed the way that the main product is produced		
Discontinued at least one product (not production) line		
Opened of new plant		
Closed at least one existing plant or outlet		
Agreed a new joint venture with foreign partner		
Obtained a new licensing agreement		
Outsourced a major production activity that was previously conducted in-house		
Brought in-house of a major production activity that was previously outsourced		
Obtained a new quality accreditation (ISO 9000)		

Q.86 Thinking of your main product line or main line of services and comparing your production process with that of your closest competitor, which of the following best summarizes your position:

My firm's technology is less advanced than that of its main competitor
My firm's technology is about the same as that of its main competitor
My firm's technology is more advanced than that of its main competitor
Don't know

Q.91a How many permanent, full-time employees does your firm have now and how many did it have in 1998/1999? (give an estimate number)

Now		**1998/1999**	
2-49		2-49	
50-250		50-250	
>250		>250	

Q.91b How many part-time or temporary employees does your firm have now and how many did it have in 1998/1999? (give an estimate number)

Now		**1998/1999**	
0		0	
1-49		1-49	
50-250		50-250	
>250		>250	

Q.92 What per cent of your current permanent, full-time workers are:

Managers (excluding those involve in shop floor supervision) %
Professionals (e.g., accountants, engineers, scientists) %
Skilled workers %
Unskilled workers %
Support workers (e.g., administration, sales) %

Q.94 What percent of the workforce at your firm have the following education levels:

Did not complete primary school %
Primary schooling %
Some secondary school %
Secondary school diploma %
Some university %
University degree or higher %

Q.96 Do you offer formal training to your employees? If yes, what percent of employees in each category received training in 2001?

	Yes	No	Don't know	If YES, % Trained
Managers				
Professional?				
Skilled workers				
Unskilled workers				
Support workers				

Q.98 Now, I would like to ask you a hypothetical question. If you could change the number of regular full-time workers you currently employ without any restrictions (i.e. without seeking permission, making severance payments etc.), what would be your optimal level of employment as a percent of your existing workforce? (e.g. 90% implies you would reduce your workforce by 10%, 110% means you want to expand by 10%) **%,**

Appendix 2. Distribution of respondents by country

Country	Frequency	Percent
Albania	170	2.55
Armenia	171	2.56
Azerbaijan	170	2.55
Belarus	250	3.75
BiH	182	2.73
Bulgaria	250	3.75
Croatia	187	2.80
Czech	268	4.02
Estonia	170	2.55
FYROM	170	2.55
Georgia	174	2.61
Hungary	250	3.75
Kazakhstan	250	3.75
Kyrgyzstan	173	2.59
Latvia	176	2.64
Lithuania	200	3.00
Moldova	174	2.61
Poland	500	7.50
Romania	255	3.82
Russia	506	7.59
Slovakia	170	2.55
Slovenia	188	2.82
Tajikistan	176	2.64
Turkey	514	7.71
Ukraine	463	6.94
Uzbekistan	260	3.90
Yugoslavia	250	3.75
Total	6,667	100.00

Appendix 3. Distribution of firms by their legal organization

Legal organization of the company	Frequency	Percent
Single proprietorship	1981	29.71
Partnership	1714	25.71
Cooperative	143	2.14
Corporation, privately held	1524	22.86
Corporation listed on a stock exchange	184	2.76
Other private sector	194	2.91
State/municipal/district-owned enterprise	629	9.43
Corporatized state-owned enterprise	237	3.55
Other state owned	61	0.91
Total	6667	100

Appendix 4. Definitions of variables

Label	Definition	Tabulation (frequencies)			Remarks
		"no" = 0	"yes" = 1	DK /NA	
1	**2**	**3**	**4**	**5**	**6**
DEPENDENT VARIABLES					
tr_man	Training managers	4404	1851	412	
tr_prof	Training professional employees	3953	2170	544	
tr_skill	Training skilled workers	4070	2027	570	
tr_unsk	Training unskilled workers	4542	562	1563	
tr_supp	Training support workers	4531	689	1447	
FACTORS					
fown	Percentage of firm owned by private foreign company/organization, %	1077 non-zero values, 5130 zero values, 460 missing values.			Variable recoded assigning zero values whenever questions s.4c.2 and/or s.4c.3 are non-missing
perf	Percentage change in firm's sales since 1998, in real terms, %	6414 non-missing observations (sales of 3225 firms increased, 1694 – decreased, 1278 – did not change).			
monop	Monopolistic / Oligopolistic position of the firm	5394	1139	134	Takes value 1 if firm faces none or 1-3 competitors in the major product market
advtech	Subjective characteristic of firm's technology being more advanced than that of main competitor	4486	1716	465	
comp_im	Competition from imports	4504	1898	265	Takes value 1 if competition from imports in the market for main product is very or extremely important

Continued

1	2	3	4	5	6
innov1	Innovativeness: developing a major new product line and/or introducing new technology	3537	3102	28	
innov2	Innovativeness: opening a new plant	5726	898	43	
avl_work	Skills of available workers	4645	1869	153	Takes value of 1 if skills and education of available workers are moderate or major obstacle for business
primsch secsch univ	Percentages of firm's workforce with primary schooling or less, secondary schooling, and university education respectively				Reference group: Primary schooling
exshare	Percentage of firm's sales that are exported (either directly, or through a distributor), %	1614 non-zero values, 5011 zero values, 42 missing values.			
fullwork	Number of full-time employees	No missing values. 3 categories.			Recoded as dummy with reference group – small firms
partwork	Number of part-time employees	No missing values. 4 categories			Recoded as dummy with reference group – small firms
lab_reg	Effects of labor regulations	5077	1374	216	Takes value of 1 if labor regulations are moderate or major obstacle for business
	CONTROLS				
country	Dummies for country				Reference country: Poland
priv	Legal organization of the firm – privately owned	927	5740	0	Takes value of 1 if firm is private.
mining constr manuf	Proxies for industry: Mining and quarrying Construction Manufacturing	No missing values.			Proxies represent sales shares in the corresponding sectors.

Continued

transp	Transport, storage and communication		Reference group: "Other sector"
distrib	Wholesale, retail, repairs		
restate	Real estate, renting and business services		
henrest	Hotels and restaurants		
	Percentage of full-time workers	95 missing values	
sh_man	Managers		
sh_prof	Professionals		
sh_skill	Skilled workers		
sh_unsk	Unskilled workers		
sh_supp	Support workers		

INSTRUMENTS

emp_opt	Optimality of employment	213 missing values	Corresponds to question Q.98
size1	The estimate of a firm's total sales in 2001	Coded as dummy	13 categories; the smallest size is a reference group
size2	The estimate of the replacement value of the physical production assets used by a firm	Coded as dummy	13 categories; the smallest size is a reference group

Appendix 5. A note on endogeneity in binary choice models

This note discusses testing for and estimating in the presence of endogenous explanatory variables in binary response models. I use the simple technique of two-stage estimation.

1. Testing

Let $y_1^* = z_1\delta_1 + y_2\gamma + u_1$, where y_2 is a (continuous) endogenous variable. We assume that a reduced form for y_2 exists: $y_2 = z_1c_1 + z_2c_2 + v_2 = zc + v_2$, where $z = [z_1, z_2]$; u_1 and v_2 are correlated.

Let further write $u_1 = \theta_1 v_2 + e_1$; then $\theta_1 = \dfrac{\mathrm{cov}(u_1, v_2)}{\mathrm{var}(v_2)}$.

$y_1^* = z_1\delta_1 + y_2\gamma + (\theta_1 v_2 + e_1)$, where $\mathrm{var}(e_1) = \mathrm{var}(u_1) - \mathrm{corr}(u_1, v_2)^2$.

Now we can set up the test as follows.

(1) Run OLS on the reduced form of y_2

$y_2 = z\hat{c} + \hat{v}_2$

and obtain the residuals series, $\hat{v}_2$

(2) Run probit/logit of y_1 on z_1, y_2, and $\hat{v}_2$

$y_1^* = z_1\delta_1 + y_2\gamma + \theta_1\hat{v}_2 + e_1$.

Test H_0: $\theta_1 = 0$ (implying $\mathrm{corr}(u_1, v_2) = 0$).

2. Estimation

Estimation proceed in a similar fashion as above 2-stage procedure while only $\hat{v}_2$ is included together with z_1 as explanatory variables in probit/logit model for y_1; y_2 (or $\hat{y}_2$) is not used.

Appendix 6. Probit estimates

Variable	Dependent variable – training for defined categories of employees				
	Managers	**Professional**	**Skilled**	**Unskilled**	**Support**
A	1	2	3	4	5
fown	.00465419***	.0025851***	.0016115**	.00130029	.0030247***
perf[1]	.00066375**	.00057329**	.00059121**	.00058202	.00074121**
monop	.15821667***	.05758764	.11637907**	.03507664	-.03553652
advtech	.19208523***	.15331312***	.2118632***	.03348679	.21871407***
comp_im	.08037365*	.0682322	.0705767	-.01958675	.06772251
innov1	.3537887***	.34247388***	.37524643***	.25698506***	.26808663***
innov2	.20254742***	.20768259***	.05822511	.24401648***	.11001553
avl_work	.09294554*	.10769869**	.15699106***	.06973285	-.00222511
secsch	.00031111	.00251739	.00265575*	-.00126153	-.0013099
univ	.00947838***	.00844304***	.00505289***	.00175197	.00465786**
exshare	.00107581	.00180163*	-.00031301	-.00087417	.00054921
fullwork_1	.42049733***	.54283072***	.22948995***	.14481386*	.40667585***
fullwork_2	.69445908***	.76575094***	.52191855***	.4911792***	.58893413***
partwork_1	.16689519	.06324677	.15870056	.11807223	.00720869
partwork_2	.10507859	.00360464	.12260975	.26697723	.08758217
lab_reg	.08705476	.04725144	.11457884**	.06929519	.03593693
d_Albania	-.48513052**	-.47518099**	-.9206358***	-1.627791***	-1.460838***
d_Armenia	-.5652979***	-.2968396**	-.5133622***	.01855834	-.35392813*
d_Azerbaijan	-.9056420***	-.7273335***	-.7283143***	-.8750359***	-1.534979***
d_Belarus	-.4447498***	-.01137037	-.3314540***	-.5619624***	-1.203243***
d_BiH	-.28388905*	-.29334493*	-.29835114*	-.8458797***	-.6362527***
d_Bulgaria	-.5597951***	-.25000076*	-.26888541**	-.37825628**	-.7216250***
d_Croatia	-.1249679	.01549035	-.24061155	-.10486911	.35833437*
d_Czech	.38798108***	.55431543***	.57035523***	.05786722	-.36820962**
d_Estonia	.5066064***	.66770483***	.33191356**	.10370198	.27874037
d_FYROM	-.7554480***	-.43918348**	-.4818549***	-.26617521	-.6384538***
d_Georgia	-.6968476***	-.38158218**	-.7316751***	-.72834203**	-1.075510***
d_Hungary	-.20956568	.27144474*	-.24722708*	-.1044953	.01708068
d_Kazakhstan	-.6097036***	-.25992141**	-.4957546***	-.6470848***	-.9771100***
d_Kyrgyzstan	-.6965931***	-.07434404	-.5268662***	-.3985067**	-.8184602***
d_Latvia	.46973668***	.86285817***	.19559515	-.34232565	-.24302551
d_Lithuania	.19080746	.55420867***	-.1482437	-.02094992	-.36827593**
d_Moldova	-.5715356***	-.03247771	-.7171854***	-.8589461***	-1.004201***
d_Romania	-.5970467***	-.5761179***	-.5815266***	-.20595356	-.7896217***
d_Russia	-.3216965***	.14082225	-.5762960***	-.9032956***	-.5382668***
d_Slovakia	.38658532**	.73457598***	.76906122***	.69272434***	.33015084*
d_Slovenia	.62529789***	.77714528***	.73827748***	.61443104***	.6769063***
d_Tajikistan	-.8514117***	-.4543486***	-.6233571***	-.34611049*	-.8573089***
d_Turkey	-.6325915***	-.8982304***	-.8075859***	-.32240011**	-.6212635***

Continued

A	1	2	3	4	5
d_Ukraine	-.5352916***	-.2815625***	-.5620843***	-.6735534***	-1.106329***
d_Uzbekistan	-.8967408***	-.33620214**	-.7678966***	-.8521294***	-1.153508***
d_Yugoslavia	-.5134296***	-.29245419**	-.3906466***	-.5963097***	-.7310523***
priv	-.01612641	-.1056373*	-.13146612**	-.12288708	-.04799523
mining	.00114926	.00113338	.00375327*	.00600427**	.00512427*
constr	.00178315	.00210629*	.00204729**	.00381991**	.00285322*
manuf	.00021601	-.00033367	-.0005097	.00326487**	.00336747**
transp	.00335963***	.00197038*	.00050197	.00249544	.00334656*
distrib	.00026754	-.00134123	-.0026360***	.00045732	.00232144
restate	.00157915	.00087528	-.00230277**	.00013343	.00111482
henrest	.00061734	-.00262659**	-.00204847*	.00297477	.00390667**
sh_man	-.00005837				
sh_prof		.00728817***			
sh_skill			.00625165***		
sh_unsk				.01185719***	
sh_supp					.0142889***
_cons	-1.261473***	-1.371977***	-1.084560***	-1.584412***	-1.667833***

legend: * p<.1; ** p<.05; *** p<.01

[1] 2-stage estimate for regressions where endogeneity was not rejected

Appendix 7. Amemiya Generalized Least Squares probit estimates

Variable	Dependent variable – training for defined categories of employees				
	Managers	Professional	Skilled	Unskilled	Support
A	1	2	3	4	5
fown	.00408664***	.00185595**	.0015275*	.00148204	.00267873***
perf	.00517001**	.00653578***	.0034197*	-.00050262	.0033054
monop	.12227317**	.01139441	.08732808	.02408989	-.05659686
advtech	.12147892**	.06845887	.16456965***	.04720936	.19270274***
comp_im	.0818729	.068747	.06775666	-.02648964	.0824039
innov1	.25457753***	.21740838***	.30673711***	.26819823***	.1989726**
innov2	.1530178**	.14635676**	.01853152	.2486426***	.07562442
avl_work	.07522601	.08235637	.13865031***	.07429779	-.01565762
secsch	-.00056744	.00154318	.00249423*	-.00077371	-.00119011
univ	.00821012***	.00734696***	.00462258***	.00217689	.00430837**
exshare	.0002897	.00076357	-.00078935	-.00063426	.00020736
fullwork_1	.39508109***	.49937413***	.20559868***	.14037946*	.37759655***
fullwork_2	.6558973***	.69950069***	.4988747***	.48378705***	.57619665***
partwork_1	.11023776	-.00670106	.10411204	.14351936	-.02338256
partwork_2	.16587447	.06281088	.12951581	.24932331	.08052424
lab_reg	.1110234*	.07419155	.11913082**	.06441382	.02979095
d_Albania	-.6027425***	-.6230981***	-.8859178***	-1.507452***	-1.690963***
d_Armenia	-.5988978***	-.32972095**	-.5398961***	.02791061	-.36749773*
d_Azerbaijan	-.9447121***	-.7818026***	-.7516728***	-.8480826***	-1.529575***
d_Belarus	-.5939447***	-.20663601	-.4450053***	-.5188328**	-1.273841***
d_BiH	-.3214543*	-.34347144*	-.29438962*	-.7781512***	-.6212742***
d_Bulgaria	-.5671220***	-.26903648*	-.28514058**	-.35613811*	-.7216314***
d_Croatia	-.2660185	-.17004917	-.34547456**	-.04020619	.37428261*
d_Czech	.28870723**	.43324194***	.50433064***	.04205144	-.4296058**
d_Estonia	.26674943	.37045746*	.23481312	.17056584	.20944841
d_FYROM	-.7772606***	-.45326223**	-.4947935***	-.24664634	-.6420761***
d_Georgia	-.7702513***	-.4712794***	-.7884959***	-.70521446**	-1.081730***
d_Hungary	-.42677794**	-.00709619	-.3748096**	-.08502634	-.10403963
d_Kazakhstan	-.7742519***	-.4836689***	-.6139961***	-.5901354***	-1.058179***
d_Kyrgyzstan	-.7224525***	-.11272791	-.5384699***	-.37412255*	-.8150116***
d_Latvia	.36575437*	.77094864***	.1544587	-.28059241	-.34075991
d_Lithuania	.12871489	.47606033***	-.19287991	.0168512	-.38613639**
d_Moldova	-.6645026***	-.14759492	-.7701975***	-.8238534***	-1.044684***
d_Romania	-.7854454***	-.8252919***	-.6958755***	-.12336519	-.8563762***
d_Russia	-.5698141***	-.1720584	-.6967033***	-.8177439***	-.6378206***
d_Slovakia	.23961702	.56828726***	.64318938***	.69518797***	.19380782
d_Slovenia	.48593293***	.63733282***	.66246517***	.63383735***	.62917197***
d_Tajikistan	-.8896436***	-.5071366***	-.6482586***	-.31996403*	-.8671513***

Continued

A	1	2	3	4	5
d_Turkey	-.5974660***	-.8488909***	-.8023444***	-.32972127**	-.6095586***
d_Ukraine	-.7395068***	-.5361840***	-.6820060***	-.6007393***	-1.225492***
d_Uzbekistan	-1.057675***	-.5467514***	-.8728569***	-.7916924***	-1.222426***
d_Yugoslavia	-.5550218***	-.34525431**	-.4044786***	-.5616234***	-.7393120***
priv	-.09661918	-.1975698***	-.16897695**	-.11470767	-.06850064
mining	.00145776	.00137185	.00380007*	.00585719**	.00508458*
constr	.00181038	.00207522*	.00212204**	.00351239**	.00267262
manuf	.00023673	-.00036961	-.00044197	.0031264*	.003235*
transp	.00319927**	.00176826	.00050197	.00254165	.00318823*
distrib	.00037242	-.0012781	-.00243604**	.00039573	.0024571
restate	.00125685	.0004904	-.00218059*	.00016841	.00134871
henrest	.00108057	-.0021578	-.0020576	.0026649	.00409266**
sh_man	.0011723				
sh_prof		.00695123***			
sh_skill			.00650029***		
sh_unsk				.01210489***	
sh_supp					.01380465***
_cons	-1.023100***	-1.067475***	-.9666192***	-1.628952***	-1.562734***

legend: * p<.1; ** p<.05; *** p<.01

Appendix 8. Probit estimates with the Huber/White/sandwich estimator of variance

Variable	Dependent variable – training for defined categories of employees				
	Managers	**Professional**	**Skilled**	**Unskilled**	**Support**
A	1	2	3	4	5
fown	.00465419***	.0025851***	.0016115**	.00130029	.0030247***
perf[1]	.00066375**	.00057329**	.00059121**	.00058202	.00074121**
monop	.15821667***	.05758764	.11637907**	.03507664	-.03553652
advtech	.19208523***	.15331312***	.2118632***	.03348679	.21871407***
comp_im	.08037365*	.0682322	.0705767	-.01958675	.06772251
innov1	.3537887***	.34247388***	.37524643***	.25698506***	.26808663***
innov2	.20254742***	.20768259***	.05822511	.24401648***	.11001553
avl_work	.09294554*	.10769869**	.15699106***	.06973285	-.00222511
secsch	.00031111	.00251739*	.00265575*	-.00126153	-.0013099
univ	.00947838***	.00844304***	.00505289***	.00175197	.00465786**
exshare	.00107581	.00180163*	-.00031301	-.00087417	.00054921
fullwork_1	.42049733***	.54283072***	.22948995***	.14481386*	.40667585***
fullwork_2	.69445908***	.76575094***	.52191855***	.4911792***	.58893413***
partwork_1	.16689519	.06324677	.15870056	.11807223	.00720869
partwork_2	.10507859	.00360464	.12260975	.26697723	.08758217
lab_reg	.08705476	.04725144	.11457884**	.06929519	.03593693
d_Albania	-.4851305***	-.4751809***	-.9206358***	-1.627791***	-1.460838***
d_Armenia	-.5652979***	-.2968396*	-.5133622***	.01855834	-.35392813*
d_Azerbaijan	-.9056420***	-.7273335***	-.7283143***	-.8750359***	-1.534979***
d_Belarus	-.4447498***	-.01137037	-.3314540***	-.5619624***	-1.203243***
d_BiH	-.28388905*	-.29334493*	-.29835114*	-.8458797***	-.6362527***
d_Bulgaria	-.5597951***	-.25000076**	-.26888541**	-.37825628**	-.7216250***
d_Croatia	-.1249679	.01549035	-.24061155	-.10486911	.35833437*
d_Czech	.38798108***	.55431543***	.57035523***	.05786722	-.36820962**
d_Estonia	.5066064***	.66770483***	.33191356**	.10370198	.27874037
d_FYROM	-.7554480***	-.43918348**	-.4818549***	-.26617521	-.6384538***
d_Georgia	-.6968476***	-.3815821***	-.7316751***	-.72834203**	-1.075510***
d_Hungary	-.20956568	.27144474**	-.24722708*	-.1044953	.01708068
d_Kazakhstan	-.6097036***	-.25992141**	-.4957546***	-.6470848***	-.9771100***
d_Kyrgyzstan	-.6965931***	-.07434404	-.5268662***	-.3985067**	-.8184602***
d_Latvia	.46973668***	.86285817***	.19559515	-.34232565	-.24302551
d_Lithuania	.19080746	.55420867***	-.1482437	-.02094992	-.36827593**
d_Moldova	-.5715356***	-.03247771	-.7171854***	-.8589461***	-1.004201***
d_Romania	-.5970467***	-.5761179***	-.5815266***	-.20595356	-.7896217***
d_Russia	-.3216965***	.14082225	-.5762960***	-.9032956***	-.5382668***
d_Slovakia	.38658532**	.73457598***	.76906122***	.69272434***	.33015084**
d_Slovenia	.62529789***	.77714528***	.73827748***	.61443104***	.6769063***

Continued

A	1	2	3	4	5
d_Tajikistan	-.8514117***	-.4543486***	-.6233571***	-.34611049*	-.8573089***
d_Turkey	-.6325915***	-.8982304***	-.8075859***	-.32240011**	-.6212635***
d_Ukraine	-.5352916***	-.2815625***	-.5620843***	-.6735534***	-1.106329***
d_Uzbekistan	-.8967408***	-.3362021***	-.7678966***	-.8521294***	-1.153508***
d_Yugoslavia	-.5134296***	-.29245419**	-.3906466***	-.5963097***	-.7310523***
priv	-.01612641	-.1056373*	-.13146612**	-.12288708	-.04799523
mining	.00114926	.00113338	.00375327*	.00600427**	.00512427**
constr	.00178315	.00210629**	.00204729**	.00381991**	.00285322*
manuf	.00021601	-.00033367	-.0005097	.00326487*	.00336747**
transp	.00335963***	.00197038*	.00050197	.00249544	.00334656*
distrib	.00026754	-.00134123	-.0026360***	.00045732	.00232144
restate	.00157915	.00087528	-.00230277**	.00013343	.00111482
henrest	.00061734	-.00262659**	-.00204847*	.00297477	.00390667**
sh_man	-.00005837				
sh_prof		.00728817***			
sh_skill			.00625165***		
sh_unsk				.01185719***	
sh_supp					.0142889***
_cons	-1.261473***	-1.371977***	-1.084560***	-1.584412***	-1.667833***

legend: * p<.1; ** p<.05; *** p<.01

[1] 2-stage estimate for regressions where endogeneity was not rejected

Appendix 9. Estimated marginal effects for probit models

Variable	Dependent variable – training for defined categories of employees				
	Managers	Professional	Skilled	Unskilled	Support
A	1	2	3	4	5
fown	0.0015268***	0.0009338***	0.0005688**	0.0001892	0.0004881***
perf[1]	0.0002177**	0.0002071**	0.0002087**	0.0000847	0.0001196**
monop*	0.0534659***	0.0209673	0.0418012**	0.005184	-0.0056481
advtech*	0.0645538***	0.0561215***	0.076292***	0.004923	0.0376229***
comp_im*	0.0266188*	0.0247919	0.0250755	-0.0028339	0.0111284
innov1*	0.116103***	0.1235106***	0.1322378***	0.0376928***	0.0436499***
innov2*	0.0693599***	0.0772838***	0.0207646	0.0403151***	0.0187529
avl_work*	0.0308446*	0.0392711**	0.0562408***	0.010353	-0.0003588
secsch	0.0001021	0.0009094	0.0009374*	-0.0001835	-0.0002114
univ	0.0031093***	0.0030499***	0.0017835***	0.0002549	0.0007516**
exshare	0.0003529	0.0006508*	-0.0001105	-0.0001272	0.0000886
fullwo~1*	0.1474835***	0.2057728***	0.0834862***	0.0223667*	0.0766903***
fullwo~2*	0.2535863***	0.293804***	0.1964093***	0.0898187***	0.1227689***
partwo~1*	0.057293	0.023139	0.0579216	0.0185671	0.0011685
partwo~2*	0.0355043	0.0013031	0.0444416	0.0461759	0.0149309
lab_reg*	0.0289866	0.0171689	0.0410614**	0.0103667	0.0058782
d_Alba~a*	-0.1333356**	-0.1501342**	-0.235669***	-0.082070***	-0.091786***
d_Arme~a*	-0.151160***	-0.0995068**	-0.155181***	0.0027343	-0.0451151*
d_Azer~n*	-0.207731***	-0.210605***	-0.202770***	-0.070098***	-0.094573***
d_Bela~s*	-0.125831***	-0.0040979	-0.107097***	-0.055485***	-0.090193***
d_BiH*	-0.0845796*	-0.098281*	-0.0968889*	-0.068331***	-0.067023***
d_Bulg~a*	-0.150813***	-0.0850839*	-0.0884294**	-0.0427658**	-0.073442***
d_Croa~a*	-0.0394033	0.005614	-0.0795895	-0.0141785	0.0720654*
d_Czech*	0.1394154***	0.2145495***	0.218603***	0.0087397	-0.0469581**
d_Esto~a*	0.1861116***	0.259517***	0.1246455**	0.0161795	0.0534486
d_FYROM*	-0.185045***	-0.1406921**	-0.147136***	-0.0322503	-0.067333***
d_Geor~a*	-0.175692***	-0.1247619**	-0.202855***	-0.0630333**	-0.085353***
d_Hung~y*	-0.0643063	0.1026246*	-0.081751*	-0.0141807	0.0027855
d_Kaza~n*	-0.161199***	-0.0882826**	-0.151744***	-0.061819***	-0.086164***
d_Kyrg~n*	-0.175968***	-0.0264194	-0.158657***	-0.0442434**	-0.077397***
d_Latvia*	0.1717764***	0.3337213***	0.0719371	-0.0390632	-0.0332949
d_Lith~a*	0.0658682	0.2146826***	-0.050401	-0.003006	-0.0468501**
d_Mold~a*	-0.152246***	-0.0116504	-0.200560***	-0.068887***	-0.082315***
d_Roma~a*	-0.158708***	-0.177307***	-0.172388***	-0.0260133	-0.074928***
d_Russia*	-0.095742***	0.0521168	-0.173667***	-0.077443***	-0.063841***
d_Sl~kia*	0.1393227**	0.2854304***	0.2971514***	0.1533568***	0.0652232*
d_Sl~nia*	0.2329204***	0.3015623***	0.2850759***	0.1308022***	0.1604801***
d_Taji~n*	-0.200627***	-0.145138***	-0.181133***	-0.0398393*	-0.079198***
d_Turkey*	-0.169751***	-0.253934***	-0.227041***	-0.0391227**	-0.071665***

Continued

A	1	2	3	4	5
d_Ukra~e*	-0.148542***	-0.095672***	-0.170624***	-0.063397***	-0.090639***
d_Uzbe~n*	-0.209808***	-0.111783**	-0.212829***	-0.071477***	-0.091664***
d_Yugo~a*	-0.140377***	-0.0982436**	-0.123438***	-0.057979***	-0.073485***
priv*	-0.0053087	-0.0387458*	-0.0473979**	-0.0189713	-0.0079196
mining	0.000377	0.0004094	0.0013248*	0.0008735**	0.0008268*
constr	0.000585	0.0007609*	0.0007226**	0.0005557**	0.0004604*
manuf	0.0000709	-0.0001205	-0.0001799	0.000475**	0.0005434**
transp	0.0011021***	0.0007118*	0.0001772	0.000363	0.00054*
distrib	0.0000878	-0.0004845	-0.000930***	0.0000665	0.0003746
restate	0.000518	0.0003162	-0.0008128**	0.0000194	0.0001799
henrest	0.0002025	-0.0009488**	-0.000723*	0.0004328	0.0006304**
sh_man	-0.0000191				
sh_prof		0.0026327***			
sh_skill			0.0022066***		
sh_unsk				0.001725***	
sh_supp					0.0023056***

legend: * p<.1; ** p<.05; *** p<.01

(*) for discrete change of dummy variable from 0 to 1

[1] 2-stage estimate for regressions where endogeneity was not rejected