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LABOR MARKETS AND PRODUCTIVITY IN THE PROCESS OF GLOBALIZATION: FIRM LEVEL EVIDENCE FROM TURKEY

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PART ONE

SUMMARY

Over the last 15 years, global economic integration has been accelerated by international trade and capital flows. Consequently, understanding the linkages between domestic producers' performance, labor markets, and globalization has become an ever more pressing concern for all who are interested in economic policy. Policy makers in many developing countries, faced with a rapidly and fundamentally changing world economy, are struggling to decide which labor market and trade policies to implement. "Correct" policy intervention, if any, is linked critically to channels through which international forces influence domestic producers and workers, as well as the concomitant impact of domestic factors on the integration of the domestic economy.

In this research, we focus on the Turkish economy during the period from 1983 to 1996. This period follows directly the 1980 initiation of the economic restructuring programs that accelerated the Turkish economy's integration to the world economy. We use a plant-level data set because such data sets are most likely to shed light on linkages between globalization, labor markets, and producer performance. The plant-level data set used in this project includes all manufacturing establishments with ten or more employees and was collected by the Turkish State Institute of Statistics (SIS).

This research project predates the ERF funding period. Access to the manufacturing establishments database was granted in June 1999, after three years of negotiations with the SIS, and under an official agreement. As such, this represents the first research undertaken outside of the auspices of the SIS using this data. During the June-December 1999 period, preliminary work was conducted with the data, leading to the project that was carried out here under ERF sponsorship.

In the component of the research discussed in this report, we focused on distinct aspects of liberalization. This was motivated by the desire to explore and identify the most important channels through which the process of globalization has impacted the Turkish economy. This strategy enabled us to work with different aspects of the data set so as to asses the overall reliability of the data and make improvements on existing problems, including missing observations and internal inconsistencies. As such, we were able to produce high quality output and this strategy has enabled us to identify important areas for future work on related subjects.

This report summarizes distinct results of the research generated during the grant period. These are:

1. The preparation of three research papers, summaries of which are included in this report. They are:
   - Export-led Industrialization and Gender Differences in Job Creation and Destruction: Micro Evidence from Turkish Manufacturing Sector by Sule Ozler
   - Does Trade Liberalization Improve Productivity? Plant-level Evidence from the Turkish Manufacturing Industry by Sule Ozler and Kamil Yilmaz
   - Dynamics of Competition and Foreign Direct Investment: Entry, Exit, and the Growth of Foreign and Local Establishments in Turkish Manufacturing by Sule Ozler and Erol Taymaz
2. The presentation of preliminary results on four additional topics, which indicate the need for further work in these issue areas. These include:
   - Technology Transfers and Productivity. Preliminary work on this issue has been presented at the American Economic Association, the NBER Summer Institute, and the Economic Research Forum.
   - Technology and Gender. Preliminary work on this issue has been presented at the International Association for Feminist Economists.
   - Markups.
   - Technology and Skills.
3. The development of a training program at the Turkish State Institute of Statistics (SIS), established in June 2001 for a duration of 14 months. The program targets permanent employees of the SIS, and is housed at the SIS, where the authors maintain a research lab and access to the data set. This training program has been important for capacity-building in local institutions, and also ensures access to this otherwise highly classified data.

PART TWO

SUMMARIES OF RESEARCH PAPERS

EXPORT-LED INDUSTRIALIZATION AND GENDER DIFFERENCES IN JOB CREATION AND DESTRUCTION: MICRO EVIDENCE FROM THE TURKISH MANUFACTURING SECTOR BY

SULE OZLER

This paper was presented at the International Association of Feminist Economists in Istanbul in August 2000, the Seventh Annual Conference of the Economic Research Forum in Amman in October, 2000, and a conference on "New Developments in Research on Gender-Aware Macroeconomics and International Economics" at the Levy Economics Institute of Bard College in Annandale-on-Hudson, New York in May 2002. The following is an abstract and a summary of the paper.

Abstract

This paper investigates gender differences in job creation and destruction patterns in Turkey during a period of substantial trade liberalization. As a result of the research, it is concluded that (a) in the manufacturing sector as a whole, the net job creation rate for females at every skill level is significantly higher than their male counterparts; (b) the gross job reallocation rate for females is about twice the size of males at the same skill levels; (c) net job creation rates in the exportable sector are higher than they are in the import competing sectors for all worker groups, but a comparison across the sectors also indicates that the relative net job creation rate for females is higher where females constitute a smaller fraction of a skill group; and (d) the ratio of the gross job reallocation rate of females to males at a given skill level differ only slightly across sectors by trade orientation.

Much has been written on women's integration into the industrialization process in semi-industrialized countries, ever since Boserup (1970) emphasized that women were marginalized under import substitution policies. There is now an extensive literature articulating the changes that have taken place since Boserup's seminal work and linking export-led industrialization to the feminization of the labor force.[1] A key message of this literature is that in semi-industrialized countries, export-led industrialization has increased women's employment opportunities, and thus their income and autonomy.[2] At the same time, however, there are numerous indications of the precariousness of women's employment resulting from factors such as poor work conditions and low pay.[3] The purpose of this study is to contribute to this literature by investigating gender differences in job creation rates and job reallocation rates across sectors by their trade orientation. As elaborated below, the focus on gender differences in job creation rates across sectors by trade orientation enables a discussion of issues relevant to the process through which the feminization of the workforce takes place. Measuring job reallocation rates, on the other hand, is a way of quantifying gender differences in the vulnerability of varying positions.

There are two views on underlying processes that lead to increased employment opportunities for women during export-led industrialization.[4] According to one view, increased exports to industrialized countries shift demand towards those sectors in which women have been traditionally employed (Wood,1991). Thus, new employment opportunities for women are to be found in export-oriented industries. Other interpretations of labor feminization are based on the notion that women constitute a "cheap" source

[1] See UN (1999) for a recent summary.

[2] There is also some evidence suggesting that the association of the increased intensity of female employment with export-oriented industrialization might be reversed (see for example Berik, 2000 and Joekes and Weston, 1994). Where it is observed, the reversal is attributed to the introduction of new technologies, skill upgrading by export producers, and the reorganization of production, especially in the form of multitasking by flexible labor engaged in high-performance production.

[3] See UN (1999) and Beneria (2001).

[4] Women's availability for paid employment in the manufacturing sector is also attributed to several different factors. "Push factors" refer to women's participation in paid employment due to increased family income insecurity during structural adjustment programs (Beneria 1992). Kabeer (1995) notes that women's entry into the workforce is a response to a variety of needs and incentives, not simply the support family income. Daughters' choice of factory employment in the face of opposition from parents, for example, is interpreted as their route to personal liberation (Wolf 1992). See Ozler (1999) for an overview of this literature.

of labor.[5] Elson (1996) argues that the changing nature of jobs as reflected in increased flexibility, and the deskilling of jobs, have jointly lead to a decline in positions that were previously held by men, translating into increased job opportunities for women. Standing (1989 and 1999), on the other hand, argues that the declining strength of labor market insiders has enabled employers to substitute women's "cheap" labor for that of men, and/or led to the decline of jobs that were previously held by men.[6] This set of explanations challenge the view that industrialization based on trade expansion and market flexibility merely expands existing employment opportunities. It thus suggests that even in sectors that are not traditionally female dominated, we would observe increased employment opportunities for women relative to men.

In empirical studies linking the female share of employees and export-led industrialization data at different levels of aggregation, several different methodologies are used. In some studies, cross-country time series comparisons are made according to an inspection of overall trends (Standing,1989 and 1999), or using an econometric framework (Wood, 1991; Cagatay and Ozler, 1995).[7] There are also numerous case studies on countries from different regions, which focus on export-processing zones, broad sectors of the economy, or sub-sectors of the manufacturing industry.[8]

Despite the presence of many studies using aggregate data, there are few studies that use plant-level data.[9] One advantage of using plant-level data to investigate job creation processes is that it permits the identification and quantification of some conditions under which workers are integrated into the workforce. In particular, it allows measurement of the job reallocation rate. Industry-level studies, with their focus on net job changes, cannot identify the degree of job reallocation (i.e. simultaneous job creation and destruction) that may be taking place in an industry. A high level of job reallocation, in the

[5] "…'cheap' labor is deconstructed beyond wage levels to include employee protection, employer's contribution to social wage, taxation, investment and working conditions in combination with non-militancy, docility and manual dexterity and conscientious application to often monotonous production process..." (Pearson (1998), p. 5).

[6] Nevertheless, the basic argument rests on outsiders replacing insiders, which is the view with which Elson (1996) takes issue.

[7] Wood (1991) estimates female share only as a function of export ratio. Cagatay and Ozler (1995) use a framework that incorporates other economic and demographic factors and information on the implementation of adjustment programs as potential explanatory variables, in addition to changes in export performance.

[8] References to many case studies can be found in Cagatay and Berik (1991), and UN (1999).

[9] See, for example, Ozler (2000 and 2001).

process of the creation of a given level of net jobs is an indicator of the high degree of uncertainty experienced by the workforce.[10] Thus, gender-based measures of job reallocation rates are important indicators of gender differences in job vulnerability.

In this study, gender difference in net job creation and gross job reallocation rates are investigated using a data set collected by the State Institute of Statistics (SIS) in Turkey for the period from 1986 to 1996. The period is well suited for the purposes of this research insofar as it follows the initiation of export-led industrialization policies in Turkey. [11] One particular advantage of this data set for the purposes outlined here is that employees are classified by gender at varying skill levels, thus enabling gender comparisons at any given skill level. The data analyzed in this study include private manufacturing establishments.

Date analysis indicates important differences in net job creation and gross job relocation rates by worker groups for the manufacturing industry as a whole. Though creation and destruction rates differ by skill level (e.g. *unskilled, skilled,* and *non-production*) for workers of the same gender, larger gaps stem from gender differences for workers at the same skill level. In fact, the most striking aspect of the results is that the net job creation rate, as well as the gross job reallocation rate, is higher for women than their male counterparts at every skill level. Among skilled workers, where the biggest gender gap in the net job creation rate is observed, the average annual net job creation rate is 5.76% for skilled females, in contrast to a rate of 1.69% for skilled males. The biggest gender gap in gross job reallocation rates is observed for skilled workers, as well. The job reallocation rate for skilled female workers, which is 87.8%, is about twice that of their male counterparts.

Categorizing industries according to their trade orientation, the above findings continue to hold qualitatively. That is to say, irrespective of a sector's trade orientation, net job creation, and the gross job reallocation rate for women at every skill level is higher than for men. Across sectors, gross job reallocation rates, or the ratio of the gross job reallocation rate of women to men at a given skill level, differ only slightly. Net job creation rates show

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[10] Plant-level studies on developing countries document that within a given industry, substantial job creation and destruction is taking place simultaneously See, for example, Roberts (1996)on Chile, Colombia, and Morocco, and Levinsohn (1999) on Chile. For examples of studies on industrialized countries using similar methodologies, see Davis and Haltiwanger (1990), and Dunne, Roberts, and Samuelson (1989) on the U.S., Baldwin, and Dunne and Haltiwanger (1994) on Canada and the U.S.

[11] The reforms were initiated in 1980. See Celasun and Rodrik (1990) for the chronology of the programs.

a more discernable difference across industries. In particular, net job creation rates in the exportable sector are higher than they are in the import-competing sectors for all worker groups. However, the net job creation rate for female production workers (non-production) relative to their male counterparts is higher (lower) in the import-competing sector than it is in the exportable sector. Since female production (non-production) workers constitute a smaller (larger) share of employees in import competing sectors, the results indicate that the relative net job creation rate for women is somewhat higher where female workers constitute a relatively smaller fraction of the workforce.

Overall, the high net job creation rates for women in export-oriented industries have obviously contributed to the feminization of the labor force in the Turkish economy. Restructuring the economy by opening it to international competition, privatization, and deregulation appear to have resulted in higher net job creation for women across sectors with different trade orientations. Thus, the changing nature of jobs, through deskilling, for example, as well as increased flexibility in the economy appear to be largely behind the increased feminization of the labor force in the manufacturing industry. This finding is consistent with the arguments of both Elson (1986) and Standing (1989 and 1999).

Before reaching the conclusion that the Turkish experience is a success story in integrating women into the work force, however, it is important to note two caveats. First, in every sector of the economy, women experience significantly higher job uncertainty, as measured by gross job reallocation rates. Second, despite high annual net job creation rates, female workers still hold a small fraction of private manufacturing jobs. Despite the fact that the period under consideration saw approximately a six percent increase in the female share of total employees, the total share of women in the workforce reached only 22% by 1996.

This paper makes three principal contributions to the existing literature. First, this paper contributes to discussions of globalization, gender, and employment by measuring the gross job reallocation rate of manufacturing jobs. The existing literature has focused on gender differences in net job creation, and concluded that trade liberalization has led to the feminization of the labor force. Increasing involvement of women in the labor force has been welcomed as a facilitator towards gender equality. At the same time, however, there is an acute awareness of the existence of conditions under which women's integration into the labor market may be worse than men's, in terms of pay, social environment, and other factors. This study quantifies one of these dimensions – employment vulnerability - by focusing on gross

job reallocation. Our findings indicate that while the net job creation for women is significantly higher than the rate for their male counterparts, the gross job reallocation rate of women's jobs is also significantly higher at every skill level.

Second, this paper contributes to the literature on employment shifts in the Turkish economy during its export-led industrialization phase. In this study, consistent with earlier studies, we find that the average net job creation rate is lower than the growth rate of the working-age population. Despite this, however, our study indicates that there are important differences in employment generation capacity across worker groups. The net job creation rate for non-production workers is significantly higher than for production workers. Similarly, net job creation rates for women, controlling for skill levels, are significantly higher than the job creation rates for men.

Finally, this paper contributes to plant-level studies on jobs not only by introducing evidence from the Turkish economy, but also by highlighting the salience of gender differences for such research. Among the earlier studies, Levinsohn (1999) has a discussion of gender differences based on a comparison of all female workers with all male workers. The advantage of this study is that it is able to compare men and women in the same skill groups. In fact, we find the largest gaps, both in net job creation and gross job reallocation, when we compare skilled males with skilled females. This would be very difficult to pick up in a comparison of all male and female workers, since women work in largely unskilled jobs, and constitute a smaller share of the skilled workforce.

DOES TRADE LIBERALIZATION IMPROVE PRODUCTIVITY? PLANT-LEVEL EVIDENCE FROM THE TURKISH MANUFACTURING INDUSTRY

SULE OZLER AND KAMIL YILMAZ

This paper was presented at the annual meeting of the Global Development Network in Rio de Janeiro in December, 2001, the 2001 annual meeting of the American Economic Association in Atlanta, and the National Bank for Economic Reconstruction's Universities Research Conference on Firm-Level Responses to Trade Policies in Boston in May, 2001. The following is an abstract and a summary of the paper.

Abstract

Applying the methodology first introduced by Olley and Pakes (1996) and further developed by Levinsohn and Petrin (2001) on plant-level data from the Turkish manufacturing sector, we estimate production functions for 24 three-digit SIC industries over the 1983-96 period. Based on the production function parameter estimates, we calculate plant-level total factor productivities and analyze them in several different ways. First, we analyze their evolution over time and across industries by trade orientation. During periods of rapid decline in protection rates, productivity gains are largest. Second, we show that productivity gains are largely due to a reshuffling of resources from less to more productive plants. Third, we estimate plant-level regressions of productivity on trade orientation by plant. Plants in tradable sectors, in particular plants in import competing sectors, have higher productivity gains. Fourth, we estimate regressions of productivity on nominal protection rates. Reduced protection improves productivity in import competing sectors, but not in others. Our main result, which demonstrates that trade liberalization leads to productivity gains, is robust to possible effects of real exchange rate movements, as well as public sector wage hikes in the late 1980s and early 1990s.

The theoretical trade literature provides conflicting predictions on the impact of liberalization on productivity. On the one hand, trade liberalization and increased competition might result in increased access to higher quality intermediate inputs, capital goods that embody improved technologies, exploitation of economies of scale, improved X inefficiencies, or plant shut down. On the other hand, if trade liberalization reduces the domestic market shares of domestic producers, their incentives to invest in superior technologies might decrease as protection is lifted. Many empirical papers have investigated the impact of trade liberalization on industrial productivity using macro-level approaches, or industry-level approaches, yielding mixed results. While trade theory has focused on intra-industry gains from trade liberalization through economies of scale, it has not explored the implications of plant heterogeneity within a given industry. Recent studies conducted with plant-level data find a significant degree of plant heterogeneity within industries for example.[1] Plant-level heterogeneity may be quite important in productivity dynamics if trade liberalization yields productivity improvements by reshuffling resources from less productive to more productive plants. It is important to evaluate whether trade liberalization improves productivity from a policy perspective as well. Trade liberalization is accompanied by large reallocations of capital and labour, thus generating costs to some groups, making the measurement of gains from liberalization an important policy issue.

Our study is not the first paper that empirically links trade liberalization and plant-level productivity. A number of studies report findings on productivity and trade liberalization, but the evidence is mixed (Tybout, 1992). Harrison (1994), and Tybout and Westbrook (1995) find positive relations between trade reform and productivity for the Ivory Coast and Mexico, respectively. In a set of studies, trade protection has been linked to productivity levels. Tybout, de Melo, and Corbo (1991) find weak evidence for the Chilean manufacturing sector. In this paper we identify the impact of trade liberalization on productivity in two different ways. First, we explore the variation in productivity over time and across sectors by trade orientation, as in Pavcnik (2001). Second, we identify the impact of trade reforms by relying on trade policy measures that show significant variation over time and across industries, using nominal protection rates measured by tariffs and quantitative restrictions. Our contribution to this literature is that we estimate plant-level productivities using intermediate inputs as a proxy input to obtain consistent

[1] See, for example, Olley and Pakes (1996), and Roberts and Tybout (1996).

estimates of productivity, and that we use time and cross-section varying nominal protection rates to identify trade liberalization.

In this study we use plant-level data for the Turkish manufacturing industry for the 1983-96 period, thus encompassing significant shifts in trade policy. For our analysis, we estimate plant-level production functions for 24 three-digit SIC industries. Our primary estimation method is one developed by Levinsohn and Petrin (2001), LP, which uses intermediate inputs as the proxy input to address the potential simultaneity bias in production function estimations. This is a modification of Olley and Pakes (1996), OP, which uses investment as the proxy. In the paper, we compare the results from the LP estimates to the more traditional OLS, fixed effects, IV, and OP methods. As with LP, we find that estimation with the most commonly used conventional methods yield the expected biases.

The plant-level total factor productivities obtained from production function estimations are analysed in a several different ways. First, we analyse their evolution over time and across industries by trade orientation. We find that productivity gains are largest during the periods of most rapid decline in protection rates. We also find that productivity gains in import competing sectors during these periods are higher than other sectors. The evidence indicates that on average the Turkish manufacturing industry attained 2.1 percent TFP growth per annum between 1983 and 1996. There is, however, a substantial difference across sub-periods. During the 1984-88 period, average TFP growth was –0.8 percent, while it was 3.9 percent during the 1989-96 period. We also inspect the growth rates for a finer division of the period. These sub-periods correspond to periods with different degrees of protection (e.g. 50 percent during 1984-85, 0.06 percent during 1986-88, 64 percent during 1989-93, and 23 percent during 1994-96.) It is evident that large productivity gains take place during periods of large decreases in protection rates: during 1984-85, and 1989-93, productivity gains were 7.8 percent and 6 percent respectively. We also analyze the TFP growth rates by sectoral trade orientation. The largest productivity gains during these periods are observed in import competing sectors, which averaged 8.6 percent during 1984-85 and 7.7 percent during 1989-93.

Second, we investigate productivity dynamics by separating productivity changes resulting from fluctuations in continuing plants' productivity from those resulting from entry or exit. We find that productivity gains are largely due to reshuffling of resources from less to more productive plants. We observe that both the within and the between component of productivity change are negative, while the covariance term is positive for the manufacturing sector as a whole. This indicates that improvements of

aggregate productivity among continuing plants results from the reallocation of resources and market shares from less to more productive plants. We also find that the contribution of net entry is negligible in comparison to the contribution of continuing plants. The contributions of entry and exit considered individually are also small. All these results largely hold for different sub-periods or different industries by trade orientation. Only during the 1989-96 period are within productivity improvements observed for import competing and non-traded industries. In particular, for the 1989-96 period, within plant productivity improvements were an important component of overall productivity improvements in these sectors. Presence of positive within plant productivity gains may indicate the importance of plant-level changes in technologies or production organization. Even in this instance, however, it is the covariance term that largely explains productivity gains.

Finally, we estimate plant-level regressions of productivity on the trade orientation of the plant. We find that plants in tradable sectors, in particular plants in import competing sectors have higher productivity gains. In these regressions, we control for the impact of plant exit. We find that on average exiting plants are less productive. Plants in the export-oriented sectors have become more productive on average since 1991 relative to plants in the non-traded sectors. This difference in productivity ranges between 11 percent and 29 percent. Similarly, plants in the import competing sectors have also become more productive on average since 1990 relative to plants in the non-traded sector. The productivity gains for the plants in import competing sectors that are attributable to liberalization range from 7 percent to 51 percent. When the incremental productivity difference of export sectors from non-traded sectors in a given year are compared to the incremental difference of import competing sectors from non-traded sectors in a given year, the productivity increase in import competing sectors is found to be higher. In 1996, for example, plants in the import competing sector were 47 percent more productive than plants in the non-traded sectors, while plants in the export-oriented sectors were about 22 percent more productive. We also investigate the role of plant exit, by using plant exit indicators. The results suggest that plants that are exiting are on average 4 percent less productive than surviving plants. Furthermore, exiting plants in tradeable sectors are relatively more productive in comparison to exiting plants in non-tradeable sectors. A comparison of exiting plants' productivity in exportable sectors with those in import competing sectors reveals that they are not statistically significantly different from each other.

The results summarized above indicate that the expected productivity changes in traded sectors did not take place until the early 1990s. At first

glance, this seems somewhat puzzling, given that the import liberalization program was initiated in 1984 and was largely in place as of 1988. During the first four years of the program, however, protection rates did not decline steadily. The initial decrease during the 1984-86 period was followed by an increase in nominal protection rates in 1987-88. In 1988, the manufacturing average nominal protection rate was about 70 percent, and though half of what it was in 1983, a regime with a 70 percent protection rate can hardly be called a "liberal trade regime." In the early 1990s, protection rates not only decline steadily but also reach 20 percent in 1994, coming much closer to what one can call a "liberalized trade regime." Thus, next we turn to an investigation of the relation between protection rates and productivity.

We find that decreases in protection rates improve productivity, especially in import competing sectors. An increase in protection rate reduces productivity statistically significantly in import competing sectors. A one percent increase in protection reduces productivity by about 6 percent.

A concern with this identification of the impact of trade liberalization on productivity in the traded sectors, in general, may be with regard to the behaviour of the real exchange rate. Real exchange rate (RER) appreciation might increase demand for non-tradables and decrease demand for domestically produced traded goods. If plants do not adjust their inputs instantaneously and have some spare capacity, the demand fluctuations induced by RER depreciation could lead to an increase (decrease) in measured productivity for plants in the non-traded goods sector and a decrease (increase) in measured productivity for plants in the export oriented and import competing sectors. In the Turkish case, we see a RER appreciation during the late 1980s. Even though the Turkish Lira experienced a real depreciation of 5 percent in the first couple of years in the 1990s, this was not sufficient to generate large shifts in demand towards tradeable goods. Nevertheless, we incorporate RER into our estimating equation. The parameter estimate has the expected sign that real exchange rate depreciation increases productivity in tradable sectors. At the same time, findings regarding the impact of nominal protection continue to hold.

The 1983-96 period also includes a point at which both public and private sector wages increased rapidly without any increase in the productivity in the pervious years. Starting in the late 1980s, there has been a drastic increase in real wages. With the beginning of political liberalization in 1988, the Ozal government yielded to populist pressures in the formulation of economic policy. This was in response to the demands of various segments of society, including organized labor. Wages in the public sector about doubled between 1988 and 1991, and continued with steep hikes into the mid-1990s. Public

sector wage hikes were followed by similar increases in the private sector. It is likely that, faced with the rapid increase in wages, many firms were forced to undertake replacement investment in order to keep unit labor costs under control. In addition, there was managerial and organizational changes that would effectively reduce X-inefficiencies. Thus we also introduce a measure of lagged public sector real wages into our estimating equation. The results indicate indeed that total factor productivity increased during the period of wage hikes.

Controlling for all these variables - protection rates, real exchange rates, lagged public wages - we find clear evidence that decreases in protection rates have improved productivity in import competing sectors.

THE DYNAMICS OF COMPETITION AND FOREIGN DIRECT INVESTMENT: ENTRY, EXIT, AND GROWTH OF FOREIGN AND LOCAL ESTABLISHMENTS IN TURKISH MANUFACTURING

SULE OZLER AND EROL TAYMAZ

This paper was presented at the 5th annual Metu Conference in Ankara in September, 2001, and the 9th annual conference of the International Joseph Schumpeter Society in Gainesville in March, 2002. The following is an abstract and a summary of the paper.

Abstract

Foreign direct investment has long been considered an important channel for the transfer of technology to developing countries, and an important tool for generating more jobs in those countries. It is suggested that modern, advanced technologies introduced by multinational firms diffuse to domestic firms through spillovers (imitation, training of local labor, vertical technology transfers, etc.). These technology spillovers and competitive pressures may help to enhance the productivity and international competitiveness of domestic firms. Moreover, multinationals bring that essential factor that developing countries need most - capital - and therefore may also help to ease the unemployment pressure created by a rapidly growing (urban) population. While it is shown by many researchers that foreign firms are much more productive than domestic firms, the empirical evidence regarding technology spillovers is not unambiguous. In this paper, we suggest that the impact of foreign direct investment on local industry hinges on the dynamics of foreign and domestic firms, i.e., entry, selection (exit), and growth processes. Our analysis of foreign and domestic firms in the Turkish manufacturing industry for the period from 1983 to 1995 indicates that foreign firms have a better performance level than domestic firms when they are first established in the local market, but foreign ownership does not play any role in explaining survival probability. Further, the presence of a high fraction of foreign ownership in an industry does not contribute to the survival probability of domestic firms in that industry.

The post-war period saw a rapid increase in international economic activity and, most importantly, in foreign direct investment (FDI) in developing countries. The rise in FDI has attracted the attention of industrial and development economists most notably since the late 1960s. FDI has been considered by many development economists as an important channel for the transfer of technology to developing countries, and an important tool for generating more jobs in those countries. It is suggested that modern, advanced technologies introduced by multinational firms diffuse to domestic firms through spillovers (imitation, demonstration effects, training local labor, vertical technology transfers, etc.). These technology spillovers and competitive pressures may help to enhance the productivity and international competitiveness of domestic firms. Moreover, multinationals bring the factor that developing countries need most - capital - and therefore may also help to ease the unemployment pressure created by a rapidly growing (urban) population.

A number of studies that have investigated differences between domestic and foreign enterprises suggest that foreign-owned plants have superior technological performance than their domestic competitors. For example, using plant-level US data, Doms and Jensen (1998), and Blonigen and Tomlin (2001) show that there are substantial size and/or labor productivity differences between US-owned and foreign plants. Globerman, Ries and Vertinsky (1994), and Griffith and Simpson (2001) observe similar differences for Canada and Britain, respectively. In a recent study, Blomström and Sjöholm (1999) show that foreign establishments have higher levels of labor productivity than domestic establishments in Indonesian industry. Although productivity differences between foreign and domestic plants could be explained by other factors like plant size, capital intensity, etc., it is one of the most robust empirical findings on FDI.

The pertinent question for policy purposes is the effect of FDI on domestic industry and firms, because the technological superiority of foreign firms *per se* does not necessarily imply any benefit for the host economy. Therefore, researchers search for spillovers from foreign to domestic firms. Early studies using industry-level data almost unanimously found a positive correlation between the presence of FDI (usually measured by the share of foreign firms) and industry (labor) productivity.[1] However, industry-level studies may suffer from some specification problems, including the endogeneity bias, i.e.,

[1] See, for example, Caves (1974), Kokko (1994), Blomström and Sjöholm (1999), and Liu *et al*., (2000).

the positive correlation may also arise if technologically advanced/ productive sectors are more attractive for foreign investment.

Thanks to the availability of data, recent studies explore spillovers from FDI by using plant-level panel data. In an early study using plant-level data, Haddad and Harrison (1993) find that that there was a level effect of FDI on the total factor productivity (TFP) of domestic firms in Morocco, but not a growth effect. Aitken and Harrison (1999) and Djankov and Hoekman (2000) find negative effects of FDI on the productivity of domestic firms in Venezuelan and Czech industries, respectively. Blomström and Sjöholm (1999) find positive spillovers in Indonesia, but the degree of foreign ownership does not affect the degree of spillovers. Kokko, Tansini and Zejan (2001) find in the case of Uruguay that spillovers, figured as a positive impact on the labor productivity of local firms, emanate only from older import-substituting multinational firms that were established before 1973. The presence of spillovers is also an issue for developed countries. In a recent study on Japanese FDI in the US, Branstetter (2000) finds evidence that FDI increases the flow of knowledge spillovers both from and to the investing Japanese firms.

Since spillovers from FDI can also be observed in higher wages, many researchers have analyzed the effect of the presence of foreign-owned firms on wages.[2] A robust finding of these studies is the fact that foreign firms pay a higher wage, but the effect on wages paid by domestic firms is not strong. A theoretical study of the effect of FDI on wages is presented in Das (2002).[3]

Thus, although foreign firms are larger, more productive, and more capital and skill intensive than their domestic counterparts in both developed and developing countries, their effects on domestic firms and the strength of spillovers are ambiguous. The findings of empirical studies lead researchers to conclude that the characteristics of the host country's industry and policy environment (Blomström and Kokko, 1998), the level of human capital stock (Borensztein, Gregorio and Lee, 1995; Noorbaksh and Paloni, 2001), and the absorptive capacity of domestic firms (Kinoshita, 2001) are important determinants of the net benefits of FDI.[4]

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[2] For a sample, see Aitken, Harrison and Lipsey (1996) for Mexico, Venezuela, and the US; Figlio and Blonigen (1999) for the US; and Lipsey and Sjoholm (2001) for Indonesia.

[3] There is also a growing literature on export spillovers generated by FDI. See, for example, Aitken, Hanson and Harrison (1997) and references therein.

[4] Although the evidence on positive spillovers from FDI is weak, many developing country governments have adopted FDI promotion policies (for policy issues, see Markusen, 1998; Hanson, 2001).

In this study we examine technology spillovers from FDI through their impact on the survival probabilities of domestic plants. The idea is that an increase in productivity through technological spillovers will, other things being equal, reduce a host country firm's average cost of production leading to a higher probability of survival for host country domestic firms. The probability of a firm surviving is determined by a firm's price cost margin. Accordingly, a firm's ability to reduce average cost will have a positive impact on its survival. However, the presence of foreign firms may also have negative effects on the survival of host country firms. Foreign firms producing at lower marginal cost than domestic firms will have an incentive to increase output and attract demand away from domestic firms. If domestic firms face a fixed cost of production, then the decrease in production by domestic firms in face of decreased demand due to presence of FDI will raise their average cost and reduce their probability of survival. Thus the impact of FDI on survival probability of domestic firms is theoretically ambiguous and needs to be determined empirically. In a study designed similar to ours, Gorg and Strobl (2001) find that the presence of FDI has a life enhancing effect on indigenous plants in high tech sectors only in Ireland.

Our investigation yields the following pertinent results:

- Foreign firms have different entry characteristics in comparison to domestic firms. They are larger, more productive, have higher survival rates, and generate greater employment growth.
- Being foreign or domestic does not have an impact on survival probability, controlling for other factors.
- The survival probability of domestic firms in industries where there is a higher fraction of foreign firms is not different from other industries.
- Controlling for all other factors, foreign firms grow more rapidly.

The policy implication of our study is that the encouragement of FDI in Turkey need not be a priority, insofar as foreign firms do not yield positive spillovers to domestic firms. However, if higher employment generation is the goal, then FDI presence contributes positively towards achieving that goal.

PART FOUR

TRAINING PROGRAM AT THE SIS

This program was established during in 2001. The program is geared towards permanent employees at the SIS, who work in the Division of Manufacturing Industry Statistics. This is the division where the research lab used to access the data set is located.

The program has the following goals:

- To describe the methods we use to check data reliability, and consistency.
- To help identify the most problematic areas in the data set.
- To assist in survey design by identifying areas in which new questions might be formulated, as well as narrowing the scope of other areas, as needed.
- To describe how various measures, such as labor productivity and capital stock series, are created.
- To train SIS employees in the use of STATA, in furtherance of the above tasks.
- To train employees of SIS in the collection and addition of information on future years in order to enable the replication of the above steps.

Toward this end, the program was carried out in six separate weeks of training over a 14-month period:

1. Capital (July 2001)
2. Labor (September 2001)
3. Intermediate inputs (December 2001)
4. Activities that facilitate globalization (March 2002)
5. Issues pertaining to small establishments questioners1 (June 2002)
6. Productivity (August 2002)
7. Putting it all together (September 2002)

[1] Enterprises with 10-24 employees.

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