**EXPORT LED INDUSTRIALIZATION
AND GENDER DIFFERENCES IN
JOB CREATION AND
DESTRUCTION: MICRO EVIDENCE
FROM THE TURKISH
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Working Paper 0116

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Abstract

In this paper we investigate gender differences in job creation and destruction patterns in Turkey during a period of substantial trade liberalization. The primary findings are as follows. 1) In the manufacturing sector as a whole, net job creation rate for females at every skill level are significantly higher than their male counterparts. 2) Gross job reallocation rate for females is about twice the size of males at the same skill levels. 3) 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 females are higher where females constitute a smaller fraction of the workforce. 4) The ratio of gross job reallocation rate of females to males at a given skill level differ only slightly across sectors by trade orientation.

I. Introduction

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 with (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 illustrations 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 we discuss below, our focus on gender differences in job creation rates across sectors by trade orientation enables us to address issues relevant to the process through which 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 positions held.

There are two views on underlying processes that lead to increased employment opportunities for women during export led industrialization[4]. In one view, increased exports to industrialized countries shift demand towards those sectors where women have been traditionally employed (Wood, 1991). Thus, new employment opportunities for women are to be found in export-oriented industries. Other interpretations of feminization are based on the notion that women constitute a "cheap" source of labor[5]. Elson (1996) argues that the changing nature of jobs as reflected in increased flexibility, and deskilling of jobs, lead to a decline of positions that were previously held by men, and increased job opportunities for women. Standing (1989, 1999), on the other hand, argues that the declining strength of labor market insiders have enabled employers to substitute women's "cheap" labor for that of men, and/or 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 intensive we would observe increased employment opportunities for women relative to men.

In empirical studies linking 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, by an inspection of overall trends (Standing (1989, 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 identifying and

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

[2] There is also some evidence suggesting that the association of increased intensity of female employment with export-oriented industrialization might be reversed. (see for example Berik (2000), Joekes and Weston (1994)). Where it is observed, the reversal is attributed to the introduction of new technologies, skill upgrading of export producers, and reorganization of production, especially multitasking of 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 in response to a variety of needs and incentives, not only to 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.

[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 that Elson (1996) takes issue with.

[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, information on 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).

quantifying some conditions under which workers are integrated into the workforce. In particular, it allows measurement of job reallocation rate. Industry level studies, with their focus on net job changes, cannot identify the degree of job reallocation (simultaneous job creation and destruction) that may be taking place in an industry. A high level of job reallocation, in the process of 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 we investigate the gender difference in net job creation and gross job reallocation rates using a data set collected by the State Institute of Statistics (SIS) in Turkey for the period of 1986-96. The period is well suited for our purposes as it follows the initiation of export led industrialization policies in Turkey[11]. A particular advantage of this data set for our purposes is that employees are classified by gender at varying skill levels, thus enabling gender comparisons at a given skill level. The data analyzed in this study include private manufacturing establishments.

Our 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 (*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 our results is that the net job creation rate, as well as the gross job reallocation rate, in each skill category, is higher for females than their male counterparts. Among skilled workers, where we observe the biggest gender gap in the net job creation rate, the average annual net job creation rate is 5.76 percent for skilled females in contrast to a rate of 1.69 percent 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 females, which is 87.8 percent, is about twice that of their male counterparts.

Categorizing industries according to their trade orientation we observe that the above findings continue to hold qualitatively. That is to say, irrespective of a sector's trade orientation, net job creation, and gross job reallocation rate for females at every skill level is higher than their male counterparts. Across sectors, gross job reallocation rates, or the ratio of gross job reallocation rate of females to males at a given skill level, differ only slightly. Net job creation rates show a more discernable difference across industries. In particular, net job creation rates in the exporting 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 females are somewhat higher where females constitute a relatively smaller fraction of the workforce.

Overall, the high net job creation rates for females in exporting industries obviously have contributed to the feminization of the labor force in the Turkish economy. However, the restructuring of the economy by opening it to international competition, privatization, and deregulation appears to have resulted in a higher net job creation for women, across sectors with different trade orientations. Thus, the changing nature of jobs, such as deskilling, and increased flexibility in the economy appear to be largely behind increased feminization of the labor force in the manufacturing industry as argued by Elson (1986), and Standing (1989, 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 females experience significantly higher job uncertainty, as measured by gross job reallocation rates. Second, despite high annual net job creation rates, females still hold a small fraction of private manufacturing jobs. Even though over the period under consideration the female share of total employment has increased by about six percent, the share of females reached only 22 percent by 1996.

The remainder of this paper is organized as follows. The data description is undertaken in Section II. In Section III we describe (a) the methodology

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[10] Plant level studies on developing countries document that, within an industry, substantial amount of 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., see Baldwin, Dunne and Haltiwanger (1994) on Canada and the U.S.

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

used in measuring job creation and destruction rates, (b) the results for workers as a whole, (c) gender and skill difference for the manufacturing sector as a whole, and (d) gender and skill differences by trade orientation. In Section IV we present some concluding remarks.

II. The Data

In this study we use a data set, collected by the Turkish State Institute of Statistics (SIS) for the Turkish manufacturing industry. SIS periodically conducts the Census of Industry and Business Establishments (CIBE)[12]. In addition, the SIS conducts Annual Surveys of Manufacturing Industries (ASMI) at establishments with 10 or more employees[13]. The set of addresses used during ASMI are those obtained during CIBE years. In addition, every non-census year, addresses of newly opened private establishments with 10 or more employees are obtained from the chamber of industry[14]. For this study we use a sample that matches plants from CIBE and ASMI for the 1986-96 period[15]. We focus only on *private establishments*. In the resulting sample of private manufacturing plants we have a total of 97,415 plant years.

The plants are classified at the three-digit level by trade orientation into three groups as *non-tradeable, import competing* and *exportable*. The classification is based on industry level data on exports, imports and production and it is undertaken by Erlat (1998) using the criterion of

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[12] Since the formation of the Turkish Republic CIBE has been conducted 7 times (in 1927, 1950, 1963, 1970, 1980, 1985, and 1992).

[13] SIS also collects data on establishments with less than 10 employees. However, up to 1992 data on these establishments were collected only during CIBE years. Since then SIS collects annual data for establishments with less than 10 employees but, using a sampling method.

[14] Thus, plant entry can be observed in every year of the sample. Though not reported here, in the CIBE years we observe a larger number of new plants and a higher fraction of smaller plants. Both of these observations reflect the concerted effort by the SIS to include all establishments in the CIBE years (Ozler (2001)).

[15] The ASMI and CIBE data are available in a machine-readable form starting from 1980. For this study we limited the sample for the post 85 period for two reasons: 1) in the years prior to 1986 the quality of data on gender breakdown of employees is less reliable and much work is needed for its improvement, 2) gender breakdown of employees is not available for plants with less than 25 employees in the years prior to 1985. For a description of the matching procedure, and other features of data preparation see Ozler (2001).

Krueger et all (1981)[16]. Since a fairly large period is covered, the fact that some sectors might have switched classification may be a source of concern. However, the classification is pretty stable through the 1980s, as reported in Erlat (1998).

In *Table 1* we present some basic statistics on employment by trade orientation (see the appendix *Table A.1* for the list of three digit industries by trade orientation and their basic employment statistics). As can be seen in the first column, the exportable sector has the highest number of observations with 46 934 and is closely followed by the import competing sector. Non-tradables, on the other hand, account for only about 8 percent of total observations. Reported in the second column are employment shares of these industries. Only 6 percent of all employees are in non-tradable sectors. The employment share of import competing sectors is 41 percent and the employment share of exportable sectors is 53 percent. Average plant size, measured with average number of employees, varies considerably across these industry groups. Plant size is nearly 90 among import competing industries, and near 106 in exportable industries. As can be observed by a comparison of the average size with its standard deviation, there is a large degree of variation across three digit industries within each sector by trade orientation.

In order to inspect how worker composition changes across industries, we create six worker ratios, which differ by skill level and gender. The surveys contain a question asking about the number of employees by gender in sub categories of production and non-production workers. Non-production workers are composed of management staff, bureau workers and others. Production workers are divided into four groups as high-level technical personnel, medium level technical personnel, foremen and workers. By aggregating some of these groups, we create three groups of employees for each gender. First is the *non-production worker* category, which is an aggregation of its subgroups. To obtain the second and third groups we divide production workers into two. The *Skilled workers* category includes

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[16] The criterion is based on the difference between domestic consumption C, and production Q, per unit of consumption: $T = (C-Q)/C$. Using $C \equiv Q-X+M$, T is calculated as $T=(M-X)/(Q-X+M)$, where M is imports, X is exports. Obviously, if a sector is a net exporter, then $T<0$. The analysis carried in Erlat (1998) leads her to use 0.40 as a cutoff value to separate non-tradable from import competing sectors. The sectors with T values between 0 and 0.40 are classified as import competing and those with T values greater than 0.40 as non-tradable.

the foremen category in addition to the high-level technical personnel, and medium level technical personnel. The number of employees in the workers category constitutes the third skill group and we refer to this group as *unskilled.*

In *Table 2.A* we report distributions of workers across sectors by trade orientation. Even though we report non-tradable sectors for completeness, due to their small share of workers, we focus on a comparison of the other two sectors. The most striking feature of these worker shares is that exportable sectors employ 82 percent of all the unskilled females and 66 percent of all the skilled females in the manufacturing industry. The share of male workers, or production workers, does not differ nearly as substantially between the exporting and import-competing sectors.

In *Table 2.B* we present the distribution of employees within sectors by trade orientation as well as for the manufacturing sector as a whole. Again, the most notable difference across industry groups by trade orientation concerns the share of female workers. In particular, import competing sectors have a significantly lower share of unskilled females in comparison to the others. Unskilled females constitute 7 percent, and 15 percent of all employees in import-competing and exportable sectors respectively. Overall, exportable sectors, in comparison to import competing sectors are more female intensive and less skill intensive. The female share of employees across all skill levels is about 13 percent in import competing sectors, but 21 percent in exporting sectors. Female and male unskilled workers together are 63 percent of import competing sectors, but 69 percent of exportable sectors. Thus as in many other developing countries, export-oriented sectors in Turkey too are unskilled worker intensive and feminized. The patterns of distribution of workers across industries as well as distribution of workers within industry groups by trade orientation suggest the presence of large gender/skill differences. We next turn to investigating whether the job creation process is merely reproducing the existing distributions or showing tendencies that alter the existing distributions.

III. Job Creation, Destruction and Reallocation

A. Definitions

In defining job creation and destruction measures we adopt the methodology in Davis and Haltiwanger (1990). For this purpose let us denote employment at plant i in year t by x_{it}, and define average

employment as: $ax_{it} = (x_{i,t} + x_{i,t-1})/2$. The growth rate of employment at plant i in period t, g_{it}, is defined so that it is symmetric around zero and lies in the closed interval [-2,2], where $g_{it} = -2$ corresponds to the death of a plant, and $g_{it} = 2$ corresponds to the birth of a plant. Using the notation introduced here, this measure of growth rate is described as[17]:

$$g_{it} = (x_{i,t} - x_{i,t-1})/ax_{it} \qquad (1)$$

Gross job *creation* is a weighted sum of employment gains at expanding and new establishments within a sector (where the weights are average employment shares of plants in a given sector). Similarly, gross job *destruction* is a weighted sum of employment losses at dying and shrinking establishments within a sector. *Gross job creation rate* in sector s at time t, and *gross job destruction rate* in sector s at time t are expressed as follows:

$$\text{Creation}_{s,t} = \sum_{\substack{i \in E_{s,t},\\ g_{it}>0}} g_{it}(ax_{it}/AX_{st}) \quad \text{Destruction}_{s,t} = \sum_{\substack{i \in E_{s,t}\\ g_{it}<0}} |g_{it}|(ax_{it}/AX_{st}) \quad (2)$$

where, $E_{s,t}$ is the set of establishments in s at time t, and AX_{st} is the average sector employment defined analogously to average establishment employment. Sectors could be defined based on 3-digit SIC codes, plant sizes, trade orientations and so forth. To obtain the creation rate for the whole sample, the weighted sum of *Creation*$_{s,t}$ is calculated, where the weights are average employment shares of the sectors. It is, of course, possible to separate *Creation* into gross job creation generated by *entry* of new plants and gross job creation generated by size adjustments of continuing plants. Similarly *Destruction* can also be decomposed into a part that arises from plant closures (*exit*) and size adjustments of continuing plants.

It is important to note that we observe only plant-level employment and hence cannot determine whether a given level of employment in two different points in time for the same plant represents different or same employment positions. Thus, these measures of creation and destruction represent lower bounds on true creation and destruction rates. Using these measures, we can calculate *net* job creation rate as the difference between

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[17] The g measure is monotonically related to the conventional growth rate measure G defined as change in employment scaled by lagged employment. The two measures are linked by the identity $G \equiv 2g/(2-g)$.

creation and *destruction*. Gross job reallocation is calculated as the sum of creation and destruction and denoted by *sum*[18].

B. Job Creation and Destruction for all Workers

Several studies on industrialized as well as developing countries have shown that jobs are being simultaneously created and destroyed (for example see Davis and Haltiwanger (1990), Levinsohn (1999), Roberts (1996)). Furthermore, the evidence indicates that even modest rates of net job creation rates are associated with high rates of gross reallocation rates. Before we turn to investigating gender/skill differences, in this section we present results for all workers and compare average magnitudes for Turkey with other countries. This comparison gives us some benchmark in evaluating whether the changes that take place in the job creation process in the Turkish manufacturing sector are large or small.

Job creation, destruction, net job creation and gross job reallocation rates for the private manufacturing sector as a whole are reported in **Table 3.A**. As can be seen in the first row of **Table 3.A**, when all employees are considered, the annual average *creation* rate is 14.44 percent, *destruction* rate is 11.78 percent leading to a *net* job creation rate of 2.66 percent. This rate is higher than the 2 percent total employment growth rate during the 1989-97 period but lower than the 3.3 percent annual population growth rate for those who are 12 years old and over during the same period[19]. As such, the average net employment generation of the manufacturing sector has been disappointing. This message is consistent with the few studies that analyze employment shifts in the post 1980 period[20]. For example, Taymaz (1999) reports an average 2.2 percent annual growth for manufacturing employment in the 1980-93 period, in comparison to 4.8 percent for the 1969-80 period.

Sum, the gross reallocation rate, for all employees, as reported in column four, row one of **Table 3.A** is 26.2 percent. To put this magnitude in perspective, it is sufficient to note that the net job creation rate is 2.66 percent during this period. Thus, the net job creation rate in Turkey (similar to other developing countries that have been studied) hides a large degree of job reallocation. For example, in his study of Chile, Colombia, and Morocco, Roberts (1996) finds gross job reallocation rates that range between 25 percent and 31 percent. These magnitudes are about 30 percent higher than those observed in Canada and the U.S.

Results by trade orientation of industries are presented in the next three rows[21]. An important difference among the sectors is manifested in a comparison of their net job creation rates. The annual net job creation rate in exportable sectors is 3.79 percent, and as such it is about 2.4 percent higher than import competing and non-tradeable sectors. A comparison of gross creation rate and gross destruction rate across industry groups indicates that export oriented industries differ from others in both respects. The gross creation rate is slightly higher, and the destruction rate is slightly smaller in exportable industries in comparison to others. Thus, the net job creation rate in the exportable sectors is somewhat larger than the others.

We do not, however, find a discernable difference in gross job reallocation rates across industry groups by trade orientation (reported in the forth column). It has been suggested that trade liberalization in developing countries may promote high turnover industries, thus creating more churning in the job market. For example Levinsohn (1999) in his study of Chile reports weak evidence for higher net job creation rate accompanied by a somewhat higher (about 6 percent higher) gross reallocation rate in the export sector. This pattern is plausible for developing countries with export sectors that are labor-intensive, which involves relatively low start up costs. The fact that this pattern does not generalize to Turkey may be a consequence of differences in policies implemented in Chile and Turkey through their trade reform episodes. In the Turkish experience, trade reforms included various types of subsidies to the export sector, which may have contributed to our findings of lower gross job destruction rates for that

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[18] *sum* is the upper bound on gross job reallocation rate. It represents an upper bound because some workers move from shrinking to growing establishments. To obtain a lower bound and eliminate the possibility of double counting one can compute **max** = max | **creation**, **destruction** |.

[19] The number is based on 1989, 97 Labor force Surveys. During the same period the population growth rate for the 15-64 group is 3.4 percent

[20] Among these Celesun (1989), and Senses (1994) address employment performance in the broad sectors of the economy, and Yenturk (1997), Taymaz (1999), and Erlat (1999) investigate employment patterns for detailed sub-sectors in the private manufacturing industry.

[21] Multiplication of the net creation rate reported for each sector by their respective manufacturing employment shares reported in Table 1, yields the manufacturing industry net creation rate 2.66 percent.

sector and hence leading to gross reallocation rates that are similar to other sectors.

The creation and destruction rates reported above include size adjustments of continuing plants as well as the entry and exit of plants. Importance of entry and exit, however, may differ across industries based on the importance of the sunk cost of entry and exit in those industries. To asses the significance of entry and exit in the Turkish manufacturing sector we report job creation rate generated by entering plants only, and job destruction rate generated by exiting plants only, under entry and exit in the first two columns of *Table 3.B*. A comparison of these magnitudes with total creation and destruction rates indicates that entry and exit play a rather insignificant role.

To better assess the role of entry and exit, in column three of *Table 3.B*, we report the ratio of net job creation generated by entry and exit to net job creation by size adjustments of continuing plants. The ratio is 19 percent for the manufacturing sector as a whole, but it varies considerably across sectors. The ratio of net changes from entry and exit to the net changes from continuing plants is only 2 percent for import competing sectors, but as would be expected it is considerably larger for exportable sectors with 20 percent. Nevertheless, entry and exit play a smaller role in net job creation in the Turkish manufacturing sector in comparison to some other countries at similar levels of development. For example, Roberts (1999) reports that net job creation due to entry and exit was double the size of net job creation created by continuing plants in Chile, Colombia and Morocco.

Given the small share of entry in job creation and the small share of exit in job destruction it is not surprising to find that the ratio of gross reallocation generated by entry and exit to gross reallocation generated by continuing plants is also small. This ratio is 10 percent as reported in column four of *Table 3.B*, and does not vary across sectors. Again this ratio is small in comparison to the 41 percent-89 percent range for other developing countries reported in Roberts (1999). Government policies that subsidize inefficient plants, factors that constrain entry, such as credit rationing, trade policies that influence the rate of entry of new firms, as well as uncertainty of feature market conditions that may result from macroeconomic instability are among the reasons that can lead to entry/exit having a relatively small role in the employment creation process in the Turkish manufacturing industry.

C. Gender and Skill Differences in Manufacturing Sector

We now turn to investigating differences in the job creation and destruction process for the six skill, gender worker groups. In *Table 4* we report job creation and destruction rates and the consequent net job creation and gross job reallocation rates for the manufacturing sector as a whole. A comparison of gross job creation rates across employee groups, presented in column one, highlights significant gender and skill differences. First, for a given gender, if we compare gross job creation rates across skill groups we see that female job creation rates vary more across skill groups than males. Second, within each skill group, gross job creation rate for females is higher than it is for males. Both of these observations also hold when we focus on job destruction rates as reported in column two.

A notable result in *Table 4* is that the net job creation rate for females, in each skill category, is higher than their male counterparts, as can be seen in column three. The net job creation rate for females is highest in the non-production workers category, and it is more than twice those of males in the same category. The biggest gender disparity is observed for skilled workers, where the 5.76 percent net job creation rate for females is more than three times that of skilled males. The lowest disparity is for unskilled workers with the net job creation rate for females being less than twice those of males. Overall, despite the disappointing average net job creation rate of private manufacturing plants during the period under consideration, there are important differences in employment generation capacity across worker groups[22]. Net job creation rate for non-production workers is significantly higher than production workers. More notably, net job creation rate for females, controlling for skill levels, is significantly higher than male job creation rates[23].

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[22] Multiplication of the net creation rate reported for worker group by their respective manufacturing employment shares reported in the last row of Table 2.B, yields the manufacturing industry net creation rate.

[23] It is important to note that this has taken place in the context of declining labor force participation among working age women. The movement of women out of the labor force is attributed to migration from rural to urban areas (see Bulutay 1995; and Tunali 1997). This decline is attributed to both cultural and economic factors. An important economic factor influencing the decision to stay home appears to be the decline in wage-earning opportunities for women in urban areas, especially for those with low education.

While female jobs have a higher net creation rate, gross job reallocation of female jobs is also significantly higher than their male counterparts, as can be seen in column four of the table. The average gross job reallocation rate for unskilled female workers is 46.8%, while it is 36% for unskilled male workers, yielding a ratio of 1:3. The gender gap in gross job reallocation rate for non-production workers is also about the same, with a female to male ratio of near 1:4. The largest gender gap is for skilled workers; the female reallocation rate (87.8%) is 1.9 times the size of the male reallocation rate (46.3%)[24].

That gross job reallocation rates for females are much higher than those of their male counterparts; this is an important piece of evidence in evaluating the precarious nature of female jobs. Such high gross reallocation rates for females are not unique to the Turkish experience. In a study, closely related to ours, Levinsohn (1999) provides a discussion of gender differences in job reallocation rates for Chile by comparing females and males, without controlling for their skill levels, and a discussion of differences between blue collar and white-collar workers. Levinsohn reports that gross job reallocation rates are significantly higher for females in comparison to males, and attributes this to gender differences rather than skill differences. Though the interpretation is likely to be correct because the gender gap in reallocation rate is a lot higher than the skill gap in reallocation rate, to obtain more accurate measures of gender gap it is important to control for skill levels while measuring the gender gap.

D. Gender and Skill Differences in by Trade Orientation

The results presented so far indicate that the net job creation rate is higher in export oriented sectors than others; they also indicate that net job creation rates for females are higher than their male counterparts in every skill group when the manufacturing sector is considered as a whole. We next turn to investigating whether the high net job creation rate for females is limited to export oriented sectors. In *Table 5.A* we report net job creation rates for each of the six worker groups by the industries' trade orientations. (Even though the results for non-tradable sectors are reported for completeness,

we focus our discussion on a comparison of import competing sectors with export sectors.) As it is when manufacturing industry is considered as a whole, the net job creation rate for females is higher than their male counterparts in every skill category, in import competing as well as export industries. Thus, the evidence suggests that, independent of the sector's trade orientation, net job creation rates are higher for females than for males.

To assess the difference in relative net job creation rates between the two sectors for gender/skill groups we present the ratio of female net job creation rates to male net job creation rates in columns seven through nine of *Table 5.A*. There is weak evidence suggesting that among production workers the net job creation rate for females is higher relative to males in import competing industries, where the representation of females is smaller. The job creation rate for unskilled females is 1.96 times that of unskilled males in the import competing sector. The comparable number for the export sector, where the unskilled female group is relatively large, is 1.20. The difference is more pronounced for skilled females as can be observed in column eight. For non-production workers the ratio is larger in export sectors than import competing sectors. Recalling that 5 percent of workers in import competing sectors are non-production females, in comparison to the 4 percent in the exports' sector (*Table 2.B*), again the net job creation rate of females is higher than their male counterparts where female representation is smaller.

It is the set of findings described above that suggest support for the "cheap labor" hypothesis discussed in Elson (1986), and Standing (1999). It is true that job creation rates are higher in export sectors for all worker groups. It is also true that females constitute a larger share of employees in export sectors, thus the changes in this sector contribute more to the changes for the manufacturing sector as a whole. However, measured with the relative female to male net job creation rate, the tendency is towards increased feminization irrespective of trade orientation of sectors.

The finding regarding gross job reallocation rate for the entire manufacturing sector continues to hold for import competing and export sectors individually: in every skill group, there is more job churning for females in comparison to males as can be seen in *Table 5.B*. In columns seven through nine we present ratios of female gross job reallocation rates to male gross job reallocation rates in each skill group. Differences between

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[24] This finding, that the gender gap for skilled workers is higher than the gender gap for unskilled workers, is primarily due to differences between females with different skill levels. The gross job reallocation rate of skilled females is 41 percent higher than unskilled females, while the rate of skilled males is only 10 percent higher than unskilled males.

sectors are less pronounced in comparison to net job creation comparisons. However, the overall pattern suggests that ratio of female to male gross reallocation rate is higher when female to male net job creation rate is also higher.

We next investigate whether entry and exit play a more prominent role for certain worker groups in comparison to others. Though the role of entry and exit in net job creation is relatively small in comparison to those generated by continuing plants, it seems to work in the direction of increasing the trend towards the convergence as noted above. In particular, in import competing sectors, where females are fewer in numbers, the ratio of net job creation generated by entry/exit to that created by continuing plants is larger for females than it is for males. (This can be seen in column five of **Table 6**.)[25]. In export sectors, on the other hand, the ratio of net job creation generated by entry/exit to that created by continuing plants is on average larger for males than it is for females[26]. As for the gross job reallocation rate, the role of entry and exit in the generation of gross job reallocation does not differ by gender/skill groups.

Since high gross job reallocation is a pronounced aspect of gender differences in the job creation process we look at this using an alternative measure of job stability. Specifically, we consider the persistence of the job creation and destruction process. To be precise, the persistence of job creation at plants is measured by calculating what percentage of jobs created between the years t–1 and t are still present in year t+1. Similarly, the persistence of job destruction is measured as the percentage of jobs lost between t–1 and t, and yet still not present in year t+1[27]. The persistence

percentages by trade orientation are reported in **Table 7.** Job creation persistence percentages for males in each skill category and across sectors are higher than their female counterparts, with one exception: only for unskilled jobs in the exportable industries, female jobs have slightly higher creation persistence. In the import competing sector, for example, almost 60 percent of jobs created for skilled males in a given year are likely to be around in two years, in contrast to the 40 percent for skilled females. To compare sectors we present ratios of the female to male ratio of creation persistence. The ratio is higher where representation of females is higher. For example, skilled female to male creation persistence is 69 percent in import competing sectors where skilled females constitute 0.9 percent of all workers, while it is 76 percent in the exportable sector where skilled females constitute 1.5 percent of all workers. Job destruction persistence percentages presented in **Table 7.B** are lower for males in each skill category than their female counterparts. This finding holds across all sectors.

Both the gross job reallocation rates and job creation and destruction persistence percentages indicate that women face less secure positions, independent of the trade orientation of industries in which they are employed. These findings suggest that females may constitute a flexible reserve. One way to see whether there is any evidence for females constituting a flexible reserve is to investigate how the job creation process changes over business cycles. Flexible reserve, or buffer hypothesis suggests that women, who are primarily less skilled than men are easy to hire and easy to fire[28]. Thus, they are drawn into the labor market during upturns and expelled during downturns, relatively more easily than men. In fact, in support of this hypothesis, Ozler (2001) finds that net job creation rates fell more quickly for skilled and unskilled females in comparison to

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[25] Entry and exit lead to net job destruction for unskilled and skilled male workers, even though the net destruction rate is small in comparison to the net job creation from continuing plants. In contrast, net job creation rate generated by entering and exiting plants for females (skilled and unskilled) is about 11-12 percent of continuing plant net creation rate.

[26] Though the ratio is slightly higher for unskilled females in comparison to males, it is larger by a greater margin for other skill groups.

[27] Plant level job creation percentage, JCPP, and plant level destruction percentage, JDPP, in year t, are:

$$JCPP_t = \begin{cases} 1 & if \quad L_t > L_{t-1} \quad and \quad L_{t+1} \geq L_t \\ \dfrac{(L_{t+1} - L_{t-1})}{(L_t - L_{t-1})} & if \quad L_t > L_{t-1} \quad and \quad L_t > L_{t+1} > L_{t-1} \\ 0 & otherwise \quad , \end{cases}$$

$$JDPP_t = \begin{cases} 1 & if \quad L_t < L_{t-1} \quad and \quad L_{t+1} \leq L_t \\ \dfrac{(L_{t-1} - L_{t+1})}{(L_{t-1} - L_t)} & if \quad L_t < L_{t-1} \quad and \quad L_t < L_{t+1} < L_{t-1} \\ 0 & otherwise \quad . \end{cases}$$

where, L_{t-1}, L_t, and L_{t+1} are employment in plant in years $t-1$, t, and $t+1$, respectively. Thus, persistence percentages are undefined in the first and last years of the sample (we choose the time interval for persistence to be two years in order not loose more observations).

[28] See Humpheries (1988).

their male counterparts as the economy headed into a recession, and then recovered before their male counterparts during the upturns[29].

To summarize, the exportable sector, with its high net job creation rate for females, contributes to the feminization of the labor force. This pattern is strengthened by the entry of new plants. However, we also find that net job creation for females is higher than their male counterparts in the import competing sectors as well. Thus, feminization of jobs is not limited to exportable sectors. At the same time, gross job reallocation rate is higher for females irrespective of skill levels, or trade orientation of sectors, indicating the pervasiveness of the precarious nature of female jobs through out the manufacturing sector.

IV. Concluding Remarks

The contribution of this study to the existing literature can be summarized as follows. First, this paper contributes to the literature on globalization, gender and employment by measuring the gross job reallocation rate of manufacturing jobs. The literature, summarized in the introduction to this paper, has focused on gender differences in net job creation, and concluded that trade liberalization has led to 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, conditions in which women's integration into the labor market may be worse than males, in terms of pay, social environment, and so forth, have been pointed out. In this study we quantify one of these dimensions by focusing on gross job reallocation. Our findings indicate that while the high net job creation for women is significantly higher than 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 females, controlling for skill levels, are significantly higher than male job creation rates.

Third, this paper contributes to plant level studies on jobs not only by introducing evidence from the Turkish economy, but also by bringing gender differences into focus. Among the earlier studies, Levinsohn (1999) has a discussion of gender differences based on a comparison of all females with all males. The advantage of our study is that we are able to compare males and females 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 and skilled females. This would be very difficult to pick up in a comparison of all males and females, since females are largely in unskilled jobs, and constitute a smaller share of skilled jobs.

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[29] Levinsohn (1999) reports similar results in his comparisons of white collar and blue-collar workers.

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Table 1: Employment by Trade Orientation

			Number of Employees	
	Number of Plant years	Employment Shares	Mean	Standard Deviation
Import-competing	42,847	0.41	89	178
Exportable	46,934	0.53	107	205
Non-tradable	7,634	0.06	60	137

Table 2: Worker Ratios

	Unskilled Female	Unskilled Male	Skilled Female	Skilled Male	Non-prod Female	Non-prod Male
A. Distribution Across Sectors						
Import-competing	0.16	0.45	0.31	0.49	0.44	0.44
Exportable	0.82	0.48	0.66	0.43	0.5	0.5
Non-tradable	0.02	0.07	0.03	0.08	0.06	0.06
B. Distribution Within A Sector						
Import-competing	0.07	0.56	0.009	0.13	0.05	0.19
Exportable	0.26	0.47	0.015	0.07	0.04	0.13
Non-tradable	0.05	0.59	0.007	0.14	0.04	0.18
Manufacturing	0.17	0.51	0.01	0.11	0.04	0.16

Table 3: Jobs For All Workers

A. All plants				
	Creation	Destruction	Net	Sum
Manufacturing	14.44	11.78	2.66	26.22
Import-competing	13.65	12.28	1.37	25.94
Exportable	15.14	11.35	3.79	26.48
Non-competing	13.74	12.29	1.45	26.03
B. Entry and Exit				
	Entry	Exit	NetE/NetC	SumE/SumC
Manufacturing	1.44	1.02	0.19	0.10
Import-competing	1.08	1.05	0.02	0.09
Exportables	1.65	1.00	0.21	0.11
Non-competing	1.04	0.94	0.07	0.08

Notes: NetE/NetC is computed as (entry-exit)/[(creation-entry)-(destruction-exit)].
SumE/SumC is computed as (entry-exit)/[(creation-entry)-(destruction-exit)]

Table 4: Job Creation and Destruction by Skill and Gender

	Manufacturing As A Whole			
	Creation	Destruction	Net	Sum
Unskilled Female	25.33	21.55	3.78	46.88
Unskilled Male	19.00	17.00	2.00	36.00
Skilled Female	46.79	41.03	5.76	87.82
Skilled Male	24.00	22.31	1.69	46.31
Non-prod. Female	30.47	23.84	6.63	54.31
Non-prod Male	20.93	18.18	2.75	39.11