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DECOMPOSITION OF LABOUR DEMAND BY EMPLOYER SECTORS AND GENDER: FINDINGS FOR MAJOR EXPORTING SECTORS IN TURKEY

GULAY GUNLUK-SENESEN[a]* and UMIT SENESEN[b]

[a]*Faculty of Political Sciences, Istanbul University, Turkey;* [b]*Faculty of Management, Istanbul Technical University, Turkey*

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This paper attempts to provide insight into the likely impacts of the current global crisis on employment in Turkey. As this crisis hits the Turkish economy through a demand squeeze in the international market, our focus is on the labour demand generated by major export sectors. The decomposition of impacts with respect to gender is of particular interest given the significant gender imbalances in the labour market. The findings indicate that female (male) employment is most sensitive to wearing apparel (trade) exports. In general, employment generation potentials of major export sectors are found to be weaker for females and stronger in agriculture, trade and finance, while they are very limited in manufacturing for both genders.

Keywords: Impact analysis; Gender; Labour demand; Multipliers

1. INTRODUCTION

The purpose of this paper is to assess the employment generation potentials of major exporting sectors (wearing apparel, textiles, motor vehicles, transportation, basic metals, communication equipment and trade) in the Turkish economy and gain insight into the likely impacts on employment of contractions in final demand in the current global crisis environment. The input–output methodology we developed is calibrated for 2002, for which the most recent I–O data are available.

The Turkish economy is characterized by growth without employment in the post-1980 liberalization era, with a switch from import-substitution to export-led development policy accompanied by complementary liberalization of trade and financial transactions (Gunluk-Senesen, 1998; Guncavdi et al., 2003). The export boom, especially of manufacturing products in 1990s and 2000s was an outcome of increased capacity utilization and labour productivity growth, thus employment generation of leading export sectors remained low. From the 1990s onwards, increased penetration of imports (both intermediate and final) in a favourable environment of large foreign capital inflows and an overvalued currency contributed to a persistent high rate of unemployment (around 10%).[1]

Although it is hard to isolate its impacts, the Customs Union formed with the EU in 1996 may have speeded import penetration, but stimulated Turkish exports less directly,

*Corresponding author. E-mail: gulaygs@istanbul.edu.tr

[1] See Senesen and Gunluk-Senesen (2007) for import patterns. As the restructuring policies in Turkey and Mexico are very similar, observations on outcomes of these policies also overlap, see for example Ruiz-Napoles (2004).

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as restrictions on imports from Turkey were lifted as early as in 1970. Until the early 2000s, improvement of productivity and therefore increased competitiveness of Turkish exports were indirect but significant effects of the Customs Union. From 2003 onwards, imports from China penetrated faster. The inflow of foreign direct investments in the whole decade following the Customs Union is rather insignificant (Yilmaz, 2010). The IMF intervention throughout the period, but more significantly after the 2001 crisis, focused on stabilizing the macroeconomic environment and liberalization. Against this background, challenges with regard to relieving the unemployment problem remained.

Employment rates in 2008 for both genders were well below their levels in the late 1980s. The male employment rate declined from 75% in 1988 to 61%, while the female employment rate dropped from 31% to 22%.[2] In view of the fact that the female employment rate in the EU-27 was 59.1% in 2008 (close to the Lisbon target of 60% for 2010), the employment status of women has been a leading challenge for Turkey's EU membership.[3] This weak presence of women in the labour market, as well as the fact that female earned income is less than one-third of male income, put Turkey in 130th position (among 134 countries) in the economic participation and opportunity category of the Gender Gap Index (World Economic Forum, 2009).[4]

The Turkish case presents a contradiction to the assertions of orthodox trade theory, since export performance especially in low-tech labour intensive manufacturing sectors relied on low wages and did not compensate for labour substitution in the rest of the economy (Aysan and Hacihasanoglu, 2007; Kizilca and Metin-Ozcan, 2008; Onaran, 2009). As discussed in Baslevent and Onaran (2004), female employment improved in services sectors and feminization of employment in manufacturing due to the export boom is hardly observed in Turkey, despite advances in clothing and textile sectors.

In the literature, Turkish export demand is found to be inelastic to exchange rate and price changes, but elastic to income (Aysan and Hacihasanoglu, 2007; Cosar, 2002). The share of EU-27 in Turkish exports was 57% in 2002, and 64% if other European countries are also taken into account. Although the corresponding figures are lower (48% and 60% respectively) for 2008, Europe is still a very significant trade partner. The unemployment rates were 16.0% for males and 21.9% for females in non-agricultural activities as a whole in 2009 in Turkey. Thus, the current global crisis poses serious threats for employment in the near future, for both genders. This paper analyses to what extent expected further reductions in export demand will affect Turkish unemployment rates for males and females.

The paper is organized as follows. The input–output methodology we develop is introduced in the next section. Section 3 discusses sectoral employment data derivation procedures with respect to gender and observations on the structure of employment and exports of Turkey in 2002. We were forced to use data for 2002 owing to limited availability of the recent input–output data. The intermediate input technology is not

[2] These figures are from Household Labour Force Survey Statistics of the Turkish Statistical Institute (TURKSTAT). See Toksoz (2007) for trends and a structural analysis of female employment in Turkey.

[3] See European Council (2009, p. 4) for EU data. For a more correct comparison, the EU employment rate has to be adjusted downward, due to the fact that around one-third of women work part time in the EU, while both genders work full time in Turkey. Still, the rate for Turkey remains significantly lower.

[4] With regard to gender gaps, Turkey ranks 110th in the educational attainment category, 107th in the political empowerment category and 93rd in the health and survival category. The rank for the composite index is 129.

expected to have changed drastically in the short run. Section 4 presents model findings for the selected sectors. A general assessment is given in the concluding section.

2. METHODOLOGY

The common practice for finding direct and indirect labour requirements (by skill or gender or total) in response to final demand changes involves multiplication of the direct labour coefficients matrix (**L**) by the sectoral output vector (**x**), which is equivalent to the multiplication of the Leontief inverse (**R**) by the final demand vector (**y**):

$$\mathbf{L}_X = \mathbf{LRy} = \mathbf{Ey} \tag{1}$$

where

l_{cj}: labour category c (in persons or hours) employed per unit output of sector j (gender, $c = 1, 2$; skill, $c = 1,2,\ldots, C$; $j = 1,\ldots, n$)

x: sectoral output vector, $j = 1,\ldots, n$

$\mathbf{R} = (\mathbf{I} - \mathbf{A}_d)^{-1}$, where $\mathbf{A}_d$ is the direct domestic input coefficients matrix.

r_{jk}: direct and indirect output expansion in sector j induced by final demand k

y: sectoral final demand vector, $k = 1,\ldots, n$.

This approach was also adopted by, for example, Gu and Rennison (2005), Wolff (2006), Steenge and Bockarjova (2007) and Nakajima (2008). A typical element of **E** (= **LR**), e_{ck}, shows demand for labour category c induced by final demand sector k. $\Sigma_c e_{ck}$ shows the total labour requirement in the economy generated by a one unit increase in the final demand of sector k, or in other words, the backward labour linkage of sector k.

Note that the location of employment generation, that is, the employer sector (j) is missing but inherent in this expression, because the above-defined relations in fact give: $e_{ck} = \Sigma_j e_{cjk}$. Exposing this dimension would require decomposition of e_{ck} with respect to the employer sector j also. Then e_{cjk} would show the requirements for labour category c induced in the employer sector j by unit of final demand of k.

Adapting the methodology for imports analysis in Gunluk-Senesen and Senesen (2001) to the context of employment effects, all three dimensions, c, j and k, of labour requirement can be captured as follows:

$$\mathbf{G^k} = \mathbf{L}\widehat{\mathbf{R}^{*k}} \tag{2}$$

Here, $\widehat{\mathbf{R}^{*k}}$ is an $(n \times n)$ diagonal matrix, formed by the k^{th} column of **R**, i.e. $(\mathbf{I}-\mathbf{A_d})^{-1}$ diagonalized for sector k, such that $r^{*k}_{jj} = r_{jk}$.

$\mathbf{G^k}$ decomposes final demand (k) induced labour requirements by category (c) and by employer sector (j), improving the information content of final demand (k) induced labour requirements by category (c) in Equation 1. A typical element of $\mathbf{G^k}$, g^k_{cj}, then stands for labour requirement (direct + indirect) of type c by the jth sector induced by one unit of the kth sector's final demand. The row sums of $\mathbf{G^k}$ give e_{ck}, which are backward labour linkages of k for category c, i.e.

$$\sum_j g^k_{cj} = \mathrm{e}_{ck} \tag{3}$$

and the column sums of $\mathbf{G^k}$ give backward labour linkages of k in sector j, i.e.

$$\sum_c g_{cj}^k = (\widehat{\mathbf{i'L}})\,\mathbf{R} \tag{4}$$

where $\mathbf{i'}$ is the row vector of unity for summation and $(\widehat{\mathbf{i'L}})$ is the diagonal matrix of total labour coefficients under the assumption of homogeneous labour. Hence

$$\sum_c \sum_j g_{cj}^k = \mathbf{i'}(\widehat{\mathbf{i'L}})\mathbf{R} = \sum_c e_{ck} \tag{5}$$

is the backward labour linkage of sector k in the economy, as in Equation 1.

The information content of this approach can be improved by incorporating the total flow concept of Szyrmer (1992). The model in Equation 1 associates labour requirements (via outputs) with final demands. However, there are cases where association with final demand changes might be of little use. For example, a sector's activity might be fully or significantly intense in intermediate production rather than producing for final demand. Similarly, in tables constructed according to the 'competitive imports' assumption, a sector's domestic final demand can be negative due to heavy reliance on imports.[5] The association of a sector's labour demand with another sector's output (or growth) in the interconnected production environment is also convenient for analytical purposes. Furthermore, as discussed in Gallego and Lenzen (2005), total flow formulations of linkages are equivalent to those found with the hypothetical extraction method.

The output multiplier in the total-flow tradition is

$$\frac{\partial x_j}{\partial x_k} = \frac{\partial x_j / \partial y_k}{\partial x_k / \partial y_k} = \frac{r_{jk}}{r_{kk}} \tag{6}$$

It is equal to 1 for $j = k$. Labour demand for type c of sector j associated with output of sector k could be expressed as:

$$l_{cj} \frac{r_{jk}}{r_{kk}} \tag{7}$$

Substitution of this definition into Equation 2 enables conversion of labour impacts of final demand changes to those of output changes:

$$\mathbf{H^k} = \mathbf{L}\,\widehat{\mathbf{R^{*k}}}(\widehat{\mathbf{r}_{kk}^{-1}}) = \mathbf{G^k}(\widehat{\mathbf{r}_{kk}^{-1}}) \tag{8}$$

$\mathbf{H^k}$ then shows labour requirements by category (c) and by employer sector (j) in association with the output of sector k. A typical element of $\mathbf{H^k}$, $h^k{}_{cj}$ stands for c type labour required (direct + indirect) by the jth sector in association with the output of sector $k \neq j$. Note that for $k = j$, $h^k{}_{cj}$ = direct labour coefficients for j (l_{cj}), following Equation 7.

[5] For example, out of 59 sectors in the 2002 I–O table for Turkey, two sectors have negative, two sectors a zero, and five sectors have very small final demands.

Since all elements of $\mathbf{G^k}$ are divided by a scalar, r_{kk}, the row sums, the column sums, and the overall sums of $\mathbf{H^k}$ are equal to the corresponding definitions in Equations 3 and 4 divided by r_{kk}, i.e.

$$\sum_j h^k_{cj} = (1/r_{kk}) \sum_j g^k_{cj} = e_{ck}/r_{kk} \tag{9}$$

$$\sum_c h^k_{cj} = (1/r_{kk}) \sum_c g^k_{cj} = (\widehat{\mathbf{i}'\mathbf{L}})\mathbf{R}(\widehat{\mathbf{r}^{-1}_{kk}}) \tag{10}$$

Hence

$$\sum_c \sum_j h^k_{cj} = (1/r_{kk}) \sum_c \sum_j g^k_{cj} = (1/r_{kk}) \sum_c e_{ck} \tag{11}$$

Incorporating gender in input–output employment modelling is relatively new.[6] One main underlying issue is the late recognition of the non-homogeneity of labour with respect to gender. The conceptual awareness then had to be complemented with the restructuring of data compilation to account for women's labour. Furthermore, household labour force surveys, the basic source of such data on employment need to be matched with I–O sector classifications. Concentration of women's employment in the informal sector (see, for example, Toksoz, 2007, for Turkey; and Sinha and Khan, 2008, for India) and/or women's universally unpaid domestic labour in the home remain mostly unaccounted for in the market oriented data collection process. The Marxian Feminist modelling of women's labour in Hanappi and Hanappi-Egger (2003) highlights the interactions between labour and class categories within an I–O framework but also calls for the need for empirical verification.[7]

Measurement issues have recently been discussed in Schaffer (2007), which shows that the gender composition of labour measured in persons for Germany deviates from that measured in working hours. The latter turns out to be a better indicator, since it captures full-time and part-time employment. The novelty of resorting to time-use surveys in Schaffer (2007) brings forth an important dimension in quantification in the usual I–O practice. Perhaps the most advanced elaboration of employment within the I–O framework is undertaken in Van der Cruyce and Wera (2007), in which several labour multipliers for Belgium are discussed, with reference to product versus industry technologies. It is obvious that use of these methods is conditional on the availability of data of sufficient quality.

[6] See Sinha (2008), Sinha and Khan (2008) and Kim (2008) for recent SAM work which account for income distribution with respect to gender. Our analysis focuses on labour requirements, a basic condition for income generation.

[7] The issue of occupational segregation in formal market activity will not be dealt with, despite its empirical significance.

3. THE DATA AND OBSERVATIONS ON EMPLOYMENT, TURKEY, 2002

3.1. The Data

There is no readily available data on employment with respect to sectors and genders for 2002, the most recent year for which input–output data are available. Since data for the sectoral breakdown of employment in other possible measurement units (hours worked, skills, occupation, education) are not available in household labour force surveys, we proceed with the number of workers as the indicator of employment.

The data estimation process involves three different data sets of the Turkish Statistical Institute, TURKSTAT. The first is the input–output tables in basic prices for 2002. These tables contain data for 59 sectors and are compiled in accordance with the third revision of the International Standard Industrial Classification of all Economic Activities (ISIC-Rev.3).[8] Input–Output tables for domestic and imported inputs by industry are separately available. The other source is the employment data in the Household Labour Force Survey (HLFS) for 2002, although in a highly aggregated form. It contains only nine sectors and its classification is based on ISIC-Rev.2. More importantly, it gives the employment data for the manufacturing sector as a whole without any details for its subsectors.

In order to overcome these difficulties, two paths were followed. One was to harmonize the sector classifications of the two sources and the other was to use the third source, 2003 employment data in Structural Business Statistics, to estimate proportionate distributions in subsectors of the manufacturing sector.

We combined input–output data for the categories A (Agriculture, Hunting and Forestry) and B (Fishing) of ISIC-Rev.3 under major division 1 (Agriculture, Hunting, Forestry and Fishing) of ISIC-Rev.2, for which employment data are available. Categories C (Mining), E (Electricity, Gas and Water Supply), F (Construction) and I (Transportation, Storage and Communications) posed no problems, because both classifications treated these in the same manner. Therefore, input–output data were aggregated for them accordingly. The I–O data for categories G (Wholesale and Retail Trade) and H (Hotels and Restaurants) of ISIC-Rev.3 are aggregated as data for major division 6 (Wholesale and Retail Trade and Restaurants and Hotels) of ISIC-Rev.2. Similar operations were carried out to aggregate categories J (Financial Intermediation) and K (Real Estate, Renting and Business Activities) of ISIC-Rev.3 into major division 8 (Financing, Insurance, Real Estate and Business Services) of ISIC-Rev.2 and also categories L (Public Administration and Defence, Compulsory Social Security), M (Education), N (Health and Social Work), O (Other Community, Social and Personal Services), P (Private Households with Employee Persons) and Q (Extra-Territorial Organizations and Bodies) of ISIC-Rev.3 into major division 9 (Community, Social and Personal Services) of ISIC-Rev.2.

The Manufacturing sector (category D) is treated rather differently since some of its subsectors are the main focus of this paper. Since the TURKSTAT HLFS does not provide employment data for each subsector for the year 2002, the 2003 data on Structural Business Statistics of TURKSTAT were used. These data contain employment figures for

[8] Product-by-product and industry-by-industry symmetric input–output tables were derived by the TURKSTAT from the supply and use tables at basic prices based on industry technology and fixed product sales structure assumptions (according to NACE Rev.1 and CPA 2002).

23 manufacturing subsectors, which are categorized under the numbers of 15-37 in ISIC-Rev.3. However, the definitions are not the same in both data sets. While HLFS data include informal as well as formal employment, the other covers only the formal sector. The mapping of sectors is summarised in the Appendix.

Assuming that male and female employment ratios in each subsector and total employment shares of each subsector in the broad manufacturing sector are more or less the same for the two data sets and have not changed considerably between 2002 and 2003, these ratios for 2003 data are calculated and applied to the aggregate employment data of the manufacturing sector for 2002. It seems that our assumptions hold quite well in general, since TURKSTAT's HLFS figures for female and male employment ratios for the manufacturing sector were 21.7% and 78.3% respectively, whereas our calculations yield 21.3 and 78.7 for the same ratios. Yet, we are not able to compare similar figures for each subsector in the manufacturing sector.

As a result, the original input–output table of 59 sectors for domestic transactions was aggregated to 31 sectors (eight main sectors and 23 subsectors of manufacturing sector) to match the reorganized employment data.

3.2. Observations on Gender Composition of Sectoral Employment in 2002

Broadly speaking, employment in Turkey is mainly concentrated in services (47%), followed by agriculture (35%) and manufacturing (18%). The differences between genders in terms of sectoral composition of overall employment are striking, especially for agriculture (male: 25%, female 60%) and services (male: 55%, female 27%). The remaining 19% of males and 13% of females are employed in manufacturing.

As shown in Figure 1, apart from agriculture, overall employment is concentrated in trade and services. This is also the case for males. As for females, while employment in services is leading (~15%), it is followed by textiles and wearing apparel combined together (~8%) and trade (~7%). The proportions of other manufacturing subsectors in female employment are less than 1%, except food products. Sectoral proportions for male employment are generally higher than those for females. Textiles and wearing apparel combined together is the only activity where the overall male share (5%) is less than the female share (8%).

In 2002, 71% of overall employment was male and 29% was female. Figure 2 shows that shares are close in agriculture, while only 21% of manufacturing and 17% of services employment is women.

Again, apart from agriculture, wearing apparel and textiles are the most female intensive sectors, with shares of ~45% and 31% respectively. The female share in the employment in textiles and wearing apparel combined together is 37%. Relatively more female hosting sectors are tobacco products, communication equipment, financing institutions, services, chemicals, precision instruments, office machinery and electrical machinery. The female share is less than 20% in all other sectors.

3.3. Observations on Exports in 2002

Manufacturing products were leading in Turkish exports in 2002 with a share of 65%, followed by services (31%), and agriculture (4%). Textiles and wearing apparel combined together constitute around 38% of manufacturing exports and 25% of total exports.

FIGURE 1. Sectoral composition of employment with respect to gender, Turkey, 2002.

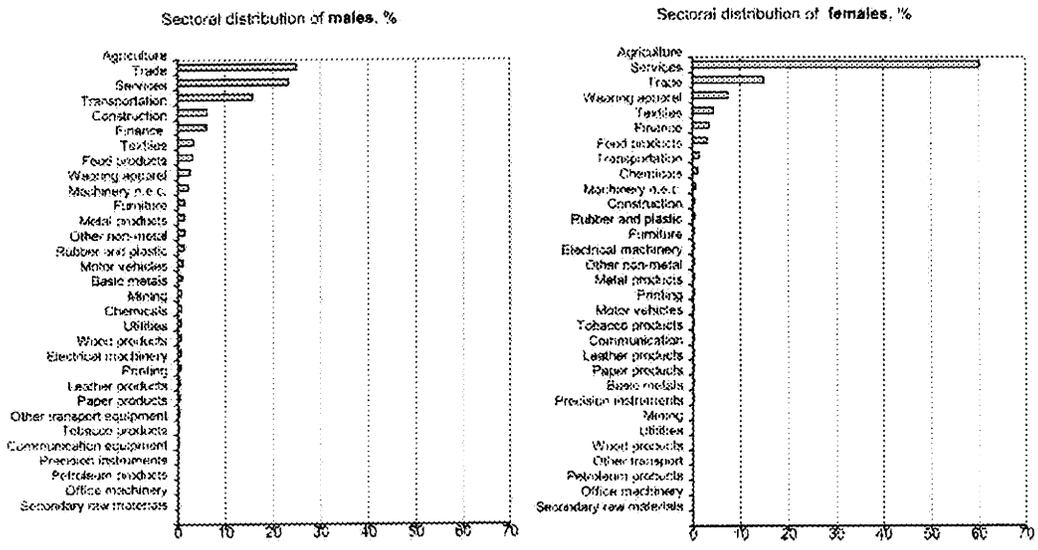
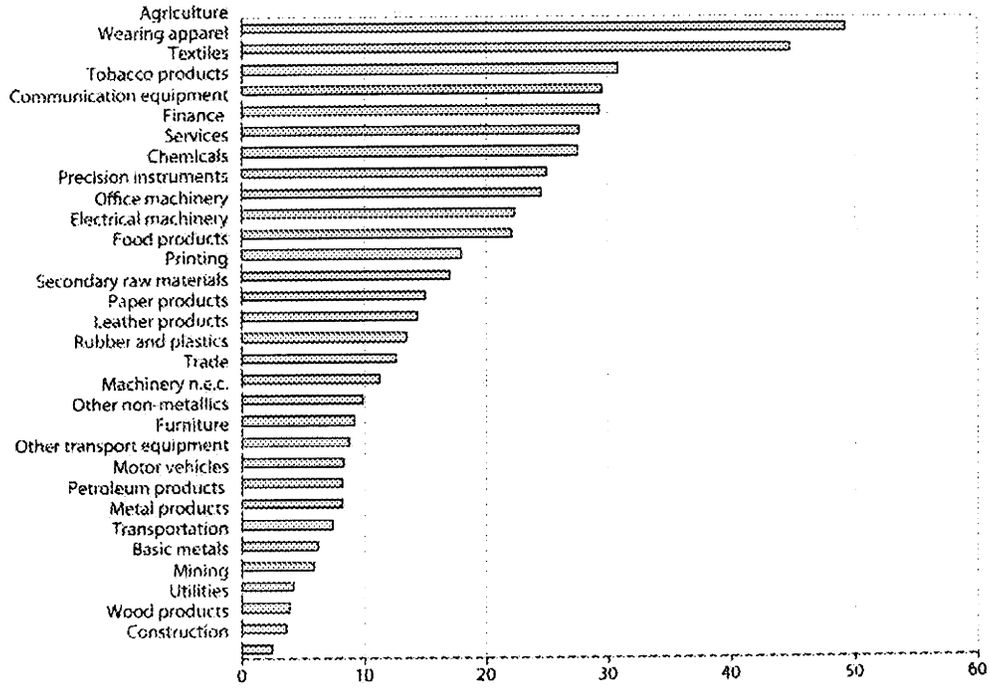
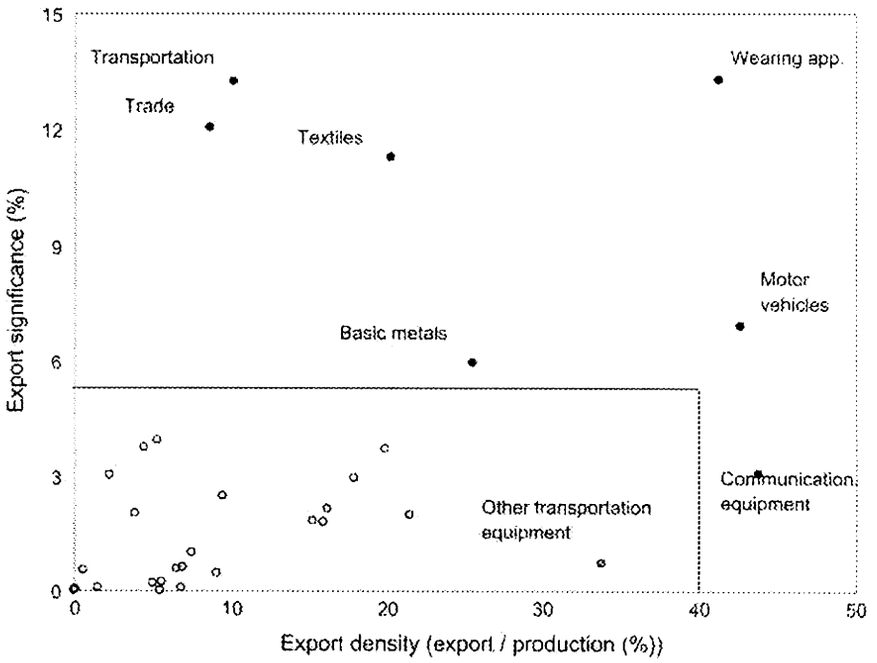


FIGURE 2. Female shares in sectoral employment (%), Turkey, 2002.



Transportation and trade exports account for 82% of services exports and 25% of total exports. All other sectors except these four sectors, motor vehicles and basic metals have export shares smaller than 5%. The vertical axis in Figure 3 shows sectors in terms of their share in total exports (export significance).

FIGURE 3. Export density and export significance of sectors (%) Turkey, 2002.



Regarding vulnerability to the external market conditions, export densities of sectors (i.e. shares of exports in sectoral outputs) are perhaps better indicators. These densities are shown in the horizontal axis of Figure 3. Over 40% of output of communication equipment, motor vehicles and wearing apparel are destined for external sales.

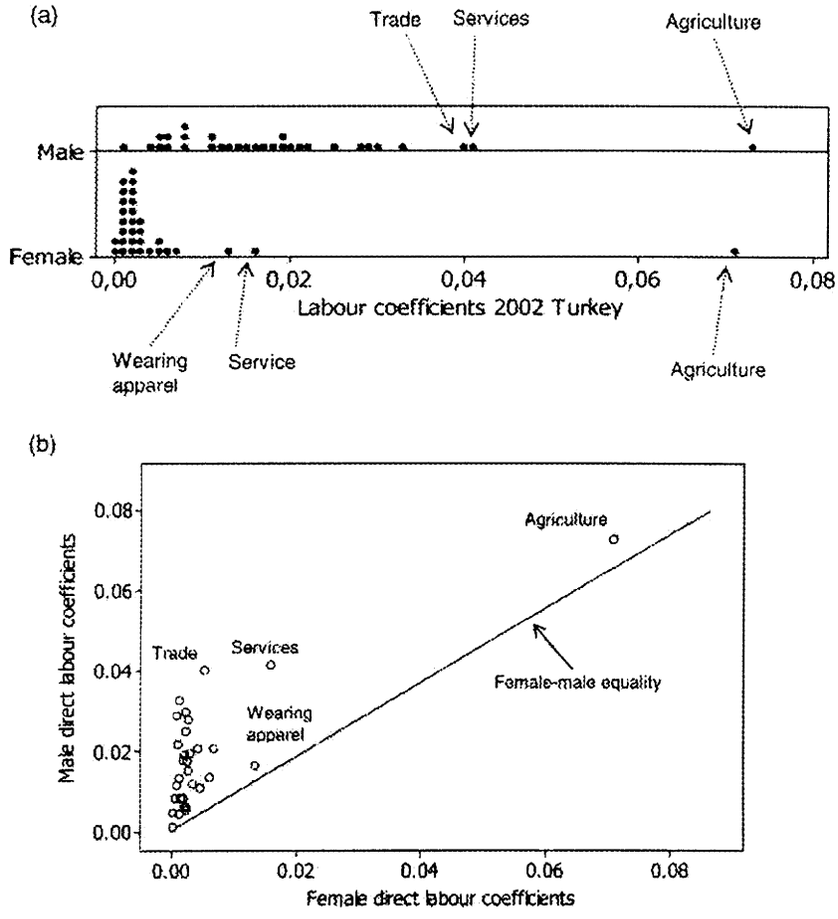
The crossplot of the indicators for export significance and density in Figure 3 serves as a basis for identifying the target sectors for our calculations. The wearing apparel sector stands out as a very significant sector with both indicators. Bottlenecks in its exports are expected to hit both the sector itself and Turkey's total exports, implying serious direct consequences for employment in the sector itself. There are six sectors that stand out in terms of both indicators, as Figure 3 shows: wearing apparel, textiles, motor vehicles, transportation, basic metals and trade. These sectors together form 54% of total exports in 2002. Although the 'other transportation equipment' sector has high export density, it is excluded due to its low export significance and also because of its vague coverage of non-motor vehicles. The communication equipment sector is included owing to its high export density, although it share in exports is only 3%.

4. MODEL FINDINGS

Before presenting findings for the leading sectors identified above, a quick look at the direct labour coefficients (l_{cj}) in Figure 4 is in order. Note that the inverses of the (l_j) coefficients indicate sectoral labour productivities. One cannot distinguish male and female productivity levels, however, due to the inseparability of output with respect to genders.

Figure 4, Panel (a) helps to compare the positions of females and males in terms of employment size standardized with output levels. As would be expected from the prior

FIGURE 4. Direct labour coefficients, l_{cj}, Turkey, 2002.



discussion, agriculture and services stand out for both genders, while the former is an outlier partly due to the highest female employment rate in agriculture.

The crossplot in Figure 4, Panel (b) illustrates in the standardized context the gender inequality disfavouring females in general, and in trade and services in particular. The agriculture (far outlier) and wearing apparel sectors stand out with their high labour coefficients being closest to the equality line.

4.1. Employment Generation Potentials of Final Demands of Selected Sectors, $\mathbf{G^k}$

In our presentation of our findings with the $\mathbf{G^k}$ and $\mathbf{H^k}$ multipliers, we adapt the positive rhetoric of 'employment generation of final demand increase' and 'employment associated with output'. In the current crisis circumstances, however, this can imply 'employment contraction due to final demand squeeze' and 'employment contraction associated with output'. Labour impacts less than 0.15 are not reported here. Figures 5–12 display findings with both final demand multipliers ($\mathbf{G^k}$) and total flow or output multipliers ($\mathbf{H^k}$). Note that the full length of each bar indicates related $g^k{}_{cj}$, while the lighter

FIGURE 5. Own effects for employment generation/association (1000 × multiplier).

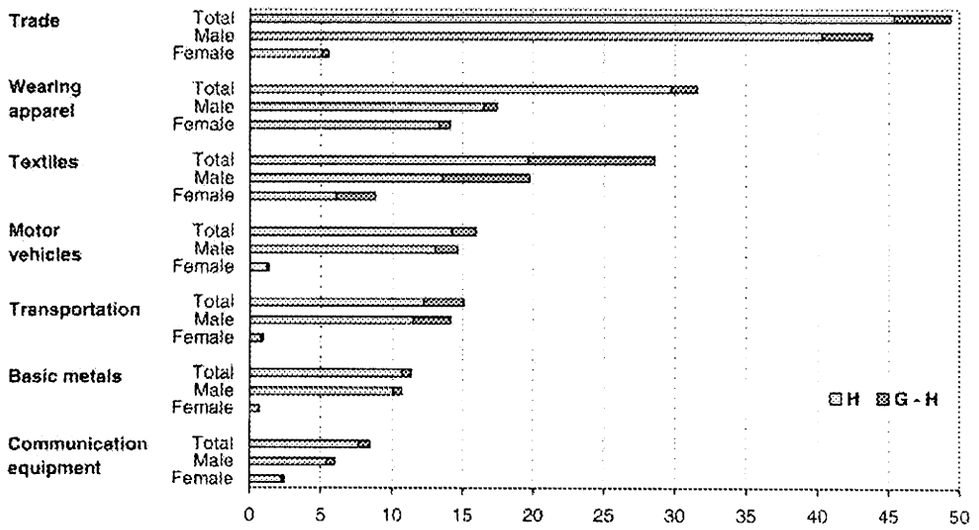
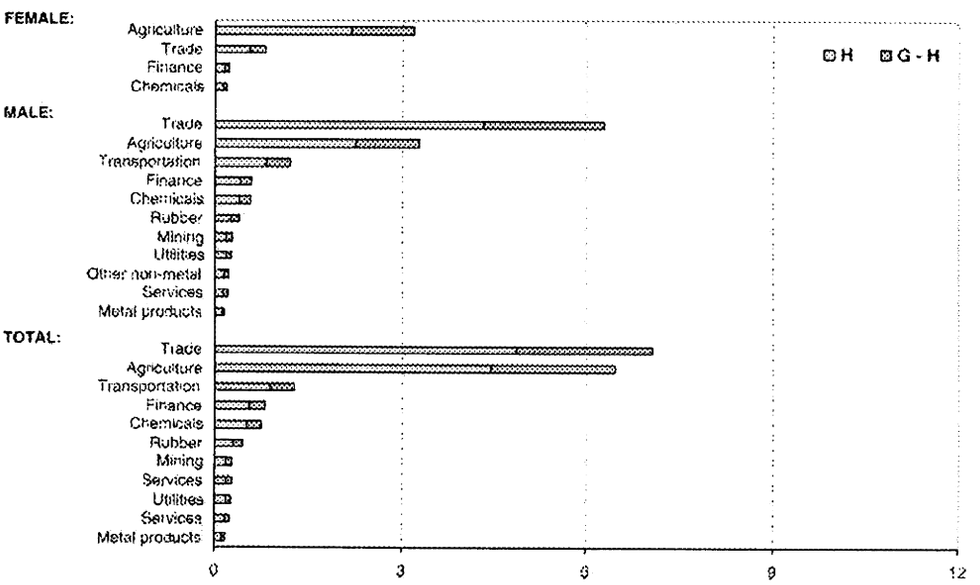


FIGURE 6. Policy sector: textiles, employment generation/association (1000 × multiplier).



grey portions show h^k_{cj}.[9] Since own effects significantly dominate in all cases, we chose to discuss the sectoral composition of cross-effects separately. Findings with h^k_{cj} are analysed in the next section.

[9] Although they are not additive by definition, measurement units and scales are the same for both multipliers. Also note that the equivalence of H multipliers with multipliers found by the hypothetical extraction method enables analysis of $G-H$ differences as net contributions to the economy, or employment in our case.

FIGURE 7. Policy sector: wearing apparel, employment generation/association (1000 × multiplier).

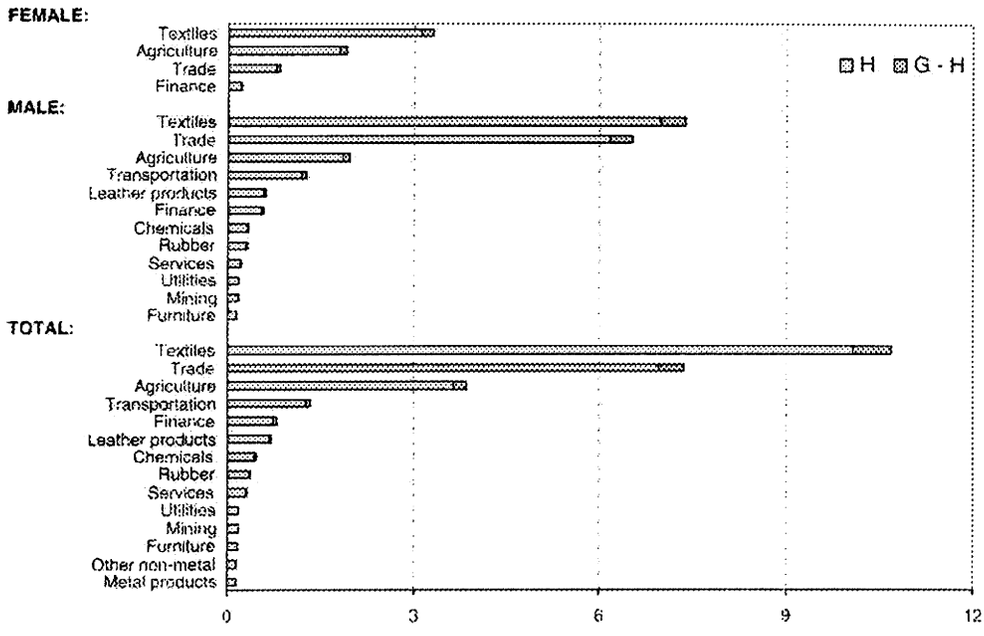


FIGURE 8. Policy sector: basic metals, employment generation/association (1000 × multiplier).

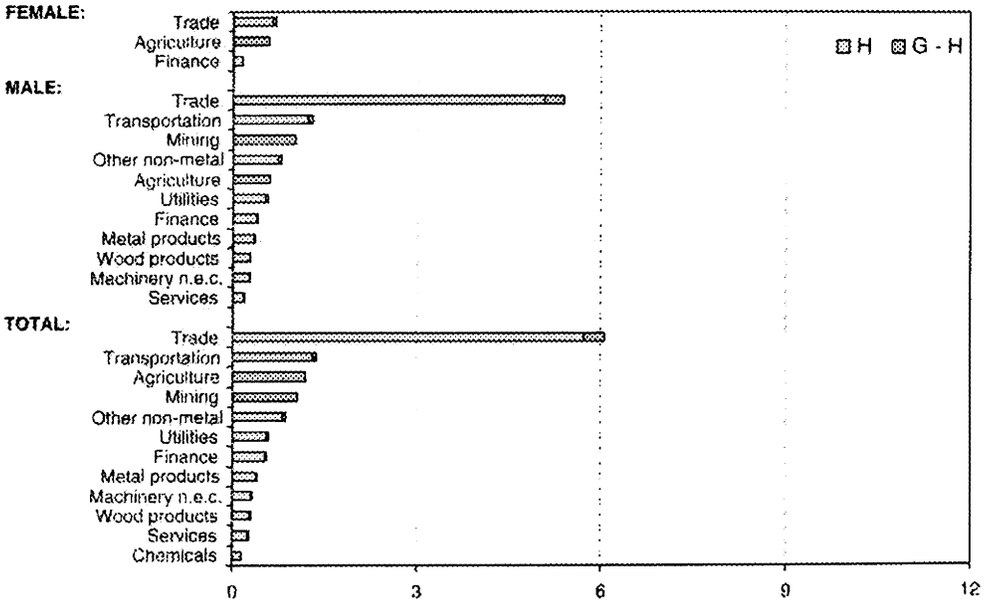


Figure 5 depicts own employment effects ranked by total employment generation. Trade activities stand out with its own employment generation effect. This high total employment effect is associated with male employment as potentials for female employment are rather low. This gender gap is observed even more strikingly for motor vehicles, transportation and basic metals. Impact on male labour in textiles is almost twice of that on

FIGURE 9. Policy sector: communication equipment, employment generation/association (1000 × multiplier).

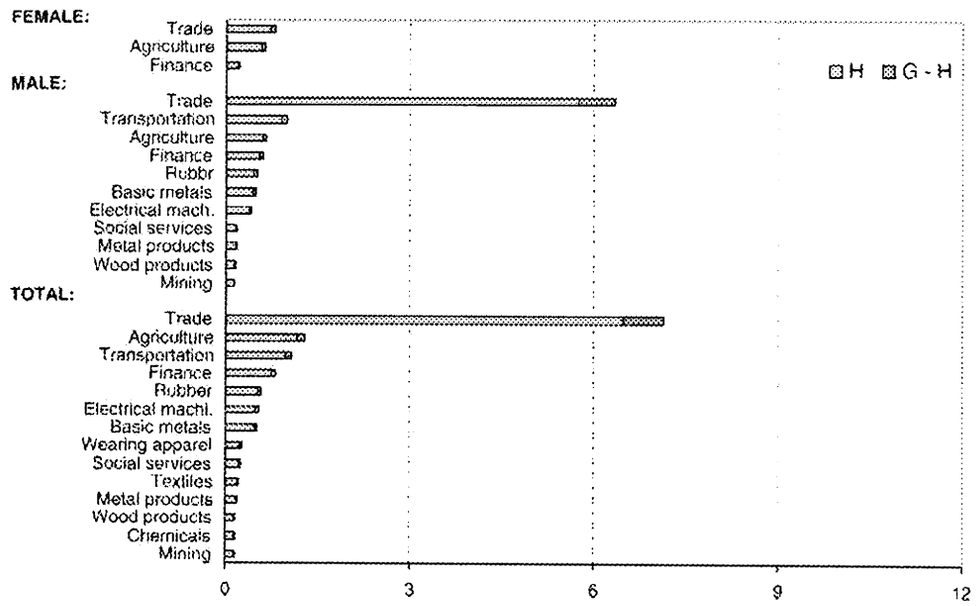


FIGURE 10. Policy sector: motor vehicles, employment generation/association (1000 × multiplier).

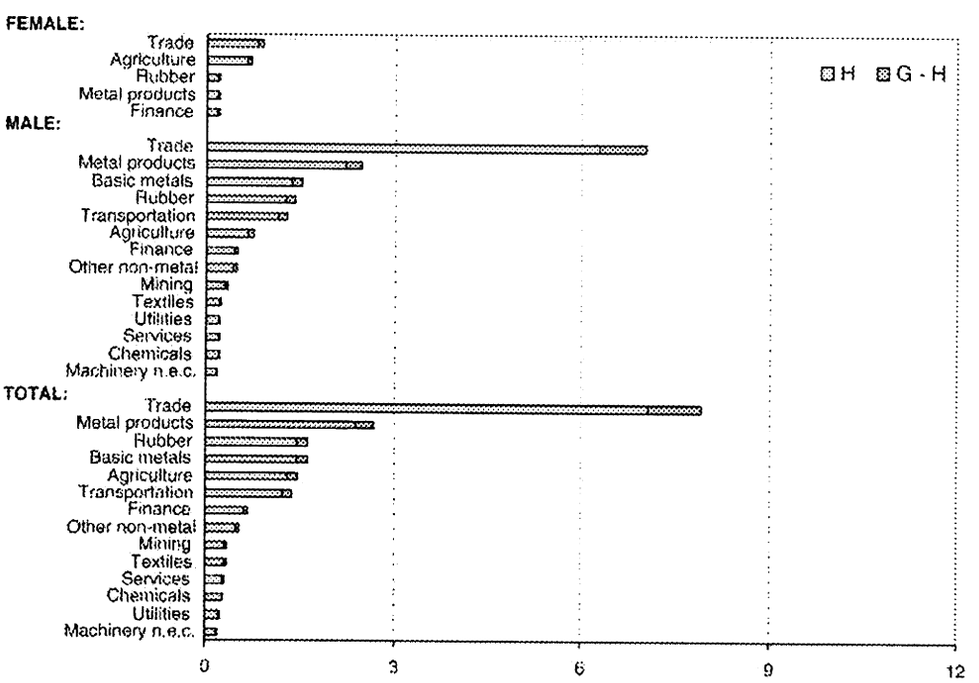


FIGURE 11. Policy sector: trade, employment generation/association (1000 × multiplier).

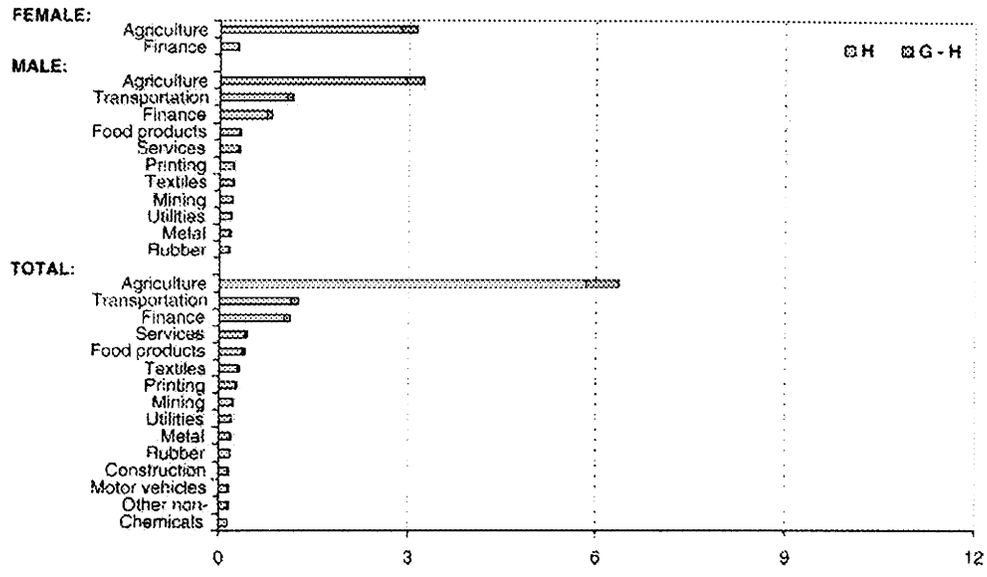
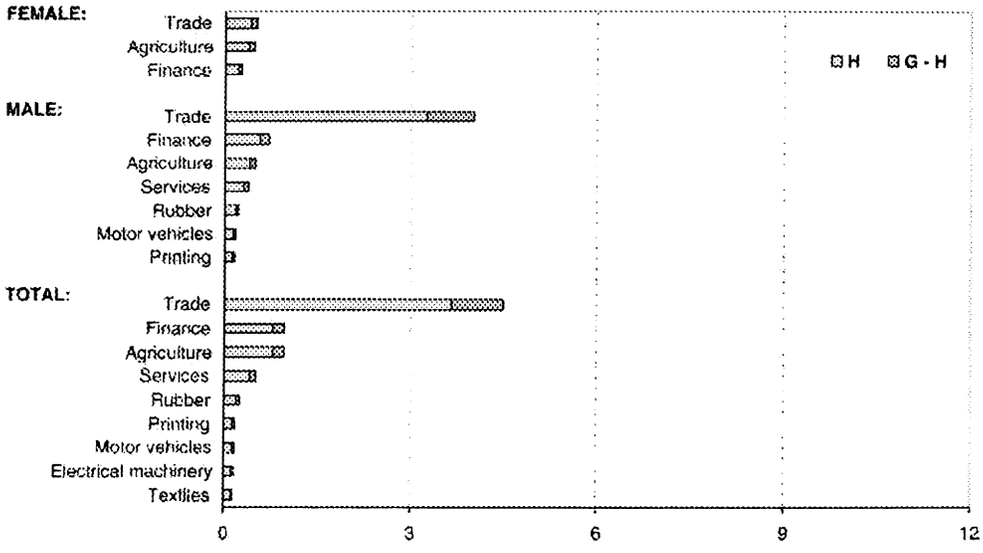


FIGURE 12. Policy sector: transportation, employment generation/association (1000 × multiplier).



female labour. The gender gap is much lower for wearing apparel, where female employment generation potential is highest compared with the other selected sectors.

Textiles

Textiles final demand would induce employment mainly in trade and agriculture as shown in Figure 6. This ordering is reversed for females. Employment generation in finance and chemicals is common for both genders, while male employment in transportation is more significant.

Wearing Apparel

Figure 7 shows the leading sectors for wearing apparel, which are textiles, trade and agriculture. Note that transportation and leather products would also demand male labour, but not female labour, significantly. Employment in financing institutions is generated for both genders.

Basic Metals

The leading sectors are trade, transportation, agriculture and mining-related activities for overall employment generation as shown in Figure 8. Impact on female employment is very low as would be expected. However, the employment effect for females in trade is as significant as basic metals itself for females (see Figure 5).

Communication Equipment

Figure 9 shows that trade is leading significantly in overall employment generation and also for males. Other important sectors are agriculture, transportation (males) and financing institutions. The employment effect for males in trade is greater than that in communication equipment itself (compare Figure 5).

Motor Vehicles

Employment for both males and females is generated in a larger number of manufacturing sectors, such as metal products, rubber and plastic, basic metals, along with agriculture, trade, transportation and financing institutions. Figure 10 also shows that variety is less for females, and impacts notably low.

Trade

Although incomparably low with respect to the female employment generated in the sector itself (Figure 5), employment generation in agriculture is outstanding for both genders. As shown in Figure 11, transportation and financing institutions are significant for males, transportation being insignificant for females.

A clarification of the coverage of trade and transportation sectors is in order here, regarding exports, hence their roles as policy sectors. Technically their export activities are directly linked to trade and transportation margins (freight costs) in goods exports and to services of trade and transportation enterprises undertaking export activities. As seen in the Appendix, both Trade (no. 28) and Transportation (no. 29) in the present study are composite sectors.

One other issue regarding the export significance in overall exports – as seen in Figure 3 – of both trade and transportation is that this could be attributed mainly to tourism related activities, a sector included in both trade and transportation. Yet the relatively low export densities of both trade and transportation raises doubt. This ambiguity is due to the wide coverage of tourism, the related activities of which are classified under main economic activities. For instance, of total tourism revenues in 2002, 19% is raised

in food and beverage (no. 3, 4, 28), 18% in shopping (5, 6, 7, etc), 16% in accommodation (no. 28), 5% in transportation (no. 29), 3% in health and recreation (no. 31) etc.[10] This would be a rough mapping, however, as the position of tourism cannot be extracted with the available input–output and employment data.

Transportation

Figure 12 shows that employment is generated in trade, financing institutions, agriculture and services. The pattern is identical for both genders, although the multipliers for females are significantly low and employment in services is insignificant.

The following generalizations can be made from these sectoral findings:

1. Employment generation is highest in the sector of the policy or final demand sector itself.
2. Among the selected sectors, trade and wearing apparel stand out with largest employment generation potentials in the economy.
3. Impacts on female employment generation are lower than on male employment in general.
4. Sectoral diversity is less for females. Hence, the overall sectoral composition of impacts is determined by males.
5. Employment for both genders is generated significantly in agriculture, trade and financing institutions by final demands of leading export sectors.
6. Female and male employment impacts are very close in agriculture, mainly due to close shares in agricultural employment.
7. Trade stands out as a significant employer sector for all policy sectors, for both genders.
8. Employment generation in transportation and services is significant for males, though not for females.
9. Employment generation effects in high-tech sectors such as office machinery, electrical machinery and precision instruments are very low.
10. For all policy sectors, the lowest employment generation is observed in tobacco products, its intermediate supply links being very few and very low; it supplies mainly for private consumption.

4.2. Employment Generation Potentials Associated with Outputs of Selected Sectors, H^k

We will discuss findings with total flow or output multipliers ($\mathbf{H^k}$) for the selected sectors only briefly here, as the sectoral patterns of employment association are, in general, very similar to those discussed above based on Figures 5–12. One exceptional point is noted in Figure 8. Female and male employment in agriculture, as well as male employment in mining associated with the output of basic metals, turns out to be negligible, although final demand multipliers are significant.

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[10] TURKSTAT, Tourism Statistics. Also note that these figures do not include package tours, which make up 21% of tourism revenues, which involve again a variety of industries.

There are several discrepancies in the rankings of the employer sectors, but the associated labour in all these cases is less than 1 person, less than 0.5 to be more specific. In conformity with the definition of total flow multipliers, they are smaller than $\mathbf{G^k}$ multipliers, and the deviations between $\mathbf{H^k}$ and $\mathbf{G^k}$ multipliers are directly related to the size of the r_{kk}. The r_{kk} values in ranked order for the leading export sectors are: 1.46 for textiles, 1.32 for basic metals, 1.23 for transportation, 1.12 for motor vehicles, 1.10 for communication equipment, 1.09 for trade, 1.06 for wearing apparel.

Figure 5 shows that own employement effects associated with domestic output are leading for trade and wearing apparel. However, the textiles sector has the largest **G-H** difference for own employment impact. In other words, textiles is the most vulnerable sector for both males and females, and thus total employment, during a contraction in its final demand. The highest cross-impact is observed on trade. On this line of reasoning, despite its significance in exports, employment in the wearing apparel sector turns out to be less vulnerable for both genders in the absence of a final demand impetus.

5. CONCLUSIONS

This paper is an attempt to find the employment generation potentials of the leading export sectors in Turkey, and to assess the implications for likely contractions in final demand in the current global crisis environment. The focus is on certain characteristics of the Turkish economy in the last few decades, which are: low employment generation, high income elasticity of exports and low employment rate of women. The gender gap in Turkey has been a critical issue, especially in the negotiations with the EU towards membership. The basic features of female employment are concentration mainly in agriculture, services, textiles and wearing apparel, and much less in the rest of the manufacturing activities.

Common employment input–output models relate overall labour requirements to final demand. In order also to locate these labour requirements, a methodology to decompose common labour multipliers with respect to employer sectors is developed. We estimated sectoral employment data with respect to gender and used the 2002 input–output data, which were aggregated for 31 sectors to comply with employment data. The findings specifically reflect the structure prior to the recent global crisis and guide predictions on the sectoral impacts on the employment of men and women in Turkey.

The **G** multipliers indicate that trade generates the highest employment for males and wearing apparel generates the highest employment for females. For both genders, employment generation potentials of major export sectors are stronger in agriculture, trade and financing institutions, while they are very limited in manufacturing subsectors. Trade stands out as a significant employer sector for all policy sectors. The impacts on female employment generation are lower than on male employment in general. Male employment generation in transportation and services is more frequent, while these sectors are not significant for female employment. Finally, employment generation effects in high-tech sectors are very low. These patterns overlap in general with the patterns found with **H** multipliers, although the levels are lower – an expected outcome. The textiles sector stands out with highest deviations from **G** multipliers, for both genders. Employment associated with its output would be hit hardest by bottlenecks in the rest of the economy with trade being the leader.

The current global crisis is characterized by the acute problem of widespread unemployment, which placed job and income creation in the centre of government agendas. The State Planning Organisation of Turkey predicts that the global crisis will have negative impacts on production and employment in Turkey mainly due to the contraction of demand for exports.[11] The economic implications notwithstanding, persistent unemployment globally poses serious threats to social cohesion.

Yet, the fact that the root cause lies in the production structure has been often overlooked in general, and the issue has mainly been addressed in the social policy context, inclusive of the elimination of gender imbalances, in the case of Turkey. The success of measures such as incentives in the form of tax exemptions for employers, or positive discrimination legislations remains limited. This paper illustrates that employment creation in a sector will not be achieved by focusing on the employer sector only, which usually is the focus of popular policy design, and which fails to take intersectoral aspects of employment generation. For example, promotion of employment in textiles is dependent on demand for wearing apparel, neglect of which will not lead to improvement in textiles. The conditions of exogenous demand (boost or contraction) for wearing apparel will not affect the textiles only, but employment also in trade, agriculture, transportation, etc, will be affected, in different orders for men and women. With similar reasoning, promotion of women's empowerment, especially with regard to employment, is conditional upon the intersectoral linkages for female labour demand. Reconciliation of this aspect with social policy could then be expected to serve social cohesion. This broadened perspective might also contribute towards policies to eliminate the adverse effects of the crisis.

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APPENDIX: SECTORAL MAPPING OF THE DATABASES*

Sectors in Household Labour Force Survey	Sectors in I–O Table
1. Agriculture, forestry, hunting and fishing	Products of agriculture, hunting and related services; Products of forestry, logging and related services; fish and other fishing products; services incidental of fishing
2. Mining and quarrying	Coal and lignite; peat; crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying; uranium and thorium ores; metal ores; other mining and quarrying products
Manufacturing	3. Food products and beverages; 4. Tobacco products; 5. Textiles; 6. Wearing apparel; furs; 7. Leather and leather products; 8. Wood and products of wood and cork (except furniture); articles of straw and; plaiting materials; 9. Pulp, paper and paper products; 10. Printed matter and recorded media; 11. Coke, refined petroleum products and nuclear fuels; 12. Chemicals, chemical products and man-made fibres; 13. Rubber and plastic products; 14. Other non-metallic mineral products; 15. Basic metals; 16. Fabricated metal products, except machinery and equipment; 17.Machinery and equipment n.e.c.; 18. Office machinery and computers; 19. Electrical machinery and apparatus n.e.c.; 20. Radio, television and communication equipment and apparatus; 21. Medical, precision and optical instruments, watches and clocks; 22. Motor vehicles, trailers and semi-trailers; 23. Other transport equipment; 24. Furniture; other manufactured goods n.e.c.; 25. Secondary raw materials;
26. Electricity gas and water	Electrical energy, gas, steam and hot water; collected and purified water, distribution services of water
27. Construction	Construction work
28. Wholesale and retail trade, hotels and restaurants	Trade, maintenance and repair services of motor vehicles and motorcycles; retail sale of automotive fuel; Wholesale trade and commission trade services, except of motor vehicles and motorcycles; retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods; hotel and restaurant services
29. Transportation communication and storage	Land transport; transport via pipeline services; water transport services; air transport services; supporting and auxiliary transport services; travel agency services; Post and telecommunication services;

(Continued)

Appendix 1. Continued

Sectors in Household Labour Force Survey	Sectors in I–O Table
30. Finance, insurance, real estate and business services	Financial intermediation services, except insurance and pension funding services; Insurance and pension funding services, except compulsory social security services; Services auxiliary to financial intermediation; real estate services; renting services of machinery and equipment without operator and of personal and household goods; Computer and related services; research and development services; Other business services;
31. Community, social and personal services	Public administration and defence services; compulsory social security services; Education services; health and social work services; sewage and refuse disposal services, sanitation and similar services; membership organisation services n.e.c.; Recreational, cultural and sporting services; other services; private households with employed persons

*Numbers indicate the 31 sectors referred to in this study.

Note: For employment data for manufacturing (3-25) sectors, see Structural Business Statistics 2003-2004, Business Statistics, TURKSTAT.