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JOBLESS GROWTH WITH IMPORTED INPUTS: THE TURKISH CASE IN THE NEOLIBERAL ERA

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Abstract

The Turkish economy in the 2000's is characterized by positive growth rates and persistent high rates of unemployment. This paper attempts to gain insight into the concurrence of these two phenomena in the neoliberal era by taking the role of intermediate imports into account, an aspect which received relatively less attention in the jobless growth literature. Considering the upward trend of intermediate input penetration in the Turkish production sectors, we hypothesize that the same GDP growth rates are feasible with less employment generation. Several hypothetical scenarios (e.g. substitution of 1 %, 5 % of domestic intermediate input use of all the sectors, of major exporting sectors, of highly import dependent sectors, etc.) are calibrated with the input-output data of TURKSTAT for 2002 and estimated employment data for 31 sectors to see the extent of (possibly negative) effects on employment. The methodology provides decomposition of employment generation of policy sectors with respect to origin sectors along with decomposition of import dependency (of destination sectors). Preliminary findings show that the shift from domestic intermediate goods to imported ones in food products, wood products, tobacco, wearing apparel, textiles and agriculture generate the highest job losses in the economy. These industries have sizeable negative effects on employment in agriculture, textiles, leather products, wood products, utilities and metals. Hence growth performance in the neoliberal era in Turkey was not matched with employment creation the sectoral breakdown of which is identified in this paper.

Keywords: imports, growth, jobless growth, employment, Turkey

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"*Even though the global economy appeared to start growing again during 2009, labour markets showed little sign of improving*." ILO (2010:9)

*"Yet the evidence is clear that the recovery in economic growth has not been matched by a similar expansion in employment opportunities in many countries."*ILO (2011:4)

"*Despite the rapid recovery in the global economy that took place in 2010, following two years of severely adverse labour market conditions, global unemployment remained elevated in 2010*." ILO (2011:12)

1 INTRODUCTION

One major characteristic of the world economy in the aftermath of the recent crisis is jobless growth as emphasized by successive reports of the International Labour Office reports, quoted above. This now deeply rooted phenomenon becomes a most serious policy issue due to its economic and social implications. Observing that the rather high growth rates in the Turkish economy in the neoliberal era are accompanied with persistent high unemployment rates, this paper attempts to gain insight into the concurrence of these two phenomena in Turkey and integrate the role of increased dependency on intermediate imports, an aspect which received relatively less attention in the jobless growth literature.

2 JOBLESS GROWTH LITERATURE

Research on jobless growth had already accumulated preceding the crisis. There are variations with respect to coverage and scope: plant, industry, macro levels; final versus intermediate imports; tradable versus non-tradable production; outsourcing, methodology, national and international contexts, demand versus supply side aspects. Although a strict definition of the phenomenon would be zero or negative output elasticity of employment (Hodge, 2009), inelasticity is a more common case.

Approaching from the supply side, as in the case of South Africa (Hodge, 2009), and also partly relevant for Turkey, faster growth of labour force than output can lead to deficiency of

[1] This is a slightly revised version of the paper 'Jobless growth with imported inputs: The Turkish case' presented at the 19th International Input-Output Conference, 13-17 June, 2011, Alexandria VA, USA.

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jobs. Alternatively, as in the case of India (Chaudhuri, 2007), the dual nature of the economy and real wage differentials might accelerate unemployment.

The demand side determinants are more widely observed at global level. Onaran (2008) identifies low output elasticity in manufacturing sectors in Central and Eastern Europe. Flaig and Rottman (2009) outline the role of rigidities due to labour market institutions (e.g. unemployment benefits, tax system, unions, job security) in OECD countries. Choice of labour saving innovative technology in export oriented economies to sustain competitiveness in the world market as well as flow of foreign capital might lead to creative destruction, like in Ireland (Li, Walsh and Whelan, 2007).

Notwithstanding the interactive role of the above summarized factors, increased globalization of supply chains also pose challenges as well as opportunities on job creation. Research focuses more on the implications of outsourcing. The results regarding imports again differ with respect to scale, sector, technology level, skills, nature of imports (intermediate or final; complementary or competitive goods) and methodology (cost/productivity and/or labour demand functions, econometric estimation). Input-output modelling of the issue is not common.

We focus on the role of intermediate imports in particular, as growth is dependent upon interaction of labour and imported inputs in production, along with capital and other inputs. Imported inputs could also have negative effects on employment generation, though indirectly, due to improved productivity, an aspect we will not deal explicitly. Final demand imports would also have implications for growth and employment, an aspect not covered in this paper.

Positive impacts of intermediate imports on job creation are found to be associated with improved efficiency in resource allocation for US manufacturing (Kurz and Lengermann, 2008). Truett and Truett (2001) discuss the positive contribution of especially complementary imports for automotives in Spain. Job losses due to outsourcing are observed for electronics in Ireland (Gorg and Hanley, 2005). Conway (2009) finds job destruction in US textiles sectors again due to intermediate import competition.

It is misleading to restrict employment effects under the assumption of labour homogeneity. A transformation in the skill requirements would be forced by, in some cases, upgraded technology embodied in intermediate imports, leading to a lagged adaptation response of employment to output growth. Hence labour outcomes differ regarding skills. Aydiner-Avsar and Onaran (2010) find that in Turkish manufacturing, high and medium skilled sectors benefit from complementary nature of high-tech imports and productivity gains.

On the other hand Aydiner-Avsar and Onaran (2010) also find that job destruction is in effect for low skilled sectors in Turkish manufacturing as cheaper low tech competitive intermediate imports penetrate the production activities. Findings for Austria in Kratena (2004) are similar for low skilled but opposite for high skilled workers. Falk and Wolfmayr (2005) find that intermediate imports from low-wage countries decrease employment in low skill (but not high skill) EU manufacturing industries. Even if the disproportionality with respect to skills could be neutralized, the adjustment process is rather sluggish in view of persistence of high unemployment rates. This is perhaps a much more acute problem for the Turkish economy.

3 GROWTH, UNEMPLOYMENT AND INTERMEDIATE IMPORTS IN TURKEY

The growth rate of the Turkish economy ranges between 5-9 % during 2002-2007, following the –6 % contraction in 2001. Growth performance was interrupted in 2008 (0.7 %) and 2009 (–4.7 %), recovering again in 2010 (8.9 % est.). Persistently high (10-14 % overall, 13-17 % non-agricultural) unemployment rates especially since 2002 imply that the degree of association

between growth and unemployment is rather low (see Figure 1). Figure 2 reveals the nature of an association, if any, between high unemployment rates and high growth rates for most of the last decades. Hence negative and low output elasticities of employment dominate the last decade. Figure 3 plots one year lagged responses of employment to GDP growth which are rather volatile and minority of points lie at the high elasticity and/or positive elasticity domains.[5]

Figure 1. Growth and Unemployment, %, Turkey, 1999-2010

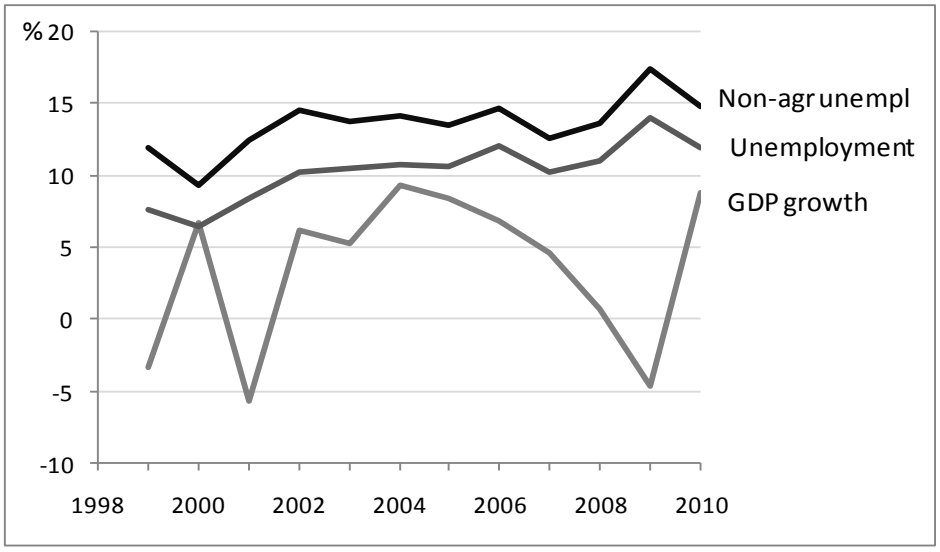
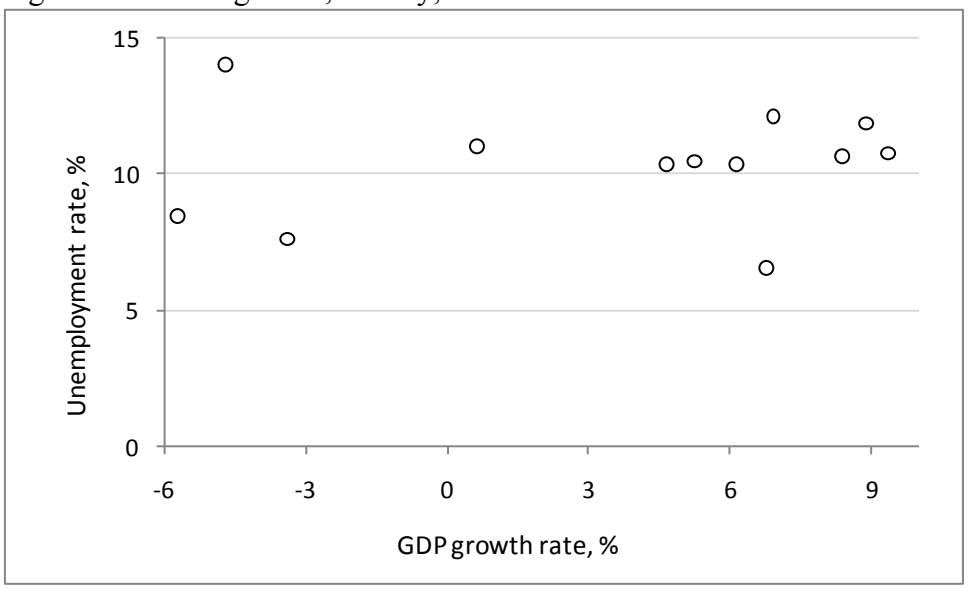


Figure 2. Jobless growth, Turkey, 1999-2010

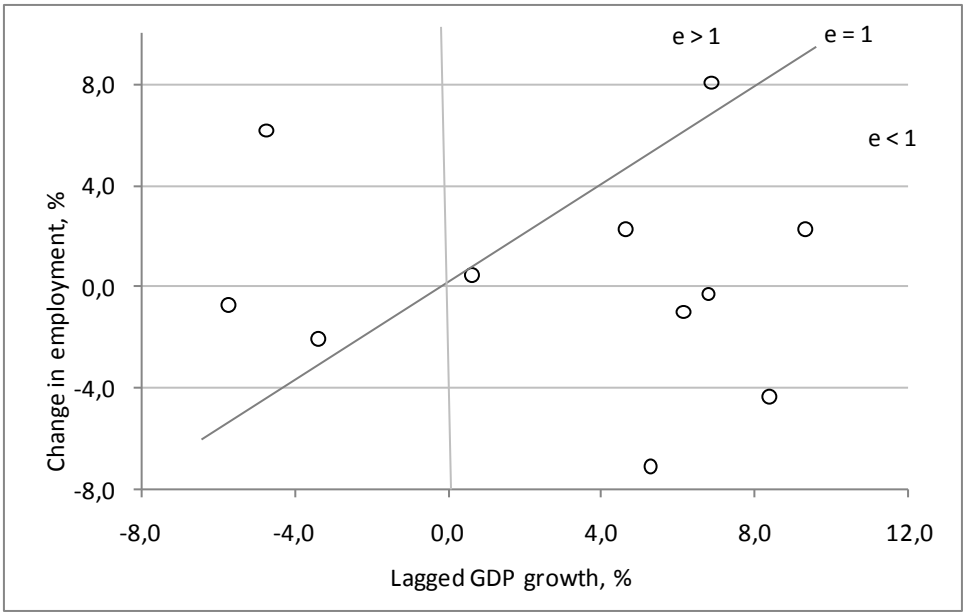


One major factor behind this outcome is penetration of imports in the economy in general and of intermediate imports in particular. Intermediate imports to GNP ratio accelerated in the post-

[5] A lag of one year might be too long for some sectors, however we present here a general snapshot of the economy.

1980 liberalization era, stagnating only at crisis years, and exceeded 20 % in early 2000s.[6] Growth performance of the economy is closely dependent upon import capability, an issue repeatedly and again at present raising concerns regarding the current account deficit.

Figure 3. Output elasticity of employment, lagged, Turkey, 2000-2010



Low employment generation capacity of economic expansion in Turkey in the last decades has been extensively addressed.[7] One major characteristic of the transformation in the production structure is the shrinking share of agriculture. Weak absorbance capacity of abundant agricultural labour in industry and services contributed to the already prevailing unemployment problem. In due course productivity improved in industry and services suppressing demand for additional labour. Availability of cheaper competitive intermediate imports especially from China and India in labour intensive sectors led to dissolving of related workplaces. Labour demand deficiency is also linked to labour market rigidities (e.g. social security payments, full time contracts, tenure). On the other hand, level of unionization is low, real wages are stagnant despite improved productivity. The rather high (42 % in 2010) rate of informal employment indicates high labour costs in formal employment, the reduction of which is found to lead to higher employment growth in Telli, Voyvoda and Yeldan (2006).[8] In short, unemployment was already high prior to the global crisis, an exacerbated outcome due to neoliberal policies.

The production structure changed in the direction of increased import intensity of inputs not only in scale but also in diversity, as discussed in detail in Senesen and Gunluk-Senesen (2007). Figure 4 shows the increasing trend of intermediate imports with respect to GNP. The drop in

[6] See Senesen and Gunluk-Senesen (2007) for the macroeconomic policies underlying this outcome, as well as trends in imported inputs.

[7] E.g. see Ansal et al (2000), BSB (2008), Ercan (2006), Erten (2009) Guncavdi and Kucukcifci (2006), Oz (2010), TUSIAD(2004), Yeldan (2006).

[8] The negative implications of this policy on government revenues and hence public services and compensating alternatives are important challenging issues. See Telli,Voyvoda and Yeldan (2006).

2009 is due to the recent crises. The rise in 2010 due to the recovery invoked an alarming current account deficit. Figure 5 depicts the box-plot distribution of sectoral domestic input use since 1970's for those years with available input-output tables. It is clear that the leading sector in terms of the share of the imported intermediate goods in total use is almost always (with one exception) Petroleum among the user sectors. Other significant intermediate input importer sectors are other manufacturing (quite small in size), electrical machinery, basic metals, paper and chemicals.

Part of this transformation can be attributed to the integration of some sectors in global chains in due course and hence transformations both in technology and product design. This trend manifests itself in the 2000's as discussed in Saygili et al. (2010). In a survey of large scale and outward oriented 145 firms, it is found that imported inputs penetration was higher in high tech sectors rather than labour intensive sectors. Saygili et al. (2010:111) also shows that supply shortage in materials is a major cause of imports, implying the complementary nature of imported inputs in high tech sectors. Although high tech competitive sectors have lower labour coefficients and account for little share of total employment in manufacturing, linkages with the rest of the economy either forced smaller scale firms to adapt to their input requirements or dissolve, hence generating indirect, mostly negative impacts on labour demand.

Our starting hypothesis is that shifting from domestic to imported intermediate inputs weakens employment generation potentials. We test this hypothesis and determine the sectoral implications on labour demand of import penetration using variants of the input-output model. We also attempt to link these outcomes to GDP growth and hence establish the links between growth, intersectoral input transactions and employment potentials.

Figure 4. Trends in intermediate imports, Turkey, 1999-2010, %

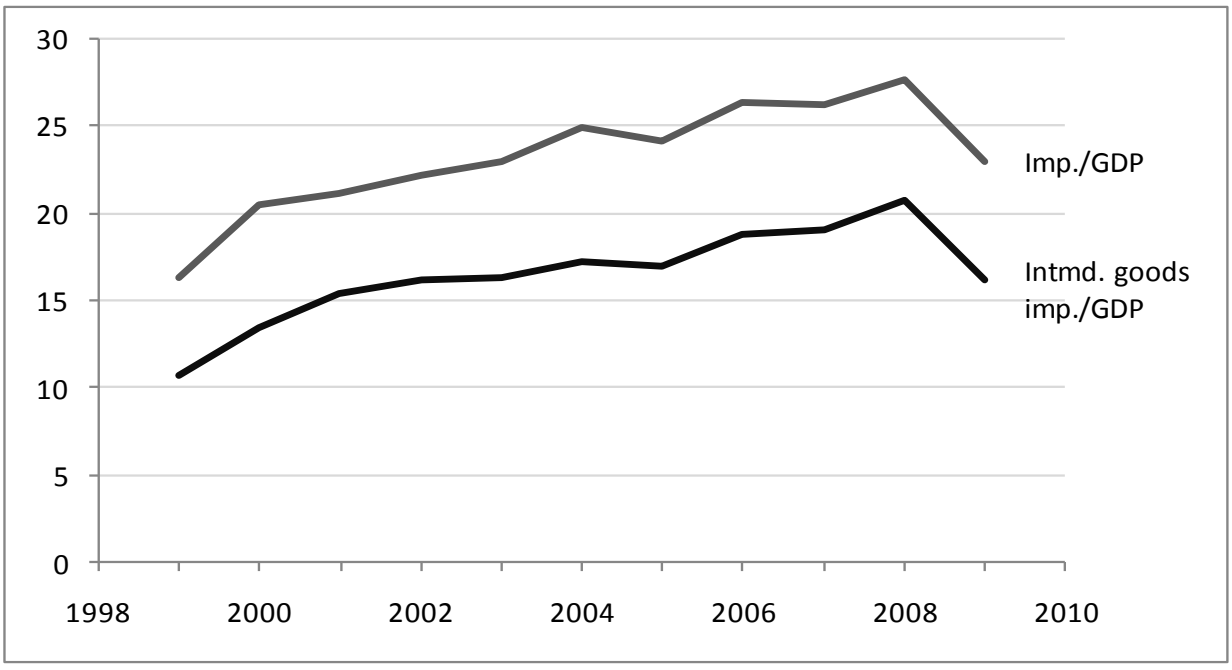
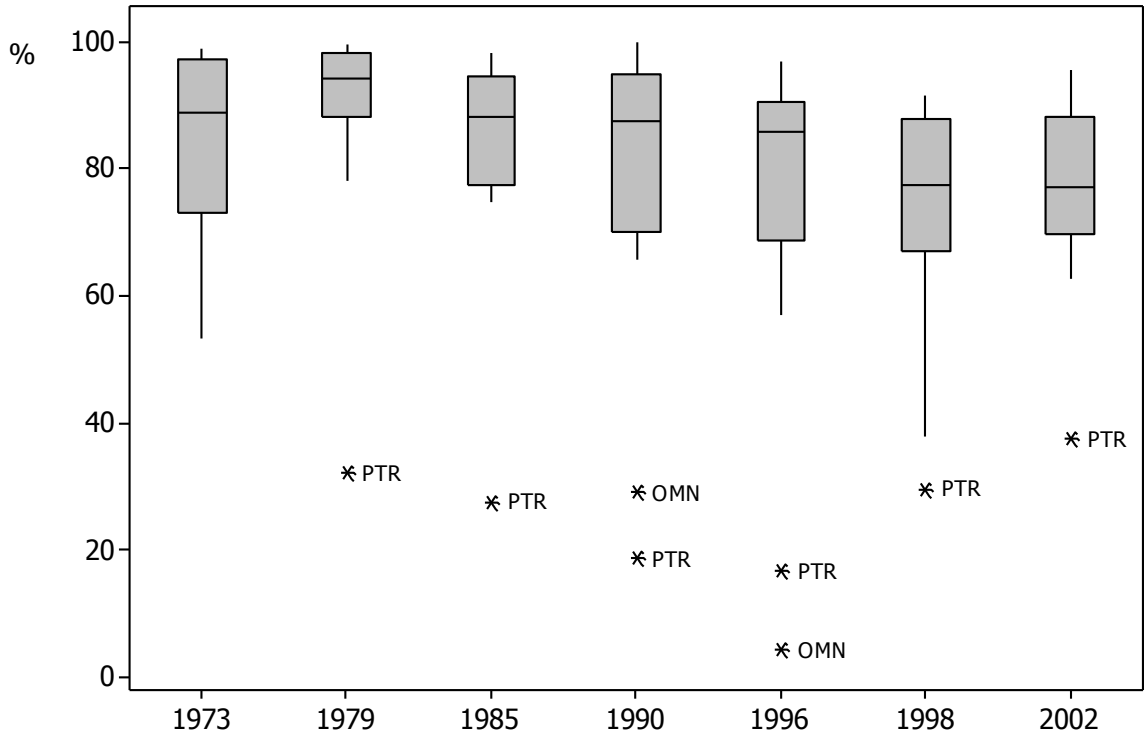


Figure 5. Share of domestic intermediate inputs in total by user sectors, %



4 METHODOLOGY:

The methodology presentation here is taken from Gunluk-Senesen and Senesen (2011). See also the references therein.

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

y : sectoral final demand vector[9], $k = 1,\ldots, n$

A: input-output coefficients matrix, , i = 1,…, n, $j = 1,\ldots, n$

(1) $x = Ax + y$

(2) $x = (I - A)^{-1} y$

(3) $a_{ij} = \dfrac{X_{ij}}{x_j}$ $\quad X_{ij}$: intermediate input demand of sector j from sector i

(4) $X_{ij} = X_{ij}^{d} + X_{ij}^{m}$ $\quad d$: domestic, m: imported

[9] Although the sectoral classifications are identical in $\boldsymbol{x}$ and $\boldsymbol{y}$, our methodology distinguishes between final demand (k) sectors and employer (j) sectors.

(5) $a_{ij}^{d} = \frac{X_{ij}^{d}}{x_j}$ $\quad a_{ij}^{m} = \frac{X_{ij}^{m}}{x_j}$

(6) $a_{ij}^{d} + a_{ij}^{m} = a_{ij}$

(7) $A = A_d + A_m$

(8) $x = A_d x + A_m x + y$

(9) $x = (I - A_d)^{-1}(A_m x + y)$ $\quad y_d = A_m x + y$ (see Appendix)

(10) $x = R\, y_d$ $\quad R$: Leontief inverse with domestic coefficients matrix

Direct and indirect labour requirements (by skill or gender or total) in response to final demand:

(11) $L\, x = L\, R\, y_d = V\, y_d$

l_{cj} : labour category c (in persons or hours) employed per unit output of sector j
(gender, c = 1, 2. or skill, c =1,2,…, C; j = 1,…, n)
r_{jk} : direct and indirect output expansion in sector j induced by final demand k
v_{ck} : demand for labour category c induced by final demand (policy) sector (k).
$\Sigma_c\, v_{ck}$: 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: $v_{ck} = \Sigma_j\, v_{cjk}$. Exposing this dimension would require decomposition of v_{ck} with respect to the employer sector j also. Then v_{cjk} would show the requirements for labour category c induced in the employer sector j by final demand of k.

All three dimensions, c, j and k, of labour requirement can be captured as follows:

(12) $G^k = L < R^k >$

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

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).

$g^k{}_{cj}$: c type labour requirement (direct + indirect) by the j^{th} sector induced by one unit of the k^{th} sector's final demand.

(13) $\Sigma_j\, g^k{}_{cj} = v_{ck}$: row sums of G^k , backward labour linkages of k for category c,

(14) $\Sigma_c\, g^k{}_{cj}$: column sums of G^k , backward labour linkages of k in sector j,

(15) $\Sigma_c \Sigma_j g^k_{cj} = \Sigma_c v_{ck}$

The findings include gender of composition of employment linkages (c= 1, 2) so that separate effects for women and men are captured. We will report here only total employment multipliers to focus on the overall structure within the scope of this paper.

In order to capture sectoral labour demand responses to intermediate imports, we alter the X^d_{ij} matrix, whereby a b % is deducted assuming that this b % is met by imported instead of domestic inputs, with $0 < b < 1$. Then we calculate the employment implications of this shift from domestic to imported intermediate inputs (*ceteris paribus*).

(16) $X^{d-}_{ij} = X^d_{ij}(1-b) = X^d_{ij} - bX^d_{ij}$

(17) $X^{m+}_{ij} = X^m_{ij} + bX^d_{ij}$

(18) $X^d_{ij} + X^m_{ih} = X_{ij} = X^{d-}_{ij} + X^{m+}_{ij}$

(19) $a^{d-}_{ij} = \frac{X^{d-}_{ij}}{x_j}$ $\qquad a^{m+}_{ij} = \frac{X^{m+}_{ij}}{x_j}$

(20) $a^{d-}_{ij} + a^{m+}_{ij} = a_{ij} = a^d_{ij} + a^m_{ij}$

(21) $A_d + A_m = A = A_{d-} + A_{m+}$

(22) $R^* = (I - A_{d-})^{-1}$

(23) $R^* = (I - bA_d)^{-1}$

Since $b < 1$, $R^* < R$, (see Appendix)

Using the *new* $R^* = (I - A_{d-})^{-1}$ relationship we find employment generation by the k^{th} final demand sector with respect to origin and destination sectors:

(24) $G^{*k} = L < R^{*k} >$

The impacts of this shift on employment levels in number of jobs, are given by $G^{*k} - G^k$ and those in percentage are given by $\frac{G^*_k - G_k}{G_k}$ (division element wise)

We apply this methodology with 2 alternative values for b: In scenario (1) b = 1%, and in scenario (2) b = 5%. Note that we also assume constant labour coefficients, i.e. they are not

affected by shifts by *b*, effects are symmetrical (increase/decrease) and efficiency gains and complementarity are not accounted for.

Next, we undertake simulations with alternative GDP (*y*) growth rates to establish links between labour demand, intermediate input use and growth.

5 THE DATA

The most recent available 2002 Input-output tables (59x59) of the TURKSTAT form the basis.[10] The 2002 Labour Force Survey gives employment data (in persons) for 9 main sectors, manufacturing being one of them. This employment data is broken into 23 manufacturing subsectors using only available 2003 Structural Business Statistics again of TURKSTAT. Calculations are carried with reconciled input-output and employment data for 31 sectors (8 main sectors + 23 manufacturing subsectors). Derivation of the data is explained in detail in Gunluk-Senesen and Senesen (2011).

6 FINDINGS

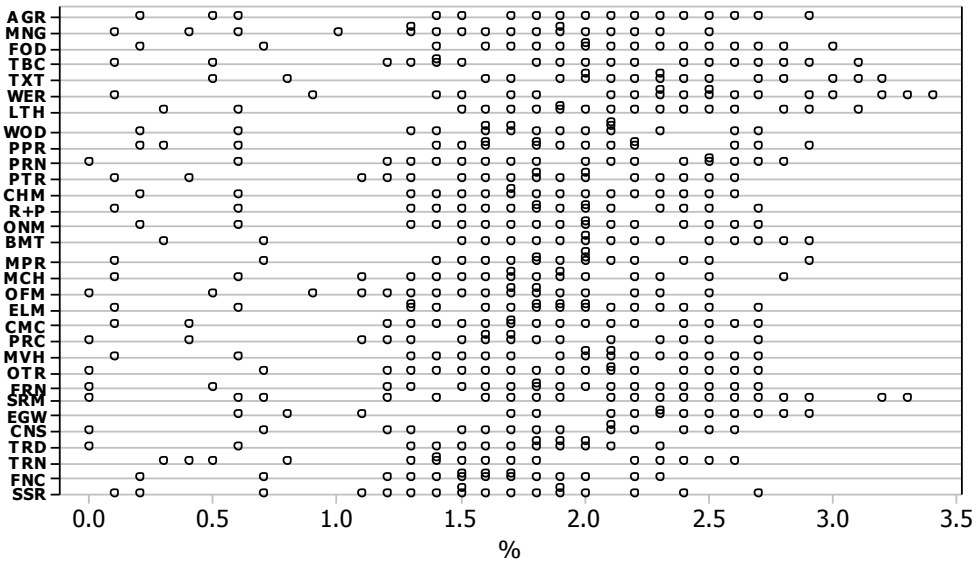
Both scenarios (i.e.1% and 5 % of domestic intermediate inputs shifted to imported ones keeping the total constant) yield **negative** employment effects in all sectors (see Figures 6 and 7 and Tables 1 and 2).

The size of these negative effects on employment depends on the policy (*k*) sector as well as the user (*j*). Among the policy sectors, those with heavy use of imported intermediate inputs (such as Petroleum, Wood products, Food, Tobacco, Wearing apparel, Textiles) and with high percentage shares in total employment (such as Agriculture) have the highest negative effects on the whole economy (in terms of number of job losses). As to the percentage effects (number of jobs lost due to the shift divided by the employment prior to the shift) Leather goods, Electricity, gas and water and Secondary raw materials join to the sectors above.

The negative effect due to a shift from domestic to imported inputs was lowest for Finance (1.6% in Scenario 1 and 7.7% in Scenario 2) and highest level for Wearing apparel (2.3% and 11.0%). Wearing apparel, Electricity, gas and water (2.3% and 10.8%), Textiles (2.2% and 10.4%), Leather good (2.1% and 9.9%)s, Food (2.1% and 9.9%) and Secondary raw materials (2.1% and 9.9%) had effects above 2% (and almost 10% or above for Scenario 2); Tobacco (2.0% and 9.4%) and Agriculture (1.9% and 9.3%) had almost 2% in Scenario 1 and above 9.3% in Scenario 2. Overall average percentage effects are almost twice as much as the percentage of shift in intermediate imports.

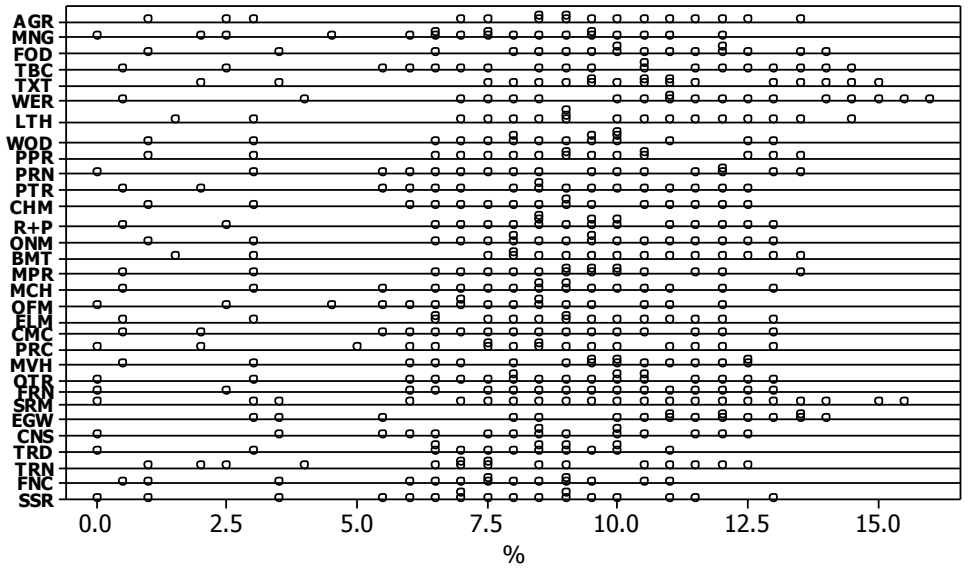
[10] Since Saygili et al. (2010) show that import penetration increased during 2002-2007, and assuming the 2002 Input-output structure did not change significantly in this period, an assumption common with I-O modeling, our data might not be considered outdated.

Figure 6. % Decrease in employment due to 1% shift from domestic to imported inputs



Each symbol represents up to 3 observations.

Figure 7. % Decrease in employment due to 5% shift from domestic to imported inputs



Each symbol represents up to 3 observations.

Table 1. % Decrease in employment due to 1% shift from domestic to imported inputs

Sector	Mean	St. dev.	Maximum	Sector	Mean	St. dev.	Maximum
Agriculture	**1.9**	**0.6**	**2.9**	**Machinery**	**1.7**	**0.5**	**2.8**
Mining	**1.6**	**0.5**	**2.5**	**Office machinery**	**1.6**	**0.5**	**2.5**
Food products	**2.1**	**0.6**	**3.0**	**Electrical mach.**	**1.8**	**0.5**	**2.7**
Tobacco	**2.0**	**0.7**	**3.0**	**Communication eqp.**	**1.8**	**0.6**	**2.7**
Textiles	**2.2**	**0.6**	**3.2**	**Precision instrumn.**	**1.7**	**0.6**	**2.7**
Wearing appar.	**2.3**	**0.7**	**3.4**	**Motor vehicles**	**2.0**	**0.6**	**2.6**
Leather prod.	**2.1**	**0.6**	**3.1**	**Other transport eq.**	**1.8**	**0.5**	**2.7**
Wood products	**1.8**	**0.5**	**2.7**	**Furniture**	**1.8**	**0.6**	**2.7**
Paper	**1.8**	**0.6**	**2.8**	**Secondary raw mat.**	**2.1**	**0.8**	**3.3**
Printing	**1.9**	**0.6**	**2.8**	**Electricity, gas**	**2.3**	**0.6**	**2.9**
Petroleum	**1.9**	**0.6**	**2.6**	**and water**			
Chemicals	**1.8**	**0.5**	**2.6**	**Construction**	**1.8**	**0.6**	**2.6**
Rubber + Plast	**1.8**	**0.5**	**2.7**	**Trade**	**1.7**	**0.5**	**2.3**
Other nonmetal	**1.9**	**0.6**	**2.7**	**Transportation**	**1.8**	**0.7**	**2.6**
Basic metals	**1.9**	**0.6**	**2.9**	**Finance**	**1.6**	**0.5**	**2.3**
Metal products	**1.9**	**0.5**	**2.9**	**Social services**	**1.6**	**0.6**	**2.7**

Table 2. % Decrease in employment due to 5% shift from domestic to imported inputs

Sector	Mean	St. dev.	Maximum	Sector	Mean	St. dev.	**Maximum**
Agriculture	9.3	3.1	13.6	Machinery	8.4	2.5	13.2
Mining	7.7	2.5	11.8	Office machinery	7.8	2.5	12.1
Food products	9.9	2.7	14.1	Electrical mach.	8.7	2.6	13.0
Tobacco	9.4	3.3	14.4	Communication eqp.	8.5	2.8	13.0
Textiles	10.4	2.8	15.0	Precision instrumn	8.3	2.7	13.0
Wearing appar.	11.0	3.4	16.0	Motor vehicles	9.4	2.7	12.7
Leather prod.	9.9	2.9	14.5	Other transport eq.	8.6	2.6	12.8
Wood products	8.7	2.3	13.0	Furniture	8.8	2.8	13.0
Paper	8.8	3.0	13.6	Secondary raw mat.	9.9	3.7	15.5
Printing	9.3	3.0	13.3	Electricity, gas	10.8	2.7	13.8
Petroleum	9.0	2.8	12.5	and water			
Chemicals	8.6	2.5	12.3	Construction	8.8	2.7	12.3
Rubber + Plast.	8.9	2.6	13.0	Trade	8.1	2.3	11.2
Other nonmetals	9.2	2.6	12.8	Transportation	8.5	3.2	12.6
Basic metals	9.3	3.0	13.7	Finance	7.7	2.4	11.0
Metal products	9.0	2.5	13.6	Social services	7.8	2.7	12.9

7 CONCLUSIONS

The interindustrial effects found in this study can be summarized as follows:

- Almost every policy sector has a considerable effect on itself and on Agriculture, the latter having the largest share in the economy.
- Textiles and Wearing apparel both have highly significant impacts on Textiles.

- Trade (at a lesser extent Transportation and Finance) are affected by almost every policy sector.
- Basic metals and Metal products are mainly affected by machinery sectors.

These findings are valid only under constant labour coefficients assumption. Any contemporaneous changes in labour and import coefficients should be expected to have composite effects on employment. Besides, the results are sensitive to measurement units, such as employment in persons versus employment in hours. For instance longer working hours with the same labour would yield lower labour coefficients. This issue cannot be addressed in this paper.

It should be added that the shifts from domestic to imported intermediate inputs are not the only factors causing jobless growth. We emphasize it as one of the important factors and illustrate possible negative effects on employment.

Since the crucial issue is unemployment in the present settings, the findings of this study reveal a significant issue in designing economic policies to reduce unemployment. In our view targeting on policy or origin sectors would be an inadequate approach for solution. Instead it is necessary to take into account employer sectors associated with policy sectors. Thus sectoral composition of public investments and of private investment incentive schemes is a crucial issue to be integrated into policy design for employment creation.

However, this integrated approach for policy and employer sectors has long been overlooked by the neoliberal policy design, Turkey being no exception. When left to global market forces, the sectoral composition of the production structure at national level was shaped in such a way that macroeconomic imbalances, e.g. unemployment and current account deficits have become persistent despite growth. We should also note in the global context that Turkish imports induce employment (and growth) in exporter countries as well as profits, the implications of which for production structure, employment, wage and work conditions in all parties remain for future research agenda.

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APPENDIX:

A. Basic accounting

$$x = A_d x + A_m x + y$$

$$(I - A_d)x = A_m x + y$$

$$x = (I - A_d)^{-1}(A_m x + y)$$

$$y_d = A_m x + y$$

$$x = (I - A_d)^{-1}(A_m x + c + i + e - m)$$

$$x = (I - A_d)^{-1}(A_m x + c + i + e - A_m x - c_m - i_m)$$

$$x = (I - A_d)^{-1}(c - c_m + i - i_m + e)$$

$$x = (I - A_d)^{-1}(c_d + i_d + e)$$

$$x = (I - A_d)^{-1} y_d$$

$$x = R y_d$$

B. *R* matrices compared

$$R = I + A_d + A_d^2 + A_d^3 + A_d^4 \ldots\ldots\ldots$$

$$R^* = I + bA_d + b^2 A_d^2 + b^3 A_d^3 + b^4 A_d^4 \ldots\ldots\ldots$$

Since $b < 1$, $\quad R^* < R$