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WHICH SECTORS DRIVE EGYPT'S GROWTH AND EMPLOYMENT?

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SUMMARY

According to the International Monetary Fund, Egypt's employment elasticity of growth in the last two decades was relatively low, as previous policies focused on capital deepening rather than improving labor utilization growth rate. This paper uses input-output analysis to identify the economic activities that have high output and employment multipliers at the subsector level of manufacturing and services in Egypt, while previous multiplier research for Egypt analyzed manufacturing as an aggregate sector. The top 20 ranking subsectors in terms Fof employment multipliers include 13 services and 7 manufacturing subsectors. Except for food and accommodation services, most of the services subsectors gain their high rank from direct and induced employment, with little contribution of backward interlinkages. The picture is mixed for manufacturing. For example, most of the employment effect of food products and beverages is attributed to the interlinkage with the agriculture sector, but the direct and induced employment effects are small. The paper presents an illustrative exercise which excludes imported intermediate inputs in order to account for the possible overestimation of the multiplier effect due to imports. The employment multiplier is reduced by more than 30% in the sectors which use intermediate inputs from high import upstream sectors.

Keywords: employment, growth, employment multiplier, aggregate sector, manufacturing

INTRODUCTION

Sustained high and inclusive growth and job creation have been among the main challenges facing Egypt (IMF 2018). Egypt's 2030 sustainable development strategy envisions "maximizing value added, and generating decent and productive jobs", with a target of increasing the share of manufacturing and services in GDP. IMF (2018a) and Morsy et. al. (2015) described the employment elasticity of growth in Egypt to be relatively low, and criticized the concentration of economic growth activities in the last two decades on capital deepening rather than improving labor utilization growth rate (measured as employment to population ratio). Therefore, an important policy question for Egypt is identifying the economic activities that have high employment potential.

Labor intensity of an economic activity is not an adequate measure of its employment potential. It is important to consider sectoral interlinkages which show the effects of an increase in final demand of one sector on other sectors' employment and therefore general employment levels. For example, an increase in apparel exports implies an increase in the output of apparel and

the other sectors which serve as inputs to the apparel industry. Input-output multiplier analysis identify interlinkages between the different sectors in the economy, and their impacts on output and employment. Therefore, multipliers are useful tools to direct cross-cutting and sector-specific development policies.

For example, Kapstein et. al. (2012 a,b) used multiplier analysis to assess potential impacts of investments of the International Finance Corporation (IFC) on employment and value added effects in Tunisia and to assess the impacts of funds provided to Jordan. The World Bank used multipliers as one of the tools for assessment of employment creation effects of infrastructure projects in developing countries (Ianchovichina et.al., 2012), and energy sector activities (Bacon and Kojima, 2011). Stehrer and Ward (2012) in a study contracted by the European Commission calculated employment multipliers of 12 sectors for European countries in order to identify the sectors with highest employment responsiveness to stimulus packages, and assess the feasibility of sector-specific measures. Stehrer and Ward (2012) is one of the few studies which distinguish between domestic and international employment multiplier effects through accounting for imported intermediate inputs.

Few studies calculated output and employment multipliers for Egypt, and to the knowledge of the author, none of them calculated employment multipliers at the subsector level of manufacturing. Fayed and Ehab (2015) examined the output multiplier effects of the construction sector using input-output tables and time series analysis, and both methods showed the high backward multiplier effects of the construction sector, where the most important feeding industries were identified as the financial and wholesale trade sectors. Earnst and Sarabia (2015) calculated employment multipliers, and used them to assess the employment impacts of the stimulus package launched by the government for 2013/14. However, their paper treated manufacturing as an aggregate sector, with some breakdown of the services subsectors. The current paper identifies output and employment multiplier effects at the subsector level of manufacturing in Egypt, and provides more detailed breakdown of the services subsectors compared to previous research on Egypt. In addition, the current paper provides an illustrative exercise to account for the possible overestimation of the multiplier effect due to imports, through presenting import-adjusted multipliers. Informing policy makers of the employment multiplier effects of each subsector of manufacturing and services guides economic development policies towards the sectors that have higher employment multiplier effects, and helps policy makers to assess the employment impacts of alternate stimulus packages.

DATA AND METHODOLOGY

Output and employment multipliers are useful for estimation of the effects of exogenous changes in demand for the output of a given sector on the other sectors of the economy. The multiplier effects include indirect effects in the form of demand for intermediate inputs from other sectors in the economy, and induced effects through changes in consumption demand resulting from higher household income and employment (Miller and Blair, 2009). For example, employment opportunities resulting from an injection of capital from a donor organization to a food processing firm includes (1) direct employment within the food processing firm, such as quality control manager (2) indirect labor in the upstream sectors such as jobs in the agricultural sector to provide raw materials, and transport services jobs outsourced from a transportation company, and (3) induced employment which includes jobs created due to higher demand triggered by the spending of the food processing direct and indirect employees, like an additional waiter job resulting from higher demand for restaurant services (Troiano et. al, 2017).

The main advantage of Input-output based multipliers is providing simple and transparent measurements of the interlinkages in the economy that can be easily understood by policy makers. However, they have some limitations and the results have to be interpreted with caution. First, it is a static model which assumes fixed proportional relationship between inputs and outputs and does

not account for structural changes; an assumption which cannot be valid in the long term. Second, the model does not distinguish between domestic and imported inputs, and does not consider the possible substitution effect of imports. Third, the model assumes constant relative prices, and does not account for the possible changes in relative prices due to changes in demand (Earnst and Sarabia, 2014). Fourth, the model does not reflect the possible differences between firms in terms of size and productivity (Kapstein et. al., 2012a).

The base of the Input-Output model is the fixed technical coefficients matrix developed by Wassily Leontief in 1936, which shows for each sector in the economy, the proportional value of inputs purchased from all sectors (including itself) per monetary unit of output. The columns of the technical coefficients matrix show the production functions of each productive sector within this economy (Cassar, 2015).

In matrix terms the model is as follows (based on Earnst and Sarbia, 2014):

$$Y = X + AY \quad (1)$$

$$(I - A)Y = X \quad (2)$$

$$\Delta Y = (I - A)^{-1}\Delta X \quad (3)$$

$$\Delta Emp = >(E/O)\Delta Y \quad (4)$$

where Y = gross output vector, X = final demand vector, A = technical coefficient matrix, where aij ≥ 0 for all i and j and aij = xij/x where xij is the j^{th} intersectoral requirement of the ith commodity and Xj is the j^{th} sectoral output, I = identity matrix, $(I-A)^{-1}$ = Leontief inverse matrix Emp = employment multiplier effects matrix= diagonal matrix of sectoral employment output ratios with ej = eij if i = j, eij = ej =employment output ratio, where j = 1…n.

The multiplier or Leontief inverse matrix $(I – A)^{-1}$measures how the demand for the i^{th} industry changes as a result of a change in exogenous demand of the j^{th} industry. The sum of each column of the matrix represents the total output multiplier effects of sector j and is defined as Type I multiplier. Indirect effects of an exogenous demand of a given sector j are obtained by subtracting the direct coefficient ajj from the total output multiplier. Type II multiplier includes type I multiplier and the induced effects in the economy caused by higher household income and expenditure as a result of the initial change in exogenous demand . In type II multipliers, household consumption is made endogenous to the model and is represented by a new column in the coefficients matrix and the corresponding expenditure of households, proxied by labor wages, is represented in a new row. The resulting matrix is known as the augmented matrix A*. The inverse of (I-A*) is calculated, and the type II multiplier is obtained following the same procedures of type I.

The employment multipliers are calculated through multiplying a diagonal matrix of employment output ratio by (I-A) or (1-A*) depending on the type of multiplier. The employment output ratio is the inverse of the labor productivity of each sector. The resulting employment multiplier is interpreted as the number of jobs created for each additional USD 1 million of final demand of sector j. The jobs created are classified into direct employment in sector j, indirect employment in the upstream sectors supplying intermediate inputs to sector j, and induced employment created to fulfill additional demand resulting from higher expenditure enabled by employee income generated through direct and indirect employment (Cassar, 2015).

An important consideration in multiplier analysis is leakages from the economy through imports. High imports of intermediates and consumer products dilute the indirect and induced multiplier effects. An illustrative exercise to demonstrate how imports can impact multipliers is provided. The approximation is based on only including the intermediate inputs sourced domestically in the technical requirements matrix. Given that the input-output tables do not show each sector's intermediate imports, the share of imports in total demand for each sector is used as a proxy for imported intermediate inputs. See Tregannia (2007) for more detail.

Data for input-output tables is obtained from CAPMAS(2016) which provides input-output tables at a disaggregated subsector level. The most recent available data with sub-sectoral breakdown and matching labor data was for 2012/13. Some subsectors are aggregated in this paper to match the

available labor data (for example, agriculture was aggregated into one sector). Employment data at the subsector level of manufacturing and mining is available from the economic census of 2012/13 (CAPMAS 2015). Agriculture and services data are obtained from the consolidated bulletin of labor survey of 2013 (CAPMAS 2014).

RESULTS AND DISCUSSION

Before discussion of the multiplier effects of the different subsectors of the economy, we present an overview of the contribution of each subsector to Egypt's value added and employment. Then, we identify where Egypt stands in terms of labor productivity gap in comparison with Turkey and Tunisia, and compare labor productivity of the different subsectors.

OVERVIEW OF SECTORAL EMPLOYMENT/VALUE ADDED SHARES AND LABOR PRODUCTIVITY

The contribution of each subsector of manufacturing and services in Egypt's value added and employment is compared in figures 1, and 2. The subsectors above the 45o line have a higher contribution to Egypt's employment compared to its contribution to value added. While the results are mixed for the different subsectors of manufacturing and services, in most cases the contribution of each subsector of services in Egypt's employment is higher than its contribution to value added. This result is more evident for construction, education, retail and wholesale trade, and public administration. For example, the contribution of construction to GDP is 6% while its contribution to Egypt's employment is 12%. Real estate, finance and insurance, and electricity, gas and water supply are exceptions. In most of the subsectors of manufacturing, the subsector contribution to value added is equal to or higher than its contribution to employment. The only exceptions are apparel, textiles, fabricated metals (excluding machinery), and furniture, for example apparel's contribution to value added is 0.5%, but its contribution to employment is 1%. On the other hand, agriculture contributes to 28% of total employment in Egypt, but its share in value added is limited to 11.5%. This reflects the low labor productivity of agriculture relative to the other sectors in Egypt. There is evidence from the literature that a large labor productivity gap exists between the different sectors of the economy, especially in developing countries. Labor productivity is defined in this study as value added per worker. Agriculture is characterized by low labor productivity as it represents 40% of Egypt's average labor productivity. On the other hand, labor productivity of manufacturing is 40% higher than the country average, but this indicator could be inflated due to the petroleum refineries labor productivity. The services sector labor productivity is close to that of the country average. Turkey's productivity gap behavior is similar to that of Egypt, while in Tunisia agriculture labor productivity represents two-third the country's average labor productivity (El- Haddad, 2015). However, the behavior of the different subsectors varies (Figures 3 and 4). Petroleum extraction, which employs less than 0.1% of the workers, has the highest labor productivity estimated at USD 1 million / worker. Meanwhile, the economic activities that employ the largest share of Egypt's workers have the lowest labor productivity. Agriculture, construction, wholesale and retail trade, education and public administration employ 28%, 14%, 11%, 9%, and 8% of the total Egyptian workers respectively. However, the labor productivity in those sectors ranged between USD 3000 to USD 5000 of value added per worker annually, which represents 40% to 65% of average productivity per worker in Egypt in 2012/13.

Figure 1 Subsector share in value Added & employment in Egypt in 2012/13, manufacturing
Source: Author Calculation, based on data from CAPMAS (2014, 2015,2016)

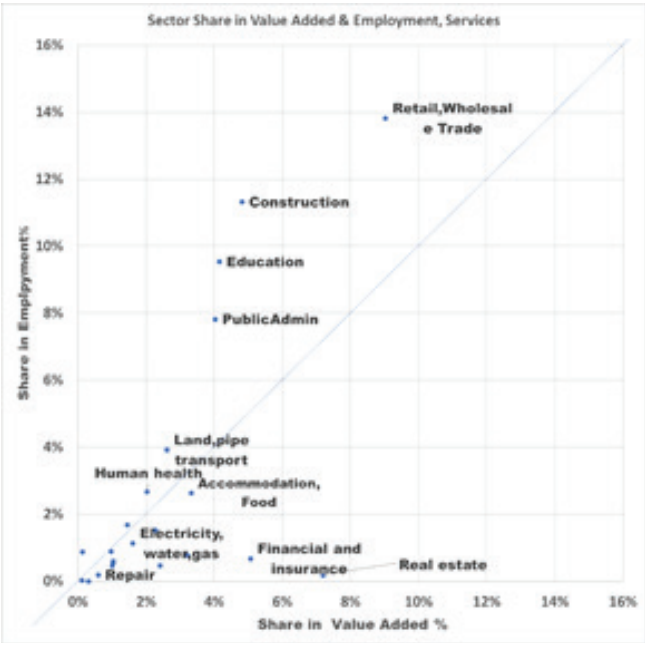


Figure 2 Subsector share in value Added & employment in Egypt in 2012/13, services

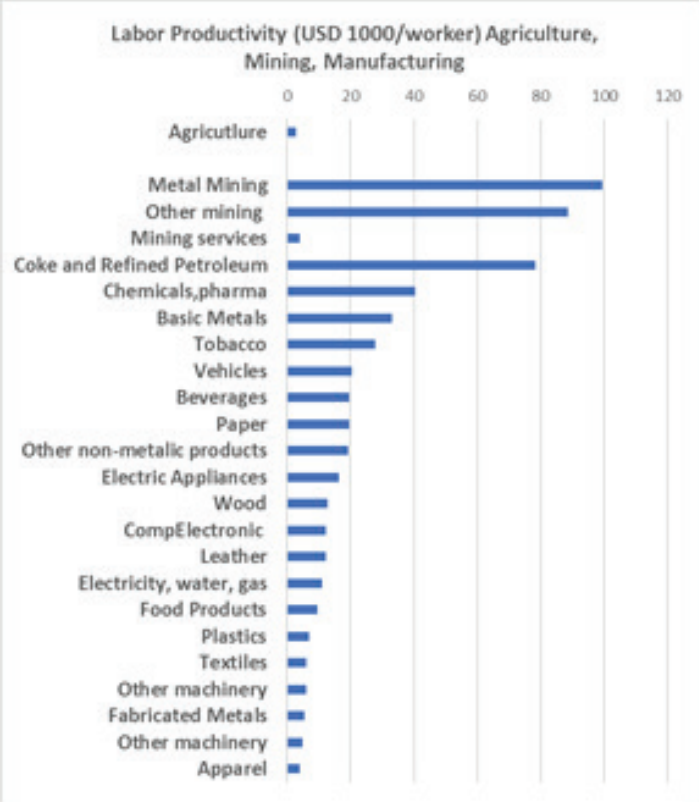


Figure 3 Labor productivity in agriculture, mining, and manufacturing
Source: Author Calculation, based on data from CAPMAS (2014, 2015,2016)

Figure 4 Labor productivity in services

MULTIPLIER EFFECTS

The output multipliers of each subsector are compared in figure 5. The indirect effect is higher in the manufacturing sectors than the services sectors. This is explained by the fact that manufacturing relies on intermediate inputs more than services do. i.e. the value added of manufacturing is lower than services. For example, the value added of education represents 95% of the total production value, and intermediate inputs represent 5%, while the value added of apparel represents 41% of the total production value, and intermediate inputs represent 59%. Therefore, the indirect multiplier effect of education is lower than that of apparel (0.2 versus 1). An indirect multiplier effect which is equal to 1 means that an increase in final demand of apparel by USD 1, results in an increase in demand for intermediate inputs from other sectors in the economy by USD 1. A similar increase of $1 in demand for education but with an indirect multiplier of 0.2, results in an increase in demand for intermediate inputs by only $0.2.

However, the induced multiplier effect is notably higher in services compared to manufacturing . Labor wages represent a high share of production value of each subsector of services. Therefore, high demand for the output of services increases the demand for labor, which increases consumption spending, thus, inducing higher consumption demand for other sectors in the economy. For example, induced multiplier effect of education is 2.7, and labor wages represent 67% of the production value of education. In contrast, the induced multiplier effect of apparel is 1.3 where labor wages represent 19% of total production value. Total labor wages in each subsector is a function of employment to output ratio (the inverse of labor productivity) and average labor wage. For example employment to output ratio for education and apparel is 33.4 and 15.4 respectively, and the average annual labor wages are USD 2926 and USD 1846 respectively.

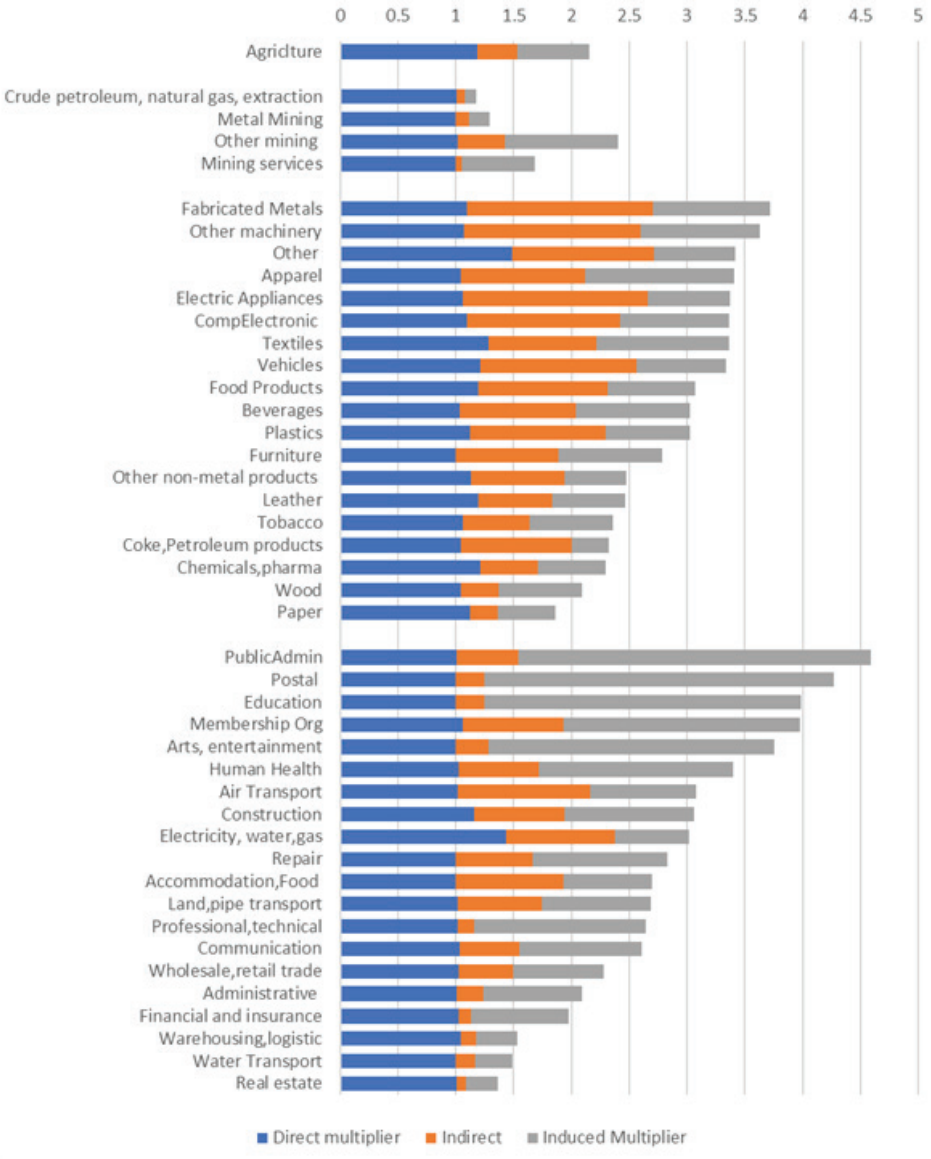
The employment multipliers are demonstrated in figure 6. In most of the manufacturing subsectors, the indirect employment effect represents the largest share of the multiplier. Direct and induced employment effects have a smaller share in the multiplier compared to services. For example, the food products and beverages sectors have indirect employment effects of 162.5 and 110.5 respectively, while the direct employment effects are 32.5 and 19 respectively, and the induced employment effects are 21.5 and 26 respectively. The two subsectors mainly rely on agriculture for intermediate inputs, and agriculture has a high employment to output ratio. Therefore, for each USD 1 million increase in the final demand for food products, 32.5 jobs are created in food products and 162.5 jobs are created in agriculture and other sectors (150 of the 162.5 jobs are in the agriculture sector). In contrast, in most of the services, the direct multiplier effect is highest followed by the induced effect, and the indirect multiplier effect is small. For example, for each USD1 million increase in demand for education, 228 jobs are created in education, 84 jobs are created in the upstream sectors, and 78 jobs are created due to induced demand (as a result in an increase in consumption demand by the education sector employees). The higher the average labor wage in the sector, the higher the induced employment effect.

Table (A.1) in the appendix ranks all the sectors in terms of Type II multiplier. Then, the sectors are ranked in terms of the direct employment, and indirect employment effects. The top twenty ranking subsectors in terms of type II multiplier include 13 services subsectors, and 7 manufacturing subsectors. The agriculture sector also ranks high. However, except for food and accommodation services, the services subsectors high ranking is due to direct employment and induced effects. There are weak backward interlinkages with the other sectors in the economy, and most of the services subsectors ranking in indirect employment is at least 9 ranks lower than their overall type II multiplier rank. Although food products, fabricated metals, and beverages rank low in terms of direct employment, they obtain their high rank in type II multiplier due to their strong backward interlinkages with other subsectors. In textiles, apparel, and furniture, direct employment effect was highest, with similar contribution of indirect, and induced effects.

The above raises an important policy implication question. Many developing countries, including

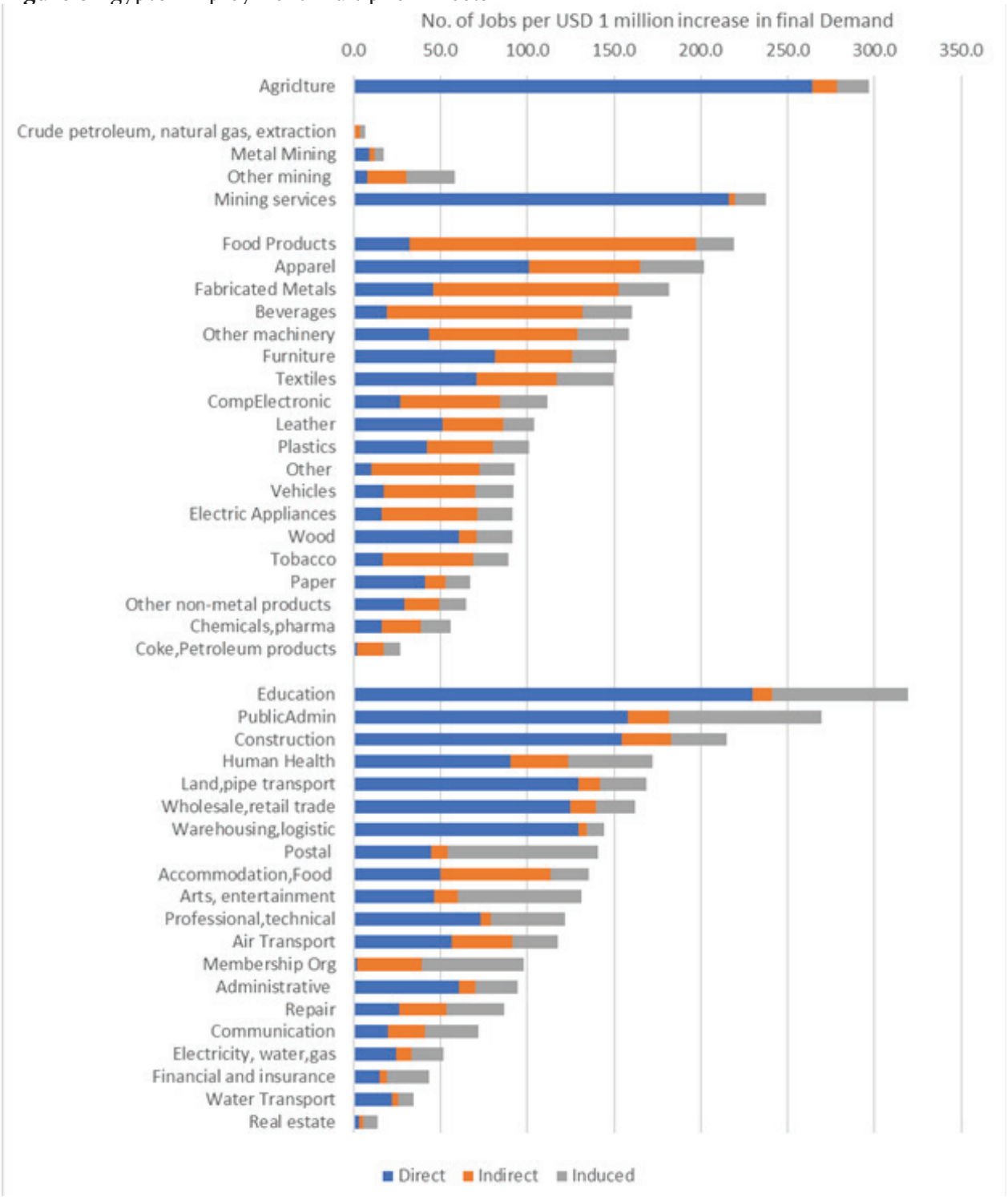
Egypt, consider higher value added sectors as drivers for economic growth, however, such sectors have low indirect multiplier effect due to weak backward interlinkages with other sectors in the economy. At the same time if labor wages represent a large share of the high value added sectors, such sectors can induce growth in the economy through higher consumption spending. An important consideration in this regard is leakages from the economy through imports. High imports of intermediates and consumer products dilute the indirect and induced multiplier effects. Figure 7 provides an illustrative exercise to demonstrate the impact of imports on multipliers. The approximation is based on only including the intermediate inputs sourced domestically in the technical requirements matrix. However, given that the input-output tables do not show each sector's intermediate imports, the share of imports in total demand for each subsector is used as a proxy for imported intermediate inputs. The table shows that the employment multiplier is reduced by more than 30% in the subsectors which use intermediate inputs from high import upstream sectors, like fabricated metals, vehicles, electric appliances, computer and electronics and other machinery. The import-adjusted employment multipliers of food products, textiles, apparel, and are 20%-25% lower than the original multipliers. The employment multipliers of most of the services subsectors witnessed little changes (less than 20%) when import adjustments were applied. Mainly food and accommodation services and communication are the services subsectors whose import multipliers were 20-25% lower than the original multipliers.

Figure 5 Egypt's Output Multiplier Effects



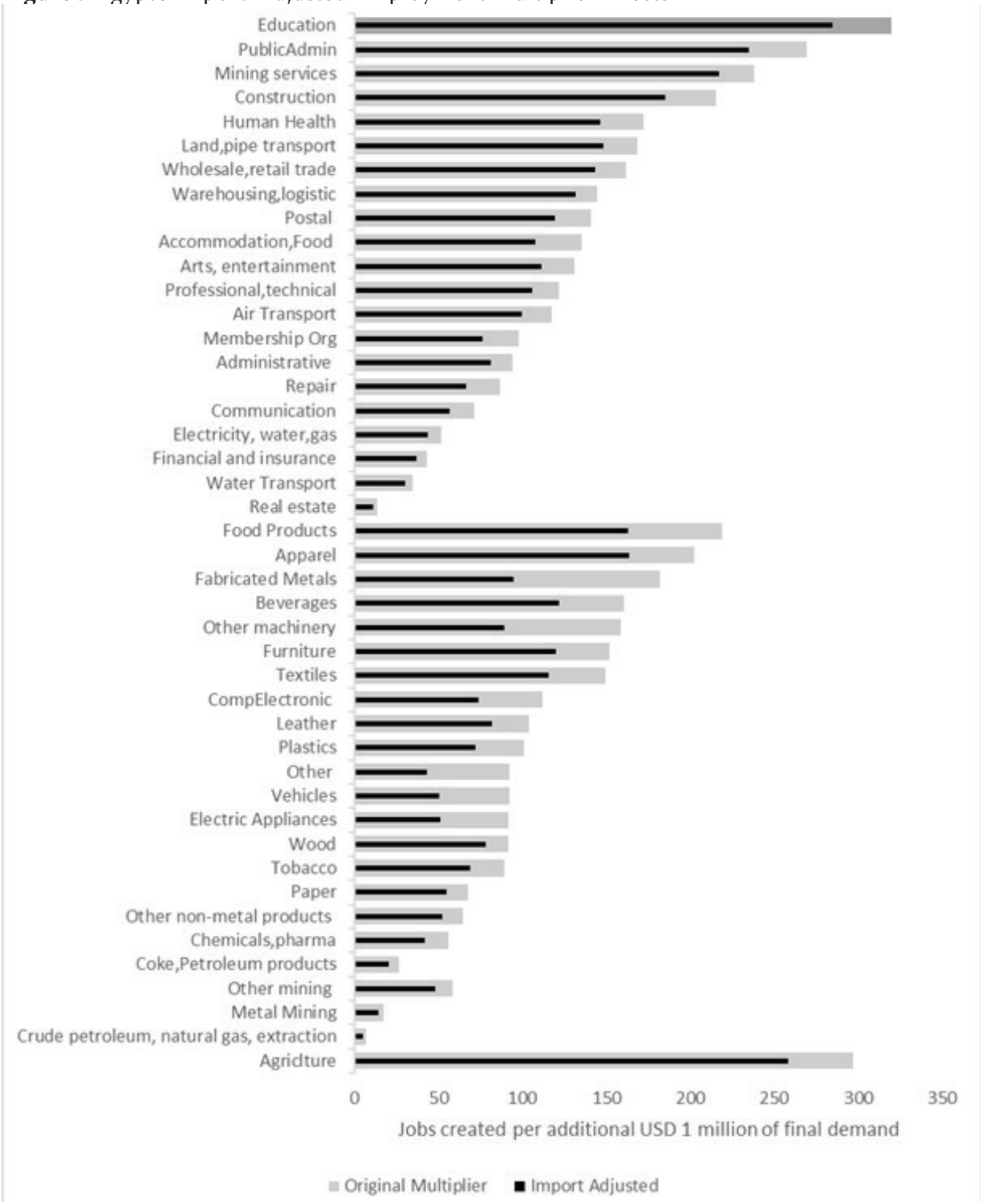
Source: Author Calculation, based on data from CAPMAS (2014, 2015,2016)

Figure 6 Egypt's Employment Multiplier Effects



Author Calculation, based on data from CAPMAS (2014, 2015 ,2016)

Figure 7 Egypt's Import-Adjusted Employment Multiplier Effects



Author Calculation, based on data from CAPMAS (2014, 2015, ,2016)

CONCLUSIONS AND POLICY IMPLICATIONS

The input-output based multipliers provide simple and transparent measurements of the interlinkages in the economy that can be easily understood by policy makers. However, the results should be interpreted with caution.

The top 20 ranking subsectors in terms of employment multiplier effects include 13 services and 7 manufacturing subsectors. Except for food and accommodation services, most of the services subsectors gain their high rank from direct and induced employment, with little contribution

of backward interlinkages. The picture is mixed for manufacturing. For example, most of the employment effect of food products and beverages is attributed to the interlinkage with the agriculture sector, but the direct and induced employment effects are small, given the relatively low labor intensity of food processing, and high labor intensity (so high indirect employment) and low wages of agriculture (so low induced employment). In textiles, apparel, and furniture, direct employment effect was highest, with similar contribution of indirect, and induced effects. Compared to services, the manufacturing subsectors show higher indirect employment multiplier effects (backward linkages), due to their high demand of intermediate inputs from the feeding industries. This finding agrees with the multiplier analysis performed in other countries, like the European Union countries (Stehrer and Ward 2012), and South Africa (Tregannia, 2007)

Egypt's industrial and trade development strategy identified some manufacturing subsectors as priority industries, for which specific development packages would be developed (Ministry of Trade and Industry, 2016). The strategy selected those subsectors based on their export readiness, and value added. The findings of this paper provide guidance to the policy makers about the employment potential of those subsectors. The subsectors with high employment multiplier effects, where more than 180 jobs are created per each additional USD 1 million of final demand are: textiles, apparel, agriculture and food products (including beverages), and fabricated metals. Engineering industries (electric appliances, vehicles, machinery, computer and electronics) generate a range of 91 to 158 jobs for each USD 1 million increase in final demand. Chemicals (includes basic chemicals and pharmaceuticals, plastics, paper) and mining generate relatively low employment opportunities (a range of 55 to 101 jobs for each USD 1 million increase in final demand for chemicals, and 17 to 53 jobs for mining); however, they are important as inputs for other industries.

Policy implications drawn from this paper should be considered in light of the low labor productivity in the subsectors with highest share in total employment in Egypt. For example, agriculture employs 28% of Egypt's workers, but its contribution to GDP is limited to 11.5%. The labor productivity of the agricultural sector is low compared to other countries. Therefore, any program or initiative directed towards this sector should set improving labor productivity as a priority. Kheir-El-Din and Al-Laithy (2008) found that improving labor productivity in agriculture reduces poverty among Egypt's agricultural labor. Improving productivity in the agricultural sector requires investments in research and development, human capital, infrastructure, and capital (El Mahdi, 2014). Considering the findings about interlinkages in the economy, higher demand for food processing and textile sectors (through demand for cotton) causes an increase in demand for agriculture, which drive investments that could boost productivity in that sector. Failure to recognize the interlinkage between agriculture and food processing in employment could result in ignoring the food processing sector in stimulus packages targeting employment on the grounds of its relatively low labor intensity.

Finally, an important policy implication from this paper is the effect of imports on domestic multiplier effects. The paper presents an illustrative exercise which excludes imported intermediate inputs in order to account for the possible overestimation of the multiplier effect due to imports. Most of the services subsectors exhibited little changes in employment effect, when import-adjusted multipliers were used, given the low intermediate input requirements of most services, and the non-tradability nature of the sector. However, the employment multiplier is reduced by more than 30% in the sectors with a high share of imported intermediate inputs, like fabricated metals, vehicles, electric appliances, computer and electronics and other machinery. Those findings guides policy makers towards subsectors that could be candidates for new investments to ensure more integration along domestic value chains, and at the same time enhance employment.

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APPENDIX

Table A.1 Employment Multipliers and the Ranking of each Subsector (Number of jobs created for each addition USD 1 million increase in final Demand)

Subsector	Employment Multiplier				Employmennt Multiplier Rank			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Manufacturing								
Food Products	32.5	164.9	21.6	219.0	25	1	5.0	5
Apparel	101.2	63.8	37.0	202.0	9	5	7.0	7
Fabricated Metals	45.7	107.0	29.2	181.8	20	3	8.0	8
Beverages	19.1	112.8	28.4	160.3	32	2	12.0	12
Other machinery	43.7	85.3	29.5	158.5	22	4	13.0	13
Furniture	81.4	44.4	25.8	151.7	11	13	14.0	14
Textiles	70.8	46.0	32.8	149.6	13	12	15.0	15
CompElectronic	27.0	57.6	27.1	111.8	27	8	22.0	22
Leather	51.1	34.9	18.3	104.3	17	16	23.0	23
Plastics	42.1	38.0	20.9	101.0	23	14	24.0	24
Other	10.3	62.1	20.2	92.5	38	7	27.0	27
Vehicles	17.7	52.5	22.2	92.3	33	10	28.0	28
Electric Appliances	16.1	55.2	20.6	91.8	36	9	29.0	29
Wood	60.5	10.5	20.7	91.7	15	33	30.0	30
Tobacco	17.1	51.8	20.5	89.4	34	11	31.0	31
Paper	40.9	12.2	14.4	67.5	24	30	34.0	34
Other non-metal products	29.4	20.0	15.3	64.7	26	25	35.0	35
Chemicals,pharma	16.4	22.5	17.0	55.9	35	22	37.0	37
Coke,Petroleum products	1.7	15.9	9.1	26.7	43	26	41.0	41
Services								
Education	229.6	11.5	78.4	319.5	2	32	1.0	1
PublicAdmin	157.7	24.2	87.3	269.3	4	21	3.0	3
Mining services	216.2	3.4	18.1	237.7	3	41	4.0	4
Construction	154.5	28.2	32.3	215.0	5	19	6.0	6
Human Health	90.1	33.7	48.4	172.2	10	18	9.0	9
Land,pipe transport	129.6	12.1	26.9	168.7	6	31	10.0	10
Wholesale,retail trade	124.9	14.4	22.6	161.9	8	27	11.0	11
Warehousing,logistic	129.3	4.9	10.3	144.4	7	38	16.0	16
Postal	44.7	9.5	86.7	141.0	21	34	17.0	17
Accommodation,Food	50.0	63.3	21.9	135.2	18	6	18.0	18
Arts, entertainment	46.4	13.9	71.0	131.3	19	29	19.0	19
Professional,technical	73.4	5.8	42.6	121.8	12	37	20.0	20
Air Transport	56.4	34.9	26.2	117.5	16	17	21.0	21
Membership Org	1.8	37.5	58.7	98.0	42	15	25.0	25
Administrative	60.7	9.3	24.3	94.2	14	35	26.0	26
Repair	26.4	27.1	33.5	86.9	28	20	32.0	32
Communication	19.6	21.8	30.3	71.7	31	24	33.0	33
Electricity, water,gas	24.6	8.6	18.3	51.6	29	36	38.0	38
Financial and insurance	15.0	4.2	24.2	43.5	37	39	39.0	39
Water Transport	22.0	3.7	9.1	34.8	30	40	40.0	40
Real estate	3.0	2.5	8.1	13.6	41	44	43.0	43
Agriclture and Mining								
Agriclture	264.4	14.2	18.0	296.6	1	28	2.0	2
Other mining	8.2	22.2	28.1	58.5	40	23	36.0	36
Metal Mining	8.9	3.3	5.1	17.3	39	42	42.0	42
Crude petroleum, natural gas, extraction	0.8	3.2	2.8	6.9	44	43	44.0	44

TTable A.2 List of Abbreviations of Subsector names

Abbreviation	Subsector
Food Products	Manufacture of food products
Apparel	Manufacture of wearing apparel
Fabricated Metals	Manufacture of fabricated metal products, except machinery and equipment
Beverages	Manufacture of beverages
Other machinery	Manufacture of machinery and equipment n.e.c.
Furniture	Manufacture of furniture
Textiles	Manufacture of textiles
CompElectronic	Manufacture of computer, electronic and optical products
Leather	Manufacture of leather and related products
Plastics	Manufacture of rubber and plastics products
Vehicles	Manufacture of electrical equipment and Manufacture of other transport equipment
Electric Appliances	Manufacture of electrical equipment
Wood	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
Tobacco	Manufacture of tobacco products
Paper	Manufacture of paper and paper products and Printing and reproduction of recorded media
Other non-metal products	Other Non-metal products
Chemicals,pharma	Manufacture of chemicals and chemical products and Manufacture of basic pharmaceutical products and pharmaceutical preparations
Coke,Petroleum products	Coke and refined petroleum Products
Other	Other manufacturing
Education	Education
PublicAdmin	Public administration, defence
Mining services	Minin Services
Construction	Consturction
Human Health	Human health and social work activities
Land,pipe transport	Land transport and transport via pipelines
Wholesale,retail trade	Wholesale and retail trade; repair of motor vehicles and motorcycles
Warehousing,logistic	Warehousing and support activities for transportation
Postal	Postal and courier activities
Accommodation,Food	Accommodation and food service activities
Arts, entertainment	Arts, entertainment and recreation
Professional,technical	Professional, scientific and technical activities
Air Transport	Air transport
Membership Org	Activities of membership organizations
Administrative	Administrative and support service activities
Repair	Repair Services
Communication	Information and communication
Electricity, water,gas	Electricity, water,gas supply
Financial and insurance	Financial and insurance activities
Water Transport	Water transport
Real estate	Real estate activities
Agriclture	Crop and animal prorudction
Other mining	Other mining and quarrying
Metal Mining	Mining of metal ores
Crude petroleum, natural gas, extraction	Crude petroleum, natural gas, extraction