

# **The Apparel Industry: Jordan's Comparative Advantage in International Trade**

**George Domat, Benjamin Glass, Drusilla Brown**  
**Tufts University**  
**Better Work Monitoring and Evaluation**

**12 December 2012**

## **I. Introduction**

Emergence of the apparel industry is a common step toward industrialization and/or economic development. Currently, we observe apparel production throughout Latin American, South Asia and Southeast Asia. However, apparel production in the Middle East has been a less pronounced feature of economic development.

Although, the stock of human capital and persistent unemployment in most countries along the southern rim of the Mediterranean would lead us to expect an apparel industry to emerge, apparel production for export is limited to Morocco, Israel, Egypt, Tunisia and Jordan. The southern Mediterranean rim countries that do not have an export-oriented apparel industry (Libya, Algeria and Syria) all have significant petroleum reserves and lack trade agreements with the United States or Europe that provide trade preferences for apparel.

The position of apparel industry in Jordan appears particularly tenuous. (1) An apparel export industry did not emerge until after the Qualified Industrial Zone Agreement (1996) with the United States. As a consequence, a commonly voiced concern is that the apparel industry in Jordan is an inefficient byproduct of preferential trade agreements between Jordan and the United States. (2) While Jordan has an apparel export industry, the fraction of production

workers who are migrants has steadily risen over the decade and now is approaching 80 percent of the apparel labor force. Thus, it is not clear that Jordan has the factor endowments that provide a comparative advantage in apparel. Jordan may be above the level of economic development at which an apparel industry normally emerges. That is, a skill mismatch may exist between Jordan's current human capital endowment and the requirements of the apparel industry.

The possible marginal economic viability of the Jordanian export apparel industry has been offered as a reason to resist improvements in working conditions. For example, compliance with minimum wage law or the harmonization of the minimum wage law across all sectors of the Jordanian economy are challenged as not being economically feasible if Jordan lacks a comparative advantage in apparel production.

A more complex set of concerns arises from the reliance on migrant labor. As a consequence of work permit and visa restrictions, migrants lack the ability to discipline the labor market by seeking out employers with the most attractive configuration of wages and working conditions. The intra-firm immobility of migrant labor and limitations on union membership render migrants vulnerable to violations such as forced labor, excessive overtime, nonpayment of wages, harsh conditions of work, etc. However, if Jordan has a comparative advantage in apparel production, the industry can remain viable even if firms are fundamentally in compliance with core labor standards and Jordanian labor law.

In spite of the concerns for the viability of the Jordanian apparel industry, apparel dominates Jordan's export profile. Jordan's share (percent) of U.S. imports and the world are reported in Table 1 for 2007. Jordan's share of the U.S. import market is less than one-one hundredth of one

percent in every industry except apparel (1.12%), nonferrous metal products (0.1694%), motor vehicles bodies trailers (0.0309%) and paper products publishing (0.0109%). Jordan's share by sector is depicted in Figure 1, in which the outsized role of apparel in Jordan-U.S. trade is clearly evident.

Before addressing question concerning the impact of labor market characteristics and trade policy on the viability of Jordan's apparel industry, we need to pose a very basic question: Given Jordan's endowment of factors of production (capital, land, skilled labor, unskilled labor and natural resources) would we expect Jordan to be a significant apparel exporter in the absence of preferential access to the U.S. market and the employment of migrant labor?

In the analysis below, data on U.S. and world trade are used to construct an empirical model of the determinants of a country's *export share profile*. That is, which industry in a country should have the largest share of the world export market and which industry the lowest? Currently, the apparel sector is ranked number one among all sectors of the Jordanian economy in terms of share of the world export market. Is this ranking consistent with Jordan's factor endowments or would we expect other sectors of the Jordanian economy to claim a higher share of world exports than the Jordanian apparel producers?

The first stage of the empirical analysis excludes Jordan. The empirical model determines the world export share profile for each industry within a country. We then employ Jordanian data to predict Jordan's exports by sector. However, in making the prediction, we abstract away from the unemployment rate, employment of migrant labor, Jordanian labor market institutions and the Jordan-U.S. Free Trade Agreement (JUSTFA). The abstraction allows us to assess the

viability and expected size of the Jordan apparel market in the absence of the JUSFTA and the employment of migrant labor.

Anticipating our conclusions, we find that

1. The apparel industry's current status as the number 1 industry among all of Jordan's export industries' in its share of world exports is not predicted by the statistical model in the absence of migrant labor.
2. The dominant role of the apparel industry in Jordan's export profile can be rationalized by having a considerably larger supply of female workers than the supply of women currently active in the Jordanian work force.
3. The additional supply of female workers which rationalizes the size of Jordan's apparel exports is currently provided by migrant labor.
4. However, additional supply of female labor could also be provided by raising the very low rate of labor force participation by Jordanian females with a secondary level of education or less. The reservation wage reported by Jordanian females in the apparel sector is 200 JD per month for a 48 hour work week. The estimated average monthly cost of a migrant from Sri Lanka working a comparable 48 hour week is 259 JD and worker from Bangladesh costs about 251 JD per month when travel, living and permitting expenses are taken into account.
5. Whether taken from the perspective of the labor force participation rate, unemployment rate or unit labor cost, Jordan appears to have a latent comparative advantage in apparel even in the absence of migrant labor or the JUSFTA.

In Section II below we present the analytical framework and Section III provides a description of the data employed in the analysis. We then turn to the regression analysis and empirical findings in Section IV. Discussion and directions for future research follow in Section V.

## **II. Analytical Framework**

According to standard international trade theory, each country tends to export goods that require its abundant factor intensively in production. So, for example, the United States is generally considered to be a skilled-labor abundant country. It stands to reason, then, that the United States will exports goods and services that require intensive use of skilled labor. By contrast, the United States will import goods that require intensive use of unskilled labor.

We expect, then, that industries with a world market share rank in a country's export profile will require a disproportionately large amount of the country's abundant factor of production. Industries that rank low require a proportionately small amount of the country's abundant factor. Returning to the example of the United States, U.S. industries requiring a large input of skilled labor will claim a larger share of world exports than U.S. industries that require little skilled labor.

In the analysis that follows, for each country, we will calculate the share of world exports for each product category. Exports shares for an individual exporting country are then ranked from lowest to highest. The calculation of export share by industry is repeated for all countries in the data set.

We then use regression analysis to develop a mathematical relationship between the ranking for each industry, the factors of production used intensively in the industry and the country's endowment of each factor of production. The mathematical model and information about

Jordan's factor endowments are then used to predict the rank of each industry in Jordan's export profile. The predicted rankings are compared to the actual rank. We will be particularly interested in determining whether we would expect the apparel industry to be Jordan's number one export industry.

A straightforward procedure to undertake this analysis is through a cross-country, cross-time regression of country characteristics on apparel production. By comparing Jordan to other countries with similar characteristics, we can develop some evidence on whether we expect the apparel industry to be viable in Jordan in the absence of migrant labor and the JUSFTA.

The formal model is developed below for the interested reader. Others may proceed to Section III.

Leamer<sup>1</sup> provides a foundation for the *Testing Trade Theories* literature upon which the analysis below is based. The essential approach is to use an econometric model to explain the volume of trade between two countries in a particular product as being determined by relative GNP, relative populations, applicable tariffs, resource endowments relative to population and distance between the two countries. However, Romalis<sup>2</sup> develops a unified analytical framework that provides more analytical rigor while relaxing some restrictive assumptions concerning the organization of goods markets imposed by Leamer. Romalis develops a multi-countries Heckscher-Ohlin model which incorporates Krugman's model of monopolistic competition and allows for transport costs.

Following Romalis, we begin taking the trade share in sector  $j$  of country  $c$  as a function of the factor cost shares as in equation (1).  $x_{cj}$  is defined as the share that country  $c$  commands of

---

<sup>1</sup> Leamer, Edward E, 1974. "[The Commodity Composition of International Trade in Manufactures: An Empirical Analysis](#)," [Oxford Economic Papers](#), Oxford University Press, vol. 26(3), pages 350-74, November.

<sup>2</sup> John Romalis, 2004. "[Factor Proportions and the Structure of Commodity Trade](#)," [American Economic Review](#), American Economic Association, vol. 94(1), pages 67-97, March.

world exports in industry  $j$  and  $z_j, k_j$  and  $m_j$  are indicators of the intensity of the use of factors  $z, k$  and  $m$  in production. For the purposes of discussion,  $z$  can be interpreted as skilled labor,  $k$  as capital and  $m$  as natural resources.

$$x_{cj} = \alpha_c + \alpha_{1c}z_j + \alpha_{2c}k_j + \alpha_{3c}m_j + \varepsilon_{cj} \quad (1)$$

In order to control for country size,  $x_{cj}$  is scaled by dividing by the average value of  $x_{cj}$  for country  $c$ . The result,  $X_{cj}$ , is an indicator of the rank of industry  $j$  in country  $c$ 's world export share. Replacing  $x_{cj}$  with  $X_{cj}$  in equation (1) yields

$$X_{cj} = \alpha_c + \alpha_{1c}z_4 + \alpha_{2c}k_4 + \alpha_{3c}m_4 + \varepsilon_{cj} \quad (2)$$

If we assume that there are no factor intensity reversals, factor intensities can be calculated using data from one country only. For our purposes, we choose the United States due to its large and diverse economy.

Note that the coefficients relating factor intensities to trade shares in equation (2) vary by country. Following Heckscher-Ohlin, each country's exports not only depend on the factor intensity of a given industry but also the factor endowments of the country. So, for example, a country with a large endowment of capital should export a disproportionate volume of the capital intensive good. In terms of equation (2), such a country has a large value for  $\alpha_{2c}$ . By comparison, a country with a large endowment of skilled labor should export a disproportionate volume of the skilled-labor intensive good and, therefore, will have a large value for  $\alpha_{1c}$ .

The relationship between coefficients in equation (2) and factor endowments are summarized by equations (3)-(5)

$$\alpha_{1c} = \beta_1 + \beta_2 skill_c \quad (3)$$

$$\alpha_{2c} = \beta_3 + \beta_4 capital_c \quad (4)$$

$$\alpha_{3c} = \beta_5 + \beta_6 raw_c \quad (5)$$

where  $skill_c$ ,  $capital_c$ , and  $raw_c$  are measures for factor abundance as defined above.  $skill_c$  is the human capital to labor ratio,  $capital_c$  is the capital to labor ratio and  $raw_c$  is the natural resource endowment divided by the total labor force of each country.

Substituting equations (3)-(5) into equation (2) we obtain

$$X_{cj} = \alpha_c + (\beta_1 + \beta_2 skill_c)z_4 + (\beta_3 + \beta_4 capital_c)k_4 + (\beta_5 + \beta_6 raw_c)m_4 + \varepsilon_{cj} \quad (6)$$

The critical terms in equation (6) are the coefficients  $\beta_2, \beta_4, \beta_6$ . If the theory is correct, estimates of these coefficients will all be positive. Why? A positive  $\beta_2$  indicates that the trade share rank rises in skill-abundant countries when exporting the skill-intensive good. A positive  $\beta_4$  indicates that the trade share rank rises in capital-abundant countries when exporting the capital-intensive good. A positive  $\beta_6$  indicates that the trade share rank rises in resource-abundant countries when exporting the resource-intensive good.

### III. Data

As will be seen below, we apply the model to Jordan's share of U.S. imports and Jordan's share of world exports.



Base Data Set. The data on international transactions is extracted from the GTAP8 database.<sup>3</sup> GTAP8 provides a micro consistent dataset that includes 57 product categories<sup>4</sup> and 129 regions.<sup>5</sup>

International Trade. Bilateral trade by country and product category is reported for 2007 (millions USD). GTAP reports trade valued at world and domestic prices. For the purposes of this analysis, trade is valued at world prices. Tariff rates are calculated by dividing tariff revenue by trade valued at world prices.

Jordan is not currently in the GTAP database. Jordan exports by sector are reported by the Jordanian Department of Statistics (DOS) for 2006 (1000 JD). The product categorization employed by the DOS is somewhat different from that used by GTAP. A consistent data set is created by combining product categories for both datasets. A summary of Jordanian and World exports (valued in Million USD) in the aggregated product categories is reported in Table 3.

However, we are able to achieve greater consistency when constructing the trade data for the analysis of Jordan's share of U.S. imports. The U.S. government reports U.S. bilateral trade by 5-digit End-use code for the period 2001-2011 (USD). The 142 5-digit categories for 2007 are aggregated to form 26 product categories developed when reconciling the GTAP and Jordanian DOS trade data. Jordan's share of U.S. imports are reported by sector in Table 1.

The first step in data construction requires a calculation of the primary factor cost shares for the United States. GTAP8 reports primary factor cost shares per industry for skilled labor, unskilled labor, capital, land and natural resources (millions USD). For the purposes of this analysis,

---

<sup>3</sup> <https://www.gtap.agecon.purdue.edu/databases/v8/default.asp>

<sup>4</sup> [https://www.gtap.agecon.purdue.edu/databases/v8/v8\\_sectors.asp](https://www.gtap.agecon.purdue.edu/databases/v8/v8_sectors.asp)

<sup>5</sup> <https://www.gtap.agecon.purdue.edu/databases/v8/default.asp>

transactions in natural resources are decomposed into Coal, Oil, Natural Gas, Minerals and other Natural Resources. We assume that purchases from each of the natural resource processing industries are dominated by a particular natural resource. That is, the coal industry's purchases of natural resources are principally coal, the petroleum industry's purchases of natural resources are principally oil, the natural gas industry's natural resource purchases are principally natural gas and the mineral's processing industry is principally minerals. Further, it is assumed that each of these natural resources must first pass through the primary processing industry and, therefore, are not purchased by any other industry.

The purpose of decomposing natural resources is to isolate the role that oil is playing in determining a country's trade pattern. As discussed above, there is a negative correlation between exploited petroleum resources and the emergence of the apparel industry.

The next step is to combine the factor cost shares employed in U.S. industries with factor endowments for each country in the analysis. However, obtaining consistent measures of resource stocks across countries is challenging. As a consequence, in the case of land, labor and natural resources, total payments to these factors in 2007 (millions USD) are used to proxy for stocks. The strength of such an approach is that the valuation of the flow, rather than the nominal value of the stock, controls for the quality of the resource.

This approach implicitly assumes that the employment of the resource is proportional to the stock. Thus, when available, factor endowments are measured by stocks rather than flows, as in the case of the capital as reported by GTAP (millions USD).

However, it should be noted that in using payments to labor rather than the stock of skilled and unskilled workers, we are ignoring the presence of unemployed workers and potential workers who are not in the labor force.

The Jordanian DOS also reports a figure for the capital stock (millions JD)<sup>6</sup> and household labor income for 2006 (JD).<sup>7</sup> As noted in the preceding paragraph, relying on household labor income allows us to focus attention on the stock of currently employed Jordanians. Unemployed Jordanians and potential labor force participants are not considered in the first stage of the analysis.

Factor endowments are calculated per capita based on population as reported by GTAP (millions). The factor endowments for each country are then interacted with the factor cost shares (for the United States) for each industry. In order to produce estimated coefficients of comparable order of magnitude, the terms which include endowments are scaled by a factor of 1/1000.

Given the focus on the apparel industry in Jordan and the dominant role of women in the global apparel industry, the labor force participation of women is of significant interest. We take the level of female economic activity as a type of endowment. The World Economic Forum<sup>8</sup> reports indices of gender engagement overall and for economic participation and opportunity, educational attainment, health and survival and political empowerment. We interact female

---

<sup>6</sup> [http://www.dos.gov.jo/dos\\_home\\_e/main/sel2/nat\\_1/3.pdf](http://www.dos.gov.jo/dos_home_e/main/sel2/nat_1/3.pdf)

<sup>7</sup> Department of Statistics, Household Expenditure and Income Survey 2006, Table 3.4 Average Annual Current Income of Household by Source and Governorates (in JD).

<sup>8</sup> [http://www3.weforum.org/docs/WEF\\_GenderGap\\_Report\\_2006.pdf](http://www3.weforum.org/docs/WEF_GenderGap_Report_2006.pdf)

employment cost share by industry for the United States<sup>9</sup> with the Economic Participation and Opportunity Score to obtain a measure of the availability of female workers.

The dependent variable in the analysis in equation (1) is export share. In order to control for unobserved country heterogeneity in trade openness, trade share for each country is scaled by the country's average trade share. Thus, the dependent variable reflects trade share rank. Further, a separate intercept is estimated for each exporter to allow for transportation costs, imperfect competition and preferential trade agreements. Thus, the analysis predicts trade share by industry relative to a country's average over all industries as a function of factor intensity and factor abundance.

#### **IV. Regression Analysis**

Equation (6) is estimated in two forms. First, we consider the determinants of the share of world exports. Results are reported in column (1) of Table 2. We then turn to consider the role of factor intensity and factor endowments in determining the share of U.S. imports. Results are reported in column (2). Estimated coefficients of the country dummies are suppressed but are available upon request.<sup>10</sup>

We must first consider the validity of the underlying model. A test of validity is that the interaction between factor cost share and factor endowment should be a positive predictor of trade share. That is, export share should increase in industries with a high factor cost share for countries endowed with the factor in question.

---

<sup>9</sup> <http://www.bls.gov/cps/wlf-table14-2011.pdf>

<sup>10</sup> Estimated coefficients of the country dummies are suppressed but are available upon request.

Indeed, the estimated coefficients on the interaction terms are all positive and statistically significant. The only exception is Land, for which the estimated coefficient is negative but not statistically different from zero.

Turning to the central question of the analysis: How does Jordan's actual trade compare to the predictions of the empirical model? To answer this question, we simply calculate Jordan's predicted share of world exports and compare values to the actual trade share.

Recall, however, that the statistical model predicts the export share of each sector relative to the average for an individual country. In order to convert the predicted value relative to the average to a trade volume, we need to choose a base. There are two obvious choices. First, we can take Jordan's current export average share. Alternatively, we can use Jordan's share of world population as the base.

Predicted trade base on Jordan's current share of world exports is reported in column (4) of Table 3. Note first, that the empirical model broadly predicts exports by sectors. Industries predicted to have a high export share rank also appear to have above average exports. However, in the case of apparel, Jordan' exported a total 939.7 million USD in 2006 whereas the model predicts exports of 35-50 million USD.

Figure 2 depicts actual Jordanian exports, predicted exports based on Jordan's current export share and predicted exports projected from population share for Jordan's largest export sectors. It is clear that actual apparel exports (dark blue) are many times larger than the predicted trade (red and green.)

The obvious question is how could apparel be dominating Jordan's export profile if Jordan lacks the resource endowments which would predict apparel exports? The answer, of course, is that Jordanian apparel firms rely on migrant labor to supplement the domestic labor force.

In order to highlight the role of migrants, we adjust the Jordanian parameters to reflect an increase in the supply of female labor by a factor of three and then recalculate export share rank. Results are reported in Table 4 and are depicted in Figure 3. Exports from the female labor intensive sectors, apparel footwear and textiles, jump to 728.24-920.51 million, almost exactly equal to the actual levels for these three industries.<sup>11</sup>

## **V. Discussion and Directions for Future Research**

The findings reported in Section IV clearly point to migrant labor as the source of Jordan's comparative advantage in apparel and other female labor-intensive sectors. We should not jump to the conclusion, however, that the apparel industry in Jordan is somehow illegitimate. It is a well-documented finding in international trade theory that international factor flows are welfare-improving for the sending country, the factor of production that moves internationally and the receiving country.

The group that is harmed by international factor flows is the domestic supply of the migrating factor. In the case of apparel, unskilled Jordanians may be made worse off by the presence of migrants in the apparel industry. The question arises, then, whether Jordan possesses a latent comparative advantage in apparel production in the absence of migrant labor. If so, a policy which increases Jordanian employment in the apparel sector may increase income, narrow the

---

<sup>11</sup> Note also that augmenting the female labor force also rationalizes Jordan's exports from the agricultural sector.

distribution of income and lower the unemployment rate for Jordanian households in the bottom half of the distribution of income.

Recent Jordanian Government strategy has focused on providing incentives for job-creating investments. Indeed, between 2000 and 2005, the Jordanian economy grew at a rate of 6 percent per year. One surprise outcome during the expansion of the apparel industry in Jordan over the past decade is the failure of the unemployment rate to decline. Of new jobs created, 63 percent were filled by migrants. As a consequence, the Jordanian unemployment rate remained around 14 percent.

It is commonly argued that there are two fundamental causes of this outcome. First, tax incentives for investment appear to have targeted industries intensive in low-wage jobs, particularly apparel. That is, the jobs created may have been a poor match for the skills abundant in Jordan. Second, there are some labor market imperfections that promote queuing outside of higher paying jobs. For example, the Civil Service Bureau accepts applications even when no jobs are available. According to the World Bank,<sup>12</sup> 20 percent of unemployed Jordanians are registered with the Civil Service Commission.

The evidence of a mismatch between jobs and skills, however, is not entirely compelling. It is true that the highest unemployment rate exists among the adult population holding a bachelor's degree. However, only 10 percent of the workforce falls into this category. More than half of the unemployed in Jordan have a secondary level of education or less. Such workers are typically observed working in the apparel industry in other countries of the world. As can be

---

<sup>12</sup> World Bank 2008 *Hashemite Kingdom of Jordan, Resolving Jordan's Labor Market Paradox of Concurrent Economic Growth and High Unemployment*, Report No. 32901-JO, p. vi.

seen in the box , 61 percent of unemployed workers have a secondary level of education or less. More importantly from the perspective of the apparel industry, 47 percent have not completed a secondary level of education.

Furthermore, the unemployment statistics mask the potential supply of labor to the apparel industry in Jordan. The unemployment rate for women in Jordan (26%) is twice that of men (13%). However, women account for only 27 percent of the unemployed due to the very low female labor market participation rate (12%) for Jordan. Most unemployed women in

Unemployed Share by Educational Attainment (World Bank 2008)	
Bachelors and Above	27%
Intermediate Diploma	12%
Secondary	14%
Less than Secondary	46%
Illiterate	1%

Jordan have an intermediate diploma or bachelors degree, making them a poor match for production work in the apparel industry. However, women with a secondary degree or less generally do not participate in the formal labor market and, thus, are not considered when contemplating the role of the apparel industry in the unemployment picture. It should also be noted that about half of the labor cost share in the apparel industry is skilled labor. Jordanian women with some post-secondary education are also well-qualified for such positions.

Now, it is interesting to ponder why the labor force participation rate for Jordanian women is so low. Large family size, poor quality or unavailable child care, low wages and the traditional role of women are likely explanations. However, we can make two clear statements. (1) There is a large pool of Jordanian females who have the educational attainment normally observed in the apparel industry. (2) Of the women with a secondary level of education or less, the unemployment rate is nearly as high as more highly educated women.



Thus, the stylized argument that the jobs created by the apparel industry are a poor match for the demographic characteristics of the workers in the labor force is only partly (and not very interestingly) correct. If one adds women currently outside of the formal labor market, the potential domestic labor force available to apparel firms in Jordan is large enough to create a comparative advantage in apparel for Jordan.

If a mismatch in skills and apparel jobs exists, it is not due to the educational characteristics and competing employment opportunities of Jordanian females. The mismatch must lie elsewhere. Some obvious possibilities include

- location of the production facilities
- cultural restrictions on female employment
- formal workplace experience of Jordanian females and/or
- legal restrictions on terms of the employment of Jordanian females (relative to non-Jordanian females)
- the reputation of conditions of work in apparel factories.

The relationship between unemployment and migration is not just a simple mathematical one. The demographic and human capital effects of the apparel industry on a society occur only over time. The impact of the apparel industry will only emerge as the opportunity to earn money wages affects family size and workers become adapted to the rigors of factory life. The apparel industry has commonly been the work opportunity in which workers acquire formal labor market skills. The presence of a readily available pool of migrant labor will short circuit the normal mechanisms which induce factory managers and the pool of local labor to learn to work together to produce increasingly higher-value added products.

The findings above are developed based on hypothetical factor supplies. However, a more direct characterization of the availability of Jordanian labor can be found by comparing the per unit cost of migrant labor to the reservation wage required by Jordanian workers.

Better Work Jordan<sup>13</sup> finds that the reservation wage for Jordanian women in the apparel industry is 200 JD per month for a 48 hour work week. The question is how the reservation wage compares to the current cost of a migrant. A comparison is provided in Table 5.

Column (1) reports the estimated hourly take-home compensation of an unskilled sewer for Jordanians and migrants from Bangladesh and Sri Lanka. In column (2), the hourly compensation is converted to a monthly rate under the assumption of a 48 hour week, four weeks per month. Columns (3) – (5) estimate additional costs for migrants, including housing and food, air travel and required work and residency permits. Each cost is converted from a lump sum to a per month cost assuming a typical three year contract. We find that the monthly cost for an unskilled sewer from Sri Lanka is 259.47JD and Bangladesh 251.30 JD. We conclude, then, that the cost of a migrant actually exceeds the reservation wage required by a Jordanian to enter the apparel sector.

Thus, whether we consider the latent supply of female labor in Jordan or the cost per worker of a migrant our findings indicate that Jordan has a comparative advantage in the apparel sector even in the absence of migrant labor and the JUSFTA. However, if Jordan is to realize the full developmental potential of the apparel sector, policies will need to be in place to increase labor force participation by Jordanian women with a secondary education level or less.

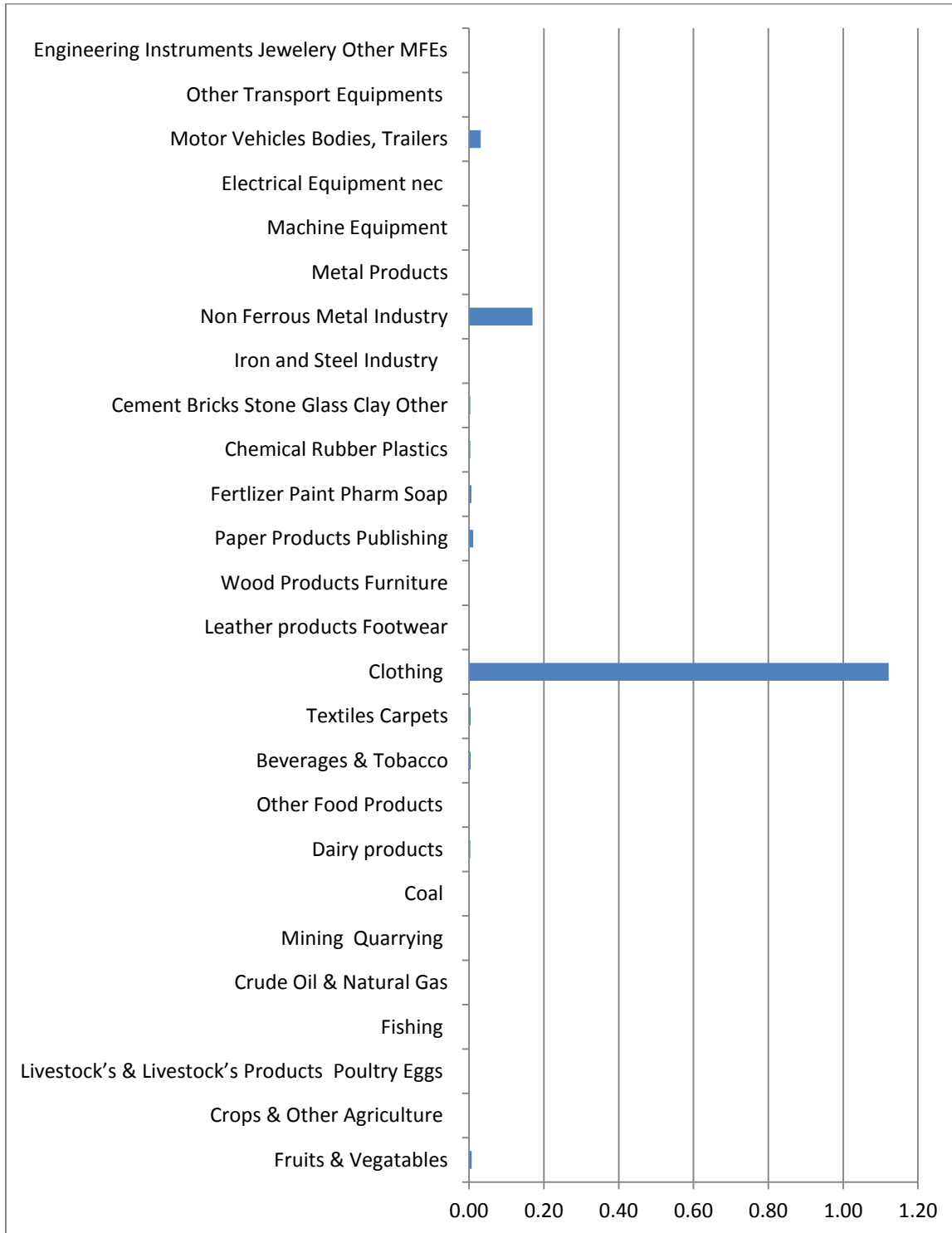
---

<sup>13</sup> Better Work Jordan. 2012. "Employment of Jordanians in the Garment Industry: Challenges and Prospects," August.

<b>Table 1 US Imports Total and from Jordan</b>	<b>Jordan Share of U.S. Imports</b>
	Percent
<b>Fruits &amp; Vegetables</b>	0.0070
<b>Crops &amp; Other Agriculture</b>	0.0014
<b>Livestock's &amp; Livestock's Products Poultry Eggs</b>	0.0014
<b>Fishing</b>	0.0000
<b>Crude Oil &amp; Natural Gas</b>	0.0000
<b>Mining Quarrying</b>	0.0004
<b>Coal</b>	0.0010
<b>Dairy products</b>	0.0033
<b>Other Food Products</b>	0.0021
<b>Beverages &amp; Tobacco</b>	0.0039
<b>Textiles Carpets</b>	0.0039
<b>Clothing</b>	1.1213
<b>Leather products Footwear</b>	0.0000
<b>Wood Products Furniture</b>	0.0023
<b>Paper Products Publishing</b>	0.0109
<b>Fertilizer Paint Pharm Soap</b>	0.0065
<b>Chemical Rubber Plastics</b>	0.0033
<b>Cement Bricks Stone Glass Clay Other</b>	0.0032
<b>Iron and Steel Industry</b>	0.0000
<b>Non Ferrous Metal Industry</b>	0.1694
<b>Metal Products</b>	0.0003
<b>Machine Equipment</b>	0.0023
<b>Electrical Equipment nec</b>	0.0002
<b>Motor Vehicles Bodies, Trailers</b>	0.0309
<b>Other Transport Equipment</b>	0.0002
<b>Engineering Instruments Jewelry Other MFEs</b>	0.0000

\*Source: United States Census Bureau, US Department of Commerce.

**Figure 1: Jordan Export Share of U.S. Imports**



<b>Table 2 Pooled Regression Import Share on Factory Intensities</b>	<b>Export Share World Trade</b>	<b>Share US Imports</b>
	<b>(1)</b>	<b>(2)</b>
<b>Land share</b>	0.636 (1.20)	1.067 (1.64)
<b>Unskilled labor share</b>	-0.555 (1.26)	-0.544 (1.00)
<b>Skilled labor share</b>	-2.120 (4.48)**	-2.146 (3.69)**
<b>Capital share</b>	0.604 (1.33)	0.476 (0.85)
<b>Oil share</b>	0.525 (0.71)	1.712 (1.90)
<b>Gas share</b>	-0.974 (1.35)	-2.062 (2.32)*
<b>Minerals share</b>	-0.319 (0.17)	3.892 (1.66)
<b>Female labor share*GEconomicRate</b>	1.261 (2.30)*	2.944 (4.36)**
<b>Land share*Land PC</b>	-2.284 (0.53)	-2.456 (0.47)
<b>Unsklab share*UnSkLab PC</b>	0.049 (1.55)	0.036 (0.85)
<b>Sklab share*Sklab PC</b>	0.416 (8.48)**	0.596 (9.55)**
<b>Oil share*OilNRPC</b>	9.175 (12.38)**	5.977 (6.59)**
<b>Gas share*GasNRPC</b>	33.017 (15.16)**	4.455 (1.67)
<b>Mineral share*MinNRPC</b>	286.872 (4.51)**	247.938 (3.19)**
<b>_cons</b>	0.383 (0.84)	1.040 (1.68)
<b>Country dummies</b>	yes	Yes
<b>N</b>	7,040	6,985
<b>* <math>p &lt; 0.05</math>; ** <math>p &lt; 0.01</math></b>		

Table 3 Jordan Exports and World Trade	Jordan Exports*	World Trade**	Jordan Share	Predicted Exports***	
	2006 Million USD (1)	2007 Million USD (2)	Percent (3)	Export Share Base (4)	Population Share Base (5)
Fruits & Vegetables	198.1	89182	0.222	38.04	53.98
Crops & Other Agriculture	2.5	177795	0.001	75.84	107.62
Livestock's & Livestock's Products					
Poultry Eggs	81.1	35256	0.230	15.04	21.34
Fishing	0.0	17085	0.000	4.99	7.08
Crude Oil Natural Gas	0.0	1168289	0.000	364.64	517.48
Mining Quarrying	408.0	194254	0.210	328.40	466.05
Coal	0.0	52950	0.000	12.23	17.35
Meat & Fish Products	23.6	93865	0.025	7.61	10.79
Olive Oil & Other Oils	56.9	65392	0.087	9.07	12.88
Dairy products	25.8	61243	0.042	20.74	29.44
Grain Mill Products Bakery Food nec	65.1	283384	0.023	63.16	89.63
Sugar & Confectionery	2.3	18878	0.012	2.35	3.34
Beverages & Tobacco	67.6	100243	0.067	29.03	41.20
Textiles Carpets	15.0	309594	0.005	73.26	103.96
Clothing	939.7	243589	0.386	34.99	49.66
Leather Products Footwear	1.7	131716	0.001	31.74	45.04
Wood Products Furniture	24.1	225226	0.011	-7.46	-10.59
Paper Products Publishing	47.8	242797	0.020	11.21	15.91
Refinery & Refined products	38.6	526079	0.007	97.94	138.99
Chemical Rubber Plastics other MFR	536.0	1930478	0.028	136.84	194.20
Cement Bricks Stone Glass Clay					
Jewelry Other	53.7	149155	0.036	0.95	1.35
Iron and Steel Industry	22.9	416140	0.005	1.48	2.10
Non Ferrous Metal Industry	89.7	473524	0.019	13.66	19.39
Metal Products	69.6	296336	0.023	-18.72	-26.57
<b>Total</b>	<b>23.8406</b>	<b>45924</b>	<b>0.003</b>	<b>0.16</b>	<b>3.01</b>

\*Source: Department of Statistics, Jordan.

\*\*GTAP8 Database.

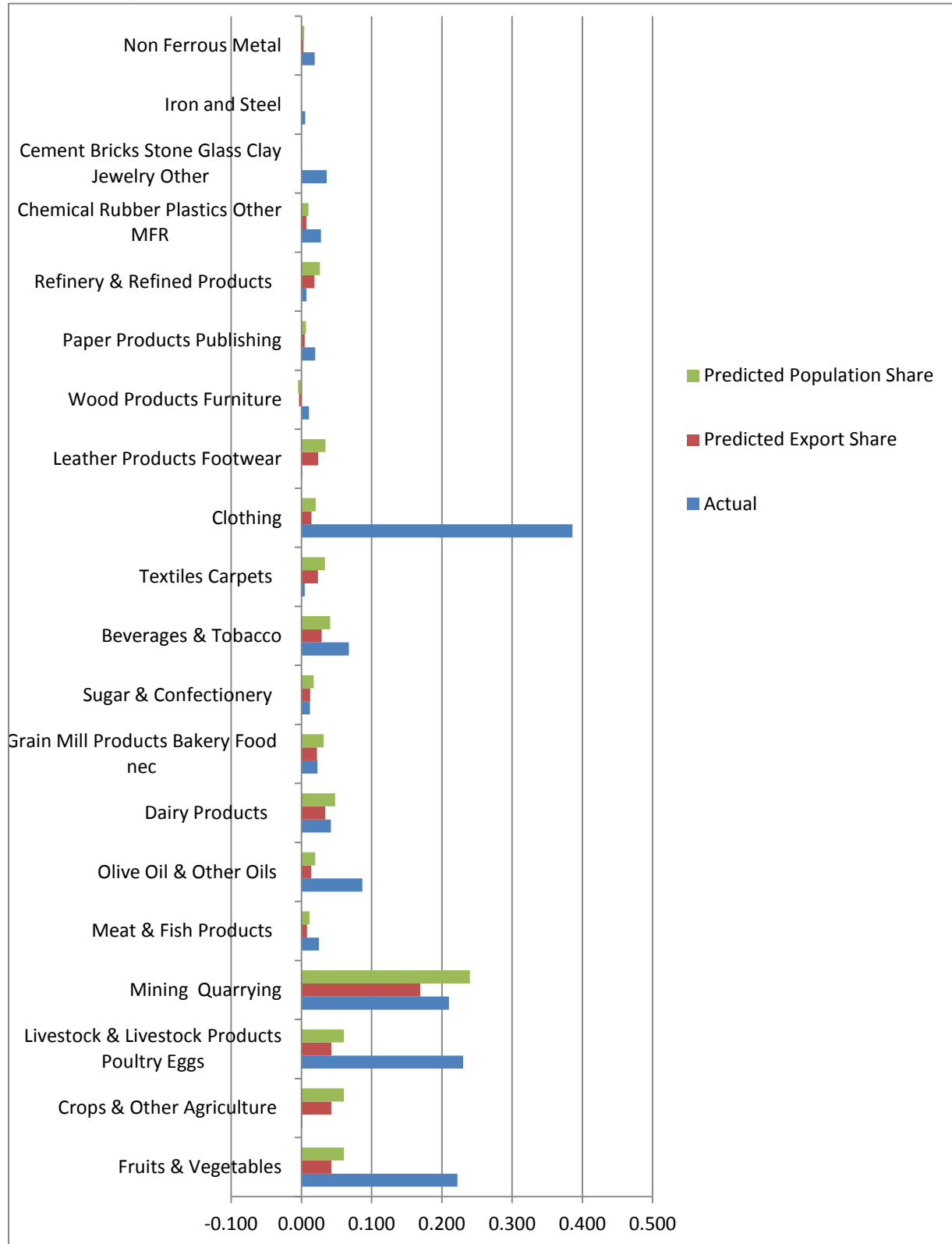
\*\*\*Authors' calculations.

Table 4 Jordan Exports and World Trade: Augmented Female Labor Force Participation	Jordan Exports*	Predicted Exports Augmented Female Labor Force Participation**	
	2006 Million USD (1)	Actual Export Share Base (2)	Population Share Base (3)
Fruits & Vegetables	198.1	72.99	103.58
Crops & Other Agriculture	2.5	145.51	206.50
Livestock's & Livestock's Products Poultry Eggs	81.1	28.85	40.95
Fishing	0.0	7.37	10.45
Crude Oil Natural Gas	0.0	700.98	994.80
Mining Quarrying	408.0	371.28	526.90
Coal	0.0	17.31	24.56
Meat & Fish Products	23.6	45.29	64.27
Olive Oil & Other Oils	56.9	35.33	50.13
Dairy products	25.8	45.03	63.91
Grain Mill Products Bakery Food nec	65.1	211.37	299.96
Sugar & Confectionery	2.3	14.82	21.03
Beverages & Tobacco	67.6	65.27	92.62
Textiles Carpets	15.0	339.16	481.32
Clothing	939.7	244.21	346.57
Leather Products Footwear	1.7	144.87	205.59
Wood Products Furniture	24.1	41.17	58.42
Paper Products Publishing	47.8	118.39	168.01
Refinery & Refined products	38.6	259.49	368.26
Chemical Rubber Plastics other MFR	536.0	1169.65	1659.91
Cement Bricks Stone Glass Clay Jewelry Other	53.7	30.53	43.33
Iron and Steel Industry	22.9	107.31	152.28
Non Ferrous Metal Industry	89.7	134.08	190.28
Metal Products	69.6	56.64	80.37
<b>Total</b>	<b>23.8406</b>	<b>1157.97</b>	<b>1643.34</b>

\*Source: Department of Statistics, Jordan.

\*\*Authors' calculations.

**Figure 2: Jordanian Exports: Actual, Predicted Current Export Share and Predicted Population Millions USD, 2007**





**Figure 3: Jordanian Exports: Actual, Predicted Current Export Share and Predicted Population Augmented Female Labor Force Supply, Millions USD, 2007**

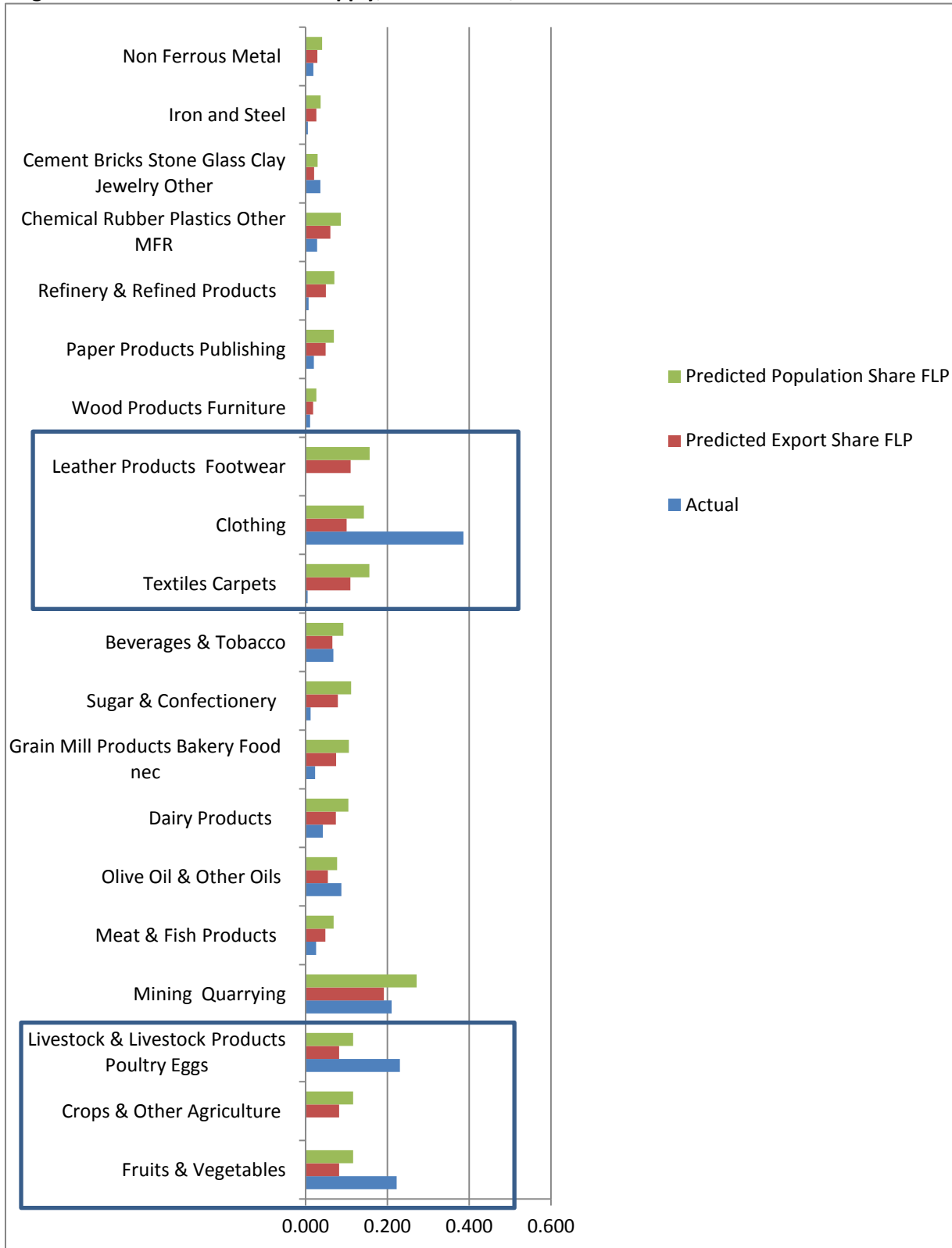


Table 5 Monthly Cost per Employee	JD per hour* (1)	JD per month** (2)	Dorm Food (3)	Airfare# (4)		Work permit+ (5)		Residency Permit+ (6)		Monthly Cost (7)
				Round Trip	Per month	Annual	Per Month	Annual	Per Month	
<b>Jordan</b>	0.780	149.79								149.79
<b>Bangladesh</b>	0.603	115.74	80	800	22.22	370	30.83	30	2.5	251.30
<b>Sri Lanka</b>	0.645	123.91	80	800	22.22	370	30.83	30	2.5	259.47

\*Author's calculation, unskilled sewer

\*\*Assuming 48 hour week, 4 weeks per month.

#Round Trip, Colombo – Amman, assuming three year contract.

+Sources: <http://www.mol.gov.jo/tabid/77/default.aspx#2> and

[http://www.lob.gov.jo/ui/bylaws/search\\_no.jsp?no=36&year=1997](http://www.lob.gov.jo/ui/bylaws/search_no.jsp?no=36&year=1997).