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**ON THE INTERACTION BETWEEN TRADE REFORMS  
AND LABOR MARKET REGULATION: EVIDENCE  
FROM THE MENA COUNTRIES' LABOR MARKETS**

**Irène Selwaness and Chahir Zaki**

**Working Paper No. 970**

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## Abstract

Using a panel of MENA countries, this paper tries to examine the interaction between trade reforms and labor market regulations on the outcome of the labor market. The theoretical predictions of this literature show that the effects of trade liberalization in any given country are conditional on the nature of labor market regulations since trade liberalization is more likely to have a positive impact on employment and wages in countries with flexible labor markets and vice versa. Moreover, more regulated labor markets tend to have higher wages at the expense of sector wide employment. Our main findings show that labor market rigidity reduces the positive impact of trade reform on employment. While this result is stronger for females, it is not for males.

**JEL Classification :** F14, F16, J08, J88.

**Keywords:** Labor Market Rigidity, Trade, MENA.

## ملخص

باستخدام مجموعة من بلدان الشرق الأوسط، تحاول هذه الورقة دراسة التفاعل بين الإصلاحات التجارية واللوائح المنظمة لسوق العمل على نتائج سوق العمل. تشير التنبؤات النظرية لهذا النوع من الأدب أن آثار تحرير التجارة في أي دولة معينة مشروط بطبيعة أنظمة سوق العمل حيث أن تحرير التجارة من المرجح أن يكون له تأثير إيجابي على العمالة والأجور في البلدان ذات مرونة في أسواق العمل والعكس. وعلاوة على ذلك، فإن أسواق العمل الأكثر تنظيمًا تميل إلى أن تكون الأجور فيها أعلى على حساب العمالة. تشير النتائج الرئيسية لدينا أن جمود سوق العمل يقلل من التأثير الإيجابي لإصلاح التجارة على العمالة. في حين أن هذا النتيجة هي أقوى للإناث، عن الذكور.

## **1. Introduction**

While labor market regulations are conceived as measures aiming to protect and raise workers' welfare, they are also usually brought up as one of the reasons behind poor labor market performance. Employment laws are the main component of labor regulation that mostly pop up when trying to explain high unemployment, growing informality, low employment ratios, wage inequality, etc.

More specifically, recent studies in MENA countries highlight that restrictive or inappropriate labor regulations are one of the key issues surrounding labor markets in these countries (Cho et al. 2012; Angel-Urdinola and Kuddo 2010). Moreover, and from a business perspective, the World Economic Forum report (2011) identifies the restrictive labor regulations as major problematic factors for competitiveness and doing business in the Arab World. Furthermore, labor market institutions are also thought to play a prominent role in propagating the impact of external shocks or policies, such as trade liberalization, on labor market outcome. In fact, Rodrik (1997) argued that trade makes the demand for labor more elastic and therefore less rigid. Lower rigidity consequently leads to larger shocks on employment and wages resulting from productivity or output demand shocks and hence increases the volatility of employment. Moreover, this increase in elasticity leads to the erosion of the bargaining power of labor in comparison with capital in the sharing of profits and lessens the bargaining power of unions. Therefore, the theoretical predictions on the nexus between trade, labor market rigidity and labor market outcomes show that the effects of trade liberalization in any given country are conditional on the nature of labor market regulations since trade liberalization is more likely to have a positive on employment and wages in countries with flexible labor markets and vice versa (Goldberg and Pavnick 2003). Moreover, more regulated labor markets tend to have higher wages at the expense of sector wide employment.

As the labor market problems were the main factors that fueled the uprisings and turmoil in the Arab countries in 2011, it is worth analyzing to what extent these regulations exert an impact on the performance of the labor market, as a first step towards understanding the problem – if there is any – and towards providing adequate solutions. Furthermore, the interaction of the trade openness policy and labor market regulation is worth studying to have a complete picture of the mechanisms leading to the observed labor market outcomes.

This paper relies on the labor market rigidity (LAMRIG) index developed by Campos and Nugent (2009). It is available for several countries in the MENA region from 1960 to 2004, thus forming a panel dataset. Combining such index with trade variables and employment outcomes allows estimating the impact of labor market rigidity and trade on labor market performance, resumed in the employment-to-population ratio and the labor force participation.

This article is organized as follows. Section II presents some stylized facts on service trade in the MENA region. Section III reviews both the theoretical and empirical literature. Section IV describes the methodology adopted. Section V is dedicated to data analysis. Section VI exhibits the econometric results. Section VI concludes

## **2. Stylized Facts**

### ***2.1 Labor regulations in MENA***

Recent studies have argued that one of the main reasons behind MENA labor market problems (e.g., the high informality, difficult youth absorption to the labor market, high unemployment, etc.) is rigid labor markets (Kabbani and Kothari 2005, Elbadawi and Loayza, 2007, Angel-Urdinola and Kuddo 2011). While many indices were developed to measure labor market restrictiveness or rigidity, they all point to an important variability across countries in the region. However, on average, MENA labor markets appear to be less restrictive than Latin America and Caribbean (LAC) and Sub-Saharan Africa, but more rigid than Eastern Europe

and the most flexible labor markets (Figure 1). Looking more closely, there are certain aspects in the labor legislation that might be more restrictive than others. For instance, while hiring regulations appear to be not too rigid, firing and dismissal procedures are perceived too restrictive to allow workforce adjustment in times of recession or expansion (Angel-Urdinola and Kuddo 2011). The average cost of dismissal, computed in weeks of salary, is estimated to be 50 weeks of salary, compared to 28 weeks in ECA, and 27 among OECD (Gatti 2011).

According to the Doing Business Employing Workers Index,<sup>1</sup> Morocco tops the most restrictive labor markets in the region (Angel-Urdinola and Kuddo2011). Stylized facts from LAMRIG index show interesting patterns. LAMRIG is a five-average year index from 1950-1954 to 2000-2004. It constitutes a 0-3 scaled index that codifies all employment laws.<sup>2</sup> Table 1 shows that Bahrain, Syria and the West Bank and Gaza top the most restrictive labor markets (LAMRIG score near 2.5). Tunisia, Iran, and Libya follow the first category, having a score that is slightly lower than 2 (Table 1). Egypt, Oman, and Morocco represent a third similar group with a score level of around 1.5. Looking at the evolution of the labor market rigidity over time, it is noticed that Egypt had known a peak in market rigidity throughout the 1985-1989 period. Israel and Lebanon have shown increasing scores from the 1960s until 2004. Tunisia has experienced a decline in its rigidity score from 1985 to 2004.

Interestingly, the perception of labor regulations forming a barrier to business development and employment creation is not always aligned with the score of labor market rigidity. Countries like Egypt, Syria, Lebanon and Iraq where labor market rigidity index is almost aligned with international benchmark are more likely to perceive labor laws as an important constraint for employment creation and entrepreneurship development (see Figure 2), relative to countries like Jordan, Algeria, Morocco, West Bank and Gaza who have higher scores of rigidity (Angel-Urdinola and Kuddo 2011).

It is worth mentioning that despite the discussion on protective and restrictive labor regulations, weak law enforcement and evasion of laws leave the labor market unregulated in certain areas, namely the intended informality of some of the workers or the sectors, the fiscal fraud, etc. (Angel-Urdinola and Kuddo 2011). This might explain why the perception of how regulations hinder business development may not match the rigidity score. Yet, we will rely on the latter since it reflects the rigidity of the labor market based on several criteria as will be shown later.

## **2.1 Trade performance in MENA**

Data from the World Development Indicators (2012) show that the share of trade in MENA's GDP increased substantially between 2004 (79%) and 2008 (96%), and was then driven down by the financial crisis to 72% in 2009, before going up again to 84% in 2010. Figure 1 shows that in 2010, the share of trade in MENA GDP was higher than the other regions, developed ones like North America (31%) as well as developing ones like Sub-Saharan Africa (65%), but this is in large part due to petroleum exports. Notably, MENA trade, excluding oil, is at about the world average but exports alone are below the world average. Behar and Freund (2011) show that, conditioning on GDP, distance and a number of other factors, a typical MENA country under-trades with other countries: exports to the outside world are at only a third of their potential. However, intra-MENA trade is conditionally higher than extra-MENA trade. These results hold for aggregate exports, non-natural exports and non-petroleum exports.

The share of service trade in MENA GDP is low at nearly 20%, although this percentage is higher than the other developed and developing regions (Figure 3). The share of exports in

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<sup>1</sup>It is worthy to note that the Employing Workers Index has been replaced by the Labor Market regulation index. For further details, see Doing Business: <http://www.doingbusiness.org/methodology/labor-market-regulation> . Last accessed June 2<sup>nd</sup>, 2015.

<sup>2</sup>Detailed description of LAMRIG is provided in section 4. For further details on LAMRIG construction, refer to Campos and Nugent (2012)

GDP is much lower, around 7.6%, although higher than most of the other regions and the world average (Figure 4). Sectors like tourism, transportation, remittance, and to a lower extent, financial, transportation and telecommunication services are the driving forces behind this stylized fact (authors' calculations from trademap.org).

### **3. From the Trade Theory to the Empirics of Trade and Labor Rigidity**

International trade theories tried to explain the impact of trade openness on employment. The Heckscher-Ohlin-Samuelson followed by the sector specific model (Viner 1931) were the main attempts to determine the effect of trade on labor market outcomes, namely employment. However, these theories do not explicitly take into account the state of labor market flexibility and whether labor markets would allow the realization of such theoretical potential impacts or not. Almost all the models assume that workers are mobile between sectors. Therefore, we will first describe the literature review of the impact of international trade on employment, then tackle the question of the nexus between labor market regulation and trade openness on the labor market.

#### ***3.1 The theoretical effect of trade on employment***

To recall, there are four main theoretical frameworks that could be evoked when studying the impact of trade on employment. A first attempt was the Ricardian model, introducing the concept of the comparative advantage. Each country exports the good in which it has comparative advantage, as defined by having a lower relative price (or higher productivity) than the other country. Consequently, each country has the incentive of increasing the production of the good it exports, leading to labor re-allocation from the import-competing industry to this export-industry. This implies a reshuffle of factors of production towards the sectors that have a comparative advantage leading to job creation in these sectors and job destruction in other sectors. The net effect may be positive or negative in the short run depending on the characteristics of the labor market. Yet, in the long run, the efficiency gains caused by trade liberalization are expected to lead to positive employment effects given that the country produces more efficiently (Krugman et al., 2011).

Second, the Heckscher-Ohlin-Samuelson model (1933 and 1941) has further elaborated the comparative advantage concept. It argues that, under free trade, countries tend to export the good that intensively use their relatively-abundant factor of production. According to the Stolper-Samuelson effect, an increase in the relative price of a good (where the country has a comparative advantage) will lead to a more than proportional increase in the real returns of the factor which is intensively used in the production of that good, and conversely, to a fall in the real returns of the other factors. Such effects are valid when factors are assumed to be mobile between different sectors. Yet, inter-sectoral mobility of the factors of production is relatively low in the short run. This is why the third framework is the sector specific model that can be perceived as the short term version of the HOS model.

The sector specific model (Viner, 1931) assumes that one factor of production is specific to a particular industry. A movement towards free trade increases the price of the exportable goods and reduces that of importable ones. Hence, the return of the factors used in the exporting sectors will increase, while factors used in the importing sectors will witness a decline in their revenues. In other words, when a factor of production, like capital, is immobile between industries, a movement to free trade will cause a redistribution of income. Some individuals, such as the owners of capital in the export industry, will benefit from free trade. Other individuals, owners of capital in the import-competing industries, will lose from free trade. In addition, according to this model, workers who are freely mobile between industries may gain or may lose since the real wage in terms of exports rises while the real wage in terms of imports falls. Therefore, the clear winners and losers in this model are distinguishable by industry. As in the immobile factor model, the factor specific to the export industry benefits while the factor

specific to the import-competing industry loses. The net effect on labor depends on the magnitude of gains from exports or losses from imports.

The final strand of international trade theory argues that instead of having a reallocation of the factors of production between sectors, this reallocation will take place within each sector. Unproductive firms will exit the market, productive firms will serve the domestic market and most productive ones will be able to face the competition and export to foreign markets (Krugman, 2011). As a result, these models predict that in all sectors, jobs are created by producers who are able to compete at the international level and destroyed by those who are unable to compete.

It is quite clear that while both the Ricardian and HOS models assume perfect inter-sectoral mobility, Viner's model seems to be more appropriate for the case of developing countries since it assumes low inter-sectoral mobility of the factors of production. Yet, all these potential impacts need to be tested taking into consideration country-specific labor market flexibility. The latter was found to be key in shaping the impact of trade on employment.

### ***3.2 The empirics of labor market rigidity and trade openness***

To study the interaction between trade and labor market rigidity, Hasan (2001) examined the effects of openness and labor market rigidity on labor outcomes using panel data from developing countries. She found that trade liberalization is more likely to have a positive impact on employment and wages in countries with flexible labor markets and vice versa. Similarly, Stone et al., (2013), using harmonized labor force surveys for six OECD economies, found that high skilled workers are the most likely to benefit from an expanding export sector and that some workers may find it more difficult to switch occupations than to switch industries. These results are consistent with sticky sector-specific human capital and information asymmetries, especially with respect to opportunities in different regions within the same country. Alexandre et al., (2010) showed that the inclusion of labor adjustment costs in a trade model affects the impact of exchange rate movements on employment. Using panel data for 23 OECD countries, they suggest that employment in low-technology sectors that have a very high degree of openness to trade and are located in countries with more flexible labor markets are more sensitive to exchange rate changes. Our model and estimates therefore provide additional evidence on the importance of interacting external shocks and labor market institutions. Parcon (2008) proved that labor market flexibility, measured by labor market standards and regulations, has two opposing effects on FDI inflows. Labor market regulations and standards decrease FDI inflows through the cost channel, but they increase FDI inflows through the productivity channel. Allowing for a non-linear relationship between different indicators of labor market flexibility and FDI inflows revealed that some degree of labor market standards and regulations may be attractive for foreign investors

Helpman and Redding (2011) presented a new framework for analyzing the interrelationship between inequality, unemployment, labor market frictions, and foreign trade. They introduced labor market frictions into a general equilibrium model of trade to the study of interdependence in labor market institutions across countries and the analysis of interactions between labor market institutions and trade liberalization. While labor market reforms that reduce search and matching frictions in the differentiated sector increase a country's own welfare, they reduce welfare in its trade partners. Furthermore, Egger et al., (2011) develop a multi-country model with imperfect labor markets to study the effect of labor market frictions on bilateral trade flows. On the short run, a higher degree of labor market rigidity decreases the value of total trade, but increases the share of intra-industry trade for a country that is larger than its trading partner. The reverse effects are observed when capital is allowed to cross country borders.

In this regards, this paper aims to shed light on the impact of the impact of labor market regulation and the trade policy on employment in MENA countries.



#### 4. Methodology and Data

We will adopt a basic specification to link the labor market outcomes to the labor market policies and to compare the effects of these policies across countries. Relying on the reduced form approach as in Heckman and Pages (2000) and Rovelli and Bruno (2007), we will investigate whether countries in the MENA and periods with more strict labor regulations combined with their trade openness are associated with lower employment or higher unemployment rates.

$$Outcome_{jt} = \alpha_0 + \alpha_1 LAMRIG_{jt} + \alpha_2 Trade_{jt} + \alpha_3 LAMRIG_{jt} * Trade_{jt} + \alpha_4 X_{jt} + g_j + g_t + \varepsilon_{jt}$$

where the subscript “j” designates the MENA countries and time is denoted by the subscript “t”,  $Outcome_{jt}$  measures two main labor market variables, namely the employment-to-population ratio for persons aged 15 to 64 and the labor force participation rate.  $LAMRIG_{jt}$  represents the labor market rigidity index.  $Trade_{jt}$  captures the effect of trade volume on labor market outcome. Several indices of trade volume will be used in the regressions in order to disentangle the effect of export performance from that of imports on employment. Export intensity or performance is calculated as the share of exports to GDP (exports/output). The imports share to GDP is the second measure used in this paper (imports/output). Trade openness is calculated as the sum of exports and imports as a proportion of GDP (exports+imports/output). We also include an interaction term that shows the effect of trade volume on labor outcome when rigidity changes.  $X_{jt}$  is a vector of control variables including the rate of enrollment in the secondary education and the share of investment in GDP. Country-specific unobservables  $g_j$  that may remain constant over time and may affect the dependent and independent variables are controlled for using the fixed effects technique and introducing year dummies  $g_t$  and  $\varepsilon_{jt}$  is the discrepancy term.

The labor market rigidity index ( $LAMRIG_{jt}$ ) measures the rigidity of employment conditions for each country at various points in time (from 1950 to 2000-04). Developed by Campos and Nugent (2009), LAMRIG is a time-update and country-extension of the employment law restrictiveness (ELR) developed by Botero et al (2004). LAMRIG index, as the ELR, captures a number of important labor market institutional dimensions: (1) the rigidity of alternative employment contracts (part-time, fixed-term), (2) rigidity of hours, (3) cost of firing workers (known as job security), and (4) dismissal procedures. Each of these four dimensions constitutes a sub-index and is composed of the sum of several individual components taking the value of 0 or 1 (each sub-index includes as much as dummies or individual components as legal provisions for each of these dimensions). For example, the first sub-index which is the strictness of protection against alternative employment contracts would include components such as whether fixed-term contracts are prohibited for permanent tasks (scored 1) or not (scored 0); whether terminating part-time workers is at least as costly as terminating full time (scored 1) or not (scored 0), etc. This means that regulated or protective individual components in each sub-index would take 1 as a value. LAMRIG is an average of these four sub-indices averaged and summed-up to 100, then transformed to 0-3 scale index. While the ELR was computed for 85 countries at 1997, LAMRIG is constructed on the basis of ELR and extended for 145 countries. It was computed as a five-year average from 1950-54 throughout 2000-2004. Campos and Nugent (2009) have succeeded in extending the index time and countries for the ELR by using ILO laws portal, known as NATLEX. Therefore, to resume, LAMRIG is a codified characterization of the employment laws and constitute a measure of *de jure* labor market rigidity.

According to Campos and Nugent (2009), high scores of LAMRIG imply that the labor market is more regulated, protective and, to a certain extent, restrictive. One cannot be easily determine more regulation as “good” or “bad.” As a matter of fact, the impact of rigid employment

protection legislation has been debatable over time. Many studies have found an association between restrictive labor regulations and high informality or unemployment (Lazear 1990, Di Tella and McCulloch 1998, Botero et al 2004) while others find ambiguous results through either an insignificant relationship between labor regulations and employment outcomes or an association with rigidity with better employment outcomes (Bertolla 1990, Boeri 1999). LAMRIG authors stick to the evidence showing that higher scores are associated with higher informality and lower labor force participation.

Regarding the sources of other variables, GDP, employment, investment, exports, imports and schooling variables come from the World Development Indicators available on the World Bank website.

According to the economic theory, we expect to find a positive effect of the education variable on employment, a positive effect of investment and openness. By contrast, as it was mentioned before, labor market rigidity is likely to have a negative impact on the labor market outcome. For this reason, the marginal effect of labor market rigidity on employment may be negative even if trade openness is likely to have a positive effect on employment.

## **5. Empirical Results**

Results for estimating fixed-effect regression models in equation (1) are presented in Tables 2 to 7, showing different specifications according to the measure of trade volume used. Specification (1) uses the trade openness as the trade policy variable and is shown in Tables 2 and 3 where the dependent variable is employment-to-population ratio and labor force participation, respectively. Specification (2) presented in Tables 4 and 5 uses the export intensity as the trade volume measure, while specification (3) uses imports share to GDP and is shown in Tables 6 and 7.

The results from specification (1) show that the main effects of the two variables of interest, namely trade variable and the labor market rigidity, are insignificant. This indicates that trade and rigidity do not affect employment or labor force participation *per se*. Yet, when the interaction term between labor market rigidity and trade openness is included in the set of regressions, the marginal effect of trade openness on labor market outcomes (both employment-to-population ratio and labor force participation) turns out to be positive and significant. This suggests that higher levels of trade openness, in general, are likely to increase the employment-to-population ratio and the labor force participation rate. However, the negative and significant coefficient on the interaction term between trade openness and rigidity implies that increased trade openness in more rigid labor markets is associated with lower levels of employment/labor force participation. Therefore, the rigidity of labor markets can slow down any positive effect of trade openness on labor market outcomes. Such a finding can be explained by the significant growth in global trade witnessed during the last two decades, due to many developing countries having undergone an economic liberalization process through tariff reduction and non-tariff barriers removal. This implies a higher trade volume that would theoretically lead to a higher level of production and a greater labor demand in expanding sectors where each country has a comparative advantage. Yet, it is worthy to note that for the labor market to benefit from this increasing labor demand, its regulations should be flexible enough to allow easy labor market entry and/or labor re-allocation between sectors. Hence, countries with higher levels of labor market rigidity will have lower labor entry/mobility between sectors, in response to a higher trade volume.

When using the export intensity as the trade volume measure, similar conclusions as in specification (1) can be drawn. Tables 4 and 5 show that countries with increased exposure to international trade, through higher export intensity, experience a rise in employment levels and labor force participation levels, respectively, as indicated by the positive and significant coefficient on the export intensity. This is only true when the interaction term between exports

and rigidity is included in the regression. Moreover and similarly to specification (1), the negative and significant coefficient on the interaction term again confirms the negative synergy between the higher levels of labor market rigidity and the increase in exports. As for specification (3), the impact of imports to GDP, used as the trade variable, on employment rates and labor force participation (Tables 6 and 7, respectively) is negative, albeit at the 10% significance level. However, when including the interaction between imports and labor market rigidity in the regression, both coefficients on imports and the interaction term appeared insignificant when the dependent variable was employment to population ratio. However, the coefficient on the interaction term is negative and significant when the dependent variable is labor force participation, suggesting that countries with higher increased competition from imports and more rigid labor markets experience a fall in their labor force participation.

At the gender level, the same set of regressions with the three different specifications were estimated separately for men and women to disentangle the differential impact of trade and labor rigidity on labor market outcome. Similar results, as discussed above, were found for women. The positive and significant coefficient on the trade variable, whether trade openness or exports intensity, together with the negative and significant coefficient on the interaction term between trade and rigidity indicate that higher trade volume in more rigid labor markets have a negative impact on both women's employment rates and labor force participation. However, men's employment to population ratio and labor force participation are not affected by changes in either the trade volume or the labor market rigidity, as implied by the statistically insignificant coefficient on both exports and the interaction term in their regressions. This result indicates that rising exposure to international trade in rigid labor market is less favorable to women and can represent an impediment to their access to labor market.

Turning to the impact of other control variables, the coefficient on the share of investment to GDP is statistically insignificant for the whole sample and the women sample. However, it is positive and significant for the men sample, indicating that countries with higher share of investment to GDP have higher men's employment to population ratio and labor force participation. This appears to be the case using trade openness (Table 2 and 3) and share of exports to GDP (Table 4 and 5). However, when using the share of imports to GDP, the investment effect on employment was significant and positive for all men and women workers. This shows the extent to which economic policies in general and investment policies in particular can achieve high and labor-intensive growth rates. These policies may lead to high investment levels, which boost the economy's ability to create jobs, and resulted in investment patterns biased for labor-intensive growth. Moreover, we found a negative and significant coefficient on the education variable (rate of enrollment in secondary education) on labor market outcomes. This indicates that countries with higher shares of secondary enrolled individuals have, in general, lower employment rates and labor force participation rates. This, partly, suggests that controlling for the higher trade growth, requiring rising competitiveness in the exports markets in the MENA countries, the demand for skills increased and thus, labor demand for the low skilled decreased, pushing their employment levels down. Therefore, countries with higher shares of low-skilled workers with secondary education on average have lower employment levels.

## **6. Conclusion**

Using a panel of MENA countries, this paper tries to examine the interaction between trade reforms and labor market regulations on the outcome of the labor market. The theoretical predictions in this literature show that the effects of trade liberalization in any given country are conditional on the nature of labor market regulations since trade liberalization is more likely to have a positive impact on employment and wages in countries with flexible labor markets and vice versa. Moreover, more regulated labor markets tend to have higher wages at the expense of sector wide employment. Our main findings show that labor market rigidity reduces

the positive impact of trade reform on employment. These results are robust using different measures of trade volumes, namely the trade openness and the export intensity. The results also show that such effects are statistically significant for women but insignificant for men. Women tend to bear the brunt of labor market rigidity when there is increased exposure to international trade.

This is an important topic as countries of the MENA region have gone through a series of reforms at both the labor market and the trade policy levels. For policy makers the results of this study provide added incentive to move the debate about trade to a different level. Trade effects on employment do not matter *per se* unless the country is characterized by a flexible labor market. The focus should not be placed on tariffs and other types of trade distorting measures but rather on improving labor market regulations and institutions at home in order to take advantage of globalization. Thus, a wide range of policies can be employed to address these labor market frictions to improve worker mobility and reduce adjustment costs.

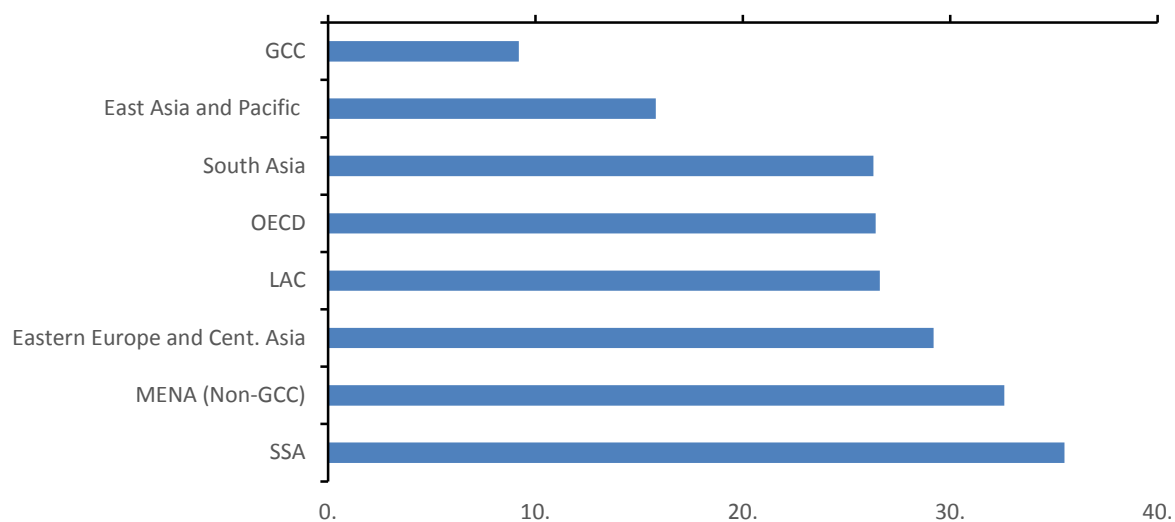
Our research agenda includes the following to improve our empirical work. We are planning to consolidate these macro findings using micro data. In fact, we are planning to use two labor market surveys (The Egyptian Labor Market Panel Survey and the Jordanian Labor Market Panel Survey), which are available at the Economic Research Forum (Cairo, Egypt), in order to examine the interaction between labor market rigidity and trade openness on the labor market outcome at the individual level (Helpman et al, 2011).

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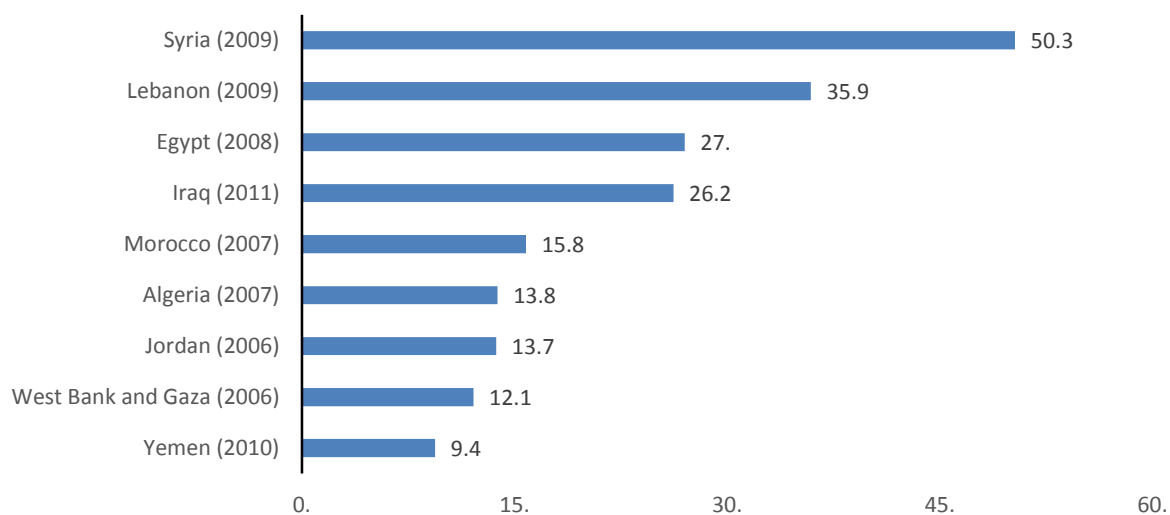
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**Figure 1: Doing Business Employing Workers Index (0-100)**



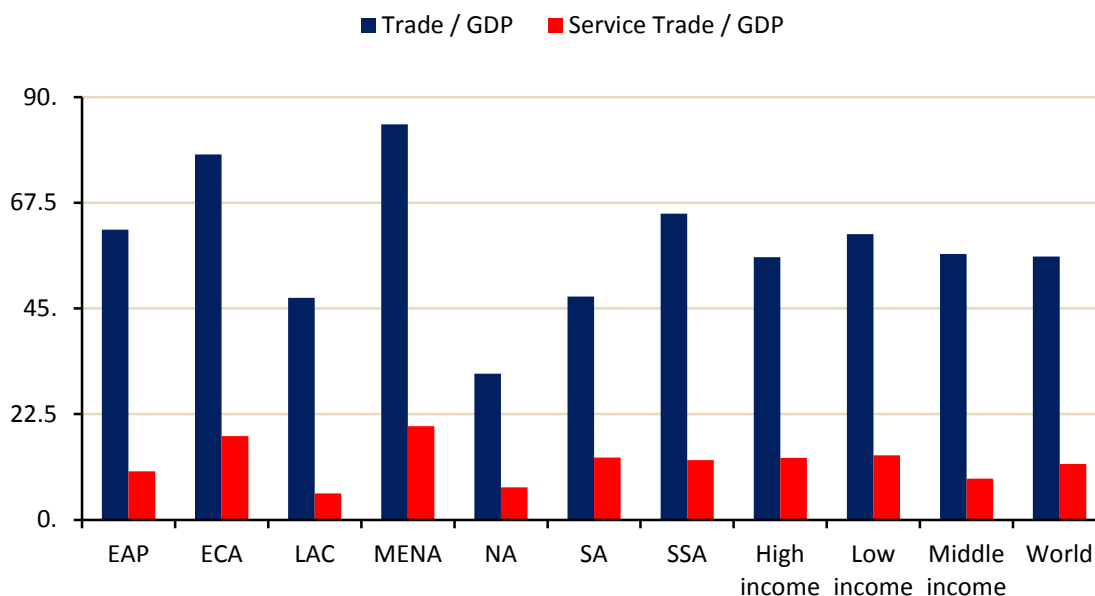
Source: Angel-Urdinola and Kuddo (2011) based on Doing Business dataset.

**Figure 2: The Percent of Firms Identifying the Labor Regulations as A Major Constraint**



Source: Enterprise Surveys (<http://www.enterprisesurveys.org>), The World Bank.

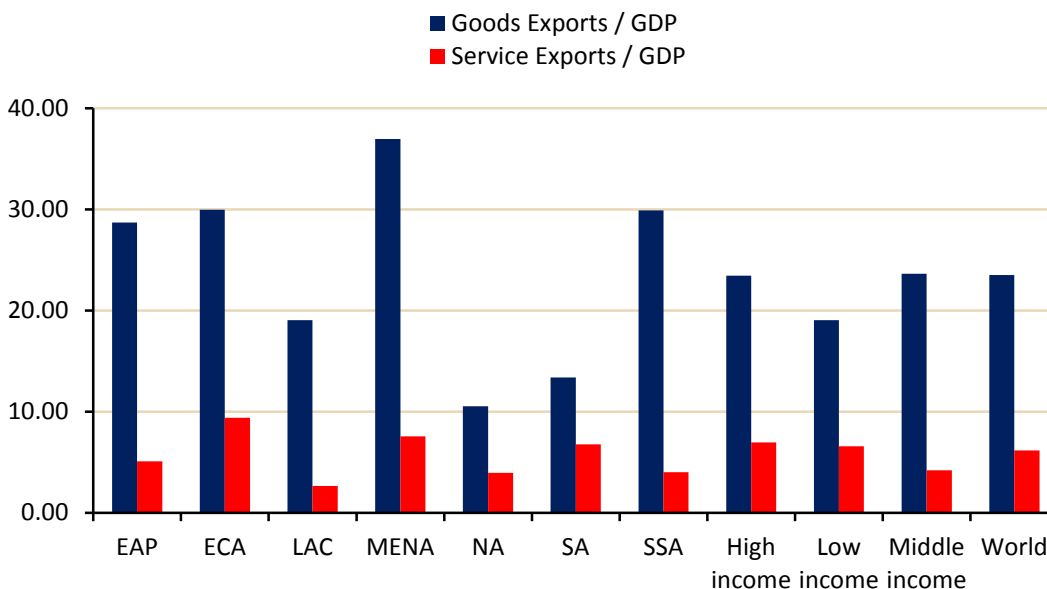
**Figure 3: Trade as a Percentage of GDP, 2010**



Note: (i) Trade the sum of exports and imports divided by the value of GDP, all in current U.S. dollars. (ii) LAC: Latin America & Caribbean; NA: North America; EAP: East Asia & Pacific; SA: South Asia; SSA: Sub-Saharan Africa; ECA: Europe & Central Asia; MENA: Middle East & North Africa.

Source: World Bank, World Development Indicators database online, 2012.

**Figure 4: Exports as a Percentage of GDP, 2010**

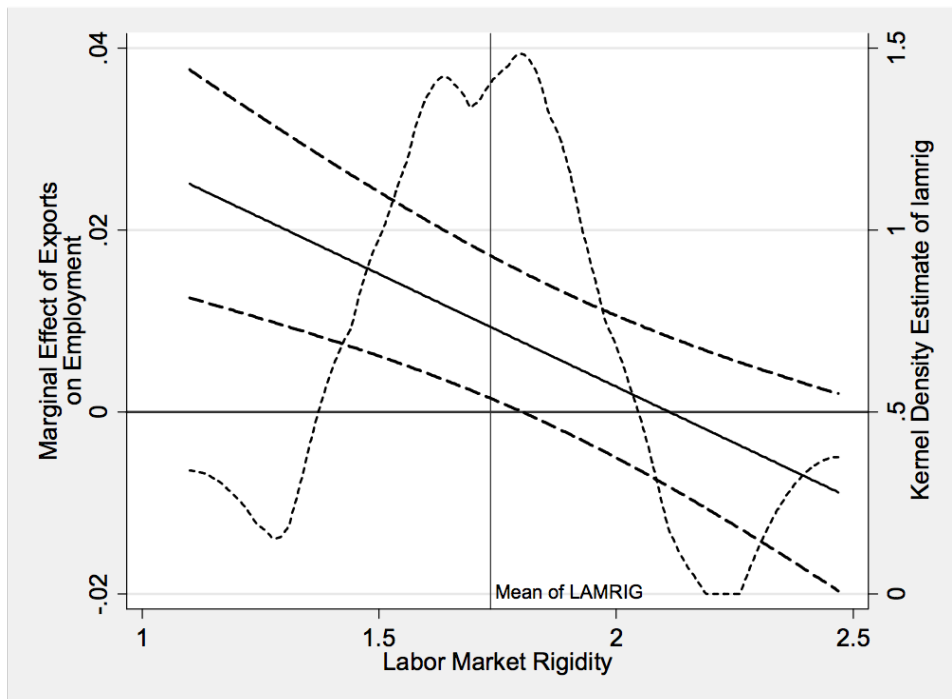


Note: (i) Trade the sum of exports and imports divided by the value of GDP, all in current U.S. dollars. (ii) LAC: Latin America & Caribbean; NA: North America; EAP: East Asia & Pacific; SA: South Asia; SSA: Sub-Saharan Africa; ECA: Europe & Central Asia; MENA: Middle East & North-Africa.

Source : World Bank, World Development Indicators database online, 2012.

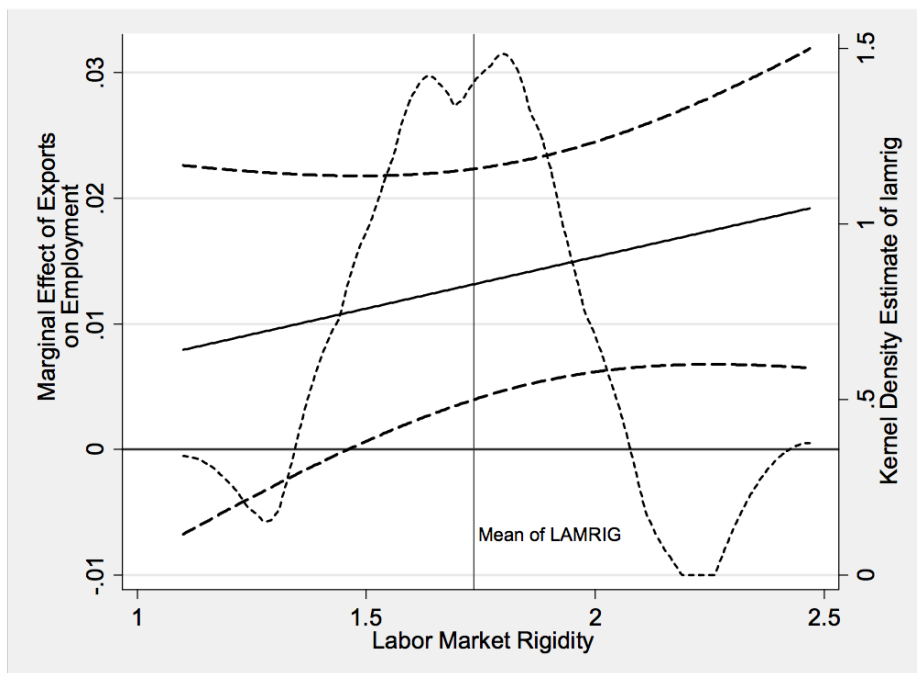


**Figure 5: Marginal Effect of Exports on Employment to Population Ratio, Conditional on Labor Market Rigidity (Total)**



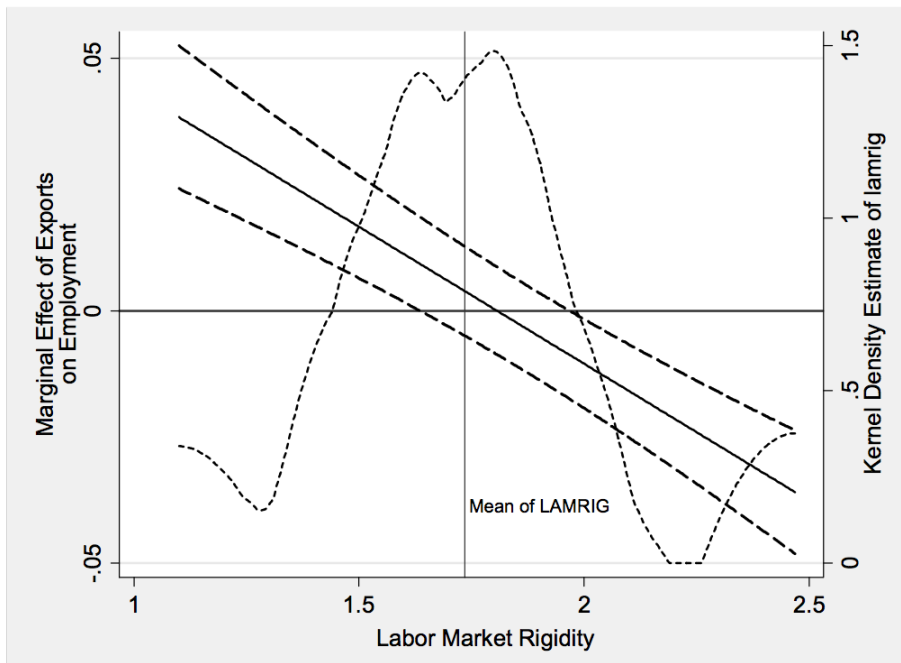
Notes: (i) Thick dashed lines give 90% confidence interval. (ii) Thin dashed line is a kernel density estimate of LAMRIG.

**Figure 6: Marginal Effect of Exports on Employment to Population Ratio, Conditional on Labor Market Rigidity (Males)**



Notes: (i) Thick dashed lines give 90% confidence interval. (ii) Thin dashed line is a kernel density estimate of LAMRIG.

**Figure 7: Marginal Effect of Exports on Employment to Population Ratio, Conditional on Labor Market Rigidity (Females)**



Notes: (i) Thick dashed lines give 90% confidence interval. (ii) Thin dashed line is a kernel density estimate of LAMRIG.

**Table 1: The Evolution of the Labor Market Rigidity Index in the MENA Region**

	1960	1965	1970	1975	1980	1985	1990	1995	2000
<b>North Africa</b>									
Algeria					1.1	1.1	1.1	1.1	1.1
Djibouti		1.7	1.7	1.7	1.7	1.7	1.4	1.4	1.5
Egypt		1.5	1.5	1.6	1.7	1.8	1.7	1.6	1.5
Iran					1.8	1.9	1.9	1.9	1.5
Iraq	0	0	0	0.4	0.4	0.5	0.8	1.1	1.1
Israel	0.2	0.2	0.8	1.2	1.2	1.4	1.5	1.5	1.5
Jordan								1.7	1.7
Lebanon	0.3	0.4	0.5	1.3	1.4	1.5	1.4	1.5	1.8
Libya				1.8	1.8	1.8	1.8	1.8	1.9
Malta		1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Morocco		1.4	1.4	1.4	1.4	1.4	1.5	1.7	1.7
Syria							2.5	2.5	2.5
Tunisia	2.2	2.2	2.2	2.2	2.2	1.9	1.8	1.8	2
West Bank and Gaza	2.3	2.3	2.3	2.3	2.3	2.4	2.5	2.4	2.3
<b>GCC</b>									
Oman		1.5	1.5	1.5	1.5	1.5	1.7	1.7	1.7
Qatar				1.2	1.2	1.2	1.2	1.2	1.3
Bahrain	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5
Kuwait							1.8	1.8	1.9

Source: Constructed by the authors using the LAMRIG dataset.

**Table 2: The Effect of Trade and Labor Market Rigidity on Employment to Population Ratio**

	Total		Male		Female	
Openness	0.00682	0.0498***	0.0146**	-0.00339	-0.00201	0.101***
	-0.00494	-0.0158	-0.00578	-0.0189	-0.00609	-0.0177
Inv/GDP	0.0581	0.0493	0.135***	0.138***	-0.00563	-0.0266
	-0.0385	-0.0377	-0.0451	-0.0452	-0.0475	-0.0423
School	-0.0886***	-0.100***	-0.0790***	-0.0741***	-0.100***	-0.128***
	-0.0234	-0.0232	-0.0274	-0.0278	-0.0289	-0.0261
Rigidity	-1.442	3.926	-0.27	-2.522	-1.045	11.85***
	-1.837	-2.593	-2.149	-3.113	-2.265	-2.914
Open*Rig		<b>-0.0233***</b>		<b>0.00979</b>		<b>-0.0561***</b>
		<b>-0.0082</b>		<b>-0.0098</b>		<b>-0.0092</b>
Constant	48.49***	40.19***	68.57***	72.05***	31.76***	11.35**
	-3.154	-4.226	-3.691	-5.074	-4.274	-5.055
Year dummy	YES	YES	YES	YES	YES	YES
Observations	170	170	170	170	170	170
R-squared	0.211	0.256	0.389	0.394	0.291	0.445
Number of code	10	10	10	10	10	10

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 3: The Effect of Trade and Labor Market Rigidity on Labor Force Participation**

	Total		Male		Female	
Openness	-0.00298	0.134***	0.0191***	0.00468	0.00887**	0.0721***
	-0.00686	-0.0198	-0.00388	-0.0129	-0.00418	-0.0129
Inv/GDP	0.00607	-0.0308	0.0456*	0.0495*	0.0256	0.00858
	-0.0465	-0.0406	-0.0263	-0.0265	-0.0284	-0.0265
School	-0.126***	-0.167***	-0.136***	-0.131***	-0.129***	-0.148***
	-0.0311	-0.0275	-0.0176	-0.0179	-0.0189	-0.018
Rigidity	-0.358	16.31***	-1.593	-3.348*	-1.761	5.924***
	-2.35	-3.064	-1.33	-1.999	-1.434	-2.001
Open*Rig		<b>-0.0741***</b>		<b>0.00781</b>		<b>-0.0342***</b>
		<b>-0.0102</b>		<b>-0.0066</b>		<b>-0.0067</b>
Constant	35.30***	9.843*	86.23***	88.91***	61.84***	50.10***
	-4.11	-4.992	-2.327	-3.256	-2.508	-3.26
Year dummy	YES	YES	YES	YES	YES	YES
Observations	193	193	193	193	193	193
R-squared	0.296	0.475	0.635	0.638	0.285	0.388
Number of code	11	11	11	11	11	11

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 4: The Effect of Exports and Labor Market Rigidity on Employment to Population Ratio**

	Total		Male		Female	
Exports	0.00596	0.0523***	0.0143***	-0.00113	-0.00356	0.0980***
	-0.00475	-0.0153	-0.00541	-0.0179	-0.0058	-0.0172
Inv/GDP	0.047	0.0366	0.113***	0.116***	0.000122	-0.0225
	-0.0365	-0.0356	-0.0415	-0.0417	-0.0445	-0.0402
School	-0.0839***	-0.0913***	-0.0724***	-0.0700***	-0.0873***	-0.104***
	-0.0213	-0.0208	-0.0242	-0.0244	-0.026	-0.0235
Rigidity	-1.06	4.216*	-0.366	-2.119	0.0468	11.60***
	-1.711	-2.348	-1.947	-2.751	-2.088	-2.648
Exp*Rig		-0.0248***		0.00823		-0.0543***
		-0.00779		-0.00912		-0.00878
Constant	49.70***	41.29***	70.38***	73.18***	29.87***	10.72**
	-2.972	-3.917	-3.382	-4.589	-4.032	-4.767
Year dummy	YES	YES	YES	YES	YES	YES
Observations	191	191	191	191	191	191
R-squared	0.191	0.241	0.386	0.389	0.276	0.42
Number of code	12	12	12	12	12	12

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 5: The Effect of Exports and Labor Market Rigidity on Labor Force Participation**

	Total		Male		Female	
Exports	-0.0035	0.127***	0.0188***	0.00655	0.00845**	0.0728***
	-0.00658	-0.0194	-0.00374	-0.0125	-0.00418	-0.013
Inv/GDP	0.0154	-0.0176	0.0444*	0.0475*	0.029	0.0128
	-0.0442	-0.0393	-0.0251	-0.0253	-0.028	-0.0263
School	-0.100***	-0.126***	-0.122***	-0.120***	-0.114***	-0.126***
	-0.0277	-0.0247	-0.0157	-0.0159	-0.0175	-0.0166
Rigidity	0.315	15.15***	-1.362	-2.747	-1.347	5.938***
	-2.214	-2.869	-1.259	-1.844	-1.404	-1.92
Exp*Rig		-0.0699***		0.00652		-0.0343***
		-0.00987		-0.00634		-0.00661
Constant	35.57***	11.59**	85.58***	87.81***	62.76***	50.99***
	-4.336	-5.118	-2.466	-3.289	-2.75	-3.426
Year dummy	YES	YES	YES	YES	YES	YES
Observations	215	215	215	215	215	215
R-squared	0.291	0.448	0.616	0.619	0.236	0.338
Number of code	13	13	13	13	13	13

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 6: The Effect of Imports and Labor Market Rigidity on Employment to Population Ratio**

	Total		Male		Female	
Imports	-4.577*	9.812	3.933	14.07	-13.48***	11.95
	-2.421	-11.9	-3.08	-15.2	-2.663	-12.98
Inv/GDP	0.107***	0.105***	0.141***	0.140***	0.0826*	0.0794*
	-0.0388	-0.0387	-0.0493	-0.0495	-0.0427	-0.0422
School	-0.0983***	-0.0922***	-0.0989***	-0.0945***	-0.0978***	-0.0869***
	-0.0228	-0.0233	-0.029	-0.0298	-0.0251	-0.0254
Rigidity	0.69	3.183	3.535*	5.291*	-0.935	3.47
	-1.408	-2.46	-1.792	-3.141	-1.549	-2.683
Imp*Rig		-7.597		-5.351		-13.43**
		-6.15		-7.855		-6.708
Constant	46.55***	41.52***	61.43***	57.89***	34.73***	25.57***
	-2.93	-5.012	-3.728	-6.401	-3.669	-5.843
Year dummy	YES	YES	YES	YES	YES	YES
Observations	183	183	183	183	183	183
R-squared	0.243	0.251	0.393	0.395	0.4	0.417
Number of code	14	14	14	14	14	14

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 7: The Effect of Imports and Labor Market Rigidity on Labor Force Participation**

	Total		Male		Female	
Imports	-16.81***	3.649	3.430*	-6.956	-6.637***	-3.896
	-2.584	-10.52	-1.759	-7.203	-1.729	-7.125
Inv/GDP	0.0895**	0.0957**	-0.0218	-0.025	0.0336	0.0345
	-0.0401	-0.0398	-0.0273	-0.0273	-0.0268	-0.027
School	-0.112***	-0.108***	-0.145***	-0.147***	-0.128***	-0.127***
	-0.0268	-0.0266	-0.0182	-0.0182	-0.0179	-0.018
Rigidity	-1.26	3.068	1.669	-0.528	-0.374	0.206
	-1.632	-2.698	-1.111	-1.847	-1.093	-1.827
Imp*Rig		-11.73**		5.953		-1.571
		-5.85		-4.005		-3.961
Constant	40.78***	32.91***	82.31***	86.31***	62.44***	61.39***
	-3.439	-5.199	-2.341	-3.559	-2.302	-3.52
Year dummy	YES	YES	YES	YES	YES	YES
Observations	206	206	206	206	206	206
R-squared	0.44	0.454	0.572	0.578	0.312	0.313
Number of code	15	15	15	15	15	15

Notes: Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1