

Assessing the Impact of Trade Reforms on Informality in Egypt

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Abstract

This paper proposes an empirical investigation of the effect of trade liberalization on informality in Egypt. Trade reforms are likely to expose formal firms to a fiercer foreign competition. Consequently, such firms try to reduce labor costs by cutting workers benefits, replacing permanent workers with part-time labor and not providing workers with formal contracts or social security. This effect of trade liberalization on the informal sector has been widely discussed at both empirical and public policy levels but was never done empirically in Egypt. Thus, combining a microeconomic dataset (the Egyptian Labor Market Panel Survey) with some macroeconomic variables (on exports, imports and tariffs), we try to assess to what extent different trade reforms affected the informal sector in Egypt. Our main findings show that trade reforms increased informality in Egypt. These results remain robust under different econometric specifications and techniques.

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1. Introduction

During the Economic Reform and the Structural Adjustment Program introduced since the early 90's, trade reforms in Egypt were adopted in order to liberalize the trade regime, described as being highly restrictive by this period. Through reductions in tariff and non-tariff barriers over two decades, Egypt has significantly liberalized its external trade. Specifically, the maximum tariff rate has decreased from 110% at the end of the 1980s to reach 40% in the end of 1990's. In 2004, the government of Egypt launched the second wave of liberalization. Its objectives were twofold: first, to reduce tariffs and rationalize the tariff structure; and second, to reduce the number of products subject to non-tariff barriers. Both nominal and effective protections have declined in the manufacturing sector from 21.3% to 12.1% and from 23.3% to 14% respectively after the 2004 reform. Consequently, exports and imports in Egypt experienced significant increases since early 1990s and in a more pronounced way after 2004, where, on average, exports increased annually by 5% before 2004 vs. 24% after this date, while imports by 2% and 24% respectively.

Claims that trade openness and markets' exposure to foreign competition could widen the wage inequality and increase labor movements towards informal sector have raised. The informal sector is mainly characterized by employment relationships that do not comply with labor regulations i.e. not protected by legal contracts or not providing social security coverage. Likewise, informality in the broader definition can be expressed by many terms such as informal enterprises, informal sector, informal jobs and informal employment. Informal sector is the sum of all informal enterprises, whose size does not exceed a determined threshold (5-10 workers depending on the national context) and are not registered/licensed or not subject to tax legislation, social protection or labor regulations. Jobs described as informal are own-account workers (self-employed), employers, employees in informal enterprises, subsistence workers (whose goods' production are for household consumption purposes), unpaid or contributing family workers, and employees in formal enterprises whose employment relationship are not subject to labor regulations, social protection systems, and/or taxation, for certain reasons. Informal employment includes all these types of informal jobs whether inside formal or informal establishments. This paper uses the lack of both legal contracts and social security coverage as indicators of informality. Effectively, the Egyptian Labor market has experienced an increase in informality during the 1990's, also associated with the economic reform and structural adjustment program. Informal sector reached 47% of total employment in 1998 and increased to 52.5% in 2006. Also, earlier studies have shown that the majority of the jobs created between 1988 and 1998 were unprotected by legal contracts where the share of growth of the unprotected regular jobs was the highest in the total growth of employment in the private sector non-agricultural sector.

This paper proposes an empirical investigation of the effect of trade liberalization on informality. Trade openness can increase the share of informality in the labor market through several mechanisms. Formal firms are more likely to get exposed to a fiercer foreign competition post trade reforms. Consequently, to keep their competitiveness, they try to reduce

labor costs by cutting workers benefits, replacing permanent workers with part-time labor and not providing workers with formal contracts or social security. They can also layoff some of their workers who, by their turn, seek informal employment afterwards. Moreover, such firms can outsource to the informal sector, such as subcontracting with home-based or self-employed micro-entrepreneurs.

This effect of trade liberalization on the informal sector has been widely discussed at both empirical and public policy levels but was never done empirically in Egypt. Thus, combining a microeconomic dataset (the Egyptian Labor Market Panel Survey) with some macroeconomic variables (on exports, imports and tariffs), we try to assess to what extent different trade reforms affected the informal sector in Egypt. We follow a two-step estimation approach to relate the change in the probability of informal employment in each industry, and each year, to trade reforms. In the first step, the probability of informal employment is estimated including worker and job characteristics in addition to industry indicators. Once coefficients of industry indicators are extracted, the second step entails their regression on variables that capture the trade reforms such as tariffs, exports performance and import penetration. This second-step analysis determines the impact of different trade reforms on informality premia. As for a robustness check, we undertake a one-step analysis where we estimate the probability of informality taking into account the trade variables besides the usual theoretical variables mentioned above. This step also allows assessing the direct impact of trade on the probability of belonging to the informal sector. Our main findings show that trade reforms increased informality in Egypt. These results remain robust under different econometric specifications and techniques.

This paper is organized as follows. Section 2 presents some stylized facts on trade and informality in Egypt. Section 3 describes the methodology we adopt. Section 4 summarizes the data sources. Section 5 displays the results and section 6 concludes.

2. Stylized Facts

2.1. Informality in Egypt

The share of the manufacturing sector workers among all workers were 12.91 % in 1998 and 11.85 % in 2006 (a sample of 1,071 and 1,700 workers respectively). Informality increased in this sector between 1998 and 2006, since the share of informal workers in this sector increased from 44.24 % in 1998 to 54.86% in 2006.

Table 1 shows the characteristics of the workers in manufacturing sector, by their formal status for 1998 and 2006. Informal workers have higher shares of females than formal workers. Informal workers are on average younger than formal ones (30 year old as compared to around 40 years old, respectively). Moreover, more than the half of informal workers is 15 to 29 years old, which is an important characteristic of the Egyptian Labor Market that informality

concerns the youngest, mainly the new entrants to the labor market. Better educated workers are less likely to be informal where 44.26 and 40.28 % of informal workers are illiterate as compared to 23.5 and 16.16 % of formal workers, in 1998 and 2006, respectively. Marriage is positively correlated with formal status, as well as being head of the household. As expected, informal workers are heavily concentrated in firms with less than 10 workers (73.09 and 69.94 % of informal workers versus only 16.74 and 26.67% of formal ones in 1998 and 2006, respectively). An important percent of formal workers report not knowing the size of their firms, implying that their firms may be of important sizes.

In 1998, informal and formal workers perform the same number of weekly hours-of-work on average while in 2006 informal workers perform lower number of hours on average (45.64) than formal workers (51.60).

For the Panel sample, workers in the manufacturing sector represent 12.65 % of all workers (1,726 workers) and informality concerns around the half of them. As shown in table 2, informal workers are more likely to be females, young. Also as find above, they are less likely to be married (44.01% of informal workers versus 74.86% of formal workers) and head of their households (30.59% of informal workers versus 66.29% of formal workers). The majority of informal workers is illiterate, can read or write or attained less than intermediate level. Lastly, informality is associated with fewer weekly hours-of-work (47.35 for informal workers versus 55.36 for formal workers)

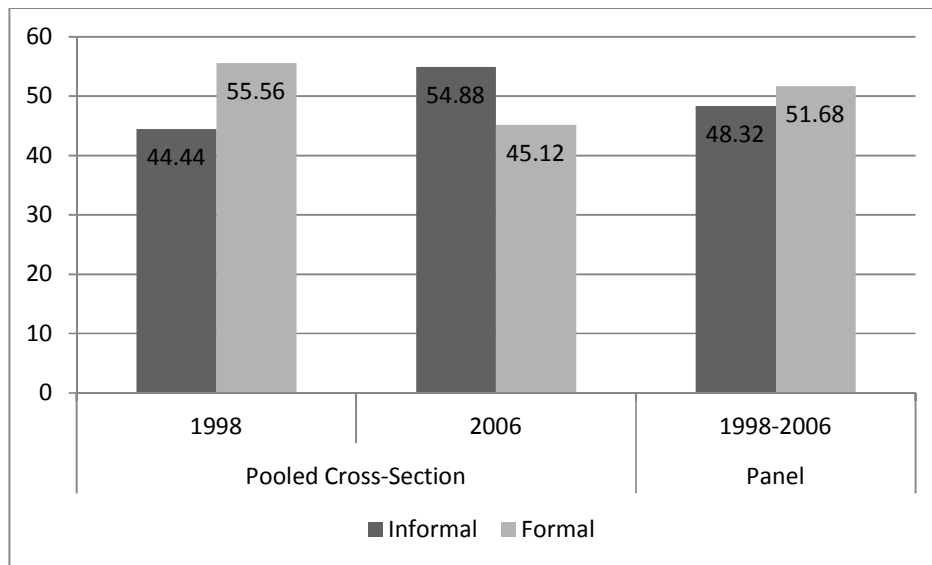
Table 1 Characteristics of Workers, by Formality Status, Repeated Cross Sections ELMS1998-ELMPS2006

	1998		2006	
	Informal	Formal	Informal	Formal
Female	16.74	8.07	26.7	11.17
Age (mean)	29.91	39.93	30.69	37.94
S.d.	12.84	11.30	11.78	11.98
Age Group				
15-29	59.1	20.75	54.81	31.03
30-49	33.71	57.31	36.24	49.93
50-64	7.19	21.94	8.95	19.04
Education				
Illiterate/Read and Write	44.26	23.53	40.28	16.16
Less Than intermediate	29.36	21.34	24.54	19.19
Intermediate	20.64	33.11	27.58	41.52
Above intermediate	5.74	22.02	7.6	23.13
Married	40.04	77.31	54.59	74.38
Head	33.9	68.74	36.86	67.94
Hhsize	6.065	5.37	5.36	4.70
Number of Workers				
0-4	51.48	12.77	56.32	20.89
5-9	21.61	4.87	13.62	5.78
10-29	9.32	6.05	8.22	5.26
30-49	2.97	4.2	2.81	4.34
50+	9.32	17.48	6.59	26.28
DK/miss	5.3	54.62	12.43	37.45
Stability				
Permanent	69.92	95.97	82.05	91.98
temporary	15.47	3.36	11.89	7.75
Seasonal	1.06	0.17	0.97	0.13
Intermittent	13.56	0.5	5.08	0.13
Medical Insurance	0.64	73.78	0.49	62.55
Hours (mean)	50.5	50.08067	45.64216	51.60315
S.d.	19.06632	12.15695	21.25257	13.38047
Sample	472	595	925	761
	44.24	55.76	54.86	45.14

Table 2 Characteristics of Workers, by Formality Status, Panel ELMS1998-ELMPS2006

	Informal	Formal
Female	23.34	9.81
Age (mean)	30.1705	39.52649
S.d.	12.1	11.74615
15-29	57.5	24.43
30-49	34.43	54.57
50-64	8.07	21
Married	44.01	74.86
Head	30.59	66.29
HHsize	5.712213	5.105975
	2.442	2.09
Education		
Illiterate/Read and Write	39.66	20.29
Less Than intermediate	27.13	20.97
Intermediate	26.52	36.98
Above intermediate	6.69	21.76
Number of Workers		
0-4	55.74	17.81
5-9	17.65	5.75
10-29	8.34	5.64
30-49	1.93	4.17
50+	7.62	20.41
DK/miss	8.71	46.22
Stability		
Medical Insurance	0.52	69.45
Permanent	76.06	94.48
Temporary	14.51	5.07
Seasonal	0.73	0.45
Intermittent	8.71	
Number of Hours	47.3555	50.36528
	19.87794	12.22557
Sample	827	887
	48.25	51.75

Figure 1 The distribution of Manufacturing Sector Workers, by Formality Status in 1998 an 2006



Between 1998 and 2006, there were 18.63% who shifted from informal jobs to formal jobs as compared to 10.43% who shifted to informal jobs. Concerning the manufacturing sector only, table 3 presents evidence of a greater percentage of workers who have shifted to informal jobs in 2006 (22.86%) than those who have shifted to formal jobs (18.18%).

Table 3 Transition Probabilities between Formal and Informal Jobs, Manufacturing Sectors Panel Data 1998-2006

	Informal	Formal	Total
Informal	108	24	132
	81.82	18.18	100
Formal	16	54	70
	22.86	77.14	100
Total	124	78	202
	61.39	38.61	100

2.2. Trade Reforms

Both exports and imports in Egypt experienced significant increases since early 1990s and in a more pronounced way after 2004. Figure 1 plots the evolution of exports and imports from 1990 to 2010. On one hand, Figure 2 shows that both exports and imports increase after 2004 are much higher than those before 2004. On average, exports increased annually by 5% before 2004 vs. 24% after this date, while imports by 2% and 24% respectively. These facts are confirmed by Figure 9 that depicts the share of exports and imports to GDP over the same period. It has a U-shaped curve showing the increases in the share of exports and imports

following the ERSAP until 1992 then the slope is downward until early 2000 after which it becomes upward again after the 2004 reform. The same analysis applies for imports. On the other hand, Egypt trade balance has been continuously in deficit throughout the period of the study. Imports exceed exports as a result of the upsurge in the volume of imports that are mainly concentrated in raw materials, investment goods or semi-finished products that are used in the production process.

Despite the widened deficit in the trade balance, the surplus on the current account (before the financial crisis) was an outcome of the rise in the services surplus and net unrequited transfers. In addition, the net inflow realized by the capital and financial account was due to the fact that foreign direct investment (FDI) increased in recent years (especially in petroleum, manufacturing and financial services).

In order to explain the burst in exports and imports, it is important to present how tariffs and other trade barriers have evolved over time. Over two decades, Egypt has significantly liberalized its external trade. The maximum tariff rate has decreased from 110% at the end of the 1980s to reach 40% in the end of 1990's. In 2004, the government of Egypt launched the second wave of liberalization. Its objectives were twofold: first, to reduce tariffs and rationalize the tariff structure; and second, to reduce the number of products subject to non-tariff barriers. The number of tariff bands was narrowed from 27 tariff brackets to 6, tariff dispersion measured by standard deviation declined from 16.1 in 2000 to 12.7 in 2004 and tariff lines were reduced from 8,000 to 6,000. Both nominal and effective protections have declined in the manufacturing sector from 21.3% to 12.1% and from 23.3% to 14% respectively after the 2004 reform. All those measures should in turn simplify procedures, minimize tariff evasion, and remove possibilities of discretion and corruption (Zaki, 2011). Therefore, the increase in exports and imports can be attributable to these trade reforms. Valdes and Foster (2011) have found that trade liberalization since the late-1990s has had a considerable impact on reducing protection of some industries. Yet, some sectors, such as the food and tobacco sectors, remain highly protected, due to tariff escalation and non-tariff barriers on the trade side, and due to energy subsidies on the input side. The effective rate of protection (ERP) has decreased from 85.6 percent in 1999 to 45 percent in 2009 for private business and from 122.5 percent to 37 percent for public enterprises over the same period. In addition, they argued that the dispersion of effective rate of protection fell between 1999 and 2009 from 192 to 57 percent, but it remains higher than the low dispersion of nominal tariffs due to first tariffs and output subsidies and second to energy subsidies.

Nearly 99% of Egypt's tariff lines are bound at the WTO. MFN tariffs on non-agricultural products are generally lower, with an average of 12.8%. Tariffs on agricultural goods remain high, with an average of 66.4%. The higher average on agricultural goods is strongly determined by average tariffs of over 1,000% on beverages and spirits. Table 5 presents both applied and

most favored nation (MFN) tariff rates¹. It is noteworthy that the simple (weighted) average² of applied tariffs has declined significantly, in particular between 2002 and 2004 reaching 20.3% (13.1%) down from 47.9% (23.7%). Despite a significant liberalization of the manufacturing sector, the primary sector remains relatively protected given the fact that in 2009, its simple average of MFN tariffs is 41% while the manufacturing's one is 9%. Finally, the difference between applied and weighted tariff rates is much larger for the primary sector (37.5% and 6% respectively) than for manufacturing (9.3% and 9.12% respectively). This is due to the fact that some products in the primary sector are subject to high tariffs (such as tobacco and alcohol) whereas their weights in international trade are significantly low.

Table 4: Tariff Rate by Sector: 1995-2009

		1995	1998	2002	2004	2009
Total	Applied simple	24.3	19.65	47.92	20.29	12.56
	Applied weighted	16.65	14.17	23.69	13.1	7.98
	MFN simple	34.65	25.23	61.76	19.94	17.21
	MFN weighted	16.65	14.17	23.69	13.1	8.67
Primary	Applied simple	25.88	23.3	19.06	88.27	37.53
	Applied weighted	7.65	8.86	9.33	18.07	6.18
	MFN simple	52.88	34.79	18.56	41.61	41.05
	MFN weighted	7.65	8.86	9.33	18.07	7.22
Manufacturing	Applied simple	24.02	19.15	50.58	12.96	9.3
	Applied weighted	22.2	17.53	30.71	11.41	9.12
	MFN simple	28.92	22.1	72.79	13.53	9.95
	MFN weighted	22.2	17.53	30.71	11.41	9.63

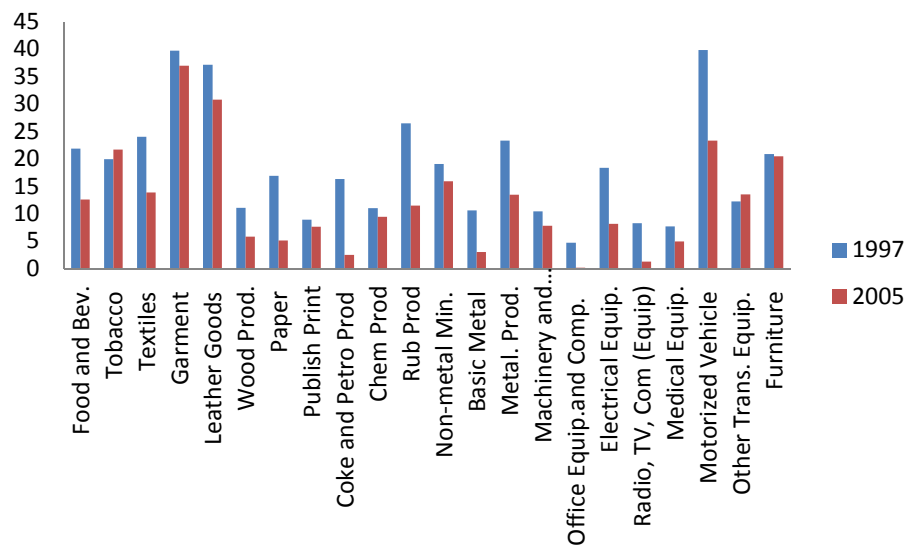
Source: World Development Indicators, 2011.

Figure 4 presents tariffs structure in manufacturing sectors. It is quite clear that tobacco, garments, and leather products have a high tariff rate while paper manufacturing, basic metal, and transport equipment are characterized by a low protection.

¹ MFN tariffs are what countries promise to impose on imports from other members of the WTO, unless the country is part of a preferential trade agreement (such as a free trade area or customs union), applied . This means that, in practice, MFN rates are the highest (most restrictive) that WTO members charge one another. Applied tariff rates is the average of effectively applied rates for all products subject to tariffs calculated for all traded goods.

² Weighted mean tariff is the average of tariff rates weighted by the product import shares corresponding to each partner country. Simple mean tariff is the unweighted average of tariff rates for all products subject to tariffs calculated for all traded goods.

Figure 2: Tariffs in Manufacturing Sector



Along with these unilateral trade liberalization efforts that took place since the 1990s, Egypt has signed many bilateral and multilateral free trade agreements (FTA). On the bilateral front, Egypt has concluded free-trade agreements with the European Union (2004), the members of EFTA (the Republic of Iceland, the Principality of Liechtenstein, the Kingdom of Norway, the Swiss Confederation, 2004), Turkey, and other Arab countries. At the regional level, Egypt has concluded to the Greater Arab Free Trade Area (GAFTA), the Common Market of Eastern and Southern Africa (COMESA) and the Agadir Free Trade Agreement (with Tunisia, Jordan and Morocco). It has also some framework agreements that should turn into free trade ones such as the agreement with the MERCOSUR countries and the one with the UEMOA (Union Economique et Monetaire Ouest Africaine). Finally, Egypt has also signed the Qualified Industrial Zones (QIZ) Protocol³ in December 2005 with the United States and Israel. All these agreements have contributed to the boom of exports and imports in Egypt starting 2004.

At the sectoral level, Figure 2 and 3 present exports performance (defined as the ratio of exports to total output) and import penetration (defined as the ratio of imports to domestic absorption which is output minus exports plus imports) for manufacturing sectors in Egypt. Sectors characterized by an important comparative advantage have a high export performance such as textiles, garments and leather. Yet, between 1997 and 2005, many sectors experienced

³ Qualifying Industrial Zones (QIZ) are designated geographic areas, within Egypt, that enjoy a duty free status with the United States. Companies located within such zones are granted duty free access to the US markets, provided that they satisfy the agreed upon Israeli component of 10.5%, as per the pre-defined rules of origin.

significant increases in terms of their exports performance especially food and beverages, metal products, machines and equipments and furniture. On the other hand, import penetration has increased for several sectors such leather goods, machines and professional equipments.

Figure 3: Export Performance in Manufacturing Sector

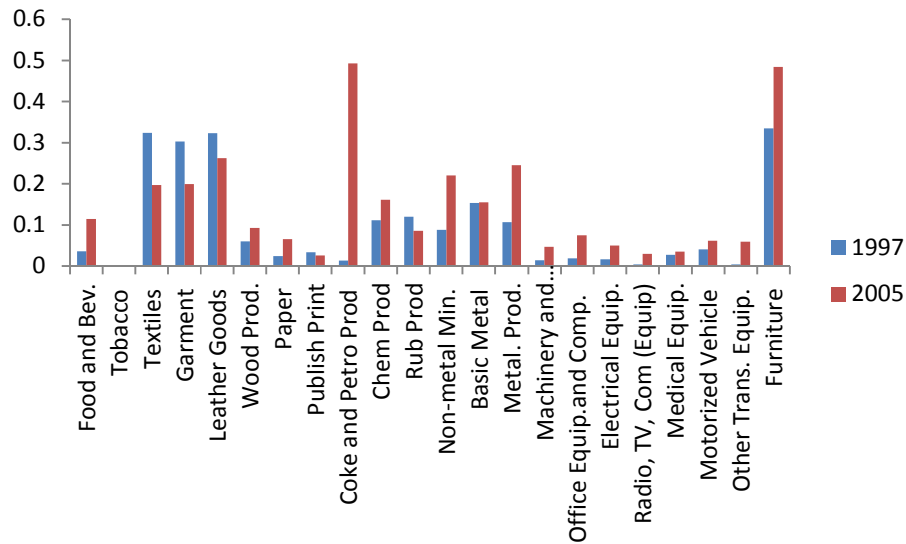
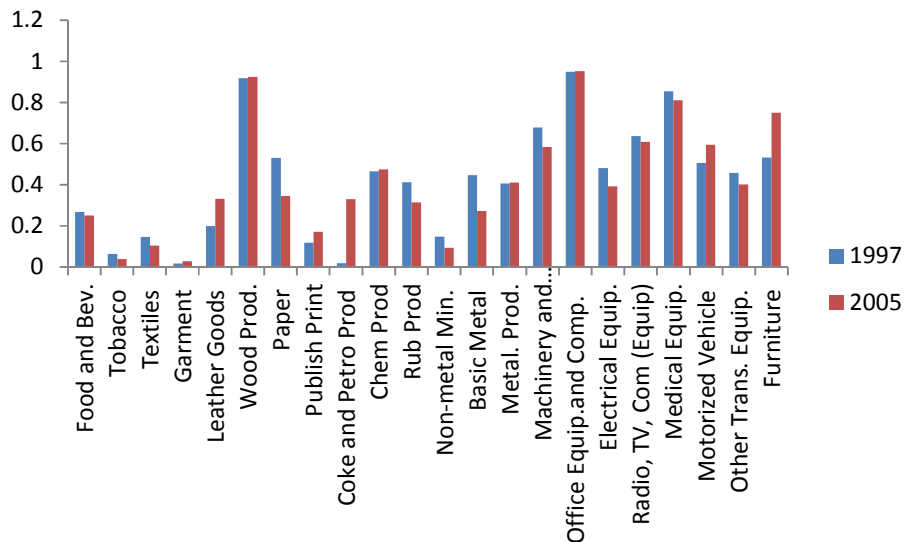


Figure 4: Import Penetration in Manufacturing Sector



After presenting these stylized facts related to the informal market and trade reforms in Egypt, it is worthy to assess the impact of such trade reforms on informality in the manufacturing sector in Egypt.

3. Methodology

3.1. A One-Step Analysis

To directly assess the effect of trade reforms on informality, we follow the methodology adopted by Goldberg and Pavcnik (2003). A binary variable of informality that takes the value of 1 if the individual i , employed in sector j at time t is working in the informal sector and 0 otherwise is constructed. This variable is regressed on some individual characteristics X_{ijt} (gender, age, age squared, marriage, education attainment, membership in a trade union), other dummies capturing some household characteristics H_{ijt} (household size, head of household and share of dependants who are out of the labor force), regional characteristics R_{ijt} and different trade variables (tariffs Tar_j , export performance Exp_{jt} and import penetration Imp_{jt}).

$$Informal_{ijt} = \beta_1 X_{ijt} + \beta_2 H_{ijt} + \beta_3 R_{ijt} + \beta_4 Tar_{jt} + \beta_5 Imp_{jt} + \beta_6 Exp_{jt} + \varepsilon_{ijt} \quad (1)$$

with ε_{ijt} the discrepancy term.

This one-step analysis allows us to assess the direct impact of trade reforms captured by exports, imports and tariffs on the probability of belonging to the informal sector.

3.2 A Two-Step Analysis: Industry Informality Differentials

In order to determine the impact of different trade reforms on informality premia, we have to run first the previous model without including trade variables in it. Furthermore, it is important to include industry indicators that control for non-observable industry characteristics ip_{jt} . The coefficient on the industry dummy, the informality premium, captures the part of the variation in the probability of being informal that cannot be explained by worker characteristics, but explained by the workers' industry affiliation. According to Goldberg and Pavnick (2003), these coefficients are called industry informality differentials. In a second stage, we retrieve industry effects to be explained by trade variables.

The first stage regressions are estimated separately for each year in our sample (1998 and 2006) as follows:

$$Informal_{ijt} = \alpha_1 X_{ijt} + \alpha_2 H_{ijt} + \alpha_3 R_{ijt} + \alpha_4 ip_{jt} + \varepsilon_{ijt} \quad (2)$$

with ε_{ijt} the discrepancy term.

As per the second step, according to Goldberg and Pavcnik (2003), since industry informality differentials are obtained by filtering out the effects of observable worker characteristics, we pool the industry informality differentials over time and regress them on a

vector of trade variables, tariffs (Tar_{jt}), export performance (Exp_{jt}) and import penetration (Imp_{jt}), year (D_t) and sector dummies (D_j) as follows:

$$ip_{jt} = \delta_1 Tar_{jt} + \delta_2 Imp_{jt} + \delta_3 Exp_{jt} + \delta_4 D_j + \delta_5 D_t + u_{ijt} \quad (3)$$

where u_{ij} is the discrepancy term.

Therefore, it is possible to determine the effect of trade variables on the inter-industry informality premium.⁴

4. Data

4.1. Macroeconomic Data

Trade policy variables have different sources. First, tariff data come from the World Trade Organization Tariffs Profile based on the Egyptian customs authority data. Those figures are applied tariffs in 1997 and 2005 at the 2 digits level. Second, exports and imports data come from the Ministry of Industry and Foreign Trade. They represent values (in million Egyptian pounds) of sectoral exports and imports in 1997 and 2005.

4.2. Microeconomic Data

We relate Trade policy measures to household survey from the 1998 and 2006 panel and cross sectional waves from the Egyptian Labor Market Panel Survey 2006 (ELMPS 2006) and the Egyptian Labor Market Survey 1998 (ELMS 1998) conducted by the CAPMAS. "ELMS 1998" and "ELMPS 2006" were carried out on a nationally representative sample of 4816 and 8349 households, i.e. 23,997 and 37140 individuals, respectively. The "ELMPS 2006" is the second round of what is intended to be a periodic longitudinal survey that tracks the labor market and demographic characteristics of the households & individuals interviewed in 1998. There are 3684 households from the original ELMS 98 who were followed and re-interviewed in 2006, hence forming a panel data. Moreover, any new households that might have formed as a result

⁴To remedy for the sensitivity of the estimated industry informality differentials with respect to the omitted industry dummy, we follow Haisken-DeNew and Schmidt (1997) methodology. Therefore, we have calculated the industry informality differentials as deviations from an employment weighted mean as follows

$$ip_j^* = [I - W] ip_j \quad (4)$$

where ip_j^* is the normalized wage differentials, I is an identity matrix and W is a matrix of industry employment weights with each element $w_j = (n_j / \sum_j n_j)$, where n is the number of workers in industry j . Thus, equation 3 is estimated using the normalized industry informality differentials not the estimated ones. In addition, because our dependant variable in the second stage is estimated, we estimate equation (3) with weighted least squares, using the inverse of the variance of the informality estimates from the first stage as weights. Goldberg and Pavcnik (2003) argue that using such weights puts more weight on industries with smaller variance in informality differentials.

of splits from the original households of 1998 were also questioned in the ELMPs 2006 (around 2167 split households), in addition to a refresher sample of households (2498) in order to ensure that the data continue to be nationally representative. Both datasets provide information on individual and household demographic characteristics (age, gender, education level, parental background and household structure), job characteristics (hours-of work, wage earnings, occupation, economic activity, sector of employment ... etc) and region. The available industry of employment related to the trade data are 22 industries per year in the manufacturing sector.

5. Empirical Results

Table 5 and 6 report the marginal effects of the individual and household characteristics on the probability of informal employment, estimated for the cross-section sample separately for 1998 and 2006 and the pooled cross section, respectively. Likewise, trade variables (export performance, import performance and tariffs) were added in these estimations. Individual characteristics include gender, age and its square, education level, marital status and regional dummies while household characteristics include the share of dependants aged 0-14, those aged 65 and above, the share of inactive adults in the household, being head of the household and the household size. We also controlled for one job characteristic which is the membership in a trade union.

Running probit estimations on the cross section sample, separately for 1998 and 2006, confirm the stylized facts explained in section 2. It suggests that, in 1998, women, younger, less educated workers whose region is not in metropolitan areas are more likely to be informal (Table 5). Regional dummies show that Alex and canal cities, though the marginal effect is significant at the 10 % confidence level, decreases the probability of informality relative to the reference region (Cairo governorates). The rural Upper Egypt is the most likely area of informal employment. The household structure did not have any impact on the probability of informal employment in 1998, except that married workers are less likely to be informal at the 5% confidence level. The members in trade unions were significantly less likely to work informally relative to the non-members. Concerning trade variables, the higher the export performance and the import penetration is, the higher the likelihood of working informally is. Surprisingly, the tariff shows positive impact on informality. This finding is different than usually expected that when lowering the tariffs (more trade liberalization), informality increases due to competitiveness impacts (cut costs, mainly subcontracting with the informal sector). One should account for the economic conjuncture to limit the bias of the tariff coefficient that could arise. Interacting the gender dummy with export performance and import penetration gives marginal effects of same direction (positive) but insignificant. However tariff interacted with the gender gives the expected negative sign on informal, but insignificant.

For 2006, while education level and trade union membership keep the same impacts as for 1998 (negative and significant on the probability of informal employment), its results are

different where gender, age and marital status do not play anymore a role in determining the legal status of the job. The likelihood of working informally still decreases in Alex and Canal cities as compared to the reference but the marginal effect become significant at 1% confidence level. Moreover, only the rural part of Lower and Upper Egypt increases the likelihood of informal employment relative to the reference. The higher the share of inactive adults in the household is, the more likely the worker is employed with contracts or with social security coverage. Export performance, albeit positive on the probability of informality, become insignificant but import penetration and tariffs levels still have positive and significant effects as found for 1998.

The pooled cross-section regressions show similar results to 1998's results (Table 6). Individual characteristics are considered as important determinants of informality. More specifically, women, younger, more educated individuals and workers who are not in Cairo or Alex cities have higher likelihoods to work in informal employment than the reference worker. Moreover, rural areas are associated with higher marginal effects on informality and the rural Upper Egypt is the most likely area for informal employment. The results also show that the household heads and workers with higher shares of inactive adults in their households are more likely to be formal. Introducing year 1998 as dummy (i.e. the reference is 2006) shows that the likelihood of working informally was lower in 1998 than in 2006, i.e. informality (working without contracts and without social security coverage) have increased in 2006, *ceteris paribus*. Such finding was also witnessed in Wahba (2009) and Assaad (2007). Trade variables increases significantly the probability of informal employment and the membership in trade unions decreases it, as discussed above in the cross-sectional results.

Table 7 shows the panel sample results which are nearly the same as the pooled cross-section results. Even though, we notice that the marginal effect of education levels gets higher with the educational level, i.e. workers with above than intermediate have more probability to be formal than those with intermediate levels and so forth. As the pooled too, it is noticed that residing in rural areas is associated with higher marginal effects on informality and that the rural Upper Egypt is the most likely area of informal employment. The household structure also affects the legal status of the job where the head of the household and the share of inactive adults are negative and significant. Being married, albeit its marginal effect is negative, is not a significant determinant. Trade union membership still have negative significant impact on informality and trade variables' (export performance, import penetration, and tariffs) keep their positive significant impact.

Table 9 shows the effect of trade variables on industry informality differentials. As it was mentioned above, since we control for worker characteristics in the first stage (and thus control for industry composition each year), our second stage results are not driven by differences in worker composition across sectors. The coefficient on tariff is insignificantly different from 0. This suggests that there is no statistical relationship between tariffs and probability of working in the informal sector. However, the coefficient on export performance is positive and significant. This result is similar to the one found for Brazil by Goldberg and Pavcnik (2003).

Table 5: Probability of Being Informal (Cross Section Regressions)

	1998			2006		
	All	Interaction	Male	All	Interaction	Male
Gender	0.136* (0.0719)	0.0791 (0.283)		0.0440 (0.0513)	0.367** (0.143)	
Married	-0.151** (0.0640)	-0.164** (0.0654)	-0.0943 (0.0760)	-0.000232 (0.0500)	0.00101 (0.0502)	0.0140 (0.0643)
Age	-0.0351*** (0.00983)	-0.0341*** (0.00986)	-0.0422*** (0.0106)	-0.00864 (0.00866)	-0.00958 (0.00867)	-0.0241** (0.00967)
Age Sq.	0.000326*** (0.000113)	0.000317*** (0.000113)	0.000400*** (0.000119)	-5.60e-05 (0.000107)	-4.56e-05 (0.000107)	0.000103 (0.000117)
Less Interm.	-0.109** (0.0468)	-0.106** (0.0471)	-0.0866* (0.0479)	-0.154*** (0.0427)	-0.154*** (0.0429)	-0.122*** (0.0464)
Intermediate	-0.268*** (0.0424)	-0.269*** (0.0424)	-0.231*** (0.0435)	-0.323*** (0.0375)	-0.316*** (0.0379)	-0.275*** (0.0417)
Above Interm.	-0.215*** (0.0544)	-0.212*** (0.0548)	-0.195*** (0.0543)	-0.272*** (0.0464)	-0.271*** (0.0467)	-0.207*** (0.0530)
Alex.	-0.0992* (0.0581)	-0.107* (0.0582)	-0.0747 (0.0608)	-0.153*** (0.0494)	-0.153*** (0.0496)	-0.155*** (0.0546)
Urban Lower	0.0892 (0.0574)	0.0799 (0.0576)	0.0853 (0.0595)	0.0421 (0.0510)	0.0373 (0.0511)	0.0474 (0.0551)
Rural Lower	0.193*** (0.0678)	0.185*** (0.0683)	0.161** (0.0717)	0.172*** (0.0580)	0.175*** (0.0581)	0.176*** (0.0625)
Urban Upper	0.253*** (0.0593)	0.251*** (0.0595)	0.254*** (0.0624)	0.00923 (0.0464)	0.00883 (0.0467)	0.0376 (0.0510)
Rural Upper	0.268*** (0.0745)	0.272*** (0.0744)	0.237*** (0.0801)	0.178*** (0.0544)	0.183*** (0.0545)	0.151** (0.0595)
HH Head	-0.119* (0.0670)	-0.108 (0.0688)	-0.0399 (0.136)	-0.128** (0.0531)	-0.128** (0.0537)	0.0407 (0.123)
HH Size	-0.00972 (0.00861)	-0.00959 (0.00870)	-0.157 (0.122)	-0.00237 (0.00852)	-0.00304 (0.00855)	-0.188* (0.102)
Share of OLF dep. (0-14)	-0.0302 (0.132)	-0.0479 (0.133)	-0.126 (0.264)	-0.0227 (0.111)	-0.0210 (0.111)	0.193 (0.234)
Share of OLF dep. (15-64)	-0.123 (0.117)	-0.129 (0.117)	-0.133* (0.0799)	-0.204** (0.0924)	-0.203** (0.0928)	-0.0845 (0.0706)
Share of OLF dep. (>65)	-0.322 (0.251)	-0.309 (0.252)	-0.00847 (0.00899)	0.0684 (0.216)	0.0751 (0.217)	0.00282 (0.00962)
Member in Trade Union	-0.450*** (0.0318)	-0.451*** (0.0320)	-0.427*** (0.0316)	-0.551*** (0.0247)	-0.552*** (0.0246)	-0.531*** (0.0272)
Exp. Performance	0.487*** (0.178)	0.413** (0.183)	0.424** (0.178)	0.223 (0.140)	0.242* (0.147)	0.237 (0.147)
Imp. Penetration	0.406*** (0.0950)	0.413*** (0.0992)	0.399*** (0.0969)	0.484*** (0.0738)	0.475*** (0.0770)	0.474*** (0.0769)
Tariff	0.0108*** (0.00321)	0.00974*** (0.00343)	0.00923*** (0.00334)	0.00926*** (0.00196)	0.0114*** (0.00228)	0.0118*** (0.00228)
Exp*Gender		1.063 (0.819)			-0.981 (0.619)	
Imp*Gender		-0.236 (0.361)			-0.0717 (0.303)	
Tariff*Gender		-0.00302 (0.0117)			-0.00748 (0.00521)	
Observations	1,057	1,057	931	1,569	1,569	1,352

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6: Probability of Being Informal (Pooled Regressions)

	All	Interaction	Male
Gender	0.0679* (0.0409)	0.0950 (0.139)	
Married	-0.0547 (0.0389)	-0.0569 (0.0390)	-0.0231 (0.0487)
Age	-0.0221*** (0.00631)	-0.0222*** (0.00631)	-0.0343*** (0.00699)
Age Sq.	0.000136* (7.55e-05)	0.000137* (7.55e-05)	0.000261*** (8.18e-05)
Less Interm.	-0.126*** (0.0315)	-0.125*** (0.0315)	-0.0991*** (0.0336)
Intermediate	-0.297*** (0.0280)	-0.296*** (0.0280)	-0.254*** (0.0303)
Above Interm.	-0.244*** (0.0353)	-0.244*** (0.0353)	-0.195*** (0.0387)
Alex.	-0.125*** (0.0375)	-0.127*** (0.0375)	-0.119*** (0.0407)
Urban Lower	0.0639* (0.0378)	0.0621 (0.0379)	0.0666* (0.0404)
Rural Lower	0.186*** (0.0435)	0.186*** (0.0436)	0.177*** (0.0470)
Urban Upper	0.0949*** (0.0362)	0.0959*** (0.0362)	0.119*** (0.0391)
Rural Upper	0.215*** (0.0433)	0.217*** (0.0433)	0.186*** (0.0471)
HH Head	-0.125*** (0.0413)	-0.123*** (0.0415)	-0.0126 (0.0912)
HH Size	-0.00483 (0.00602)	-0.00503 (0.00602)	-0.185** (0.0783)
Share of OLF dep. (0-14)	-0.0501 (0.0842)	-0.0522 (0.0843)	0.0441 (0.174)
Share of OLF dep. (15-64)	-0.197*** (0.0722)	-0.195*** (0.0722)	-0.104** (0.0526)
Share of OLF dep. (>65)	-0.115 (0.161)	-0.113 (0.161)	-0.00148 (0.00660)
Member in Trade Union	-0.508*** (0.0198)	-0.508*** (0.0197)	-0.487*** (0.0209)
Exp. Performance	0.365*** (0.104)	0.327*** (0.109)	0.288*** (0.109)
Imp. Penetration	0.428*** (0.0558)	0.437*** (0.0581)	0.445*** (0.0581)
Tariff	0.00948*** (0.00164)	0.0103*** (0.00184)	0.0112*** (0.00186)
Exp*Gender		0.405 (0.378)	
Imp*Gender		-0.0300 (0.226)	
Tariff*Gender		-0.00393 (0.00417)	
Dummy 1998	-0.0859*** (0.0272)	-0.0900*** (0.0274)	-0.113*** (0.0293)
Observations	2,626	2,626	2,283

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Probability of Being Informal (Panel Regressions)

	Random Effects			Population Averaged		
	All	Interaction	Males	All	Interaction	Males
Gender	0.470** (0.200)	0.172 (0.708)		0.124** (0.0517)	0.0402 (0.186)	
Married	-0.250 (0.190)	-0.258 (0.191)	-0.120 (0.226)	-0.0740 (0.0494)	-0.0757 (0.0496)	-0.0358 (0.0609)
Age	-0.0772** (0.0322)	-0.0764** (0.0321)	-0.114*** (0.0344)	-0.0194** (0.00811)	-0.0192** (0.00810)	-0.0303*** (0.00888)
Age Sq.	0.000468 (0.000382)	0.000462 (0.000381)	0.000828** (0.000396)	0.000113 (9.78e-05)	0.000112 (9.77e-05)	0.000219** (0.000105)
Less Interm.	-0.534*** (0.175)	-0.530*** (0.175)	-0.393** (0.175)	-0.130*** (0.0402)	-0.129*** (0.0402)	-0.0999** (0.0430)
Intermediate	-1.098*** (0.192)	-1.093*** (0.192)	-0.801*** (0.184)	-0.268*** (0.0372)	-0.267*** (0.0374)	-0.206*** (0.0407)
Above Interm.	-1.166*** (0.250)	-1.166*** (0.250)	-0.858*** (0.242)	-0.273*** (0.0421)	-0.272*** (0.0421)	-0.214*** (0.0471)
Alex.	-0.177 (0.202)	-0.187 (0.202)	-0.182 (0.214)	-0.0584 (0.0506)	-0.0611 (0.0506)	-0.0567 (0.0551)
Urban Lower	0.533*** (0.197)	0.530*** (0.198)	0.571*** (0.203)	0.144*** (0.0498)	0.143*** (0.0499)	0.162*** (0.0538)
Rural Lower	0.891*** (0.225)	0.889*** (0.225)	0.845*** (0.228)	0.243*** (0.0543)	0.242*** (0.0544)	0.242*** (0.0595)
Urban Upper	0.796*** (0.202)	0.801*** (0.202)	0.915*** (0.211)	0.218*** (0.0497)	0.219*** (0.0497)	0.261*** (0.0537)
Rural Upper	1.243*** (0.253)	1.245*** (0.253)	1.121*** (0.251)	0.335*** (0.0551)	0.336*** (0.0551)	0.322*** (0.0616)
Share of OLF dep. (0-14)	-0.501 (0.394)	-0.518 (0.395)	-0.289 (0.408)	-0.130 (0.104)	-0.135 (0.104)	-0.0736 (0.111)
Share of OLF dep. (15-64)	-0.736** (0.353)	-0.737** (0.352)	-0.681* (0.370)	-0.207** (0.0921)	-0.208** (0.0922)	-0.197** (0.0993)
Share of OLF dep. (>65)	-1.110 (0.763)	-1.090 (0.763)	-0.423 (0.796)	-0.323 (0.198)	-0.318 (0.197)	-0.142 (0.213)
HH Head	-0.552*** (0.212)	-0.546** (0.213)	-0.410 (0.252)	-0.152*** (0.0527)	-0.151*** (0.0529)	-0.121* (0.0669)
HH Size	-0.0381 (0.0296)	-0.0394 (0.0296)	-0.0410 (0.0308)	-0.0110 (0.00771)	-0.0113 (0.00774)	-0.0121 (0.00835)
Member in Trade Union	-2.246*** (0.288)	-2.254*** (0.288)	-2.063*** (0.285)	-0.455*** (0.0271)	-0.456*** (0.0270)	-0.426*** (0.0285)
Exp. Performance	1.784*** (0.494)	1.668*** (0.513)	1.503*** (0.492)	0.456*** (0.122)	0.423*** (0.127)	0.393*** (0.125)
Imp. Penetration	1.537*** (0.284)	1.540*** (0.294)	1.521*** (0.282)	0.425*** (0.0703)	0.428*** (0.0732)	0.426*** (0.0724)
Tariff	0.0289*** (0.00743)	0.0293*** (0.00827)	0.0308*** (0.00795)	0.00798*** (0.00192)	0.00811*** (0.00214)	0.00861*** (0.00211)
Exp*Gender		1.530 (1.733)			0.431 (0.458)	
Imp*Gender		0.285 (1.091)			0.0690 (0.280)	
Tariff*Gender		-0.00173 (0.0202)			-0.000463 (0.00527)	
Observations	1,654	1,654	1,427	1,654	1,654	1,427
Number of indid	1,228	1,228	1,036	1,228	1,228	1,036

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Two-Step Analysis: Results of the First Stage

	Marginal Effects		Coefficients	
	1998	2006	1998	2006
Gender	0.157** (0.0773)	0.0839 (0.0531)	0.397** (0.196)	0.211 (0.134)
Married	-0.142** (0.0683)	-0.0150 (0.0512)	-0.367** (0.177)	-0.0379 (0.129)
Age	-0.0381*** (0.0106)	-0.00525 (0.00880)	-0.0986*** (0.0272)	-0.0132 (0.0222)
Age Sq.	0.000353*** (0.000120)	-9.19e-05 (0.000108)	0.000913*** (0.000309)	-0.000232 (0.000274)
Less Interm.	-0.0927* (0.0508)	-0.143*** (0.0437)	-0.245* (0.137)	-0.368*** (0.116)
Intermediate	-0.222*** (0.0492)	-0.288*** (0.0397)	-0.609*** (0.145)	-0.759*** (0.112)
Above Interm.	-0.166** (0.0676)	-0.220*** (0.0515)	-0.458** (0.203)	-0.588*** (0.150)
Alex.	-0.109* (0.0632)	-0.159*** (0.0510)	-0.293* (0.177)	-0.416*** (0.140)
Urban Lower	0.0789 (0.0623)	0.0312 (0.0529)	0.202 (0.158)	0.0785 (0.133)
Rural Lower	0.179** (0.0728)	0.143** (0.0622)	0.454** (0.185)	0.359** (0.159)
Urban Upper	0.275*** (0.0629)	-0.0123 (0.0488)	0.703*** (0.167)	-0.0311 (0.123)
Rural Upper	0.294*** (0.0799)	0.156*** (0.0583)	0.755*** (0.219)	0.393*** (0.150)
HH Head	-0.101 (0.0719)	-0.124** (0.0549)	-0.263 (0.187)	-0.314** (0.140)
HH Size	-0.00688 (0.00958)	-0.00221 (0.00879)	-0.0178 (0.0248)	-0.00557 (0.0222)
Share of OLF dep. (0-14)	-0.0479 (0.143)	-0.00858 (0.115)	-0.124 (0.369)	-0.0217 (0.289)
Share of OLF dep. (15-64)	-0.173 (0.127)	-0.198** (0.0952)	-0.447 (0.330)	-0.500** (0.240)
Share of OLF dep. (>65)	-0.403 (0.272)	0.141 (0.225)	-1.044 (0.702)	0.357 (0.568)
Member in Trade Union	-0.460*** (0.0368)	-0.547*** (0.0248)	-1.605*** (0.251)	-1.951*** (0.210)
Constant			2.662*** (0.542)	1.485*** (0.432)
Industry dummies	Yes	Yes	Yes	Yes
Observations	1,003	1,561	1,003	1,561

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9: -Step Analysis: Results of the Second Stage

Industry Informality differentials	
Tariff	-0.0253 (0.0183)
Exp. performance	1.224* (0.660)
Imports penetration	-2.572* (1.379)
Constant	3.547** (1.405)
Year dummy	YES
Sector dummies	YES
Observations	36
R-squared	0.931

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6. Conclusion

This paper proposes an empirical investigation of the effect of trade liberalization on informality in Egypt. Trade reforms are likely to expose formal firms to a fiercer foreign competition. Consequently, such firms try to reduce labor costs by cutting workers benefits, replacing permanent workers with part-time labor and not providing workers with formal contracts or social security. This effect of trade liberalization on the informal sector has been widely discussed at both empirical and public policy levels but was never done empirically in Egypt. Thus, combining a microeconomic dataset (the Egyptian Labor Market Panel Survey) with some macroeconomic variables (on exports, imports and tariffs), we try to assess to what extent different trade reforms affected the informal sector in Egypt. Our main findings show that trade reforms increased informality in Egypt. These results remain robust under different econometric specifications and techniques.

As the informal sector is an important employer in the Egyptian labor market, new mechanisms have to be implemented to attract the informal sector into the mainstream business community. Such formalization should strengthen the competition in the Egyptian market since the informal sector represents a wasted opportunity. Among the mechanisms that may be adopted to formalize the informal sector, the following can be proposed: simplifying the rigid regulations that pushing employers and workers into the informal sector, and promoting public education campaigns through the media to boost the spirit of entrepreneurship. Finally, it is worthy to note that the informal sector should benefit from the trade openness effects when it is formalized.

References

- [1] Assaad, R. (2002a) "Informalization and De-feminization: Explaining the Unusual Pattern in Egypt". Paper presented at the conference on "*Rethinking Labor Market Informalization: Precarious Jobs, Poverty, and Social Protection*", Cornell University.
- [2] Assaad, R. (2002b) "The Transformation of the Egyptian Labor Market: 1988-1998", In *The Egyptian Labor Market in an Era of Reform*, R. Assaad (Ed.), Cairo: American University in Cairo Press, pp. 3-64.
- [3] Assaad, R. (2007) "Labor Supply, Employment and Unemployment in the Egyptian Economy 1988– 2006", Economic Research Forum Working Paper 0701.
- [4] Barssoum, G. (2007) "Egypt labour market panel survey 2006: Report on methodology and data collection", Economic research forum (ERF) working paper 0704.
- [5] Bivens, L. Josh and Sarah Gammage. (2005) "Will better workers lead to better jobs in the developing world?" , In *Good Jobs, Bad Jobs, No Jobs: Labor Markets and Informal Work in Egypt*, T. Avirgan, L.J. Bivens and S. Gammage (Eds.). EL Salvador, India, Russia, and South Africa: Economic Policy Institute, Washington DC, pp.1-30
- [6] El Azzawi, Shireen and Mona Said. (2009) "Trade Liberalization, Inter-industry Wage Differentials and Job Quality in Egyptian Manufacturing", *Gender and Work in the Mena Region*, Working Paper Series, No. 6, August 2009. Cairo: The Population Council
- [7] El-Hamidi, F. (2008) "Trade liberalization, gender segmentation, and Wage Discrimination: Evidence from Egypt", Economic Research Forum Working Paper 414.
- [8] Goldberg, Pinelopi, and Nina Pavcnik. (2003) "The Response of the Informal Sector to Trade liberalization", *Journal of Development Economics* 72: 463–96.
- [9] Haisken-DeNew, J. and Christoph M. Schmidt. (1997) "Inter-Industry and Inter-Region Differentials: Mechanics and Interpretation," *Review of Economics and Statistics*, 79 (3), pages 516–21.
- [10] International Labour Office. (2002) "Decent Work and the Informal Economy", *Report VI, International Labour Conference, 90 st Session*. Geneva: International Labor
- [11] Wahba, Jackline. (2009) "The impact of Labor Market Reforms on Informality in Egypt", *Gender and Work in the Mena Region*, Working Paper Series, No. 3, August 2009. Cairo: The Population Council
- [12] Zaki, Chahir. (2011) "On Trade Policies and Wage Disparity: Evidence from Microeconomic Data", Economic Research Forum, Working Paper 606, August.

Appendix:

Table 10 Characteristics of Informal and Formal Workers, Repeated Cross Sections ELMS 1998 - ELMPS2006

	1998		2006	
	Informal	Formal	Informal	Formal
Female	48.01	23.92	42.05	24.1
Age (mean)	33.62	40.43	33.61	39.74
15-29	44.58	17.95	48.05	21.79
30-49	40.53	60.98	37.24	57.82
50-64	14.89	21.07	14.71	20.4
Education				
Illiterate/Read and Write	59.48	17.04	50.36	13.67
Less Than intermediate	19.65	14.11	18.3	11.6
Intermediate	16.13	29.22	24.87	35.29
Above intermediate	4.74	39.62	6.47	39.44
Total	4,519	3,720	8,814	5,390
Married	55.58	77.91	60.97	80.48
Head	28.16	60.25	33.44	62.82
Hhsize (mean)	6.79	5.37	6.02	4.84
Number of Workers				
0-4	79.93	15.64	57.58	25.77
5-9	11.58	2.71	10	3.45
10-29	3.49	2.61	3.75	2.6
30-49	0.77	1.29	1.09	1.93
50+	1.45	5.8	1.37	7.27
DK/miss	2.79	71.94	26.19	58.98
Stability				
permanent	79.82	96.64	84.38	93.56
temporary	5.62	2.55	5.7	5.75
seasonal	1.49	0.08	0.35	0.06
intermittent	13.08	0.73	9.57	0.63
Medical Insurance	0.36	79.17	0.5	73.02
Economic Activity				
Agr., hunt. & fores.	58.42	2.71	55.23	3.27
Fishing	0.81	0.11	0.72	0.13

Mining & quarry.	0.15	0.4	0.1	0.46
Manufacturing	10.36	15.99	10.43	14.13
Electr., Gaz & water supp.		2.04	0.02	2.32
Construction	7.35	2.47	8.51	2.8
Wholes.& retail trade	12.59	9.46	14.8	9.75
Hotels & Restur.	1.97	1.67	2.51	2.27
Transp., storage & commun.	2.15	9.14	3.65	9.58
Financial intermed.		2.26	0.02	2.3
Real est.,rent.& busin.activ.	0.57	1.24	1.12	1.95
Pub.admin.& def./compul.soci.secur.	0.13	21.74	0.14	19.37
Education	0.37	21.28	0.51	21.84
Health & social work	0.35	5.19	0.41	6.18
Oth.commun.,soci.& person.serv.activ.	4.39	4.22	1.31	3.36
Priv.hh(s) with empl. persons	0.37	0.08	0.52	0.22
Int.Organ.,Embass.&Consul.				0.04
Weekly Hours	34.77	46.55	35.07	47.23
	24.24	14.05	24.82	14.79
Sample	4,559	3,721	8,876	5,390
	55.06	44.94	62.22	37.78

Table 11 Characteristics of Informal and Formal Workers, Panel Data ELMS 1998 - ELMPS2006, All sectors

	Informal	Formal
<i>Individual Characteristics</i>		
Male	54.88	74.79
Age	33.52	40.65
15-29	46.17	18.89
30-49	39.09	59.16
50-64	14.74	21.95
<i>Education</i>		
Illiterate	43.25	7.95
Read & write	9.37	7.23-
Less than intermediate	19.99	12.72
Intermediate	21.38	32.67
Higher than intermediate	2.06	8.98
University complete	3.95	30.46
Married	55.94	78.64
<i>Family background</i>		
Head	29.64	60.39
Household size	6.299646	5.12
<i>Job Characteristics</i>		
<i>Firm Size</i>		
1-4	67.32	21.17
5-9	11.12	3.15
Less than 10 workers	78.44	24.32
10-29	3.59	2.45
30-49	0.84	1.53
50+	1.4	6.31
DK/miss	15.73	65.39
Medical Insurance	0.45	76.64
<i>Job Stability</i>		
Permanent	82.13	95.34
Temporary	6.03	3.99
Seasonal	0.77	0.03
Intermittent	11.06	0.64
<i>Economic Activity</i>		
Agr., hunt. & fores.	54.45	2.82
Fishing	0.9	0.15
Mining & quarry.	0.12	0.54
Manufacturing	10.84	14.89
Electr., Gaz & water supp.	0.01	2.16
Construction	7.84	2.52
Wholes.& retail trade	15.57	9.97
Hotels & Restur.	2.28	1.83
Transp., storage & commun.	2.95	8.64
Financial intermed.	0.03	2.37
Real est.,rent.& busin.activ.	0.87	1.21
Pub.admin.& def./compul.soci.secur.	0.18	21.68

Education	0.46	21.93
Health & social work	0.41	5.45
Oth.commun.,soci.& person.serv.activ.	2.74	3.74
Priv.hh(s) with empl. persons	0.35	0.07
Int.Organ.,Embass.&Consul.		0.03
Weekly Hours of work	35.29	46.64
	(24.80007)	(14.08234)
Sample	7629	5961
	56.14	43.86

Table 12 Transition Probabilities for All sectors, Panel Data 1998-2006

	Informal	Formal	Total
Informal	1,874	429	2,303
	81.37	18.63	100
Formal	241	2,069	2,310
	10.43	89.57	100
Total	2,115	2,498	4,613
	45.85	54.15	100