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INFORMALITY AND POVERTY:
A CAUSALITY DILEMMA
WITH APPLICATION TO EGYPT

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Abstract

This paper analyzed the inverse causality between informality and poverty in Egypt, in addition to the impact of different individual and socio demographic factors affecting both of them. Using the "Egypt Labor Market Panel Survey" (ELMPS) 2012, we studied the impact of individual, socio demographic, household's and firm characteristics, in addition to regional dummies, on the likelihood of being informal wage worker as well as on the incidence of being poor for male household's head. Our results came in line with the literature; informality and poverty are concentrated among the less educated and low skilled occupations in rural areas. Moreover, small firms, with limited access to capital market are more likely to offer informal employment. Our findings revealed that informality in Egypt might be a voluntary and supply led form of employment and not a result of being trapped into poverty.

JEL Classification: J4

Keywords: Informality, Poverty, ELMPS, Egypt

ملخص

نقوم في هذه الورقة بتحليل العلاقة السببية العكسية بين القطاع غير الرسمي والفقر في مصر، بالإضافة إلى تأثير العوامل الديموغرافية المختلفة الفردية والاجتماعية التي تؤثر على كل منهم. وباستخدام المسح التتبعى لسوق العمل في مصر (ELMPS) 2012، قمنا بدراسة التأثير الفردي والديموغرافية الاجتماعية، خصائص الأسرة والمؤسسات، بالإضافة إلى الدمى الإقليمية، على احتمال كونها تتمثل في عامل بأجور في القطاع غير الرسمي وكذلك في احتمال كونهم فقراء لرب الأسرة من الذكور و. وجاءت نتائجنا تتماشى مع الأدب. ويتركز القطاع غير الرسمى والفقر بين المهن الماهرة الأقل تعليما والمنخفضة في المناطق الريفية. وعلاوة على ذلك، فان الشركات الصغيرة، مع وصول محدود إلى سوق رأس المال، تكون أكثر عرضة لتقديم العمالة غير الرسمية. وكشفت النتائج التي توصلنا إليها أن القطاع غير الرسمي في مصر قد يكون شكلا طوعيا من أشكال عرض العمل وليس نتيجة الوقوع في براثن الفقر.

1. Introduction

When the informal sector was first introduced in the 1970s, the common belief was that it existed only in some low-income countries. Informality was explained as a consequence of under-development where inefficient public institutions, burdensome registration processes and a general distrust of the government urged the creation of a market outside a country's formal structures. Therefore, it was assumed that these factors – and hence informal employment – would disappear with economic development (OECD 2009).

However, reality turned out to be different. Informality increasingly spread worldwide. In developed countries, a growing tendency to an "informalisation" of working conditions created informal employment, partly because of increasing international competition in the course of globalization (OECD 2009). In developing countries, informal employment became one of the key characteristics of the labor markets. Large numbers of workers in those countries accept jobs with lower wages, poor working conditions oftenly without access to social security coverage. According to a recent study by the OECD (2009), informal employment worldwide amounts to an average of 60% of total non-agricultural employment. This share varies from about 50% in Latin America, the Middle East and North Africa to almost 70% in South and Southeast Asia, and 75% in Sub-Saharan Africa. So "informal is normal" illustrates very precisely a key feature of today's labor markets worldwide.

This widespread growth of the informal sector during the past decades attracted the attention of researchers and policy makers and nourished a debate on defining its features, measuring its size, and identifying its various consequences economically, socially and politically. On the one hand, in cases of limited employment growth rate in the formal sector, the informal sector is viewed as a safety valve absorbing excess labor and reducing poverty especially in time of crises (Abd El-Fattah 2012). On the other hand, the informal sector may cause negative impacts on some of the main economic and social indicators. At the macro level, high rates of informal employment result in reduction in the tax base and hence reduction in the amount of resources available to address vital social objectives such as the provision of health and unemployment protection. Informality may also negatively affect competitiveness and growth, as informal jobs are believed to be of lower efficiency and productivity. At the micro level, informal employment often means being locked in low-paid, high-risk and unstable activities and hence increasing poverty and low job quality. This is a challenging situation especially for developing countries where labor is by far the most important productive asset of the poor (OECD 2009).

Accordingly, one of the most debated aspects of informality is its role in economic development, and within this debate, a primary place is occupied by the study of the relationship between informal jobs and poverty (World Bank 2006).

The OECD (2009) report stated that the mass of the poor in the world depend entirely on their labor for survival, highlighting the key importance of employment for poverty reduction and economic development. Furthermore, employment is considered the main channel through which economic growth reduces poverty. If employment increases with economic growth, the benefits of growth will be broadly shared among the poor. However, access to employment is not enough in this regard. A study by the International Labor Organization (ILO) suggested that over 500 million employed individuals worldwide live in households whose expenditure falls below the 1 dollar-a-day International Poverty Line (PL) (Kapsos 2004). Thus, the quality of employment also matters for employment to reduce poverty. Since informal employment is, often, unstable, low-paid, and risky it provides low quality jobs and is considered as a poverty trap (Heintz and Vanek (2007). On the other hand, some view the role of the informal sector in providing employment and income opportunities as very important in reducing the extent and intensity of poverty. As although Income levels in the

informal sector are generally low and the dominance of poverty is high, still without this sector the poor would be driven into impoverishment (UNEC and Social Council 2006).

Meanwhile, poverty is considered as one of the determinants of informality. A general lack of formal employment and inadequate coverage and efficiency of social security systems entail that the poor often have to accept any type of job in order to maintain themselves and their families. Moreover, dismissed poor workers often have to move to the first available job even if it is of a lower quality than the previous one (OECD 2009).

Accordingly, there is an overlap between working in the informal economy and being poor. The poor are more likely than the non-poor to rely on the informal economy for their survival; earnings are generally lower in the informal economy than in the formal economy; and a higher share of people working in the informal economy, relative to the formal economy, are poor (Chen et al. 2011). Although there is some agreement around this idea, there is still limited evidence about the interactions between the two phenomena. In this context and given the proliferation of the informal sector worldwide, understanding the links between informal employment and poverty is becoming ever more critical for formulating policies (Heintz and Vanek 2007).

In Egypt -as in many developing countries- persistent poverty and flourishing informal sector are considered of the top economic challenges facing the Egyptian government. Furthermore, they could be of the main reasons that triggered the 25th of January revolution during 2011. According to the Household Income, Expenditure and Consumption Survey (HIECS) for 2012/2013; 26.3 percent of the Egyptian population lived below the National Poverty Line (NPL) of 327 L.E./month per individual.

Poverty varies across different regions in Egypt; the urban frontier governorates witnessed the lowest poverty rate of 11.4%, while rural Upper Egypt governorates showed the highest poverty rate of 49.4% (Figure 1) (Egypt's Central Agency for Public Mobilization and Statistics - CAPMAS 2012/2013).

Concerning the profile of the poor, the data showed that there is high correlation between low education level and poverty. Among the illiterate, 37% are poor while there is only 8% of those who finished universities are poor. The poor mainly exist in large households with more than 10 members where 67% of these households are poor (CAPMAS 2012/2013)

Moreover, the poor cannot afford being unemployed; they suffer from underemployment with low earning per worker hours and harsh working conditions. According to Egypt's Central Agency for Public Mobilization and Statistics (CAPMAS), 2012/2013, 30% of the poor, compared with 15% of the non-poor, have temporary work. Moreover, the poor are mainly working outside establishments; among Egyptians working outside establishments, 36% are poor, while among those working in the public sector, only 13% are poor.

Meanwhile, the informal sector in Egypt is flourishing as it absorbs an important and increasing number of workers. Hence, it is playing an important role in employment creation and income generation in Egypt (El- Ehwany and El-Laithy 2000 and Attia 2009).

According to the Egyptian labor Market Survey (ELMPS) for 2012, 41.5% of workers are without written contracts in urban areas, while this percentage is 59.33% in rural areas. In addition, 40.68% and 59.16% of workers are not contributing to social security in urban and rural areas respectively.

Angel-Urdinola and Tanabe (2012) found that 59.3% of workingwomen are in the informal sector; this rate corresponds to 57.9% for men. Informality is concentrated more among the young; 87.1% of young workers aged between (15-24) have informal employment. Informality is mainly concentrated in the primary sector where there are 94.1% informal

workers. Education is an important factor in describing informality; the less educated is the individual, the higher probability is to be working in informal low earning job. According to the ELPMS (2012), 68.6% of illiterate wageworkers belong to the informal sector, while 85% of wageworkers with university degree are in the formal sector.

Various studies tackled the Egyptian informal sector, its size, characteristics and its relation with other economic variables. Meanwhile, some other studies addressed poverty, its profile and reduction policies. Nevertheless, to our knowledge no study has investigated the link between informality and poverty and the theoretically assumed simultaneous two-way relationship between them, which is the main concern of this paper.

Tackling this issue now is more important than ever given the current policy maker interest and efforts to formalize the informal sector one of which is that the ministry of finance constructed a special unit for this specific target. In this context, the current paper is an attempt to cover this gap in the literature in general and in the Egyptian case in specific. More precisely the paper tries to examine the theoretically assumed link between poverty and informality through answering the following two questions: Is informality in Egypt a major reason for falling into poverty? Furthermore, could the fact of being poor be considered as a main factor for accepting informal jobs?

The paper is organized as follows; the second section reviewed the literature concerned with informality and poverty. Section 3 described the methodology. Section 4 described the data used in the analysis. The estimated results were presented and discussed in section 5 and finally section 6 concluded.

2. Background and Literature Review

The expression "Informal sector" was first used to describe the urban labor force working outside the formal labor market in developing countries in the early 1970s). The usage of the term was operationalized by focusing on "all groups of small self-employed individuals". In the following years, the ILO enlarged this definition; accordingly, informality was distinguished by avoidance of government regulations and taxes (De Soto 1989). In 1993 The ILO defined the informal sector in the 15th International Conference of Labor Statisticians (ICLS) as "activities that are engaged in the production of goods and services with the primary objective of generating employment and incomes to the persons concerned. These activities operate within a small sector, with little division if any between labor and capital as factors of production. Labor relations in these activities are socially determined as opposed to being contractually set with formal guarantees (ILO 1993).

Since then the expression "informal sector" has been very widely used, nevertheless, there was no agreement on how to define or measure it. The literature provided a large number of definitions according to which a common feature of the informal sector is that it occurs outside the legal framework[1] (Angel-Urdinola and Tanabe 2012).

This disagreement around defining the informal sector is partially related to the fact, that it is a heterogeneous concept, where different types of activities co-exist such as the unregistered small firm, the street vendor, and the large registered firm that employs a share of its workers without a written contract (Reis et al., 2009 and Angel-Urdinola and Tanabe, 2012). This heterogeneity was obvious in the failure of the "informal sector", as defined by the 15th ICLS in 1993, to capture the huge increase of unprotected jobs within the formal sector itself. Thus, the 17th ICLS (2003) provided guidelines for the definition and measurement of informal employment, a concept including unprotected jobs in both the formal and informal sectors1 (ILO 2003).

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[1] For a detailed survey of different definition, see Loayza (1997) and Henley et al. (2009).

Accordingly two distinguished terms emerged; *informal sector* and *informal employment*. The "Informal sector" is an enterprise-based concept of the informal economy, which includes all individuals who work in small-unregistered enterprises, both employers and employees, as well as self-employed persons who work in their own or family businesses. In practice, the informal sector is commonly identified by; registration status (is the firm registered with a government/regulatory agency?), or size (firms with fewer than 5-10 employees), or a combination of registration status and size (Heintz and Vanek 2007).

"Informal employment" refers to a broader, job-based concept of informal activities. It is concerned with the characteristics of jobs, rather than the economic units to which they belong (Heintz and Vanek 2007). The 17th (ICLS) defined informal employment as the total number of informal jobs, whether carried out in formal sector enterprises, informal sector enterprises, or households. Hence, Informal employment is comprised of informal employment in informal enterprises (small unregistered or unincorporated) including employers, employees, own-account workers, and unpaid family workers; and informal employment in formal enterprises (domestic workers, casual or day laborers, temporary or part-time workers, industrial outworkers – including home workers – and unregistered or undeclared workers) (ILO 2003). In practice, The informal status of a job is typically determined by whether the worker in that job has access to a defined set of social protection indicators (such as paid leave, an employer-provided pension and contributions to a social security fund); or on the existence of a written, or enforceable, contract; or both (Heintz and Vanek 2007). In the present research, we are using the informal employment as a definition for informality.

 Since the introduction of the term informal economy in the early 1970, there has been an intense academic and political debate over how to conceptualize its role in economic development. Some has a positive view of the informal economy, as it is seen as a 'pool' of entrepreneurial talent, a 'cushion' during economic crises and as a source of livelihood for the working poor. While others view it more problematically, arguing that people join the informal economy intentionally to avoid registration and taxation. In addition, it usually provides low wage, poor quality and indecent jobs and hence it is considered as a poverty trap. Behind these different perspectives are two different hypotheses regarding the nature of informal economy (Harati 2013).

The first considers employment in the informal sector to be supply-led and voluntary[2]. That is, workers voluntarily choose employment in the informal or the formal sector in response to their preferences and the value of their marginal productivity in each sector (Heckman and Sedlacek 1985; Melony 2004 and Packrd 2007). According to this view the link between informality and poverty is not obviously manifested.

The second hypothesis consider the informal economy as a secondary market where all those without access to the primary formal market find themselves[3]. This describes informal

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[2] Different schools of thought have emerged to discuss the nature and the reason of existence of the informal economy. Of these, the following can be viewed as supporting this hypothesis. First, the legalist considered the informal economy as a response to excessive state regulation. They viewed the informal sector as comprised of 'plucky' micro-entrepreneurs who choose to operate informally in order to avoid the costs, time and effort of formal registration (De Soto 1989, 2000; Maloney 2004 and Perry et al. 2007). Second, the structuralist, viewed the informal economy as comprised of subordinated economic units and workers that serve to reduce input and labor costs and, hence, increase the competitiveness of large firms (Moser 1978, Castells and Portes 1989). Finally, a parasitic school focused on illegality of informal activities and considered them as a way to gain an unfair advantage over their formal counterparts (Lewis 2004 and OECD 2009).

[3] The dualist school viewed the informal economy as a set of marginal subsistence activities that have no link to the formal sector. Informal sector is due to surplus labor. Informal activities are seen as operating in separate spheres and in segmented labor (and product) markets (Hart 1973; Lewis 1954).

employment as a job of last resort in order to escape unemployment. Individuals take these jobs when they need to work and cannot find a job in the formal sector because of their personal characteristics, institutional barriers, or labor-market discrimination. This informal market is usually characterized by lower wages, poorer working conditions and poorer career prospects than in the formal sector highlighting the negative effect of informality on poverty (Fields 1975; 1990; Amuedo-Dorntes 2004 and Devincienti et al. 2009).

Accordingly, and in contrast with the first hypothesis, work in the informal sector is demand-led and involuntary. This means that employment in the informal sector is driven by firms' demand for employment and workers' need to find a job, but not by workers' preference for this type of employment. In this context, the failure to cover minimum household food, clothing, shelter, and fuel requirements, as captured by household poverty, associated with the difficulty to get a job in the formal sector, may explain household heads' decision to accept a job in the informal sector. Consequently, household poverty may not only be one of the consequences of low-pay household head's employment in the informal sector, but also one of its determinants (Amuedo-Dorntes 2004; Chen 2008; Lewis 1954; ILO 1972; Sethuraman 1976; Tokman 1978).

Each of these hypothesizes treated the informal sector as homogeneous, assuming free entry and no segmentation of labor market. Although Hart (1973) emphasized the diversity of jobs in this sector, in addition Fields (1975) pointed out that the informal sector is best represented not as one sector but as two qualitatively distinct sectors, it is only recently that economists have adopted the hypothesis of heterogeneity in the informal sector. Fields (2005) presented 3 features of the informal sector labor markets: the informal economy as a last resort sector, the informal economy as a desirable sector and, an informal economy with its own internal dualism combining the first two. It is that heterogeneity of the sector that makes both the direction of the relationship between informality and poverty and the effect of each of them on the other ambiguous; depending on the individual examined belonging to which segment of the informal sector (Harati 2013).

Concerning Poverty, a household is considered to be poor if the total income or expenditure of its members lies below a specific threshold (known as the Poverty Line, PL) which reflects the cost of meeting the family's basic food and non-food needs. Poverty can thus be defined in terms of the monetary[4] value required to attain a particular level of welfare (Abu Ismai et al. 2012).

Poverty as one of the negative consequences of informality is well recognized in the literature. Informality may be one of the causes of poverty if informal jobs are coupled with low incomes. Therefore, a major bulk of the available empirical research has focused on the assessment of the existence of an earnings gap between formality and informality (Devincienti et al. 2009). This could be considered as an indirect examination of informality as a cause of poverty.

The common methodological approach used depends on isolating the effect of informality from those resulting from other income-determinants variables (Devincienti et al. 2009). In this context, most existing studies for developing countries found a formality premium, especially among wage earners. Hence, informality could be considered as one of the causes of poverty.

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[4] It is worth noting that income poverty is not the only deprivation that a household can face; there is as well deprivation from education, health care, clean water,….etc. Such deprivation is captured by measures such as the Human Development Index (HDI) and the Multidimensional Poverty Index (MPI). However this is out of the scope of the current study as it is concerend with income poverty only.

Early studies usually treated the informal sector as homogenous. This group of studies found that formal sector workers are better rewarded for their earning-relevant characteristics than their informal sector equivalent (Mazumdar, 1981 for Malaysia; Heckman and Hotz 1986 for Panama; Roberts 1989 and Gong and Van Soest 2002 for Mexico; Alzua 2008 for Argentina; Carneiro and Henley 2001 for Brazil; Pradhan and Van Soest, 1995 for Bolivia; Badaoui et al. 2008 for South Africa; Blunch 2011 for Serbia; Falco et al. 2011 for Ghana and Tanzania and Tansel 1999, 2000 and Baskaya and Hulagu 2011 for Turkey).

A group of recent studies allowed for heterogeneity in the formal and informal sectors. This was usually done by distinguishing labor inside the formal and informal sector according to employment type (formal wage workers, informal wage workers, formal self-employed and informal self-employed) as well as position in earning distribution (upper-tier jobs and lower –tier jobs) (Tannuri-Pianto and Pianto 2002 for Brazil; Packard 2007 for Chile ; Aris and Khamis 2008 for Argentina; Bargain and Kwenda 2009 for Brazil, Mexico and South Africa; Nguyen et al. 2011 for Vietnam; Tansel and Kan 2012 for Turkey and Harati 2013 for Egypt). The results suggested that formal/informal wage gap depends highly on the employment type and the position in the earnings distribution [5].

On the other hand, studies tackling the impact of informality on poverty directly are rare and descriptive in nature. In sum, most of these studies confirmed the theoretically assumed association between informality and poverty; however, neither the causality nor the direction of the relation is examined. For example, Cartaya (1994) suggested that informality is strongly associated with intensity of poverty in Venezuela. Gasparini and Tornaroli (2007) found that on average the difference in the poverty headcount ratio between informal and formal workers is around 4 times in Latin America. Sastry (2004) reached a similar conclusion for India. However, for the case of Egypt, Attia (2009) considered the informal economy as an engine for poverty reduction and development, he concluded that the ratio of poverty is shocking in Egypt but being involved in the informal sector is better than not working at all.

The inverse relationship, from poverty to informality is less investigated in the empirical literature. At the theoretical level[6], this direction of the relationship is well recognized. The fact that the head of a poor household faces a greater chance to engage in informal employment compared to a non-poor head highlights the involuntary nature of informality. Poor household heads usually cannot afford the entry costs in the formal sector and cannot wait until a formal job is available; their household immediate necessities make the acceptance of an informal job a survival, although second-best, choice. A number of factors (i.e. residential segregation, spatial labor mismatch, labor discrimination) coupled with the condition of poverty may make the prospects of a formal job even less likely. Hence, informality could be considered as the result of some poverty aspects (Devicienti et al. 2009).

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[5] In contrast, a study by Pratap and Quintin (2006) found no difference between formal and informal earnings in Argentina after controlling semi parametrically for individual and employer characteristics. The authors justified reaching different conclusion by two reasons. First, the use of parametric techniques by all previous studies. Parametric rejections of the hypothesis that earning functions are the same across sectors could owe to misspecification, especially since the distribution of worker and job characteristics differs greatly across sectors. On the other hand semi parametric methods require no assumption on the form of earning functions, and limit wage comparisons to observably similar workers. Second, the definition of informality used by previous studies, several of these studies used establishment size in their definition of formal sector employment. Since large establishments tend to indicate formal sector jobs, the reached premium may be no more than a standard size wage premium.

[6] Theoretically, informality could be attributed to micro and macro factors. Micro factors include firm size, productivity and the cost of entering the formal sector Macro factors include economic characteristics such as the tax rate, excessive regulations, weakness of the legal system, corruption, inequality in income distribution, poverty and financial constraints (Abd El-Fatah 2012)

However, to our knowledge most of the empirical studies examining determinates of informality did not consider poverty explicitly as a determinant of engaging in the informal sector[7].

In sum, available empirical studies pointed to individual socioeconomic characteristics, business environment, institutional context and government policies as the main determinants of informality (Traore 2012).

Individual characteristics and family background including gender, age, marital status, household size and parental occupation were found to impact occupational choice and the risk of informality by many studies (Rees and Shah 1986; El Aynaoui 1997; Zerbo 2006; Traoré 2012; Rodin et al. 2012; and Harati 2013). Similarly, results from various studies found that education increases the chances of getting better-paid jobs in the formal sector (Kuepie, et al. 2009; Nguetse Tegoum 2009; Zerbo, 2006; Traoré 2012 and Rodin et al. 2012).

External factors to individuals such as place of residence (rural or urban) and the economic environment (mainly physical and financial endowment, liquidity constrains, inflation, unemployment rate and business cycle) were also found to play a role in the occupational choice (INSD 2003; Zerbo 2006; Loayza and Rigolini 2006; Fiess, Fugazza and Maloney 2010; Traoré 2012; Ogbuabor and Malaolu 2013 and Bosch et al. 2007).

Cogneau (2001) and Zerbo (2006) identified job rationing in the formal sector as an important factor that limits the absorption capacity of the formal economy. Rodman (2007) and Angel-Urdinola and Tanabe (2012) highlighted the importance of the size of the public sector and the size of the agriculture sector as main determinants of informality.

Finally, institutional context was detected to be important in understanding occupational choices. Studies confirmed a positive effect of: excessive labor market and intellectual property rights regulation, high rate of taxation, inefficient social security system, inadequate business environment and governance failure on informality (Perry and al. 2007; Maloney 2004;DCED 2009; Andrews and al. 2011; Jütting and al, 2008; Schneider 2007; Oduh et al 2008; Ogbuabor and Malaolu 2013; Galal 2004 ; Loewe 2000 and Harati 2013).

Only recently have empirical researchers tried to examine the simultaneous two-way relationship between poverty and informality, which is the focus of this study. Amuedo-Dorantes (2004) used cross sectional data and static probit model with sample selection for Chile. The study examined the role of household poverty on the decision by household heads to work in wage and salary jobs in the informal sector, as well as the immediate implications of this form of employment on their families' poverty status. The study concluded that household poverty increased the likelihood of employment in the informal sector by approximately 3% among male household heads and by 6% among female household heads. In addition, it was shown that having an informal job enhanced the probability of becoming poor by 8% among male-headed households and by 4% among female-headed households.

Devicienti et al. (2009) studied the dynamics of poverty and informality for Argentina. They estimated a bivariate dynamic random effect probit model using panel data covering the period 1996-2003. They argued that the interconnection between informality and poverty is dynamic in nature. In particular, they examined whether being employed in an informal job in the past may lead to poverty in the future and whether experiencing episodes of poverty may

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[7] This is perhaps because examining the link between poverty and work in the informal sector is complex as poverty is usually measured at the household level, while information on employment, human capital, and personal characteristics affecting work is available at the individual level. In an attempt to address this problem, the analysis is carried out at the household level using employment, human capital, and personal information on household heads (Amuedo- Dorantes 2004).

lead to episodes of informality henceforward. The results showed that both poverty and informal employment are highly persistent processes at the individual level. Moreover, positive spillover effects are found from past poverty on current informal employment and from past informality to current poverty status.

Concerning Egypt, the empirical literature on the informal sector tackled the issue from various angles. Some focused on measuring the size of the informal sector, some studied its characteristics and transition between formal and informal sectors, while few others examined the relation between informality and other economic variables.

Results of studies trying to measure the size of informal sector in Egypt reached relatively different figures according to the definition of the informal sector, analysis period and the measurement approach used. However, a common conclusion was reached by these studies indicating a considerable size of informal sector in Egypt. According to Ernste and Schneider (1998), who used the electricity approach the informal sector accounted for 68 % of GDP in Egypt. While Schneider and Klinglmair (2004), estimated the informal sector at 35.1 % of GDP based on the currency demand approach. In Schneider and Buehn (2009), the informal sector was estimated to account for 36.5 % of GDP based on the latent variable approach.

Another group of studies measured the size of informal sector in term of employment. Moktar & Wahba (2000) found that non-agricultural workers engaged in informal jobs increased by 5 to 6 percentage points in the 1990s. They also indicated that new entrants to the labor market who started their job in the informal sector increased from 20% in the early 1970s to 69% in the 1998. This result was confirmed by a more recent study, McCormick and Wahba (2004) who found that the predicted probability of a new entrant being informal in 1998 was 8 % more than in 1990. Similarly, Economic Research Forum (ERF) (2004) indicated that 65 % of the jobs taken up by the new entrants to the labor force in 1998 were informal, compared to 40 % in the mid-1980s.

El Mahdi (2002) showed that informal enterprises in 1998 compromised 83.6 % of the total number of small enterprises. Moreover, the formal units increased between the 1988 and 1998 by 8.7 %, while the informal units grew by 14.1 % in the same period. As for the informal wageworkers, the study showed that informality among wage workers in the public sector decreased from 38.6 % in 1988 to 34.6 % in 1998. While informality among the private sector wageworkers did not change in the two years, as it remained at around 81% of total private sector wageworkers. This increase in informal employment was attributed to privatization and the diminishing role of the state. Furthermore, the author identified significant gender differences in both the formal and informal sectors. Assad (2006) estimated informal employment to account for 55 % of total non-agriculture employment in Egypt. Finally, Attia (2009) indicated that the informal enterprises in Egypt constitute 82% of the total number of economic units and the informally employed 40% of the total labor force for 2006.

Amin (2009) examined efficiency of the informal sector. The study estimated average productivity of labor in informal firms and found that firms that are established as a way of taking advantage of business opportunities i.e. voluntarily are more efficient than those that are established because the owner cannot find an alternative job i.e. involuntarily.

Another group of studies examined the sectoral choice and the determinants of informal employment for Egypt. Wahba (2009a) focused on the effect of the labor law 12/2003 on formal employment in the private non-agricultural sector. The study showed that the labor law had a positive impact on those who were informally employed in 1998 and no significant impact on new entrants. In Addition, Wahba (2009a) argued that declining fertility and mortality coupled with the increasing share of the youth population who attain tertiary

education (notably among women) are also important factors contributing to the expansion of informal sector in Egypt.

Wahba (2009b) concluded that moving from informal to formal employment is determined by two factors: education and gender. Where holders of higher education compared to illiterates, and males versus females, have a higher probability to shift to formality. Accordingly, the author considered informal employment as a stepping-stone for highly educated male workers, and a dead end for the uneducated and female workers. This conclusion was supported by El Mahdi (2010) who viewed the informal sector as the house of the uneducated.

Galal (2004) tried to explain why Egyptian entrepreneurs choose to stay informal and assessed the expected welfare impact of formalization on different economic agents using a partial equilibrium model. He concluded that under the current regulatory framework, formalization is not sociably wanted, although the potential net benefits of formalization may become positive conditional on reforms implementation.

Abd El-Fattah (2012) investigated the determinants of job satisfaction, profitability and informality in the informal sector in "Manshiet Nasser", which is a mostly informal area. Results revealed that for employers, longer working hours increased their incentives to stay informal as they enjoy higher profitability, higher education attainment reduced employers' incentives to stay informal and employers in trade and services had a lower probability to continue being informal compared to the manufacturing sector. As for employee, results indicated that only working days had a significant negative effect on continuing as informal.

Angel-Urdinola and Tanabe (2012) assessed the main micro determinants of informal employment for some countries in the Middle East and North Africa (MENA) region. Using probit model, the results for Egypt showed that urban workers are 9.5 % less likely to be employed informally than otherwise similar workers in rural areas. Being a male worker is associated with a 12 % lower probability of being employed informally; being married is associated with a 13.9 % lower probability of working in the informal sector. Adults thirty-five and older are 29.2 % less likely to work in the informal sector than youth aged fifteen to twenty four. More education is associated with a lower probability of being employed in the informal sector. Most interesting is that public sector employment was perhaps the most important determinant of informality; workers in the public sector are associated with 59 % higher probability of working formally compared to otherwise similar workers in the private sectors. Finally, the results indicated an important association between informality and firm size, workers in medium size (large size) firms are 15.9 (32.4) % less likely to work in the informal sector compared to workers in small size firms.

Finally, Harati (2013) tried to explain the development of the Egyptian informal sector allowing for the heterogeneity of informal jobs and therefore the existence of different segments within the informal sector using a mixture model. He concluded that the Egyptian informal labor market in 2006 was composed of two segments with distinct wage equations. An interesting finding was that the size of the wage gap for those formal workers who optimally would work in the informal sector was not big enough in order to attract them to take risks and work informally. The non-monetary benefits offered by formal jobs after law 12 as stability and no moral judgment compared to informal employment were particularly important to offset this financial gap.

Nevertheless, to our knowledge no study has investigated the poverty and informality link in Egypt. This would be the contribution of the present research by studying the simultaneous two-way relation between poverty and informality in Egypt.

3. Methodology

Theoretically- as previously mentioned- informality and poverty are assumed to affect each other in both directions in addition to other factors that affect both of them. On one hand, low earnings resulting from informal employment is a major reason for household poverty. On the other hand, household poverty may be a reason for household head to accept informal work, as he or she cannot afford being unemployed.

More over both informality and poverty are affected by other factors including individual's characteristics, household's characteristics and some firm and regional characteristics. Individual characteristics include the respondent's age, gender, education and his or her parents' education. Education is considered to be an important determinant of both informality and poverty; as better-educated workers are supposed to be more productive and can be offered good opportunities and well-paid jobs (Amuedo-Dorantes 2004). Another group of factors affecting the likelihood of being poor and working in the informal sector is the household's characteristics such as its size, number of siblings and number of households' members working. Although, poverty increases with household size, according to Amuedo-Dorantes (2004), larger family increases the reservation wages of the household's head, which decrease the likelihood of accepting low earning informal job. Finally, some firm and regional characteristics often enhance the employer's likelihood of offering wage and salary employment in the informal versus the formal sector. For instance, smaller firms with limited access to borrowing markets might be more likely to hire workers on an informal basis. Similarly, regional characteristics, such seasonality of activities in certain regions (agricultural, tourism, etc.), might influence the number of wage and salary workers hired on an informal basis to carry out short-term tasks. In addition, poor households are mostly concentrated in rural areas mainly characterized by agriculture employment.

Modeling this inverse relationship between poverty and informality is usually challenging. First, this inverse causality may lead to endogeniety problem, which would result, into biased estimated coefficient when using Ordinary Least Squares (OLS). In order to take this problem into consideration we used instrumental variables (IV) technique. Second, working in the informal sector is mainly an individual choice of each household's member. However, poverty is usually computed at the household level where the household composition, the earning of the different members and their basket of consumption are taken into consideration. To overcome this challenge, we will follow Devicienti et al (2009), by focusing our analysis on a sample of household's head. We will compare the per capita expenditure per month of the household's head with the national poverty line to determine his or her poverty status (El- Ehwany and El-Laithy 2000).

Accordingly, both household poverty and job informality can be modeled as follows:

$$Informality_i = \beta_1 Poverty_i + \beta_2 F_i + \beta_3 I_i + \beta_4 R + \varepsilon_i; \qquad (1)$$

$$Poverty_i = \alpha_1 Informality_i + \alpha_2 H_i + \alpha_3 I_i + \alpha_4 R + v_i; \qquad (2)$$

Where

- The dependent variables in equations (1) and (2) $Informality_i$ and $Poverty_i$ are the probability that the household's head, i, is working in an informal job and the probability of the household's head, i, being poor respectively.
- As for the exogenous variables, $Poverty_i$ in equation (1) enters as a dummy variable that *equals* 1 if per capita expenditure of the household's head, i, is below the national poverty line, 0 otherwise. While $informality_i$ in equation (2) is a dummy variable that takes the value 1 if the individual, *i,* is working in informal employment, 0 otherwise. We

consider an individual working in informal employment if she/he has neither a contract nor social security.

- Other exogenous variables affecting both sides include, household's characteristics (H_i) such as number of other households member working with respect to the household size. Personal demographic (I_i) of the household's head i; such as age, his/her education, his/her parents education level and work-related characteristics (F_i), such as size of the firm where she is working.

- The vector R refers to a vector of location-specific characteristics.

- α and β are the parameters to be estimated; α_1 reflects the impact of working in informal employment on the likelihood of poverty while β_1 measures the impact of being poor on the likelihood of informality.

- The two-error terms ε_i and v_i are assumed to be independent and normally distributed.

As described above, given the inverse causality between poverty and informality in both equations (1) and (2), $Poverty_i$ may be correlatd with ε_i in equation (1) and $Informality_i$ may be correlatd with v_i in equation (2), therefore both regressors, poverty and informality, are considered as endogenous. To correct for endogeniety, both equations will be estimated using maximum likelihood probit model with instrumental variables. The informality equation is identified by the exclusion of the number of other household's members working with respect to the household size. While the number of other household's members working is likely to affect head's likelihood of being poor, they are not, by themselves, determinants of the likelihood of household head informal employment other than through household head's poverty. Similarly, equation (2) is identified by the exclusion of the factor variables of the size of the firm where the head is working. Firm size is found to be highly correlated with the incidence of wage and salary informal employment, but not with the likelihood of being poor.

Finally, as robustness check, we re-estimate the same model with sample selection for both equations, to account for the selection problem into wage –workers in private sector[8]. More precisely, we first estimated equation 1 (equation 2) as a linear probability model without the poverty (informality) variable. In the second step, the estimated poverty and informality status from step one are included as exogenous variable in both equations (1) and (2), respectively, these two equations are then estimated as probit model with sample selection. The sample selection equation for being a wageworker, in the private sector, includes age, age squared, education level, occupation, father's employment as wageworker, parents' education and regional dummies. For the model to be well identified, the father's employment as wageworker is included in the selection equation but not in the probit equations [9].

4. Data

The data used in this paper is drawn from the Egyptian labor Market Panel Survey (ELMPS) for 2012. The ELMPS is carried out by the Economic Research Forum (ERF) in cooperation with CAPMAS since 1998. The ELMPS 2012 is the third round of a periodic longitudinal survey that tracks the labor market and the demographic characteristics of households and individuals interviewed in 2006, both individuals included in the ELMS 1998 and individuals added in 2006, as well as a refresher sample of 2,000 new households to ensure that the data continues to be nationally representative, a total sample of 12,060 households and 49,186

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[8] Moreover, for robustness checks a selection model with bootstrap was performed to correct the standarred deviation. Results are available upon request.

[9] Other exclusion variables for the selection equation including parents education were also used, however this didn't affect our results hence we reported only results for the selection equation including only father's employment as wageworker as our exclusion variable.

individuals. The ELMPS is a wide-ranging, nationally representative panel survey that covers topics such as parental background, education, housing, access to services, residential mobility, migration and remittances, time use, marriage patterns and costs, fertility, women's decision making and empowerment, job dynamics, savings and borrowing behavior, the operation of household enterprises and farms, besides the usual focus on employment, unemployment and earnings in typical labor force surveys.

Our focus is on male household head private sector wageworkers. We focus on this specific type of employment in the informal sector- i.e. the wageworker -because it is believed that it has potentially serious implications for workers' well being as opposed to employers or self employed. We restricted our sample to male head wageworker, as the incident of a female head wageworker in the Egyptian case is very rare. According to ELMPS 2012 sample, out of 6060 head wageworkers only 3% were females. In addition, almost all male head informal wageworkers (99%) are in the private sector. Therefore, our analysis will focus on male head wageworkers in private sector. This leaves us with a sample of 3437 male head wageworker in private sector.

As explained above, we consider individuals who have social security or a work contract or both as formal wageworker. Among the 3437 male head wageworkers in private sector, 73% are working in the informal sector, 98% are married and with an average age of 36, 36 and 37 years old for the whole sample, informal workers and formal workers respectively, indicating that informality is concentrated more among the young.

Concerning the poverty status; we used the estimates for individual poverty in the ELMPS 2012 from Assaad et al (2014). We found that among the 3437 male head wageworkers in the private sector, 23% are poor. This poverty rate reached 28% among the informal male wageworkers in private sector compared to only 9% poor among males in formal private wageworkers.

Figures 2 and 3 show the distribution of the informal wageworkers in the private sector and the poor among the different education levels, respectively. Both informal wageworkers and the poor are mainly concentrated in the first three education levels; illiterate, basic education or secondary. There is 36% of informal wageworkers, in the private sector, with secondary education level, 28% illiterate and 21% with basic education. While for the poor, 43% are illiterate, 32% had secondary education and 17% had basic education. Individuals with high level of education had lower incidence of working informally or falling into poverty; only 7% of the informal wage workers in the private sector and only 1% of the poor had university education or higher.

Most of the informal (40%) and the poor (40%) wageworkers work in crafts occupation. Agricultural occupation came in the second level, as 31% of the poor and 24% of the informal wageworkers are skilled agricultural, forestry and fishery workers. Almost no managers or professionals work informally or fall into poverty (Figure 4). Moreover, informal wageworkers are mainly concentrated in small firms, 57% of them worked in firms with less than 5 employees, while only 4% worked in large firms with 100 or more employees.

Poverty and informality vary across the different regions of Egypt. Poor wage workers are concentrated in Rural Upper Egypt with 56% of the poor living there. Followed by Rural Lower Egypt and Urban Upper Egypt with 20% and 19% of the poor, respectively. Informal wageworkers are concentrated in rural areas as well with 31% and 32% in Rural Upper Egypt and Rural Lower Egypt, respectively.

5. Results

Using ELMPS (2012), the probit models for both poverty and informality status of male household's head, are estimated using instrumental variables technique. Probit models with selection are estimated as well for robustness check. Table 1 displays the estimated marginal effects of poverty and informality in equation (1) and equation (2) respectively[10]. Our results showed that poverty is not significantly affecting the probability of working in informal private sector. While being an informal wageworker in the private sector significantly increases the likelihood of falling into poverty[11]. It worth noting that taking selection into consideration did not affect our results[12]. However, the estimated marginal effects of both poverty and informality, from simple probit model without correcting for endogeniety or sample selection, are positively significant.

Concerning the other determinants of the likelihood of working informally and falling into poverty, we will report here the estimated marginal effects obtained from the probit models with instrumental variables[13]. For informality, we found that a U-shape relation existed between the likelihood of being informal wageworker in the private sector and the respondent's age. While, the relation between the likelihood of being poor and age had an inverse U-shape.

In accordance with the literature, poverty is more likely among the illiterates. Having any education level, as compared to being illiterate, decreased the likelihood of falling into poverty. However, only University and Post University education, as compared to being illiterate, had significant negative impact on informality.

Informality and poverty are concentrated in low skilled occupations. Being skilled agricultural, forestry and fishery workers increased the probability of being poor and being informal wageworkers, relative to being crafts and related workers. Other occupations; such as managers, professionals, clerical supports, service and elementary occupations, decreased significantly the probability of being informal wageworker when compared to being in crafts or related workers occupation. While for poverty, only technicians and associate professionals, relative to being crafts or related workers, had a significant negative impact on the likelihood of being poor.

Mother's education is found to be insignificant for both informality and poverty of the households' head. A father with secondary education or higher, relative to illiterate father, decreased the probability of being informal wageworker as well as the probability of being poor. However a father with basic education decreased the likelihood of being informal with no significant impact on poverty.

As expected, small firms with 5 to 9 employees increased the likelihood of being informal, while, working in large firms, with 10 employees or more, decreased the likelihood of being informal wage worker in private sector, compared with working in small firms with 1 to 5 employees. The likelihood of falling into poverty decreased with the number of other households' member working with respect to the household size.

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[10] Simple Probit model is estimated as well for each equation without taking endogeniety or selection into consideration.

[11] Tests of endogeniety and weakness of the instrumental variables are performed for each model. Results are available upon request.

[12] It is worth noting that results for the probit with selection showed that selection is insignificant in poverty while selection into wage worker was significant and positive in informality implying that the unobservable that affect informality are correlated with unobservable that affect being a wage worker, hence being a wage worker increase the probability of being informal.

[13] For more details about the estimated marginal effects of simple probit, probit with IV and probit with sample selection, see Appendix 1.

Finally, we found that the regional context is significantly affecting the likelihood of being informal wageworker and the likelihood of falling into poverty. Living in Alexandria and Suez Canal governorates, compared with living in Great Cairo, decreased the likelihood of being poor with no significant impact on informality. The informal wageworkers are concentrated in Urban Lower, Rural Upper and Rural Lower Egypt, compared to Great Cairo. While, living in any other region, as compared to live in Great Cairo, increased the likelihood of falling into poverty,

6. Concluding Remarks

This study was an attempt to study the inverse causality between being informal private wageworker and being poor in Egypt. Using ELMPS (2012). The likelihood of being informal wageworkers in private sector and the likelihood of being poor were estimated taking into consideration endogeniety and sample selection.

The results reached raise two main conclusions. **First**, when endogeniety and selection effect are taken into account, results uncovered that poverty is not affecting the likelihood of informal wage employment. While, there is weak evidence that informality is a significant determinant of the incidence of falling into poverty. This result is confirmed whatever the estimation method used. These findings support the view that being informal wageworker is a voluntary and supply led form of employment (Amuedo-Dorantes 2004). Since it is evidence that poverty is not a significant determinant of informal employment, it can be concluded that informal wageworker in Egypt choose to work in the informal sector not primary because they are poor and need a job but because they prefer being informal. However this type of employment has a weak effect on falling into poverty.

This result has important implication for policies that aim at formalization in Egypt. Since working informally may lead to poverty, it is a priority to target formalization. However several points should be taken into consideration when doing so. First, reasons for preference to stay informal should be identified. Second necessary incentives and other mechanisms targeting these reasons and making formalization more affordable and appealing to informal economy workers and economic units need to be created. In other words, policies should create an environment in which the benefits of formalizing outweigh the costs of remaining informal (de Medina, 2006). Such incentives may include improvements in the accessibility to micro-finance, improvements in labor standards and legislation, social protection and worker benefits, secure property rights, stronger and more representative informal sector associations that can add the voice of informal workers to the policy process (de Medina, 2006). And finally, these policies and legal frameworks facilitating appropriate formalization need not only to be developed but, more crucially, implemented (de Medina, 2006). Such policies will not only reduce informality in Egypt, it will reduce poverty as well given the significant positive impact of informality on poverty.

Second, concerning other common factors affecting both informality and poverty, education is an important determinant of informality as well as poverty. Poverty and informality in Egypt is found to be concentrated among the less educated and low skilled occupations. Highly educated individuals are able to get well-paid opportunities in the formal sector. In addition, the regional context was found to be a significant determinant of both poverty and informality, where poor households are concentrated in rural areas. While for informality, small firms with limited access to borrowing markets represented a major obstacle facing formality in Egypt.

In sum, poverty and informality are two major challenges facing the Egyptian economy. Our models' findings confirmed that some common determinants are affecting both poverty and informality. Hence, we can conclude that both issues should be addressed simultaneously. Investing in human capital is an important factor that would decrease both informality and

poverty together. Developing rural areas and access to capital market are other factors that should be taken into account while facing poverty and informality in Egypt.

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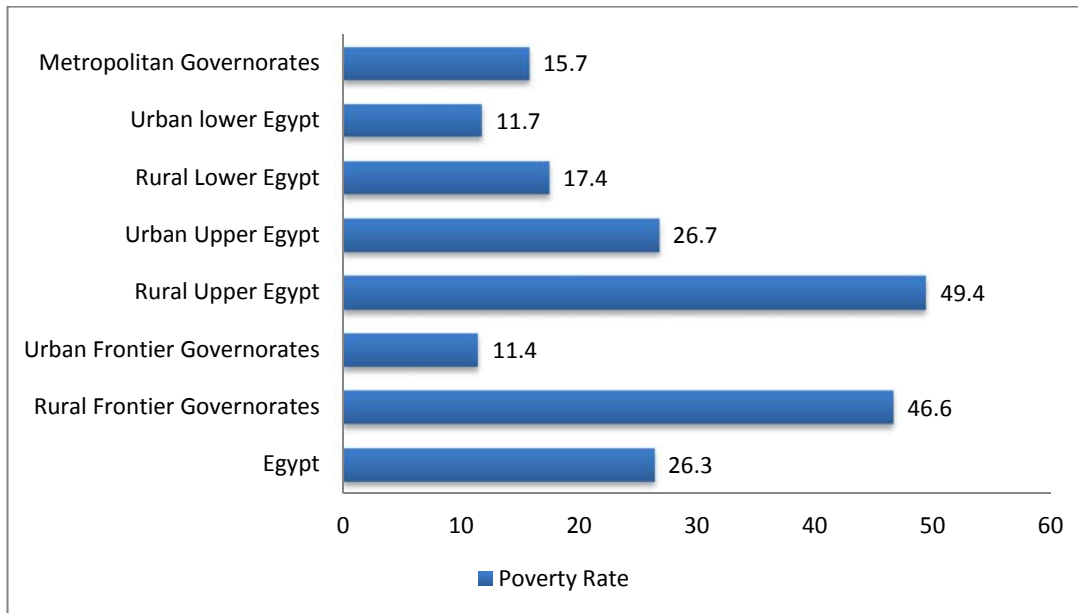
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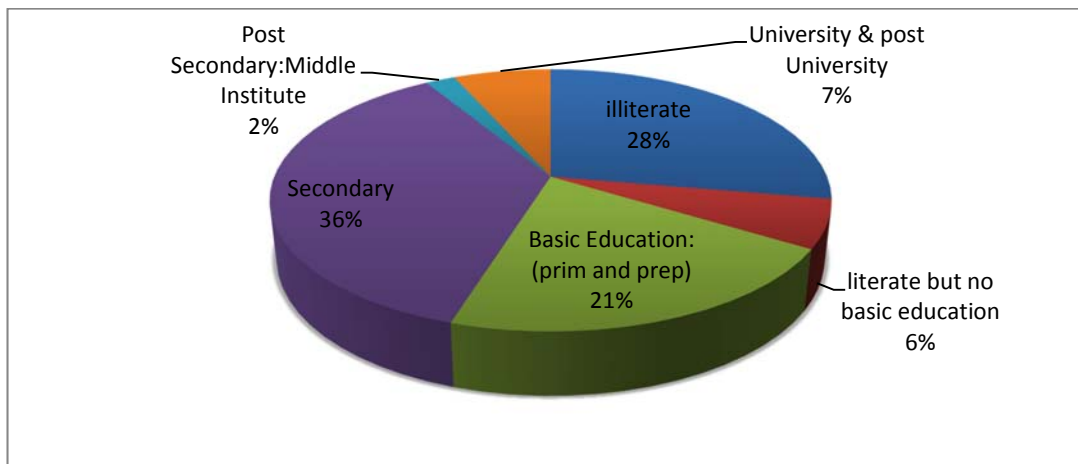
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**Figure 1: Poverty Rate (%) in the Different Egyptian Regions in 2012/2013**

Figure 2: Distribution of the Informal Male Wageworker in the Private Sector According to the Education Status

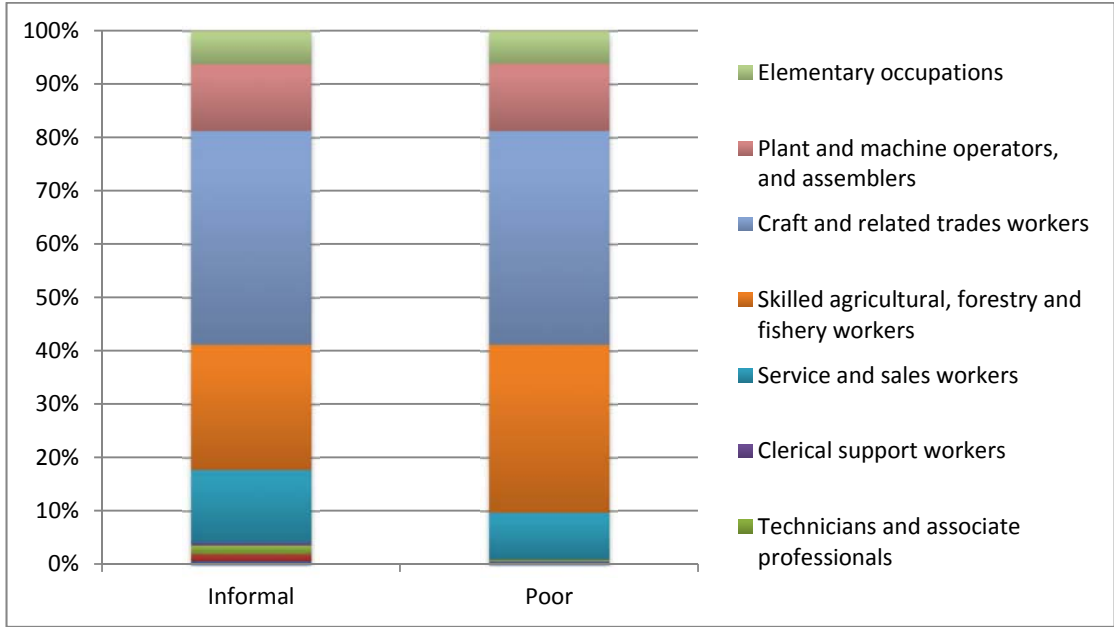**Figure 3: Distribution of the Poor Male Wageworker in the Private Sector According to the Education Status**

Figure 4: Distribution of the Informal and Poor Male Wageworker of the Private Sector According to Their Occupation

Figure 5: Distribution of the Poor and Informal Wage Workers according to the 6 Egyptian Regions
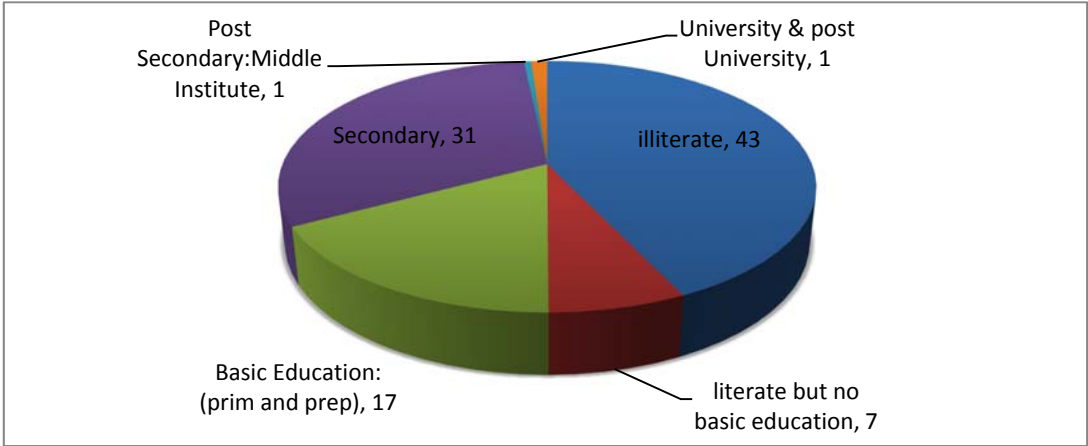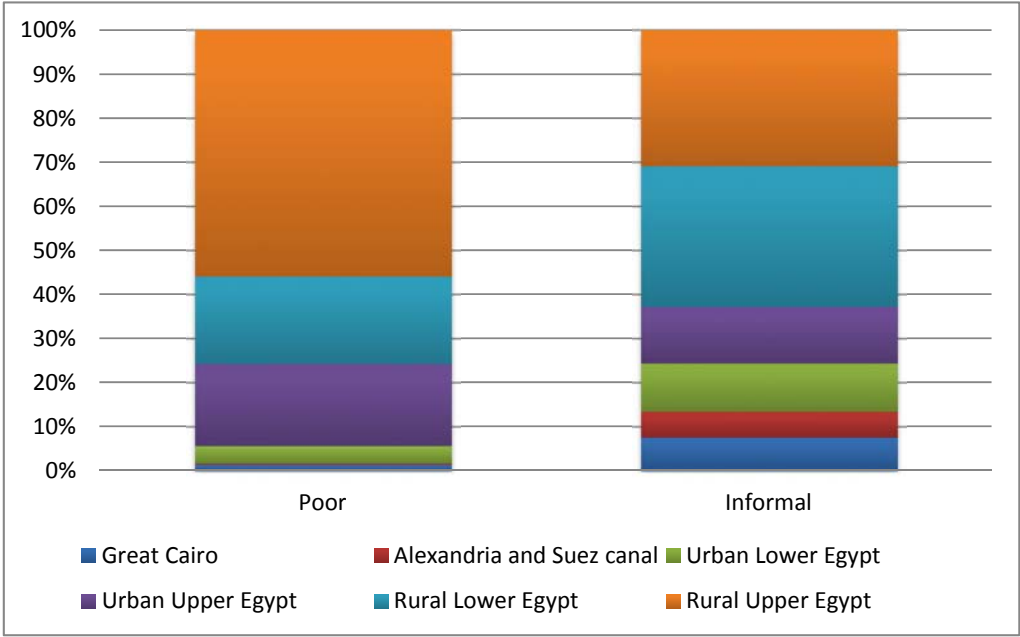
Source: calculated by the authors using ELMPS2012

Table 1: Estimated Marginal Effects of Poverty and Informality

	Probit	Probit with IV	Probit with selection
Pr(informal=1)			
Poverty	0.04540***	0.02785	0.00819[1]
	0.01712	*0.05443*	*0.36000*
Pr(poverty=1)			
Informality	0.05092***	0.07811*	0.03112*[2]
	0.01769	*0.04096*	*0.01653*
N	3437	3437	8267

Notes: Standard Errors are in bold and italic. *** p<0.01, ** p<0.05, * p<0.1. Poverty Variable used in the heckman regression is the estimated value obtained from a linear regression of the poverty on the same regressors in addition to the number of household members working with respect to the household size. Informality Variable used in the heckman regression is the estimated value obtained from a linear regression of the informality on the same regressors in addition to the firm sizes.

Appendix A: The Estimated Marginal for the Three Regression Models for Informality and Poverty

Table A1: Estimated Marginal Effects of Informality Models

Probability (informal=1)	Probit	IV Probit	Heckman Probit [1]
Poverty	0.045***	0.028	0.008
	0.017	*0.054*	*0.22*
Age	-0.02***	-0.01***	-0.019***
	0.004	*0.004*	*003*
Age Squared	0.0001***	0.0001***	0.0001***
	0.00004	*0.00005*	*0.00003*
Education Level (Reference: Illiterate)			
Literate but no basic education	-0.039	-0.041	-0.058***
	0.026	*0.027*	*0.018*
Basic Education: (prim and prep)	-0.011	-0.013	-0.040***
	0.019	*0.02*	*0.013*
Secondary	-0.013	-0.015	-0.043***
	0.018	*0.019*	*0.012*
Post Secondary:Middle Institute	0.026	0.021	-0.044*
	0.036	*0.038*	*0.024*
University & post University	-0.054**	-0.059**	0.01
	0.025	*0.028*	*0.018*
Occupation (Reference Category: Crafts and related work)			
Managers	-0.277***	-0.276***	-0.523***
	0.043	*0.043*	*0.021*
Professionals	-0.267***	-0.266***	-0.456***
	0.03	*0.03*	*0.018*
Technicians and associate professionals	-0.223***	-0.225***	-0.387***
	0.027	*0.027*	*0.017*
Clerical support workers	-0.179***	-0.179***	-0.320***
	0.04	*0.04*	*0.027*
Service and sales workers	-0.123***	-0.123***	-0.167***
	0.018	*0.018*	*0.013*
Skilled agricultural, forestry and fishery workers	0.064**	0.064***	-0.099***
	0.026	*0.026*	*0.015*
Plant and machine operators, and assemblers	-0.242***	-0.243***	-0.141***
	0.015	*0.015*	*0.012*
Elementary occupations	-0.113***	-0.112***	-0.222***
	0.021	*0.021*	*0.014*
Parents Education: Reference No Education			
Your father has basic education?	-0.042**	-0.043**	-0.055***
	0.018	*0.018*	*0.013*
Your father has secondary education or higher?	-0.048**	-0.049**	-0.019
	0.022	*0.022*	*0.016*
Your mother has basic education?	0.025	0.025	0.014
	0.027	*0.027*	*0.020*
Your mother have secondary education or above?	0.015	0.016	0.023
	0.029	*0.029*	*0.020*
Firm Size (Reference: 1-5 employees)			
firm size (5-9)	0.037**	0.037**	0.014*
	0.019	*0.019*	*0.008*
firm size (10-24)	-0.060***	-0.060***	-0.026***
	0.019	*0.019*	*0.008*
firm size (25-49)	-0.102***	-0.103***	-0.044***
	0.024	*0.024*	*0.01*
firm size (50-99)	-0.188***	-0.188***	-0.079***
	0.024	*0.024*	*0.01*
firm size (+100)	-0.318***	-0.318***	-0.135***
	0.014	*0.014*	*0.01*
Region: (Reference: Great Cairo)			
Alx, Suez Canal	-0.015	-0.016	-0.056***
	0.022	*0.022*	*0.016*
Urban Lower	0.037*	0.037*	-0.061***
	0.021	*0.021*	*0.015*
Urban Upper	0.029	0.034	-0.079***
	0.022	*0.026*	*0.017*
Rural Lower	0.040**	0.042**	-0.072***
	0.018	*0.019*	*0.013*
Rural Upper	0.072***	0.078***	-0.062***
	0.021	*0.029*	*0.017*
Is your father a wage worker?			0.048***
			0.008
N	3437	3437	8267

Notes: Standard Errors are in bold and italic. *** p<0.01, ** p<0.05, * p<0.1. (1) Poverty variable used in the Heckman regression is the estimated value obtained from a linear regression of the poverty on the same regressors in addition to the number of household members working with respect to the household size.

Table A2: Estimated Marginal Effects for Poverty Models

Pr(Poverty==1)	Probit	IV Probit	Heckman probit[1]
Are you informal wageworker in private sector?	0.051***	0.078	0.031
	0.018	*0.041*	*0.017*
Age	0.011***	0.012***	0.0004
	0.004	*0.004*	*0.002*
Age Squared	-0.0001***	-0.0001***	0.00003
	0.00005	*0.00005*	*0.00002*
Education status (Reference: Illiterate)			
Literate but no basic education	-0.071***	-0.071***	-0.042***
	0.023	*0.023*	*0.01*
Basic Education: (prim and prep)	-0.090***	-0.089***	-0.047***
	0.016	*0.016*	*0.007*
Secondary	-0.102***	-0.101***	-0.052***
	0.014	*0.014*	*0.007*
Post Secondary: Middle Institute	-0.253***	-0.252***	-0.120***
	0.056	*0.056*	*0.024*
University & post University	-0.213***	-0.209***	-0.073***
	0.038	*0.038*	*0.016*
Occupation (Reference: Craft and Related trade workers)			
Managers	0.007***	0.02	-0.120***
	0.076	*0.078*	*0.031*
Professionals	-0.131***	-0.119	-0.162***
	0.087	*0.089*	*0.036*
Technicians and associate professionals	-0.173***	-0.158**	-0.158***
	0.061	*0.064*	*0.026*
Clerical support workers	-0.136***	-0.124	-0.132***
	0.106	*0.107*	*0.045*
Service and sales workers	0.003***	0.006	-0.035***
	0.02	*0.02*	*0.009*
Skilled agricultural, forestry and fishery workers	0.027***	0.027*	-0.029***
	0.015	*0.015*	*0.007*
Plant and machine operators, and assemblers	-0.033***	-0.023	-0.023***
	0.018	*0.022*	*0.01*
Elementary occupations	0.022***	0.028	-0.046***
	0.023	*0.024*	*0.01*
Parents Education (Reference: No Education)			
Your father has basic education?	-0.034**	-0.032	-0.026**
	0.025	*0.025*	*0.011*
Your father has secondary education or higher?	-0.074**	-0.072**	-0.030**
	0.036	*0.036*	*0.015*
Your mother has basic education?	-0.057	-0.058	-0.023
	0.05	*0.05*	*0.021*
Your mother have secondary education or above?	-0.082	-0.082	-0.027
	0.065	*0.065*	*0.027*
number of hh members working with respect to Hh size.	-0.951***	-0.951***	-0.385***
	0.049	*0.049*	*0.021*
Region (Reference: Great Cairo)			
Alex and Suez Canal	-0.108*	-0.108*	-0.060**
	0.061	*0.061*	*0.025*
Urban Lower	0.070*	0.067*	0.002
	0.035	*0.035*	*0.015*
Urban Upper	0.301***	0.298***	0.090***
	0.031	*0.031*	*0.013*
Rural Lower	0.138***	0.136***	0.026**
	0.031	*0.031*	*0.013*
Rural Upper	0.334***	0.331***	0.103***
	0.029	*0.029*	*0.013*
Your Father is Wage Worker			0.021
			0.004
N	3437	3437	8267

Notes: Standard Errors are in bold and italic. *** p<0.01, ** p<0.05, * p<0.1. (1) Informality variable used in the Heckman regression is the estimated value obtained from a linear regression of the informality on the same regressors in addition to the factor variables of the firm size.