Returns to Qualification in Informal Employment: A Study of Urban Youth in Egypt

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Abstract:

Informal employment is a reality for roughly two-thirds of economically active youth in urban Egypt, and it has been argued to be correlated with poverty, poor working conditions, and few opportunities for advancement. This essay analyzes whether informal employment rewards job qualification measures, using survey data from 2006 and a Blinder-Oaxaca wage decomposition. After creating a taxonomy of formal, para-formal, and informal modes of qualification, it is shown that formal public and formal private jobs tend to reward those with formal qualifications, while informal employment tends to reward informal qualification mechanisms. The notion that informal employment does not reward qualification is disputed. Furthermore, there are large wage premia based on formality of employment, region, and gender. The results can be explained by analyzing the formality decision and the qualification decisions of youth. This suggests an alterative explanation for "dualistic" outcomes in youth labor markets.

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Disclaimer

All arguments and opinions stated in this essay are solely those of the author and do not reflect the organizations worked with or any other institutions.

Note on transliteration

Due to the very low number of Arabic words used in the following paper, no organized system for transliteration has been used, nor has any differentiation been made between Modern Standard Arabic and Egyptian Colloquial Arabic. All Arabic words are spelled as is common in the literature or using the author's own phonetic transliterations.

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I. Introduction

After nearly two decades of reform, youth in Egypt continue to have a difficult labor market position. Due to high population growth in the past decades, there are 900,000 new entrants to the Egyptian labor market per year and, partly due to limited opportunities, recent years have been marked by an increase in youth unemployment and informal employment.[1] Informal jobs, meanwhile, are often considered to be low-productivity, poorly paid jobs with inadequate working conditions and a high correlation with poverty. Accordingly, the topic of informal employment of youth has been snatched up by policymakers, and the creation of "decent work" for young Egyptians remains a major priority of the state and foreign development initiatives.[2]

Given the scale of informal youth employment, the phenomenon has naturally received academic attention, as well. One central question on the issue is: do informal employment relationships reward job qualification? This rather simple question has both practical and theoretical importance. In practical terms, because of the sheer size of informal employment for youth, the returns to such qualification measures affect the incentives which youth are faced with, and may explain the degree and manner in which youth choose to become qualified. For issues of theory, the returns to qualification in the informal sector have important implications for the view of informal employment as part of a "marginalized sector". The issue thus also weighs on considerations of informality as one section of a dualistic or segmented labor market, and for human capital theory.

This essay takes up the returns to qualification in informal employment with a theoretical and empirical approach. The theoretical analysis is at the intersection of two literatures: that on human capital – a long-standing topic of analysis in labor economics – and that on informal economies – a topic of debate in the economic, sociological, and anthropological disciplines. The question also concerns the nature of informal employment, itself. If informal employment is merely an unregulated counterpart to formal employment, characterized by absence of taxes, free entry and competition, then human capital accumulation should occur as in theory; the returns should be present and correspond closely to productivity increases. If, on the other hand, informal employment is an unskilled safety net for those rationed out of the formal sector, it is conceivable that there will be few or no returns to qualification.

The empirical findings of this essay imply that neither of these arguments accurately describe the situation. Rather, the evidence points to a view of informal employment as

[1] See Amer, 2006; Ahlberg and Amer, 2000

[2] See the Egyptian Youth Employment National Action Plan of 2003, described in Samia Farid Shihata, "Decent Work is Good Business", *Al-Ahram Weekly*, 17-23 Apr., 2008; further discussion in Section III.

following a different set of rules regarding qualification, rewarding primarily informal qualification modes for urban youth. After creating a taxonomy of formal, para-formal, and informal qualification mechanisms, worker data on urban youth from the nationally representative Egyptian Labor Market Panel Survey (ELMPS 06) are introduced and a simple Oaxaca-Blinder wage decomposition is used to derive returns. It is shown empirically – with one-period and two-period data – that informal employment does, in fact, reward qualification, though primarily informal, demonstrable qualifications such as apprenticeships and on-the-job training which, due to the very nature of informal employment are more common than in the more formalized and "credentialist" types of formal private and formal public employment. There is also a formal/informal wage differential, which disappears when controlling for the individual, and which thus could be attributable to certain formality-specific firm- and individual-level factors and persists because of both barriers and the outside options of formal and informal employment. For females, there are lower wages and returns to qualification across the board, which are most likely maintained through gender discrimination and monopsonistic employer behavior.

The analysis of returns to human capital in Egypt is most closely related to the studies of Assaad (1996), Wahba (2000), and Said and El-Hamidi (2005; 2007), who also analyze the (sector- and gender-specific) returns to human capital using wage decomposition models. The key differences, besides the use of 2006 data, are the broader "qualification" definition of human capital, the sole focus on urban youth and the explicit separate empirical and theoretical treatment of informal employment.[3]

The theoretical discussion, meanwhile, seeks to bridge human capital and informality literatures, showing how the assumptions of human capital accumulation change due to the unique individual and firm characteristics of informal employment. An essential component of this argument is that informal employment is both a result of certain microeconomic considerations, and a factor which itself has an effect on job characteristics and bargaining. The labor market for youth is "polarized" insofar as formality is anticipated and guides the training decisions of the informally employed into a formal or informal track. This may offer an alternative explanation to certain characteristics explained by the traditional dualist model.

[3] Assaad, 1996, focuses on the (formal and informal) private sector, analyzing the nature of the wage differential for social protection and varying returns to human capital. Wahba, 2000, conisders the public and private sectors separately and directly estimates returns to schooling. Said and El-Hamidi, 2005, compare the Egyptian and Moroccan experiences after structural adjustment to determine women's returns to schooling, while Said and El-Hamidi, 2007, break down men's and women's white- and blue-collar employment to examine the effects of economic reform on gender inequality.

The break-down of the paper is as follows. Section II offers a critical discussion of the concepts, definitions, characteristics, and theories of informal employment – including the connection to human capital theory – by situating it in the literature on *informal economies* from across the economic and sociological literatures. Section III takes a closer look at informal employment relationships of youth in Egypt, and links them to prevalent modes of career qualification. Descriptive evidence seeks to make these considerations more concrete. In Section IV, data are introduced and analyzed descriptively, deriving some background results on the data, while in Section V, the data are used to derive empirical findings regarding the returns to career qualification measures among informally employed youth. The key results – using a simple uncorrected Oaxaca-Blinder model with one-period data and two-period panel data – are that formal and informal employment reward differing types of qualification, with some large unexplained gender, union, and formality differentials. Section VI seeks to explain these results theoretically by analyzing the formality decision itself, the effects this has on the returns to qualification, and how qualification may tend toward a "polarized" outcome. This condition is then applied to the discussion of labor market dualism, with further analysis discusses gender-specific effects. Finally, section VII concludes and offers a few further avenues for research.

II. Informal Employment in Comparative Perspective

The concept of the *informal economy* – and the related ideas of a *shadow economy, hidden economy*, or *underground economy*[4] – is readily familiar to observers of developing economies and labor markets, yet has bounds and definitions that vary and often defy easy categorization. Generally characterized by small firms, low capital intensity, decentralized organization, and the lack of regular accounts, the ranks of informal actors are large and scattered, geographically and sectorally, in most developing and developed economies. Thus, the concept encompasses "street vendors in Bogota, shoeshine workers in Calcutta, garbage collectors in Cairo, textile waste recyclers in Manila, homebased garment workers in Buenos Aires, and homebased electronics workers in West Yorkshire"[5] all as "informal". With such a broad purview, is it sensible to speak of a universal concept of informality? This section briefly surveys the literature as it relates to urban Egypt.

[4] While each of these terms have their own meanings in their contexts of use, further differentiation of *these* terms is not undertaken here. For the "hidden economy" in Egypt, see Roy, 1992; for the "shadow economy", see Schneider, Friedrich, Enste, and Dominik, 2000; and for the "underground"/informal economy, see Portes and Sassen-Koob, 1987, and Portes and Castells, 1989.

[5] Chen, Sebstad, and O'Connell, 1999, p. 603

The separate phenomena of the "informal sector", "informal employment", and "informal economies" are the subjects of a long series of academic and policy discussions dating back to the 1970's, with a literature that spans the disciplines of economics, sociology, anthropology and political science. The seminal contribution came from Hart (1973), who described the informal income sources of Frafra migrants in the slums of Accra, providing an early study of the manifold mechanisms which urban "sub-proletariat" use to make a living outside of traditional wage employment.[6] Following Hart, the concept of an "informal sector" was taken up by the International Labor Organization (ILO), and spawned a series of policy reports and surveys designed to better understand the sector and its relation to urban unemployment and poverty. An especially important effort was to come up with international definitions and characteristics.[7] Extended in the 1980's to fertile ground in the countries of Latin America and, in another vein, in immigrant enclaves in the United States, new advances were made in measurement and theory. Portes, Castells, and Benton (1989) compiled an extensive collection of work on informal economies throughout the Americas and Europe. De Soto (1987) also became well-known outside academic circles for the contention that informality mirrors excessive market regulations, supported by the "days to register a business" measures of regulatory burden and observations as a policy advisor in Peru.[8] The literature has also been extended to applications in East and South Asia, the Arab countries,[9] and the countries of OECD – where informal or "shadow" activities have become a topic of popular debate.[10] Throughout the discussion, labor markets have remained a primary focus.

The economics literature, meanwhile, which had already dealt with "segmented" labor markets, began by absorbing this concept into the existing dualist framework. The traditional interpretation divided labor markets into a "primary" sector of high wages and protections – caused by, alternately, market regulation, union power, or the preponderance of efficiency wages – and a marginalized "secondary" sector, in which those pushed out of the formal sector by entry barriers could accept a lower wage.[11] A central question came to be the extent to which such barriers could be tested and proven empirically. Numerous models sought to test segmentation with various selection models based on varying underlying assumptions.[12] These works, while capturing the essential aspect of the segmented labor market and barriers

[6] Hart's analysis remains highly relevant and brings up some useful questions on how income is distributed across sectors.
[7] See Sethuraman, 1976, for a review.
[8] De Soto, 1987. I return to the concept of informality as a reaction to regulatory burden below.
[9] Mazumdar, 1982; Marcouiller, Castilla, and Woodruff, 1997; Maloney, 2004; Smith and Koo, 1983; Vernango, 2004.
[10] See Schneider and Enste, 2002
[11] Stiglitz, 1976; Esfahani and Salehi-Isfahani, 1989
[12] Dickens and Lang, 1985; Gindling, 1991; Magnac, 1991; Günter and Launov, 2006

to formal entry, often did not go further in the discussion of pervasiveness of informality in the economy or its unique institutional characteristics. Explorations of definitional issues, characteristics, causes, and the link to human capital have been the critical areas where new results have been the most significant in furthering understanding.

Definitions and dimensions of informality: informal economies and employment

All work on informality has had to deal with the definitions, bounds, and characteristics of the nebulous and overlapping phenomena of "informality", the "informal sector", "informal employment" and "informal economies". While uses tend to depend on context, clarity in these concepts is of great importance. In this section, the distinctions are introduced, with "informality" as the umbrella concept.

At a basic level, the most useful definition of the *informal economy* has been that of Portes and Castells, by which the informal economy is:

> …a process of income generation characterized by one central feature: *it is unregulated by the institutions of society, in a legal and social environment in which similar activities are regulated*.[13]

This posits informality primarily as a legal condition, characterized by production outside the – socially and politically defined – bounds of state regulation, such as taxation, registration, safety and health standards, etc. This type of "extralegal" activity – or "the illicit production of licit goods" – contrasts to criminal activities, which involve the (illicit) production of illicit goods and services.[14] The informal economy must be seen as economic activity which, for varying reasons, escapes regulation in an otherwise regulated and formalized economy, while *informal employment* is the label for the array of possible work relationships taking on these characteristics. The *informal sector* is that part of the economy where firms and workers are primarily informal, though the idea is often criticized for its implied clean distinction from the formal sector.[15]

The creation of definitions of informality which are measurable and – as is especially important for empirical analysis – statistically tenable requires a more functional definition. Aside from the difficulty of measuring activities which are, by definition, unreported, categorization is a difficult issue. Thus, since the varying concepts of informality have been introduced, attempts have been made to categorize the nebulous group of "informal workers" and "informal firms" into clean, statistically applicable definitions – ideally capturing all possible dimensions of informality with an easily usable rubric. The definitions which have

[13] Portes and Castells, 1989, p. 12. This is also used by Assaad, 1993, and related to definitions used elsewhere in analysis of Egypt's informal labor markets.
[14] Portes and Castells, 1989, p. 13.
[15] Ibid.

resulted include the sectoral, firm size, firm registration, labor contract, and social coverage criteria, with the main difference being the economic unit of analysis.

Early economic work, recognizing the limitations, opted for a sectoral definition of informality, i.e. an *informal sector*, generally by first defining an explicitly *formal sector*. For example, in one study, "public sector employment … and large commercial establishments in the private sector, especially foreign-financed ones, are excluded", so that "the informal sector, defined as a residual, includes all the remaining private enterprises in the urban economy."[16] Such a method, while easily applicable to data analysis, runs into serious problems of accuracy, the most pressing of which is the degree of heterogeneity among sectors and professions within (and, more starkly, between) countries, and particularly the heterogeneity of states of formality. A slightly more useful correlate of the "informal sector" thus involves firm size – a method officially adopted by the International Conference of Labor Statisticians in 1993[17] – with the justification that small firms are generally more invisible to regulation and thus, in general, more likely to be informal. Under the most common variants, all firms with fewer than 5 (or 10) workers – thus including workshops and vendors, household enterprises, and the self-employed – are defined as informal, while all firms with larger workforces – regardless of sector – are treated as formal. While this also has a form of justification in Egypt, where the 1981 Labor Law freed establishments of under 5 persons from certain regulations, the obvious problems here is the existence of small, high-capital formal enterprises and larger informal firms.[18] This firm-level definition – and its more accurate yet work-intensive alternative, which categorizes firms as formal or informal based on legal definitions, such as formal registration, paying of taxes, or regular bookkeeping – does not necessarily lend itself to studying informal employment due to the incidence of informally employed workers within formal firms. Thus, one must separate the concept of informal employment from the informal sector and informal firms.

Informal employment, in turn, is best captured in a worker-level definition, primarily contingent on the existence of a work contract and/or social insurance coverage. While individual-level data is needed, this is often available through independent surveys, making it tenable for wage analysis. The existence of such a definition made possible many new

[16] Sethuraman, 1976, p. 76
An alternative method (particularly in the economics literature) has taken this further by using a residual after the deduction of the public sector and *occupations* which are more likely to be formal, such as "medical (doctors and nurses), social sciences, law … mail, mining, banking, insurance" and professions likely to be unionized (Gindling, 1991, p. 601).
[17] See ILO, 1993; the ICLS was refining an earlier definition.
[18] See Labor Law of 1981, Book 3, Article 59.
An example from Prof. Alia El Mahdi of a small but clearly formal firm is a high-capital, two-man shoebox manufacturing operation in Giza which, while clearly operating in the realm of formal regulation, would fall out under this definition.

analyses, especially in the 1990's.[19] Yet even the individual-level suffers from ambiguity if, for example, a labor contract is not enforced, or states a lower actual salary than actually paid to reduce social security contributions. The question of unpaid family workers, small-scale self-employed or employers (SE/E) and infrequent casual laborers present further definitional difficulties. The collection of both formal and informal payments by small-scale entrepreneurs also creates states of semi-formality which may not be caught by individual classification. Nonetheless, the labor contract/social insurance definition presents a more useful gauge of "informal employment" than firm-level definitions.

An ideal method may focus on the transaction level for informality which, however, is impractical for statistical analysis. Since informal transactions are by definition unrecorded – and would be extremely difficult to be identify exhaustively with surveys – it is unlikely that thorough statistical analysis would be possible. Where descriptive evidence can be obtained, this is an area in which sociological techniques have proven more successful and where fruitful research is taking place.[20] This dimension of informality is likely the best one to serve discussion of "informal economies" or even "informalized economies".[21]

It is thus clear that each type of definition presents unique problems and captures only certain aspects of the phenomenon of informality. It is possible that, always dependent on national context, a variety of definitions are needed to capture essential elements, and that especially individual, transaction, and firm-level definitions are needed in different contexts. From here on, this paper will use "informal economy" to describe transactions, "informal firms" to define those outside regulatory functioning, and "informal employment" to define all relevant informal working relationships (paid or unpaid). Following the example of others in analyzing informal employment in Egypt,[22] this paper uses a combination of the labor contract and social insurance criteria in distinguishing formal and informal workers.

Characteristics of informal employment

The features of informal employment for the informally employed vary across national contexts, as well, yet in general, informal employment relationships entail reduced social protection, a degree of legal invisibility, and lack of access to formal labor market institutions such as wage bargaining and the judicial recourse. For the goals of poverty reduction,

[19] In Egypt, the first such survey was the special round of the 1988 Labor Force Sample Survey, followed by the 1998 Egypt Labor Market Survey and 2006 Egypt Labor Market Panel Survey, introduced below. Studies using the 1998 data – including on informal employment – are presented by El Mahdi and by Wahba and Mokhtar in Assaad (ed.), 2002.
[20] See Light, 2004; for Egypt, see Roy, 1992, who talks of the "hidden economy".
[21] Light, 2004
[22] See use in Assaad, 1996, and in El Mahdi and Wahba and Mokhtar, in Assaad (ed.), 2002.

expansion of worker protections, a more even income distribution or sustainable productivity growth, informality can be – and often is – seen as a major setback.[23]

Of course, disconnected from such welfare considerations there are other observable characteristics of informal employment which can be generalized from existing research. Here, several common themes can be identified, running through informality literature from the early 1970's to the present, with some relating to the nature of informal firms and others relating to informal employment relationships, specifically. While they are taken from a variety of national contexts, they can be generalized and compared with research on urban Egypt. Here I present five main themes relating to informal firms – where the majority of informal workers are employed – and three relating to informal employment relationships – which are common to informal workers in and outside of formal and informal enterprises.

The first firm-related theme is the integration into a small-scale, decentralized production network, a condition relating to small firm size and the need for invisibility in unregistered production.[24] Second, informal working methods are characterized by low capital intensity – relating both to the legal and economic risks of high sunk capital costs for firms, and the difficulty of acquiring informal credit. This translates into a common situation where informal workers use little capital in production, and explains the concentration of informal activity in the services sector.[25] A third theme is the dominance of family employment – much of it unpaid – as family enterprises continue to be a main feature of informal activity.

A fourth recurring theme is the reliance on social networks in informal businesses, which Light (2004) refers to as "a network-based embeddedness … the opposite of neoclassical theory based on many buyers and many sellers who have no relations that could influence transactions". As an example, many business owners seek to create personal linkages to suppliers and buyers which, in the absence of a more transparent formal market, ensure stability of materials and final product demand; this puts business owners, but also workers in a position of dependence on social contacts.[26] As a fifth characteristic, transparency from the law results in a reluctance to work with state actors, and a specific avoidance of state bureaucracy, where possible. If interactions do exist, they may entail a fulfillment of only minimum standards of regulation in order to forestall severe consequences.[27] Workers may often be party to such evasion practices.

[23] See the discussion in Avirgan, Bivens, and Gammage, 2005
[24] See ILO, 1972, which describes the informal sector as: small-scale, family-dominated, easy to enter, and based on indigenous resources; see also Portes and Castells, 1989; Light, 2004
[25] Again, see Portes and Castells, 1989; Light, 2004; for Egypt, see Mead, 1982; Galal, 2004
[26] Portes and Sensenbrenner, 1993, discuss how such networks of social capital are maintained and used for economic gain.
[27] De Soto, 1987; Kamrava, 2004

Each of these is observable for workers of informal Egyptian firms. Relating to the fact that over 82% of enterprises in Egypt are informal, and over 90% of these are sole proprietorships with fewer than 5 workers, most informal workers work in an environment with only a few co-workers, or work alone.[28] Evidence has shown that capital is relatively scarce or informally rented,[29] while family-owned enterprises are common and may have increased in importance in the 1990's.[30] Social networks are clearly an advantage for businesses, and there is evidence of worker involvement in building and maintaining these ties. The avoidance of state institutions and enforcement (in the form of police) is also an important feature of informal activity.

The three themes specific to informal working relationships may be found for employees in informal firms or (otherwise) formal firms,[31] and are related to the condition of informal wage employment *per se*. First, due to the lack of standardization, a radical heterogeneity of wage outcomes may exist in informal employment relationships. Wages may be a matter of negotiation and personalized considerations, and depend heavily on business success or performance through, e.g. piece rates. This would imply an increased volatility and, for an outside observer, arbitrariness of pay rates, particularly in contrast to heavily standardized public sector pay schedules.[32] Second, the lack of formal benefits such as vacation, maternity leave, or pensions may mean alternative arrangements, or simply a lack of pay during these work absences. Finally, informal wage employment may be much less regular and, like pay, the existence of work may depend on fluctuating business conditions.

While these individual-relevant themes have been analyzed in Egypt, reviewing them and linking them to informal employment will be a task for later sections.

Informalization of the labor market and explanations

In a number of developed and developing countries, it can be shown that informal employment has grown faster than formal employment in the last decades.[33] Yet, to an even greater extent than the definition of informality, the trends explaining a growth in informality

[28] Galal, 2004

[29] Mead, 1982, reports that informal Egyptian furniture makers tend to do all machine work outside the shop, with shared machinery that they pay a service fee for, rather than buying costly fixed equipment. This serves as a means of pooling capital costs and raising efficiency.

[30] See Meyer, 2000; El Mahdi, 2003.

[31] Again, it should be noted that the classification of firms is equally messy, and a firm which employs workers informally could thereby become informal or semi-formal.

[32] This result was derived in Assaad, 1996; deriving it from 2006 data is one aim in Section V.

[33] For Russia, El Salvador, India, South Africa, and Egypt see Avirgan, Bivens, and Gammage, 2005. Only in South Africa was informal employment declining as a proportion of total employment. See also the 76-country analysis in Schneider and Enste, 2002, which shows a steep increase in various definitions of the "shadow economy" between the 1970's and 1990's.

are highly country-specific and may even show considerable variation between a country's regions – particularly between rural and urban areas. Some overarching frames of explanation can nonetheless be identified which seek to account for this growth. On the macro level, a rough distinction can be drawn between dualistic, structuralistic, and legalistic lines of thought.[34]

Dualistic theories are the most common in the economic literature and draw on earlier models of labor markets which sought to explain productivity differentials through a high-productivity "primary" and low-productivity "secondary" sector.[35] One variant of this attributes the existence of the segmentation to efficiency wages or unionization, which create a protected market to well-paid primary jobs with union- or firm-created barriers to entry. The primary/secondary dichotomy can easily be extended to a formal/informal context, and conditions such as efficiency wages, minimum wage laws, labor protection, or formal qualification requirements can be the sources of barriers, pushing in one segment of the labor force into marginal, low-productivity positions without social protection. Recent contributions have problematized this distinction and theorized an informal sector which is, itself, divided into two parts – an "upper tier" competitive to the formal sector and a non-competitive "lower tier".[36] A very early debate around dualistic theories concerned whether the formal sector is "modern" while the informal sector is a "traditional" or "peasant" sector, destined to wane and disappear as growth occurs and market failures are hammered out.[37]

Structuralistic explanations offer a rationale for why informality has grown over time. For example, it has been put forth that the increasing use of informal labor relationships in manufacturing is a response to cost pressures from international competition, a consequence of globalization. Dedeoglu (2004) identifies Turkish family-owned garment factories (*atölye*) – to which larger textile firms sub-contract for sale in both domestic and export markets – as a means of lowering costs and increasing flexibility with unpaid female household labor. Other sources, such as the analysis of the informal manufacturing sector in Cairo by Meyer (2000), report similar advantages of small-scale, decentralized production relationships, such as the ability to rapidly adjust wages and employment in periods of economic downturn. One interpretation of the structuralistic perspective thus sees informalization as a deliberate

[34] I owe this taxonomy to Avirgan, Bivens, and Gammage, 2005, who in turn are influenced by the four modes of explanation outlined by Chen, Sebstad, and O'Connell, 1999.
[35] See Doeringer and Piore, 1971
[36] Maloney, 1999, 2004; Günther and Launov, 2006
[37] Lewis, 1954; Piore, 1979; Fields, 1975; Stiglitz, 1976 all weigh in on the debate; ILO, 1972, criticizes the distinction.

strategy by large corporations to reduce labor costs and circumvent national labor laws. This remains applicable, however, only to sectors previously organized in large firms.

More explicit attention to labor laws and institutions is provided through legalistic – or, relatedly, institutional – approaches to explaining informality, the most well-known of which is the work of De Soto (1987). De Soto, a former advisor to Peruvian President Alberto Fujimori, has spearheaded research on the accessibility of formal titles and registration procedures, including the now well-known indicator of the "days to register a firm".[38] According to this approach, informal entrepreneurs are unable or unwilling to formalize their firms because of costly or burdensome labor, tax, and business regulations. This induces firms to use informal labor so long as regulatory laxness makes this possible.[39]

Outside such schematic views, there are other more proximate causes on offer. Portes and Castells (1989) posit *inter alia* that the economic crises and restructuring of the 1970's and 1980's caused a new surge in informal employment, which became a means of survival for an increasing number of marginalized people – especially youth, ethnic minorities, and women in developing countries. Kamrava (2002) argues that informality and "semi-formality" in the Middle East is a direct cause of weak state capacity and the strategies of rentierism and corporatism adopted by Middle Eastern states since independence. Schneider and Enste (2002) present the same discussion from the other side, arguing that the decision to operate informally reflects a lack of trust in state institutions – an "exit" from formal protection rather than exercising "voice" so as to change unfavorable conditions.

In Egypt, informalization has been explicitly linked to the process of structural adjustment which took place in the 1990's,[40] and to legal and institutional characteristics. El Mahdi (2003) argues that the high incidence of informality in Egypt is a sign of institutional failure, and specifically a lack of attention to and appropriate policy for small enterprises by the responsible state actors. She outlines the multitude of steps needed for a street vendor to become formally registered, and argues that this is a major disincentive and a barrier to informal firm growth. Galal (2004) estimates that for an average informal firm, adherence to formal requirements of registration, bookkeeping, taxation, and exit would outweigh the costs of informality, which include "bribes, costly finance, and low protection", costing an additional LE 14,900 yearly – more than the average per capita income in Egypt.[41]

[38] De Soto, 1987
[39] Almeida and Carneiro, 2006, apply this to Brazil, and find that where law enforcement is greater, firms use less informal labor yet also have lower productivity.
[40] Wahba and Mokhtar, 2002; Meyer, 2000
[41] Galal, 2004, p. 3. Because this study was published in 2004, using somewhat older data, it is unknown whether the results have since changed with the passing of new legal reforms and an increased focus on registration.

These micro-level analyses provide further explanations for the growth of informality in Egypt, and yet there are relatively few existing analyses which go further and examine the individual formality decision of employment. This will thus be brought up in the theoretical section, where issues of the causes of informality are returned to.

Returns to human capital in informal employment

Given dualist interpretations of informal employment, it is logical to view the informal sector as one of low productivity and few returns to human capital – an argument made explicitly by Dickens and Lang (1985). This has a number of variants. For example, "[i]t is a direct consequence of human capital theory that workers and firms will invest little in firm-specific training if the worker is not expected to remain within the firm very long".[42] Or, given the initial assumptions of informal workers in primarily service positions, implying labor-intensive yet low value-added technologies, it is logical that long-time workers would have limited use of schooling and gain few job-specific skills, meaning little chance at advancement through experience. If informal employers – for structural or efficiency reasons – use labor less frugally, more as a homogenous input than a skilled service, it is imaginable that productivity enhancing measures are unnecessary.[43] In such circumstances, entry into the formal sector may be the only option for advancement from low-paid and unstable work.

If parts of informal employment are competitive to formal employment, however, as argued by Maloney (1998, 1999, 2004) and tested by Günther and Launov (2006), then it is thinkable that similar dynamics regarding returns to human capital prevail. If formal and informally employed workers use the same technology, then differences between returns to human capital would either be minimal, or would have to be due to non-productivity-related conditions such as effort observability or compensating wage differentials which have time components. Further still, it could be that the freedom of entry and lack of regulations actually promote a more competitive outcome whereby wage is linked more directly to productivity and thus to human capital investments.[44] Or, if, as posited by Maloney (1998, p. 2), "informal salaried work is the entry point and perhaps training area for young workers", who later take on formal work, then returns to human capital should be extant in the form of better opportunities in later formal employment.

[42] Dickens and Lang, 1985, p. 802
[43] Esfahani and Salehi-Isfahani, 1989
[44] This argument is merely speculative; no source has gone, to my knowledge, so far as to claim this.

In Egypt, three existing empirical studies have investigated returns to human generally, including those in the public vs. private sector. The first of these is by Wahba (2000) who, using 1988 data on all Egyptian wage earners, and without distinguishing between formal and informal employment, finds increasing returns to education among wage earners, with primary and secondary school bringing smaller pay advantages and university paying much more. She interprets this unusual result as evidence of "credentialism" in the Egyptian labor market, whereby: "educational degrees provide a signal and serve as a convenient screen rather than improve workers' productivity. This is especially true in the case of university degrees mainly due to the public sector hiring practices."[45] Said and El-Hamidi (2005) are interested in the effects of structural adjustment in Egypt and Morocco on women over time, yet also find this anomaly, referring to it as the "sheepskin effect". From their analysis, it is demonstrated that primary and secondary schooling are little valued throughout the Egyptian labor market, and university education creates a disproportional jump – possibly relating to the particular dynamics of public sector employment.[46]

Assaad (1996) is the only author who explicitly disaggregates formal and informal employment, attempting to measure the extent of the formal/informal wage differential by controlling for selection and human capital. The result of this estimation is that formal employment has slightly higher returns to education for men, and much higher returns for women, owing partly to wage discrimination in informal employment of women; another factor is the earlier exit from employment after marriage which, as mentioned above, directly discourages human capital accumulation. On top of these varying returns, there is a large unexplained wage differential between formal and informal employment, which – even before taking into account fringe benefits of formal employment – implies an 85-90% job rent in formal over informal employment.

This paper is closest in its empirical framework to Assaad, and attempts to extend the analysis with a more thorough treatment of qualification mechanisms, an explicit separation of sector of employment, and recently available data. Before results for informal employment can be derived, however, a qualitative analysis of informal employment and human capital – in the broadened form of "qualification" – is in order for urban Egyptian youth.

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[45] Wahba, 2000, p. 32

[46] Specifically, those university graduates who are employed can expect a high wage level, while other university graduates are unemployed due to the job queue, and thus fall out of the sample. This may be one case of selection bias – but the returns to university education may also actually be much higher.
For a humorous account of a type of credentialism in Egypt, see Galal Amin's *Whatever (Else) Happened to the Egyptians?* (Cairo, AUC Press: 2004), Ch. 15, "The Doctorate", in which he lambasts how doctorate holders in Egypt are given – in his view – undue license in the media on the basis of academic title.

III. Informal Employment and Qualification of Urban Egyptian Youth

In this section, an analysis of informal employment and career qualification among urban Egyptian youth is given, based on primary and academic sources and some limited interview evidence from a 3-week field study.[47] These observations are meant to serve as a supplement and backdrop for the more formal derivation of results from survey data in Section IV. Besides the economic context and extent of mass informal employment of youth, the focus is on formal and informal labor market institutions, and methods of formal and informal job qualification, broken down into formal, para-formal, and informal mechanisms.

I begin with an overview of the scope and distribution of informal employment in urban Egypt. With the processes of structural adjustment and the shrinking of the public sector in the 1990's, there are indications that informal employment actually increased between 1988 and 1998, in both absolute and relative terms. In the labor force as a whole, 34% of non-agricultural wage workers (NAWW) in 1998 were informally employed, including 64% in the 15-29 age group.[48] This has been accompanied by at least three further trends of relevance for youth. First, there was a radical defeminization of the labor market across sectors – and especially in the self-employed and employer categories, where 7% and 15% of women, respectively, had worked in 1988, and only 0.7% and 3% of a smaller women's labor force worked in 1998.[49] It can be shown that more women have left the labor force since.[50] A second trend was growing unemployment among youth, and especially vocational school and university graduates, such that by 2006, 22% of all male and 39% of female university graduates in the 15-29 group were unemployed.[51] Finally, youth entering the labor force were much more likely to begin their working career in informal employment relationships, in contrast to earlier generations who had often found their way directly into government or public enterprise employment. Studies of labor market insertion of youth have confirmed that at least 30% of youth entrants by 2006 were employed in regular informal wage work, with another 10 to 15% employed informally on an irregular basis. Private formal work represented a small but growing share of 10%.[52]

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[47] The primary interview partners in this study were representatives of the German *Gesellschaft für Technische Zusammenarbeit* (GTZ), Cairo Regional Unit of the Dual System (RUDS), TVET Reform Programme, and Population Council, as well as some casual conversations in the al-Darb al-Ahmar area. While a larger, representative study with survey evidence would have been desirable, this was not possible given time constraints. Recognizing the limitations, I will draw on the findings of these interviews for some qualitative information. Formal results using professionally collected from the ELMPS are derived in Section IV.

[48] Wahba, 2002, according to the social security and contract definition

[49] El Mahdi, 2002

[50] Assaad, 2007, shows that the recent fall in female unemployment was due mainly to labor force exit.

[51] Amer, 2007, according to the standard unemployment and market labor force definition.

[52] Assaad, 2007

All of these phenomena point to a situation in which a growing labor force – represented at the margin by youth – was unable to be absorbed into the stagnant public sector or the limited number of formal private jobs, and hence entered informal work or unemployment, with particularly severe barriers for young women. This relates, however, not only to the demographic change of Egypt but also to institutional factors. These, along with the institutions of the informal employment, provide needed background.

Formal and informal institutions of urban labor markets for youth

Since the Revolution of the Free Officers in 1952 and the experiment with "Arab Socialism" under President Gamal 'Abd al-Nasser, the labor market in Egypt was defined by a high degree of central planning and a marginalization of more traditional industries. Employment growth was driven in the 1960's by the public sector, including the civil service and state-run enterprises – mainly nationalized industries in textiles, energy, and manufacturing. With the drive to increase education and make up for the lack of skilled workers following the exodus of foreigners in the 1950's, one of the chief policies of public sector employment growth was the employment guarantee for graduates – a program initiated to encourage higher education by guaranteeing all graduates of universities and, later, higher vocational education, of a state job. Through the 1970's, the conditions of such jobs were extremely favorable, including relatively high real wages, short working hours, social security and healthcare benefits, and access to subsidized goods and, in some cases, housing. Studies have posited that this guarantee and the high wages and benefits of the public sector contributed to a simultaneous oversupply of graduates and their relative undersupply of them in the private sector.[53]

The implementation of the *Intifah* or "Open Door" policy by President Anwar Sadat beginning in 1974 brought about a much greater role of the private sector in growth and employment – and a parallel emphasis on the private sector in creating employment and economic opportunity. The new Labor Law of 1981 sought deliberately to "extend protection to all workers in the private sector",[54] providing for a system of enforceable labor contracts, social insurance, a minimum wage, 21 days of vacation per year, 50 days paid maternity leave, *de facto* lifetime employment security, a cap on working hours, and representation in trade unions.[55] On the other hand, state control continued to play a large role, as job

[53] Assaad, 1997
[54] Awad, 1981, Preface to the translation of the Labor Law; Labor Law of 1981
[55] Labor Law of 1981, art. 80-83 (labor contract), 154 (maternity leave), 71-75 (termination of employment), etc.

recruitment was to take place centrally and trade unions were to be subsumed under the leadership of a Labor Supreme Council of the Ministry of Manpower and Training.[56]

The legal institutions of the state only apply, however, in their actual enforcement, and this issue has been critical. Following the implementation of a structural adjustment program beginning in 1991, public employment growth was drastically curtailed, and the state employment guarantee eroded to the point of irrelevance – with waiting lists often reaching 10 years for a state job, in which time informal employment disqualified a candidate.[57] The Labor Law of 1981, meanwhile, was only partially enforced, and it is possible that the state had no interest or ability to regulate certain sectors of the economy.[58] These factors go a long way toward explaining the rise in informality through 1998. This was partly reversed in 2003, with the passing of the new Labor Law, which introduced greater flexibility, and with a new drive by the state toward formalization. Nonetheless, it can still be shown that in 2006, a majority of youth were employed informally.[59]

For these broad "unregulated" swathes of the labor force, it would nonetheless be a mistake to argue that no constraining institutions exist. Indeed, in the both the formal and informal economies there are parallel informal market institutions, enforced by social pressure, custom, and shared societal imagination.[60] It is likely that these are yet stronger in the informal economy, however, due precisely to the lack of formal regulation to overcome recurring coordination problems and areas of contention. Assaad (1993), in studying the Cairene construction industry, identifies informal counterparts to three sets of formal institutions, finding that in every case the informal institutions are stronger. Specifically, local coffee houses trump trade unions as fora for workers to convene, gain group representation, and search for jobs; casual labor is universally more common than contract work in construction; and traditional apprenticeships are held in higher esteem than government training initiatives, especially for highly skilled craftsmen. Other studies find a similarly strong role for informal labor market institutions. Investigating the small-scale Egyptian furniture industry, Mead (1982) finds a strongly institutionalized use of child labor during school breaks. Meyer (2000) discusses constraints on the use of reserve family labor.

In the course of interviews regarding the small-scale manufacturing sector in Cairo, it was revealed that in the absence of legal regulation, informal labor market "arrangements" for

[56] Ibid., art. 16-18 (regarding recruitment) and art. 76-78 (collective labor relations).
[57] Assaad, 1997
[58] See Kamrava, 2002; Galal, 2004, also discusses the debate on formalization in Egypt.
[59] See data in Section IV.
[60] See Schlicht, 1996. Here, I constrain myself to examples in the informal economy as they relate to youth employment.

sick leave, vacation, recruitment, promotion and pay persist in these sectors in semi-standardized forms. When a worker is sick, for example, he or she is not entitled to pay, but may often take out credit which is to be deducted from later pay. Some employers may refuse this, however.[61] Job recruitment is also likely to run through informal channels – such as extended family contacts or neighbors – with, again, informal mechanisms of guaranteeing both the suitability of a worker and of a job.[62] Pay systems appears to vary radically depending on the context, yet various combinations of piece rates and weekly wages, along with contingent methods of performance pay or profit sharing, appear to be common.

In the division of labor, the role of the shopkeeper appears to be especially well defined. The owner of an establishment may often work alongside employees, overseeing their work, providing training, and coordinating relations with suppliers and buyers. Negotiation skills, business acumen, acceptance of volatile earnings, and the provision of capital seem to be rewarded with capture of higher pay in profits, explaining one reason why shop owners are often the source of informal credit.[63] For workers, earnings tend to be more constant; for the self-employed, earnings may be low and quite erratic, meaning that economic activity is often quite precarious.[64]

These observations are merely preliminary and of limited depth, yet they may provide some concrete impulses for making sense of the informal institutional environment.

Modes of qualification in the formal and informal sectors

Of the most important institutions of the labor market are those which heighten productivity and employability through education and training. These can be broadly bundled under the headings of "human capital development", "skills training", or "career qualification". Here, I opt for the broadest measure of "qualification" to capture all activities which a worker engages in that directly or indirectly raise productivity and employability.

The decision to broaden the definition of qualification beyond formal schooling and work experience is not new, and has been the focus of policy debate – if not always economic analysis – in many national contexts.[65] In Egypt, the full range of qualification mechanisms

[61] The same may occur in the case of a sick family member, or in a particularly "tight" month. Because of community-enforced trust and social sanctioning, repayment is likely enforced

[62] In the case of a privately facilitated job match, an intermediary may be held responsible for both the employer and employee. See Cunningham and Sarayrah, 1994, who discuss the role of "wasta" – translated as "intercession" or "social contacts" – in development in the Arab world.

[63] See Mohieldin and Wright, 2000, who discuss informal credit markets, though with a focus on rural Egypt.

[64] An interesting example of this group is provided in the discussion of independently operating street salesmen of *karkadey*, a popular hibiscus drink, in "The Hibiscus Seller", *The Egyptian Gazette*, May 28, 2008, p. 3.

[65] For a discussion of broader measures of human capital in Canada, see Livingstone, 1997.

have been targeted for policies regarding youth employment for both national policy and international development actors, with the frequent argument that further skills development is vital to create a more qualified workforce capable of further employment and employability.[66] While the spectrum of potential qualification mechanisms is intentionally quite broad, a useful division of these is into formal, "para-formal" and informal modes of qualification.[67] Despite the parallels to formal and informal employment it is important to note that each mode could be applicable to formal or informal jobs, as well.

Formal qualification is likely the most obvious and includes the national education system including university and technical schooling. Public education in Egypt is divided into primary schools (1st – 6th grades), secondary (7th – 9th grade), and vocational education (3-5 years following secondary schooling) or preparatory school (3 years for preparation for university).[68] Higher education is possible at universities and technical colleges, to which graduates of preparatory school (but not vocational education) have a legal right. There are commonly leveled critiques of the Egyptian education system including the high class size, poor pay of teachers, need for private lessons or study groups, and rigor of yearly standardized tests, which have high failure rates and tend to block students who have failed from advancement. This, along with the costs of books, private lessons, transport, and foregone labor income, are partial explanations for the high incidence of non-enrollment in Egypt, the other being child labor.[69] Nonetheless, the enrollment rate has increased over the last decades, climbing from 84% in 1991 to 94% of primary age children in 2004.[70]

The large role of technical education in the education system relates, again, to the education drive following the Egyptian Revolution. In technical education, three- and five-year courses in agriculture, industry, and commerce are offered in a class-like setting. Again, there is a frequent claim that education quality is poor, techniques taught are out-dated, and graduates are unlikely to use their knowledge in their later field of work.[71] University education has become much more common in the last several decades but, as previously

[66] Egyptian state initiatives have included the creation of vocational education schools and numerous individual initiatives through the 1960's and 70's, as well as the Social Fund for Development, and new activities outlined in the 2003 Youth Employment National Action Plan. Some external actors in this sector are: the European Union through the European Training Foundation and co-funded TVET Reform Programme, and GTZ through the Mubarak-Kohl Initiative and, more recently, MKI Vocational Education, Training and Employment Program (MKI-vetEP).
[67] I owe this division to Guido Lotz, who provided very helpful comments on career qualification. The phrase "para-formal" is my own and is intended to avoid confusion with the ambiguous term "semi-formal".
[68] An alternative to state education is the traditional Islamic *Azhari* education, which remains common in rural areas of Egypt but which is declining in importance in urban areas.
[69] See Wahba, 2006. Regarding a recent initiative by Egyptian First Lady Suzanne Mubarak against child labor and for enrollment, see Reem Leila, "Child labour online", *Al-Ahram Weekly*, 3-9 Jul., 2008.
[70] United Nations Development Fund, *Human Development Report 2007/2008* (New York: UNDP, 2008)
[71] Al Heeti and Brock, 1997; see also Lotz, 2008; Laila Iskandar, "Formalising the Informal", Al-Ahram Weekly Online, 27 March – 2 April, 2008

implied, is sometimes seen as a mere credential without great advantage for skill acquisition or productivity growth, or connection to later work activity. These are nonetheless prerequisites for government employment and, accordingly, the number of graduates of each increased greatly under the graduate employment guarantee.[72] The Egyptian state also formally certifies a number of occupations – particularly skilled technicians – although this formal qualification mechanism is not always respected in the private economy.[73]

Formal qualification mechanisms are complemented by para-formal mechanisms, which can be defined to include all officially recognized modes of qualification not captured under the national education system – i.e. courses outside of schools or university, formal work experience, and formalized skills training. For example, government or community-sponsored literacy programs may serve as a means of attaining literacy skills not acquired in primary schooling. Publicly and privately offered language and computer courses offer certifiable training modes in these areas.[74] Formal work experience is also a semi-formal means of qualification, in that it – while not officially part of formal training initiatives – can be certified; this type of experience, along with any on-the-job training entailed by it, can be declared to a formal employer without problem.

The role of informal qualification mechanisms, meanwhile, is quite large, particularly in informal employment. The most well-known of these is the traditional industrial apprenticeship (*sabi'ana senai'ana*) system – common especially in construction, artisan trades, among mechanics, and for other skilled trades. Dating back to the guild system of the 19th century, the apprenticeship remains a roughly standardized institution with set norms including "discipline and absolute loyalty to one's master, the willingness to tolerate harsh disciplinary measures, verbal and physical abuse, and the willingness to work for an extended period of time at very low wages".[75] This likely overlaps to a great extent with ordinary on-the-job training which, while less institutionalized, also takes place in informal employment relationships. Mead (1983) points out how apprentices are often used for menial tasks, such as fetching food, with sometimes very irregular training components. Nonetheless, workers and apprentices with a long-term attachment to a shop owner may be trained quite thoroughly.

An equally significant mode of informal qualification may be implicit knowledge and social contacts. For formal employment, this is likely to be very useful to overcome hurdles to

[72] Assaad, 1997
[73] Assaad, 1993, mentions the lack of acceptance of so-called "October workers" trained in a state initiative following the 1973 war.
[74] See the discussion in Bhaumik et al., 2004
[75] Assaad, 1993, p. 932

recruitment from a broad pool of candidates; particularly a mastery of formal signals and presentation skills may be of use in recruitment for well-paid formal jobs.[76] In informal employment, social contacts are crucial not only for finding work, but also for the operation of small business (especially for those higher up in the hierarchy) and for individual wage bargaining and earnings supplementation. Avoiding the legal consequences of enforcement is also likely to be easier with good contacts or knowledge of enforcement mechanisms.[77] For this reason, it can be hypothesized that implicit knowledge – while not measurable – is very likely to contribute to success in both formal and informal environments.

This taxonomy of qualification institutions is not exhaustive, yet offers an idea of the type of mechanisms that are relevant to youth in urban Egyptian labor markets. By finding corresponding measures in the available data, returns to qualification in the form of wages can be measured.

IV. ELMPS Data and Descriptive Results

Empirical analysis is based on data from the Egyptian Labor Market Panel Survey (ELMPS) 2006, a nationally representative household survey carried out in 2005/2006 by the Economic Research Forum (ERF) and Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS). The survey, conducted through household visits, served as a follow-up to comparable national labor market surveys from 1998 and 1988. With a sample of 8,349 households and 37,140 individuals, the household make-up was weighted using census statistics and includes a wealth of household and individual-level information.[78] The data – along with data from the 1988 and 1998 survey rounds, which together create a panel dimension – have been used extensively for analysis of labor market participation, unemployment, gender discrimination, and employment characteristics.[79] Here, they will serve as the basis for descriptive, entry, and wage analysis of formal and informal employment of urban youth.

To only capture those individuals who are the object of this study, a preliminary filter captures all individuals who: 1) are between the ages of 15 and 29 at the time of the survey (determined by birth year), 2) live in an urban area, as defined by the Egyptian census

[76] Here, again, there is a broad literature on the importance of non-measurable social knowledge and social networks in economic success, which extends well beyond the informal sector. The phenomenon also clearly relates to the EU focus on "employability", cited especially often in labor market projects in Egypt. See ILO, 2007. For a recent psychological analysis of the concept, see Fugate and Kinicki, 2008, who discsuss the role of individual disposition in learning and employability.
[77] See Bourdieu, 1972; Portes, 1998
[78] Barsoum, 2007
[79] Analyses using the 2006 data include Assaad, 2007; and El Mahdi and Rashed, 2007,.

definition, and 3) have been in the labor market in the past 3 months.[80] In 2006, this generates a sub-sample of 2,204 economically active urban youth, distributed across government, public enterprise, and private employment in formal and informal wage worker, self-employed, employer, and unpaid family worker status. "Formal" is defined by the presence of a labor contract *or* social insurance coverage, while "informal" is the lack of both. The other employment status categories are based on answers provided by the individual. Wage data are available only for wage workers, totaling 1,571 individuals, along with a series of entries on bonus, incentive, overtime, and profit sharing pay. These measures, in turn, can be added (adjusting for the reported pay period) and divided by reported weekly working hours to generate a single variable on hourly earnings. While some individuals – especially those employed in the civil service – have secondary jobs, these are left out for simplicity.

Qualitative questions whose responses are in the form of categories can provide information on sector and place of work, job stability, and means of finding the job.[81] Geographic information is available, as well, to correct for regional differences in wages.[82] To capture the various modes of qualification, variables must be identified which correspond to the formal, semi-formal, and informal institutions outlined above. Formal qualification modes can be recorded through years or level of school, type of school, university education, and registration of a profession. Variables corresponding to semi-formal means are more difficult, but include participation in a government language or computer course, or experience in formal employment. Other means are not available in the data. Informal qualification modes such as the industrial apprenticeship can be captured by response to individual questions on where skills were attained, in which there is evidence of the institutionalized industrial apprenticeship and various skill levels. Informal work experience can also be measured by entry into the labor force and the presence of a contract in the first job. The presence and quality of social contacts is a variable which cannot be measured but which is surely correlated with both earnings potential and job status.[83]

There are other limitations to the data which deserve mentioning. First, data was collected entirely through household surveys and may suffer from a variety of reporting

[80] Participation in the labor force is based on the extended definition, which includes home-based economic activities in addition to market work. See Assaad, 2007 for a discussion of the differences.
[81] Many of these variables are only available consistently for wage-workers.
[82] In the sample, Greater Cairo makes up 21% of individuals, Alexandria and the Suez Canal Cities are 19%, urban Lower Egypt is 26% and urban Upper Egypt is 34% of all individuals. This geographical skew is partly a result of the very different age structure in different regions of Egypt – i.e. a much higher relative youth population in upper Egypt – and also a result of unweighted use of the data. Attempts at weighting the data are not made here.
[83] It would be beyond the bounds of a national survey to collect such information exhaustively, though it is interesting to note that recent sociological research has constructed such measures of social capital. For an interesting example relating to the power of social networks for immigration to the US from Northern Mexico, see Palloni et al, 2001.

biases. Particularly data on earnings may be inaccurate due to under- or overreporting. Secondly, while the survey was meant to be nationally representative, the use of the urban youth filter may compromise this, and reduce the sample size greatly. It is believed that this focus is justified, as it allows a deeper understanding and more differentiated results than combining urban and rural and youth and non-youth. The data is unweighted, meaning an overrepresentation of Upper Egypt and underrepresentation of Cairo. Third, there is no variable available in the data which can accurately predict formality of employment, and which is not correlated with wage, meaning the issue of selection bias cannot be adequately overcome (see below). Fourth, firm size was not consistently available, even though tests showed that firm size effects on wages could be significant. The variable was dropped due to problems with missing observations. Finally, the data on earnings are static and, although a panel dimension is available, it is only applicable for those individuals who were in the labor force 8 years ago and were part of the 1998 survey. With these limitations in mind, the data can be used to derive empirical results.

Descriptive characteristics of youth employment, formality, and sectoral distribution

Some descriptive statistics of the economically active youth are provided in Table 1. In the sample, 71% of economically active individuals (61% of women, 75% of men) are wage workers; women are clearly underrepresented among employers and self-employed, but overrepresented among unpaid family workers. In the sample as a whole, only 27% of all economically active individuals and 23% of all wage workers are female. Of wage workers, 44% are formally employed using the combined labor contract / social insurance definition; the overlap between labor contract and insurance is strong but not perfect. Interestingly, a majority of female wage workers (64%) but a minority of males (39%) are formally employed, reflecting the previously derived[84] fact that informally employed women are scarcer and more likely to leave the labor force after marriage. This is borne out by the age structure of women's employment: participation in informal work for women peaks at age 23, while formal employment is relatively constant for all cohorts 23 and above. Statistics on age of entry for both males and females show that workers in formal employment generally entered the labor force later (mode age: 21) than informal and non-wage workers (mode age: 17) – presumably after the completion of formal secondary or university education.

[84] Assaad, 2007

An especially interesting result is found in the sectoral distribution of formal and informal workers between government (civil service), public enterprise, foreign, non-establishment, and private employment. As expected, private employment plays the dominant role for youth overall, and here, most males and females are informally employed or are non-waged (employers, self-employed, or unpaid family workers). Government and public enterprise employees, meanwhile, are predominantly formal, yet here there is also an incidence of public sector workers who report having no contract and no social insurance. This implies either that the indicator for informality is imperfect, or that Egyptian state agencies and state-owned firms also employ workers informally – or quite possibly both. An important question is whether these individuals are more similar to other (formal) public employees, or to other (private) informal workers. Since this cannot be determined conclusively, the following sections will divide formal public and private workers, and group all informal workers – whether public, private, or other – into one "informal" category.

Table 1 – Employment and age profile statistics

Employment status:

	Wage worker	Employer	Self-employed	Unpaid family work	Total
Male	1,213	113	134	156	1,616
Female	358	4	12	214	588
Total	1,571	117	146	370	2,204

*Formality of Employment:**

	Contract	No contract	Total
Social insurance	510	56	566
No insurance	131	874	1,005
Total	641	930	1,571

*Combined Formality Definition:**

	Formal	Informal	Total
Male:	468	745	1213
Female:	229	129	358
Total:	697	874	1,571

Sector of employment:

	Government	Public Enterprise	Private	Joint Venture	Foreign/other	No establishment
Formal (male)	143	61	203	23	2	36
Informal (male)	4	11	465	6	2	257
Non-wage (male)	-	-	403	-	-	1
Formal (female)	143	13	70	2	-	-
Informal (female)	7	1	115	1	1	5
Non-wage (female)	-	-	230	-	-	1
Total	297	86	1,486	32	5	300

Current age:

	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	Total
Formal (male)	-	-	-	4	8	5	9	26	26	43	66	70	65	76	70	468
Informal (male)	18	15	19	38	47	44	50	55	74	69	64	77	72	59	44	745
Non-wage (male)	5	13	17	18	16	16	16	35	29	30	30	45	41	52	41	404
Formal (female)	1	-	-	1	4	10	18	17	21	28	29	27	19	31	23	229
Informal (female)	4	-	10	6	8	11	11	12	16	9	13	9	6	10	4	129
Non-wage (female)	7	12	12	10	24	12	20	17	15	16	19	16	26	15	10	231
Total	35	12	22	95	126	118	145	184	204	219	246	270	256	271	221	2,204

Age of entry into labor force:

	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Formal (male)	-	-	-	1	2	5	10	10	11	12	10	17	46	45	41	36	67	60	43	31	17	10	4	-
Informal (male)	3	1	7	5	28	19	53	36	47	79	46	70	82	70	52	38	41	29	14	5	12	5	1	2
Non-wage (male)	4	3	10	4	27	13	28	25	23	46	26	41	68	41	34	25	25	24	17	9	3	1	1	-
Formal (female)	-	-	-	-	-	-	-	2	-	-	3	7	14	13	15	36	38	38	23	22	11	5	2	-
Informal (female)	-	-	1	-	1	1	3	4	-	6	3	15	23	11	14	10	11	14	2	3	3	4	-	-
Non-wage (female)	-	4	6	2	9	10	9	4	4	8	9	20	14	22	22	15	24	14	5	2	6	1	-	-
Total	77	4	7	2	10	11	12	93	4	14	112	186	264	220	197	180	227	201	127	96	77	52	35	2

*only wage workers

An additional result of importance is the even ratio of male and female employment in government; women actually represent a slight majority of government employees, at 51%. It has been claimed that government jobs are much more accessible to women and more egalitarian in the pay structure, which is one factor behind the "feminization" of the civil service in the past decades.[85] In every other sector, including public enterprises, joint ventures, and especially the private sector, women make up less than 30% of the employed.

Modes of qualification

Table 2 shows the distribution of qualification mechanisms by gender and type of employment for wage workers. Formal qualification is, again, represented by schooling and university. Schooling is distributed between illiterate (9.5%), primary/literate (15%), preparatory (6%), general/vocational secondary (39%), post-secondary (5.5%) and university/post-graduate (26%) education. Vocational secondary school graduates – of which most have attended vocational education in industry (57%) or commerce (35%) – are more likely to be employed informally, whether male or female, with only 37% of males and 43% of females in public or private formal employment.[86] The opposite is true for university graduates, who at 67% (males) and 83% (females) are universally more likely to be formally employed. This may partly reflect the continuing role of the state as an employer for graduates, although especially for male university graduates, private formal employment is quite sizeable at 39%. Most – but not all – illiterates are employed informally. The primary/literate and preparatory categories are actually *less* likely than illiterates to be formally employed, at 18% and 23%, respectively, vs. 28% for illiterates. Interestingly, a full 19% of illiterate wage workers in the sample are employed formally in the public sector.

Para-formal and informal qualification mechanisms are not measured directly in the data, and therefore must be analyzed indirectly – for example through the survey questions, "Does your job require any skill?" and "How did you acquire that skill?" as well as job history (see below). A majority of male and female formal employees report being skilled and having gained this skill through regular schooling; this method is much less common among informal workers (10% of males and 8% of females). Of informal workers, 14% of males and 17% of

[85] Said and El-Hamidi, 2008; it is important to note that they also find a slight reverse in the trend with data up through 2004.
[86] Contrary to expectations, there is no significant difference in the sectoral or formal/informal distribution of vocational secondary graduates by field. Graduates in industry, commerce, and agriculture appear equally well-represented in formal public, formal private, and informal employment.

females reported having acquired the skill required for the job primarily in on-the-job training or in computer and language courses – i.e. para-formal qualification modes. These modes are also common (17% and 13.5%, respectively) among male and female private formal workers, but not common among those in public employment.[87]

Especially among the informally employed, indications of informal qualification mechanisms can be found: for example, 43% of males and 15% of females learned a skill for their current job through a craftsman. It can be speculated that this group learned or is learning primarily through the traditional apprenticeship or informal on-the-job training in a skilled trade. Over half of those trained by craftsman had already become craftsmen, themselves, while the remaining 42% of males and 49% of females were assistants or apprentices. 21% of all craftsmen and apprentices, male and female, are formally employed.

Table 2 – Modes of qualification by employment group

*Educational attainment:**

	Illiterate	Primary/literate	Preparatory	Gen./voc. second.	Post-secondary	Univ./post-grad.
Formal, pub (male)	13	6	8	84	21	72
Formal prv (male)	13	32	7	104	11	97
Informal (male)	96	175	64	305	28	77
Formal, pub (fem.)	16	-	-	37	15	88
Formal, prv (fem.)	-	4	6	14	3	46
Informal (female)	10	15	3	67	8	25
Total	149	232	88	611	86	405

Type of secondary/higher education:†

	Gen. sec./post sec.	Vocational – agr.	Vocational – ind.	Vocational – com.	University 4yr.	Univ. 5yr./post-gr.
Formal, pub (male)	22	3	58	22	64	8
Formal, prv (male)	13	6	76	20	84	13
Informal (male)	38	23	186	86	74	3
Formal, pub (fem.)	15	2	5	30	80	8
Formal, prv (fem.)	3	-	5	9	43	3
Informal (female)	9	3	16	47	24	1
Total	93	37	346	214	369	36

*Means of skill attainment for current job:**

	Regular school	Voc. training	Through contractor	Through craftsman	OTJ/courses	No skill required
Formal, pub (male)	125	13	1	7	13	45
Formal, prv (male)	95	13	1	47	47	61
Informal (male)	68	13	44	317	105	198
Formal, pub (fem.)	130	3	-	-	3	20
Formal, prv (fem.)	44	6	-	3	10	10
Informal (female)	29	4	-	19	22	55
Total	491	52	46	393	200	389

Skill level: ‡

	Apprentice	Assistant	Craftsman	Total
Formal, pub (male)	-	7	12	19
Formal, prv (male)	-	22	54	76
Informal (male)	33	125	225	383
Formal, pub (fem.)	-	-	-	-
Formal, prv (fem.)	1	7	1	9
Informal (female)	4	10	15	29
Total	38	171	307	516

*only wage workers †only secondary/higher graduates ‡ only skilled workers who acquired their skill outside of schooling

[87] A surprisingly constant proportion of 25% across employment groups report being unskilled. This was only lower for formal, public-sector female employees, at 13%, and higher for informally employed females, at 43%.

Overall, despite the mixing, it is clear that there is a tendency toward either extensive formal education and training for formal employment, or informal qualification toward informal employment. This divergence will become important again below.

Differentiation between formal and informal on-the-job training is only possible by reviewing job history, and this, in turn, is the focus of Table 3. The data on previous employment status show that prior to the current job, 25% of the sample was in another waged job, 1% were employers or self-employed, 3% were unpaid family workers, 17% were unemployed, 34% were full-time students, and the remaining 19% were temporary workers, housewives (relevant only to the female sample), or in another status. This distribution shows that most wage workers in the sample are in their first waged job, meaning that on-the-job training is likely to have occurred mostly in the current job. Among those who previously held some form of employment, however, most (85%) were in informal or non-waged jobs.

There is a surprising degree of mobility between formal and informal employment. In fact, 48% of previously employed formal public employees and 61% of formal private employees had held informal jobs prior to the current job. This movement seems to be unidirectional, however; only 3.5% of informal employees who had been previously employed had held formal jobs.[88] Furthermore, of the entire sample, females are again underrepresented, at only 11% of previously employed individuals. This seems to confirm that young women are less mobile in the urban labor market than men[89].

Table 3 – Job history and job search mechanisms

*Employment status before current job:**

	Wage worker	Employer/self-emp.	Unpaid family work	Unemployed.	Full-time student	Temp/houswif/oth.
Formal, pub (male)	55	3	10	37	58	41
Formal, prv (male)	80	4	8	49	65	58
Informal (male)	215	11	32	71	267	149
Formal, pub (fem.)	25	-	-	45	65	21
Formal, prv (fem.)	8	-	-	33	21	11
Informal (female)	17	-	-	31	58	23
Total	400	18	50	266	534	303

Sector/formality of previous job:º

	Formal public	Formal private	Informal	Non-wage	Total
Formal, pub (male)	14	6	35	13	68
Formal, prv (male)	2	21	57	12	92
Informal (male)	3	4	208	43	258
Formal, pub (fem.)	12	3	10	0	25
Formal, prv (fem.)	2	2	4	0	8
Informal (female)	0	3	14	0	17
Total	33	39	328	68	468

[88] A test using the panel dimension of the data, i.e. comparing formally and informally employed youth in 1998 and 2006, shows that over the 8-year period, 21% of informal employees had moved to formal employment, and only 4% of formal employees had become informal. This movement is higher than that attained for the entire sample in previous survey, such as Wahba and Mokhtar, 2002, who found only 11% of non-contract-holders and 3.5% of contract-holders changing their contract status between 1990 and 1998. Most of this is likely due to the greater mobility of new labor market entrants.

[89] Again, this result has been derived by Assaad and Arntz, 2005, who use constrained mobility to describe part of the male-female wage differential. While their focus is geographic, the data here show a lack of movement *between jobs* by women.

*Means of finding current job (more than one response per person possible):**

	Government facil.	Application/inquiry	Friends/relatives	Direct contact	Newspaper ads	Private office
Formal, pub (male)	87	64	50	20	29	4
Formal, prv (male)	40	74	113	53	38	9
Informal (male)	3	106	356	385	42	1
Formal, pub (fem.)	93	34	19	12	11	0
Formal, prv (fem.)	8	32	28	6	13	3
Informal (female)	2	27	64	46	10	1
Total	233	337	630	522	143	18

*only wage workers °only previously employed wage workers

Before moving on to job characteristics, further results regarding "means of finding current job" provide a look at the differences between formal and informal job search mechanisms. A rather striking first result is the use of friends and relatives to find the current job across the board; 40-50% of males and females in informal and private formal employment found their job through friends and relatives, while 12% of females and 25% of males in formal public sector jobs used such means. Clearly, family and friends are an important help in finding employment, even in the public sector. Government facilitation – in the form of job competitions and government employment offices – plays a large role for public employment and, not surprisingly, a much more limited role in private employment, where the Egyptian Ministry of Manpower and Emigration may also place individuals, but does so with less frequency. Overall, direct contacts – a category which includes contact with employers and contractors as well as waiting at gathering locations – are equally or more important than job applications or newspaper ads, especially for informal employment. Access to informal jobs is shown to be highly network-dependent, a characteristic also present in the other sectors but more important for informal employment.

Working Conditions

A final area of descriptive analysis is working conditions, where a clear question is the nature and scope of differences between formal (public and private) and informal employment. A summary is shown in Table 4, including stability of employment, working hours, monthly wage, hourly wage, and place of employment. To provide a means of comparison, the non-wage group (employers, self-employed, and unpaid family workers) has been reintroduced where data is available.

Table 4 – Employment Conditions

Stability of employment:

	Permanent	Temporary	Seasonal	Casual	Total
Formal, pub (male)	178	26	-	-	204
Formal, prv (male)	213	45	1	5	264
Informal (male)	412	173	2	158	745

Non-wage (male)	384	9	-	10	403
Formal, pub (fem.)	116	40	-	-	156
Formal, prv (fem.)	56	17	-	-	73
Informal (female)	67	58	-	4	129
Non-wage (female)	226	3	-	1	230
Total	1,042	359	3	167	2,204

Member of a trade union: *Medical insurance:*

	Yes	No	Yes	No	Total
Formal, pub (male)	102	102	172	32	204
Formal, prv (male)	80	184	89	175	264
Informal (male)	13	732	3	742	745
Non-wage (male)	15	388	6	397	403
Formal, pub (fem.)	81	75	120	36	156
Formal, prv (fem.)	22	51	29	44	73
Informal (female)	3	126	0	129	129
Non-wage (female)	1	229	2	228	230
Total	317	1,887	421	1,783	2,204

Hours per week:

	Mean hours	Standard deviation	Minimum	Maximum	Observations
Formal, pub (male)	47.62	12.65	21	108	204
Formal, prv (male)	54.36	12.89	0	102	264
Informal (male)	53.82	15.78	5	114	745
Non-wage (male)	52.33	19.40	2	105	403
Formal, pub (fem.)	40.13	10.26	2	72	156
Formal, prv (fem.)	47.53	14.68	3	90	73
Informal (female)	54.96	16.23	6	84	129
Non-wage (female)	11.20	12.80	1	72	230
Whole sample	47.48	20.06	0	114	2,204

*Monthly wage:**

	Mean wage (LE)	Standard deviation	Minimum	Maximum	Observations
Formal, pub (male)	889.27	3417.25	99	46,830	204
Formal, prv (male)	792.95	1190.88	80	11,500	264
Informal (male)	411.02	281.50	0	3,900	736
Formal, pub (fem.)	400.08	412.40	37	3,120	156
Formal, prv (fem.)	458.88	418.88	80	2,400	73
Informal (female)	253.15	390.28	0	3,120	129
Whole sample	526.14	1369.601	0	46,830	1,562

*only wage workers

As can be expected, most formal employment – whether public or private – is of a permanent nature; temporary employment relationships are extant in public and private formal employment, but are much more common for informal workers. Casual employment is almost universally a domain of informally employed males. Almost all non-wage workers are permanently employed, as they or their families own the business in which they work. Membership in a trade union is much more common – though never more common than 50% – in formal employment, which likely has to do with the state dominance of trade unions in Egypt.[90] Medical is available for a majority of formal public sector workers, and about one third of formal private workers. On the other hand, both trade union membership and sick leave are very uncommon for the informally employed.[91]

[90] Again, see Assaad, 1993

[91] The only exceptions – i.e. informal employees with union membership or medical insurance – are private informal workers. No public informal workers have these benefits, again supporting the conclusion of informal employment in the public sector. The statistics for sick leave and vacation leave mirror medical insurance.

Large differences between formal and informal employment are found in working hours and wages. Informal and private-sector employees in the sample work much longer on average than their formally employed counterparts in the public sector; the difference is greatest for women, where formal public sector workers have 40 hours weekly, formal private workers 47.5, and informal employees an average of 55 hours per week (with increasing variance). Non-wage females – most of whom are family workers – work much less, at 11 hours per week on average, showing the use of women's unpaid labor as a supplemental labor supply alongside household responsibilities. Males in non-waged, informal, and formal private-sector employment work 52-54 hours per week (against 47 hours in the public sector); informal and non-waged workers show greater variance.

These differences in working hours are dwarfed by the gaps in monthly and hourly wages between employment groups. While male formal public-sector workers earn LE 890 per month,[92] and male formal private-sector workers earn LE 793, informally employed males earn an average of LE 411, less than half of the public sector wage. This is still higher than the average wage for female formal public-sector employees (LE 400), and while the formal private sector wage is somewhat higher for females (LE 459), the wage for informal employees is a mere LE 253, exactly half of the overall sample average. While especially formal public and private sector wage distributions among males show an extremely high skewness – with maximum values over 52 times greater than the average – this shows very high wage differentials between groups. Explaining these differentials – and the extent that they have to do with qualification differences or wage premia – requires multivariate regression analysis. To control for differences in working hours, this will use hourly wages.

Summary of the findings

In summary, the descriptive statistics deliver the following background facts about urban labor markets for youth, which provide further insight about the nature of formal and informal employment and modes of qualification and undergird the following analysis:

1) With the labor contract and social insurance definition, an indicator for informal employment can be derived, which overlaps some with government and public enterprise employment. Most private employees are informally employed.
2) Females are underrepresented across the sample, and especially among employers and self-employed, and those with previous job experience. The only segments with an even balance of females and males are government employment and unpaid family work, where women are a slight majority.

[92] This amounts to US$ 165 at current exchange rates and US $564 at purchasing power parity (source: www.xe.com, market exchange rate for Aug. 1, 2008; World Bank, 2007 World Development data).

3) There is an apparent educational dichotomy between formal and informal employees, whereby most university graduates are employed formally – in the public or private sectors – and most vocational school graduates and those with lower education levels are employed informally. Illiterates appear to be employed formally more often than primary and preparatory school graduates.
4) Informal employees were much more likely to use informal modes of qualification such as the traditional apprenticeship and on-the-job training with a craftsman. Some of those who had trained to craftsman level were formally employed.
5) Most urban wage workers under 30 were still in their first job after leaving school or unemployment. Of those who had been previously employed, most had been informally employed or non-wage-workers. There is a unidirectional mobility from informal to formal employment.
6) Informal employees are more likely to use facilitation by relatives and friends or direct contacts to find employment – modes present in formal employment, as well.
7) Working conditions between formal and informal employment – i.e. working hours and wages – are strikingly different. Without controlling for qualification differences, formal public-sector male employees earn twice the monthly wage of male employees and 3.5 times that of informal female employees, with great variance.

An empirical model will help get at how the variation is related to qualification measures, and help derive stronger results for theoretical discussion.

V. Empirical Model and Regression Results

Answers on the returns to qualification measures can be delivered, as in the human capital literature, through multivariate wage regressions. Here, a standard Oaxaca-Blinder model of wage decomposition with Mincerian human capital and experience terms is used.[93] The assumption underlying this model is that market wages can be explained through productivity-related characteristics from schooling, on-the-job training, and other qualification mechanisms, and non-productivity-related factors such as place of residence (due to regional differences in the cost of living or productivity), gender (due to gender discrimination or gender-specific characteristics), age (due to seniority pay not tied to experience) or family background (to control for social differences). The functional form used here is as follows:

$$\ln(y) = \alpha + \beta X + \gamma exp + \delta exp^2 + \zeta N + \varepsilon$$

where y is hourly wage (used logarithmically to derive marginal results), X is a vector of human capital characteristics, exp is current experience, with a squared term to control for diminishing returns over time, N measures various non-productivity related variables and ε is

[93] Oaxaca, 1973; Blinder, 1973; Mincer, 1974. These papers generally serve as the basis for wage regressions, a large body of literature which is summarized neatly in, e.g., Borjas, 2008. The same model is used in Assaad, 1996; Wahba, 2000, and Said and El-Hamidi, 2005, as mentioned above.

a normally distributed error term with a mean or zero. The variable exp is defined (initially) as years since labor market entry; possibilities for differentiating between formal and informal experience are introduced below. X is made up primarily of dummy variables separating the various levels of education and means of skill attainment, while N includes standard terms such as geographic dummies (here, defined at the macro-level of region) and, importantly, sex. Occupation can be introduced, using fixed effects to control for occupation-specific characteristics such as occupational risk.[94] Initial specifications will use sectoral and formality dummies, while later specifications will separate by gender, sector, and formality.

There is a strong case for selection bias among the data, as the choice of entry into formal or informal employment is non-random and very likely correlated with unobservable worker-specific effects such as ability and job preference, as well as the partially observable characteristic of socioeconomic background.[95] Put more precisely, it could be that more able individuals, or those that place a high value on social protection, choose jobs in formal employment, while less able or more "individualistic" workers decide to work informally. If the two groups are highly diverse – a likely condition – then consistent estimations may be difficult or impossible. Estimated differences in returns to qualification may be skewed.

One previously used alleviant to the selection issue is a two-stage Heckman correction, where the propensity to enter informal employment is predicted in the first stage with a probabilistic selection model, and taken as a "lambda" term in the second-stage wage regression.[96] Such a selection model could be defined as:

$$p(\text{formal}) = \Phi(\alpha + \beta X + \zeta N + \eta P + \varepsilon)$$

such that $\Phi(\cdot)$ is an inverse cumulative distribution (probit) function, X and N are the same vectors on qualification and individual characteristics as before, and P is a vector of predictor variables which are correlated with the formality decision but not wage.[97] This can be inserted into the wage decomposition, with λ=p(formal), such that:

$$\ln(y) = \alpha + \beta X + \gamma exp + \delta exp^2 + \zeta N + \theta\lambda + \varepsilon$$

While this selection equation presents a possibility for correction, the first-stage selection must accurately predict formality of employment, and have at least one strong (instrumental) variable in vector P which is not included in the wage equation. This is a very difficult task. If the individual is married, it can be estimated that formality would be more important due to,

[94] An example would be heavy machinery work, which standard theory would suggest to be compensated with higher wages. As will be seen below, however, the rationale for occupational dummies is more of a practical than a theoretical nature.
[95] It seems likely that certain population segments are much more likely to take up informal work.
[96] For the original discussion of this, see Heckman, 1979. For selection bias in a very similar context, see Assaad, 1996.
[97] The α, β, ζ, and ε terms used in the selection equation are not the same as those estimated in the wage decomposition.

for example, the advantages of medical insurance for one's spouse or children[98]; yet marriage is also known to influence wages, as will be seen below. Assaad (1996) includes father's and mother's educational status, with the assumption that individuals with educated parents are more likely to be formal, yet parents' education is also likely to be correlated with innate ability – and it is not consistently available in the 2006 data. Available information on an individual's first job can help generate a "formality of first job" variable, yet this will correspond exactly to formality status for all individuals who are currently still in their first job. Table A1 in the Appendix shows the results of the selection equation for the whole sample and for males and females separately using various specifications. It is worth noting that with repeated tests, none of the predicted probabilities from these equations had a significant coefficient in the second-stage equations.

As such, the question of how two identical individuals would earn in a formal vs. informal job is extremely difficult to determine from the existing data and model. The altered question of how the *same* individual has earned in different sectors can be analyzed, using the panel dimension of the data.[99] Indeed, the data include 360 individuals (285 males and 75 females) who were employed as wage workers in both 1998 and 2006. By comparing these individuals' wages – correcting for inflation and wage growth – we can obtain an indication of whether the results are consistent. The model, using year and individual fixed effects, is:

$$\ln(y/inf) = \alpha + \beta X + \gamma exp + \delta exp^2 + \theta N + fe_i + fe_{yr} + \varepsilon$$

where inf is the yearly Consumer Price Index deflator, fe_i and fe_{yr} are fixed effects terms for individual and year, and all other variables are the same. Most variables in vector N will have to be dropped, however, as these are invariant for the individual over time. Further, the model only applies to those individuals who participated in the survey in both years and changed employment status – which itself is unlikely to be a randomly selected sample. It can nonetheless help obtain more consistent results than the simple static regressions.

Aggregated regression analysis and results

Table 5 shows the results of the initial round of OLS wage equations. Stars indicate the 90% (*), 95% (**), and 99% (***) significance levels, with t-scores in parentheses to the right. The base case in all regressions is an individual who is illiterate, unskilled, in the private sector, and in Cairo, as well as male in specifications (1) through (4).

[98] Marriage and status as household head are used as determinants of the formality decision in Marcouiller et al., 1997.
[99] This is similar to Badaoui et al., 2007, who attempt to calculate the formal/informal wage gap in South Africa using both panel data and propensity score matching (PSM). Their analysis is strengthened by the availability of more than two periods.

The results of the regressions are, at first glance, congruent with human capital theory. Higher education level wages lead to significantly higher wages across the board, as do experience (with a negative quadratic term) and the range of job-relevant skills. One result in the education coefficients is quite surprising, however. For all youth, primary school actually entails – all else equal – *lower* wages than illiteracy, and there is no statistically significant benefit for preparatory, general secondary, or vocational secondary education. In fact, vocational education has an insignificant negative coefficient, which is similar regardless of subject. Returns to formal education in the results only become visible at the university and post-graduate levels, though here they are substantial: a 4-year university graduate can expect to earn 22% more than an illiterate with the same characteristics, a 5-year graduate will earn 75% more, and a post-graduate degree holder will earn 140% more.[100] This is yet stronger for males, as seen in specification (5). When education is defined by years of schooling,[101] the coefficient is negative with a positive coefficient for the quadratic term. This again supports the notion of *increasing* returns to education. While this result is unusual in the human capital literature, it has been found in a handful of other countries.[102]

The returns to experience, meanwhile, are closer to expectations; in the whole sample and for males, there is a significant 3-6% return on work experience, with significant diminishing returns. The level of these returns is lower when age is taken into account, as in specifications (1) and (2), and higher when age is dropped; it is difficult to know the extent to which the effect has to do with actual on-the-job experience vs. seniority pay. This work experience can be divided into work experience in formal and informal employment by using previous job characteristics and start dates, in order to distinguish between the on-the-job training in both. Interestingly, both types of experience remain highly significant, and informal experience appears to have a slightly higher return of 4% (as against 3% for formal experience). This will be returned to below.

Table 5 – Aggregated OLS wage regressions

	(1)		(2)		(3)	(4)		(5) Males		(6) Females	
Education											
Read/write	-0.085	(-0.83)				0.063	(0.57)	-0.043	(-0.42)	-0.422	(-1.07)
Primary school	-0.169**	(-2.27)	-0.135*	(-1.90)		-0.017	(-0.20)	-0.154**	(-2.00)	-0.161	(-0.65)
Preparatory school	-0.106	(-1.17)	-0.098	(-1.08)		0.067	(0.65)	-0.094	(-1.01)	0.141	(0.50)
General sec. ed.	0.074	(0.40)	0.099	(0.54)		0.315	(1.62)	0.131	(0.71)	0.797	(1.11)
Voc. sec. – agr.	-0.177	(-1.44)	-0.081	(-1.22)		-0.015	(-0.11)	-0.065	(-0.51)	-0.303	(-0.89)
Voc. sec. – ind.	-0.080	(-1.14)				0.101	(1.21)	0.001	(0.01)	0.234	(1.14)

[100] Marginal effects derived with e^(.564) and e^(.893), assuming dummies=1.
[101] The procedure for defining years of schooling is the same as used in Wahba, 2000, whereby illiterate = 0 years of schooling, read and write = 3 years, primary = 6, etc. Because there is perfect multicollinearity between this variable and the educational dummies, it is not possible to include both attainment level and years of school, as in Said and El-Hamidi, 2005.
[102] Wahba, 2000, cites studies on the Sudan, Malaysia, and Taiwan which show similar increasing returns to education.

Voc. sec. – com.	-0.097	(-1.30)					0.110	(1.20)	-0.009	(-0.11)	-0.103	(-0.65)
Voc. sec. – 5yr.	-0.051	(-0.20)	0.029	(0.31)			0.219	(0.67)	-0.397	(-0.89)	0.002	(0.01)
Post-secondary	0.020	(0.21)					0.218*	(1.94)	0.179*	(1.71)	-0.030	(-0.14)
University – 4yr.	0.199**	(2.55)	0.308***	(4.29)			0.377***	(3.73)	0.397***	(4.81)	0.110	(0.71)
University – 5yr.	0.564***	(3.95)					0.811**	(2.42)	0.766***	(4.79)	0.376	(1.30)
Post-graduate	0.893***	(3.27)	1.002***	(3.68)			0.942***	(3.07)	1.764***	(3.98)	0.534	(1.41)
Years of education					-0.031*	(-1.92)						
Years of $educ^2$					0.003***	(3.27)						
Work experience												
Experience	0.031**	(2.13)			0.041***	(2.77)			0.058***	(3.88)	-0.023	(-0.62)
$Experience^2$	-0.001*	(-1.76)			-0.001	(-1.22)			-0.002***	(-2.61)	0.004*	(1.73)
Exper. – formal			0.034*	(1.95)			0.047**	(2.50)				
Exper. – $formal^2$			-0.002*	(-1.87)			-0.002	(-1.42)				
Exper. – informal			0.040**	(2.58)			0.047***	(2.87)				
Exper. – $informal^2$			-0.002**	(-2.09)			-0.001	(-1.49)				
Skills acquired												
Regular schooling	0.182***	(3.46)	0.193***	(3.68)	0.030	(0.44)	0.026	(0.38)	0.158***	(2.65)	0.238**	(2.09)
Vocational training	0.245**	(2.54)	0.251***	(2.59)	0.115	(0.95)	0.120	(0.98)	0.206*	(1.92)	0.364**	(1.65)
Through contractor	0.281***	(2.59)	0.293***	(2.70)	0.181	(1.41)	0.169	(1.31)	0.304***	(2.88)	---	---
Through craftsman	0.268***	(5.31)	0.271***	(5.36)	0.125*	(1.71)	0.104	(1.40)	0.266***	(5.13)	0.248	(1.40)
Courses/other	0.168***	(2.93)	0.168***	(2.93)	0.057	(0.84)	0.045	(0.65)	0.150**	(2.45)	0.253*	(1.74)
Sector/job status												
Formal?	0.187***	(3.74)	0.229***	(3.17)	0.133**	(2.35)	0.151*	(1.81)	0.192***	(3.54)	0.323***	(2.69)
Trade union?	0.268***	(4.94)	0.288***	(5.33)	0.254***	(4.02)	0.244***	(3.83)	0.264***	(4.20)	0.291***	(2.68)
Medical insurance?	0.284***	(4.80)	0.281***	(4.73)	0.260***	(3.81)	0.277***	(4.02)	0.215***	(3.13)	0.429***	(3.54)
Government	-0.242***	(-4.00)	-0.251***	(-4.15)	-0.296***	(-3.87)	-0.286***	(-3.73)	-0.272***	(-3.67)	-0.185*	(-1.66)
Public enterprise	-0.040	(-0.49)	-0.027	(-0.34)	-0.144	(-1.55)	-0.134	(-1.43)	0.008	(0.09)	-0.103	(-0.49)
Outside of establ.	0.405***	(8.25)	0.397***	(8.07)	0.275*	(1.93)	0.194**	(2.09)	0.347***	(7.18)	2.041***	(5.64)
Joint venture	0.340***	(2.84)	0.346***	(2.87)	1.178*	(1.91)	0.282**	(1.96)	0.368***	(3.02)	-0.196	(-0.47)
Foreign	1.035**	(2.25)	0.982**	(2.13)	0.620	(0.88)	1.180*	(1.91)	1.307**	(2.10)	0.813	(1.15)
Other	-0.046	(-0.12)	-0.022	(-0.06)	0.133**	(2.35)	0.628	(0.88)	-0.037	(-0.10)	---	---
Personal char.												
Female	-0.288***	(-5.98)	-0.291***	(-6.17)	-0.224***	(-3.97)	-0.230***	(-4.03)	---	---	---	---
Married	0.144***	(2.59)	0.146***	(2.63)	0.116***	(2.70)	0.119***	(2.75)	0.107**	(2.48)	0.204**	(2.16)
HH Head	-0.018	(-0.28)	-0.026	(-0.42)								
Age	0.020***	(2.83)	0.021***	(2.91)								
Region												
Alex./Canal Cities	-0.061	(-1.24)	-0.071	(-1.46)	-0.094*	(-1.68)	-0.094*	(-1.68)	-0.016	(-0.30)	-0.237**	(-2.12)
Upper Egypt	-0.155***	(-3.27)	-0.156	(-3.30)	-0.169***	(-3.19)	-0.166***	(-3.12)	-0.104**	(-2.02)	-0.355***	(-3.18)
Lower Egypt	-0.085*	(-1.84)	-0.091	(-1.98)	-0.135**	(-2.64)	-0.138***	(-2.65)	-0.071	(-1.40)	-0.230**	(-2.10)
Constant	-0.392**	(-2.60)	-0.447***	(-2.92)	0.140	(1.38)	0.054	(0.50)	-0.101	(-1.10)	-0.993***	(-2.67)
Occupational fe's?	No		No		yes		yes		no		no	
Observations	1,557		1,557		1,557		1,557		1,201		356	
R^2	0.3028		0.2963		0.5211		0.5249		0.2698		0.4217	

Skill variables – dummies which record whether the individual reported having a skill, and where this was acquired – generally have large, significant, and positive coefficients, with the largest and most significant effects for those who learned their skill through a contractor or craftsman. This seems to show the strength of the institution of the traditional apprenticeship and informal skills training, which adds as much as 35% to wages. Skills seem to be unique to particular occupations, however, since controlling for occupations causes all coefficients – with the exception of craftsman training – to become insignificant.

These effects are made more accurate by controlling for personal, job-related, and geographic variables, which deliver interpretable effects of their own. The strongest differences are seen in the sector, job status, and gender results, which in these specifications

are still treated together. In every estimation, formality brings with it a significantly higher wage, on the order of 15-25%, with a much higher effect (38%) for women. When controlling for occupation, the effect is smaller, implying that part of the differential may have to do with occupation – some of which are more likely than others to be formal. Government employment seems to have a pay *disadvantage* relative to private employment, while public enterprises show no significant difference to private work. It should be cautioned that this is an effect which does not price in public sector fringe benefits. The positive pay differentials for joint ventures and foreign establishments – both of which had small samples – are not unusual,[103] but the strongly positive effect of working outside an establishment is quite surprising. Unionization has a rather strong and significant wage effect, as does medical insurance. This result is also surprising, as a competitive labor market should include compensating wage differentials which *lower* the wage of an insured individual by the value of a social benefit.[104] The fact that medical insurance signals a higher wage implies an uncompetitive market and job rents – a condition requiring theoretical explanation.

Across the sample, the wage disadvantage for females' employment is at least 25%; in the separate male and female equations the constant term for female employment is .9 log points lower. It appears that informally employed females have an even higher wage differential to males than formally employed females. The other coefficients show a clear divergence from men in the lack of significant differences between educational levels once job characteristics have been taken into account. While part of this due to small sample size, it may also be that the unusually strong effects of formality, skill level, union membership, marriage, etc., catch and negate the effects of education. The regional corrections are also much stronger for women, raising the possibility that young women have a more difficult position in locales outside of Cairo – especially Upper Egypt – where discrimination may be stronger. With the strength of these effects, a much higher r^2 value is possible for women, showing that 42% of the variance in log wages can be explained, vs. only 27% for men.

With the large differentials between males, females, and employment groups in mind, the next section will disaggregate the sample by gender, sector, and formality and compare the effects of qualification in each of the six resulting samples.

[103] Numerous authors, including te Velde and Morissey, 2003, have shown that foreign employers in developing countries tend to pay higher wages. It is instructive that both individuals in the sample in foreign employment are formal and have medical insurance.
[104] Again, see Assaad, 1996. This issue was the key thrust of Assaad's analysis.

Gender, sector, and formality-separated wage analysis and results

This section separates samples by gender and employment status (formal public, formal private, and informal private), creating six sets of wage regressions. This has its justification in that wage setting mechanisms may be vastly different between sectors (with particularly rigid rules in public employment) and that only a separate analysis can return results on individual returns. While the choice of division can be criticized, the empirical results above have proven that it is sensible to segregate gender and government vs. private employment; the separate treatment of informal employment allows analysis of the returns to formal, para-formal, and informal qualification mechanisms in formal vs. informal employment.[105]

The results are listed in Table 6. Using a specification similar to (4) from Table 6, but without controlling for occupation due to the smaller sample sizes, estimations (1) through (6) show the effects of the various qualification mechanisms for each employment group. Because various sectors are still present in each sample, these have been left in the regressions. The base case in (1) and (4) is government employment, and private employment in (2), (3), (5), and (6).

Table 6 – OLS wage regressions by sector, gender, and formality

	(1)		(2)		(3)		(4)		(5)		(6)	
	Formal, pub., mal		Formal, priv., male		Informal, male		Formal, pub., fem.		Formal, priv., fem.		Informal, female	
Education												
Read/write	-0.949	(-1.04)	0.409	(1.34)	-0.021	(-0.21)	---	---	---	---	-0.197	(-0.45)
Primary school	-0.590	(-1.21)	-0.216	(-0.90)	-0.047	(-0.60)	---	---	-0.283	(-0.19)	0.236	(0.79)
Preparatory school	-0.786**	(-2.06)	-0.198	(-0.62)	0.010	(0.10)	---	---	0.708	(0.52)	0.429	(1.01)
General sec. ed.	-0.401	(-0.49)	0.137	(0.26)	0.234	(1.22)	---	---	---	---	0.659	(0.91)
Voc. sec. – agr.	-0.434	(-0.81)	0.209	(0.59)	-0.126	(-0.91)	-1.045**	(-2.08)	---	---	0.307	(0.71)
Voc. sec. – ind.	-0.561**	(-2.05)	-0.082	(-0.36)	0.103	(1.21)	0.710’	(1.80)	0.555	(0.40)	0.373	(1.30)
Voc. sec. – com.	-0.593*	(-1.90)	-0.177	(-0.69)	0.078	(0.81)	-0.271	(-1.15)	0.541	(0.42)	0.124	(0.51)
Voc. sec. – 5yr.	-0.836	(-1.38)	---	---	---	---	-0.213	(-0.59)	---	---	---	---
Post-secondary	-0.085	(-0.28)	0.189	(0.63)	0.085	(0.63)	-0.318	(-1.04)	0.282	(0.20)	0.554*	(1.70)
University – 4yr.	-0.155	(-0.61)	0.537**	(2.28)	0.348***	(2.93)	-0.181	(-0.96)	0.693	(0.49)	0.305	(1.06)
University – 5yr.	0.163	(0.42)	0.936***	(3.02)	0.590*	(1.75)	0.151	(0.45)	0.595	(0.37)	---	---
Post-graduate	0.123	(0.15)	2.925***	(4.20)	---	---	0.163	(0.32)	-0.674	(-0.25)	0.827*	(1.91)
Work experience												
Exper. – formal	0.105*	(1.80)	0.129***	(3.03)	0.050	(1.04)	-0.081	(-0.94)	-0.200*	(-1.75)	0.199	(0.81)
Exper. – formal^2	-0.006	(-1.23)	-0.010***	(-3.46)	-0.002	(-0.83)	0.011	(1.37)	0.014*	(1.69)	-0.021	(-0.97)
Exper. – informal	0.115*	(1.68)	0.093**	(2.02)	0.043**	(2.37)	-0.125	(-0.86)	0.064	(0.09)	-0.010	(-0.17)
Exper. – informal^2	-0.006	(-1.60)	-0.005**	(-2.28)	-0.001	(-1.60)	0.004	(0.59)	0.039**	(1.66)	0.003	(0.71)
Skills acquired												
Regular schooling	0.092	(0.59)	0.080	(0.66)	0.167**	(1.99)	0.024	(0.13)	0.455	(1.15)	0.445**	(2.56)
Vocational training	0.428*	(1.67)	0.259	(1.19)	-0.055	(-0.34)	0.034	(0.07)	0.610	(0.95)	-0.080	(-0.19)
Through contractor	-0.372	(-0.39)	0.375	(0.56)	0.291***	(2.93)	---	---	---	---	---	---
Through craftsman	-0.055	(-0.16)	0.189	(1.26)	0.292***	(5.48)	---	---	1.093	(1.18)	0.237**	(2.05)
Courses/other	0.373	(1.46)	0.145	(1.08)	0.132*	(1.92)	0.021	(0.05)	0.479	(1.01)	0.310*	(1.76)
Sector/job status												
Trade union?	0.229*	(1.67)	0.192*	(1.84)	0.423**	(2.49)	0.181	(1.41)	0.382	(1.05)	0.895*	(1.66)
Medical insurance?	0.176	(1.02)	0.230**	(2.32)	-0.236	(-0.70)	0.447***	(2.85)	0.343	(1.15)	---	---
Government					-0.555**	(-1.98)			---	---	-0.271	(-0.83)
Public enterprise	0.285**	(2.07)			0.049	(0.27)	0.161	(0.75)	---	---	-0.584	(-0.84)

[105] Other divisions of the sample – including along medical insurance, union, or occupational lines – were tried but showed less clarity than the division by formality and sector. An empirical test for the division of the labor market into multiple segments, as described in Günther und Launov, 2006, could offer more formal empirical justification, but was not attempted.

Outside establ.			0.219	(1.45)	0.363***	(7.62)			---	---	2.041***	(5.67)
Joint venture			0.384**	(2.49)	0.171	(0.74)			-0.037	(-0.05)	-0.186	(-0.27)
Foreign			1.316*	(1.99)	---	---			0.463	(0.49)	---	---
Other			0.282	(0.42)	0.076	(0.19)			---	---	---	---
Personal char.												
Married	0.106	(0.50)	-0.038	(-0.23)	0.090	(0.95)	0.328**	(2.52)	0.101	(0.37)	0.124	(0.57)
HH Head	-0.152	(-0.70)	0.229	(1.32)	0.057	(0.59)	-0.689	(-1.38)	---	---	---	---
Age	.002	(0.07)	-0.017	(-0.77)	0.013	(1.42)	0.029	(0.95)	0.028	(0.42)	0.032	(1.43)
Region												
Alex./Canal Cities	-0.068	(-0.37)	0.028	(0.24)	-0.033	(-0.50)	-0.297*	(-1.72)	-0.214	(-0.65)	-0.237	(-1.38)
Upper Egypt	-0.240	(-1.46)	-0.009	(-0.07)	-0.086	(-1.41)	-0.401**	(-2.07)	-0.263	(-0.69)	-0.429***	(-2.73)
Lower Egypt	-0.189	(-1.25)	-0.113	(-0.89)	-0.040	(-0.68)	-0.451***	(-2.65)	0.131	(0.38)	-0.032	(-0.17)
Constant	0.410	(1.21)	0.340	(0.68)	-0.429**	(-2.48)	-.209	(-0.27)	-0.925	(-0.52)	-1.255***	(-2.79)
Observations	204		264		745		156		73		129	
R^2	0.2259		0.3575		0.2415		0.3919		0.3746		0.4766	

As can be expected, the education coefficients are much weaker across samples – both due to the smaller sample size, and selection. As was shown above, more educated individuals – whether male or female – are more likely to enter formal employment, especially in the public sector, meaning that there is a preponderance of these individuals in (1), (2), (4), and (5). In the public sector – shown in (1) and (4) – the seeming lack of returns to education could be due to the fact that entry to the public sector itself is a return to education. Put differently, more schooling may not lead to a higher wage in a public job because it primarily leads to a better chance at a public job. The pattern of higher returns to education in formal public employment is not confirmed, when selection is not taken into account.[106] Skills acquired in vocational training bring a significant return to formal public sector males, but not to females, while informal qualification mechanisms do not seem to be rewarded.

In the private sector, the returns to formal education are much higher, though they are only significant for males; especially university and post-graduate education are rewarded. Formal and informal experience also show high, significant returns, although the inverted pattern of increasing returns to formal experience is again observable for females. The skills variables are positive but not significant.

The results of interest to this analysis are found in specifications (3) and (6), where informal wages for males and females are disaggregated. These equations also show returns to education, yet a much higher pattern of returns to informal qualification mechanisms. Beginning with formal education, the returns to schooling for informally employed males show a completely flat pattern up until university and post-graduate education, where those males of these groups who are informally employed show large and significant wage advantages over their less educated informal counterparts. For females, there is a large and

[106] Again, a much stronger result could be delivered with a two-stage model, but this is not possible in the data.

significant premium for university education. One explanation for this is the higher reservation wage of these informal employees, who would be more able to find a well-paying formal job in the public or private sector, and thus only work informally if the wage offered induces them to change sectors. An undiscussed possibility is informal credentialism.

The experience terms show the expected signs for males, but not for females; in both cases, they are smaller and less significant than in private formal employment, though it is important to note that the informal experience term is more significant for informally employed males. For this group, each year of informal work experience brings a 4.4% increase in wages, with decreasing returns, possibly while these workers become more skilled, gain contacts, and climb up in the small firm hierarchy. Informally employed females with formal employment experience seem to be compensated at 20% per year of experience, but the result is not significant. This finding, if valid, could also have to do with the higher reservation wage required to bring a formally employed female worker into an informal job.

It is the skills terms which show the most important results. For both males and females, skilled work brings a premium, and especially if the skills were acquired through a contractor or craftsman – the marginal effect is on the order of 25-35%. While it is not possible to divide this further into those individuals who had trained "officially" as an apprentice (*sabi*) and those who had learned on-the-job, the distinction is likely not critical for the purpose of analysis. Besides the apprenticeship, other skills are important, as well, especially for young women. Those skills acquired through regular schooling are rewarded at 18% for males and 56% for females. Those male workers who had learned the skill for their job through a course were earned 14% more, while females earned 36% more. Thus, despite the fact that the skills question is only a very imperfect measure for training in an apprenticeship or other informal institutions, these proxies for informal training can be found to have a significant effect in increasing earnings in informal employment.

Across the samples, the wage premia for union membership and medical insurance are also still present, showing that these lead to wage differentials within employment groups, as well.[107] Formality can still be shown to bring a premium, seen in the higher constant terms of the formal employment groups. The sectoral results are also as before, except that the "outside establishment" term seems to bring a much higher wage in informal employment. Further analysis reveals that this effect disappears when controlling for occupation, as most of those outside an establishment are bundled in the "craft and related trade workers" and "plant and

[107] The result on medical insurance is not unique to this dataset, but has been derived for industrialized countries, as well. See Currie and Madrian, 1999.

machine operators and assemblers" groups, which may capture independently operating craftsmen. It can be speculated that these occupations are generally more skilled, meaning that this sectoral variable is also catching skills variables.

Finally, it is noticeable that the r-squared term is much lower for informally employed males (0.24) than for formal privately employed males (0.36), despite the lower variance in wages. This lends credence to existing results that such earnings are much more volatile, and also implies that the specification still cannot account for much of what makes up informal earnings – which could include ability, negotiating skills, and social contacts. For females, the explained variance is higher (0.47) for the informally employed, meaning that much of the (relatively low) variance in wages is explained by union membership, sector (whether outside of an establishment), the skill terms, and geography. Similar to the results in Assaad (1996), but using data from 18 years later, there is an indication of significantly lower wages for young informally employed women in Upper Egypt.

Panel data regressions and individual fixed effects

All of the results derived above could suffer from the effects of selection bias into formal and informal employment, which it has not been possible to solve with a two-stage correction. Thus, the introduction of two periods – 1998 and 2006 – with strictly the same individuals, can provide more robust results for comparison. By only comparing the same individuals, the possibilities for individual-specific differences in innate ability are excluded. Any effects from qualification measures, job characteristics, sectoral differences, family status or region will result strictly from changes in these characteristics between the two periods by one individual. It is not possible to measure the effects of sex, which is constant for the individual, or of age, which should be 8 years higher for all respondents in 2006 than in 1998.[108]

Table 7 shows the results of the six regressions for the sample of strictly the same 360 individuals.[109] While it has not been possible to disaggregate by formality, sector, and gender, the separate specifications for the whole sample (1), males (2) and females (3), and formal public (4), formal private (5), and informal (6) workers can still provide a higher level of detail. Because 2006 employment status is used, it is also possible to record the effects of formality and sector for each of the employment groups for those individuals who switched sectors.

[108] In actuality, the difference between age in 1998 and 2006 ranged from 6 to 10 years, resulting from minor reporting error. It should be noted that the age definition is based on age in 1998; as such, some individuals are actually 37 or 38 in 2006.
[109] The results for the entire samples in 1998 and 2006 have also been calculated but are left out due to space constraints.

Table 7 – Panel data wage regressions

	(1) Whole sample		(2) Males		(3) Females		(4) Formal, public		(5) Formal, private		(6) Informal	
Education												
Primary/read/write	-0.257	(-1.32)	-0.205	(-1.03)	---	---	---	---	-0.710	(-1.40)	-0.081	(-0.41)
Preparatory school	-0.429*	(-1.66)	-0.374	(-1.37)	---	---	-1.455**	(-2.02)	-0.329	(-0.61)	-0.279	(-0.90)
General sec. ed.	---	---	---	---	---	---	---	---	---	---	---	---
Voc. secondary	0.020	(0.07)	0.022	(0.07)	0.496	(0.48)	-1.012	(-1.43)	-0.236	(-0.44)	0.580	(1.16)
Post-secondary	0.162	(0.50)	0.149	(0.42)	0.411	(0.40)	-0.876	(-1.19)	-0.060	(-0.10)	---	---
University	0.669*	(1.83)	1.147***	(2.46)	0.250	(0.29)	-0.575	(-0.73)	1.164*	(1.72)	---	---
Post-graduate	0.776	(1.33)	1.440**	(1.96)	0.317	(0.25)	-0.834	(-0.85)	1.792*	(1.65)	---	---
Work experience												
Exper. – formal	0.040*	(1.66)	0.035	(1.22)	0.022	(0.37)	0.018	(0.48)	0.016	(0.32)	0.176	(1.13)
Exper. – formal^2	-0.001	(-1.07)	-0.001	(-0.87)	0.000	(-0.09)	0.000	(0.27)	-0.002	(-0.90)	-0.010	(-0.81)
Exper. – informal	0.018	(0.95)	0.025	(1.23)	-0.075	(-0.83)	0.044	(0.98)	-0.019	(-0.41)	0.063**	(2.31)
Exper. – informal^2	-0.001	(-0.57)	-0.001	(-0.77)	0.004	(0.60)	-0.004	(-1.18)	0.000	(0.10)	0.000	(-0.34)
Skills acquired												
Regular schooling	-0.205**	(-2.03)	-0.139	(-1.12)	-0.390**	(-1.96)	-0.176	(-1.28)	-0.345	(-1.54)	0.012	(0.04)
Vocational training	0.165	(0.83)	0.192	(0.89)	0.718	(0.90)	0.106	(0.29)	-0.050	(-0.13)	0.073	(0.15)
Through contractor	0.311	(1.37)	0.304	(1.31)	---	---	---	---	-0.177	(-0.18)	0.405*	(1.81)
Through craftsman	0.218*	(1.83)	0.223*	(1.82)	1.140	(0.89)	-0.068	(-0.19)	0.295	(1.10)	0.215*	(1.71)
Courses/other	0.066	(0.48)	0.102	(0.71)	-0.103	(-0.13)	-0.202	(-0.77)	0.505	(1.57)	-0.096	(-0.45)
Sector/job status												
Formal?	0.067	(0.60)	0.086	(0.71)	-0.145	(-0.38)	0.369	(1.10)	-0.136	(-0.74)	-0.015	(-0.06)
Union?	0.166**	(1.87)	0.222**	(2.09)	0.191	(1.05)	0.177*	(1.74)	0.115	(0.65)	0.047	(0.10)
Government	-0.242	(-1.33)	-0.396*	(-1.89)	0.450	(1.01)	-0.239	(-0.71)	-0.295	(-0.55)	-0.258	(-0.56)
Public enterprise	0.202	(1.10)	0.188	(0.91)	-0.064	(-0.13)	0.199	(0.59)	0.081	(0.17)	-0.733	(-1.28)
Outside establ.	-0.209*	(-1.70)	-0.202	(-1.59)	-0.446	(-0.51)	---	---	-0.327	(-1.22)	-0.134	(-0.90)
Joint venture	0.293	(1.38)	0.281	(1.26)	0.266	(0.29)	---	---	0.307	(1.09)	0.068	(0.12)
Foreign	---	---	---	---	---	---	---	---	---	---	---	---
Other	-0.420	(-0.90)	-0.347	(-0.74)	---	---	---	---	0.080	(0.11)	-1.203	(-1.36)
Personal char.												
Married	0.043	(0.35)	-0.007	(-0.05)	0.054	(0.18)	-0.112	(-0.58)	0.216	(0.70)	0.030	(0.16)
HH Head	0.089	(0.72)	0.147	(0.97)	-0.506	(-0.93)	0.287	(1.47)	0.216	(0.71)	-0.077	(-0.39)
Region												
Alex./Canal Cities	---	---	0.004	(0.00)	---	---	---	---	---	---	-0.089	(-0.10)
Upper Egypt	---	---	---	---	---	---	---	---	---	---	---	---
Lower Egypt	0.036	(0.05)	---	---	---	---	---	---	---	---	---	---
Survey round (yrly)	0.087***	(6.17)	0.083***	(5.38)	0.110***	(2.67)	0.102***	(4.06)	0.113***	(3.83)	0.035	(1.52)
Constant	-0.276	(-0.73)	-0.284	(-0.86)	-0.443	(-0.45)	0.545	(0.80)	-0.005	(-0.01)	-0.697**	(-2.15)
Observations	720		582		138		282		204		234	
R^2	0.791		0.789		0.846		0.802		0.821		0.807	

The returns to education follow largely the same pattern as observed before, with increasing returns to male education and positive but non-significant effects for females, with the private sector seeming to reward university and post-graduate education highly. Experience terms are weakened in this model due to the effects of the survey round, yet again, formal and informal experience both seem to have a positive effect on earnings overall and in the public formal and informal estimations. In informal employment, formal experience seems to be rewarded highly, though again the effect is not significant; informal experience is rewarded significantly for the same individual at 6.5% per year.

Most importantly, the skill terms are again significant in informal employment but not in formal employment; training through a contractor or a craftsman brings a 53% or 25% wage premium, respectively. Again, this only applies to changes to the responses of one individual, but it shows that an individual who, between 1998 and 2006, attained a skill through a contractor or craftsman could expect a significantly higher wage compared to a worker without such a skill. In public and private formal employment, this effect cannot be found, although the returns to courses are high and almost significant in formal private employment. The divergent returns to qualification modes are, once again, observable.

It can therefore be concluded with reasonable certainty that divergent qualification effects are present in the data. One effect which can no longer be proven is the formality premium, which is small or negative and never significant throughout the specifications. This is similar to the results of Badaoui et al. (2007) in South Africa, who also found that the formality term disappears when controlling for individual effects. Nonetheless, there are at least two reasons why the formal-informal differential cannot be disproved on these grounds. First, the group which switched formality status is non-random and, especially in informal employment, only consists of those individuals who had been formally employed in 1998 and left for an informal job; if this group had largely left voluntarily, then it would not be surprising if they expected the same wages as in formal employment. Those moving in the other direction could be especially motivated or well-connected workers who also earned well in informal employment, negating the formality premium. Second, it is important to note that formal employment, especially in the government and public enterprises, brings with it significant fringe benefits in housing, clothing, and medical insurance – all of which are present in the data but difficult to price into wages. The formal wage premium thus cannot be supported empirically in this model, yet it also cannot be disproved. The fact that the constant for estimation (6) is .7 log points lower than formal private and 1.2 log points lower than formal public employment implies that there still may be a large unexplained differential.

Once again, it must be noted that because of the limited sample size, the imperfect nature of the formality indicator, and reporting error, particularly for earnings, all of the results still need to be taken with a proverbial grain of salt. Especially the effects derived previously for females cannot be checked, because there simply are not enough observations across both periods for robust results. Nonetheless, the fact that the divergent qualification trend between public formal, private formal and informal employment can once again be proven is strong support for the validity of these results. The formality premium, while not supported in the results, still cannot be ruled out.

Summary of the results

The empirical analysis thus confirms four stylized results which must be explained theoretically. These are:

1) There are higher returns to formal education and work experience in the formal employment, yet higher returns to informal forms of qualification such as skills training from a craftsman in informal employment. There is a divergence of returns to qualification.
2) Informal and formal work experience have very similar returns to one another across employment groups; there is no clear disadvantage to informal job experience.
3) An unexplained differential between formal and informal employment is apparent before controlling for individual effects; there are also strong and statistically significant medical insurance, gender, regional, and unionization differentials.
4) Informal employment of males shows a high unexplained variance in wages, while the wages of informally employed females can be explained with higher accuracy.

What is missing from the analysis is some idea of how self-employed/employers earn. This is not available in the data, yet almost certainly has large effects on labor market outcomes. For example, if informal employees tend to become employers with time and earn quite a bit more, then this would clearly increase the actual returns to qualification measures in informal employment – yet this would not show up while the individual is still informally employed. There is indirect evidence that there are attractive earnings potentials as an informal employer. From the data, it can be seen that entrance into informal employment remains high, despite the apparently lower absolute wages there. Also, there is anecdotal evidence that these workers earn well – they tend to be the main creditors in areas dominated by informal economic activity. While it is not available in the data, this is an important point which needs to be determined in future research. This point, while relevant, unfortunately goes beyond the bounds of what could be measured in the existing data.

Overall, the notion that informal employment does not reward qualification can not be confirmed. Explaining these results theoretically is the focus of the next section.

VI. Theoretical Discussion

The results of the empirical work offer little support to the hypothesis that informal employment does not reward job qualification. Rather, the results seem to point out only that there is a divergence in the modes of qualification rewarded – with informal employment putting more weight on informal training for both males and females. This contrasts with the stress on higher education in formal public employment, and the importance of formal and

para-formal qualification modes in formal private employment. The noted differences in male and female returns to qualification also persist, as do a number of further trends.

A theoretical grounding for these results is still needed, however, and all of this returns to the discussion of the nature of informal employment. Again, if informal jobs are a low-productivity second-best option for those rationed out of the formal sector, then one would expect those with poor education to land there and not become qualified. If informal work is characterized merely by flexibility and free entry, and is largely competitive to formal work, then there could be opportunities for young people to gain on-the-job training there and use this as elsewhere; they may choose to enter informal employment because it offers some advantage over formal employment or adheres more closely to their preferences, some of which may not fully be expressed in wages.

To truly understand the differences, it is necessary to analyze the formality decision and the effects that this may have on returns to qualification and the incentives to qualify using different mechanisms. The idea is that formality itself is a job characteristic resulting from employer-employee negotiations, but also one that is correlated with certain employment features, as discussed before, such as dependence on social contacts, lack of standardization, and higher negotiation regarding wages, and which has its own unique effects on worker qualification. In deriving the formality decision, it can also be speculated as to what effect this has on qualification incentives, deriving a result which explains the empiric results and can allow a discussion of the nature of labor market dualism.

On this issue, meanwhile, it has been noticed that there is a certain amount of polarization of qualifications between formality and informality, which can be explained in that those employees expecting formal employment will choose formal and para-formal mechanisms (schooling, courses), while those expecting informal employment will choose others (apprenticeships, informal training), recognizing that this brings higher returns than the opposite type of qualification. Because of the firm dimensions of informal employment, such as low firm size and low capital intensity, a wage gap could emerge which is supported by path dependency of qualification. Further, because many who will eventually become formally employed begin in informal employment, as a means of gaining income while they wait for or look for formal work, they will also be included in the informal sample as a distinct sub-group of informal employees. While a strict division of the labor market into formal and informal does not apply, there are trends toward the two extremes which are roughly consistent with the newer theories of “dualistic dualism” in the labor market.

Young women have a somewhat more difficult condition in all of this: they have nearly equal opportunity in the public sector, somewhat less in the private formal, and very poor opportunity in informal employment, which is a disincentive to stay in informal work after marriage. Those women who are in the labor force are immobile between jobs, which creates an incentive for employers to train them more heavily, but also an opportunity for monopsonistic wage-setting, which would mean that even those employees who are skilled may not be fully rewarded, and the returns not evident. Outright discrimination represents a further factor preventing higher wages and returns to qualification.

The following sections lead the reader through these considerations.

The formality decision

To begin, one must return to the causes of informality at an individual level. Let us assume that at the beginning of every new employment relationship, the decision on whether the worker is to receive a formal work contract and social security is bargained over anew.[110] For the employer, a work contract and social security bring two main advantages, namely a clear, standardized relationship with the worker and, more importantly, averting the costs of legal punishment for informally employing workers. The costs of formality, in turn, include social insurance contributions (which amount to 24/26% of gross wages up to LE 1200 for the employer)[111] as well as the cost of minimum wage laws (stipulating a very low wage of LE 120 per month) and paperwork. Of course, there are also social norms governing the decision to employ formally or informally which, if broken, could cause reputational damage. It may be of advantage for one employer (e.g. a large private company) to hire employees formally because this is the norm in the field. Smaller employers may not be expected to hire formally. Because of size and visibility, the risk of legal punishment will also vary between a large and smaller employer. Thus, there is a rift between certain firms which are more likely to hire informally, and others which tend to hire formally, but – if the existence of informal workers in public employment was any indication – there are also clear exceptions to this trend. Especially some otherwise formal employers find it advantageous to hire informally or to state lower wages (e.g. the minimum wage) on the official contract. This is one reason why it is difficult to distinguish between a formal and informal sector by firm.

[110] There is unlikely to be much debate over this in reality, but serves only as a first step in analysis.
[111] Up to LE 700, the rate is 26%; for the LE 500 surpassing this, the rate is 24%. See American Chamber of Commerce in Egypt, "Doing business in Egypt", online at: http://www.amcham.org.eg/dbe/Labor_new.asp, accessed Jun. 6, 2008.

For the employee, the value of formal employment will vary to a large extent based on perception and household factors, as discussed briefly above.[112] For example, where an individual is the head of a household, formal employment will bring social insurance and, if it is in the public sector, perhaps subsidized housing or food to the rest of the family; yet if another household member is already formally employed, the family may already enjoy these benefits, meaning that formality brings no additional benefit. Further, a formal contract may offer protection to an employee in the form of sick leave, vacation, or maternity leave, but will also cost 14% of gross wage to the employee. It has been observed that especially younger workers in Egypt do not value the protection of formal labor contracts highly.[113] When a worker decides on a job, the decision to seek or demand a contract with an employer will be influenced by these factors. If a worker has formal alternatives, it is also more likely that he or she will choose a formal job, while in the lack of such alternatives, informal employment is acceptable.[114]

Parallel to the formality decision, employer and employee will come to an understanding on pay, average working hours, potential for bonuses, medical insurance, etc. – factors which have been analyzed much more extensively in labor economics.[115] It is known that workers with a higher productivity are more likely to receive higher pay, more flexible working hours, performance bonuses, and insurance; formality may move along with these trends for two reasons. First, as stated, a worker with higher productivity is more likely to find another formal job, which we assume that the worker values positively. Secondly, the relative cost of paperwork and registration to gross wage for the employer is lower, while the probability of being caught or reported for employing a worker informally is higher. Thus, formality is likely to be one job characteristic which is likely to move "up" and "down" along with others like pay, medical insurance, union membership, and job stability. Formality is itself a job characteristic and return to qualification.

The effects of the formality decision

If formality is also an important determinant of productivity and wage setting, however, then the result of the formality decision will also become a cause of specific working conditions and wage returns to qualification. The characteristics of informal employment

[112] In the discussion of selection equations in Section V, all of these factors were mentioned, yet unusable for the selection equation because of their correlation with wages. Table A1 in the Appendix shows their validity as correlates with formality.
[113] Lotz, 2008; further, interviews in Cairo revealed that many younger employees were not aware of the contract requirement, and did not see much possible benefit from a contract.
[114] Similar to reservation wage, one could speak of reservation job conditions including formality which affect labor supply.
[115] Again, see Borjas, 2008

introduced in Section II are again relevant here. For example, the lack of regulatory standards on wage and working conditions could mean that much more of wages is up to negotiation, implying a wider range of outcomes dependant on relative bargaining positions. If, as argued by Esfahani and Salehi-Isfahani (1989), observability of effort is higher in informal employment than in formal employment, there will be less rationale for paying efficiency wages. In unpaid family employment – a regular fixture of informal employment of youth – the benefits accruing to work and the incentives to train or gain new skills will obviously function very differently and, perhaps, be more socially determined in family interactions.[116]

Most importantly, the "personalized" nature of informal employment and the pre-eminence of social contacts and networks for finding work and acquiring skills may lead to a strong dependence of outcomes on personal acumen and contacts, as hinted at in the case studies. In a highly compartmentalized informal labor market, knowing a successful employer or being able to establish a useful contact may be keys to greater earnings. Being part of a social network specializing in a particular business – such as garbage collecting in Cairo[117] – may also be an advantage in receiving higher earnings. Just as formal employment is often described as having high barriers to entry, the same may be true in parts of informal labor markets, where the barriers are of a more socially enforced nature. Overcoming such barriers could also be a function of social capital.

The evident result of these considerations is that formal and informal employment each reward different modes of increasing productivity through qualification. A worker in the formal private sector appears to be rewarded for having higher education, work experience, and having participated in formal courses; these certifiable means of qualification bring job-specific skills which are of use there. Formal public sector employment seems to be made accessible through formal schooling, which explains why there are few returns to education here, but something of a negative wage differential for those with lower education.

In informal employment, the means of qualification are different. Skills obtained may – due to a lack of information and standardized institutions – have to be demonstrated or otherwise observable. Examples would include manual skill in certain trades, which an employee can improve through the quality of his or her work. Other possibilities are qualifications which can be verified socially – for example via an intermediary ("wasta"), or an apprenticeship with a known master. This would explain why informal employment

[116] Dedeoglu, 2004, reports that there are highly skilled family workers in Turkey's informal *atölye*, with claims by shop owners that training takes up to 10 years. The mechanisms for attaining these skills may be quite specialized, though.
[117] See Assaad, 1996b, for an account of the Zebbaleen (informal garbage collectors) and their attempts at maintaining their traditional, informal business – which is heavily network and family-based – against a formalization initiative of the state.

rewards informal experience and skills training through a craftsman, with a large unexplained component for males. The unexplained component of wages likely includes personal ability and acumen, negotiating ability, and membership in a social group which has access to a lucrative business opportunity. While investments in these areas are possible – for example through acquiring implicit knowledge or through social contacts acquired private – the investments may look very different than formal schooling or courses; these types of investments in human and social capital are not recordable in the existing survey evidence.

Formal qualifications such as schooling or state certification of a trade could be of less use in qualification for informal work if these methods are not tailored to the needs of informal employment. Moreover, time spent in formal education is time not spent in an informal apprenticeship or in informal employment (less years of experience or less chance at attaining a skill), meaning a potentially worse outcome. This may explain the low returns to formal education and the fact that illiterates were likely to earn better, all else equal, than those who had completed primary or preparatory school in both formal and informal employment. If the years between age 6 and 15 are applied toward learning a trade rather than attending school, informal skills can be acquired, which may increase wages and even the chance of formal employment in one's trade.

Further research into this area could bring up new results, but these speculations offer an explanation for the results observed in the data.

Labor market expectations and the polarization of qualification

It can be expected that, recognizing the outcome of the formality decision on a macro level, both employers and workers will "use" informal employment in particular situations. For employers – even in the public sector – it is advantageous to hire informal employees for unskilled, temporary, or occasional jobs where the costs of formal employment would be higher. Small producers are also likely to always use informal employment for the reasons listed above, and because this represents a cost advantage when competing with other small producers and large firms. Employees may enter informal employment at the beginning of their career, for both the reasons listed above and because informal employment may represent a means of earning money casually before finding a more lucrative formal opportunity. This would explain the trend shown in Section IV of most workers – even those formally employed at the time of the survey – having begun in informal employment.

More broadly, many workers will have expectations about their long-term labor trajectories and whether they are to enter formal or informal employment in the long run.

Those who expect to gain formal public sector employment will remain in school and attempt to gain formal credentials which improve the likelihood and outcome of employment. The same is very likely to be true for those expecting to work in private formal employment, who are more likely to stay in school and enroll in (para-formal) courses to attain skills that will be of use for a formal private employer.

Employees who expect to stay in informal employment in the long run will likely prepare themselves, meanwhile, with informal qualifications such as informal work experience, an apprenticeship, social contacts or negotiating skills. The reward for these qualifications may be higher wages in informal employment, or even the potential to become an employer one day and hire others. Given this trajectory, formal schooling may be a hindrance to labor market success because of the years spent not working and the inability to become an apprentice following the completion of schooling.[118]

The existence of different "tracks" of qualification for formal and informal employment thus could lead to a polarization of qualification outcomes – an effect observed in the distribution of educated workers into public and private formal employment and those with less schooling or skills acquired from a craftsman into informal employment. This does not have to be strict, however – the results also showed illiterates in formal employment and some with a post-graduate education in informal employment; it may be possible and even advantageous for some workers to switch from formal to informal employment or vice versa and, in so doing, retain their rough wage level. This would explain the high returns to higher education in informal employment and the lack of a formality premium in the panel data equations with fixed effects.

Further, those employees who use informal employment as a training ground before entering formal work, as suggested by Maloney (1998) and supported in the evidence of unidirectional mobility to formal employment, represent an important exception to the trend of polarization of qualification, as they likely have gained formal qualification for the long term even though they are currently informally employed. The general result remains to be a tendency toward the extremes of little schooling and much informal experience, or formal schooling with para-formal qualification mechanisms roughly dividing the labor markets.

[118] In several conversations with knowledgeable labor market observers, it was stated that informal employers often prefer an apprentice who has not been "spoiled" by schooling, but who was an "empty page" for informal training.

Relation to dual labor market theory and the formal-informal wage premium

The polarization of qualification outcomes could have important macro-level effects on labor markets for youth, including a wage structure outcome which would parallel the result predicted by labor market dualism, but would in fact be explainable by qualification. When the mobility of some workers from informal to formal employment is considered, a result mirroring the "dualistic dualism" proposed by Maloney (2004) and Günther and Launov (2006) may result. It can be suggested that this applies to urban Egypt.

Again, it is important to review the dualistic hypothesis and the concordant possibilities for a formal-informal wage premium identified previously. Using the efficiency wage variant of the dualistic hypothesis, employers pay a wage above the market clearing rate – and thus hire less workers than available – in order to achieve certain productivity effects; those who cannot find a job paying at this rate would earn less in informal employment. This could explain the formal-informal wage premium apparent in some of the estimations by Marcouiller et al. (1997), Badaoui et al. (2007), and Assaad (1996). Newer studies such as Maloney (2004) and Günther and Launov (2006) discuss a further division of informal employees into an "upper tier" and "lower tier" group – a kind of "dualistic dualism". It is contended that the upper tier of informal workers choose to be employed informally, because it is more advantageous to them, while the lower tier would prefer to be in formal employment. The basic idea of barriers to entry continues to drive the results.

If the two types of employment reward differing types of qualification, however, and there is a polarization of individuals toward one of two tracks, then this represents an alternative explanation for segmentation in the labor market. Specifically, individuals who have become qualified informally may not be able to fully transfer these skills to formal employment, and vice versa. As an example, a mechanic who had trained as an informal apprentice may not be able to find a formal job, and if so, only at a much lower wage. A formally trained service employee may gain entry to informal work, but not be able to apply the skills acquired there, thus also receiving a lower wage. Precisely because formal and informal work prefer different means of skill attainment and qualification, it may not be possible to transfer skills without some cost for most individuals. This creates a qualification barrier between formal and informal work, with very select movement between the two.

The next necessary step to explain a dualistic wage structure would be a reason for an absolute wage differential between the two sectors, to which several non-qualification-related explanations can be used. For example, of the factors associated with informal firms is small firm size, which is known to bring about lower wages for employees in various national

contexts.[119] The correlation of informal work with small firms could lower average wages. Another correlated factor is the capital constraints of informal firms, which also should lead to lower wages given the known link between the capital intensity of a job and wages.[120]

The important question is why such formal-informal wage gaps would persist over time, given that in a competitive labor market, any systematic premium to formal employment should induce a migration of workers from informal to formal work, eventually evening out the expected lifetime income in both for a marginal worker. Yet three options present themselves to justify an ongoing differential. First, there may be a degree of "path dependency" of qualification if a worker expects to enter one type of employment and the relative wages change; in this case, it would be costlier to switch paths than to continue in the same type of employment, even if the relative wages were lower. Second, there may be non-wage benefits to informal employment such as the opportunity to work with friends and relatives. Whether these benefits are greater than the benefits of formal employment – such as medical insurance – is an open question. Finally, and most probably, it could be that factors such as innate ability and social milieu play into which trajectory a worker chooses, meaning that the formal and informal groups are not truly comparable. Anecdotal evidence suggests that there is a class dimension to the formality of employment, a topic which cannot be analyzed further here.

If this is combined with the known movement of some workers who expect formal employment in the long run through entry positions in informal employment, then these new entrants – who are less qualified in informal mechanisms than their informally trained counterparts – could also pull down the average wage. If experience is not measured or measured imperfectly this would create the appearance of a higher formal-informal wage gap.

Further, the division of informal employees into two groups – an "informal-to-formal" and a "skilled informal" group – is logical. The informal-to-formal group will expect to eventually be employed in formal employment and thus use primarily formal modes of qualification, resulting in lower wages in informal work yet higher wages later. The skilled informal group will expect to remain in informal employment throughout their career, and thus tend toward informal qualification which will bring higher wages. The skilled informal group corresponds roughly to an upper tier of informal employees, while the informal-to-formal group is a (temporary) lower tier.

[119] See Schwimmer, 2007, for a review of the literature and theoretical explanations. It has frequently been observed that smaller companies pay up to 30% less for the same jobs than larger companies – which Schwimmer attributes to the higher division of labor in larger companies and consequent greater need for highly skilled individuals.
[120] Goldin and Katz, 1998

Table 8: Characteristics of Formal, informal-to-formal, skilled informal and unskilled informal trends in urban Egypt

	Formal	Informal-to-formal	Skilled informal	Unskilled Informal
Formal qualification	Formal schooling, higher education	Formal schooling, higher education	Little schooling, exit for full-time work	Little or no schooling, exit for full-time work
Para-formal qualification	Courses, formal on-the-job training	Courses, informal on-the-job training	Informal on-the-job	Informal on-the-job
Informal qualification	None	Some informal training	Informal apprenticeship	Some informal training
Work conditions	Brief hours, high wages	Longer hours, low wages	Longer hours, higher wages	Irregular hours, very low wages
(Unemployment)	(High)	(Low in informal work, high in formal)	(Low)	(Low)
Job search methods	Government, formal applications, friends and relatives	Government, formal applications, friends and relatives; social contacts	Primarily friends, relatives, and social contacts	Primarily friends, relatives, and social contacts
Labor market trajectory	Formal employment	Formal employment	Informal employment	Labor force exit

The lower tier could include one more "unskilled informal" group, however, which is somewhat more familiar to the traditional dualistic structure. This group, made up of unpaid family workers and especially informally employed females, can expect lower wages and little formal or informal qualification. The reasons why this might apply especially to females are analyzed in the next sub-section. Table 8 presents some hypotheses about each group.

A definitive answer to the question of segmentation in urban labor markets is still elusive, and as always would be a task for an empirical test such as simulation of earnings in formal and informal employment, or survey evidence which asks workers to characterize the chances of gaining formal employment, and whether there are perceived barriers. The results derived in this analysis offer one proposition for how a dualistic structure to the labor market – and to informal employees – may be possible in urban Egypt even in the absence of formal barriers to entry.

Gender differentials in returns to qualification

A final line of analysis is segmentation of qualification returns along gender lines, including the reasons for the observed lack of returns to schooling and lower level and unexplained variation of wages in informal employment. Of course, gender differentials in wages are an extremely important topic in every labor market and are one of the primary uses of Oaxaca-Blinder models.[121] Among urban youth in Egypt, it has been shown that young women are much less likely to be economically active and, where they are employed formally and informally, consistently earn less than their male counterparts. Moreover, females are less likely to be rewarded for formal, para-formal, and informal qualification. Three factors that are known to have a strong effect on the labor market outcomes of women are: constrained

[121] See Oaxaca, 1973, whose focus is on male-female wage differentials.

labor supply due to domestic responsibilities and fertility; lack of labor market mobility; and social expectations about women's work, which relate closely to issues of gender discrimination. All of these can have an effect on the absolute level of young women's wages, and thus account for the absolute wage gaps, but they also can have an impact on the returns to qualification for females.

The labor supply issue is well-known. Young women are more likely to have domestic responsibilities – which can be expressed as a high reservation wage – and leave the labor force after marriage or childbearing, offering a disincentive for both employers and employees to invest in qualification. This is especially applicable in informal employment, where females are often employed for only a limited time period between school and marriage. As seen in the data, this type of work is often not continued past the age of 25, undermining the rationale for intensive skills training. Experience in an informal job could be less skilled and on-the-job training less likely, which would weaken the effect of the work experience term in the wage decomposition; one would also expect fewer costly investments such as schooling or courses, affecting absolute level of qualification. Formal public employment is more likely to be continued after marriage – partly because of the higher wages and more equitable employment chances for education females – which should encourage employer and employee to invest more heavily in skills training. While higher returns were not apparent in the data, a higher absolute level of wages for formally employed women may have to do with this difference in qualification levels.

Labor mobility works along comparable grounds, although here the lack of mobility between jobs by young women could actually serve as an incentive for employers to invest more in training for women. Since it is unlikely that the employee will be "poached" and thus investments in training accrue to another employer, precisely the lack of mobility serves as a guarantee for long-term investments in female employees' human capital. This would serve as a countervailing effect, increasing the coefficient to years of employment experience. Yet the lack of mobility can also be exploited monopsonistically, allowing an employer to pay uncompetitively low wages without danger of losing the employee. Dedeoglu (2004) offered evidence for family workers in Turkey that training is intensive and rents mostly captured by family, and not the worker. Thus, it may be possible to increase a worker's productivity through training without paying a commensurate premium. If this is the case, the returns to qualification to the employee will be low and unmeasurable in statistical analysis.

Finally, there are specific social expectations about women's work, which tie in very closely with the classic theory of labor market discrimination – whether through employers,

employees, or customers with a taste for discrimination[122], or due to a perceived statistical correlation between gender and productivity[123]. Certain skilled occupations are understood as "men's work" and women generally discouraged from entry. Expectations for marriage and family play a role for both young men and women, yet women – who are not expected to be primary providers – may be passed over for prime jobs and specialized skill attainment, crowding young women into less skilled trades. Bargaining power regarding wages may also play a role, as women could be in a weaker bargaining position in relation to employers, impacting both wages and training opportunities.[124] Thus, discrimination provides further hindrances for women to obtain formal and informal qualification, and lower returns on those qualifications which are obtained. Further research into these topics in Egypt is highly warranted.

VII. Conclusion

Since the new Labor Law of 2003, the regulatory framework for employment has become much more flexible and employer-friendly; it is expected that with these reforms, the incentives for employers and employees to bypass labor laws through informal employment relationships have been weakened greatly. Furthermore, there have recently been attempts by Egyptian state agencies to register and formalize informal firms and workers, and the ranks of the formal have grown greatly over the past several years.[125] Perhaps the trend toward informalization is turning around, which is a largely positive development, for at least three reasons. First, informal employment is known to mean lack of social and legal protection, precarity of employment, and possibly lower wages, all of which are problematic for workers, particularly youth, females, and those with little schooling. Secondly, the informal economy as a whole is characterized by intransparency, lack of standardization, and asymmetric information – which create information rents and are negative for both economic efficiency and income distribution. Finally, the erosion of social legislation and the tax base through informal economic activity impede public initiatives in the economy. It can be debated whether the interactions between the formal and informal economies are positive – because the informal economy tends to lower production costs and prices and serve as a labor "shock absorber" in downturns – or negative – because informal labor uncompetitively undercuts formal labor and thus punishes legality. In any case, the choice made by the Egyptian state

[122] Becker, 1957
[123] A discussion of these topics and the literature is available in Berk, 2001. Berk traces the debate back to Arrow, Phelps, Spence, and Reder, all of whom wrote during the early 1970's on similar topics in non-taste-based discrimination.
[124] Al Amry, 2008
[125] For a good summary of recent initiatives, see El-Megharbel, 2007.

seems to have taken the disadvantages of informality into account, and reacted to reduce the phenomenon.

Nonetheless, this analysis suggests one more reason that decision makers should be careful in designing such policies. It has been shown that a large part of the youth labor force continues to rely on informal modes of qualification – likely due to expectations of later informal work experience – which are not as highly rewarded in formal employment. It is suggested that many workers actually earn better, given current conditions, in informal jobs than in formal, and that formalization would mean a welfare loss to precisely this socially weak segment of the labor force. Indeed, this finding is congruent with other studies, such as Galal (2004), who showed that formalization without concurrent reform of labor and tax institutions would mean a welfare loss for workers, small firms, and the economy. Such attempts at establishing formal institutions without a co-opting of informal training institutions may repeat misstakes of the past, as many Arab governments effectively undermined traditional sectors through misguided formalization of training, as discussed by Al-Heeti and Brock (1997). The demise during the 20th century of many Egyptian handicraft industries could arguably be traced back to failed industrial and training policies.

Thus, the call by several commentators on informality (El Mahdi, 2003; Light, 2004; Schneider and Enste, 2002) to co-opt informal actors into the formal legal institutions and create a facilitating environment for small, currently informal actors is lent further support. Although further policy recommendations are not appropriate given the speculative nature of the results, the analysis can add weight to a sensible argument by others.

In summary, this paper has argued that informal employment does reward qualification, but that it does so primarily through informal mechanisms such as the informal apprenticeship and on-the-job training, as well as unobservable social capital factors. Having discussed critically the concepts of informal economies and informal employment, some observations about qualification in informal and formal employment have been described. Using a Oaxaca-blinder framework and ELMPS data, a divergence of qualification mechanisms can be shown for formal and informal employment using both separated single-period data, and two-period panel data using individual fixed effects. Other significant results are a union, medical insurance, and formality premium, the last of which disappears when controlling for individual effects, and a large gender differential, especially in informal employment. A theoretical discussion has discussed these effects, suggesting how the formality decision – which is endogenous and likely to vary along with other job characteristics – could also have an exogenous impact on returns to qualification and, thus, on labor market outcomes.

Specifically, a polarization of labor market trajectories and qualification has been proposed, which could explain formal-informal wage differentials even in the absence of strict barriers. Further disaggregation provides an explanation of the two-tier hypothesis of informal employment. It has been also proposed that the lower returns to qualification for females can be explained through female-specific labor supply and mobility effects, and through labor market discrimination.

Future research could investigate the issue of qualification for informal employment further, and perhaps new data can show how other forms of qualification are rewarded. A more sophisticated empirical model can come up with deeper results, using a selection model or multi-period panel data. Perhaps more in-depth field research could provide better and more nuanced examples of informal qualification, which would allow a much variegated analysis of this unrecorded and rapidly changing phenomenon.

Important questions which cannot be looked at here are formal, para-formal, and informal institutions are changing over time, as well as the long-term expectations of youths and their families in the labor market, and how they perceive qualification and job opportunities. It is clear that quick changes in both institutions and outcome-shaping perceptions are taking place in the wake of new reforms, which will doubtless have far-reaching, long-term impacts. Macroeconomically, the link between informality and unemployment among youth in urban Egypt could be examined, as Boughzala and Kouki (2003) have done for Tunisia. Due to the topical focus of this essay, no attempt at discussing unemployment trends has been made, even though there are clear and important connections between unemployment and informal employment in Egypt.

Finally, an interesting theoretical question is whether formal employment or informal employment of urban Egyptian youth more closely matches the predictions of neoclassical labor market theory. Formal employment, which is legally regulated and standardized by the institutions of the state, clearly also has some form of job rationing and imperfect entry, while credentials may hold more importance than actual productivity differences in wage setting. Informal employment, meanwhile, though supposedly characterized by a lack of regulation and “free entry”, is actually highly regulated through informal institutions and social contacts, and particular segments may be even more protected – via social barriers – than formal employment. Thus, neither type of employment truly matches neoclassical predictions. This state, distressing or intriguing for the theorist, is unlikely to be unique to Egypt. A theory including some form of barriers to entry and market segmentation may be a closer approximation to the reality of many developed and developing country labor markets.

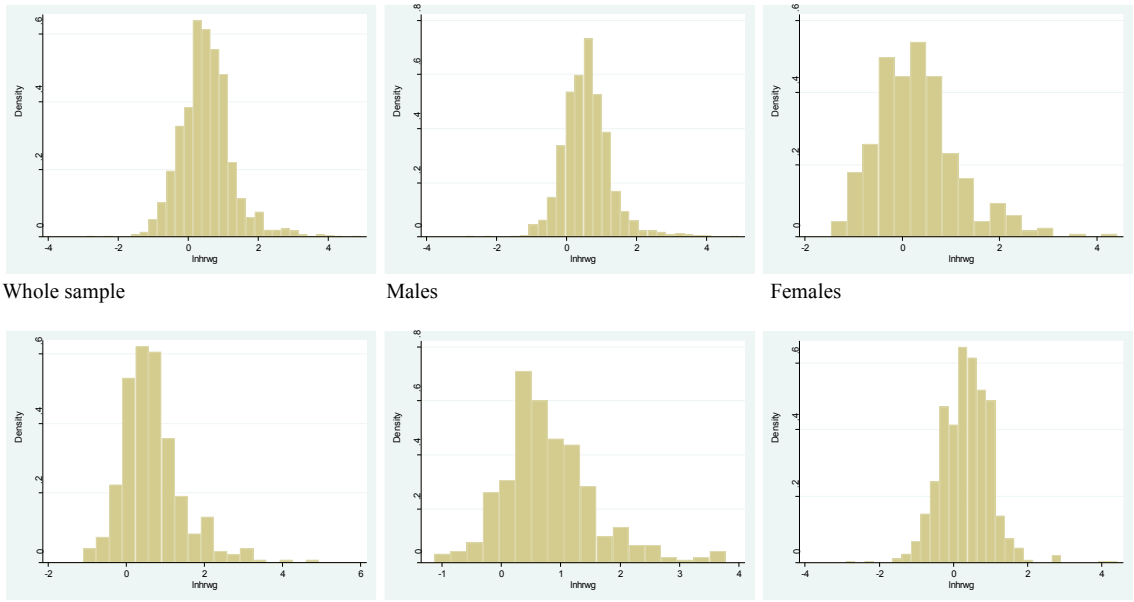
Appendix: Additional Tables and Figures

Table A1 – Probit regressions for formality of employment

	(1) Wage workers		(2) Male wage workers		(3) Female wage wrkrs		(4) Whole sample		(5) Males		(6) Females	
Education												
Read/write	0.219	(0.90)	0.206	(0.78)	0.214	(0.29)	0.328	(1.64)	0.319	(1.39)	0.366	(0.65)
Primary school	0.111	(0.60)	0.108	(0.54)	-0.072	(-0.14)	0.203	(1.44)	0.268	(1.64)	-0.017	(-0.05)
Preparatory school	0.207	(0.97)	0.096	(0.41)	0.796	(1.38)	0.151	(1.01)	0.155	(0.89)	0.219	(0.63)
General sec. ed.	0.297	(0.70)	0.455	(1.03)			-0.349	(-1.49)	-0.326	(-1.30)		
Voc. sec. – agr.	0.279	(1.01)	0.310	(1.04)	0.089	(0.11)	0.485**	(2.49)	0.493**	(2.26)	0.763	(1.57)
Voc. sec. – ind.	0.431***	(2.83)	0.461***	(2.76)	0.069	(0.15)	0.501***	(4.31)	0.567***	(4.14)	0.404	(1.41)
Voc. sec. – com.	0.177	(1.07)	0.214	(1.10)	0.137	(0.39)	0.357***	(2.88)	0.404**	(2.50)	0.506**	(2.11)
Voc. sec. – 5yr.							0.972**	(2.06)	0.674	(0.90)	1.239	(1.64)
Post-secondary	0.362*	(1.75)	0.354	(1.50)	0.532	(1.14)	0.354**	(2.28)	0.276	(1.42)	0.915***	(3.22)
University – 4yr.	0.523***	(3.31)	0.455**	(2.49)	0.680**	(1.98)	0.450***	(3.86)	0.354**	(2.42)	0.700***	(3.05)
University – 5yr.	1.105***	(2.97)	1.024***	(2.60)			0.463*	(1.90)	0.467*	(1.68)	0.991**	(1.99)
Post-graduate	0.161	(0.25)			-0.156	(-0.20)	0.346	(0.60)			-0.053	(-0.08)
Skills acquired												
Regular schooling	0.968***	(9.24)	0.834***	(6.72)	1.182***	(5.38)	2.225***	(27.93)	1.556***	(15.25)	3.210***	(21.67)
Vocational training	0.742***	(3.65)	0.708***	(2.99)	0.819*	(1.91)	1.732***	(9.55)	1.206***	(5.66)	2.786***	(7.52)
Through contractor	-1.399***	(-3.84)	-1.464***	(-3.99)			-0.221	(-0.82)	-0.545**	(-1.99)		
Through craftsman	-0.586***	(-5.11)	-0.644***	(-5.24)	-0.193	(-0.48)	0.358***	(3.80)	0.011	(0.11)	1.368***	(3.62)
Courses/other	-0.003	(-0.02)	-0.038	(-0.29)	0.096	(0.32)	0.664***	(7.48)	0.313***	(3.12)	1.435***	(6.93)
Personal char.												
Female	0.242**	(2.31)					-0.359***	(-4.68)				
Married	0.545***	(4.32)	0.282*	(1.65)	0.940***	(4.37)	-0.071	(-0.85)	0.209	(1.44)	0.011	(0.08)
HH Head	-0.174	(-1.23)	0.012	(0.07)			0.502***	(4.94)	0.277*	(1.87)	0.186	(0.44)
Age	0.101***	(7.49)	0.115***	(7.37)	0.053*	(1.81)	0.104***	(10.85)	0.129***	(11.02)	0.075***	(3.67)
Region												
Alex./Canal Cities	0.069	(0.63)	-0.028	(-0.23)	0.376	(1.59)	0.125	(1.48)	0.050	(0.48)	0.355**	(2.11)
Upper Egypt	-0.095	(-0.88)	-0.120	(-0.99)	-0.117	(-0.48)	-0.066	(-0.80)	-0.078	(-0.80)	-0.005	(-0.03)
Lower Egypt	-0.126	(-1.23)	-0.260**	(-2.21)	0.273	(1.17)	-0.075	(-0.96)	-0.131	(-1.39)	0.016	(0.10)
Constant	-3.256***	(-9.07)	-3.460***	(-8.46)	-2.332***	(-2.93)	-4.318***	(-16.62	-4.650***	(-15.07)	-4.601***	(-8.21)
Observations	1,564		1,209		342		6,123		3,048		2,692	
R^2	0.312		0.282		0.355		0.469		0.377		0.656	

Note: estimations (1) through (3) predict the probability of a wage worker being formally employed for all wage workers, male wage worker and female wage workers. This group is, however, also self-selected, as the decision to enter wage work is itself endogenous to numerous considerations. Estimations (4) through (6), therefore, estimate the probability of formal employment for the entire sample of youth, whether economically active or not. Possibilities for a two-stage model of selection (first into wage work and then into formal employment) have been considered but in the end have not been used. All attempts to integrated the predicted value of the above regressions into the wage decompositions has failed to yield superior results.

Figure A1: Wage histograms of employment groups



Whole sample | Males | Females

Formal public workers | Formal private | Informal

Figure A2: Map of Egypt with regions

Source: http://www.diggerhistory2.info/graveyards/pages/others/egypt.htm, accessed Sep. 10, 2008.

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Erklärung

Hiermit versichere ich, dass ich die vorliegende Arbeit selbständig und ohne Benutzung anderer als der angegebenen Hilfsmittel angefertigt, noch nicht einer anderen Prüfungsbehörde vorgelegt und noch nicht veröffentlicht habe.

Jon Frost
München, den 15. September, 2008