Factors Influencing Youth's Decision in Entering Formal and Informal Labour Markets in Egypt

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This paper attempts to uncover the factors influencing youth's choices into labour market in Egypt. Using the ILO's School-to-work transition survey (Egypt, 2014) as the main source of data, the paper is trying to formulate a clear idea about the socio-economic and demographic background characteristics of both formal and informal sector workers. Using "Discriminant Function Analysis", the results confirm to the hypothesis that formal workers are different from those who join the informal labor markets. Informal sector workers are likely to be more male-dominant, younger, mostly reside in rural areas, poorly educated, have no-formal education or training experiences, have more children, comes from a financially poor families, and educationally less advantages parents. Education, place of residence, age at first marriage, parents' level of education, and principal work status made the greatest contribution in differentiating between the two groups and can be considered as the most predictor variables of the informal workers.

1. Introduction

Informality has been a challenge for Egypt for some decade. Data on the pattern of new entrants to the Egyptian labour markets from 1969 till 1998 show that new entrants to the labour markets were disproportionately drawn into informal sector (El-Bakly, 2001). The study shows that in 1969, around 75% of new workers were drawn into formal public employment and 20% into informal jobs.[2] Since 1993, informal sector has been providing more employment than formal public employment. Thus, by 1998 about 70% of new workers were drawn into

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[2] Informality in the mentioned study measured by whether job contract is existent or not.

informal sector employment and only about 20% into formal public jobs. The relative share of formal private employment has doubled; however remain modest.

Recent data suggests that the informal employment accounts for about 40% in 2012 and growing at faster pace than the formal employment (El-Sayed, 2014). Moreover, data from Egypt "School-to-Work Transition Survey, 2014" suggested that this pattern remains.

Since 1970's economic policies that have been implemented in Egypt have neither stimulated the growth of the industrial sector nor have encouraged the private sector investment. Informal sector had been growing at about 2.8% per annum between 1976 and 1986 (Handoussa, 1991). This rate of growth increased to 3.6% per annum between 1980 and 1985 (Rizk, 1991). With this rate of growth, informal sector employment accounted for about 24 and 26% of the total active labour force in 1976 and 1986 respectively (Al-Mahdy, 1996). When agriculture activities are excluded, the informal sector would contain about 45% and 40% of the total employment in 1976 and 1986 respectively. Moreover, in the non-agriculture private sector, informal sector would account for about 93% and 90% of the total labour force in 1976 and 1986 respectively (Handoussa, 1992).

During the 1990's, the share of informal sector employment[3] outside agriculture, increased from about 40% in 1990 to 46.3% in 1998 according to Egypt Labor Market Survey of 1998, and would have been increased to 56.12% if all workers were considered. Therefore, the majority of jobs created in the 1988-1998 decade were among the informal sector. Informal sector employment share would account for more than 82% of the employment growth of private non-agricultural wage employment between 1988 and 1998. Moreover, informal sector employment grew at 7% per annum during 1988-98, while the corresponding rate for the formal private employment was 4.8% during the same period.

Moreover, 75% of new entrants who entered the labor market during 2000-2005 were entering into informal work, resulting in the share of informal workers escalated to 61% of all employment in 2006 (Assaad,

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[3] Informal sector employment includes those who have neither contract nor social security.

2007). This trend continued, as another nationally representative data set, specifically the Egyptian Labor Market Survey (ELMS) of 2012, shows that among the 66.7% of young men who had a paid job, about 52% of them joined the informal sector, however, women's situation was different with lower share entering the informal sector (Amer, 2014). Data from Egypt "school-to-work transition survey" 2014 dataset suggests that this pattern remains (El-Bakly, 2016), which supports the argument that the era of the government being the major employer is gone as the role of the government shifted to be a regulator and facilitator for job creation and for the protection of workers' rights (Barsoum, 2014, Nazier, Hanan and Ramadan, 2014).

Accordingly, relying on any definition of informality, the data show that informality became a feature of Egypt labour market. The negative impacts of informality are not restricted to the individuals, households or institutions that are working in the informal sector but on the economy of Egypt as a whole (For details on the negative impacts of informality see Kassem, 2014). Hence, attempts to integrate informal sector into formal one became crucial approach to rescue Egypt's economy and get it out of the unforeseen future. To do that, the main target could be eliminating freedom to choose between joining the formal and informal sectors or encourage people to join the formal sector. However, such approach requires enough information on the type of factors influencing people's choice to join informal sector, which is the main focus of the current paper.

2. Significance of Study

Any approach which recommends mandatory legislative, executive and judicial reforms aiming at depriving individual from joining the informal sector will not be fully effective unless considering the socio-economic background of those who joined or intend to join the informal rather that the formal sector. Also, any attempt to integrate informal into formal sector on the individual or firm basis will go vain without knowing the main factors that play the major roles in determining people's choices in entering the labour market.

Moreover, with respect to policy making, one should keep in mind that any mandatory legislative, executive and judicial reforms should be accompanied with a socio-economic policies aiming at providing

individuals, for example, with the proper education and skills to meet the principal requirements, if any, to join the formal sector.

The results of the current research can be of great importance in labor policy making in in Egypt and other developing countries as well, in most of these countries, informal sector labor represents about half of their total labour. The increase in the number of informal employment makes it more urgent to develop specific policies with aim not only to improve the well-being of millions of these workers and create better jobs for all but also to try stimulating informal labor to join the formal sector. Informal work prevalent in low- and middle-income countries; and it is important in some high-income economies as well. In many cases, the share of job practice outside official institutions of a country may represent more than half of non-farm employment, or up to 90% if agricultural employment is included. World wide data show that the informal labor represents 60% of the total work. Also, the largest proportion of the non-farm informal labor are in Africa - Sub-Saharan by up to 80%, followed by South and Southeast Asian countries about by about 70%, and Latin America by 52% (OCDE, 2009).

3. Methodology

Any examination of the factors that influence people's choices in entering labour markets is conceptually difficult. The problem of causal inference is particularly complex, since an independent effect on joining the labour markets cannot always be identified. Workers who join the informal labour markets might be different in many ways from those who join the formal labour markets (see for example El-Bakly, (2001), El-Bakly, (2003), Labour and Social Affairs Commission of the African Union (2009)).

To examine the above hypothesis, it is appropriate to have an overview and to formulate a clear idea about the socio-economic and demographic background characteristics of both formal and informal sector workers. Particular attention should be directed to certain characteristics that are considered as the potential micro determinants operating on people to join the informal labor market.

As comparing between formal and informal sector workers, a question must be raised whether any revealed difference between the two groups

(in terms of percentage distribution) is sufficient evidence for differentiating between them or whether the difference could have arisen by chance. This is can be done by using what is called a "Chi-squared Test". The classification of the two sector groups based on some criteria that used to identify the informal sector workers from the overall formal sector workers.

Also in differentiating between two or more groups with respect to several variables, a question must be raised about the rules that should be adopted so as to make as few mistakes as possible over a large number of similar situations. Questions of this type give rise to what is called "Discriminant Function Analysis", the general objective of which is to find rules of behavior in the assignment of individuals to predetermined classes with optimal properties.

However, it could be appropriate first to justify why "Discriminant Function Analysis" is used. In the strict statistical sense, several statistical methods can be used to differentiate between different groups of things or persons. These are called "Multivariate Analysis", which means the study of how several variables vary together.

Analysis of Covariance and Discriminant Function Analysis could be used in this paper. However, there are two major differences between the two techniques that make the latter method more suitable for the present study. In 'Discriminant Function Analysis' the x and y variables are interdependent and have the same logical status (having similar categories). In 'Analysis of Covariance', on the other hand, the x variables are covariance variables and the y variables are dependent. The second major difference between the two methods is that the 'Analysis of Covariance' incorporates one or more treatment or comparison variables, which are represented by the allocation of persons to two or more groups. In 'Discriminant Function Analysis' every person is treated as if he or she belongs to one and the same group. Thus the 'Discriminant Function Analysis' is considered the best technique to be used in differentiating between the formal and informal group of workers.

4. Data Source

Main source of data used in this paper is the ILO, School-to-work transition survey, Egypt, 2014.

5. Literature Review

Available researches highlighted the importance of individual socioeconomic characteristics, as one of the main determinants of informality (Traore, 2012). Individual characteristics and family background including gender, age, marital status, household size and parental occupation were found to impact occupational choice and the risk of informality by many studies as well. Similarly, results from various studies found that education increases the chances of getting better-paid jobs in the formal sector. Other factors such as place of residence, economic environment were also found to play a role in the occupational choice (Amer, 2014).

Although a great number of researches have been dealt with informality in Egypt, most of them have focused on measuring its size, trend, and trying to understand its characteristics. For example, El Mahdi (2000) dealt with the changing role of the informal sector in providing work opportunities to the growing labor force in Egypt in the late 90s. Her main concern is whether, and the extent to which, workers have become informalised during the period of economic structure reform.

In another study, Moktar & Wahba, (2000) investigated the degree of informality in the Egyptian labor market and found that the share of non-agricultural workers involved in informal sector has been increased by about 6% during the 1990, as more of the new entrants to the labor market have been drawn into informal employment. In the early 1970s, some 20 % of workers used to start their working life with informal jobs, but by 1998, approximately 69 % of new workers have started in informal employment.

Few recent studies have focused on the main features of the informal enterprises in Egypt, the role they play in employment creation, the sources of funding their activities, their ability to survive and the problems they encounter in their daily transactions, for example see Abdelhamid and ElMahdi (2003). Another supporting study carried out

by McCormick and Wahba (2004) concluded that the Egyptian labor market has experienced an increase in the informalisation of "new" workers, as they found that the predicted probability of a new entrant being informal in 1998 was 8% more than in 1990.

Others have examined the characteristics of informal workers, for example, Wehba (2009) in addressing the mobility from informal to formal sector in Egypt, she examined the characteristics of informal workers in 1998 and 2006, and found that although there has been a slight increase in the proportion of women; and informal employment is still male dominated. Also, she found that there has been an increase in the share of 20-29 years old among informal workers. She also suggests that the share of illiterate workers among informal workers has declined, as there was an increase in the share of those with intermediate education and university graduates among informal workers in 2006.

Angel-Urdinola and Tanabe (2012) studied the effect of the micro determinants of informal employment in the Middle East and North Africa (MENA) region. Using probit model, the results for Egypt showed that place of residence, gender, marital status, and age are the main factors of informality. Also, urban workers are found to be 9.5 % less likely employed informally than workers in rural areas; being a male worker is associated with a 12 % lower probability of being employed informally; being married is associated with a 13.9 % lower probability of working in the informal sector. Adults thirty-five and older are 29.2 % less likely to work in the informal sector than youth aged fifteen to twenty four. More education is associated with a lower probability of being employed in the informal sector.

Addressing patterns of labour market insertion in Egypt, Amer (2014) found that precarious employment (informal wage work and unpaid work) largely dominates, as among the 66.7% of young men who had a paid first job, more than half of them had informal wage work (51.7%). She also concluded that the evolution of the first labor market status from 1998 to 2012 clearly shows that the share of informal employment has increased (from 42.5% to 51.7%). She also found that education is a key factor affecting young men and women entering labour market, as the more educated the more the share of protected types of employment at the expense of precarious employment. She found that private informal employment decreases gradually with education from 63.1%

among the least educated young men to 24.4% among the most educated. Moreover, Hanan and Racha, (2014), stated that education is an important factor in describing informality; the less educated is the individual, the higher probability is to be working in informal job. They found that 68.6% of illiterate wageworkers belong to the informal sector, while 85% of wage workers with university degree are in the formal sector. Their results confirm that informality is concentrated among the less educated and low skilled occupations in rural areas.

Although some literature address the socioeconomic factors of informal works, the current paper will examine the factors that influence youth's choices into labour market in Egypt by discriminating between formal and informal sector workers.

6. Conceptualization of the Informal Sector[4]

Discussion on the informal sector conceptualization through range of literature on the Less Developed Countries with the main focuses on Egypt covers the terms and definitions used, the framework in which the informal sector theoretically operates, determinants and factors that assumed or explored to affect the informal sector whether the starting point or its growth.

Literatures suggest that a universal definition of the informal sector cannot hold true for every single country context. In addition, instead of defining the informal sector unites a shift occurred toward defining the informal sector workers.

The conceptualization and the framework in which the informal sector operates have changed over time. From the tripartite division of activity that failed to represent the heterogeneity of activities found under each subsystem, to the sectorist school that view the informal and the formal parts of the economy as two sectors operating under one economic system characterized by either a complementarity or competitiveness relationship. Informal sector within the Arab countries is assumed to be operating within the sectorist view. In identifying the informal sector workers, **three main criteria** are suggested**;** include **non-registration**

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[4] For more literature see El-Bakly, (2016).

of the workplace, lack of social insurance and lack of health insurance.

It worth mentioning that, a shift of discourse on notion of the informal sector in Egypt is a substantial change, from the notion **"margins"** of the "modern" economy to the **"engine of growth"** of the economy. Till the end of the 1960s, the informal sector (margins population) was a problematic segment. After 1960's, this problematic segment became a solution to the economic crisis just by redefining it to the "engine of growth" and suggesting that it can play an important role in addressing employment crisis.

It seems that the determinants or factors that affect the starting point of the informal sector differ between Developed and Developing Countries, while there are common factors between the two groups that affect its growth. The failure of the modern economy in the Developed Countries to provide sufficient jobs for the growing number of job seekers could be the starting point of the informal sector, while the sudden penetration of capitalism associated with twentieth-century techniques may have created the initiatives of the informal sector in the Developing Countries.

On the other hand, informal sector growth in Developed and Developing Countries is affected by same factors: regulations and legislation, economic recession, and macro-economic policies. On the micro level factor, poverty, education, and skill level are those factors that influence the growth of the informal sector.

7. Characteristics of the Survey Sample

7.1 Individual Characteristics

Table (1) shows some selected background characteristics of the sampled population, the figures show that out of the (5758) individuals, 51.7% are male, more than 70% are less than 25 years of age, with the mean age 21.4 years, and 44.9% have an urban background. In such young populated sample, it is expected to find about 38% of the sample cases still enrolled in schools (2176 individuals). For those who completed their education, more than 75% of them have an intermediate level of education or lower. Also, for a young population, it is not astonishing to find three quarter of the sampled individuals either less

than the legal age of marriage (24%) or never married (50.5%). Almost 30% are currently working (either paid or un-paid worker or self-employed), while 5.7% are unemployed (worked before) and 7.5% searching for work for the first time, and the remaining 57.4%, seemed to be still enrolled in the education system, as they never worked and never searched for work.

Table 1: Survey sample by selected background variables

	Number	%
Gender		
Male	2975	51.7
Female	2783	48.3
Total	5758	100
Urban / Rural		
Urban	2586	44.9
Rural	3172	55.1
Total	5758	100
Current age		
15-19	2298	39.9
19-24	1830	31.8
25-29	1630	28.3
Total	5758	100
Mean age	21.4	
Median age	21.0	
SD	4.3	
Educational level		
Illiterate	86	2.7
Read & write	206	6.4
Less than intermediate	784	24.3
Intermediate	1381	42.9
Above intermediate	134	4.2
University & above	631	19.6
Subtotal	3222	100.0
Other*	2536	44.0
Total	5758	100.0
Marital status		
Less than the legal age	1381	24.0
Never-married	2905	50.5
Married	1432	24.9
Widowed & divorced	40	0.7
Total	5758	100
Principal work status		
Paid or un-paid worker or self-employed	1693	29.4
Currently not working but worked before	329	5.7
Never worked and search for work	429	7.5
Never worked and never searched for work	3307	57.4
Total	5758	100.0

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.
* Those who either still enrolled (2176 individual) or dropout from school.

7.2 Family Characteristics

The available family and background characteristics of the sampled population are shown in table (2), the figures show that the majority belongs to a very educationally poor parent, more than 61% their fathers have less than intermediate level of education, and 55% of them have an illiterate father. The case of mother's education is worse, as about 70% of the sample have a mother with less than intermediate level of education, and more that 77% of them have an illiterate mother. Also, the figures show that the majority (63.6%) of the sample stated that they belong to families with an average financial status, the remaining are almost equally distributed among (very good or good) and (poor or very poor).

Table 2: Survey sample by selected family and household background variables

	Number	**%**
Father level of education		
Illiterate	1990	34.6
Read & write	831	14.4
Less than intermediate	772	13.4
Intermediate	1168	20.3
Above intermediate	202	3.5
University & above	768	13.3
Other	27	0.5
Total	5758	100
Mother level of education		
Illiterate	3145	54.6
Read & write	393	6.8
Less than intermediate	533	9.3
Intermediate	1039	18.0
Above intermediate	158	2.7
University & above	483	8.4
Other	7	0.1
Total	5758	100
Financial status of the family		
Very good	117	2.0
Good	959	16.7
Average	3663	63.6
Poor	902	15.7
Very poor	117	2.0
Total	5758	100.0

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

8. Identifying the Target Group

As discussed before, three main criteria can be used to differentiate between the informal and formal sector workers: non-registration of the workplace, lack of social insurance and lack of health insurance. Therefore, among the (5758) sampled individuals, there are (1758) individuals were selected as they are currently working (within the reference week), out of them, those who work for the government, NGO's or non-profit organization (NPO's), international or diplomatic agency, unspecified agency were excluded. The remaining (1489 individuals) are working either in private sector (paid or self-employed) or in family business (see Table 3). Egypt school-to-work transition survey includes variables on registration of the workplace, availability of a work contract, and availability of social and medical insurance services. For simplicity reason, among those who are operating in the private sector (paid or self-employed or in family business), and working in unregistered firm or have no contract would be considered as informal sector workers. By applying this operational definition, Table (3) shows that the majority of the workers fall into the informal sector category, as 71.2% of the sampled workers were classified as informal sector works, and the remaining 28.8% have formal sector job.

Table 3: Selected sample by work status, type of work place and formality

	Number	%
Principal work status		
Paid work	1378	23.9
Employer	62	1.1
Self-employed	99	1.7
Unpaid family worker	236	4.1
Unpaid other worker	10	.2
Subtotal	**1785**	**31.0**
Did not work	3973	69.0
Total	**5758**	**100.0**
Type of work place		
Government or public sector	161	9.0
Private sector	848	47.5
NGO's	8	0.4
Private business	423	23.7
Family business	218	12.2
International or diplomatic agency	7	0.4
Other	120	6.7

	Number	%
Total	1785	100.0
Sampled workers by formality		
Formal	429	28.8
Informal	1060	71.2
Total	1489	100.0

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

9. Background and Family Characteristics (Formal versus Informal)

9.1 Gender

Both formal and informal sector workers are predominantly male (Table 4). This is more evident in the case of informal sector workers since over 87% of them are male, while the female informal sector workers account for as little as 12.2%. The formal type of worker is little different, although it is still dominated by males, female workers account for about 18% of the formal sector workers.

9.2 Current Age

Informal sector workers are on average more than one and half year younger than their formal counterparts (the mean age are 22.58 and 24.14 years respectively) (Table 4). Looking at the distribution by age groups is also indicative. About half of the formal sector workers belong to the age group (25-29), and about (38%) dominated within (20-24) age brackets, and only about (12%) belongs to the (15-19) age brackets, while the informal sector counterparts are almost scattered across all of the age groups, with higher proportion of informal sector workers fall in the first age group than their formal counterparts, which means that child labour phenomenon is slightly evident among the informal sector.

9.3 Place of Residence (Urban / Rural)

Current place of residence (urban / rural) conform to the suggestion that informal sector workers are a rural phenomenon as workers in rural areas are more likely to begin their working life in an informal jobs compared to formal labourers. More than (60%) the formal sector workers are currently live in urban areas, while about (33%) of the

informal sector workers live in urban areas. The situation is reversed with respect to rural place of residence. The proportion of the formal sector workers living in rural areas is much lower than that of their informal sector counterparts.

Table 4: Workers by formality status and some selected background variables

	Formal	Informal
Gender		
Male	82.1%	87.8%
Female	17.9%	12.2%
Total	100	100
Current age		
15-19	12.4%	28.1%
19-24	38.0%	34.8%
25-29	49.7%	37.1%
Total	100	100
Mean age	24.14	22.58
SD	3.46	4.06
Place of residence (Urban / Rural)		
Urban	60.8%	32.9%
Rural	39.2%	67.1%
Total	100	100
Marital status		
Less than the legal age	5.1%	13.4%
Never-married	72.0%	63.1%
Married	22.4%	23.1%
Widowed & divorced	0.5%	0.4%
Total	100.0%	100.0%
Level of education		
Illiterate	2.5%	4.4%
Read & write	2.8%	9.6%
Primary school	9.6%	19.7%
Intermediate school	8.1%	9.6%
Public highs school	2.0%	3.2%
Technical highs school	35.9%	41.0%
Above highs school	5.1%	2.7%
University & above	34.1%	9.8%
Total	100.0%	100.0%
Formal education or training experiences		
Yes	98.1%	89.0%
No	1.9%	11.0%
Total	100.0%	100.0%
Principal work status		
Paid worker	84.6%	70.2%
Employer	5.1%	3.7%
Self-employed	3.5%	7.1%
Un-paid family worker	6.1%	18.6%
Un-paid other worker	.7%	.5%
Total	100.0%	100.0%

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

9.4 Marital Status

There is only a small difference between formal and informal workers regarding all marital status categories, with the exception of less than the legal age as the gap between the formal and informal sector groups is clearly evident. The proportions of informal sector workers that belong to the first marital status category are higher than those found among their formal group correspondents.

9.5 Level of Education

Education data conform to the suggestion that informal labourers are poorly educated compared to formal labourers. More than half the formal sector workers have higher than intermediate levels of education (77.1%), while about (56.7%) of the informal sector workers belong to this same education category (Table 4). With respect to all other lower education categories, the situation is reversed. The proportion of the formal sector workers is lower than that of their informal sector counterparts. The share of informal sector workers with intermediate or lower level of education is almost doubles that of the formal sector workers (43.3% and 23% for both groups respectively). Therefore, how important is education in determining young individuals' working lives?

9.6 Formal Education or Training Experiences

It seems that joining formal education or training can determine young people in joining the labour market. Although the difference between formal and informal workers regarding being in formal education or training is small, the gap between both groups is evident. The proportions of formal sector workers that join formal education or training are higher by (9) points than their informal group correspondents.

9.7 Principal Work Status

Data suggests that principal work status is not of great importance in measuring differences between formal and informal sector workers as proven in previous studies. As Table (4) indicates, the majority (84.6%) of formal sector workers and about (70%) of the informal sector workers are paid workers. The gap between the two groups is clear with respect

to self-employed and un-paid family worker categories. The share of the informal workers self-employed is double than formal workers self-employed, the gap reachs tribble with respect to un-paid family worker category.

9.8 Age at First Marriage

Although, the sampled individuals are relatively young, more than a quarter are ever married, among those, the data shows there is no significant difference between formal and informal workers with respect to age at first marriage as the majority of both groups are getting married in the (20-24) age brackets. However, the share of the informal workers who get married as early as in the (15-19) age group is more than double than that of the formal correspondents. The situation is reversed with regard the older age group (24-29).

9.9 Number of Children

Number of children seems to have a significant importance in differentiating between formal and informal sector workers. The gap between formal and informal workers regarding all number of children categories is evident, especially the first and last brackets where more than half of the formal sector workers while about 38% of the informal sector workers have one child. And the share of the informal sector workers with three or more children is double than their formal group correspondents.

9.10 Family Characteristics

Data on financial status of the family (Table 5) show that, as found among the total sample, the majority within formal and informal workers (66.9% and 62.5% respectively) stated that they belong to families with an average financial status, however, with regard to the (very good or good) and (poor or very poor), the gap between formal and informal sector workers is wider. The share of the informal worker group who stated that they belong to (poor or very poor) family is almost double of their formal correspondents (27% and 13.8%). The situation among (very good and good) category is reversed. In conclusion, financial status of the family can be an important factor in differentiating between formal and informal sector workers.

Data on father and mother educational level can also be an important factor in differentiating between formal and informal sector workers. The data show that while the majority among both groups belongs to the very educationally poor parents, it shows that parents of the informal sector workers are educationally less advantage compared to their formal correspondents. Data on father education show that about 55% of informal workers' fathers are illiterate, while their formal counterparts figure is about 30%, while the mother situation is worse as more than 77% of the informal workers' mother are illiterate, while the figure among formal workers is 51%. This can lead to a suggestion that financial burden of the family associated with low level of education of the parents are significant factors influence young people choices in entering labour markets in Egypt.

Table 5: Workers by formality status and some demographic and family background variables

	Formal	Informal
Age at first marriage		
15-19	8.6%	17.9%
20-24	61.3%	64.2%
24-29	30.1%	17.9%
Total	100.0%	100.0%
Number of children		
1	52.7%	37.6%
2	36.5%	41.8%
3 and above	10.8%	20.6%
Total	100.0%	100.0%
Financial status of the family		
Very good	3.7%	.9%
Good	15.6%	9.4%
Average	66.9%	62.5%
Poor	11.9%	24.3%
Very poor	1.9%	2.7%
Total	100.0%	100.0%
Father level of education		
Illiterate	30.1%	55.3%
Read & write	16.3%	16.7%
Less than intermediate	14.5%	12.3%
Intermediate	17.5%	11.1%
Above intermediate	4.0%	1.4%
University & above	17.2%	2.4%
Other	.5%	.8%

	Formal	Informal
Total	100.0%	100.0%
Mother level of education		
Illiterate	51.0%	77.4%
Read & write	6.8%	6.3%
Less than intermediate	11.7%	5.7%
Intermediate	16.3%	8.6%
Above intermediate	2.6%	0.8%
University & above	11.4%	1.2%
Other	.2%	.0%
Total	100.0%	100.0%

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

10. Interpreting Chi-squared Values

Table (6) presents X2, d.f., and P values for each anticipated characteristic. The figures of the table suggest that three quarter the background and family characteristics have a highly significant level of differences between the two groups. Current Age, place of residence (urban / rural), marital status, formal education or training experience, principal work status, financial status of the family, father level of education, and mother level of education have a significant importance in differentiating between formal and informal group of respondents.[5] Age at first marriage and gender comes next, and the remaining variables (level of education and number of children) have a moderate level of significance (at about 0.2%).

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[5] All of these variables have a *P* value of less than 0.02. This means that the probability is less than .02% that such observed difference in these variables could have been arisen by chance.

Table 6: Chi Squared test values for the comparison between formal and informal workers

Variables	X^2	d.f	P
Gender	8.556	1	0.003444
Current age	60.099	14	<0.001
Urban / Rural	98.402	1	<0.001
Marital status	25.789	5	<0.001
Level of education	9.479	7	0.220055
Formal education or training experiences	33.416	1	<0.001
Principal work status	48.868	4	<0.001
Age at first marriage	8.557	2	0.013866
Number of children	6.308	4	0.177275
Financial status of the family	48.646	4	<0.001
Father level of education	168.479	10	<0.001
Mother level of education	149.695	9	<0.001

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

11. Discriminating Between the Formal and Informal Sector Workers (Statistical Assessment)

1.1. Differences Between Formal and Informal Sector Workers

'Discriminant Function Analysis' is applied in this subsection to investigate the differences between the two labour market groups (formal and informal) with respect to a selected set of socio-economic and demographic variables.

1.1.1. Mean Values of Discriminating Variables

Table (7) presents the mean values and standard deviations of the selected background characteristics for the two sector groups. Workers in the two sector groups differ markedly in some ways and show similarities in others. The two groups are different with respect to respondents education and parents level of education, as Informal sector workers seem to be less educated, having less advantage parents' level of education compared with their formal sector counterparts. Both groups seem to be similar with respect to their other variables included in the analysis, with some standard divaitions differences in some variables as in the case of marital status and financial status of the family.

Table 7: Mean and standard deviation values of selected variables used to differentiate between formal and informal sector workers

Selected Variables	Formal		Informal	
	Mean	S. D.	Mean	S. D.
Gender	1.14	.348	1.17	.377
Current Age	26.53	2.207	26.56	2.136
Urban / Rural	1.53	.503	1.72	.450
Marital Status	4.04	.354	4.02	.142
Level of Education	5.94	1.815	5.03	1.807
Formal education or training experiences	1.00	0.000	1.00	0.000
Principal Work Status	1.56	1.073	1.95	1.430
Age at first marriage	22.74	2.512	21.86	2.528
Number of Children	1.63	.759	1.79	.778
Financial status of the family	2.96	.795	3.03	.596
Father Level of Education	4.32	11.418	3.84	13.823
Mother Level of Education	3.68	11.479	1.53	1.351

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.

11.1.2 Discriminant Function Coefficients

To examine the contribution of the individual variables, the discriminant function coefficients is used. There are two types of coefficients, unstandardized and standardized coefficients. While the former tells us the absolute contribution of a variable, this information may be misleading when the meaning of one unit change in the value of a variable is not the same from one variable to another. Thus, we must go beyond the unstandardized coefficients if we want to know the relative importance of a variable, i.e. the standardized coefficients should be examined.

a. The Unstandardized Coefficients

Interpreting the discriminant functions can be done by either (1) examining the relative positions of the data cases and group mean (known as group centriods) or (2) studying the relationship between the individual variables and the calculated function. Here, the first approach is adopted. In calculating the discriminant score, the discriminant functions (unstandardized), which are exhibited in Table (8), were multiplied by the raw variable values, the product summed and then added to the constant (shown in the same table) to give the discriminant score. This procedure provides the values of the discriminant scores

(.550 and -.269) for the formal and informal sector workers respectively. This means that each positive sign indicates a push towards the formal group, whereas the negative sign means a pull towards the informal group. Accordingly, place of residence, principal work status, current age, and financial status of the family are important variables in identifying the informal workers. By contrast, all the remaining variables can be used in identifying the formal group of workers.

Table 8: Discriminant function coefficients, and structure matrix coefficients

Selected Variables	Discriminant Function Coefficients		Structure Matrix	
	Unst.	St.		
Gender	.380	.140	Level of Education	.615
Current Age	-.241	-.521	Urban / Rural	-.505
Urban / Rural	-.718	-.336	Age at first marriage	.422
Marital Status	.086	. 020	Mother Level of Education	.394
Level of Education	.312	. 564	Principal Work Status	-.366
Principal Work Status	-.318	-.422	Number of Children	-.260
Age at first marriage	.266	. 670	Financial status of the family	-.126
Number of Children	.393	. 303	Marital Status	.111
Financial status of the family	-.116	-.078	Gender	-.104
Father Level of Education	-.016	-.204	Father Level of Education	.044
Mother Level of Education	.048	. 319	Current Age	-.021
(Constant)	-.534	--		

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.
Unst.: Unstandardized coefficients.
St.: Standardized coefficients.

b. The Standardized and Structure Matrix Coefficients[6]

The standardized coefficients (Table 8) are helpful because we can use them to determine which variable contributes most to the function. This is done by examining the magnitude of the coefficients (ignoring its sign), The larger the magnitude the greater is that variables contribution. The figure in the table show that age at first marriage has the highest

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[6] Standardized coefficients are the ones that would be obtained if all original data had been standardized so as to have a mean of 0 and a standard deviation of 1.0. We can compute the standardized coefficients (C's) from the unstandardized ones (U's) by using the following transformation (Klecka, 1980; Norusis, M.J/ SPSS Inc, 1994):
$C_i = U = U_i \sqrt{[W_{ii} / (n. - g)]}$

Whereas W_{ii} is the sum of squares for variable i, n. is the total number of cases, and g is the number of groups.

contribution, followed by level of education, current age, principal work status, and place of residence (urban / rural). The remianing varibles comes next with lower contibution to the function. However, structure matrix show that level of education is the larger pridector variabel follwoed by place of residence, age at first marrige, mother level of education and work status.

12. Accuracy and Test of Significance of the Discriminant Functions

For every statistical analysis, there are always ways to determine the extent to which the analysis provides accurate and reliable results. As far as 'Discriminant Function Analysis' is concerned, two methods can be used to measure the accuracy and significance level of the derived results. Both methods will be used here. However, some adavntages and disadvantages of the analyisis worth to be mentioned.

12.1 Advantages

The following are the main advantages of the analysis:
- The predictore variable (the indpendent one) should be and are not highly correlated (see Annex (1)).
- In terms of sample size, the smallest group exceeds the predictor variables, as it must be.
- As for Box's M, the result show that the analysis is highly significant (at 0.000) in rejecting the null hypothesis of equal population.

12.2 Disadvantages

The following can be considred as disadvantages of the analysis:
- As case processing summary table shows only (219) cases were valid as 1270 case has at least one missing discriminating variable.
- As the test of equality of group means shows that Wilks' lambda of most of the predictor variables are not statisticlly significant, level of education has the hightest significant level (0.001), followed by place of residence (0.004), age at first marriage (0.017), and mother educational status (0.026). The rest of the variables has lower level of significance.

- The larger the eigenvalue the more variance functions explains in the dependent variables, and as eigenvalue as low as 0.149, and the canonical correlation is as low as (0.360), this means that there is a need for another analysis to support the results of the current one.

12.3 Accuracy of the Derived Discriminant Functions

The purpose here is to investigate the adequacy of the derived discriminant function. In that respect, the second type of the discriminant function's activities, which is the classification function, is dealt with. Classification is the process by which a decision is made that a specific case belongs to or most closely resembles one particular group. This could be done by calculating a classification score for each case on each group using the same way of calculating the discriminant score. Each case is then classified into the group in which it has the higher score. The output of this procedure is presented in Table (9).

Table 9: Comparison between actual and predicted classification for formal and informal workers

Actual Groups		Predicted Group Membership		Total %
		Formal %	Informal %	
Original	Formal	56.2	43.8	100
	Informal	35.9	64.1	100
Cross-validated	Formal	18.4	81.6	100
	Informal	57.7	42.3	100

Source: Constructed from the ILO, School-to-work transition survey, Egypt, 2014.
a Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.
b 61.8% of original grouped cases correctly classified.
c 35.4% of cross-validated grouped cases correctly classified.

Figures in Table (9) show the classification matrix for the two worker groups. The diagonal elements are the number of cases classified correctly, according to the model, into the groups. For example, 56.2% of the formal sector workers are classified correctly and 64.1% of the informal workers are classified correctly, according to the model. The overall percentage of cases classified correctly is the sum of the number of cases classified correctly in each group divided by the total number of

cases. The proportion of respondents who are correctly classified into formal and informal sector groups is equal to 61.8%, which is higher than the expected percentage of correct classification (50%) if assignment were made randomly, but the improvement is moderate. This could mean that the discrimination power is moderately accurate.

There is another measure of the improvement called "proportional reduction in error statistics "TAU". In this case TAU is equal to 0.382, which means that classification based on the discriminating variables made 38.2% fewer errors than would be expected by random assignment.

The second panel of Table (9) represents the cross-validated classification matrix. The difference between the original and the cross-validated figures is that in cross validation, each case is classified by the function derived from all cases other than that case. The table shows that the proportion of cases that are correctly classified according to the model is (18.4%), when cross-validation is applied, is lower than that found when original grouping is applied (56.2%). However, the discrimination power is still moderately highl and consequently can be defined as accurate.

12.4 Test of Significance of the Discriminant Functions

When there are no differences among the populations from which the samples are selected, the discriminant functions reflect only sampling variability. A test of the null hypothesis that, in the population, the means of all discriminant functions in the two groups are really equal and zero can be based on what is called "Wilks' lambda". "Wilks' lambda" is not just the ratio of the between-groups to within-groups sum of squares but is the product of the univariate Wilks' lambda for each function. Based on a chi-square transformation of the statistics, the significance level of the observed "Wilks' lambda" can be tested. The value of Wilks' lambda and its associated chi-square value, the degrees of freedom, and the significance level are 0.870, 29.425, 11, and 0.000. this means the null hypothesis that the means of both functions are equal in the two populations can be rejected. In other words, the two populations (the informal and the formal) are different.

13. Conclusion

The main purpose of this paper is to formulate a clear idea about the socio-economic and demographic background characteristics that affect the youth's choices in entering formal and informal labour markets in Egypt, through differentiating between those who enter the labour market as formal worker and those who fall into the informal sector group of work. Comparison between the two groups was attempted and particular attention has been directed to certain characteristics that are assumed to be the potential micro determinants for joining the informal labor market in Egypt and are included in the suevey data. These include gender, age, marital status, education, principal work status, and some other socio-demographic characteristics. A 'Chi-squared' test and 'Discriminant Function Analysis' were applied as a statistical assessment in differentiating between the two groups.

The results confirm to the hypothesis that formal workers are different from those who join the informal labor markets. Informal sector workers are likely to be more male-dominant, younger, mostly reside in rural areas, poorly educated, have no-formal education or training experiences, have more children, comes from a financially poor families, and educationally less advantages parents, compared with their formal labor counterparts. The two groups seem to be similar with the rest of the variable included in the analysis. These characteristics seem to hinder young people from joining the formal sector group of work.
Respondent level of education, place of residence, age at first marriage, parents' level of education, and principal work status made the greatest contribution in differentiating between the two groups. Those variable works as the most predictor variables of the informal workers.

14. Recommendations

As Informality is quiet prevalent in developing countries including Egypt, and also in low- and middle-income countries. Also, as mentioned above, negative impacts of informality hits at all levels, individuals, households or institutions, and the economy as a whole. Therefore, attempts should be made to either deprive people from joining the informal sector or formalizing the informal sector. In doing so, any approach which recommends mandatory legislative, executive and judicial reforms aiming at depriving individual from joining the

informal sector will not be fully effective unless considering the socio-economic background of those who joined or intend to join the informal rather that the formal sector. Also, any attempts to integrate informal into formal sector on the individual or firm basis will go vain without knowing the main factors that plays the major roles in determining people's choices in entering the labour market.

Moreover, with respect to policy making, one should keep in mind that any mandatory legislative, executive and judicial reforms should be accompanied with a socio-economic policies aiming at providing individuals, for example, with the proper education and skills to meet the principal requirements, if any, to join the formal sector.

Based on the results of the current research, for eliminating freedom to choose between joining the formal and informal sectors or encourage people to join the formal sector, any policy-oriented recommendations for Egypt and for developing countries as well, should place formal education for everyone at the top priority of the government, with the main focus should be on financially less advantage families reside in rural areas.

Data wise recommendations is that a specific survey focusing on labour markets and examining the formality of workers should have more attention on the quality of data especially with respect to missing data, as it was a reason that more than 85% of the selected cases has at least one missing discriminating variable and were excluded from the analysis.

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Annex 1: Correlations matrix between variables

	Gender	Current Age	Urban / Rural	Marital Status	Level of Education	Formal education or training experiences	Principal Work Status	Age at first marriage	Number of Children	Financial status of the family	Father Level of Education	Mother Level of Education
Gender	1	-	-	-	-	-	-	-	-	-	-	-
Current Age	-.003	1	-	-	-	-	-	-	-	-	-	-
Urban / Rural	-.121	-.103	1	-	-	-	-	-	-	-	-	-
Marital Status	.064	.601	.079	1	-	-	-	-	-	-	-	-
Level of Education	.147	.407	-.196	.114	1	-	-	-	-	-	-	-
Formal education or training experiences	.180	-.021	.055	.063	.[a]	1	-	-	-	-	-	-
Principal Work Status	.124	-.121	.172	-.038	-.030	.112	1	-	-	-	-	-
Age at first marriage	-.454	.441	-.051	.050	.190	-.211	-.314	1	-	-	-	-
Number of Children	.181	.260	.123	-.095	-.168	.221	.073	-.460	1	-	-	-
Financial status of the family	.043	-.148	-.006	-.039	-.287	.194	-.044	-.069	-.012	1	-	-
Father Level of Education	.012	.028	-.066	.009	.118	-.050	-.042	-.033	.010	-.090	1	-
Mother Level of Education	.070	.064	-.239	-.013	.311	-.106	-.059	.027	-.094	-.178	.334	1

.[a] Cannot be computed because at least one of the variables is constant.