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**Abstract**

Youth in Egypt suffer from high rates of unemployment and inactivity. They are also heavily affected by the widespread use of informal employment. This paper addresses the effects of employment transitions on the health of youth in Egypt. It specifically focuses on the effect of temporary and informal employment compared to non-employment on the psychological health of youth. Using data from the Survey of Young People in Egypt for the years 2009 and 2014, I identify the causal effects of various employment transitions on mental health outcomes by estimating a matched difference-in-differences. Results show that the transition from non-employment to employment improves the individual's mental health in general. There are differences in the magnitude of the effect according to gender and the type of employment where those in informal and temporary employment have lower improvements compared to formal and permanent employment.

**Keywords:** Labour market transitions, Unemployment, Temporary employment, Informal employment, Mental health, Matched difference-in-differences, Egypt.

**JEL Classifications:**

# 1 Introduction

Egypt suffers from high unemployment rates of youth and the widespread use of informal employment. Firms opt to hire workers informally to decrease the costs of hiring and firing particularly to evade paying social security instalments and/or medical insurance. To tackle these issues, labour market flexibility measures were introduced in the labour law no.12 of the year 2003 particularly making it easier to hire and fire employees, in an effort by the government to formalize jobs. These measures resulted in increasing the incidence of formal temporary employment (Wahba and Assaad, 2017). Despite the introduction of these measures, the level of informal employment is still high; in 2016, the informal employment represents approximately 51 percent of total non-agricultural employment (International Labour Organization, 2018). The informal employment is hence a dominating characteristic of the contract types in the private sector. Furthermore, irregular employment increased substantially in 2012 compared to previous years. On average and despite the measures taken by the government, the employment conditions in the private sector are deteriorating (Assaad and Krafft, 2013).

The most vulnerable group to the widespread use of such contract types are the youth. These contracts can result in inequalities whether on the monetary level (i.e., wage penalties) or the health level. The health penalties can be on the general well-being of the individual or can further affect their psychological health. Hence, it is necessary to identify the health effect of informal employment and compare it to the effect of temporary employment to stand on the impact of introducing such hiring flexibility on youth.

My primary research question is whether temporary jobs compared to informal ones have integrative potential by improving the health of non-employed workers or they are low quality jobs that have detrimental consequences on the mental health of individuals. Hence, the paper estimates the impacts of the transition to employment and whether these effects are moderated by the stability and the formality of the job, differentiating between informal, temporary and permanent jobs.

To address these research questions, I use the Survey of Young People in Egypt (SYPE) for the waves of 2009 and 2014. The dependent variables reflect psychological health outcomes. Regarding econometric methods, I apply the matched difference-in-differences to identify the causal effects on health outcomes. The matching part of this method creates comparable units between the two waves. Because the matching is based only on some observable characteristics, the difference-in-differences is also implemented on the outcomes of matched individuals to remove the impact of time-invariant confounding factors.

To the best of my knowledge, two studies have tackled the issue of the health outcomes in Egypt, and depending on the Survey of Young People in Egypt (SYPE). Rashad and Sharaf, 2018 identified the effect of precarious employment on youth mental health, well-being and marriage happiness. They estimated this relationship using Fixed Effects and Instrumental Variable estimation. However, they focused on wage workers only and did not identify the effect of the transition from non-employment to the various employment options. Furthermore, given the small sample size for women, they were not able to identify significant effects for most of the outcomes. Liu, Modrek and Sieverding, 2017 studied only the associations of various transitions to adulthood on youths' mental outcomes in Egypt using Ordinary Least Squares. The transitions to adulthood considered in this paper are the transitions in education, employment, and marriage. The employment transitions that they focused on are the transition in and out of employment and the labour

force. Hence, they did not consider the job quality nor the job stability in their analysis.

My addition to the literature is hence twofold. First, the paper considers the effect of transition from non-employment to various employment situations tackling the effect of the job quality particularly stability and formality which is a critical aspect in developing countries. So, instead of making an upward comparison as done by Rashad and Sharaf, 2018, I compare the outcomes of those in various employment situations to those in non-employment (a downward comparison). This comparison is particularly important since temporary jobs are seen as a tool to integrate the unemployed in the labour market (Gebel, 2013). Besides, youth face a high unemployment rate despite the increase in their educational attainment; the unemployment represents 15.7 percent for the youth population (Barsoum, Ramadan and Mostafa, 2014). In addition, I estimate the heterogeneous effects by gender to highlight the differences in the impact of employment transitions for men and women. Second, methodologically, to reduce the selection bias, I estimate the causal relationship between the employment transitions and the health outcomes using a quasi-experimental method. The matched difference-in-differences tackles both the observables and the time-constant unobservables, hence tackles the endogeneity due to selection and makes the control and treatment groups comparable.

This research paper will help in providing critical insights into what the young people experience in Egypt, particularly identifying the various impacts of non-employment, temporary employment and informal employment on their health outcomes. This identification helps in determining whether the substitution of informal employment with temporary employment contracts is beneficial for individuals and their health outcomes compared to non-employment. This is critical to provide youth with better employment opportunities.

The remainder of this proposal is organised as follows. Section 2 reviews the literature and the value added of the research. Section 3 highlights the conceptual framework, particularly data used, the sample, variables and the identification strategy. The empirical results of the effect of employment transitions on the psychological health of youth is presented in section 4. Section 5 provides the concluding remarks and policy implications.

## 2 Literature review

The employment transitions can affect the monetary level. The alteration in the employment status and the financial situation can also have an impact on the individual's health. To date, several studies have been conducted to investigate the relationship between employment transitions and monetary outcomes. When considering the health outcomes of employment transitions, most of the papers have tended to focus on the impact of unemployment on the health outcomes of individuals. However, fewer studies analyse the effect of transitioning from non-employment to either temporary or informal employment particularly in developing countries.

Using data from the British Household Panel Study (BHPS) and the German Socio-Economic Panel (GSOEP), Gebel, 2010 identifies the effects of temporary employment at labour market entry on following individual careers particularly wage penalties for the period from 1991 to 2007. He estimated this impact using two-step propensity score matching methods that takes into account the labour market entry probability in temporary versus permanent job and then estimate the penalty in a second step. The results of this

study indicate that entrants in temporary employment face an initial wage penalty that diminishes over time compared to permanent employment entrants in Germany.

Since the informal employment is a characteristic of the labour markets in developing countries, the wage penalty is calculated for the informal employment. Using Egypt Labour Market Panel Survey for the years 1998, 2006 and 2012, Tansel, Keskin and Ozdemir, 2015 estimate the wage penalty as a result of informal employment for wage workers in the private sector. They estimate Mincer wage equations in addition to fixed effects quantile regression that make use of the panel feature to tackle the unobservable characteristics. They found that the informal wage penalty is prevalent, persistent and increased over time. Besides, the penalty is bigger for the those with higher education levels and smaller for those with higher experience level. So, in this case we see a persistent wage penalty of the informal employment that does not diminish over time. Hence, its effect determinate the individual's career and their well-being.

Staneva and Arabsheibani, 2014 explains the definition of the informal sector employment. In addition, the differences in employees' earnings between the formal and informal sector in Tajikistan for the year 2007 is identified. Using quantile regression decomposition technique, and considering self-selection of individuals into different employment types, they find a significant informal employment wage premium across the whole earnings distribution.

When assessing the impact on the health outcomes, most of the studies focus on the effect of reemployment or unemployment on the individuals' general and mental health. Little is done on the impact of the job quality measured by stability and formality on the individuals' well-being.

Farré, Fasani and Mueller, 2018 tested the causal effect of job losses on the mental health in Spain using data from the Spanish National Health Survey comparing the years 2006 and 2011. They employed a two-stage least square estimation technique where the instrumental variable used for individual unemployment is vulnerability to the breakdown in the construction sector particularly in employment opportunities. Their results suggested that a rise in the unemployment rate due to the collapse in construction sector increased self-reported poor health and mental disorders.

Hurd, Rohwedder and Tassot, 2015 estimated the effect of employment transitions, specifically unemployment and reemployment, on the subjective of well-being of individuals in the United States during the period 2009-2013. Using the RAND American life panel, they estimated a first-difference model. They found that unemployment results in a decrease in the individual's well-being. However, the marital status has a role in decreasing this effect where married individuals witness a smaller effect when suffering from unemployment compared to singles. This decrease is persistent in the subsequent months. On the contrary, the effect of reemployment on health status is positive and only shows in the first month after the transition.

Thomas, Benzeval and S. A. Stansfeld, 2005 analysed the effect of employment transitions, particularly between employment and different types of non-employment, on the mental health of individuals. They conduct logistic regression models using data from the British household panel survey for the period 1991-1999. They found that exiting employment resulted in an increase in the psychological stress. The type of transition and the individual's gender determines the magnitude of this impact. In addition, they found that the effect is stronger during the first six months after the transition is witnessed.

Carlier, Schuring and Burdorf, 2018 assessed the effect of a reemployment program conducted in the

Netherlands. Using a quasi-experimental method, specifically the propensity score matching, to assess the impact of the interdisciplinary re-employment program in comparison with the regular re-employment programs. They found that individuals who transitioned to paid employment witnessed an improvement in physical and mental health, while health status remained the same among those who stayed in unemployment. However, one should be cautious when interpreting there results since unobservables may affect either employment or health status or both can result in biased estimates. This is particularly important since the placement/participation in the reemployment program was not random.

Almost the same result was reached by a study conducted earlier also in the Netherlands (Carlier, Schuring, Lötters et al., 2013). They studied the effect of reemployment on the quality of life and self-rated health outcomes. Their sample included those who are unemployed and receiving social security and unemployment benefits. Implementing a generalized estimating equations, they found that the reemployed individuals witnessed a positive effect on both outcome variables compared to the constantly unemployed. The effect is still prevalent even after controlling for several determinants of health. However, it decreased with getting older.

Thomas, Benzeval and S. Stansfeld, 2007 examined how the effect of employment change on mental health is mediated by changes in financial circumstances. They answered this question using the British household panel survey through estimating random effects logistic regression models. They particularly focused on the transition from unemployment to paid employment to examine the role of the subjective financial position. Individuals who change their employment status from unemployed to employed were less likely to witness mental distress. However, this effect is limited to those who witnessed distress in the first place when being unemployed. The perceived financial difficulties also affected the psychological distress for individuals.

Regarding the impact of temporary employment on the health outcomes, Dawson and Veliziotis, 2013 studied the relationship between temporary employment and the well-being of individuals in Britain using the subjective indicators of psychological distress, general health, anxiety and depression, and life satisfaction. They estimated OLS models using the British Household Panel survey for the period 1991-2008. Hence, they did not account for the selection bias. They compared the health outcomes of those in temporary employment to those in permanent employment. They found that those who have temporary contracts experience lower levels of well-being and job satisfaction. They concluded that despite the flexibility of the temporary contracts, their use results in well-being penalty for individuals in Britain. However, this result is subject to selectivity bias since they did not account for unobservable differences between individuals that might affect their employment choices and their health outcomes.

Gebel and Voßemer, 2014 tackled the problem of selection bias through implementing a matched difference-in-differences. They also focused on whether the prevalent use of temporary employment has affected the positive health effects of being employed using the German Socio-Economic Panel covering the years from 1995 to 2010. They found that generally temporary and permanent employment have similar health premiums, concluding that the adverse health effects are a result of unemployment. We will conduct the same methodology as implemented here by Gebel and Voßemer, 2014 to tackle the bias due to observables and time-constant unobservables. But we will consider more types of job contracts mainly testing the effect of job formality which is regarded as more relevant to the Egyptian Labour Market.

One study is done on identifying the health risks associated with informality in South Africa (Alfers and Rogan, 2015). They used data from the National Income Dynamic Study in 2008. Focusing on wage employment, they estimated ordered probit model for self-reported health. They found that employment formality is associated with positive health outcomes. In addition, women suffer more from the adverse effects of informality on health. However, this study is descriptive with no causal implications about the relationship.

It is now well established that reemployment has a positive impact on the health outcomes of individuals. However, the influence of the job characteristics and quality particularly transitioning from non-employment to temporary and informal employment on individuals' well being in developing countries have remained understudied. The contribution of this paper is hence to fill the gap and conduct a downward comparison with the non-employed rather than an upward comparison with the permanently employed. This analysis will provide a deeper understanding of the impact of low-quality jobs compared to staying in unemployment or inactivity on the well-being of youth.

# 3 Research design

This section introduces the data used in the analysis, the outcome, treatment and control variables in addition to the identification strategy.

## 3.1 Sample

The paper depends on the panel data of Survey of young people in Egypt for the years 2009 and 2014 to examine change in health outcomes for the same group of individuals over time. The data collection for 2014 is conducted by the Population Council in cooperation with the Central Agency for Public Mobilization and Statistics (CAPMAS), while the data for 2009 was collected with the Information and Decision Support Centre of the Egyptian Cabinet. The sample in 2009 is a nationally representative sample of 15,029 individuals aged 10-29. The 2014 sample covers 10,916 young people who were interviewed in 2009 (representing 72.6 percent of the 2009 sample). (Roushdy and Sieverding, 2015).

This data set is the best to be used in the data analysis given that it covers essential areas of the situation of youth in Egypt particularly, the transition to employment, and the health module that describes the health situation of the young people in Egypt. It also covers the necessary background information of the individuals required for the analysis.

Regarding the core demographic characteristics of the interviewed individuals in 2014 for those aged 13–35, the percentage of males is 51.2 percent, and the females represent 48.8 percent. Regarding the marital status, 64.8 percent are single. The majority of youth are living in rural areas representing 60.7 percent. 42.8 percent of youth live in Lower Egypt while 36.7 percent reside in Upper Egypt (Roushdy and Sieverding, 2015).

## 3.2 Variables

### 3.2.1 Outcome variable

The main outcome variable of interest is the mental health dummy variable. It is mainly a psychological health index that captures the medium-term health effects of employment transitions. This is measured using a self-reporting questionnaire of 20 questions with a yes and no answer, designed by the World Health Organisation. The questionnaire captures the mental disorders in developing countries (Table 1 shows the questions). The respondent's score is calculated by the number of yes answers to questions, where a higher score is an indication of mental disorder. The cutoff score of 8 is used as a positive screen for mental disorder (Roushdy and Sieverding, 2015). So, the mental health dummy variable is 0 for those with no mental illness and 1 for those who suffer from a mental illness.

Table 1: Questions capturing the mental health in the SYPE questionnaire

| # | **Mental health (Yes or no questions)** |
|---|---|
| 1 | Do you often have headaches? |
| 2 | Is your appetite poor? |
| 3 | Do you sleep badly? |
| 4 | Are you easily frightened? |
| 5 | Do your hands shake? |
| 6 | Do you feel nervous, tense or worried? |
| 7 | Is your digestion poor? |
| 8 | Do you have trouble thinking clearly? |
| 9 | Do you feel unhappy? |
| 10 | Do you cry more than usual? |
| 11 | Do you find it difficult to enjoy your daily activities? |
| 12 | Do you find it difficult to make decisions? |
| 13 | Are you unable to resume your daily work? |
| 14 | Are you unable to play a useful part in life? |
| 15 | Do you lose interest in things? |
| 16 | Do you feel that you are a worthless person? |
| 17 | Has the thought of committing suicide been on your mind? |
| 18 | Do you feel tired all the time? |
| 19 | Do you have uncomfortable feelings in your stomach? |
| 20 | Are you easily tired? |

Source: Survey of Young People in Egypt, SYPE 2009 and 2014.

### 3.2.2 Treatment variables

Following the methodology implemented by Gebel and Voßemer, 2014, the treatment is the transition of the individual out of non-employment to employment particularly those who were non-employed at 2009 and became employed in 2014. So, I start with those who were non-employed in 2009 and observe those who

transition to various jobs. The comparison is done relative to those individuals who remained non-employed during the period 2009-2014 (the control group).

In a next step, to assess the impact of the quality of work on the health outcomes of youth, we focus on the job stability dimension particularly being in a permanent or a temporary job. In the survey, these options are considered regular jobs. While the casual and seasonal employment are also dimensions of job stability but are considered irregular jobs. So, in these cases, the treatment is transition to either a permanent or a temporary or a seasonal/casual job and the control for all the cases is staying in non-employment.

To assess the impact of having formal job characteristics, the formality of the job is included. The informal employment refers to the absence of having a contract or social insurance. So, in these cases, the treatment is transition to either a formal job or an informal job and the control for these cases is staying in non-employment.

### 3.3 Control variables

The control variables included are measured in the baseline year (2009) before the treatment occurs to avoid any endogeneity problems. The variables used affects employment transitions and health outcomes (Table 2). I control for individual characteristics like gender, age, age squared, ever married status. To ensure balancing within marital statuses, I also include an interaction between ever married and being a female[2]. I also control for parenthood status by adding the number of children to the matching covariates. The relation to the head of household is also controlled for (head of the household, spouse or others). I also account for the years of education and the educational attainment of the individual, in particular, no education, primary and preparatory education, secondary and post-secondary education, and university and post-graduate.

Since the local labour market conditions might affect the employment dynamics and the health outcomes of individuals, we control for the region of residence (rural, urban or informal/slum area). To control for the wealth status of the individual and his household, I control for the transportation used frequently; these include public transportation, private car or taxi, on foot, truck or others (cart, bicycle, motorcycle, etc.). In addition, I account for the type of dwelling they live in. There are three types of dwellings, namely apartment, house or villa and rooms in an apartment. For each of them, I created a dummy variable that takes one if the individual is living in such type of dwelling and zero if otherwise. So, in the case of an individual living in a room or more in an apartment, the dummy variable would take 1. For those living in rural areas, 48 percent live in an apartment while 46 percent live in villa or a house and the remaining 6 percent live in a room inside an apartment. For urban areas, the majority of the individuals live in apartments settings (84 percent) while the remainder live in either villa/house or a room inside an apartment.

To control for some of the unobserved differences across individuals , I control for their plans to save money for retirement. This question is about whether the individual has a saving plan for retirement; so, it is not only whether they currently save or not. I argue that individuals who have a saving plan might be different in some unobserved characteristics, not only time preferences, compared to those who do not have a plan.

[2]If I conduct the analysis on the sub samples of women by their marital status, I would lose a large sample size which will render my estimates inefficient. This is the reason for only conditioning on the marital status in the matching step

The sample consists of those who transition to employment from non-employment (both inactive and unemployed). Those who witness such a transition from non-employment are mainly women while men are rarely inactive and are rather unemployed. Women in Egypt suffer from persistently low labor force participation (Assaad, Hendy et al., 2018).

The average marriage age for women in the sample is 19 years old with a standard deviation of 2.6. This is very similar to the median age found by Assaad, Krafft and Selwaness, 2017. According to them, the median age at marriage is 22 for women aged 22-39 using ELMPS data for the year 2012.

Table 2: Summary statistics for the baseline covariates (in 2009)

| **Variable** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** |
|---|---|---|---|---|---|
| Female | 2102 | 0.83 | 0.376 | 0 | 1 |
| Age | 2102 | 23.021 | 3.667 | 15 | 29 |
| Ever married | 2102 | 0.574 | 0.495 | 0 | 1 |
| No of children | 2102 | 0.972 | 1.163 | 0 | 7 |
| Saving plans | 2102 | 0.073 | 0.26 | 0 | 1 |
| Rural | 2102 | 0.57 | 0.495 | 0 | 1 |
| Urban | 2102 | 0.302 | 0.459 | 0 | 1 |
| Informal/slum | 2102 | 0.128 | 0.334 | 0 | 1 |
| No education | 2102 | 0.095 | 0.293 | 0 | 1 |
| Primary and preparatory | 2102 | 0.254 | 0.435 | 0 | 1 |
| Secondary and post-secondary | 2102 | 0.516 | 0.5 | 0 | 1 |
| University and post-graduate | 2102 | 0.136 | 0.342 | 0 | 1 |
| Years of education | 2102 | 10.662 | 3.776 | 0 | 17 |
| Head of household | 2102 | 0.023 | 0.149 | 0 | 1 |
| Spouse | 2102 | 0.461 | 0.499 | 0 | 1 |
| Other | 2102 | 0.517 | 0.5 | 0 | 1 |
| Public transportation | 2102 | 0.727 | 0.446 | 0 | 1 |
| Private car/Taxi | 2102 | 0.041 | 0.199 | 0 | 1 |
| On foot | 2102 | 0.155 | 0.362 | 0 | 1 |
| Other | 2102 | 0.006 | 0.075 | 0 | 1 |
| Truck | 2102 | 0.071 | 0.257 | 0 | 1 |
| Own apartment | 2102 | 0.679 | 0.467 | 0 | 1 |
| House/villa | 2102 | 0.284 | 0.451 | 0 | 1 |
| Rooms in an apartment | 2102 | 0.037 | 0.189 | 0 | 1 |

Source: Author's calculations based on Survey of Young People in Egypt (SYPE) 2009.

### 3.4 Identification Strategy

To estimate the impact of job stability and formality on the mental health outcomes of youth, a first step is to conduct a difference-in-differences (DiD) analysis between the treatment and the control group[3].

[3]The ideal experiment to identify the impact of finding a job, it would be in an environment where all those who do not have jobs apply, and then there is a lottery that assigns people into jobs or no jobs. Since, I do not have such an experiment in the Egyptian

This identification strategy tackles the fixed unobservables. Since I am using panel data, the estimator is based on individual differences over time which means that differencing done by the difference-in-differences results in removing time constant confounding factors (Lechner, 2011b and Angrist and Pischke, 2009. However, I can not control for time-varying unobservables.

One of the main assumptions of the DiD is the common trend assumption. This assumption assumes that there are no potential differences between the treatment and the control group in their outcomes if both groups were not subject to the treatment in the post-treatment period.

To ensure that the common trend assumption is not violated, it is necessary to conduct propensity score matching before the DiD to guarantee that the outcomes of both the treatment and the control groups would have followed the same trend if they remained non-employed. In other words, the matching ensures that both groups are similar with regards to observables, if the treatment did not occur (Gertler et al., 2016). Correcting for the bias in the DiD estimates through using matching to choose the initial control group. This removes the initial heterogeneity between the treatment and control groups (Schultz and Strauss, 2008).

However, I acknowledge that reverse causality might exist between the treatment and outcome variable. In addition, there might be spill-over effects. To avoid this contamination of the results, I ensure that the common trend assumption is satisfied through the matching. I do not match using pretreatment outcome since it produces an inconsistent estimator (Lechner, 2011b and Chabé-Ferret, 2017).

Using matched DiD takes into account both the observables and the time-invariant unobservables between the treatment and the control groups. The implementation of this method starts with conducting the propensity score matching based on observed baseline characteristics. The treated observation is defined as an initially non-employed individual who will witness an employment transition in the following period. The treatment is hence witnessing an employment transition from non-employment to either permanent, temporary, or seasonal/casual jobs and formal or informal contracts. Each treated observation is matched to the control observation. This control group consists of those who start as being non-employed and remain non-employed during the study's period.

The propensity scores are estimated using a logit model for the probability of getting treated based on a function of individual observables in the base period before finding a job. These observables are basically the determinants of employment transitions and health outcomes (the control variables mentioned in the previous section). These variables must not be affected by the treatment to avoid getting biased estimates (Rosenbaum and Rubin, 1984).

After the matching and achieving the balance across the covariates, the DiD is applied on the treatment and control observations that are on the common support to estimate the counterfactual for the change in outcomes between the treatment and the control groups; particularly identifying the effect of employment transitions on the mental health outcomes of the treatment group over time and compare it to the counterfactual trend. This is the change in their health outcomes if they remained non-employed which is approximated by the health outcomes of the control group. The matching ensures that the control group have similar outcomes to the treatment group in the absence of the treatment that could be used as a counterfac-

context. In addition, the costs of such experiments render them undoable. It is still beneficial to conduct a quasi-experimental estimation method to estimate the effects of employment transitions on the mental health of youth.

tual in calculating the differences. Finally, the average treatment effect on the treated is calculated (Lechner, 2011a), which is the health effect of the employment transition for the treated (i.e. those who transitioned).

### 3.5 Descriptive analysis

This section provides the descriptive analysis for the relationship between employment transitions and the psychological health. Figure 1 shows the differences between the treatment and control groups in their mental health outcomes before and after the treatment. When considering the treatment of getting employed compared to staying in non-employment, in 2009, the mental health of the treatment group is worse than the control group. Both groups see an improvement in their mental health in 2014; however, the improvement is higher for the treated group compared to the control group (Panel A, figure 1).

The same trend is seen for all the conditional transitions to employment with the exception of getting a seasonal or a casual job. Nevertheless, the magnitude of the improvement differs. For example, those who transition to formal employment witness better improvement in their mental health compared to the non-employed and it is higher in magnitude compared to those who get an informal job compared to remaining in non-employment (Panel E and panel F, figure 1). The baseline difference is .037 indicating the worse off situation for the treated group in the baseline period.

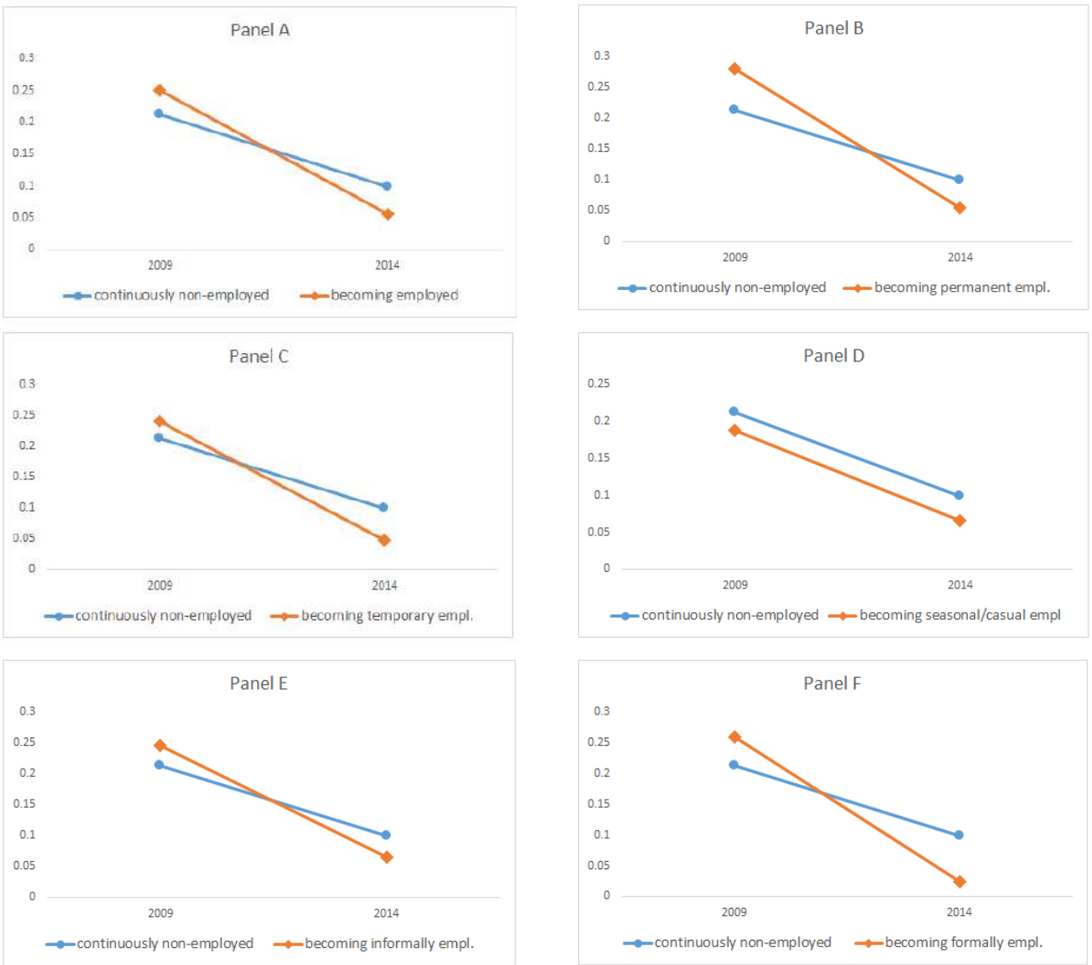
With respect to getting a seasonal or a casual job, in 2009, the control group is worse off with regards to mental health compared to the control group. The baseline difference is -.025. Both groups see an improvement in their mental health in 2014, with the treatment group still being better off than the control group (Panel D, figure 1).

From these mental health trajectories of treatment and control groups, it can be seen that the treatment groups have better mental health outcomes compared to the control group in 2014. However, there are substantial differences according to the characteristics of the job with regards to stability and formality.

The propensity score matching is conducted to ensure that the treated and control groups are similar with respect to baseline covariates. The matching algorithm for all treatment variables is the $10^{th}$ nearest neighbour with the exception of informal job which is matched with Kernel propensity score matching. The individuals off-support are less than 10 in all the treatments considered. After the matching, the balance of the covariates is assessed. Table 3 shows the standardised mean and median bias. For the unconditional employment, both biases are below 3. This is also the case for permanent, informal and formal employment. The biases are above 3 for only the seasonal or casual job however it is still low. Table 4 shows the standardised mean and median bias for the sub-samples of women and men. The bias is below 3 for most of the treatments in the sub-sample of women. For men, the bias is a little higher but is still below 3 for unconditional employment and informal job and below 5 for getting a temporary job.

In the next step, I assess the standardised bias across the covariates for each treatment. The treatment is “observed transition to employment” but we do not know why some people transition and others do not. I divide the sample into treated and control groups and show how the two groups are comparable in terms of characteristics. I control for the characteristics of the individual to have a better match between the treatment and the control group, particularly their gender, age, education and marital status, among others. In order to show how the treatment and control group comparability in terms of characteristics before and

Figure 1: Mental illness trajectories of treatment and control groups




Source: Author's calculations based on SYPE 2009 and 2014.

after the matching, table 5 present the mean of the characteristics before and after matching and the percent of standardized bias. A reduction of bias is almost evident for all the covariates.

Given this reduction in bias, it is best to adjust for covariates and make the two groups comparable using matching to achieve the parallel trend assumption of the difference-in-differences.

Table 3: Standardised mean and median bias

| | Mean bias | Median bias |
|---|---|---|
| **T**ransition to any employment[1] | 1.8 | 1.8 |
| Job stability: | | |
| Permanent job | 1.9 | 1.6 |
| Temporary job | 2.8 | 2.3 |
| Seasonal or casual job | 4.3 | 3.4 |
| Job formality: | | |
| Informal job[2] | 2.0 | 1.9 |
| Formal job | 2.1 | 1.1 |

Notes: 1. unconditional treatment effects. 2. Informal job is defined as an individual who does not have an employment contract or is not covered by social security system. *The matching algorithm for all treatment variables is the 10th nearest neighbour with the exception of informal job which is matched with Kernel propensity score matching

Source: Author's calculations based on SYPE 2009 and 2014.

Table 4: Standardised mean and median bias for subsamples by gender

| | Women | | Men | |
|---|---|---|---|---|
| | Mean bias | Median bias | Mean bias | Median bias |
| Transition out of non-employment to: | | | | |
| Any employment[1] | 1.6 | 1.1 | 2.2 | 1.8 |
| Job stability | | | | |
| Permanent job | 2.5 | 1.6 | 4.4 | 4.1 |
| Temporary job | 2.4 | 1.7 | | |
| Seasonal or casual job | 2.3 | 1.8 | | |
| Job formality | | | | |
| Informal job[2] | 2.1 | 1.8 | 3.5 | 2.1 |
| Formal job | 1.7 | 1.3 | | |

Notes: 1. unconditional treatment effects. 2. Informal job is defined as an individual who does not have an employment contract or is not covered by social security system. *The matching algorithm for all treatment variables is the 10th nearest neighbour with the exception of informal job which is matched with Kernel propensity score matching

Source: Author's calculations based on SYPE 2009 and 2014.

Table 5: Balance of covariates for the transition to employment: Averages before and after the matching

| | | Transition into employment | | |
|---|---|---|---|---|
| | | Treated | Control | % bias |
| Female | Unmatched | .8356 | .82553 | 2.7 |
| | Matched | .8348 | .85267 | -4.7 |
| Age | Unmatched | 22.82 | 23.16 | -9.2 |
| | Matched | 22.82 | 22.876 | -1.5 |
| Age squared | Unmatched | 534.5 | 549.62 | -9 |
| | Matched | 534.4 | 537.45 | -1.8 |
| Ever married | Unmatched | .5567 | .58643 | -6 |
| | Matched | .5546 | .54965 | 1 |

Table 5: Balance of covariates for the transition to employment: Averages before and after the matching

| | | Transition into employment | | |
|---|---|---|---|---|
| | | Treated | Control | % bias |
| Ever married * female | Unmatched | .5428 | .57431 | -6.3 |
| | Matched | .5407 | .53884 | 0.4 |
| No of children | Unmatched | .9236 | 1.0057 | -7.1 |
| | Matched | .9174 | .93814 | -1.8 |
| Rural (urban omit.) | Unmatched | .5578 | .57835 | -4.1 |
| | Matched | .5569 | .55802 | -0.2 |
| Informal or slum | Unmatched | .1273 | .12843 | -0.3 |
| | Matched | .1267 | .13419 | -2.2 |
| Primary and preparatory (no educ. omit.) | Unmatched | .2789 | .23667 | 9.7 |
| | Matched | .2779 | .27837 | -0.1 |
| Secondary and post-secondary | Unmatched | .5034 | .52423 | -4.2 |
| | Matched | .5058 | .51791 | -2.4 |
| University and post-graduate | Unmatched | .1331 | .13732 | -1.2 |
| | Matched | .1337 | .13291 | 0.2 |
| Years of education | Unmatched | 10.61 | 10.695 | -2.1 |
| | Matched | 10.63 | 10.747 | -2.9 |
| Head of household (spouse omit.) | Unmatched | .0254 | .021 | 3 |
| | Matched | .0255 | .02174 | 2.5 |
| Other | Unmatched | .5289 | .50808 | 4.2 |
| | Matched | .5302 | .52779 | 0.5 |
| Private car or Taxi (public transport omit.) | Unmatched | .0486 | .03635 | 6.1 |
| | Matched | .0488 | .04186 | 3.5 |
| On foot | Unmatched | .1574 | .15267 | 1.3 |
| | Matched | .1581 | .1536 | 1.3 |
| Other | Unmatched | .0081 | .00404 | 5.2 |
| | Matched | .0058 | .00291 | 3.7 |
| Truck | Unmatched | .0648 | .07593 | -4.3 |
| | Matched | .0627 | .05953 | 1.3 |
| House or villa (own apartment omit.) | Unmatched | .2812 | .28595 | -1 |
| | Matched | .2802 | .265 | 3.4 |
| Rooms in an apartment | Unmatched | .0405 | .03473 | 3 |
| | Matched | .0395 | .04291 | -1.8 |
| Saving plans | Unmatched | .0729 | .0727 | 0.1 |
| | Matched | .0732 | .07221 | 0.4 |

Source: Author's calculations based on SYPE 2009.

# 4 Empirical results: Effect on mental health

Table 6 provides the average treatment effect on the treated for various treatment variables. Regarding the unconditional employment, the mental health has improved compared to those staying in non-employment (ATT=-0.0796). The result is the same when we introduce the matching but with a lower magnitude (ATT=-0.053). This result is in line with the descriptive analysis of the mental health trajectories.

There are remarkable differences when we compare the effect according to the type of job stability. The mental health of those who transition to a permanent job improves with a higher magnitude (ATT=-0.114) compared to those who get a temporary job (ATT=-0.083). Both effects are statistically significant. The effect of transitioning to a seasonal or a casual job is very close to zero and is insignificant, showing that getting this unstable job is close to remaining in non-employment with regards to their effect on the mental health of the individual.

Regarding the formality of the job, the transition to a formal job result in an improvement of the mental health (ATT=-0.112, s.e. 0.039) while transitioning to an informal job also improves the mental health of the individual but at a lower rate (ATT=-0.049, s.e.=0.039).

It can be concluded that the characteristics of the job affect the psychological health of the individual. The more stable and formal the job is, the better is the mental health of the individual. Transitioning to an unstable job (informal or casual) have the same effect on the individual's psychological health as staying in in non-employment. This shows the negative impact of such jobs.

Table 6: Average treatment effect on the treated

| Outcome variable: Mental illness[1] | ATT | | S.e. | Bootstrapped s.e. | $N_t$ |
|---|---|---|---|---|---|
| | Without matching | With matching[4] | | | |
| **Transition** | | | | | |
| **out of non-employment to:** | | | | | |
| Any employment[2] | -0.0796 | -0.053 | 0.023 | 0.026* | 864 |
| **Job stability** | | | | | |
| Permanent job | -0.112 | -0.114 | 0.029 | 0.032* | 488 |
| Temporary job | -0.079 | -0.0829 | 0.043 | 0.044*** | 164 |
| Seasonal or casual job | -0.009 | -0.009 | 0.036 | 0.041 | 212 |
| **Job formality** | | | | | |
| Informal job[3] | -0.067 | -0.049 | 0.023 | 0.026** | 773 |
| Formal job | -0.122 | -0.112 | 0.039 | 0.046** | 209 |

Notes: 1. a binary indicator taking 1 if the individual suffers from a mental illness and zero otherwise. 2. unconditional treatment effects. 3. Informal job is defined as an individual who does not have an employment contract or is not covered by social security system. 4. Matching is implemented using pre-treatment control variables and estimated through a logit model. Bootstrapped standard errors (S.E.) (200 repetitions). Nt: number of treated individuals. Number of control individuals: 1444. *,**,*** denote significance at 1%, 5% and 10% levels, respectively

Source: Author's calculations based on SYPE 2009 and 2014.

The effects may differ according to the characteristics of the individual. The heterogeneous effects are considered with regards to gender (table 7). For the unconditional employment, men's witness a higher

level of improvement in mental health compared to women when they transition to employment (yet, it is insignificant). However, when I conduct the matching the results for men and women become comparable (ATT for men=-0.084 and ATT for women=-0.072). For the permanent employment, after the matching, men still witness an improvement in their mental health higher than women (significant effects). Another remarkable difference is according to the job formality for women; females transitioning to the formal employment have lower benefits on their psychological health (ATT=-0.115) compared to those transitioning to informal employment (ATT=-0.2). This indicates that the stability of the job matters most to the women mental health compared to the formality of the job.

To summarise, men and women both witness an improvement in their mental health when they transition to employment. The differences are seen in the size of the effects. It is important to note that the number of women in the sample might be driving the results for the whole sample. However, it does not affect the validity of the results since the estimated effects are in the same direction for both men and women.

Table 7: Average treatment effect by gender

| | | ATT | | | | |
|---|---|---|---|---|---|---|
| Outcome var.: mental illness[1] | Gender | Without matching | With matching[4] | S.e. | Bootstrapped S.e. | Nt |
| **Transition out of non-employment to:** | | | | | | |
| Any employment[2] | Women | -0.072 | -0.071 | 0.026 | 0.027** | 718 |
| | Men | -0.101 | -0.084 | 0.044 | 0.052 | 140 |
| **Job stability** | | | | | | |
| Permanent contract | Women | -0.104 | -0.236 | 0.048 | 0.034** | 408 |
| | Men | -0.135 | -0.125 | 0.058 | 0.065*** | 75 |
| Temporary contract | Women | -0.084 | -0.1095 | 0.048 | 0.055*** | 136 |
| Seasonal or casual job | Women | 0.007 | 0.019 | 0.041 | 0.046 | 176 |
| **Job formality** | | | | | | |
| Informal job[3] | Women | -0.060 | -0.2 | 0.027 | 0.035 | 550 |
| | Men | -0.083 | -0.067 | 0.050 | 0.053*** | 101 |
| Formal job | Women | -0.115 | -0.105 | 0.045 | 0.050** | 171 |

Notes: 1. a binary indicator taking 1 if the individual suffers from a mental illness and zero otherwise. 2. unconditional treatment effects. 3. Informal job is defined as an individual who does not have an employment contract or is not covered by social security system. 4. Matching is implemented using pre-treatment control variables and estimated through a logit model. Bootstrapped standard errors (S.E.) (200 repetitions). Nt: number of treated individuals. Nc for women is 1022 and for men is 216 *,**,*** denote significance at 1%, 5% and 10% levels, respectively

Source: Author's calculations based on SYPE 2009 and 2014.

# 5 Conclusion

Using Survey of young people in Egypt for the years 2009 and 2014, this paper estimates the causal effect of various employment transitions on the psychological well-being of youth using matched difference-in-differences. We focus on the transition from non-employment to seasonal and casual, temporary, and permanent employment in addition to formal and informal employment. So, the research paper tries to tackle the question of whether the health vulnerability of youth is affected by the job quality particularly its stability and formality.

This research contributes to a deeper understanding of the impact of low-quality jobs compared to non-employment on the well-being of youth. The characteristics of the job affect the psychological health of the individual. The more stable and formal the job is, the better is the mental health of the individual. In addition, the magnitude of the effect is higher for women compared to men. Transitioning to an unstable job (seasonal or casual) have the same effect on the individual's psychological health as staying in in non-employment. This shows the negative impact of such jobs. Women's mental health benefit more from a stable job while formality of the job has lower effects compared to informal jobs.

I acknowledge that the general economic situation matters and there might be some spill over effects from it. Yet, I need further data to be able to answer such a question. This effect could be estimated with different data, and over time when the economic situation changes.

From a policy perspective, this topic is crucial given the high unemployment and inactivity rates witnessed across youth and the widespread use of unstable and informal employment, suffering from work inequalities. The government tried to solve the problem of informal employment through increasing the labour market flexibility. It is important to see the effect of the temporary employment compared to the informal employment and non-employment on the health status of the young people. Understanding the impact of the job quality will help in providing youth with decent employment opportunities and decrease their vulnerability to the job characteristics.

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