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Abstract

The aim of this paper is to assess to what extent is the Egyptian labor market dynamic and the impact of its dynamics on stagnant unemployment rates. By estimating annual and semi-annual transition probabilities of workers among different employment sectors as well as between employment and non-employment states, the paper explores how sluggish the Egyptian labor market has been throughout the past decade, and characterizes the subcategories which suffer the most from this rigidity. In the absence of official and research statistics of these transitions in Egypt, these estimates would surely improve the monitoring of business cycles, the detection of inflection (turning) points and the assessment of labor market tightness. A unique semi-annual panel of labor market micro-data, generated from the new cross-sectional Egypt Labor Market Panel Survey 2012, is used in the analysis. Results show evidence of relatively rigid dynamics within the Egyptian labor market with a turning point in trends of job accession (job finding) and separation rates right after the financial crisis and the January 2011 uprising. Flows into and out of unemployment seem to have been affected by the slowdown of the economic growth following the Arab Spring during which separation rates almost doubled and job finding rates declined. Even after an increase in the separation rates of about one percentage point, these rates remain very low, reflecting an extremely rigid labor market. In such times of crises, unemployment rises not only because workers lose their jobs into non-employment (evidence of increasing involuntary job exits), but also because it becomes harder to find jobs, which is verified by a substantial decline in the job finding rate after 2009. Results also suggest that claims of increasing job losses after January 2011 uprising were exaggerated. Additionally, a rise in job-to-job transitions, especially among informal workers, is observed.

JEL Classification: J2, J3

Keywords: hiring, job finding, separation, job-to-job, transition probabilities, unemployment.

ملخص

الهدف من هذه الورقة هو تقييم مدى ديناميكية سوق العمل المصري وتأثير هذه الديناميات على معدلات البطالة الراكدة. وعن طريق تقدير احتمالات الانتقال السنوية ونصف السنوية للعمال بين قطاعات العمل المختلفة وكذلك بين العمالة وعدم استخدامهم الدول، تستكشف الورقة مدى بطئ سوق العمل المصري طوال العقد الماضي، وتميز الفئات الفرعية التي تعانى أكثر من غيرها من هذا الجمود. وفي ظل غياب الإحصاءات الرسمية والأبحاث من هذه التحولات في مصر، فإن هذه التقديرات تستطيع بالتأكيد تحسين رصد الدورات التجارية، والكشف عن انعطاف (تحول) نقاط وتقييم ضيق سوق العمل. تم استخدام بيانات تتبعية نصف سنوية فريدة من سوق العمل، متولدة من المسح التتبعى لسوق العمل مصرلعام 2012. وتظهر النتائج دليل على ديناميات جامدة نسبيا في سوق العمل المصري مع نقطة تحول في اتجاهات الانضمام لوظيفة (تقصي العمل) ومعدلات الانفصال مباشرة بعد الأزمة المالية وانتفاضة يناير 2011. يبدو ان التدفق داخل وخارج البطالة قد أثر على تباطؤ النمو الاقتصادي في أعقاب الربيع العربي والتى تضاعفت خلالها معدلات الانفصال ، وانخفضت معدلات البحث عن وظيفة. وحتى بعد زيادة في معدلات الفصل بحوالي نقطة مئوية واحدة، لا تزال هذه المعدلات منخفضة جدا، مما يعكس أن سوق العمل جامد للغاية. في مثل هذه الأوقات من الأزمات، يعزى ارتفاع معدلات البطالة ليس فقط لأن العمال يفقدون وظائفهم في حالة عدم العمل (دليل على زيادة مخارج الوظائف اللاإرادية)، ولكن أيضا لأنه يصبح من الصعب العثور على وظائف. تشير النتائج إلى أن ادعاءات زيادة فقدان الوظائف بعد انتفاضة يناير 2011 مبالغ فيها. بالإضافة إلى ذلك، لوحظ ارتفاعا في التنقل من وظيفة إلى وظيفة ، خاصة بين عمال القطاع غير المنظم.

1. Introduction

Previous research in Egypt has paid close attention to the stocks of the employed, the unemployed and the inactive (i.e., those not working or looking for work), as well as to the balance between labor demand and supply often referred to as "tightness". However, the labor market stocks and aggregate indicators are fundamentally driven by the behaviour of flows between employment, unemployment and inactivity. Egyptian labor market dynamics remain therefore an unexplored research topic where even official statistics lack records of these flows, namely job accession (transitions from non-employment to employment), separation (transitions from employment to non-employment) and mobility (job-to-job transitions).

An understanding of all the relevant flows is essential to the comprehension of labor market dynamics and business cycle fluctuations. For policy makers, knowledge of those facts can help improve monitoring the business cycles, detecting inflection (turning) points and assessing labor market tightness. To guarantee productivity growth along with economic (GDP) growth, it is important to ensure a healthy dynamic labor market where low productivity jobs are being destroyed, higher productivity jobs are being created and existing jobs are getting more productive. This paper can hence be seen as a reference for a number of measures of dynamics, and can also provide a guideline for the properties one should expect a dynamic Egyptian labor market to have. The preliminary results of this paper are not reassuring in terms of the dynamics of the labor market where job accession and separation seem to be extremely low in the economy, and even job-to-job transitions take place in the wrong direction where people are experiencing worsening job statuses rather than becoming more productive and moving up the job ladder. The key answer to a healthy and dynamic labor market is simply firms and workers becoming better at what they do, and for this to take place, policies should encourage all three types of transitions: job accession, separation and mobility.

To the best of my knowledge, this paper is the first attempt to assess from a descriptive point of view the transitions within/between employment and non-employment states in the Egyptian labor market. Yassine (2013) provided estimates using ELMPS 2006 showing how rigid this labor market tends to be, where a worker can spend up to 25 years in one job. There is a need to reassess such results with more descriptive evidence, using a longer and more recent panel, which shall be the mission of this paper. This is particularly important given that in recent years the Egyptian labor market is thought to have undergone substantial structural change especially with the January 2011 uprising.

Thus the objective of this paper is to describe the main developments in and establish a number of key facts and descriptives about the recent history of these important Egyptian labor market flows. The paper points out the characteristics of short-term transitions, stayers and movers among the different labor market states, and explores the determinants to move, leave or quit with respect to those who have stayed in their jobs over the past decade (2002-2012). The analysis focuses especially on the period after the January 2011 uprising, after which many workers claimed to have lost their jobs.

In this paper, a semi-annual synthetic panel over the period 2002-2012 is extracted, by combining information obtained from rich retrospective job histories, unemployment spells, a life events calendar and current job status details available in the Egyptian Labor Market Panel Survey (ELMPS) 2012 data. The innovation of obtaining an employment/non-employment vector for each and every individual every six months over a period of ten years allows one to monitor the fullest possible range of job accession, separation or job-to-job transitions occurring in the Egyptian labor market during the observed period. I am therefore able to quantify and characterize these transitions and hence provide the literature with

stylized facts and descriptives about the Egyptian labor market dynamics that even official statistics have lacked.

The rest of the paper is divided as follows. The second section briefly presents the data used in the analysis, the creation of a semi-annual synthetic panel, and the resulting potential errors and their treatment. The third section provides an overview of the average gross flows of jobs and the macroeconomic labor market trends in Egypt. The fourth section explores the determinants of job leavers/losers and movers as opposed to job stayers over the period 2002-2012. The fifth section concludes.

2. Methodology: From Stocks to Flows

2.1 Data treatment

The analysis relies mainly on the Egypt Labor Market Panel Survey 2012 (ELMPS 2012), the third round of a periodic longitudinal survey that tracks the labor market and demographic characteristics of households and individuals interviewed in 2006 and 1998. The dataset is designed to be nationally representative, where a total sample of 12,060 households and 49,186 individuals were interviewed in 2012 (Assaad & Krafft 2013).

This paper makes use of the rich retrospective accounts available in the questionnaire, namely information about first, second, third and fourth employment statuses, status after January 2011 uprising, as well as current job status and the newly added life events calendar. This raw data allows one to extract an employment, unemployment and inactivity trajectory yielding a semi-annual panel of 49,186 individuals, with an employment/non-employment vector of each individual in the sample annually and semi-annually over the years 2000-2012. Moreover, using information about each workers' status, sector, type of contract and stability, it is possible to divide the labor market states into different subcategories; public wage work, formal and informal, non-wage work (self-employment, employers and unpaid family workers), unemployed and non-participants.

A worker is defined to be employed in a formal job if he or she has a contract and/or social insurance. The ELMPS 2012 questionnaire makes it possible to determine the formality of the firm where a firm is defined as formal when the worker interviewed has a formal job or other workers in the firm have contracts and/or social insurance. For the current job status, extra questions add to the firm's formality detection such as whether the firm keeps registers and accounting books or not.

Using the new questions added to the ELMPS 2012 questionnaire about the time lag between accessing a job and acquiring a contract or social insurance, it was possible to fully capture informal-to-formal job-to-job transitions that the individuals have gone through during their work history.

It is therefore worth summarizing at this point that for the analysis two retrospective synthetic panel data sets were extracted; one where the individual employment vector occurs annually and the other every six months. Stocks always refer to a specific aggregate at the beginning of the year. These stocks are therefore derived from the annual trajectory. For the transitions (job accession, separation and switches), these are flows that occur during the year in question, and since the aim is to capture the most possible transitions an individual went through during the year, transitions are derived from the semi-annual synthetic panel.

The sample used in this paper includes individuals, 6 years and older, who had ever worked in the Egyptian labor market. With the availability of questions about unemployment spells and the data treatment methodology, the sample also includes the new entrants and individuals who are permanently out of the labor force. Throughout the paper, different sub-samples are used and hence are described in detail in the relevant section.

In general, using panel surveys may suffer from attrition bias, which is addressed by using the attrition weights attributed in this dataset and which are used to expand figures to the population level (Assaad and Krafft 2013). However, missing values about the month and year of start of a job tend to be problematic when creating the synthetic panels. A set of assumptions, when creating the data sets, were therefore adopted. In the survey, a status could not be recorded unless an individual has spent at least 6 months in it. It is therefore assumed that an individual has spent the first half of the year in one job and the second in the other if the month value is missing and two job statuses started in the same year. If the month of start of a job is missing and only one job status started in that year, I assume that the status started at the begining of the year. If the year of start of the job status was missing, nothing could be done about this and the individual would be dropped from the sample. Fortunately I did not encounter this last scenario.

Another potential type of error that the data is susceptible to is response error. This includes recall error which I try to reduce by limiting the analysis to the most recent 10 years (2000-2012). Response errors also include "present" mis-report bias, that is when some people deliberately mis-report their current employment status and information, even though they have given exact and correct information about their work history, just to avoid taxes and government registers[1]. That both these types of error are occurring becomes obvious when the analyses using ELMPS 2012 and ELMPS 2006 were overlapped and when unemployment rates from stocks and flows were compared. Both are briefly discussed below. However, further research and investigation are needed to explore the extent of bias (whether recall or response) comparing synthetic panel data sets constructed using the retrospective questions and the available ELMPS cross-sections 1998, 2006 and 2012.

Finally, going back in time, the sample should have included people who were alive in 2002 but passed away before 2012 and hence did not respond to the ELMPS. This is defined as "backward attrition" and which I try to avoid by limiting the age of individuals in the sub-samples to between 20 and 49 years old in year t of the constructed synthetic panel.

2.2 Concepts of the labor market dynamics [2]

In this paper, the working age population at year t (W_t) comprises three stocks of individuals; employed E_t, unemployed U_t and inactive (out of the labor force) I_t.

$$W_t = E_t + U_t + I_t \tag{1}$$

The labor force L_t is made up of the employed and unemployed.

$$L_t = E_t + U_t \tag{2}$$

Total employment in year $t+1$ is determined by the employment in the previous year t, the hiring flow from the pool of unemployed M_t^{UE} and inactive M_t^{IE}, less the gross separation flows to unemployed and inactive respectively; S_t^{EU} and S_t^{EI}.[3]

$$E_{t+1} = E_t + M_t^{UE} + M_t^{IE} - S_t^{EU} - S_t^{EI} \tag{3}$$

[1] The ELMPS 2012 survey was conducted by the Central Agency for Public Mobilization and Statistics personnel and hence for the interviewed households, it was government authorities collecting the information.

[2] In this section, concepts discussed by Gomes (2012) and Shimer (2012) are summarized.

[3] The superscripts ij, where $i \neq j$, denote the origin state i (the state from which an individual is transiting) and the destination state j (the state to which an individual is transiting).

Similarly, the unemployment stock changes over time, however, this time, flows between the unemployed and inactive stocks G_{UI} and G_{IU} are added.

$$U_{t+1} = U_t - M_t^{UE} + S_t^{EU} - G_t^{UI} + G_t^{IU} \quad (4)$$

The empirical literature has studied labor market dynamics using different approaches. Emphasis has been put on gross flows in work by Blanchard and Diamond (1990); and Bleakley et al. (1999), and also on transition rates like work by Shimer (2012), Fujita and Ramey (2009) and Davis et al. (1996). Since this paper is a first attempt to explore facts and statistics about Egyptian labor market dynamics, the best would be to provide a thorough survey of both approaches using the ELMPS. It is extremely important to note that throughout when talking about job accession, I differentiate between hiring rates h and job finding rates f. The hiring rate measures the rate at which employment expands between two points in time calculating new jobs created as a rate relative to the existing number of jobs. It resembles the job creation rate discussed from the firm dynamics point of view (Davis et al. 1996)[4]. The job finding rate represents the probability that a non-employed individual finds a job (Shimer 2012). To be able to understand this difference, it is crucial at this point to distinguish between two concepts used in the analyses of labor market dynamics; job turnover and labor turnover. The economy-wide job turnover rate is simply the absolute sum of net employment changes across all establishments or firms, expressed as a proportion of total employment. By simply comparing two points in time, it is an indicator of the expansion or contraction of employment within establishments or firms in the economy. Labor turnover is simply the sum of job turnover and the movement of workers into and out of ongoing jobs in establishments or firms. Workers find and leave jobs regardless of whether the firm, or even employment in the economy itself is growing or declining. For this reason, the analysis in this paper distinguishes between the hiring rate (new jobs as a proportion of employment i.e. the expansion of employment in the economy) and the job finding rate , which is simply the probability an unemployed worker finds a job and moves into the stock of employed.

To summarize, the flows discussed in this paper, can be categorized into three types;

- **Job Accession:** when a non-employed individual (unemployed or inactive) gets a job. This is described by the hiring and job finding rates.
- **Job-to-Job Transitions:** when an employed worker changes jobs (employers), or changes formality status within the same job.
- **Separation:** when an employed worker exits his or her job. It is important to note that this includes voluntary (quits) and involuntary (job loss) exits, which will be discussed in detail below. Appendix 6 shows in detail how the gross flows and transition rates are formalized in equations.

3. General Macroeconomic Trends

Labor market stocks and aggregate indicators are fundamentally driven by flows between employment, unemployment and inactivity. This section discusses these flows and their evolution over time as well as the characteristics of individuals who are at risk of these transitions. The sample includes only male workers within the working age population (between 15 and 64 years of age). Female workers are excluded from the sample since transitions of female workers follow special patterns and are related to different factors such as marriage, child-birth and sector of employment.

[4] This is what is referred to in the literature as job creation rate (in this analysis it does not include unfilled vacancies, since estimates are obtained from individual workers' survey). This is usually calculated from individual firm level data. I therefore choose to call it hiring rate. It is also important to note that the job turnover by definition does not include job vacancies that remain unfilled, which explains why the ELMPS synthetic panel data set can be used to calculate the Egyptian job turnover.

3.1 Average gross flows and transition probabilities over the period 2002-2012

Figures 1 and 2 summarize the average annual gross worker flows for males between 15 and 64 years of age over the periods 2002-2006 and 2007-2012. It reports the total number of people that changed status in thousands (t) and as a percentage of the working age population (p) and as a transition rate out of the stock of employed workers (e).

Over the period 2002-2006, there was an average net increase of 400,000 in employment every year whilst over 2007-2012 the increase was 300,000. Of course substantial gross flows hide behind these values. An annual average of 190,000 male workers moved out of employment over the period 2000-2006, approximately 80% of whom moved into inactivity. Over the period 2007-2012, some 290,000 workers per year moved out of employment, about 70% out of whom moved to inactivity. Over 2000-2006, 590,000 male workers moved into employment and over 2007-2012, it was 550,000. The majority of people transiting from non-employment to employment, over both periods, were entrants from inactivity, being 78% over 2002-2006 and 72% over 2007-2012. In general, the percentage of the working age population moving out of employment into unemployment has almost doubled between the two periods and increased slightly for employment-to-inactivity moves. Hiring from inactivity (which is most likely new labor market entrants) slows down and remains the same from workers entering the employed pool from unemployment. The flows in 1 also show very low transitions between unemployment and inactivity, which is normal since usually the frontiers between unemployment and inactivity are not perfectly defined.

It is worth noting here that the values reported in this paper maybe inappropriate in cases of cross-country comparisons due to the existence of multiple transitions. To avoid people reporting summer internships and very short-term type of jobs, the ELMPS 2012 questionnaire is only designed to capture a job status that has lasted for at least 6 months. Now, suppose someone is unemployed in the first month, then moves to inactivity in the second, and then back to unemployment. While a monthly survey (as in the case of many developed countries' labor market data) would pick up all transitions, the semi-annual synthetic panel would not detect any. It is possible to overcome the problem of multiple transitions by correcting for time aggregation (as in Shimer 2012). For this to hold true, one has to assume that the conditional probabilities are equal across monthly transitions that generate the observed semi-annual probabilities. For the scope of this paper, knowing the nature and rigidity of the Egyptian labor market, capturing transitions from semi-annual synthetic panel data sets is considered sufficient. However, it is important to recall at this stage that final conclusions about the rigidity of the Egyptian labor market need further investigations[5] mainly due to recall error[6] and other data problems that were discussed in the previous section.

3.2 Evolution of labor market flows & business cycles

Figure 3 shows the evolution of hiring, separation and job-to-job transition rates over the period 1998-2011 in Egypt for both male and female workers. The figure also includes jobs created, jobs lost, and the GDP growth rate over time. The trend of the aggregate job flows is relatively stable within the sample over time. However, for male workers, there appears an inflection point at the year 2009, i.e after the financial crisis for both hiring and separation rates. The turning point happens earlier for the job-to-job transition rates. For female workers, the trends of these job flows remain stable over time. It is logical that female workers have higher separation rates than their male peers, since they tend to move out of employment for

[5] For further research and data treatment for the Egyptian labor market panel data sets, see Langot & Yassine (2014) and Yassine (2013).

[6] Recall error is a major problem of retrospective data that almost all literature refers to and continuously attempts to find solutions to.

personal reasons such as marriage and child-birth. This is why most labor market transitions analyses exclude female workers from their samples, which is the method adopted in this paper. It is worth noting here, that since female workers stay for a much shorter period in the labor market, they experience much higher hiring rates, otherwise the stock of female employment would not have been maintained in the economy. However, this does not mean that females are more likely to get hired, it simply shows the rate at which female employment expands with respect to already existing jobs occupied by female workers. As a matter of fact, when comparing the female and male workers' job finding rates (i.e. the probability that a non-employed worker finds a job) over time in figure 4, it is quite obvious that the probability of finding a job for a non-employed female worker is much lower than a non-employed male worker. It is true that this can partially be explained by employers preferring to hire male workers than female workers. Yet, it can also be explained by female job-seekers being more selective about what jobs they will take. Moreover, since female workers tend to stay for a shorter period in the labor market, they tend not to move much between jobs and therefore they have lower job-to-job transition rates (figure3).

When limiting the age to 20-49 years old, the above trends are more or less the same for both male and female workers. The increase in separation rates starting the year 2009 is clearly shown in figure 5, showing a one percentage point jump between the year 2010 and 2011 i.e. after the 25th of January uprising. Throughout the rest of the paper , the analysis tries to investigate and characterizes this observation; this increase in separation rates seems to be logical knowing the precariousness of the Egyptian labor market after the January 2011 uprising. Yet, doing the same exercise using the ELMPS 2006 dataset, the same jump in separation rates was observed in figure 6 between 2004 & 2005 aggregates, which suggests an underestimation of the job transitions using retrospective data. This bias might originate from the potential errors discussed in the data section, namely recall bias as well as "present" mis-reporting bias. The comparison between the retrospective data and panel data would therefore require further investigation in a separate research paper.

It is intuitive and very likely that when reporting their job market histories, individuals would not recall all (sometimes any of) their unemployment spells, especially the short ones. Consequently estimates of the separation rates over previous years are likely to be underestimated. Still, even after the substantial increase observed between 2010 and 2011, separation rates remain at an extremely low level. This reflects the rigidity of the Egyptian labor market, where once an individual finds a job, he rarely quits or loses that job before retirement. It is striking how the Egyptian transition rates persist at a very low level when compared to other countries, even those known for the rigidity of their labor markets and high employment protection regimes. For instance, using the French LFS, Hairault et al. (2012) obtained a corrected monthly French separation probability of 1.2% which is 14.4% yearly. Gomes (2012) estimated a quarterly average rate of about 3.2% of separations in the UK, which is 12.8% yearly. In Peru, Herrera and Rosas Shady (2003) estimated the separation rate of men between 1997 and 1998 of about 12.5% in the urban areas and 4.2% in the rural areas.

Since recall error is expected among unemployment spells, these transitions might be observed in the panel as a job-to-job movement and not necessarily an employment to non-employment transitions. As observed in figure 5, job-to-job transition rates are also very low relative to the economy's employment and non-employment stocks; these transition rates reach a maximum of 5.5% over the past decade.

In figure 5, a slight increase in the trend of job switches over the period 1998-2011 is noted, with a substantial increase of 2 percentage points between the years 2007-2009 suggesting that the market was becoming more dynamic over that period, then a retreat between 2009-2011. It is shown however in the next section that most of these job-to-job transitions tend to

occur within the informal sector, which can simply be explained by the fact that these workers cannot afford being unemployed and hence move from one informal job to the other, until they are able to find a formal private or public sector job, if ever. For the decrease in job switches between 2009-2011, this might be a reaction to the financial crisis and the 25th of January uprising. People would not change jobs in times of recession when labor market tightness is usually at its maximum.

Job accession and separation rates are equally important determinants of unemployment fluctuations; it is therefore necessary to analyze the trend of each separately. Figure 7 shows the employment inflows, specifically hiring and job finding rates from inactivity and unemployment, for male workers between 20 and 49 years of age, over 2000-2011. As explained earlier, when referring to hiring rates, the reference stock is the stock of employed in year $t-1$ while the job finding rates are based on the unemployed and/or inactive stock in the year $t-1$. In figure 7a, the unemployment to employment hiring rate is flat over time, while the inactivity to employment hiring rate has a decreasing trend parallel to the declining working age population growth. This shows that the general declining trend in the expansion of employment has been tracking the decline in the growth of the working age population, as the youth bulge moves forward over time and gradually gets absorbed in the Egyptian labor market. However, as the non-employment to employment finding rates are plotted in figure 7b, it is noted that they decline at a much faster rate than the hiring and working age population growth rates. The probability for a non-employed individual to find a job decreases substantially over time especially among the new labor entrants, as shown by the decreasing inactivity to employment finding rates. The situation gets even worse with the financial crisis and the January 2011 uprising after which the inactivity to employment finding rate dropped by about 10 percentage points from 25% to 15%. This drop suggests that new entrants are taking longer to find jobs after January 2011. Consequently, in 2011, an inactive person (most probably a new entrant) has an annual probability of 15% to find a job, while an unemployed person has an annual probability of 30%. These estimates therefore suggest that it would take an inactive person up to 6 years to find his next job while an unemployed would stay up to 3 years. Comparing these values to other countries the Egyptian labor market has a problem in the job finding process. Even among existing jobs (whether old or newly created), there are obstacles on both the labor demand and supply sides to becoming matched. According to Hairault et al. (2012), the average monthly French job finding probability amounts to 7.5% (90% yearly), corresponding to an unemployment spell of 13.4 months (approximately 1 year).

Turning now to the employment outflows in figure 8, the period 2000-2011 has been dominated by two main trends for both employment to unemployment and employment to inactivity transition rates. Between 2000-2009, the employment to unemployment separation rate follows a slightly increasing trend, while the employment to inactivity rate declines from about 0.6% to 0.3%. This further analysis of employment outflows has revealed that the separation rates, both employment to unemployment and employment to inactivity, experienced a huge increase after 2009 of almost 0.8 (to unemployment) and 0.5 percentage points (to inactivity).

It is important to note however that the separation rates remain at relatively low levels with respect to the persistent high non-employment stock in the economy. The detection of this inflection point therefore seems to be partly explained by a reaction to the slowdown of economic growth following the financial crisis in 2008 and the January 2011 uprising more than a movement towards a more dynamic labor market. This is consistent with the evidence explained in figure 18, where an increase in the proportion of involuntary quits is observed. Yet, part of this increase is explained by the what have been earlier referred to as recall and "present" mis-reporting biases.

In order to study further the impact of job flows on unemployment fluctuations, I briefly discuss the decomposition of unemployment in Egypt over the period 2000-2011 into its basic structural, cyclical and frictional components. The paper distinguishes between the three types of unemployment:

- ***Structural unemployment***: unemployment due to a mismatch between labor supply and labor demand. The unemployed lack the skills needed for jobs, or they may not live in the part of the country or world where jobs are available. This can also occur with a technical change, the extinction of a certain industry or the growth of other industries, due to demographic pressures such as Egypt's youth bulge, or due to high expectations among the unemployed.
- ***Frictional unemployment***: unemployment that occurs because of people moving or changing occupations. It is the time period when a worker is transitioning from one job to the other, also known as "search unemployment".
- ***Cyclical unemployment***: unemployment due to business cycle fluctuations in output (GDP), i.e. the normal up and down movements in the economy as it cycles through booms and recessions over time.

In an economy, the rate of unemployment to which the economy naturally gravitates in the long run is known as the natural rate of unemployment. This rate of unemployment is determined by looking at the rate at which people are finding jobs, compared with the separation rate, and not the size of the population or the economy. In any given period, people are either employed or unemployed. As a result, the sum of structural and frictional unemployment [7] is referred to as the natural rate of unemployment also called the "full employment" unemployment rate. This is the average level of unemployment that is expected to prevail in an economy in the absence of cyclical unemployment. With s being the separation rate and f being the job finding rate, the natural unemployment rate can be expressed as follows;

$$\underbrace{\frac{U}{L}}_{UnemploymentRate} = \frac{s}{s+f} \qquad (5)$$

A healthy dynamic labor market is one with high separation as well as high job finding rates, keeping the natural unemployment rate at its minimum, which underlines the urgent need to understand job flows within the Egyptian labor market, where research has focused on stocks and forgotten about flows—the main determinant that drives persistent high unemployment rates.

Starting 2009, evidence of increasing trends of cyclical unemployment is observed. With the rising separation rates following the financial crisis and the 25th of January uprising, cyclical unemployment has increased. This rise in the separation rates was not offset by the job finding rates. On the contrary, job finding experienced a decline showing that the Egyptian labor market remains rigid in terms of transitions and is not growing dynamic by any means. In such times of crises, unemployment is high because of two factors; jobs are hard to find and also those who were employed are entering the stock of non-employed through the elevated separation rates. Over the past several years the increase in the unemployment rate was very small because the cyclical increase was offset by the absorption of the youth bulge in the Egyptian labor market over time. Decreased demographic pressures have eased the situation in the market. The unemployment driven by the structural component was actually

[7] Frictional unemployment occurs naturally in any economy. People have to search to find an employer who needs their specific skills. Finding the right employee-employer match takes time and energy. Individuals have to look for the right job, and firms have to screen individuals for the right qualifications. This takes some time. Therefore, there will always be some level of unemployment in the healthiest of economies.

decreasing (Assaad and Krafft 2013). This should be a source of worry, since in the near future, the echo of the youth bulge will enter the labor market causing extra pressure and a rising structural unemployment trend worsening the situation and causing the rate of unemployment to increase substantially. In the long run, one would expect a substantial increase in the prevailing Egyptian unemployment rate as job finding probability of the non-employed continues to fall, separation rates continue to rise along with the increasing demographic pressures resulting from the echo of the youth bulge.

Moreover, as one analyzes the Egyptian labor market flows over time, it is observed that the cyclical component of unemployment in Egypt is almost nil. The Egyptian job finding and separation rates, and consequently the unemployment rate hardly respond to the macroeconomic business cycles. They actually sometimes fluctuate in paradoxical directions, where for instance the job finding rate would decline as the GDP growth rate increased, when one would actually expect it to rise. This phenomenon definitely requires further research and investigation, taking into consideration the peculiar characteristics of the Egyptian labor market such as the existence of a large informal sector. The cyclical behaviour of labor flows seems to have only changed in recent years as a response to the 2011 uprising. The availability of only one year of data after the January 2011 does not however make it possible to confirm such a trend.

4. Characterizing Labor Market Flows

In this section, the aim is to characterize the job flows observed above, specifically job accession, separation and mobility. With a focus on the observed transitions out of employment after 2009, after the financial crisis and January 2011 uprising, the analysis illustrates the individuals' and firms' characteristics that tend to affect the likelihood of staying in, leaving/quitting or switching jobs. It is important to note at this point that when analyzing a job quit/leave or a job-to-job switch, the characteristics of the job before the change occurs (the characteristics of the origin job status) are explored. When discussing a job accession, the characteristics of the new job created after transition (the destination job status) are analyzed.

4.1 Characteristics of the Egyptian job flows

Figure 9 shows the evolution of the mean age of male workers in each type of transition over the past ten years. In general, entrants to the labor market from inactivity are younger than those entering from the unemployment stock. This verifies the fact that these represent the new labor market entrants, who are accessing jobs for the first time in their labor market history. Workers moving out of employment to an unemployment spell are on average younger than those transiting from employment to inactivity. Workers moving from one job to the other are in general of a relatively young age (compared to the mean age of the sample), showing that all the churning seems to occur among young workers and as one grows older, logically he gets more and more stabilized in his job.

Categorizing separation rates by education level, figure 10 illustrates monotonic trends for all three education levels, similar to the general trend explained in the previous section. The observed increase in the separation rate between the year 2010 and 2011 exists among the three education groups (below secondary, secondary and above and university and above), but is amplified among workers with secondary and above education levels. This group includes workers with vocational secondary education, who are more likely to be present in small informal firms. It is shown below that workers within informal employment experienced a large increase in separation rates of about two percentage points between the years 2010 and 2011. The most educated group of workers hardly quit or lose their jobs. Their separation rates are the lowest (sometimes almost nil) except for the rise observed starting 2009. For the labor market entrants, education seems to play an important role over the observed period.

Observing the trends for the job finding probability of a non-employed person, it is the most difficult for a below secondary educated person to find a job. It is also slightly less or almost similarly difficult for a university (or above) graduate to find a job. In other words, it takes a longer time for the most educated university and above non-employed individuals to find a job than their secondary and above peers. It is interesting to note however, that the university and above educated group appear to be the least affected by the drop in the job finding rates observed after the financial crisis and the January 2011 uprising. As for the transitions from one job to the other, the least educated group seems to be the most stable. These workers are more likely to be poor. They cannot afford to be unemployed and since their job finding probability from unemployment is low, they will not search (on-the-job search) unless they are forced to leave their job.

To examine dynamics by the type and sector of employment, figures 11-14 show that non-wage workers experience very little changes over time of extremely low transition rates (accession, separation and mobility). All the observed churning seems to occur among the wage workers whether discussing job accession, separation or mobility. Moreover as public and private wage employment are distinguished, one notes that separation and job-to-job transitions are extremely low for the public sector. Wage workers who are losing their jobs or moving from one job to the other are mainly those employed in the informal and formal private sector. It is important to note however that informal private wage workers have the highest job-to-job transition rates. The sharp increase in separations was exclusively limited to the private sector wage workers. Both formal and informal private wage workers experienced an increase in separations, of about two percentage points each. Obviously both formal and informal employers resorted to large-scale layoffs during the crises of 2009 and 2011, in addition to hours or wages reductions. Figure 11 also shows that between 2010 and 2011, the job finding rates declined from 6% to 3% in the formal private wage employment and from 12% to 11% in the informal private wage employment. Interestingly, figure 12 illustrates a remarkable slowdown in the expansion of the formal private jobs, demonstrated by a decrease in the hiring rate from 4% to 2% (two percentage points of formal private wage employment).

Figure 15 highlights the distribution of wage workers who quit or lose their jobs over time. The pattern in general confirms that the majority of workers losing or quitting their jobs are originally wage workers in the informal sector. The most noticeable though is the slightly increasing trend in the share of formal wage employment over the past decade, especially in the most recent years. This mirrors the increase in separation rates among formal private wage workers observed above in figure 13. Strikingly, this increase is mapped by a decrease in the share of informal wage workers out of establishment over time, which suggests that there might have been a slight adjustment to shock (financial crisis and January 2011) taking place within the formal wage employment sector.

As observed based on the job-to-job transitions in figure 16, the increasing trend of transitions over time is driven primarily by informal workers. The distribution of workers who switch to new jobs over the period 2000-2011 by formality and in/out of establishment (for their job destination) in figure 17 shows that on average only about 40% of wage workers transiting from previous jobs (whether formal or informal) move to formal jobs afterwards. The remaining 60% are distributed between workers who find jobs in the informal wage work sector inside and outside establishments. Over the period 2007-2011, there has been a decline in transitions to formal jobs while the share of workers moving into informal wage work (within establishments) has been increasing. To summarize, the Egyptian labor market is not only characterized by very low job-to-job transition rates. If these transitions do take place, they occur among workers who have a low “reservation” package or low expectations (reservation offer including the wage level, work conditions, job quality, formality, productivity, skills level required...). These workers do get affected by the slowdown in

economic growth but since they cannot afford to stay unemployed, they would rather move to and accept informal jobs. This also explains the small increase noted in the unemployment rates in recent years even though one would have expected a large increase in these rates after the financial crisis and the January 2011 uprising.

Having discussed the age, education and sector of employment of wage workers transiting from one state or job to another, it is crucial at this point to explore the reason of transition for these workers. In figure 18, the evolution of the share of voluntary and involuntary movers is plotted. An involuntary leave or job switch is one which was out of the worker's hands and where he was forced to transit to another state or job.

In general, job quits and job-to-job transitions have been mainly driven over the past decade by the worker's will and desire. In the year 2005, 90% of male workers who moved out of employment were quitting their jobs voluntarily, and 85% were willingly switching to another job. Unsurprisingly, the share of involuntary leaves increased over the period 2009-2012. These were mainly workers who reported that their contracts were ended and not renewed by the employer. This provides additional evidence that the increase in separations in figure 8 was a reaction to the economic downturn, and not purely an artificial increase due to recall and misreporting problems. Trends in involuntary job switches have remained stable with a slight increase between the years 2010 and 2011. This increase was mainly due to workers who searched for other jobs because they were terminated by their employers or were working in a project that got suspended.

4.2 Labor market trajectories of Egyptian workers

The previous sections showed and characterized the extent of rigidity in the Egyptian labor market. That having been established, it is crucial to explore at this stage the trajectory of an employed worker within such a context and whether patterns have changed over time. For this purpose, two groups of employed male workers between 20 and 49 years of age are sampled, one in 2002 and the other in 2006. Each group is then followed over the following period of 6 years and categorize who among these workers stayed in their jobs, who moved out to non-employment and who transitted to another job. These workers are also classified by their sector of employment, namely public wage employment, private wage employment and non-wage workers (employers, self-employed and unpaid family workers). Figure 19 shows the share of job stayers among the group of male workers who were employed in 2002 and 2006, over different time spans from each starting point. Not surprisingly, the most stable group of workers were the public wage workers followed by non-wage workers. By the end of a period of six years, only 10% of public wage workers and 15% of non-wage workers would have moved out whether to non-employment or to another job. When comparing the 2002 and 2006 patterns, there was not a change for these groups of people over time. However the group of private wage workers becomes slightly more mobile over time. By the end of the six year span from 2002, three quarters of these workers would still be in their jobs while by 2012 (six years from 2006), only two thirds would stay in the same job. The noticed change in pattern starts after the second year (2008), where the gradient of the curve becomes steeper for the 2006 group of workers, i.e. more workers are changing jobs. In general, these results show that even among the most mobile group of workers (i.e. private sector) and in periods of recessions (financial crisis and January 2011 uprising), only about a third would actually transit out of their job (whether to non-employment or job switch). This is consistent with estimates previously calculated by Yassine (2013) showing that in the Egyptian labor market, once a worker is hired, he can spend up to 25 years in that job. The lack of dynamics definitely hinders the levels of productivity and growth within the economy.

As for those workers who have not stayed in their jobs, it is noted in figure 20 that by six years after 2002 only about 2 percent of the least stable private wage workers would have

moved out to non-employment. Non-wage workers were the least susceptible to leave or lose their job. However, private sector and non-wage workers experienced a substantial change in patterns over the period 2006 and afterwards. Almost double the share of workers moving out of their jobs to non-employment, among both private wage workers and non-wage workers, is observed. Further research and investigation would be interesting at this point to study whether this has been a reaction to the economic slowdown the Egyptian labor market has experienced during the period after 2006 or the implementation of the 2004 labor law, which made it easier for firms to lay off workers (only private wage workers) (Langot and Yassine 2014).

Figures 21 and 22 follow the samples of workers over time as they transit to other jobs within the same or a new sector of employment. Logically, public wage workers are unlikely to move to new employment sectors. There has been no observable change in the patterns for all three categories of workers except that the 2006 group seemed to have been slightly more dynamic within their same employment sector. Moving to a new job in another employment sector has become more difficult, especially for private wage workers after the financial crisis and January 2011 uprising, as expected.

5. Conclusion

The objective of this paper is to set out a number of stylized facts about Egyptian labor market flows over the past decade using the ELMPS dataset. Although it is descriptive by nature, the main contribution of this paper is to provide a summary of a wide range of information about the Egyptian labor market dynamics from several different angles. These facts are the first of this kind and may prove useful to researchers and policy-makers working on various aspects of the Egyptian labor market. Knowledge of those facts is crucial to be able to monitor business cycles, detect inflection points and assess labor market tightness (how labor demand and supply are balanced within the economy). It is important to ensure a healthy dynamic labor market where productive jobs are being created, existing jobs are getting more productive and less productive jobs are being destroyed. This is not happening at all in the Egyptian labor market where most of the churning is occurring in small informal sector jobs, job-to-job transitions are extremely low and when they occur it is because people are moving within or to the informal sector. The formal public and private sectors suffer from an extremely rigid environment where workers, once they access jobs in these sectors, would hardly ever leave or move to other jobs. In general, separation rates in Egypt are extremely low. Yet, there have been better responses to the economic slowdown from the private formal sector than from the public sector, especially after January 2011 uprising. Overall, the sluggishness of the Egyptian labor market is hindering to a large extent the productivity levels and growth within the economy.

The main findings of this paper confirm the fact that unemployment in Egypt tends to be dominated by structural rather than cyclical and frictional components. However, there appears some evidence of an increasing role of cyclical unemployment in the Egyptian labor market starting in 2009, as a reaction to the financial crisis as well as the January 2011 uprising. In general, the Egyptian labor market suffers from low job accession, separation and mobility rates relative to stocks of employment and unemployment. The paper notes a declining trend in hiring rates, which mirrors the falling trend in the working age population growth rate, showing that the youth bulge was successfully absorbed in the Egyptian labor market over the past decade. However, it became more difficult for a non-employed individual to find jobs during the period after the financial crisis and the January 2011 uprising. Rates of workers quitting their jobs or getting laid off remain at a low level even after an apparent increase, after 2009. Indeed, the results suggest that separation rates reach their highest levels in 2011, however this highest rate is only 2% of the total employment. The analysis shows that the share of involuntary job loss has increased over the period 2009-2011.

This suggests that these trends reflect the response of the Egyptian labor market to the financial crisis and the January 2011 uprising rather than a more dynamic labor market. However, one cannot confirm this conclusion given potential recall errors. Further research might be required given that only a short period after the turning point is observed. The analysis also shows evidence of increasing job-to-job transition rates, even before the uprising, especially among informal workers. In general, the formal sector remains rigid although evidence of better responses to the economic slowdown from the private formal sector, than from the public sector, has been documented.

The overall picture suggests that the Egyptian labor market should be a source of worry. Future unemployment rates are expected to be substantially higher due to the the increasing separations and declining job finding, as well as higher demographic pressures resulting from the echo of the youth bulge.

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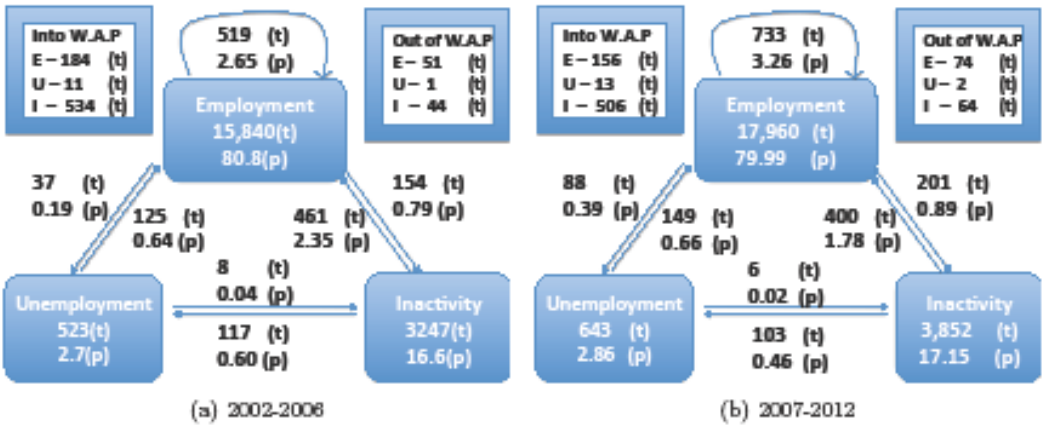
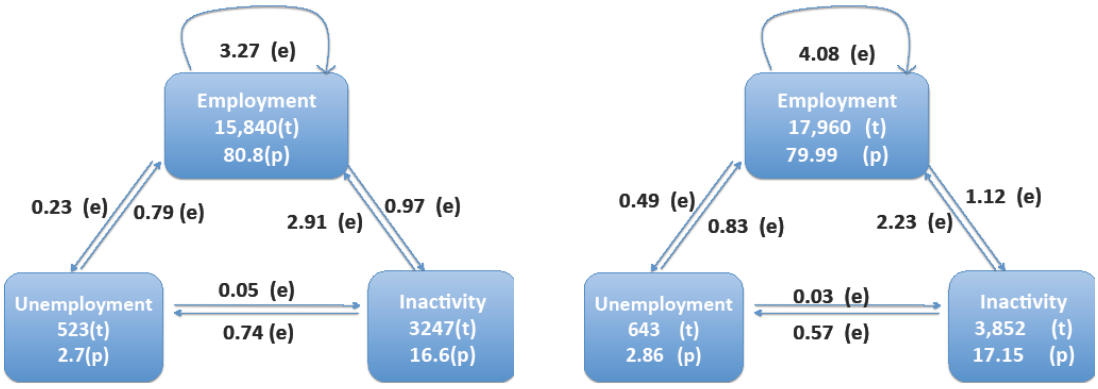
Figure 1: Average Annual Gross Flows for Male Workers between 15 & 64 Years of Age



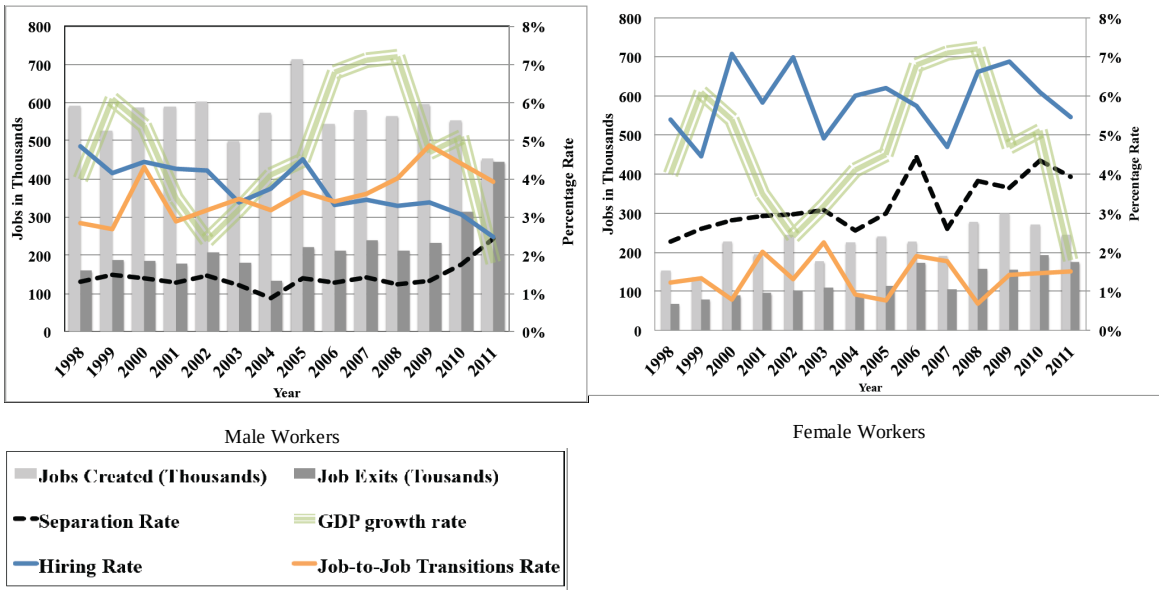
Notes: W.A.P: working age population; *p*: percentage of working age population; *t*: thousands.
Source: Author's own calculations using ELMPS12.

Figure 2: Average Annual Transition Rates (Out of Employment) for Male Workers between 15 & 64 Years of Age



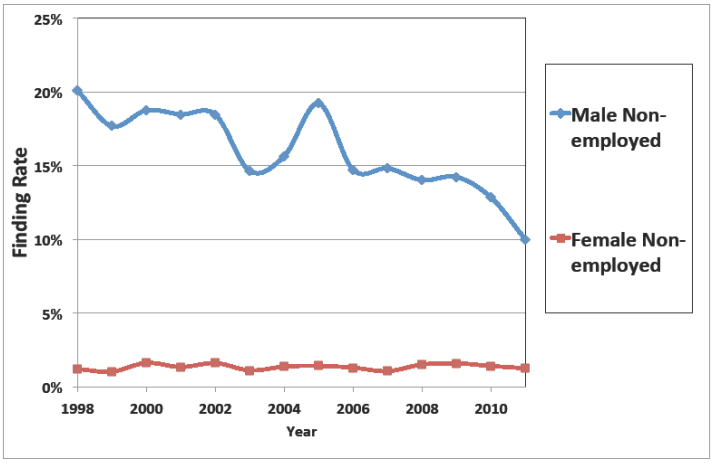
Notes: e : transition rate out of stock of employed; p : percentage of working age population; t : thousands.
Source: Author's own calculations using ELMPS12.

Figure 3: Evolution of Hiring, Separation and Job-To-Job Annual Transition Rates for Workers between 15 & 64 Years of Age, over the Period 1998-2011 in Egypt



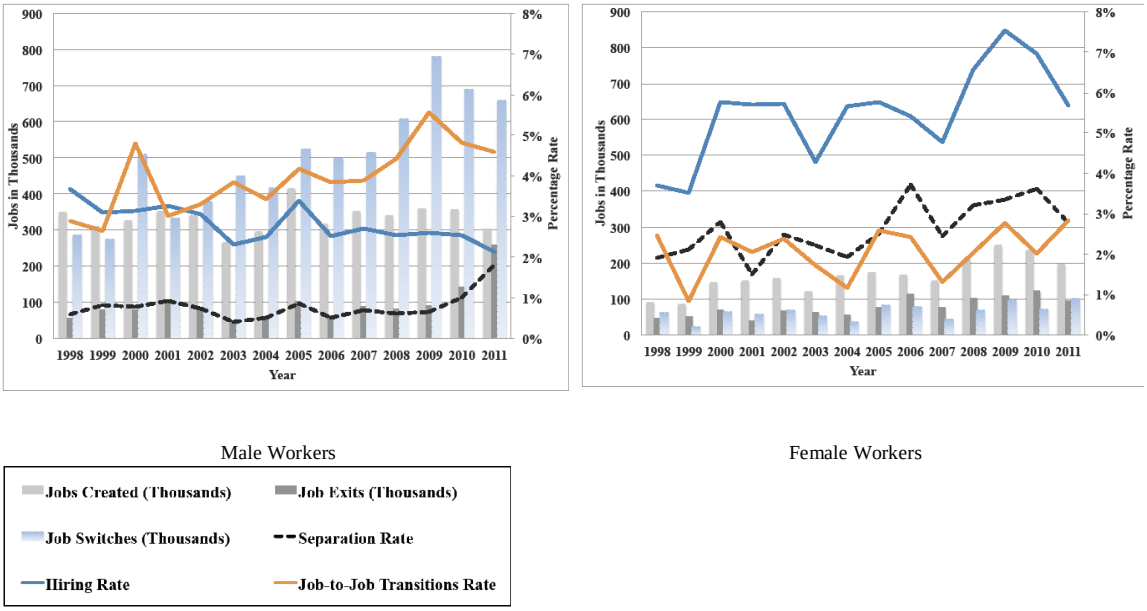
Source: Author's own calculations using ELMPS12.

Figure 4: Evolution of Annual Job Finding Rates for Male and Female Non-Employed Individuals between 15 & 64 Years of Age, over the Period 1998-2011 in Egypt



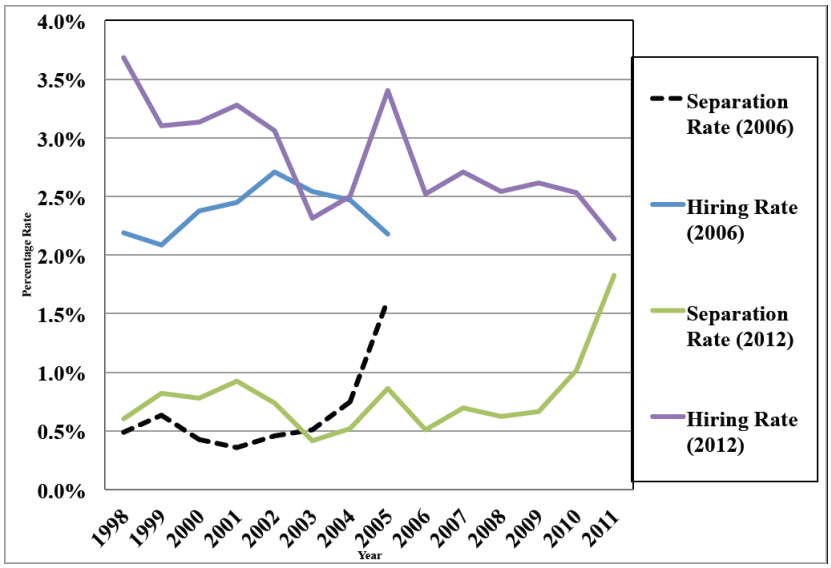
Source: Author's own calculations using ELMPS12.

Figure 5: Evolution of Job Finding, Separation and Job-To-Job Annual Transition Rates for Workers between the Age of 20 & 49 Years, over the Period 1998-2011 in Egypt



Source: Author's own calculations using ELMPS12.

Figure 6: Evolution of Job Finding and Separation (Annual) Rates for Workers between the Age of 20 & 49 Years, over the Period 1998-2011 in Egypt Using ELMPS 2006 and ELMPS 2012.

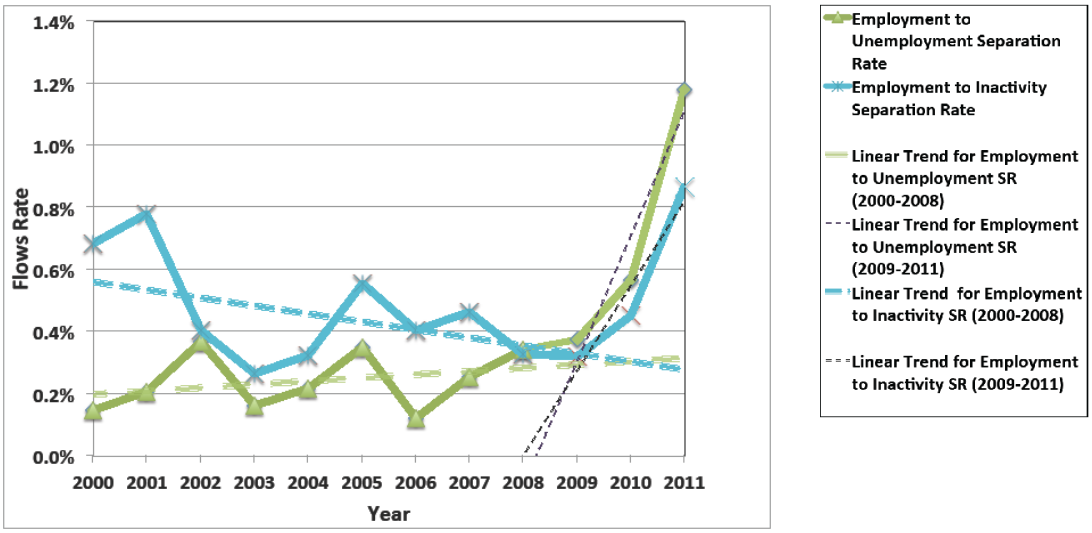


Source: Author's own calculations using ELMPS 06 and ELMPS 12.

Figure 7: Employment Inflows Annual Hiring and Job Finding Rates, Male Workers between 20 & 49 Years of Age, over the Period 2000-2011

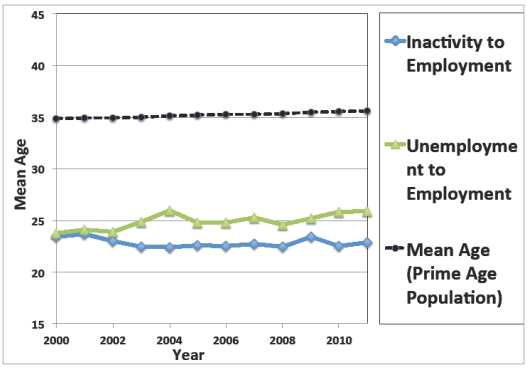
Source: Author's own calculations using ELMPS12.

Figure 8: Employment Outflows, Annual Separation Rates, Male Workers between 20 & 49 Years of Age

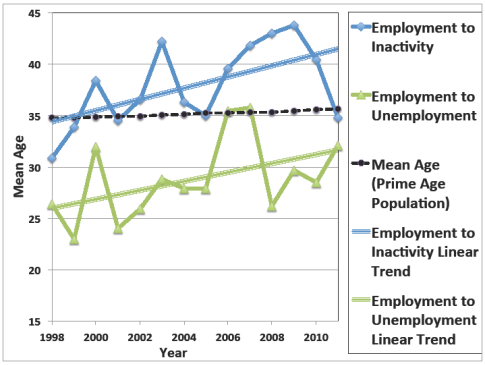


Source: Author's own calculations using ELMPS12.

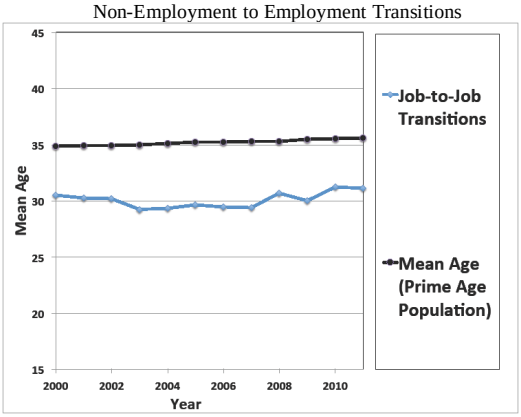
Figure 9: Evolution of the Mean Age of Male Workers Accessing Jobs, Quitting/Losing Jobs and Switching from Job to the Other, over the Period 2000-2011



Non-Employment to Employment Transitions



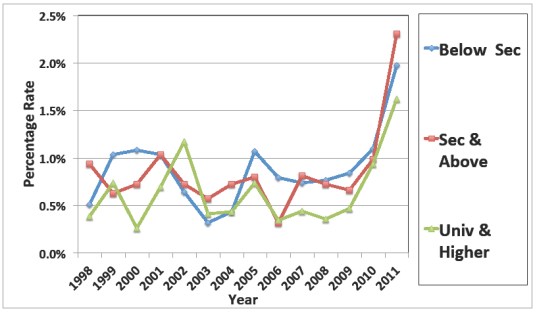
Employment to Non-employment Transitions



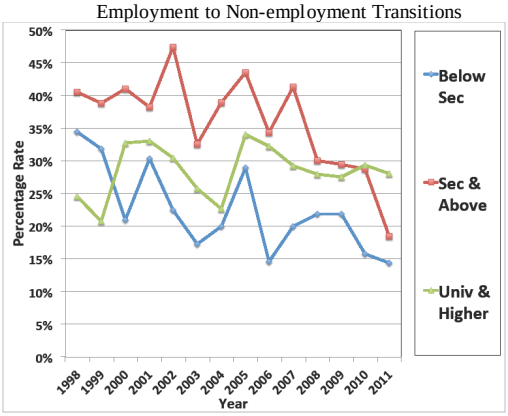
Job-to-Job Transitions

Source: Author's own calculations using ELMPS12.

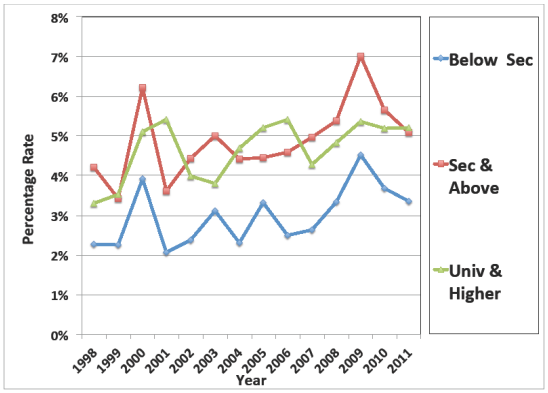
Figure 10: Evolution of Transition Rates for Male Workers, between 20 & 49 Years of Age, by Education Level



Employment to Non-employment Transitions



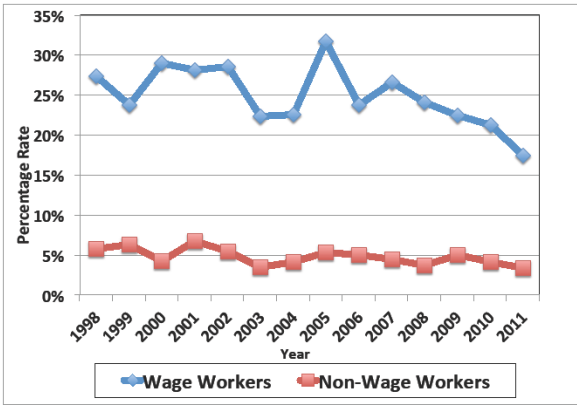
Non-Employment to Employment Transitions



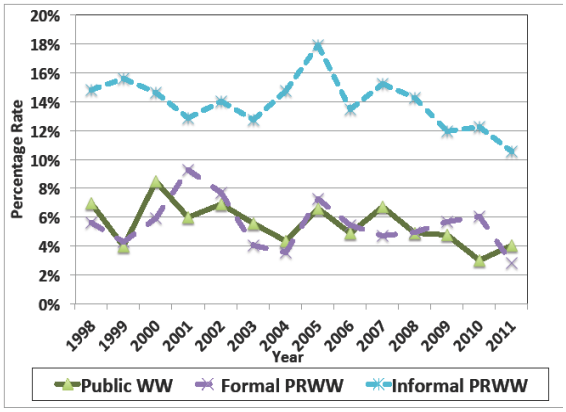
Job-to-Job Transitions

Source: Author's own calculations using ELMPS12.

Figure 11: Evolution of Job Finding Rates for Male Workers, between 20 & 49 Years of Age, by Type and Sector of Employment



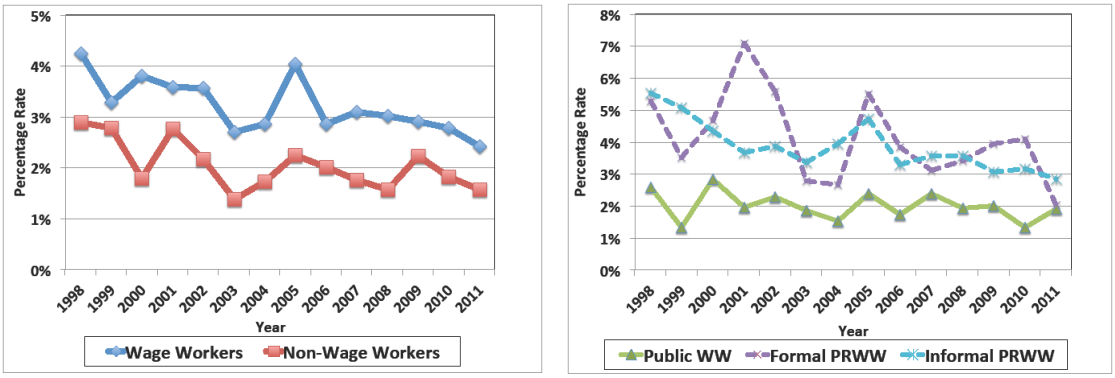
(a)



(b)

Source: Author's own calculations using ELMPS12.

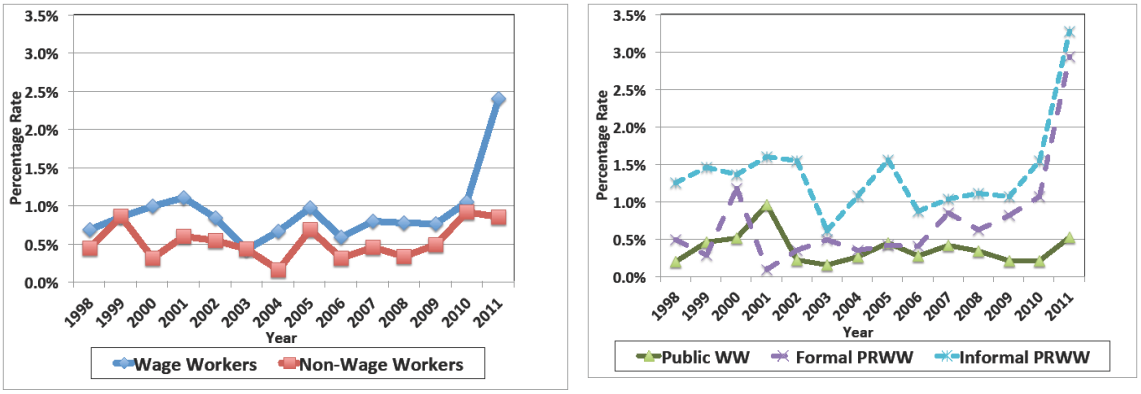
Figure 12: Evolution of Hiring Rates for Male Workers, between 20 & 49 Years of Age, by Type and Sector of Employment



(a) (b)

Source: Author's own calculations using ELMPS12.

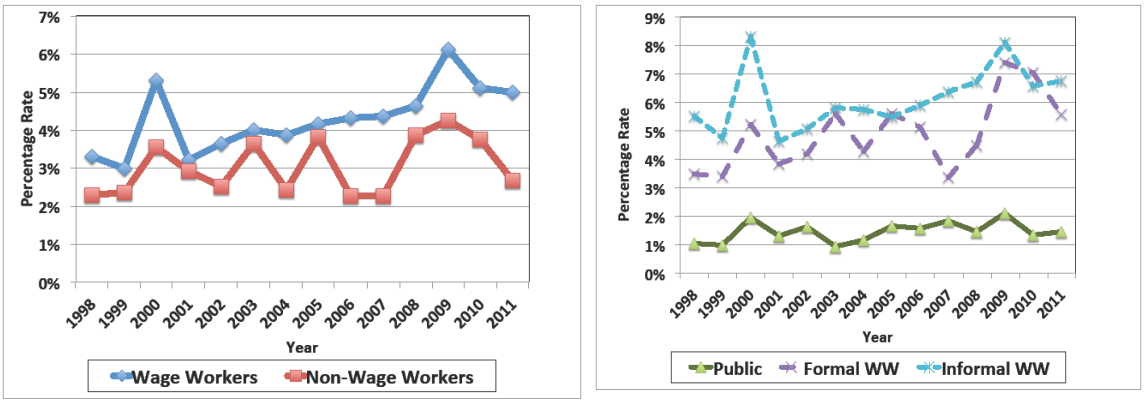
Figure 13: Evolution of Separation Rates for Male Workers, between 20 & 49 Years of Age, by Type and Sector of Employment



(a) (b)

Source: Author's own calculations using ELMPS12.

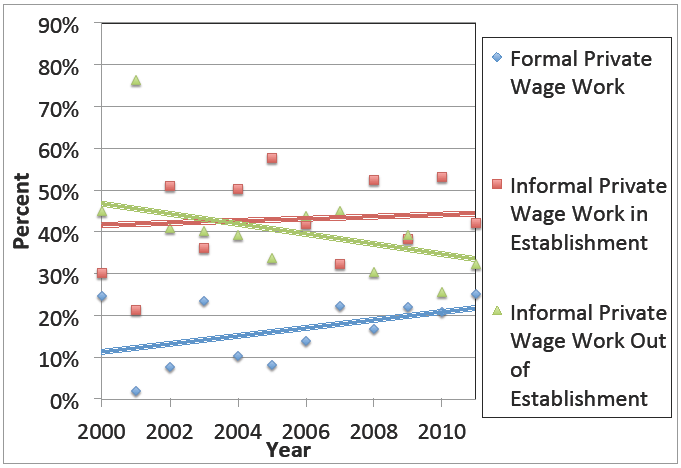
Figure 14: Evolution of Job-to-Job Transition Rates for Male Workers, between 20 & 49 Years of Age, by Type and Sector of Employment



(a) (b)

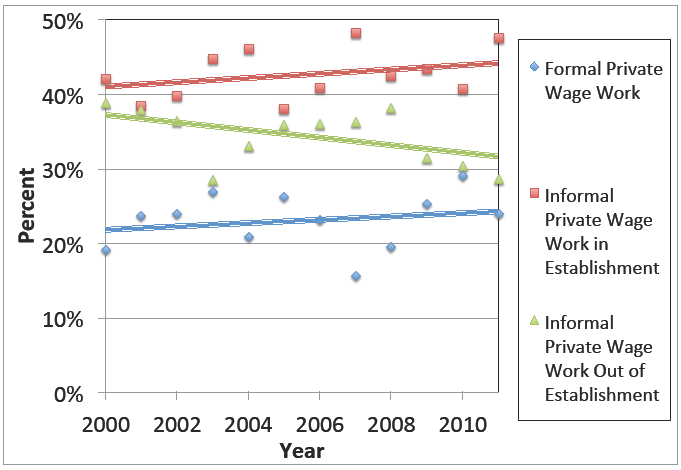
Source: Author's own calculations using ELMPS12.

Figure 15: Distribution of Private Wage Workers Who Quit/Lose Their Jobs over Time by Formality and In/Out of Establishment



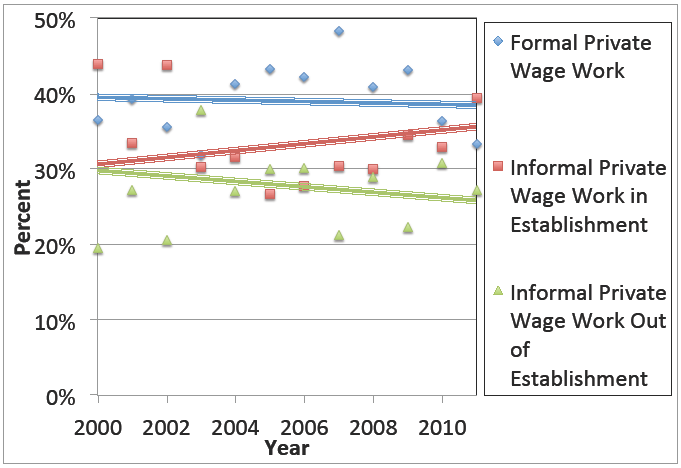
Source: Author's own calculations using ELMPS12.

Figure 16: Distribution of Private Wage Workers Who Move From One Job to Another (Job-to-Job Transition) over Time by Formality and In/Out of Establishment of the Source Job



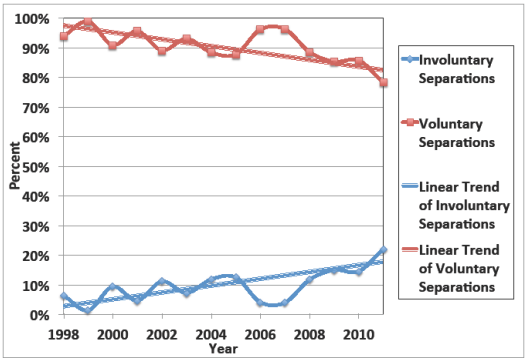
Source: Author's own calculations using ELMPS12.

Figure 17: Distribution of Private Wage Workers Who Move from One Job to Another (Job-To-Job Transition) by Formality and In/Out of Establishment of the Destination Job

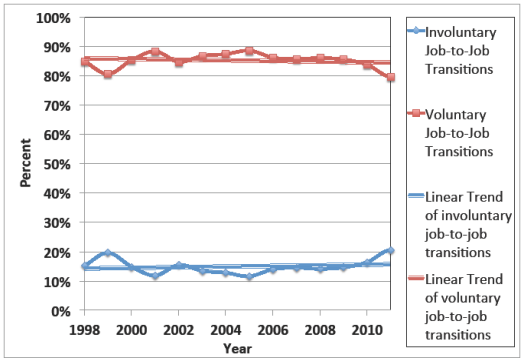


Source: Author's own calculations using ELMPS12.

Figure 18: Distribution of Employment to Non-Employment (Separations) and Job-to-Job Transitions over the Period 1998-2012 by Reason of Change



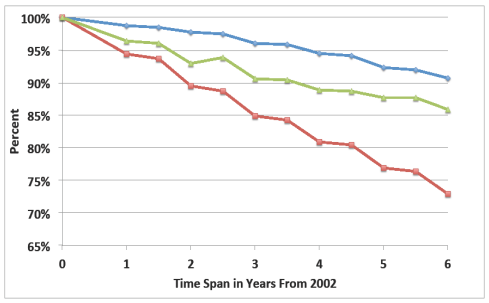
Employment to Non-employment Transitions

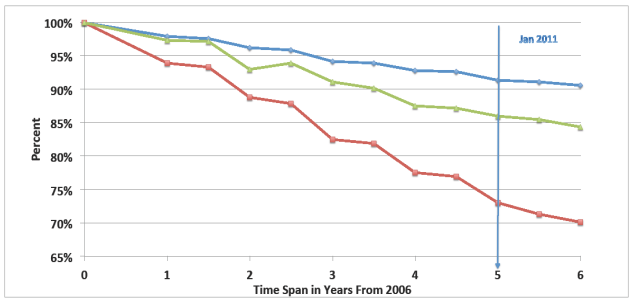


Job-to-Job Transitions

Source: Author's own calculations using ELMPS12.

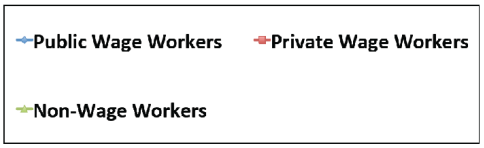
Figure 19: Evolution of the Share of Job Stayers Among Male Workers between 20 & 49 Years of Age, over Different Time Spans Starting 2002 and 2006, by Sector of Employment





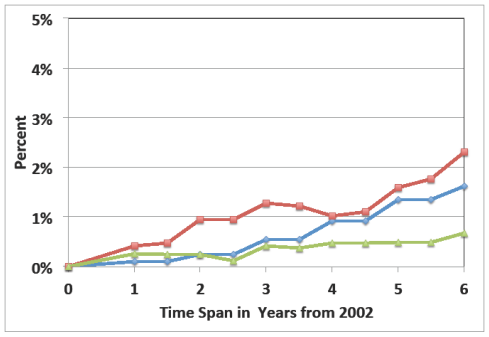
Following Male Workers between the Age of 20 & 49 years old in 2002

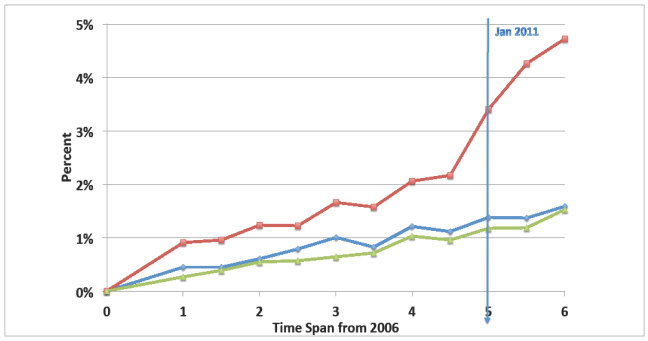
Following Male Workers between the Age of 20 & 49 years old in 2006



Source: Author's own calculations using ELMPS12.

Figure 20: Evolution of the Share of Job Leavers/Losers among Male Workers between 20 & 49 Years of Age, over Different Time Spans Starting 2002 and 2006, by Sector of Employment



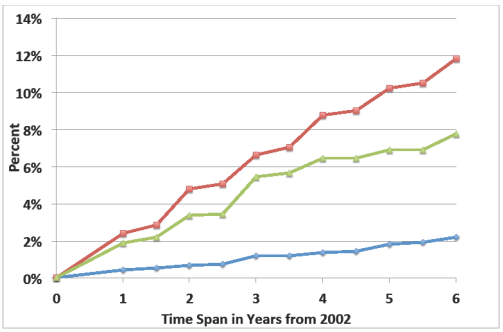


Following Male Workers between the Age of 20 & 49 years old in 2002

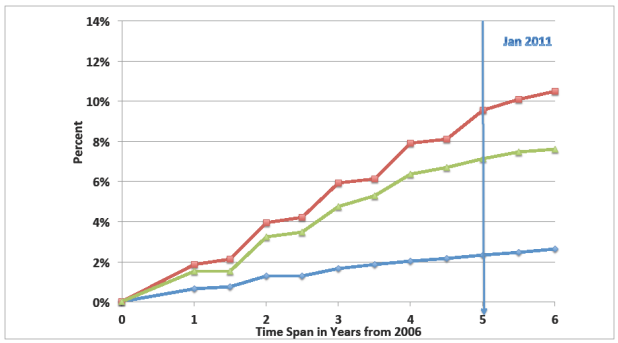
Following Male Workers between the Age of 20 & 49 years old in 2006

Source: Author's own calculations using ELMPS12.

Figure 21: Evolution of the Share of Job Movers into a New Sector of Employment among Male Workers between 20 And 49 Years of Age, over Different Time Spans Starting 2002 and 2006, by Sector of Employment



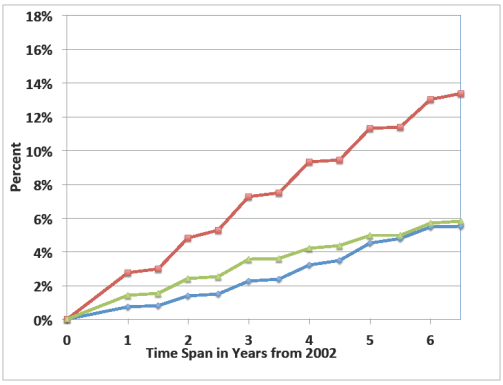
Following Male Workers between the Age of 20 & 49 years old in 2002



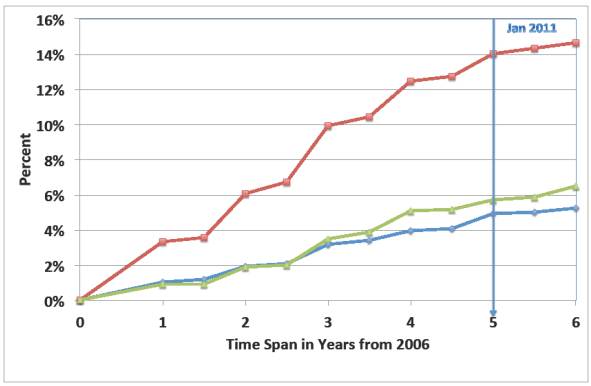
Following Male Workers between the Age of 20 & 49 years old in 2006

Source: Author's own calculations using ELMPS12.

Figure 22: Evolution of the Share of Job Movers within the Same Sector of Employment Among Male Workers between 20 &49 Years of Age, over Different Time Spans Starting 2002 and 2006, by Sector Of Employment



Following Male Workers between the Age of 20 & 49 years old in 2002



Following Male Workers between the Age of 20 & 49 years old in 2006

Source: Author's own calculations using ELMPS12.

Appendix

Gross Flows and Transition Rates

Both the gross flows and transition rates approaches can be formalized in equations as follows;

$$\frac{E_{t+1}-E_t}{W_t}=\frac{M_t^{UE}}{W_t}+\frac{M_t^{UI}}{W_t}-\frac{S_t^{EU}}{W_t}-\frac{S_t^{EI}}{W_t} \tag{6}$$

where as one normalizes by the total working age population, an equation, that focuses on the total gross flows as the determinant of changes in the employment rate, is obtained. An alternative method would be to write equation 3 in terms of hiring rates (h) and separation rates (s).

$$\frac{E_{t+1}}{E_t}-1=\frac{M_t^{UE}}{E_t}+\frac{M_t^{UI}}{E_t}-\frac{S_t^{EU}}{E_t}-\frac{S_t^{EI}}{E_t}$$

$$=h_t^{UE}+h_t^{UI}-s_t^{EU}-s_t^{EI} \tag{7}$$

Similarly, an examination of gross flows or transition rates can be done using the decomposition of changes in unemployment (equation 4). Again, it is possible to normalize by the total working-age population;

$$\frac{U_{t+1}-U_t}{W_t}=-\frac{M_t^{UE}}{W_t}+\frac{S_t^{EU}}{W_t}-\frac{G_t^{UI}}{W_t}+\frac{G_t^{IU}}{W_t} \tag{8}$$

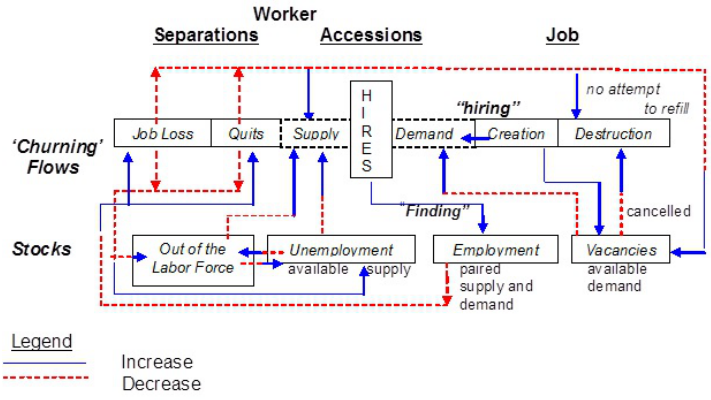
or write the unemployment decomposition equation in terms of job finding rate f and separation rates as follows;

$$\frac{U_{t+1}}{U_t}-1=-\frac{M_t^{UE}}{U_t}+\frac{S_t^{EU}}{U_t}-\frac{G_t^{UI}}{U_t}+\frac{G_t^{IU}}{U_t}$$

$$=-f_t^{UE}+s_t^{EU}\frac{E_t}{U_t}+\frac{G_t^{IU}-G_t^{UI}}{U_t} \tag{9}$$

Figure 23 summarizes the above combination of labor market stocks and flows, to simplify for the reader each of the concepts used in this paper.

Figure 23: A Simplified View of Labor Market Stocks and Flows



Note: Courtesy Stevens (2002).