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Labor Market Transitions in Egypt Post-Arab Spring

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Abstract

This paper examines the Arab Republic of Egypt's labor market transition dynamics post–Arab Spring based on the two most recent rounds of the Egypt Labor Market Panel Survey conducted in 2012 and 2018. In addition to providing disaggregated-level analysis by examining labor market transitions by gender, education, and age groups, the paper provides a cross-country, cross-regional perspective by comparing Egypt's labor market transitions with Mexico's, relying on data from the Encuesta Nacional de Ocupación y Empleo. To match the span of Mexico's transitions (which are measured over a one-year period) and Egypt's (which are measured over six years), the analysis uses Monte Carlo simulations of repeated discrete-time Markov chains. Based on these results, the Egyptian labor market appears to be highly rigid compared to the Mexican labor market, which instead shows a large degree of dynamism regardless of individual initial labor market states at baseline. Auxiliary regression analyses focusing on transitions to and from the dominant absorbing labor market states in Egypt —public sector employment for both genders, nonparticipation for women, and the informal sector for men—show that having a post-secondary education is associated with a lower probability of remaining out of the labor force for women who were already out of the labor force at baseline, while being married at baseline is found to be a significant predictor for women to stay out of the labor force if they were already so. Among men, the better educated are found to be more likely to secure formal employment, be it in the public or private sector, and are more likely to keep their public formal jobs once they secure them.

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Labor Market Transitions in Egypt Post-Arab Spring

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1. Introduction

With its rich history and large population, the Arab Republic of Egypt's economy plays a pivotal role in the Middle East and North Africa region. Unsurprisingly the functioning of Egypt's labor markets has garnered a lot of attention from academics and practitioners alike, especially since jobs creation for Egypt's young population is seen as a key element of economic development and social cohesion.

Important work has been done to understand the Egyptian labor market. Assaad (2002), Assaad (2009), Assaad and Krafft (2015) and Assaad and Krafft (2022) provide a characterization of the evolution of the Egyptian labor market focusing on the youth bulge in the 1990s, reforms and global slowdown in the 2000s, and political upheavals in the 2010s. This literature has highlighted key trends in Egypt's labor market including the long-term decline in female labor force participation combined with rising levels of education, the large gender gap in the unemployment rate, and the more recent decline in male labor force participation.

A complementary set of contributions has highlighted the lack of dynamism of Egypt's labor market (Amer 2015; Assaad 2014; Assaad and Krafft 2016; Hertog 2020; Yassine 2015). Both transitions between labor market states and between sectors are infrequent. Even job-to-job accession and separation are rare (Yassine 2015). Private sector workers rarely move to the public sector, and vice versa (Assaad 2014; Yassine 2013). Women persistently – and indeed increasingly – stay out of the labor force (Assaad et al. 2020; Krafft, Assaad and Keo 2019) and unemployed youths still struggle to find jobs after finishing school (Amer 2015; Assaad and Krafft 2016).

While these papers outline the key contexts in which labor market transitions occur, the literature examining the actual transitions is considerably sparser and tends to focus on specific groups or specific stages of the life cycle (an exception is the earlier contribution of Gatti et al, 2012). Yassine (2015) takes an aggregate view of labor market transitions in Egypt, computing flow rates that characterize the level of dynamism in the labor market, primarily with the 2012 round of the ELMPS. The paper also provides an excellent vantage point to view the extent of rigidity in Egypt's labor market relying on descriptive survival analyses over how long individuals would stay in one job. Meanwhile, Amer (2015) studies labor market insertion, focusing in particular on youth entering the labor market, and the time needed for insertion. Therefore, by construction Amer (2015) only studies transitions to the first job. The paper affirms Yassine's (2015) finding on rigidity and adds further insights from a gender perspective, highlighting that women who obtain a formal job upon entry into the labor market end up staying longer in the labor market as opposed to women who obtain other types of employment.

Building on the existing rich compendium of notable work examining the employment profile in Egypt and labor market transitions for specific groups, our paper contributes to the literature in at least two ways. First, our paper provides a detailed discussion of Egypt's labor market transition dynamics post-Arab Spring, focusing on the two most recent rounds of the Egypt Labor Market Panel Survey. Thanks to the panel structure of the data, we examine labor market transitions in Egypt between 2012 and 2018, tracking individual employment status and job trajectories between the two waves. While important work has been done to characterize the

evolution of the Egyptian labor market over the past years, the literature tends to address these questions from a cross-sectional perspective, thus falling short on tracking individual trajectories between survey rounds. Tansel and Ozdemir (2019) is the only paper thus far using transition matrices to study the labor market in Egypt, which provides us with a methodological guide, as well as an understanding of transitions from 2006 to 2012. This paper updates their work with more recent data from 2018 and provides further insights with more disaggregated analyses by education and age groups. Second, our paper provides a cross-country and cross-regional perspective on such transitions by comparing Mexico's labor market transitions with Egypt's. Such cross-country or cross-regional perspectives remain wanting in the existing literature, while they are of utmost importance to better understand the functioning of the Egyptian labor market and to assess its relative rigidity with respect to a relevant comparator country.

Our paper relies on the two most recent rounds of the Egypt Labor Market Panel Survey (ELMPS), conducted in 2012 and 2018, and the 2005 round of its Mexican counterpart, *Encuesta Nacional de Ocupación y Empleo* (ENOE). For an overview of the Egyptian labor market, we use cross-sectional data to summarize individuals' employment statuses and employment profiles across sectors in both years. To track individual transitions between the two rounds in Egypt, we take advantage of the panel structure of the ELMPS, as well as the detailed information on labor market status, employment, and individual characteristics. We also rely on the panel structure of ENOE to simulate labor market transitions in Mexico over the same time span. Relying on the Mexican data, we observe individual transitions over at most one year in Mexico. To compute transitions commensurable with those in Egypt, we simulate 6-yearly transitions in Mexico with Monte Carlo simulations of repeated discrete-time Markov chains. Next, this paper provides regression analysis of the potential determinants of labor market transitions in Egypt, with a focus on transitions to and from the dominant absorbing labor market states in Egypt for both women and men—public sector employment for both genders, non-participation for women, and informal sector employment for men.

The remainder of this paper is structured as follows. Section 2 describes the data we use for Egypt and Mexico, followed by Section 3 discussing the background and context of the Egyptian labor market. Section 4 describes the methodology employed to compute the transition matrices in Egypt and that to simulate their Mexican counterparts. Section 5 presents the results from Egypt's transition matrices, puts the Egyptian matrices in context by way of comparing with those of Mexico, and regression analysis output on the determinants of transitions in Egypt. Section 6 presents some concluding remarks.

2. Data

2.1 The Egypt Labor Market Panel Survey (ELMPS)

We use data from the ELMPS (Egypt) and ENOE (Mexico). The ELMPS is a nationally representative survey conducted by the Economic Research Forum (ERF) in collaboration with Egypt's Central Agency for Mobilization and Statistics (CAPMAS). In this paper, we rely on the

two most recent rounds of the ELMPS data conducted in 2012 and 2018 to characterize the Egyptian labor market post-Arab Spring. As in a typical labor market survey, the ELMPS covers topics such as employment, unemployment, job dynamics, and earnings. It also provides very rich information on education, household demographics, migration, and socio-economic characteristics.

We rely on the cross-sectional dimension of the ELMPS surveys in 2012 and 2018 and also exploit the panel dimension of the data when examining labor market transitions between 2012 and 2018. The 2018 survey tracks households and individuals who were previously interviewed in 2012 and also includes a refresher sample of 2,000 households. By design, the refresher sample oversampled rural communities that were among the "1,000 poorest villages" of Egypt (see Krafft, Assaad and Rahman (2019) for more information on the data and sample design).

In our analysis, we make use of the employment module of the ELMPS, which provides information on individual work status (employed, unemployed, or out of the labor force) and rely on the market definition of work status with reference one week. The market definition of employment considers as employed only individuals engaged in market economic activities, while it excludes individuals who engage in subsistence economic activities. Following the ILO, we also rely on a standard unemployment definition, which requires individuals to be actively searching for a job to be considered as unemployed. We also distinguish between employed individuals depending on their sector of employment (public versus private) and on the formality status. Therefore, we rely on the following tripartite classification: public formal, private formal, and private informal sectors. An individual is considered to be employed in the formal sector if the individual has a work contract and a social security for the primary job, while an individual is considered to be informally employed if the individual did not have a work contract, social security, or neither. Public sector jobs include the following: public and government, while private sector jobs include the following: private, investment, international, and other.

Whenever relying on the cross-sectional rounds of ELMPS, we focus on individuals aged between 20 and 59 years old in each round. On the other hand, when we rely on the panel dimension, we focus on those aged at least 20 in 2012 and at most 59 in 2018 (hence 53 in 2012) to account for aging between the two surveys. Table A.1 in the Appendix reports descriptive statistics on the sample of men and women as well as discussions on the sampling bias resulting from focusing on the panel sample. We contrast raw data from each round of the ELMPS survey against our cross-sectional and panel samples, to which the age restrictions described above are applied.

2.2 Encuesta Nacional de Ocupación y Empleo (ENOE)

The ENOE is Mexico's labor force survey, nationally representative of the population older than 14. As does the ELMPS, the ENOE also includes comparable labor market characteristics of labor market states and dynamics, as well as demographic information on age, gender, education, among others. Notably, the ENOE is conducted at a much higher frequency than the ELMPS. In each

round of ENOE, respondents are interviewed every quarter for a total of five quarters,[2] with a fifth of the sample being refreshed every quarter.

In line with Bobba, Flabbi, and Levy (2022), we rely on the 2005 round. This is due to two reasons: first, informality rates remained relatively stable over this time period and second, the institutional background was likewise stable, with no reform taking place in the period. Similar to our treatment of ELMPS, we restrict our sample in ENOE to individuals aged between 20 to 53 at the beginning of the survey whenever relying on the panel dimension of the data. As in the ELMPS, we choose not to impose restrictions on sector, rurality, work schedules or education levels to capture a more comprehensive picture of the two labor markets, and thus avoid overrepresenting certain sectors or labor market states over others.

The definitions of labor market states used in ENOE are consistent with those in ELMPS. Unemployment requires job search effort and absence of a job or market activity in a one-week reference period. Being out of the labor force requires an individual to not have conducted search in the reference week.[3] The ENOE contains a detailed discussion on the definition of formality and informality as part of its documentation,[4] consisting of 14 categories for the former and 9 for the latter. Similar to the ELMPS, all workers without social security benefits are classified as informal. One category that has been discussed at length is that of the self-employed. Both ENOE and ELMPS count them as part of the informal sector.

3. Employment Profiles in Egypt

We start by presenting the respective employment profiles for men and women in Figure 1. The vast majority of men are employed. While male unemployment remained roughly the same between 2012 and 2018, employment fell and the share of men who are out of the labor force (OLF) increased. Instead, in both rounds, around three-quarters of women (20-59 years) are out of the labor force, and only one-fifth of women are employed. Female employment remained constant between the two years, while the share of women being OLF increased and female unemployment declined. Labor market attachment decreased for both genders, with a corresponding decline in employment for men and in unemployment for women.

[2] Individuals are interviewed for four quarters in a given year and in the first quarter of the following year.
[3] Information on the definition of out of the labor force can be accessed through: https://en.www.inegi.org.mx/app/glosario/default.html?p=ENOE15
[4] Information on the definition of informality can be accessed through: https://en.www.inegi.org.mx/app/biblioteca/ficha.html?upc=702825060459

Figure 1: Employment status among those aged 20-59, by sex

Notes. The analysis relies on cross-sectional data from the Egypt Labor Market Panel Survey (ELMPS) in 2012 and 2018. This figure presents the employment status of individuals aged between 20 and 59 years old in each survey round. We rely on the market definition of work status, search required (reference 1 week). Expansion weights are used.

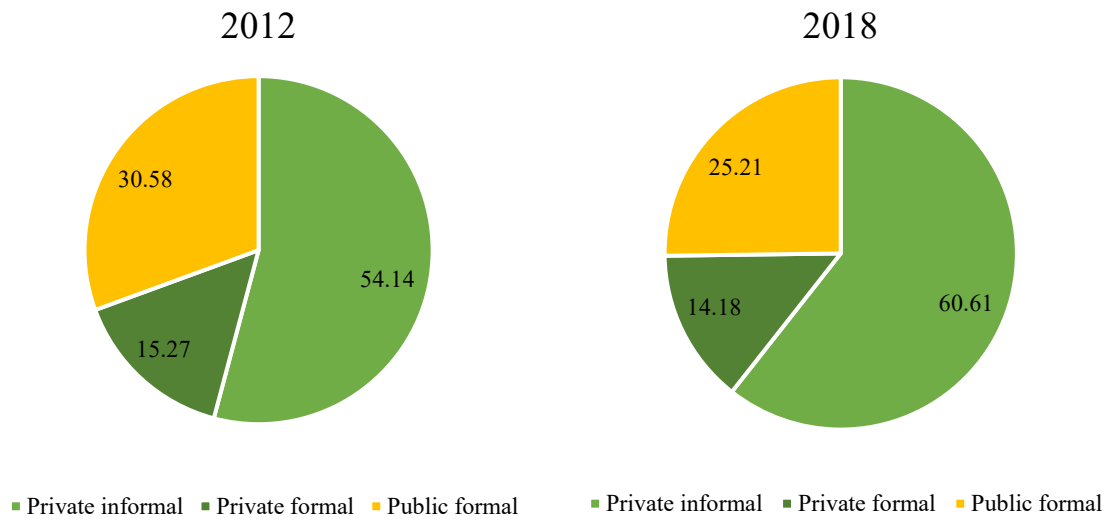
We now turn to the sectoral make-up of the Egyptian labor market. We adopt a tripartite classification of private informal, private formal, and public formal sectors. Egypt's large informal sector is similar in size to those of Mexico and Colombia, each having around 60% of workers employed informally.[5] However, Egypt had a substantially larger public sector, which accounted for over one-quarter of employment. Instead, in 2020, the public sector accounted for 13% of Mexico's employment[6] and just over 4%[7] of Colombia's. Other countries at similar level of GDP

[5] Lanau, S, Rodríguez-Delgado, D., and Toscani, F. 2018. 'Colombia Selected Issues'. IMF. p 17.
Gurría, Á. 2019. Presentation of the 2019 Economic Survey of Mexico. OECD.
[6] Source: ILO and Encuesta Nacional de Ocupación y Empleo. Data on the year of 2020. Retrieved Jan 2022.
[7] Source: ILO and Gran Encuesta Integrada de Hogares. Data on the year of 2020. Retrieved Jan 2022.

per capita, such as Indonesia and Malaysia, also had much smaller public sectors, accounting for 8% and 15% of total employment, respectively.[8]

The size of Egypt's public sector is more in line with other Arab states, where public sectors tend to account for between 20% to 30% of employment.[9] Figure 2 shows a breakdown of employment in Egypt. Most notable is the very large informal sector, which had grown over the six years, mostly at the expense of the public sector. Also notable is the small size of the private formal sector, approximately a quarter of the informal private sector.

Figure 2: Share of employment in Egypt by sector, 2012 and 2018



Notes. The analysis relies on cross-sectional data from the Egypt Labor Market Panel Survey (ELMPS) in 2012 and 2018. The analysis is restricted to individuals aged between 20 and 59 years old in each survey round. A job is defined as being formal if the individual had both a work contract and social security in the primary job. A job is defined as informal if the individual did not have a work contract, a social security, or neither. Expansion weights are used.

4. Labor Market Transitions: Methodology

Employment profiles provide a useful snapshot of individuals' labor market positions in a given point in time. But labor market positions are dynamic, i.e. they change and evolve over time. Such evolution is as important as an accurate description of a specific point in time. For example, it is very useful to record the unemployment rate in a given month and year but it is very different if most of those unemployed in that month and year have been in the state for a long or a short period of time.

To describe labor market dynamics, we construct transition matrices over the relevant labor market states. Transition matrices link the labor market state of a given individual at a given date with the labor market state of the *same* individual at a future date. As a result, transition matrices

[8] Source: ILO, Malaysia Labour Force Survey, and Indonesia National Labour Force Survey. Data on the year of 2020. Retrieved Jan 2022.
[9] Source: ILO and national statistical offices. Data on the year of 2020. Retrieved Jan 2022.

require panel data and that is why the ELMPS for Egypt and the ENOE for Mexico are appropriate data sets for the analysis. All transition matrices describe transitions among five different labor market states: public sector employment, private formal sector employment, private informal sector employment, unemployment, and out of labor force. The computation of transition matrices for each individual country follows standard procedures. By construction, the sample is restricted to individuals interviewed in both rounds. The transition matrices are disaggregated by sex. Panel weights are used.

A frequency gap exists between the six-yearly ELMPS and quarterly ENOE. Even with the panel structure of the ENOE, one can at most compute annual transitions. Six-yearly transitions from Egypt and annual transitions from Mexico are clearly not comparable, as individuals not only have far more time to transition but also age to different extents. In the absence of data that allow for directly comparable transition, harmonization is in order.

In principle, we can either infer continuous-time transition intensity matrices for both labor markets or simulate in discrete time six-yearly transition matrices in Mexico based on annual ones. However, the former approach is riddled with issues that make it less reliable and can only be imperfectly addressed by existing techniques.[10] We therefore opt for simulation. In the simulations, we assume labor market transitions in each period to be discrete-time Markov processes. That is, the transition probability for each worker from one state to another depends on and only on her initial state. Hence, Markov processes are "memoryless," as each individual's history is irrelevant. This is unlikely to be entirely accurate, as the probability of one's transition would depend on whether, or to where, one has recently transitioned but delivers a feasible solution to the problem of comparability.

Further, we assume the transition probability matrix in each period to always be the empirical annual transition matrix observed from 2005 Q1 to 2006 Q1. This assumption is unlikely to be entirely accurate as well. Individuals age and change transition behavior over time. The underlying macroeconomy will have changed as well, leading to cyclical changes in employment and favoring some sectors over others. The assumption is that a six-year horizon is not long enough to generate significant departures from the underlying steady state equilibrium. See Appendix A.2 for a more complete discussion of the limitations of our simulation method.

To simulate the transitions, we firstly model the individual labor market transition process. Starting from each initial state, we draw a possible transition outcome in accordance with the transition probability matrix, representing one transition. Then the same procedure is repeated with the new initial state changed to the result of the previous draw. This process is done six times in total, modeling transitions after six years.

We then apply the Monte Carlo method to calculate the six-yearly transition probability matrix (p_{ij}). For each possible initial state i, the aforementioned procedure is repeated 100,000

[10] These issues of estimation are of two types: aliasing problems and embeddability problems. The former refers to the fact that the estimated transition intensity matrix is not necessarily unique. The latter refers to the fact that there could be no solution whose estimated parameters satisfy the requirements of probability distributions. See Bosch and Maloney (2007) or Fougère and Kamionka (2005) for a more complete discussion.

times, with each time producing a destination state j. Therefore, the Monte-Carlo-estimated transition probability from state i to j after six periods is simply the number of times where state j is reached (n_{ij}) divided by the number of simulations beginning from state i ($n_{i.}$, which is set to be 100,000). Thereby, for each entry of the matrix we have

$$p_{ij} = \frac{n_{ij}}{n_{i.}}$$

It is worth noting that transition simulations of this kind have a tendency to move towards a steady state where the transition probability distributions converge for all initial states, as one increases the number of transitions each individual can have. More generally, as long as for all i and j there is no such $p_{ij} = 1$, then as the number of transitions becomes arbitrarily large, the transition probability distributions would move towards convergence regardless of the initial states.

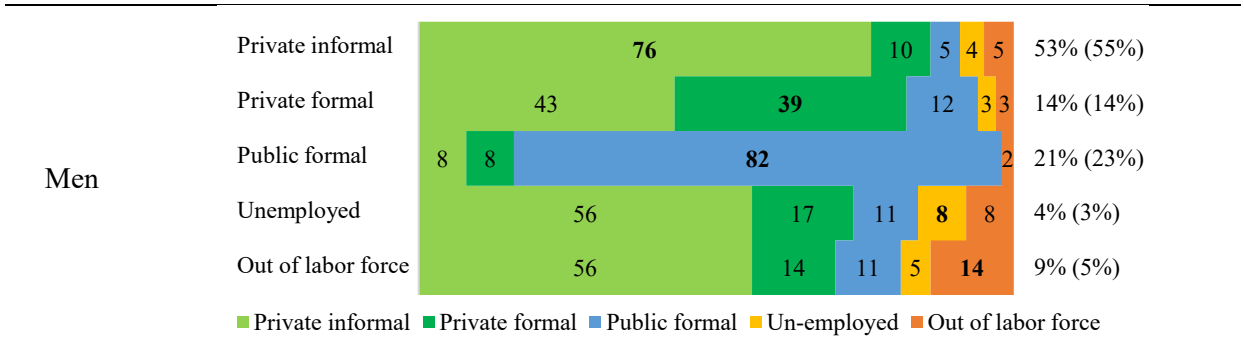
5. Labor Market Transitions: Results

5.1 Transition Matrices in Egypt

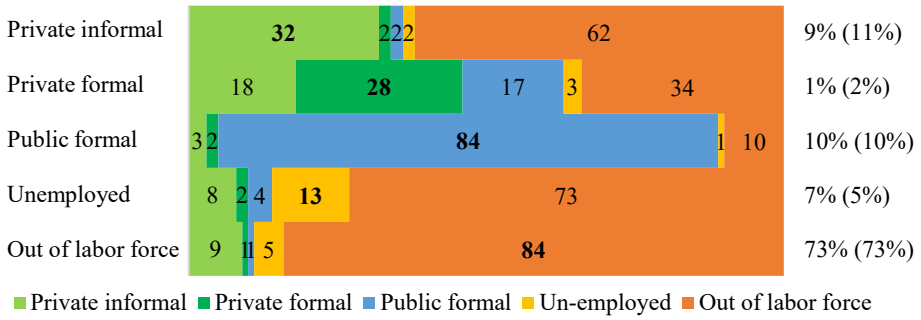
The transition matrices below show individuals' transition across sectors and employment statuses between 2012 and 2018 in Egypt. Each row shows the respective percentages of individuals moving to each employment status/sector in 2018, by their employment status/sector in 2012. The percentages on the far right show the shares of individuals in each employment status/sector in 2012, with percentages in 2018 in brackets. Bold texts indicate the shares of individuals who did not make a transition.

In Figure 3, we focus on men and women of working age (aged at least 20 years old in 2012 and at most 59 years old in 2018). We find that men who were unemployed or OLF at baseline tended to become employed, while unemployed or OLF women in 2012 tended to either drop out or remain out of the labor force. Indeed, three-quarters of women who were unemployed in 2012 dropped out of the labor force and 84% of already OLF women remained OLF in 2018. Transitions within the private sector, between its formal and informal sectors, are much more frequent than those from the private to the public sector. Conversely, those starting in the public sector rarely transition to either private sector, though, when they do, they are more likely to move to the informal than the formal sector.

Figure 3: Transition matrices by employment status, formality and sectors between 2012 and 2018



Women



Notes. This figure relies on panel data from the Egypt Labor Market Panel Survey in 2012 and 2018. We restrict our analysis to individuals who were interviewed in both rounds. We focus on those aged at least 20 years old in 2012 and at most 59 years old in 2018. We use transition matrices by sex to examine individuals' transition between their work status/sector in 2012 and their work status/sector in 2018. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2012, with the shares in 2018 reported in brackets. Panel weights are used.

Figure 4 and Figure 5 show the transition matrices across employment statuses/sectors, by education, for men and women, respectively. Across all education groups, unemployed and OLF men, at baseline, tended to find jobs (mostly in the informal private sector). Though transitions to the informal private sector remain the most likely transition among men who were unemployed or OLF in 2012, regardless of their educational attainment, we note that the highest the level of education, the greater the share transitioning to the formal sector, be it in the private or public sector. Similarly, we also find that men's education also matters for within-sector transitions, and particularly for transitioning out of the private informal sector. Indeed, a third of men with above secondary education, who were employed in the private informal sector at baseline, successfully managed to transition to the formal sector (private or public) versus only 7% of informally employed men in 2012 with no formal education qualification.

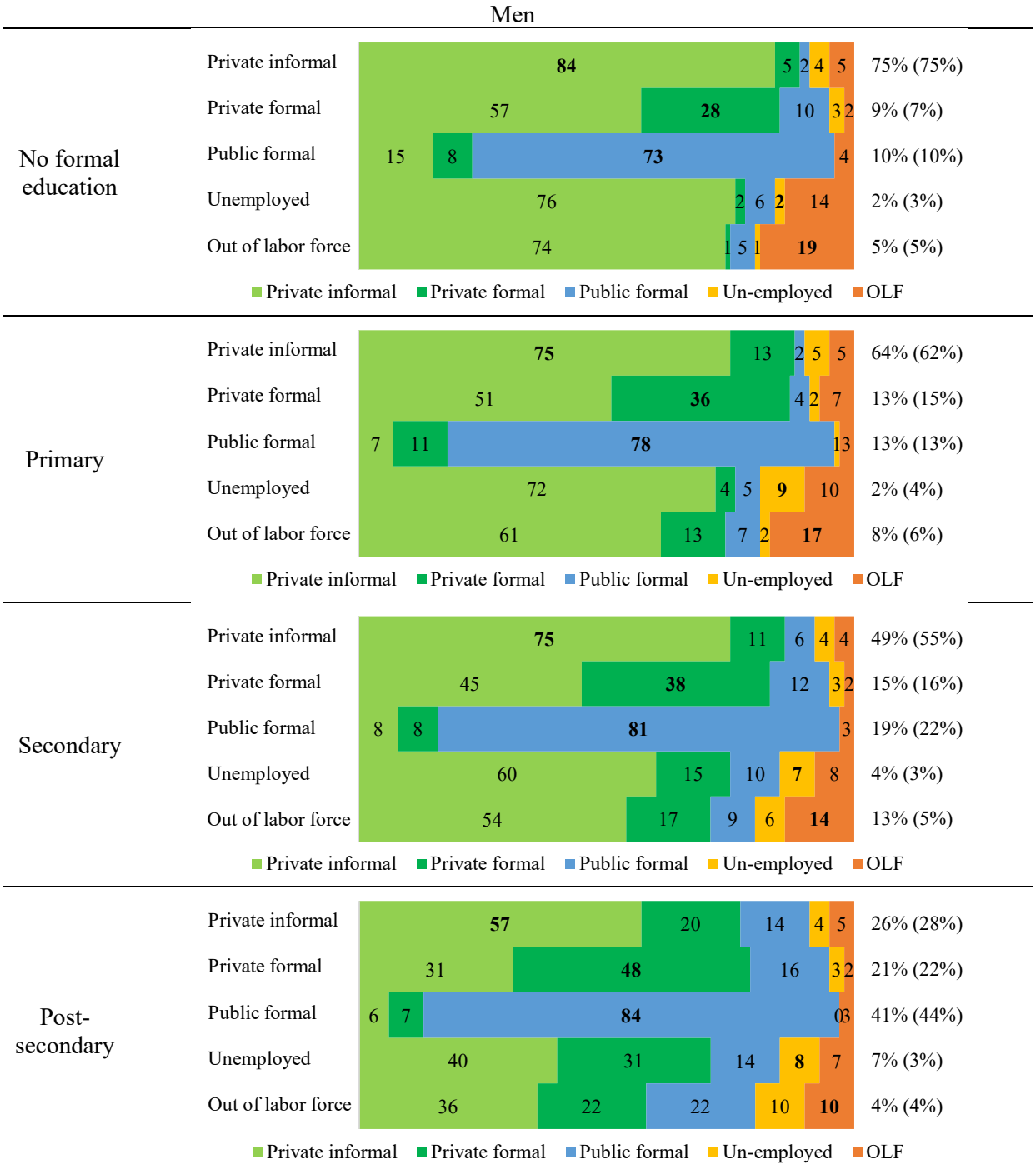
As for women, we consistently find that those who were unemployed or OLF at baseline tended to drop out or remain out of the labor force, regardless of their education. However, women with above secondary education are much more likely to become employed or to remain unemployed—instead of dropping OLF—relative to women with lower levels of education. Public sector employment is highest among highly educated women (those with above secondary education), with a third of educated women being employed in the public sector in 2018 versus less than 1% of less educated women (with primary education or less). Similarly to men, we also find that the higher the educational level, the more likely it is to retain a public sector job between the two survey rounds. Indeed, 84% of women with above secondary education who had a public sector job in 2012 retained in 2018, while only a third of women with no education qualification did.

Figure 6 and Figure 7 show the transition matrices across employment statuses/sectors, by age groups, for men and women, respectively. Among men, those unemployed or out of labor force moved into employment between 2012 and 2018, especially among the younger cohorts. Men across all age groups exhibited high transitions from the formal private to the informal private sector between 2012 and 2018. Such transitions from the formal to the informal private sector are

more pronounced among younger age groups. Approximately half of the men aged 20-29 years and formally employed in the private sector in 2012 transitioned to the informal private sector in 2018, versus 43% of those aged between 50-59 years old.

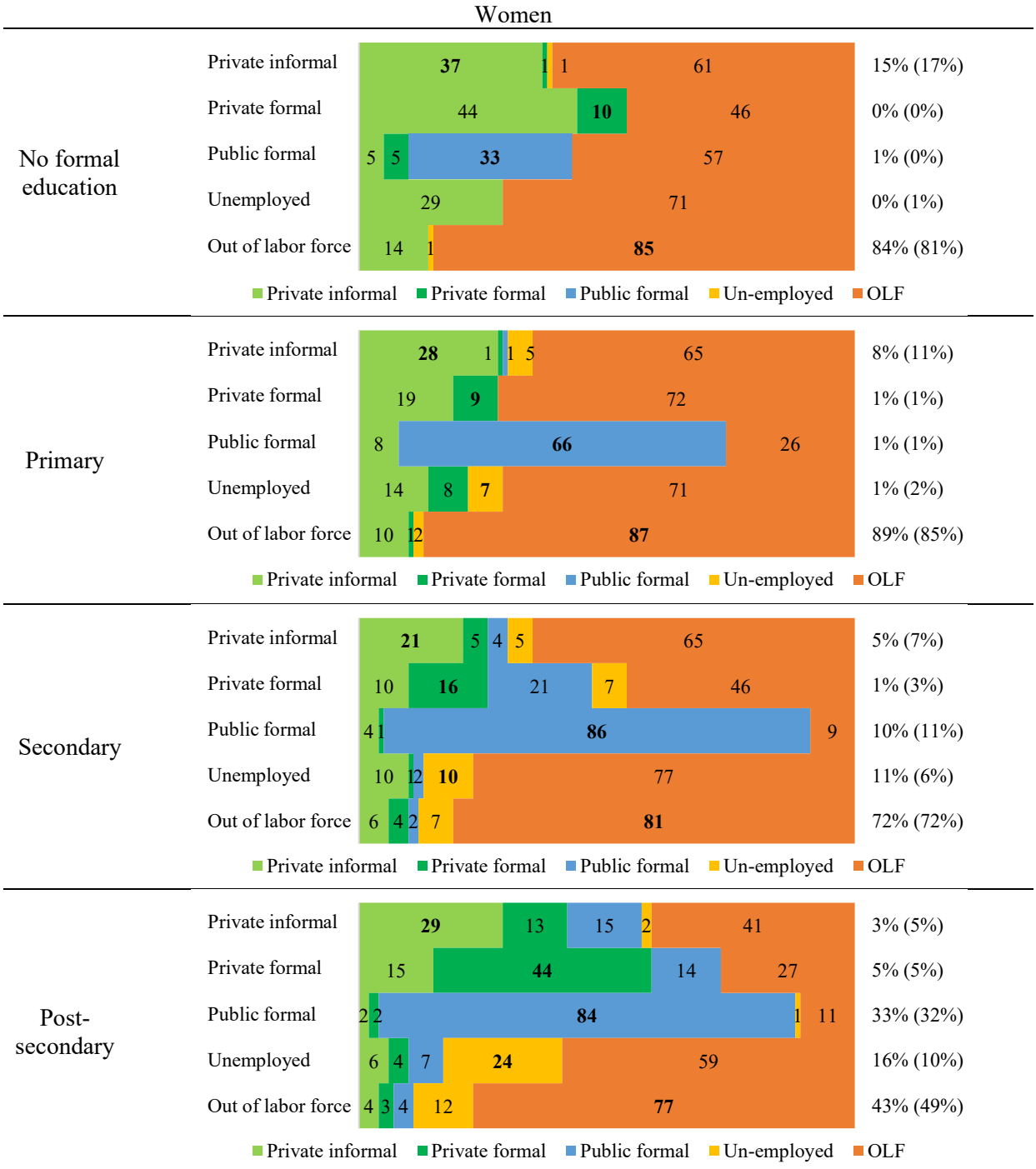
Women, however, increasingly withdrew from the labor force between 2012 and 2018, regardless of their age but particularly if they were in a relatively vulnerable situation at baseline, that is informally employed, unemployed or OLF. Nevertheless, around a third of prime-aged women (20-39 years old) who were formally employed in the private sector in 2012 still dropped OLF by 2018. Across all age groups, more than 80% of women who were employed in public sector employment in 2012 retained their jobs in 2018. Inter-sectoral transitions between the formal private sector and the informal private sector are generally low and when they do occur, female transitions from the formal private sector to the informal private sector are more likely than vice versa.

Figure 4: Employment transition matrices for men by employment status, formality and sectors between 2012 and 2018, by level of education



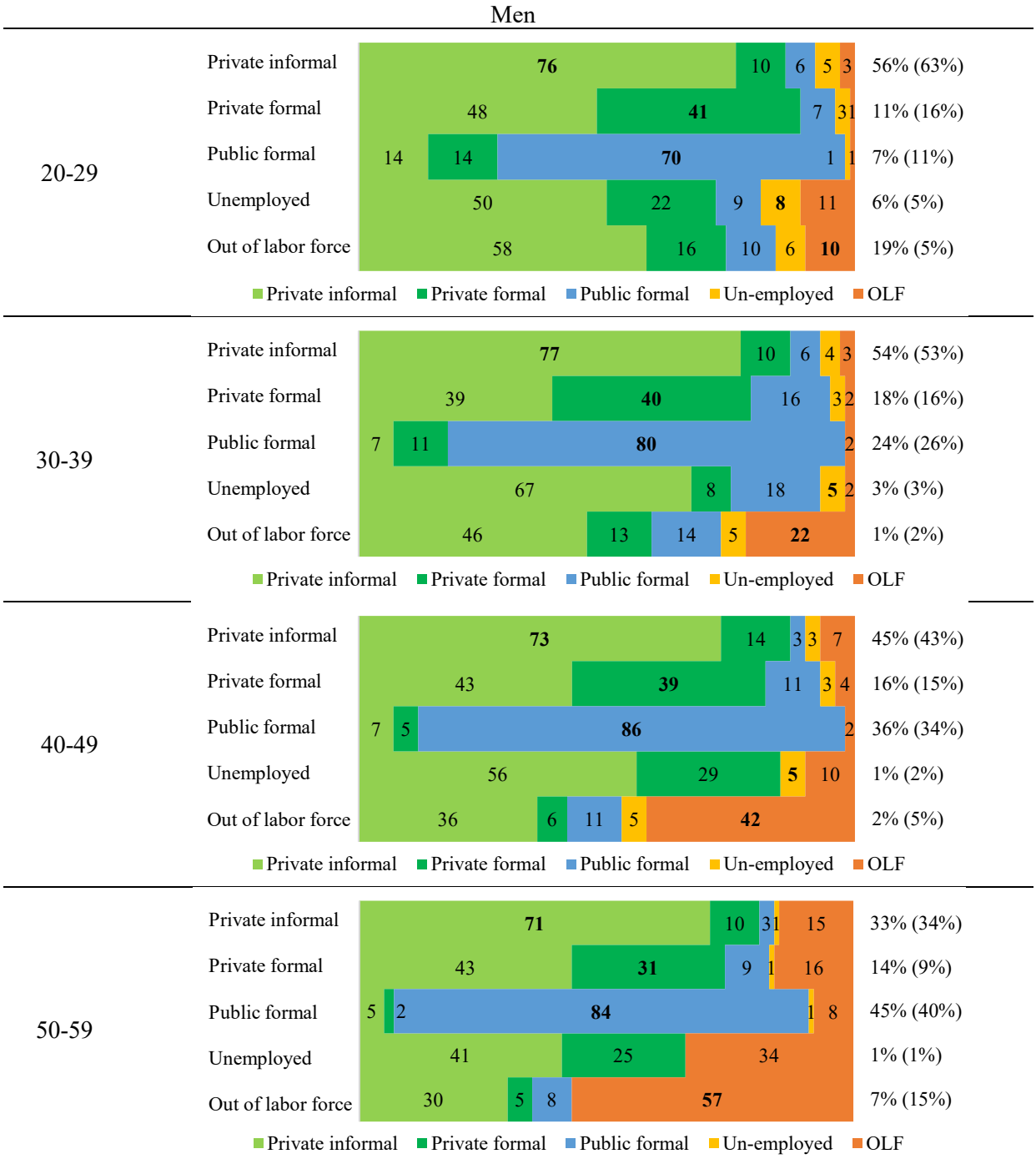
Notes. This figure relies on panel data from the Egypt Labor Market Panel Survey in 2012 and 2018. We restrict our analysis to men who were interviewed in both rounds. We focus on those aged at least 20 years old in 2012 and at most 59 years old in 2018. We use transition matrices to examine individuals' transition between their work status/sector in 2012 and their work status/sector in 2018, by educational levels. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2012, with the shares in 2018 reported in brackets. Panel weights are used.

Figure 5: Employment transition matrices for women by employment status, formality and sectors between 2012 and 2018, by level of education



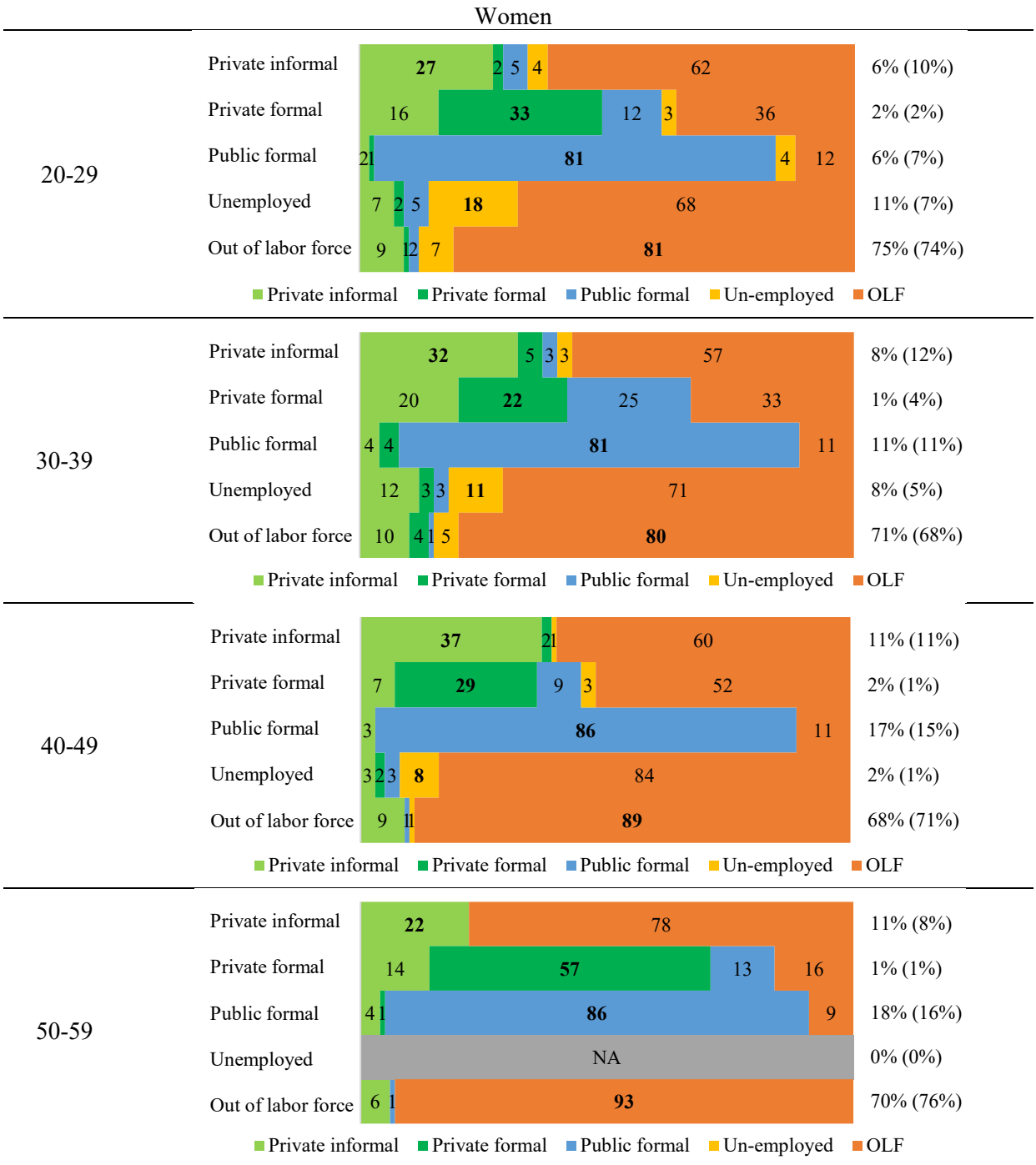
Notes. This figure relies on panel data from the Egypt Labor Market Panel Survey in 2012 and 2018. We restrict our analysis to women who were interviewed in both rounds. We focus on those aged at least 20 years old in 2012 and at most 59 years old in 2018. We use transition matrices to examine individuals' transition between their work status/sector in 2012 and their work status/sector in 2018, by educational levels. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2012, with the shares in 2018 reported in brackets. Panel weights are used.

Figure 6: Employment transition matrices for men by employment status, formality and sectors between 2012 and 2018, by age groups



Notes. This figure relies on panel data from the Egypt Labor Market Panel Survey in 2012 and 2018. We restrict our analysis to men who were interviewed in both rounds. We focus on those aged at least 20 years old in 2012 and at most 59 years old in 2018. We use transition matrices to examine individuals' transition between their work status/sector in 2012 and their work status/sector in 2018, by age groups. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2012, with the shares in 2018 reported in brackets. Panel weights are used.

Figure 7: Employment transition matrices for women by employment status, formality and sectors between 2012 and 2018, by age groups



Notes. This figure relies on panel data from the Egypt Labor Market Panel Survey in 2012 and 2018. We restrict our analysis to women who were interviewed in both rounds. We focus on those aged at least 20 years old in 2012 and at most 59 years old in 2018. We use transition matrices to examine individuals' transition between their work status/sector in 2012 and their work status/sector in 2018, by age groups. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2012, with the shares in 2018 reported in brackets Panel weights are used.

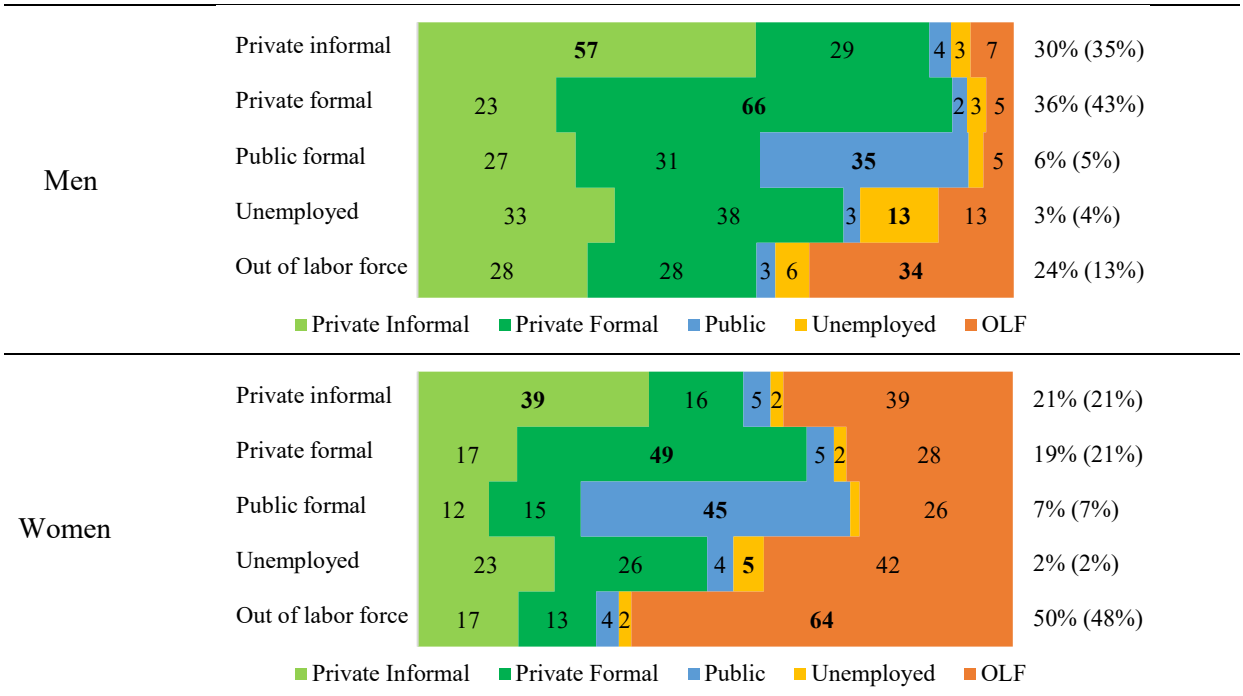
5.2 Transition Matrices in Egypt in Comparison with Mexico

Mexico and Egypt are both developing countries with comparable levels of GDP per capita at purchasing power parity (as of 2020, $18,444 in Mexico and $12,607 in Egypt). Importantly, notable similarities exist between both labor markets. Both have large informal sectors that make up just under two-thirds of total employment (Wahba and Assaad 2017). Both have a young labor force, but also face low labor force participation rates, especially among women (OECD 2018).

These underlying similarities make for an informative comparison of labor market transitions in the two countries, which also differ in significant respects. Egypt has a considerably larger public sector segmented from the rest of the labor market and a much smaller private formal sector. Workers in Mexico also regularly transition from the informal sector to the formal sector as they secure better employment (Gong, van Soest, and Villagomez 2004).

As described in Section 4, we simulate six-yearly labor market transitions in Mexico based on observed annual ones. Figure 8 below firstly shows the empirical annual transition for men aged 20 to 53 in Mexico over one year, on which we base our simulations.

Figure 8: Transition matrices by employment status, formality and sectors in Mexico, 2005 Q1 – 2006 Q1

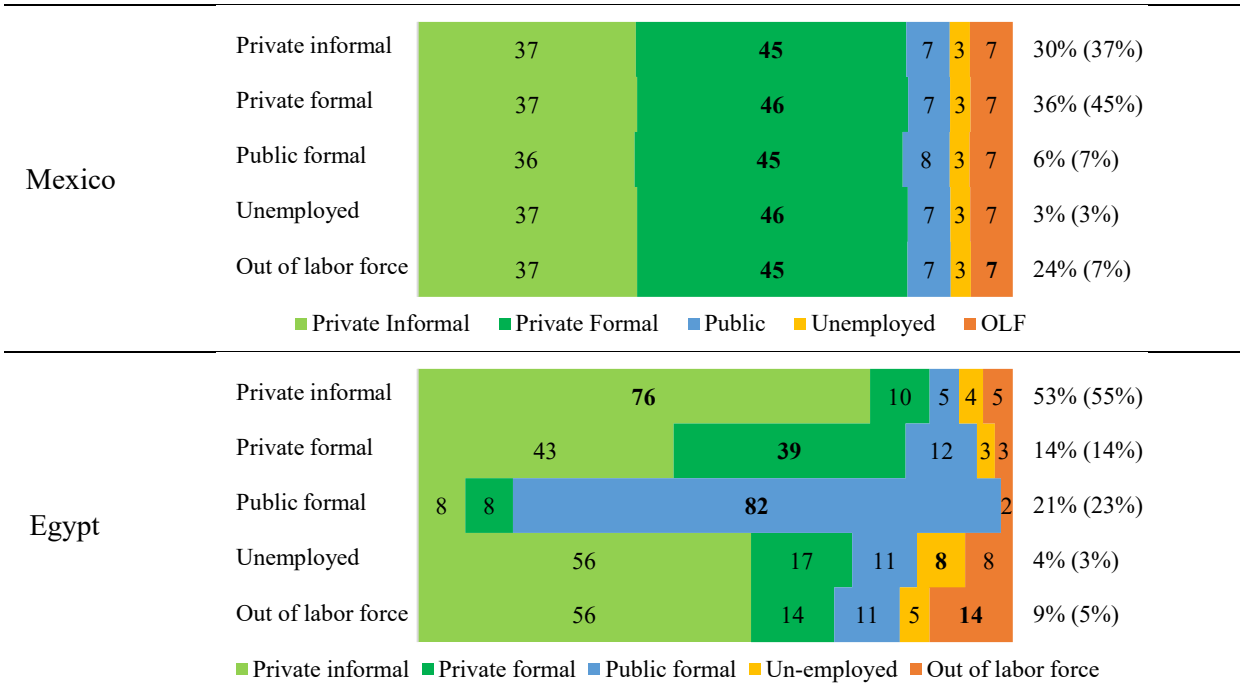


Notes. This figure relies on panel data from the ENOE in 2005 Q1 and 2006 Q1. We restrict our analysis to individuals aged 20 to 53 who were interviewed in both rounds. We use transition matrices to examine individuals' transition of their work status/sector between the two dates. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2005 Q1, with the shares in 2006 Q1 reported in brackets. Panel weights are used.

Even on an annual basis, transitions are more frequent in Mexico than in Egypt on a six-yearly basis. And even the stickiest private formal sector only retains two-thirds of workers after one year. Those out of the labor force also find employment rapidly. The two largest stocks of

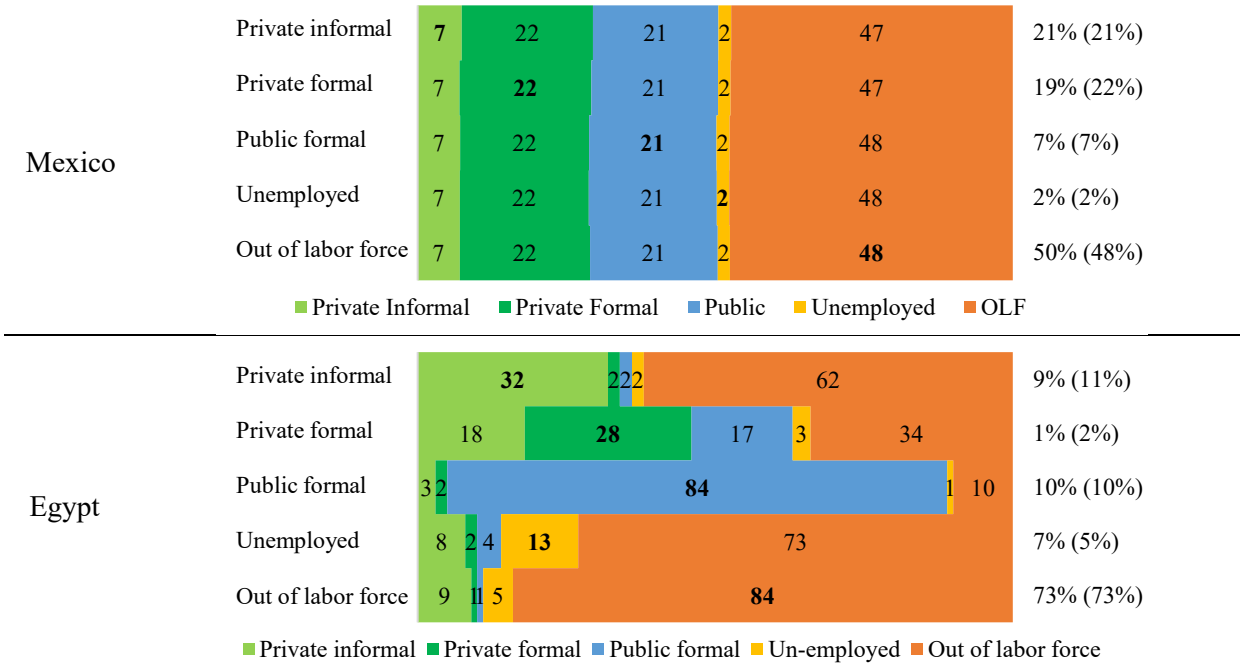
states both have large flows in and out of them. Additionally, unlike Egypt, the public sector sees the most transitions in and out of it. This might be due to its small size, employing only around 5% of the workforce in this sample; small movements in and out of the sector would therefore have a large effect on transitions. Figure 9 shows the simulation results among men aged 20-53 in 2005 Q1. The lower panel reports the comparable transition matrices for Egypt (focusing on men in the same age group observed empirically between 2012 and 2018). The lower panel was previously presented in Figure 3.

Figure 9: Six-yearly transition matrices for males aged 20-53 in Mexico and Egypt



Notes. The upper panel is simulated by Monte Carlo Method described in Section 4 Methodology. 100,000 simulations of transitions after six years were performed for each initial state, where the transition probability matrix per period is taken from the empirical annual transition matrix in Figure 8. The annual transition matrix relies on panel data from the ENOE in 2005 Q1 and 2006 Q1. We restrict our analysis to men aged 20 to 53 who were interviewed in both rounds. We use transition matrices to examine individuals' transition of their work status/sector between the two dates. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2005 Q1, with the shares in 2006 Q1 reported in brackets. Panel weights are used. The lower panel relies on panel data from the Egypt Labor Market Panel Survey in 2012 and 2018. We restrict our analysis to individuals who were interviewed in both rounds. We focus on those aged at least 20 years old in 2012 and at most 59 years old in 2018. We use transition matrices by sex to examine individuals' transition between their work status/sector in 2012 and their work status/sector in 2018. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2012, with the shares in 2018 reported in brackets. Panel weights are used.

Figure 10: Six-yearly transition matrices for females aged 20-53 in Mexico and Egypt



Notes. The upper panel is simulated by Monte Carlo Method described in Section 4 Methodology. 100,000 simulations of transitions after six years were performed for each initial state, where the transition probability matrix per period is taken from the empirical annual transition matrix in Figure 8. The annual transition matrix relies on panel data from the ENOE in 2005 Q1 and 2006 Q1. We restrict our analysis to women aged 20 to 53 who were interviewed in both rounds. We use transition matrices to examine individuals' transition of their work status/sector between the two dates. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2005 Q1, with the shares in 2006 Q1 reported in brackets. Panel weights are used. The lower panel relies on panel data from the Egypt Labor Market Panel Survey in 2012 and 2018. We restrict our analysis to individuals who were interviewed in both rounds. We focus on those aged at least 20 years old in 2012 and at most 59 years old in 2018. We use transition matrices by sex to examine individuals' transition between their work status/sector in 2012 and their work status/sector in 2018. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2012, with the shares in 2018 reported in brackets. Panel weights are used.

The convergence seen in the upper panels of Figure 9 and Figure 10 shows that there is no labor market persistence in Mexico after six years – regardless of the initial state one finds oneself at the beginning, the transition probability distributions are almost identical. This result is subject to certain limitations. As the Markov chains assume memoryless-ness and hence a constant rate of transition, the simulations will tend to over-state dynamism in the labor market. Such caveats are discussed in further detail in Appendix A.2. However, as Appendix A.2 shows, this over-statement is not unreasonably large. The simulations therefore still provide evidence in support of the remarkable dynamism of Mexico's labor market. Further details on how the transitions take place in Mexico can be found in the per-period simulations in Appendix A.3, which shows that persistence in Mexico ends after 3 years for men and 4 years for women.

This result stands in stark contrast to what we empirically observe in Egypt, where only a small proportion of individuals have left their original sectors. One should note that since the transition is observed only at the two ends of a six-year period, it is entirely possible for individuals to have moved to another (or several other) different sectors, only to move back to the original starting point. However, existing research instead points to workers not changing jobs at all as primary reason for this phenomenon (Yassine 2015). As also noted by Amer (2015), job tenures tend to be very long in Egypt.[11]

The resulting labor market composition after six years also points to the rigidity of Egypt's labor market. Figure 9 indicates substantial labor market upgrading among Mexican men, but almost no compositional changes among Egyptian men. In Mexico, only 7% of men remain out of the labor force after six years; the share of men in the private formal sector increases from 36% to 45%, while the corresponding increase in the informal sector goes from 30% to 37%. Whereas among men in Egypt, the only compositional changes come from a small reduction in non-participation, which translates into small increases in the shares of employment in the informal and public sectors. However, Mexico's labor market upgrading does not apply to Mexican women, who fare as poorly as their Egyptian counterparts. Figure 10 shows that neither labor market has led to substantive compositional changes for women over the six-year window of analysis.

5.3 Regression Analysis

Table 1 and Table 2 present results from a linear probability model on employment status and formality-sector transitions. In each column, the sample is restricted to those individuals with the relevant initial status in 2012, and the dependent variable takes the value one if the individual reached the corresponding destination status in 2018. The reference category for the educational dummies is having no formal education qualification.

Table 1 shows the transition regression outputs from the two initial baselines women are most likely to be in, either out of the labor force or employed in the public sector. We find that younger women are more likely to transition from OLF to employment than older women. Aging by one year makes a young woman more likely to enter employment, with the highest likelihood at age 33. We also find that having primary, secondary or post-secondary schooling (relative to having no formal education) reduces the probability of transitioning to employment from OLF for women. Among women, we also find that having post-secondary education is associated with a lower probability of remaining OLF for those already OLF at baseline. Being married at baseline

[11] We have attempted to explore labor market states' persistence in further detail in ELMPS, but substantial measurement errors preclude a useful analysis. We tracked individual labor market status in 2012 based on retrospective information provided in the 2018 survey and cross-checked the accuracy of this information based on a sample of panel observations that were also interviewed in 2012. The data analysis revealed significant discrepancies between what individuals report in the current section of the 2012 round and what they report in the retrospective section of the 2018 round. Of those who retrospectively reported in 2018 that they were not employed in 2012, 44% were found to be employed in 2012. On the other hand, of those who retrospectively reported being employed in 2012, 20% were found to be unemployed.

is another significant predictor for women to stay out of the labor force if they were already so. On the other hand, holding any educational qualification also significantly reduces the probability that a publicly employed woman drops out of the labor force. Younger, unmarried women, and women living in smaller households are more likely to move from the public to the private formal sector.

Table 1: Determinants of employment status transitions between 2012 and 2018

Women							
Initial status 2012	Public Formal				Out of labor force (OLF)		
Destination status 2018	Public Formal	Private Formal	Private Informal	OLF	Public Formal	Any Employment	OLF
Age	-0.018	0.011*	0.008	-0.012	-0.021*	0.023***	-0.023***
	(0.016)	(0.010)	(0.011)	(0.010)	(0.011)	(0.004)	(0.003)
Age^2	0.001	-0.003*	-0.003	0.004	0.003*	-0.002***	0.002***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.000)
Primary school	0.209	-0.088	-0.036	-0.408**	0.034	-0.063***	0.048***
	(0.142)	(0.062)	(0.083)	(0.163)	(0.031)	(0.012)	(0.016)
Secondary school	0.239	-0.067	-0.087	-0.502***	0.158***	-0.050***	-0.003
	(0.132)	(0.059)	(0.064)	(0.152)	(0.031)	(0.014)	(0.013)
Post-Secondary	0.238	-0.075	-0.085	-0.499***	0.373***	-0.072***	-0.057**
	(0.127)	(0.048)	(0.062)	(0.148)	(0.042)	(0.017)	(0.024)
Married	0.051	-0.049***	0.005	0.032	-0.137***	-0.039**	0.108***
	(0.029)	(0.009)	(0.017)	(0.031)	(0.044)	(0.011)	(0.024)
Household size	0.010	-0.013*	-0.000	0.072	-0.004	0.000	-0.002
	(0.013)	(0.004)	(0.001)	(0.011)	(0.008)	(0.002)	(0.001)
Region dummies	✓	✓	✓	✓	✓	✓	✓
Occupation dummies	✓	✓	✓	✓	X	X	X
Observations	811	812	812	908	790	6,618	6,618

Notes. *** p<0.01, **<0.05, *<0.1. A linear probability model's coefficient estimates and standard errors are reported. This table uses panel data from the Egypt Labor Market Panel Survey in 2012 and 2018. The sample is restricted to those aged at least 20 years old in 2012 and at most 59 years old in 2018. All control variables refer to 2012. Panel weights are used.

Table 2 shows the regression output on formality-sector transitions for men. We consider men who were employed either in the public sector or informally—which we define as the two absorbing states—at baseline and examine the transition probability to the public formal sector, private formal sector and private informal sector in 2018. Predictably, those better educated are found to be much more likely to secure formal employment, be it in the public or in the private sector. Having a secondary or a post-secondary level of education is strongly associated with moving out of the private informal sector. The better educated are also much more likely to keep their public formal jobs once they secure them. They are much less likely to move to the private,

especially private informal, sector than their less educated counterparts. Married men are far more likely to stay put in the public sector, though being married at the baseline does little to help an informally employed man to secure a public sector job.

Table 2: Determinants of formality-sector transitions between 2012 and 2018

Men						
Initial status in 2012	Public Formal			Private Informal		
Destination status in 2018	Public Formal	Private Formal	Private Informal	Public Formal	Private Formal	Private Informal
Age	-0.002	0.002	-0.008	0.007*	0.004	-0.005
	(0.010)	(0.017)	(0.008)	(0.004)	(0.003)	(0.007)
Age^2	0.003	-0.004	0.002	-0.004*	0.001	0.001
	(0.004)	(0.003)	(0.003)	(0.002)	(0.001)	(0.003)
Primary school	0.075	-0.002	-0.066*	0.004	0.065***	-0.074***
	(0.039)	(0.033)	(0.025)	(0.006)	(0.010)	(0.017)
Secondary school	0.117**	-0.036	-0.082**	0.043***	0.073***	-0.103***
	(0.042)	(0.032)	(0.034)	(0.012)	(0.014)	(0.012)
Post-Secondary	0.190***	-0.058	-0.133***	0.109***	0.118***	-0.235***
	(0.036)	(0.036)	(0.028)	(0.008)	(0.020)	(0.018)
Married	0.150***	-0.082**	-0.078**	-0.002	0.005	-0.009
	(0.024)	(0.034)	(0.031)	(0.005)	(0.008)	(0.015)
Household size	0.009	-0.006*	0.003	0.002	-0.000	0.004
	(0.007)	(0.003)	(0.002)	(0.003)	(0.001)	(0.003)
Region dummies	✓	✓	✓	✓	✓	✓
Occupation dummies	✓	✓	✓	✓	✓	✓
Observations	1,713	1,713	1,713	4,305	4,305	4,305

Notes. *** p<0.01, **<0.05, *<0.1. A linear probability model's coefficient estimates and standard errors are reported. This table uses panel data from the Egypt Labor Market Panel Survey in 2012 and 2018. The sample is restricted to those aged at least 20 years old in 2012 and at most 59 years old in 2018. All control variables refer to 2012. Panel weights are used.

6. Concluding Remarks

The persistence in and the rigidity of labor market states were always key characteristics of the Egyptian labor market. This paper revisited these questions relying on transition matrices to examine the dynamics of labor market transitions post-Arab Spring. The analysis relies on the two most recent rounds of the Egypt Labor Market Panel Surveys (ELMPS) and exploits the panel structure of the data to track individual employment status and job trajectories between the two rounds.

To offer a cross-country and cross-regional perspective, we compare the Egyptian labor market transition matrices with those of Mexico. Mexico provides an interesting comparator country given its similar level of GDP per capita in purchasing power parity, its large private informal sector, its young labor force, and low female labor force participation—all of which are common characteristics with Egypt's labor market.

Our transition matrices showcase particular dominant absorbing labor market states among women and men. Specifically, we find a large degree of persistence in being out of labor force among women. On the other hand, we find very low female labor market engagement in the private sector, be it formal or informal, while we observe an important female presence in the public sector and in particular, a persistence in female public sector employment among the most educated. As for men, we find suggestive evidence of high informality—in particular among the less educated—and a lack of dynamism to transition to the private formal sector or the public formal sector. Such transitions are only likely to occur among the most educated men.

The stickiness of these dominant absorbing states is further confirmed when contrasting Egypt's transition matrices with those of Mexico. Relying on data from Mexico's labor force survey, Encuesta Nacional de Ocupación y Empleo, and simulating labor market transitions over a six-year window using Monte Carlo simulations of repeated discrete-time Markov chains, our results highlight very divergent levels of dynamism between the two labor markets. Mexico's labor market shows a large degree of dynamism over the six-year window regardless of individual initial labor market states at baseline, while Egypt's labor market shows great persistence in labor market states and far fewer transitions between the two rounds.

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Appendix A.1: Sample Selection Comparing Raw, Cross-Sectional, and Panel Samples

Table A.1: Descriptive statistics on the 2012 and 2018 estimation samples versus raw data

	Men						Women					
	2012			2018			2012			2018		
Mean (St. Dev.)	Raw	Sample	Panel	Raw	Sample	Panel	Raw	Sample	Panel	Raw	Sample	Panel
Age	25.817	34.957	33.211	25.924	35.653	39.284	26.795	34.768	33.138	26.969	35.503	39.187
	(19.656)	(10.856)	(9.236)	(19.805)	(10.604)	(9.275)	(20.192)	(11.248)	(9.638)	(20.426)	(10.87)	(9.609)
Rural	0.567	0.546	0.59	0.642	0.624	0.589	0.560	0.540	0.596	0.636	0.621	0.593
	(0.495)	(0.498)	(0.492)	(0.479)	(0.484)	(0.492)	(0.496)	(0.498)	(0.491)	(0.481)	(0.485)	(0.491)
Household wealth	0.381	0.386	0.384	0.256	0.261	0.263	0.382	0.390	0.388	0.258	0.266	0.266
	(0.129)	(0.128)	(0.125)	(0.137)	(0.14)	(0.14)	(0.134)	(0.134)	(0.129)	(0.141)	(0.144)	(0.145)
Household size	5.013	4.813	4.902	4.767	4.538	4.576	4.945	4.698	4.851	4.687	4.463	4.538
	(2.167)	(2.141)	(2.174)	(1.835)	(1.793)	(1.702)	(2.237)	(2.139)	(2.139)	(1.961)	(1.844)	(1.763)
Below primary	0.283	0.216	0.207	0.296	0.223	0.246	0.397	0.345	0.338	0.399	0.336	0.37
	(0.45)	(0.411)	(0.405)	(0.456)	(0.417)	(0.431)	(0.489)	(0.476)	(0.473)	(0.49)	(0.472)	(0.483)
Primary	0.251	0.165	0.169	0.232	0.136	0.129	0.212	0.123	0.124	0.213	0.125	0.107
	(0.433)	(0.371)	(0.375)	(0.422)	(0.343)	(0.336)	(0.409)	(0.328)	(0.33)	(0.41)	(0.331)	(0.309)
Secondary	0.303	0.399	0.423	0.322	0.437	0.398	0.257	0.339	0.362	0.259	0.352	0.327
	(0.459)	(0.49)	(0.494)	(0.467)	(0.496)	(0.49)	(0.437)	(0.474)	(0.481)	(0.438)	(0.478)	(0.469)
Post-secondary	0.164	0.221	0.201	0.150	0.204	0.226	0.134	0.192	0.175	0.129	0.187	0.195
	(0.37)	(0.415)	(0.4)	(0.357)	(0.403)	(0.418)	(0.34)	(0.394)	(0.38)	(0.335)	(0.39)	(0.396)
Cairo	0.105	0.111	0.081	0.072	0.078	0.081	0.112	0.118	0.083	0.077	0.08	0.084
	(0.307)	(0.314)	(0.273)	(0.259)	(0.269)	(0.273)	(0.315)	(0.323)	(0.276)	(0.267)	(0.271)	(0.277)
Alexandria	0.081	0.087	0.07	0.059	0.063	0.07	0.079	0.088	0.066	0.056	0.062	0.067
	(0.273)	(0.282)	(0.254)	(0.235)	(0.242)	(0.256)	(0.27)	(0.283)	(0.248)	(0.23)	(0.24)	(0.249)
Urban Lower Egypt	0.110	0.115	0.113	0.099	0.101	0.113	0.111	0.117	0.115	0.101	0.106	0.116
	(0.313)	(0.319)	(0.316)	(0.299)	(0.302)	(0.317)	(0.314)	(0.321)	(0.319)	(0.301)	(0.308)	(0.32)
Urban Upper Egypt	0.138	0.142	0.147	0.128	0.133	0.147	0.140	0.138	0.140	0.130	0.132	0.140
	(0.345)	(0.349)	(0.354)	(0.334)	(0.34)	(0.354)	(0.347)	(0.345)	(0.347)	(0.337)	(0.338)	(0.347)
Rural Lower Egypt	0.284	0.287	0.314	0.291	0.295	0.313	0.277	0.277	0.307	0.286	0.289	0.305
	(0.451)	(0.453)	(0.464)	(0.454)	(0.456)	(0.464)	(0.447)	(0.448)	(0.461)	(0.452)	(0.453)	(0.461)
Rural Upper Egypt	0.282	0.258	0.276	0.351	0.329	0.275	0.282	0.262	0.289	0.349	0.332	0.288
	(0.45)	(0.437)	(0.447)	(0.477)	(0.47)	(0.447)	(0.45)	(0.439)	(0.453)	(0.477)	(0.471)	(0.453)
Employed	0.615	0.872	0.878	0.572	0.844	0.915	0.141	0.204	0.199	0.125	0.184	0.222
	(0.487)	(0.334)	(0.328)	(0.495)	(0.363)	(0.279)	(0.348)	(0.403)	(0.399)	(0.331)	(0.387)	(0.416)
Unemployed	0.025	0.036	0.035	0.029	0.041	0.035	0.045	0.068	0.074	0.032	0.05	0.047
	(0.156)	(0.187)	(0.184)	(0.166)	(0.198)	(0.184)	(0.208)	(0.251)	(0.262)	(0.177)	(0.219)	(0.211)
Out of labor force	0.360	0.092	0.087	0.400	0.115	0.050	0.814	0.728	0.727	0.843	0.766	0.731
	(0.48)	(0.288)	(0.283)	(0.49)	(0.319)	(0.218)	(0.389)	(0.445)	(0.446)	(0.364)	(0.423)	(0.443)

Notes. This table relies on data from the Egypt Labor Market Panel Survey (ELMPS) 2012 and 2018.

By construction, the raw data differs with respect to the sample in 2012 and 2018, as well as with respect to the panel data along the age dimension. By excluding all individuals below 20 years old, individuals in our sample and panel data are older than those in the raw data. Overall, we find that men and women distribution across Egyptian regions seem to be comparable in the raw, sample, and panel data. However, the sample data seems to slightly underrepresent individuals from rural residency, with smaller household size, and lower wealth score relative to the raw data. Both the sample and panel data seem to overrepresent individuals with higher levels of educational attainment (secondary education and above secondary education) and to slightly underrepresent individuals with lower levels of education (those with primary education or less). In terms of work status, by definition, we find higher incidence of employment, among both men and women, in the sample and panel data relative to the raw data. Unemployment is likewise higher in the sample and panel data relative to the raw data, while the incidence of being out of the labor force (OLF) is higher in the latter relative to the former.

While the descriptive analysis shows some differences across multiple dimensions, several of these are to be expected, by definition, given the age restrictions employed. This applies to the age differences, the educational differences, as well as the differences in terms of work status. Educational differences—in terms of slight overrepresentation of the highly educated in the sample and the panel—is likely driven by the exclusion of the youth (below 20 years old) with lower levels of education. Likewise, the overrepresentation of the active population (employed and unemployed) and the underrepresentation of the OLF in the sample and panel data relative to the raw data once again merely reflects our focus on prime working age individuals.

Appendix A.2: Discussion on the Limitation of Monte Carlo Simulations of Markov Chains in Labor Markets

As noted in the Methodology Section 4, the repeated Markov process being simulated assumes memoryless-ness and hence also constancy over time. In reality, when conditioning on history, probabilities of transitioning to other states are likely to be lower than the unconditional probabilities. Individuals who have recently made job moves are unlikely to do so as much as those who did not. Therefore, by assuming memoryless-ness, the simulations have a tendency of *over*-stating dynamism in the labor market, but not to an extent that makes the results unreasonable. As an example, the robustness check below shows the simulated outcome of four quarterly transitions (based on transitions from 2005 Q1 to 2005 Q2) with the empirical annual transition matrix obtained from ENOE. Though this does qualify our simulations as noted in the paper, our main argument nevertheless holds, as it is evident that the degree of dynamism of the labor market is highly divergent between Mexico and Egypt.

Table A.2: Simulated annual transition with quarterly data and empirical annual transition of Mexican men

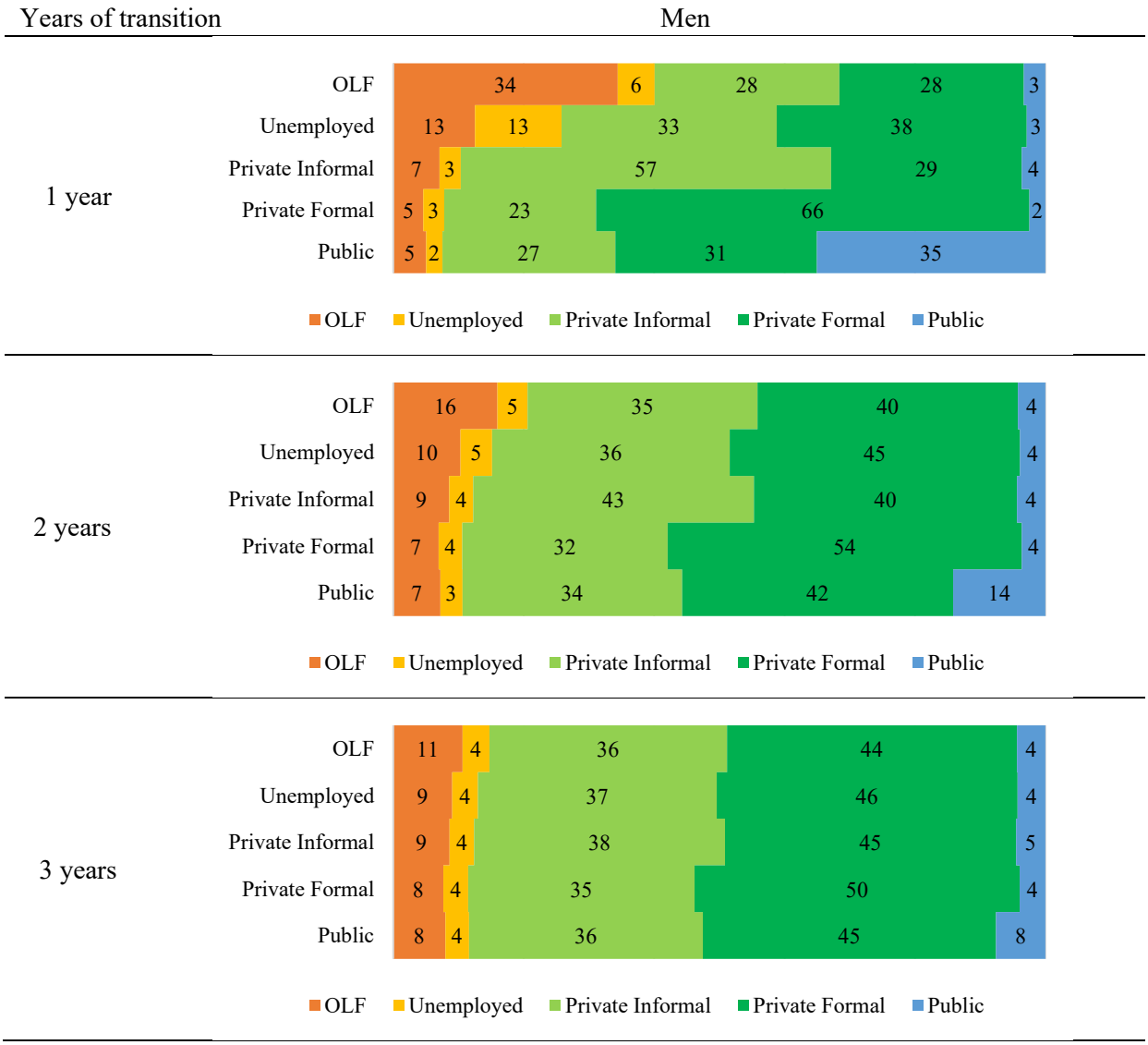
	Simulated					Empirical				
	Public	Private Formal	Private Informal	Un-employed	OLF	Public	Private Formal	Private Informal	Un-employed	OLF
Public	33%	32%	26%	3%	7%	35%	31%	27%	2%	5%
Private Formal	3%	57%	29%	3%	7%	2%	66%	23%	3%	5%
Private Informal	3%	35%	45%	4%	13%	4%	29%	57%	3%	7%
Unemployed	4%	37%	39%	4%	16%	3%	38%	33%	13%	13%
OLF	3%	28%	37%	4%	27%	3%	28%	28%	6%	34%

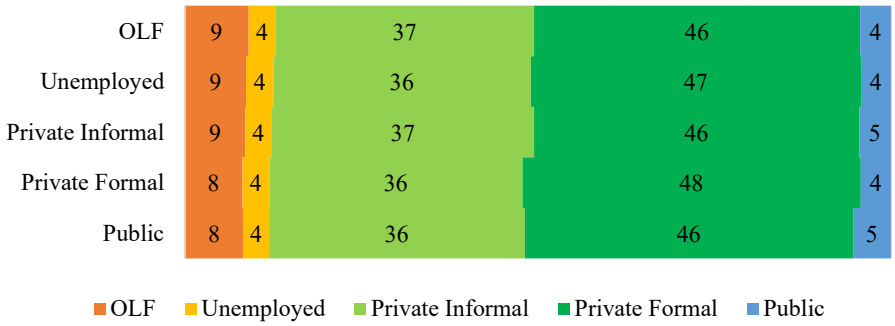
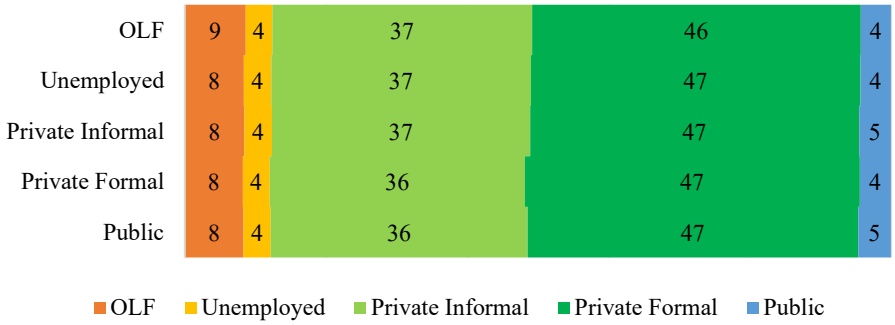
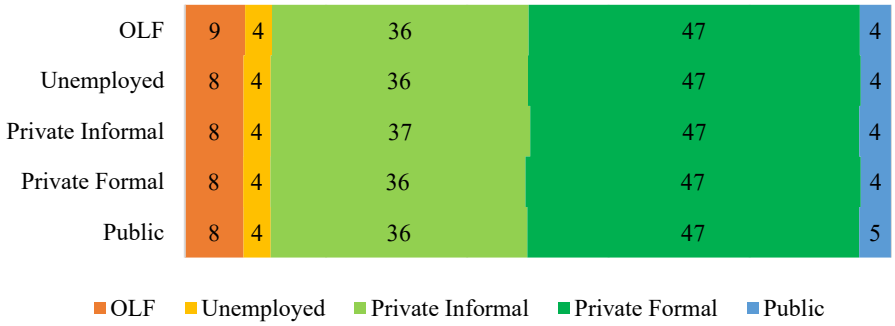
Notes. The left panel is simulated by Monte Carlo Method described in Section 4 Methodology. 100,000 simulations of transitions after 4 quarters were performed for each initial state, where the transition probability matrix per period is taken from the empirical quarterly transition matrix computed from ENOE 2005 Q1 and Q2. We restrict our analysis to men aged 20 to 53 who were interviewed in both rounds. We use transition matrices to examine individuals' transition of their work status/sector between the two dates. We rely on the market definition of work status, search required (reference 1 week). Panel weights are used. The right panel relies on panel data from the ENOE in 2005 Q1 and 2006 Q1. We restrict our analysis to individuals aged 20 to 53 who were interviewed in both rounds. We use transition matrices to examine individuals' transition of their work status/sector between the two dates. We rely on the market definition of work status, search required (reference 1 week). Panel weights are used.

Appendix A.3: Per-Period Labor Market Transition Simulations in Mexico

Appendix A.3 shows the simulated transition matrices in Mexico for each period of transition, where one can examine the degree of labor market rigidity and dynamism in Mexico in further detail. Figure A.1 confirms the high degree of dynamism among men in the Mexican labor market, with persistence largely disappearing after just three years. Transitions into the labor force occur especially quickly. By contrast, women in Mexico need 4 years of transitions to reach their steady state.

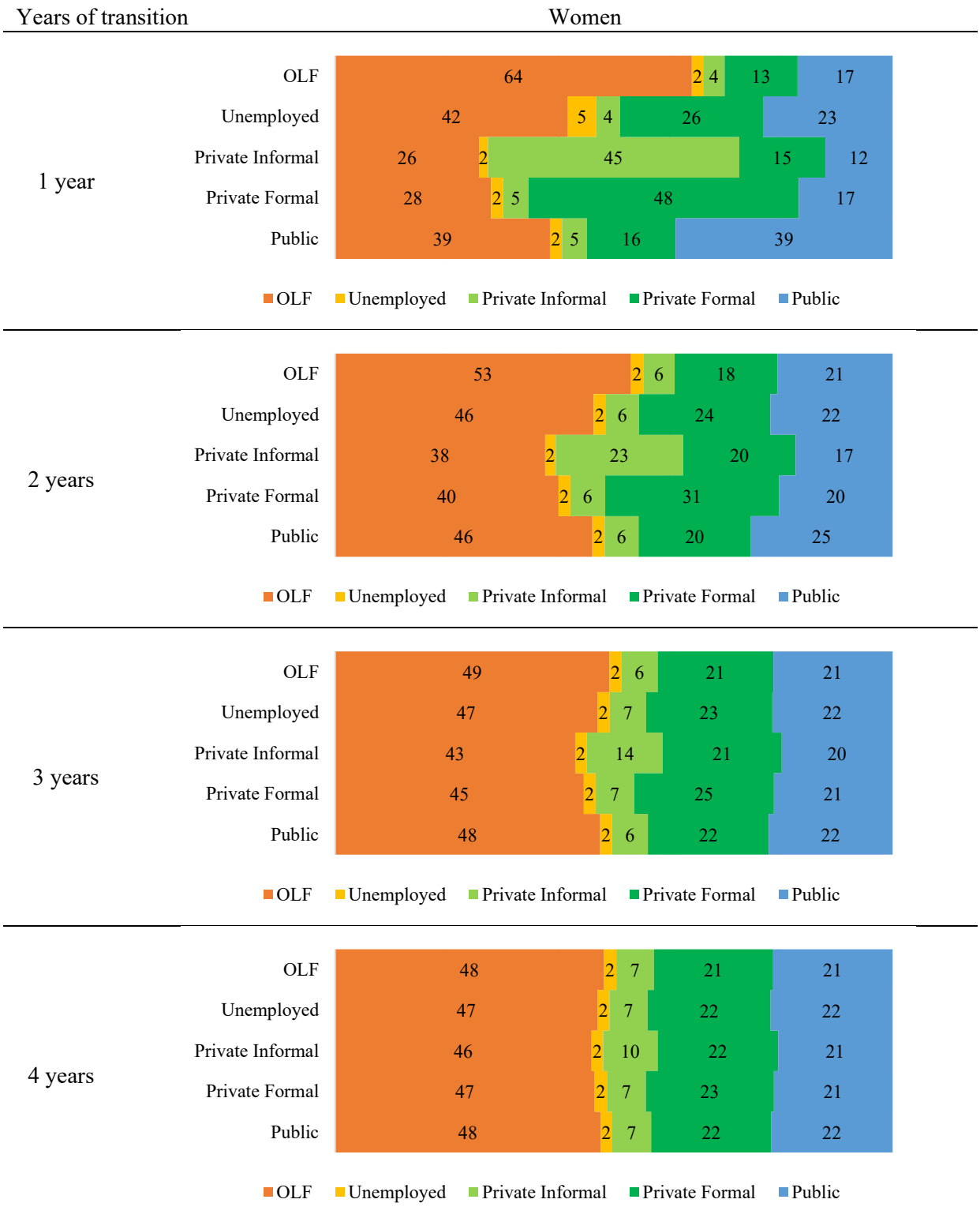
Figure A.1: Simulated transition matrices by employment status, formality and sectors in Mexico per period of transition, among men aged 20-53



4 years	
5 years	
6 years	

Notes. Each panel is the simulated result of transitions after a given period of time by Monte Carlo Method described in Section 4 Methodology. 100,000 simulations of transitions after six years were performed for each initial state, where the transition probability matrix per period is taken from the empirical annual transition matrix in Figure 8. The annual transition matrix relies on panel data from the ENOE in 2005 Q1 and 2006 Q1. We restrict our analysis to men aged 20 to 53 who were interviewed in both rounds. We use transition matrices to examine individuals' transition of their work status/sector between the two dates. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2005 Q1, with the shares in 2006 Q1 reported in brackets. Panel weights are used.

Figure A.2: Simulated transition matrices by employment status, formality and sectors in Mexico per period of transition, among women aged 20-53



Notes. Each panel is the simulated result of transitions after a given period of time by Monte Carlo Method described in Section 4 Methodology. 100,000 simulations of transitions after six years were performed for each initial state, where the transition probability matrix per period is taken from the empirical annual transition matrix in Figure 8. The annual transition matrix relies on panel data from the ENOE in 2005 Q1 and 2006 Q1. We restrict our analysis to women aged 20 to 53 who were interviewed in both rounds. We use transition matrices to examine individuals' transition of their work status/sector between the two dates. We rely on the market definition of work status, search required (reference 1 week). The percentages reported at the end of each row show the shares of individuals in each employment status/sector in 2005 Q1, with the shares in 2006 Q1 reported in brackets. Panel weights are used.