

The Dynamics of Social Insurance in Egypt

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Abstract

Contributory social insurance provides essential benefits to workers when they retire and is associated with a host of other benefits while working. Yet social insurance coverage is low and declining in Egypt. This paper uses both panel and retrospective data from Egypt to assess the dynamics behind these trends in social insurance coverage. Analyses examine the dynamics of gaining social insurance, including specifically at entry and when already working but uninsured. Losing social insurance, both when continuing to work and due to exiting work, is also examined. The results highlight not only the decline of social insurance coverage but an informality trap: workers often obtain social insurance at the start of a job, and so long as they remain employed in that job, are unlikely to lose social insurance. However, workers who start work without social insurance coverage rarely gain social insurance thereafter, unless they change jobs. One reason for the decline in social insurance may be the low value workers place on coverage; the unemployed have, typically, the same reservation wages for jobs with and without social insurance coverage.

Keywords: Social insurance, informality, Egypt.

JEL Classifications: J32, J38, J26, J46, J62.

ملخص

يلعب اقتصاد الرعاية مدفوعة الأجر دورًا حاسمًا في توظيف النساء. ويعمل هذا القطاع أيضًا كآلية للحد من أعمال الرعاية داخل الأسر المعيشية، مما يؤثر على المرأة بشكل غير متناسب. تبحث هذه الورقة في تطور اقتصاد الرعاية المدفوعة الأجر في مصر خلال الفترة 2009-2021، بالاعتماد على ثلاثة مصادر بيانات مختلفة لتقييم الاتجاهات في العمالة وظروف العمل. توضح التحليلات أنه على الرغم من الأهداف المعلنة لتنمية اقتصاد الرعاية المدفوعة الأجر، فقد تقلص التوظيف في مجال الرعاية المدفوعة الأجر بمرور الوقت في مصر مدفوعًا بتراجع القطاع العام. وبينما نمت العمالة في مجال الرعاية في القطاع الخاص، فإنها لم تفعل ذلك بالقدر الكافي للتعويض عن تدهور القطاع العام. وعلاوة على ذلك، تدهورت ظروف العمل في مجال الرعاية بمرور الوقت، ويرجع ذلك جزئيًا إلى زيادة خصصة العمالة في مجال الرعاية. وقد ازدادت مع مرور الوقت الحصص غير الرسمية من العمالة في مجال الرعاية (بدون تغطية للضمان الاجتماعي). وقد أثرت إضفاء الطابع غير الرسمي والخصخصة بشكل خاص على النساء العاملات في مجال الرعاية المدفوعة الأجر. بينما لم تكن هناك فجوة في أجور الرعاية في البداية، فقد تشكلت واحدة بمرور الوقت. إن تشجيع نمو اقتصاد الرعاية المدفوعة الأجر ليس فقط، ولكن أيضًا ظروف العمل اللائقة والمنصفة هي قضية ملحة للتنمية البشرية وعمالة المرأة.

1 Introduction

Informal employment plays an important, but controversial role in labor markets in low- and middle-income countries (LMICs) (Günther & Launov, 2012; Loayza & Rigolini, 2011). Worldwide, around two billion workers are employed informally (International Labour Organization, 2023). More than half of workers are informal, 58% in 2022, with little progress over time, as 60% were informal in 2010 (International Labour Organization, 2023). Informal workers are not contributing to social insurance and lack a host of protections and benefits (International Labour Organization, 2013).³

Past research has established a number of facts about patterns of formality and social insurance coverage for workers. The inability to provide good (socially insured) jobs has been a particular struggle in the Middle East and North Africa (MENA) (Gatti, Angel-Urdinola, Silva, & Bodor, 2014). Workers with social insurance coverage in MENA often benefit not only from social insurance, but also other benefits and higher wages, and are more satisfied with their jobs (Alloush, Chartouni, Gatti, & Silva, 2013; Gatti, Angel-Urdinola, Silva, & Bodor, 2014). Youth and new entrants in MENA are particularly likely to lack social insurance coverage (Alazzawi & Hlasny, 2022; Alhawarin & Selwaness, 2019; Amer, 2019; Angel-Urdinola & Tanabe, 2012; Merouani, 2023).

Relatively less research has focused on the underlying dynamics of formality or social insurance coverage in LMICs or MENA. Some research has analyzed, using panel data, transitions between being uncovered (informal) and covered (formal) by social insurance (Bosch & Maloney, 2010; Fields, Gindling, Sen, Danquah, & Schotte, 2023). Self-employed workers are particularly likely to persist without insurance, while dynamics for wage workers vary substantially across countries (Fields, Gindling, Sen, Danquah, & Schotte, 2023). Past research has highlighted workers' education, job-generating growth, and specific policies encouraging job formality as key to dynamics that increase social insurance and formality (Bosch & Maloney, 2010; Fields, Gindling, Sen, Danquah, & Schotte, 2023; Maurizio & Vásquez, 2019; Romanello & De Oliveira Gonçalves, 2017). This type of research on dynamics and transitions has been limited by the scarcity of labor market panel data in LMICs, and disproportionately focused on Latin America and the Caribbean.

This paper explores the dynamics of social insurance coverage in Egypt, using panel data covering 1998, 2006, 2012, and 2018, as well as retrospective data from 1990-2017. Egypt has low social insurance coverage, only 32% in 2018, a decline from 52% in 1998 (Barsoum & Selwaness, 2022). The analyses examine two key margins of social insurance dynamics: gaining social insurance (often distinguishing at entry from while remaining in employment) and losing social insurance (distinguishing between remaining in employment and exiting work). The research also explores the value workers place on social insurance coverage, comparing reservation wages for the unemployed between jobs with and without social insurance coverage. Although there is a sizeable literature on the effects of social insurance programs in LMICs, there is less on the design and take-up (Banerjee, Hanna, Olken, & Sverdlin-Lisker, 2022).

³ Social insurance is the single criteria for wage workers' formality status per the International Labour Organization (2013); for non-wage workers the definition depends on whether the firm is registered with the government, which is generally a pre-requisite to social insurance coverage.

Our results highlight myriad dynamics behind the decline in social insurance. First, entrants are less likely to obtain social insurance when they transition into employment in recent years. Those already in employment are decreasingly likely to obtain social insurance in recent years. There has also been a substantial increase in workers who had social insurance losing it in recent years. Workers in the public sector, in larger firms, working in establishments, with permanent jobs, who are more educated and older, and with more years in their current job are more likely to gain social insurance and also often less likely to lose social insurance. We demonstrate one reason that social insurance coverage may be declining in Egypt – the unemployed have similar reservation wages for jobs with and without social insurance. The low value placed on social insurance may be due to its design and regressive nature in Egypt.

2 Background: Social insurance coverage and dynamics in Egypt

Social insurance coverage rates in Egypt have been falling since public sector hiring was curtailed in the late 1980s (Assaad, 1997) and structural reform in 1991 (Bromley & Bush, 1994). While historically Egypt and many other countries in MENA had an authoritarian bargain social contract, providing public sector jobs and services in exchange for political acquiescence, this social contract broke down after structural reform, and a new social contract has not effectively developed (Assaad, 2014; Devarajan, 2022; Devarajan & Ianchovichina, 2018; El-Haddad, 2020; Loewe, Zintl, & Houdret, 2021; Malik & Awadallah, 2013). As public sector employment shrank, the private sector was unable to provide quality, socially insured jobs (Assaad, AlSharawy, & Salemi, 2022; Roushdy & Selwaness, 2015; Selwaness & Ehab, 2022; Sieverding & Selwaness, 2012). Social insurance coverage rates were 52% in 1998, but had fallen to 32% by 2018 (Barsoum & Selwaness, 2022).

Two key margins drive social insurance coverage rates for workers. First, for workers who are attached to a firm (wage workers), their firm has to register with the social insurance system (Barsoum & Selwaness, 2022). Second, wage workers must then themselves be specifically enrolled into social insurance by their employer. Self-employed workers likewise have to work in registered and tax-paying businesses (Barsoum & Selwaness, 2022). Casual and intermittent workers (e.g., those in construction and agriculture) can also self-enroll, but rates of doing so are persistently low (Barsoum & Selwaness, 2022).

Both firm-level social insurance registration and worker-level social insurance enrollment have faced challenges over time in Egypt. The decline in public sector hiring has meant more workers are employed by private sector firms, which may or may not be registered with the social insurance system (Assaad, AlSharawy, & Salemi, 2022; Selwaness & Ehab, 2022). Moreover, at least among micro and small household-held enterprises, firm business registration, a pre-requisite to social insurance registration, has declined over time (Krafft, 2016; Krafft, Assaad, Rahman, & Cumanzala, 2020).

The design of Egypt's social insurance scheme is regressive, with high contribution rates, particularly for low earners (Barsoum & Selwaness, 2022). Through 2018 (the period we study) contribution rates were high at 40% (14% employer and 26% employee). In 2019, the rates changed to 29.75% (18.75% employer and 11% employee) (Barsoum & Selwaness, 2022). A maximum nominal level of insurable wages made the system regressive, and this continued to be an issue post-2019 reforms (Barsoum & Selwaness, 2022). Workers must contribute for ten years

to benefit from social insurance at retirement age (age 60 as of 2018) and for twenty years to retire at any age (with a reduced benefit) (Barsoum & Selwaness, 2022; Sieverding & Selwaness, 2012). Some types of workers (irregular, self-employed, and unpaid family workers) are not legally required to contribute to social insurance, while for other workers it is, technically, illegal to not have social insurance (World Bank, 2023).

Among private sector firms that are registered and where some workers have social insurance, only about half of workers are initially enrolled in social insurance at the start of their first job (Selwaness & Ehab, 2022). Workers may subsequently obtain social insurance; coverage rates increase with years of work experience (Roushdy & Selwaness, 2012). Workers may obtain social insurance within the same firm, or by switching jobs, but initial social insurance status tends to be persistent (Selwaness & Ehab, 2022). Past research on the dynamics of social insurance in Egypt has highlighted the rigid labor market and relatively low rates of transition to insured statuses (Assaad & Krafft, 2015; Tansel & Ozdemir, 2019; Yassine, 2015). However, more flexible labor regulations around hiring and firing in 2003 may have helped uninsured workers within registered firms enroll in social insurance (Wahba & Assaad, 2017).

Workers in Egypt may value social insurance and related benefits. Estimates of median reservation wages by sector show that job seekers are willing to accept lower wages in the public sector than the private sector (Barsoum & Abdalla, 2022). Likewise, a study demonstrated that Egyptian job seekers were willing to accept 5-16% lower wages (depending on the elicitation method) in exchange for health insurance (Feld, Nagy, & Osman, 2022). However, job seekers do not necessarily strongly value social insurance in the private sector. Women actually had lower median reservation wages for private sector jobs without social insurance than with social insurance (Barsoum & Abdalla, 2022). This pattern may be because the lower take-home pay with formal jobs may not be worthwhile for women who plan to work only briefly before marriage, and thus not ultimately qualify for social insurance benefits (Assaad, Krafft, & Selwaness, 2022; Selwaness & Krafft, 2021).

3 Data

3.1 Surveys

This paper uses the Egypt Labor Market Panel Survey (ELMPS) waves (OAMDI, 2019). The ELMPS, fielded in 1998, 2006, 2012, and 2018, is a nationally representative panel survey, with refresher samples added each round (see Krafft, Assaad, & Rahman, 2021 for details).⁴ The 1998 wave included 23,997 individuals, the 2006 wave included 37,140 individuals, the 2012 wave included 61,231 individuals, and the 2018 wave 49,186 individuals. We focus our analyses on those aged 18-59, as this is the age group that is eligible for social insurance, with retirement (and receipt of social insurance benefits) typically at age 60 (Selwaness & Ehab, 2022; Sieverding & Selwaness, 2012).

The ELMPS has two key desirable features for analyzing informality dynamics. First, the panel nature of the data allows us to directly assess dynamics, comparing the same individuals at two points in time. We focus on transitions from 2012 to 2018 in our multivariate models, as the most

⁴Data are publicly available at www.erfdportal.com

recent dynamics, but present descriptives on other periods as well. Second, the surveys include a retrospective labor market history.

The retrospective data capture every job lasting 6 months or more, and the nature and timing of initial insertion into the labor market (including unemployment), as well as any periods of unemployment or non-participation following jobs.⁵ For each job, there are data on whether the worker had social insurance in the job, if so whether they obtained it at the start, and if obtained later, when. These variables allow us to create an annualized data set, where an observation is a person and a calendar year, wherein we observe whether they had social insurance coverage within that year, in order to subsequently assess outcome dynamics. The 2018 history implemented substantial improvements in detecting statuses and transitions (Krafft, Assaad, & Rahman, 2021), and we therefore use the 2018 data as our source for retrospective analyses, but cover annual states from 2017 back through 1990 with that data. Each data source had distinct advantages and disadvantages. The panel data are less likely to be subject to recall errors, but are only available for a few points in time. The retrospective data are more likely to be subject to recall error, but allow us to examine trends in each year over a longer time span.

3.2 Outcomes

Our focus is social insurance coverage dynamics. The dynamics compare two points in time, t_0 and t_1 . When we use the panel data, for instance, we compare 2012 (t_0) and 2018 (t_1). When we use the retrospective data, we compare transitions annually, for example, 2010 (t_0) and 2011 (t_1). Our outcomes focus on the dynamics of gaining and losing social insurance. Gaining social insurance is conditional on not having it in t_0 . Losing social insurance is conditional on having it in t_0 . Because social insurance coverage is conditional on being employed ($E_t=1$), we examine some dynamics conditionally and others unconditionally on employment in t_1 . This allows us to distinguish between those who lose social insurance while continuing to work and those who lose social insurance who may do so because they exit work. To consider entrants separately, and their dynamics, we condition on not being employed in t_0 but being employed in t_1 . We also consider separately the dynamics of those employed in both periods. Specifically, we use as our key outcome dummies (indicator function $1[\cdot]$) to consider changes (Δ) in social insurance coverage (y) as:

$$\text{Gain:} \quad \Delta y_{t_0,t_1} = 1(y_{t_1} = 1 | y_{t_0} = 0) \quad (1)$$

$$\text{Gain, currently employed} \quad \Delta y_{t_0,t_1} = 1(y_{t_1} = 1 | y_{t_0} = 0 \ \& \ E_{t_1} = 1) \quad (2)$$

$$\text{Gain, prev. \& curr. employed} \quad \Delta y_{t_0,t_1} = 1(y_{t_1} = 1 | y_{t_0} = 0 \ \& \ E_{t_0} = 1 \ \& \ E_{t_1} = 1) \quad (3)$$

$$\text{Gain, entrants} \quad \Delta y_{t_0,t_1} = 1(y_{t_1} = 1 | y_{t_0} = 0 \ \& \ E_{t_0} = 0 \ \& \ E_{t_1} = 1) \quad (4)$$

$$\text{Lose:} \quad \Delta y_{t_0,t_1} = 1(y_{t_1} = 0 | y_{t_0} = 1) \quad (5)$$

$$\text{Lose, prev. \& curr. employed} \quad \Delta y_{t_0,t_1} = 1(y_{t_0} = 0 | y_{t_1} = 1 \ \& \ E_{t_0} = 1 \ \& \ E_{t_1} = 1) \quad (6)$$

Comparing the dynamics for entrants versus those already in employment and remaining so is particularly important for assessing any informality trap. While we descriptively present gaining

⁵The retrospective data are, of course, subject to recall errors. However, research validating the retrospective data against previous waves of the panel has demonstrated that formal jobs tend to be relatively better measured than other aspects of retrospective work (e.g. hours) (Assaad, Krafft, & Yassin, 2018).

social insurance unconditional on employment, because this conflates gaining employment and gaining social insurance, we do not consider this outcome in our multivariate models, instead conditioning all our gain of social insurance multivariate models on $E_{t1} = 1$, to separate out obtaining employment from obtaining social insurance within employment. The same issue does not occur for losing social insurance, since losing social insurance is conditional on having social insurance at t_0 and thus inherently conditional on being employed at t_0 . In the retrospective data, we cannot observe individuals losing social insurance within a job given how the questions are asked. While we present the lose outcomes descriptively as described above, for our multivariate models with the retrospective (but not panel) data losing social insurance is conditioned on changing jobs, since this would otherwise be a perfect predictor.

3.3 Covariates

We consider a number of covariates that may predict social insurance coverage dynamics. Sex is considered, along with a dummy for being ever married (the latter is time varying) and an interaction between sex and ever married. Region of residence (which distinguishes urban/rural as well as region) is time-varying. The age of the individual (in t_1 , which is mathematically related to t_0) is controlled for quadratically. Our age restrictions of 18-59 are specific to t_1 , so that we include initial transitions and exclude retirement ages (60+).

We also consider employment characteristics. These include whether employment is public sector wage work, private sector wage work, or non-wage work. We account for the firm size, categorically, and whether the firm operates out of a fixed establishment. We consider the economic activity of the firm and the occupation of the worker, categorically. Worker's stability (permanent, temporary, seasonal, or casual) is a key covariate for worker-employer relations.

Covariates for gaining employment primarily consider any employment characteristics in t_1 , since our multivariate outcomes require $E_{t1} = 1$, however, there are a few exceptions, including whether the respondent changed jobs, which is based on both t_1 and t_0 . We also control for the previous state (t_0 employed, unemployed, out of the labor force) in models that include more than one of these groups. We control for whether the worker was in a firm where other workers (but not the respondent) had social insurance in the previous period.⁶ We also control for the natural log of the number of years in the job (at t_1), given past research (Selwaness & Ehab, 2022) showing workers are more likely to obtain social insurance in the first few years of their job. These last two covariates are not included in the models for entrants. Being in a firm where other workers had social insurance is not applicable for losing social insurance. For losing social insurance, we consider the employment covariates primarily based on t_0 . In the retrospective model, we also consider time trends, with dummies for each year, based on the year in t_1 .

4 Methods

We initially present descriptive statistics on social insurance dynamics. We present descriptive statistics from both the retrospective and 1998-2006, 2012-2018, and 2012-2018 panel data. We then turn to logit models for the various gain and loss of social insurance outcomes for the retrospective data and 2012-2018 panel transitions. We present odds ratios and, for the

⁶This is set to zero for the non-employed in t_0 .

retrospective models, cluster standard errors on the individual level, since individuals have multiple observations over time.

5 Results

5.1 *Dynamics of social insurance coverage: descriptive annual transition rates*

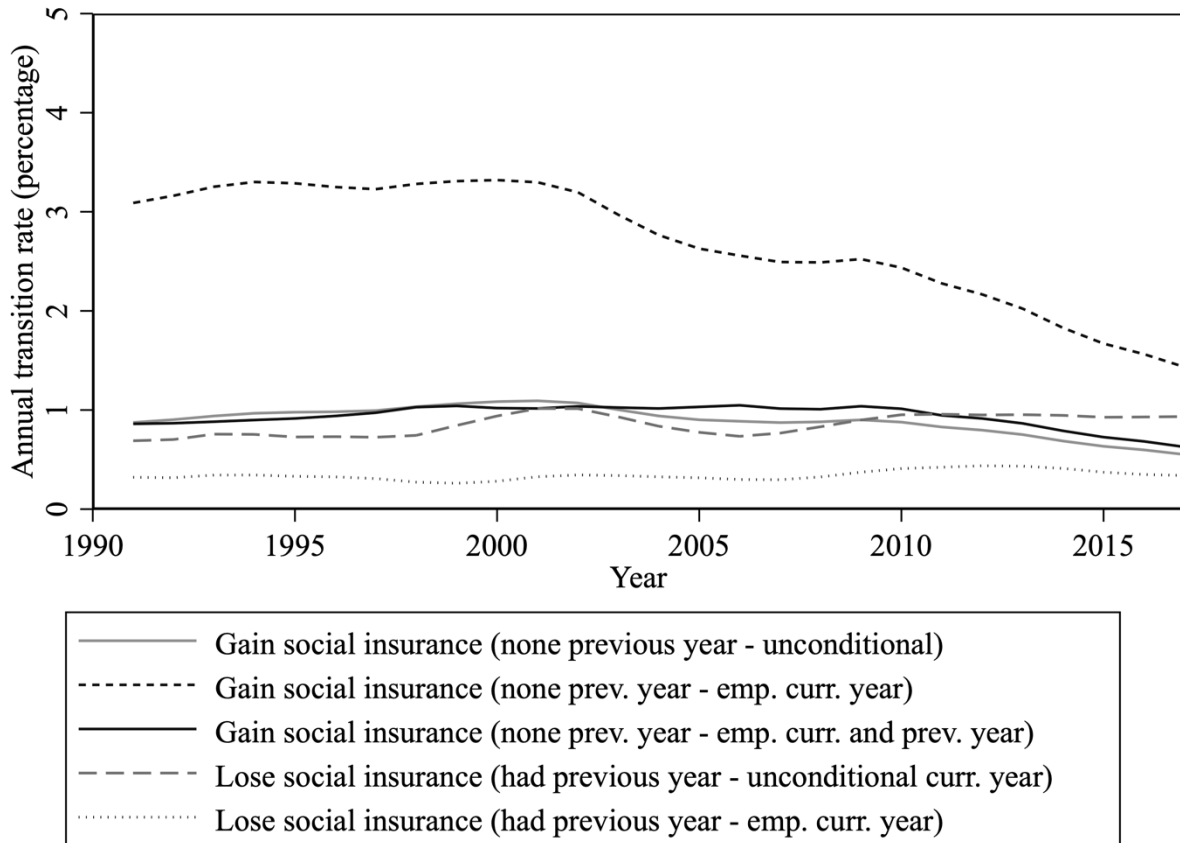
We begin with annual transition rates for gaining and losing social insurance, conditioning on a variety of states, based on the retrospective data, in Figure 1. Even in the 1990s, only around 1% of those who did not have social insurance the previous year gained it each year,⁷ and this rate declined from the early 2000s to 2017. This figure, however, conflates any changes in gaining employment with trends in social insurance. The next series examines gaining social insurance for those who had none the previous year and are employed the current year; around 3% of this group gained social insurance each year in the 1990s, but this fell to around 1.5% by 2017. Those who remained employed were less likely to gain social insurance (we look at entrants only, on a different scale, in Figure 2). Those who were previously employed but lacked social insurance have always had at most a 1% chance of gaining social insurance. This probability actually rose very slightly from the 1990s to 2000, plateaued through 2010, and then declined through 2017. As further corroboration of social insurance as, primarily, a function of conditions at the start of the job, we note that in the ELMPS 2018, 91% of workers who had social insurance coverage reported they got social insurance as soon as they got their job.

We turn now to the dynamics of losing social insurance, for those who had it the previous year. Slightly less than 1% of those who had social insurance the previous year lose it each year.⁸ This is partially driven by those leaving work, as the rate is roughly halved for those who remain employed in the current year.

⁷ As a percentage of the entire adult population (not conditional on anything), 0.7% gain social insurance every year, on average, over the period.

⁸ As a percentage of the entire adult population (not conditional on anything), 0.1% lose social insurance every year, on average, over the period.

Figure 1. Annual transition rates (percentages), individuals aged 18-59 in year, 1990-2017

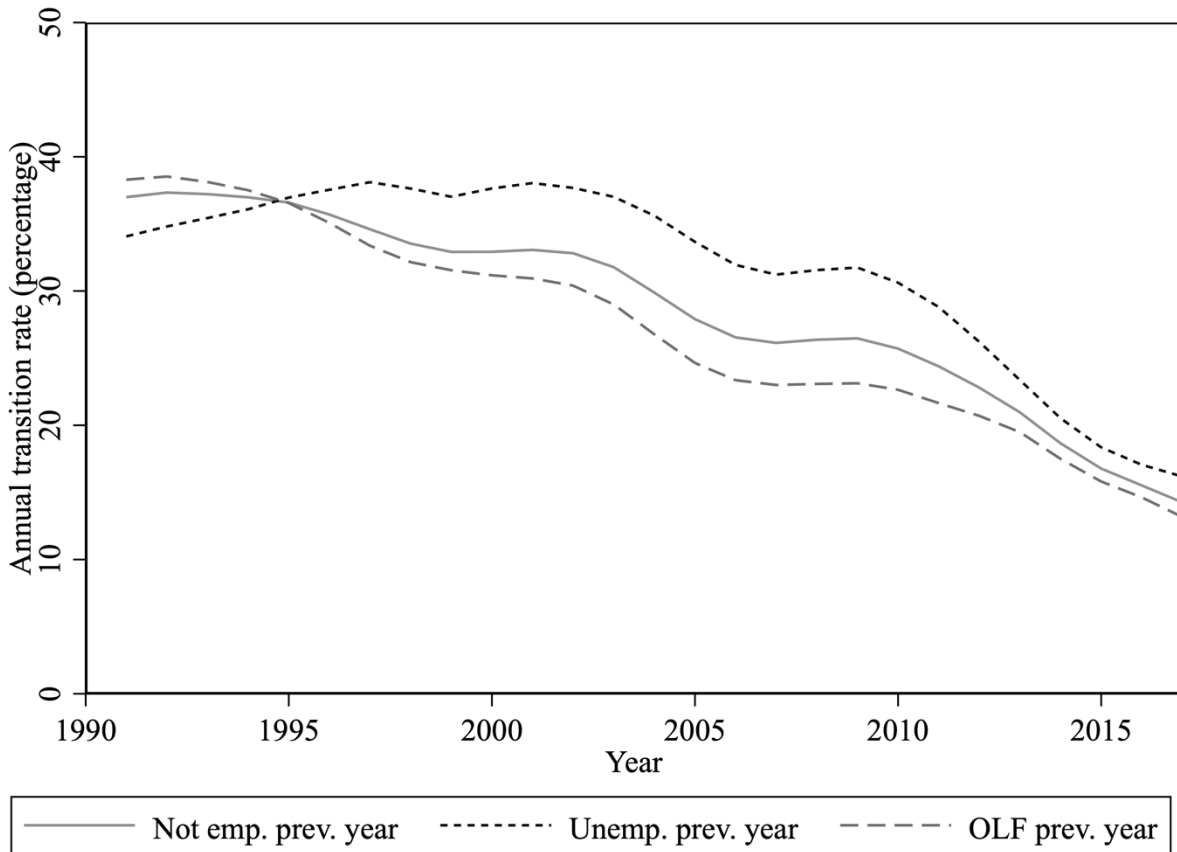


Source: Authors' calculations based on the ELMPS 2018 retrospective data

Notes: Lowess running-mean smoother, bandwidth=0.33

Figure 2 examines annual transition rates for gaining social insurance specifically for the group we refer to as entrants: those non-employed in the previous year who are employed in the current year. We examine patterns both overall for those non-employed in the previous year and separately for the two components of non-employment: the unemployed and those out of the labor force. Obtaining social insurance at entry is much more common than within employment (if social insurance is not obtained initially, as shown in Figure 1). In the early 1990s, slightly more than 35% of entrants obtained social insurance on entry, slightly fewer for the previously unemployed entrants and more for the out of labor force entrants. This rate fell from around 1995 through 2017, when it reached only 15% per year. This is a remarkable decline in obtaining social insurance at entry. Moreover, since obtaining social insurance within a job has remained flat or declined (as shown in Figure 1), this has very concerning implications for future and long-term trends in social insurance coverage. Starting after 1995, it was particularly those entering from unemployment, more so than those entering from out of the labor force, who obtained social insurance at entry. The unemployed may have queued in unemployment, holding out for social insured and particularly public sector jobs.

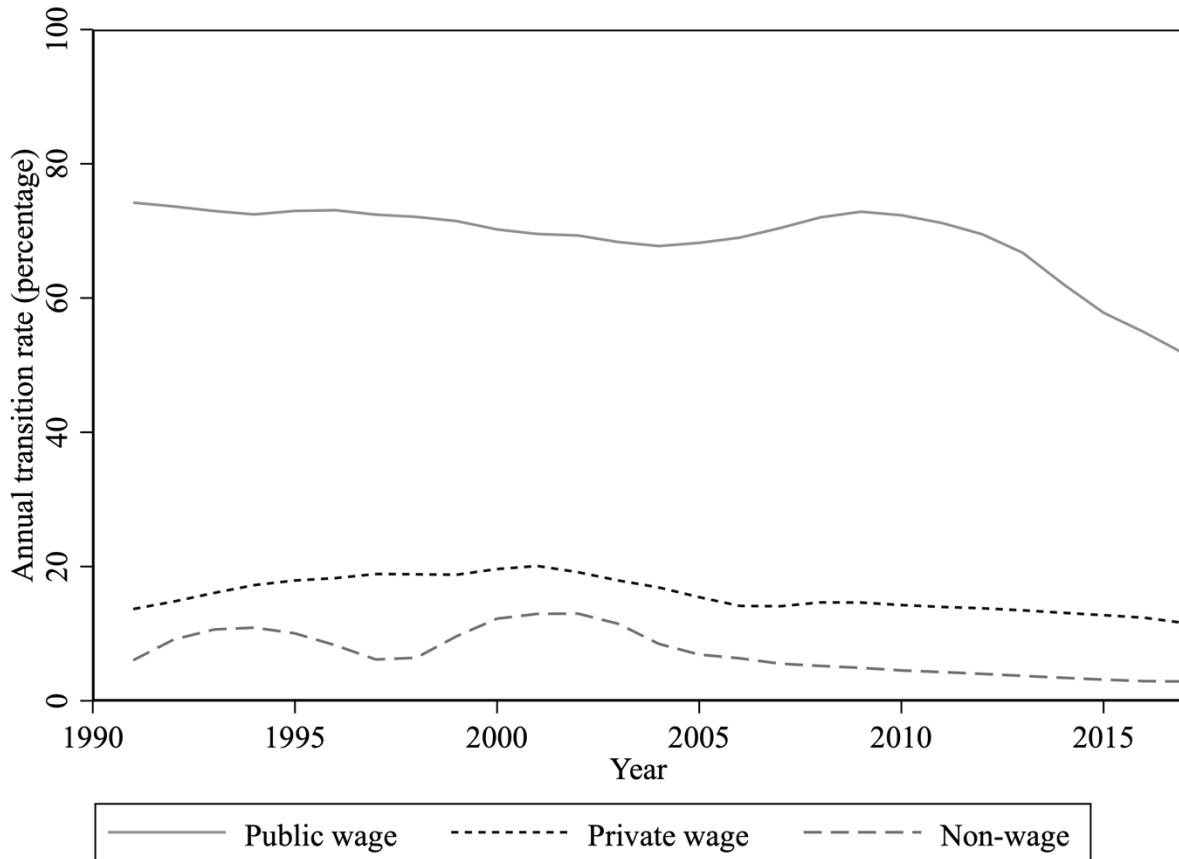
Figure 2. Annual transition rates for gaining social insurance (percentages), individuals aged 18-59 in year, non-employed in previous year (all non-employed, unemployed, and out of the labor force [OLF]), employed in current year, 1990-2017



Source: Authors' calculations based on the ELMPS 2018 retrospective data
 Notes: Lowess running-mean smoother, bandwidth=0.33

Figure 3 explores dynamics at entry by sector. Specifically, it shows for those who were not employed the previous year and are employed the current year the rates of gaining social insurance by the sector of employment in the current year. Public sector entrants' rates of obtaining social insurance coverage at entry were high, around 75%, for the public sector through at least 2012, but then recently declined through 2017. The share of entrants initially obtaining social insurance in the private sector was less than 20% in the early 1990s, rose through the early 2000s, and then declined thereafter. Entrants into non-wage work had fluctuating but slightly higher coverage rates in the 1990s and early 2000s, which then fell through 2017.

Figure 3. Annual transition rates for gaining social insurance (percentages) by sector, individuals aged 18-59 in year, non-employed in previous year, employed in current year, 1990-2017



Source: Authors' calculations based on the ELMPS 2018 retrospective data

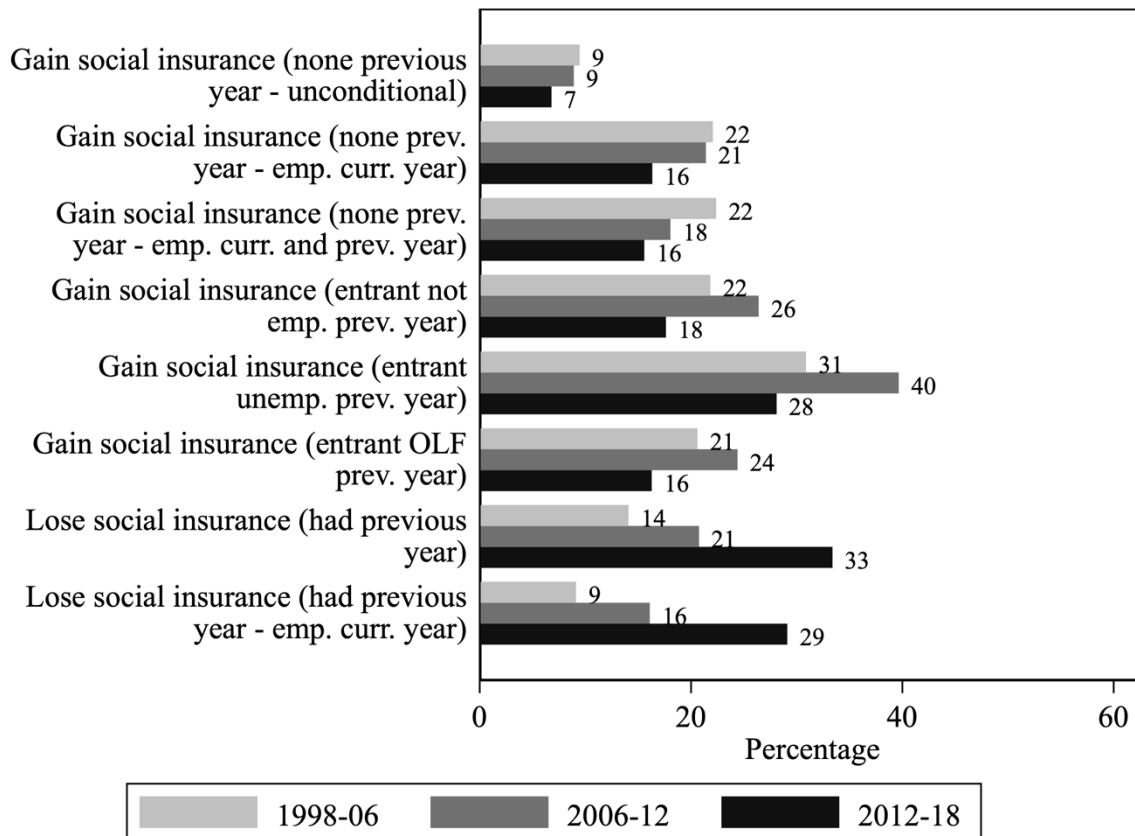
Notes: Lowess running-mean smoother, bandwidth=0.33

5.2 Dynamics of social insurance coverage: descriptive panel transition rates

Figure 4 shows the panel transitions of gaining and losing social insurance coverage over 1998-2006, 2006-2012 and 2012-2018. It is important to keep in mind that 1998-2006 is a longer period by two years. Unconditionally, gaining social insurance declined from 1998-2006 and 2006-2012 (both 9%) to 2012-2018 (7%). Conditioning on current employment, 21% of those without social insurance in 2006 who were then employed in 2012 gained social insurance, compared to 16% of those over 2012 to 2018. The share gaining social insurance while remaining employed also fell over time, from 22% in 1998-2006 to 18% in 2006-2012 to 16% in 2012-2018. Entrants experienced an increase in gaining social insurance from 1998-2006 (22%) to 2006-2012 (26%), but then a further drop in 2012-2018 (18%). This pattern over time held for both entrants from unemployment and entrants from being OLF, but those entering from unemployment (who likely had higher reservation working conditions) were more likely to gain social insurance at entry.

Concerningly, losing social insurance increased substantially over time, rising from 14% of those with social insurance between 1998 and 2006 to 21% in 2006-2012, and 33% between 2012 and 2018. These results are not driven by additional exits from the labor force; among those who remained employed from 1998-2006 only 9% lost social insurance, compared to 16% in 2006-2012 and 29% over 2012-2018. Although there are some differences in the details, the results from the panel are generally consistent with the retrospective data in showing, particularly comparing 1998-2006 and 2012-2018, workers are less likely to gain social insurance at entry or while remaining employed and are more likely to lose social insurance over time.

Figure 4. Panel transition rates (percentages), individuals aged 18-59 in 2006/2012/2018 over panels 1998-2006, 2006-2012 and 2012-2018



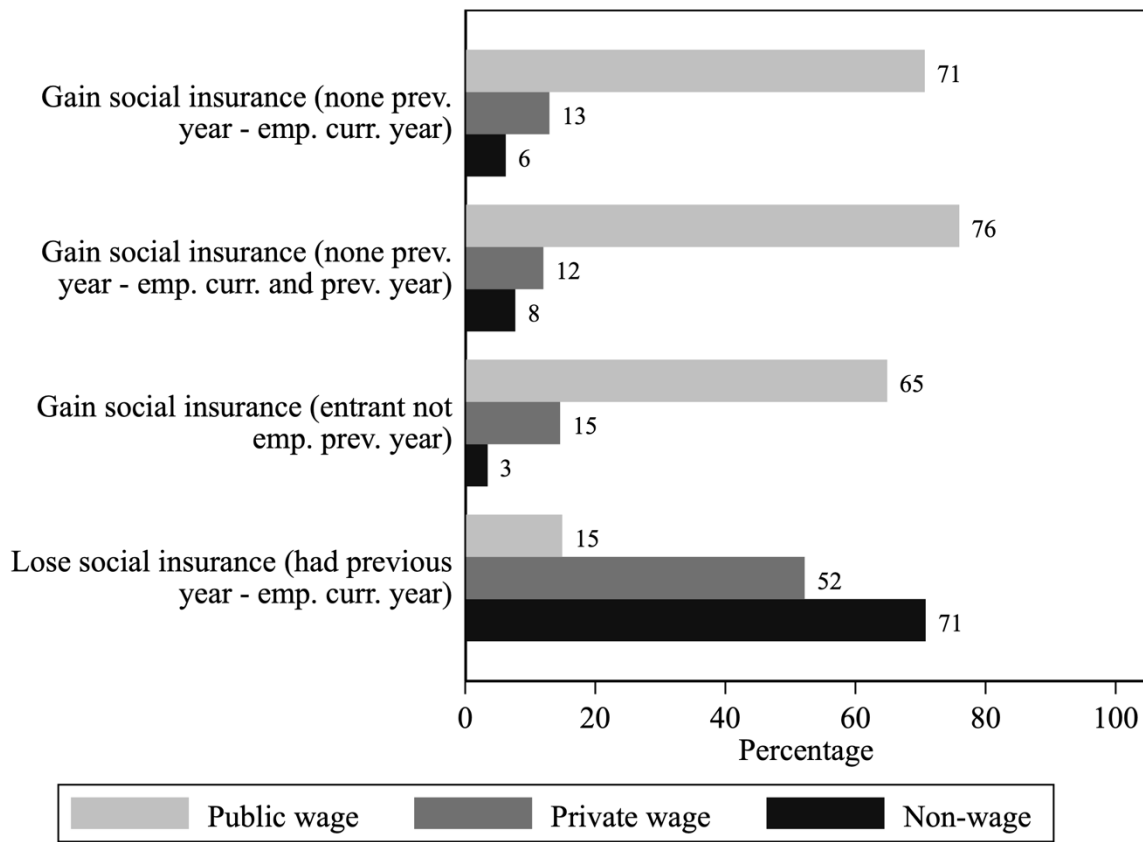
Source: Authors' calculations based on the ELMPS 1998, 2006, 2012, and 2018 panel data

Notes: Entrant is an individual who was not employed in the previous year and is employed in the current year.

Figure 5 shows the panel transitions for 2012-2018 by sector in 2018 (thus, among those employed in 2018). Gains of social insurance for those who did not have it in the previous year are higher in the public sector (71%), compared to the private sector (13%) or non-wage work (6%). There are only some small differences for those who remain employed but did not have social insurance previously and new entrants who were not previously employed in these patterns. Those who were employed but lacked social insurance have a 76% chance of gaining social insurance in the public

sector, but only 12% in the private sector and 8% for non-wage workers. For new entrants, 65% gain social insurance on entry to the public sector, 15% to the private sector, and only 3% in non-wage work. These patterns by sector are, notably, quite consistent with those shown in Figure 3 with the retrospective data. The percentage of those who lose social insurance while remaining employed (but potentially transitioning jobs or sectors, a point we explore in the multivariate models) is lower in the public sector (15%) but higher in the private (52%) and non-wage sectors (71%).

Figure 5. Panel transition rates (percentages), individuals aged 18-59 in 2018, 2012-2018 by sector in 2018



Source: Authors’ calculations based on the ELMPS 1998, 2006, 2012, and 2018 panel data
 Notes: Entrant is an individual who was not employed in the previous year and is employed in the current year.

5.3 Multivariate models of annual gain/loss of social insurance

We now turn to the multivariate models of gaining social insurance in Table 1 and losing social insurance in Table 2, showing results for both the retrospective and 2012-2018 panel in the same tables. We model gaining social insurance for those who did not have it the previous year and are employed the current year; gaining social insurance for those who did not have it in the previous year and were in employment both years; gaining social insurance for entrants (who were not

employed in the previous year); losing social insurance for those who had it the previous year; and losing social insurance for those who had it previously and remained currently employed. We discuss our results first for gaining and then for losing social insurance.

From the retrospective data, those whose previous state was out of the labor force or unemployed are more likely to gain social insurance than those who were previously employed but did not have social insurance already (odds ratios around 1.7). There are not, however, statistically significant differences between the two non-employment states in the probability of gaining social insurance for entrants. The results from the panel data on the previous (2012) state show positive but not significant differences for those previously in non-employment. Compared to public sector wage workers, current private sector wage workers and non-wage workers have significantly lower changes of obtaining social insurance. There are not large differences between private sector wage workers and non-wage workers, but there are large differences by current firm size, with larger firms significantly more likely to give their workers social insurance. Establishment-based firms are also significantly more likely to provide social insurance. Compared to permanent workers, temporary, casual, and especially seasonal workers are significantly less likely to gain social insurance.

By far the strongest predictor of gaining social insurance from the retrospective data is changing jobs (odds ratio of 984 in the gain model that includes all previous labor market states; odds ratio of 2548 in the model that includes those both currently and previously employed). The panel data shows no impact for changing jobs. There is a positive odds ratio on having a previous formal firm in the model that includes all previous labor market states, but this is significant only for the retrospective data and only for the model for those who were both previously and currently employed (odds ratio of 1.6).

Compared to the wholesale and retail trade, workers currently in transportation and storage and other services (for some models) are significantly more likely to gain social insurance, while workers in accommodation and food services are significantly less likely (for some models). Compared to managers, the occupations of clerical support workers, service and sales workers, skilled agricultural workers, craft and related trades workers, and elementary occupations have lower odds of gaining social insurance (in at least one and usually more models), with the lowest for agricultural workers. Plant and machine workers, professionals, and technicians have similar odds to managers.

In terms of worker demographics, women are significantly less likely to gain social insurance than men in some of the models. More educated workers are significantly more likely to gain social insurance in most of the models. Ever married individuals (particularly the reference men) are significantly more likely to gain social insurance (significant in some models). The probability of gaining social insurance rises and then falls with age (both the main and squared terms are significant in most models). There are significantly lower odds of gaining social insurance in some of the models in rural areas and for those abroad. More (log) years in the job predicts a significantly higher probability of gaining social insurance. There are significantly lower odds of gaining social insurance starting in 2013 in the overall and entrant models.

We turn now to the models of losing social insurance, for all workers (including those who lose by exiting employment) and those who remain employed. For these models, employment characteristics are of the previous type of work. Models are conditional on having social insurance in the previous period. Those previously in private wage work are significantly more likely to lose social insurance than public sector wage workers; the odds ratio for non-wage work is greater than one but insignificant for the retrospective data (possibly due to the relatively few non-wage workers with social insurance). Only in the panel models are there significantly lower odds of losing social insurance when working in a larger firm. Compared to permanent workers, casual workers are more likely to lose social insurance (significantly so in most models).

Compared to wholesale/retail activities the only significant difference is a lower odds of losing social insurance in other services activities in the retrospective models. Craft and related trades workers and elementary occupations are significantly more likely to lose social insurance compared to the reference category of managers in the retrospective models.

Women remaining employed are significantly less likely to lose social insurance in the panel data (no significant differences in the retrospective data), but more educated workers, particularly university graduates are significantly less likely to lose social insurance, as are the ever married (significant in most models). There is a reduction in losing social insurance with age (but only significant in some cases). There are in some cases significantly higher odds of losing social insurance in Lower Egypt, particularly rural areas, and when abroad/missing. There was a significantly lower chance of losing social insurance in 1994 compared to 1991 in the still employed model, but not in any other year.

Table 1. Logit models of (1) Gain social insurance (none previous year, emp. current year); (2) Gain social insurance (none previous year, emp. current and previous year); (3) Gain social insurance (entrants: none previous year, emp. current and non-emp. previous year) by data source

| | <u>Gain (emp. curr.)</u> | | <u>Gain (emp. curr & prev.)</u> | | <u>Gain (non-emp. prev. emp. curr.)</u> | |
|--|--------------------------|---------------------|-------------------------------------|---------------------|---|---------------------|
| | Retro. | Panel | Retro. | Panel | Retro. | Panel |
| Labor market status (prev. year) (emp. omit.) | | | | | | |
| OLF | 1.733*** (0.196) | 1.362 (0.248) | | | | |
| Unemployed | 1.708*** (0.197) | 1.196 (0.331) | | | 1.032 (0.095) | 0.773 (0.229) |
| Current type of work (public wage omit.) | | | | | | |
| Private wage | 0.317*** (0.034) | 0.318*** (0.056) | 0.270*** (0.051) | 0.244*** (0.052) | 0.314*** (0.038) | 0.302*** (0.077) |
| Non-wage | 0.275*** (0.045) | 0.242*** (0.055) | 0.258*** (0.067) | 0.213*** (0.054) | 0.229*** (0.046) | 0.208*** (0.091) |
| Firm size (1-4 omit.) | | | | | | |
| 5-9 | 0.794 (0.121) | 0.944 (0.174) | 0.997 (0.262) | 1.121 (0.232) | 0.765 (0.136) | 0.698 (0.259) |
| 10-24 | 2.113*** (0.311) | 1.927*** (0.373) | 1.806** (0.396) | 2.156*** (0.502) | 2.176*** (0.377) | 1.815 (0.655) |
| 25-49 | 3.490*** (0.520) | 2.957*** (0.704) | 3.965*** (1.087) | 3.728*** (0.990) | 3.342*** (0.566) | 2.485* (1.084) |
| 50-99 | 4.938*** (0.807) | 6.097*** (1.648) | 5.173*** (1.352) | 6.032*** (1.721) | 5.235*** (1.041) | 6.635*** (3.258) |
| 100+ | 6.515*** (0.802) | 7.591*** (1.264) | 5.810*** (1.141) | 7.078*** (1.388) | 6.466*** (0.942) | 8.619*** (2.516) |
| Don't Know | 2.735*** (0.459) | 5.107*** (1.644) | 1.970* (0.531) | 3.188*** (1.097) | 3.057*** (0.597) | 4.760** (2.427) |
| Establishment (out omit.) | | | | | | |
| In establishment | 1.649** (0.257) | 2.608*** (0.441) | 1.913** (0.459) | 2.516*** (0.488) | 1.468* (0.246) | 2.307** (0.748) |
| Stability (perm. omit.) | | | | | | |
| Temporary | 0.317*** (0.035) | 0.453*** (0.074) | 0.400*** (0.072) | 0.583** (0.119) | 0.302*** (0.037) | 0.288*** (0.077) |
| Seasonal | 0.059*** (0.043) | 0.241* (0.153) | 0.132 (0.157) | 0.320 (0.211) | 0.029*** (0.031) | |
| Casual | 0.221*** (0.046) | 0.285*** (0.074) | 0.431** (0.124) | 0.320*** (0.095) | 0.169*** (0.046) | 0.337* (0.152) |
| Change job (no omit.) | | | | | | |
| Changed job | 983.984*** (203.667) | 1.032 (0.203) | 2548.221*** (823.493) | 1.175 (0.284) | | |
| Previous firm formal (no omit.) | | | | | | |
| Previous firm formal | 1.279 (0.229) | 1.109 (0.221) | 1.609* (0.317) | 1.190 (0.244) | | |
| Econ. act. (retail omit.) | | | | | | |
| Agriculture | 1.187 | 0.445 | 1.525 | 0.578 | 1.060 | 0.203 |

| | <u>Gain (emp. curr.)</u> | | <u>Gain (emp. curr & prev.)</u> | | <u>Gain (non-emp. prev. emp. curr.)</u> | |
|---|--------------------------|--------------|-------------------------------------|--------------|---|--------------|
| | <u>Retro.</u> | <u>Panel</u> | <u>Retro.</u> | <u>Panel</u> | <u>Retro.</u> | <u>Panel</u> |
| | | (0.382) | (0.316) | (0.771) | (0.457) | (0.454) |
| Manufacturing & utilities | 1.231 | 1.090 | 1.423 | 1.064 | 1.101 | 0.986 |
| | (0.182) | (0.238) | (0.337) | (0.271) | (0.204) | (0.406) |
| Construction | 0.939 | 1.100 | 1.009 | 0.743 | 0.786 | 1.603 |
| | (0.176) | (0.304) | (0.289) | (0.223) | (0.182) | (0.752) |
| Transp. & storage | 2.129*** | 2.513*** | 2.351** | 2.042* | 2.072** | 3.957* |
| | (0.385) | (0.686) | (0.619) | (0.625) | (0.533) | (2.350) |
| Accomm. & food serv. | 0.502* | 0.458* | 0.318* | 0.519 | 0.525* | 0.363 |
| | (0.139) | (0.153) | (0.160) | (0.195) | (0.172) | (0.227) |
| Other Services | 1.386* | 0.941 | 1.933** | 1.188 | 1.069 | 0.809 |
| | (0.181) | (0.189) | (0.408) | (0.269) | (0.176) | (0.288) |
| Occupation (manager omit.) | | | | | | |
| Professionals | 0.882 | 1.442 | 0.679 | 0.783 | 0.984 | 1.991 |
| | (0.170) | (0.444) | (0.202) | (0.293) | (0.239) | (1.096) |
| Technicians and associate professionals | 1.061 | 1.644 | 0.968 | 1.696 | 0.987 | 1.785 |
| | (0.244) | (0.494) | (0.338) | (0.597) | (0.269) | (1.054) |
| Clerical support workers | 0.658* | 0.796 | 0.853 | 0.651 | 0.649 | 0.811 |
| | (0.139) | (0.253) | (0.287) | (0.254) | (0.171) | (0.462) |
| Service and sales workers | 0.567** | 0.506** | 0.588 | 0.485* | 0.517** | 0.665 |
| | (0.108) | (0.126) | (0.164) | (0.138) | (0.125) | (0.344) |
| Skilled ag. | 0.129*** | 0.189* | 0.135*** | 0.156* | 0.105*** | 0.283 |
| | (0.059) | (0.137) | (0.081) | (0.125) | (0.064) | (0.325) |
| Craft and related trades workers | 0.408*** | 0.313*** | 0.452** | 0.351*** | 0.353*** | 0.262* |
| | (0.085) | (0.087) | (0.135) | (0.108) | (0.095) | (0.157) |
| Plant and machine op. | 0.931 | 1.354 | 1.192 | 1.661 | 0.721 | 0.854 |
| | (0.191) | (0.357) | (0.335) | (0.495) | (0.188) | (0.486) |
| Elementary occupations | 0.493** | 0.391* | 0.485 | 0.322** | 0.430** | 0.640 |
| | (0.125) | (0.146) | (0.196) | (0.133) | (0.135) | (0.504) |
| Sex (male omit.) | | | | | | |
| Female | 0.687** | 0.723 | 0.306** | 1.156 | 0.786 | 0.709 |
| | (0.089) | (0.220) | (0.115) | (0.756) | (0.105) | (0.269) |
| Education (illit. omit.) | | | | | | |
| Reads & Writes | 0.795 | 1.063 | 0.822 | 0.975 | 0.755 | 1.374 |
| | (0.183) | (0.277) | (0.249) | (0.269) | (0.237) | (1.298) |
| Primary | 1.291 | 1.136 | 0.970 | 1.747 | 1.717 | 0.229 |
| | (0.314) | (0.437) | (0.299) | (0.507) | (0.617) | (0.271) |
| Preparatory | 1.805* | 2.575** | 1.163 | 2.651** | 2.694** | 3.517 |
| | (0.514) | (0.752) | (0.428) | (0.862) | (0.917) | (2.354) |
| General secondary | 1.138 | 1.700 | 1.187 | 1.438 | 1.356 | 3.204 |
| | (0.311) | (0.724) | (0.557) | (0.798) | (0.448) | (2.177) |
| Vocational secondary | 1.248 | 2.464*** | 0.913 | 1.934** | 1.946** | 6.232*** |
| | (0.204) | (0.475) | (0.204) | (0.403) | (0.429) | (3.075) |
| Post-secondary institute | 1.613* | 4.808*** | 1.197 | 5.879*** | 2.404** | 6.908** |
| | (0.335) | (1.529) | (0.387) | (2.298) | (0.654) | (4.384) |
| University & above | 1.377 | 3.125*** | 1.138 | 2.605*** | 1.933** | 6.405*** |
| | (0.253) | (0.767) | (0.301) | (0.702) | (0.462) | (3.569) |
| Ever married (no omit.) | | | | | | |
| Ever married | 1.244* | 1.479* | 1.243 | 1.831* | 1.256 | 1.748* |

| | <u>Gain (emp. curr.)</u> | | <u>Gain (emp. curr & prev.)</u> | | <u>Gain (non-emp. prev. emp. curr.)</u> | |
|-------------------------------------|--------------------------|---------------------|-------------------------------------|-------------------|---|------------------|
| | <u>Retro.</u> | <u>Panel</u> | <u>Retro.</u> | <u>Panel</u> | <u>Retro.</u> | <u>Panel</u> |
| | (0.136) | (0.264) | (0.197) | (0.459) | (0.178) | (0.457) |
| Ever married # sex int. | | | | | | |
| Ever married # Female | 0.716 (0.124) | 0.702 (0.246) | 0.578 (0.301) | 0.686 (0.475) | 0.699 (0.135) | 0.598 (0.289) |
| Year of age | 1.203*** (0.046) | 1.125* (0.063) | 1.148* (0.080) | 1.160* (0.079) | 1.163*** (0.052) | 1.107 (0.108) |
| Year of age sq. | 0.997*** (0.001) | 0.999 (0.001) | 0.998* (0.001) | 0.999 (0.001) | 0.998** (0.001) | 0.999 (0.001) |
| Region (Greater Cairo omit.) | | | | | | |
| Alx. Sz C. | 0.805 (0.114) | 1.228 (0.316) | 0.655 (0.178) | 1.712 (0.523) | 0.833 (0.129) | 0.820 (0.310) |
| Urb. Lwr. | 0.888 (0.109) | 1.266 (0.293) | 0.813 (0.158) | 1.462 (0.405) | 0.887 (0.125) | 0.893 (0.319) |
| Urb. Upp. | 0.957 (0.114) | 1.140 (0.261) | 1.201 (0.239) | 1.156 (0.321) | 0.818 (0.110) | 1.268 (0.441) |
| Rur. Lwr. | 0.710* (0.098) | 1.316 (0.278) | 0.746 (0.152) | 1.445 (0.359) | 0.663* (0.115) | 1.119 (0.358) |
| Rur. Upp. | 0.741* (0.097) | 1.152 (0.259) | 0.639* (0.135) | 1.509 (0.395) | 0.793 (0.126) | 0.675 (0.230) |
| Abroad/missing | 0.695 (0.174) | | 0.884 (0.329) | | 0.543* (0.165) | |
| Ln of years in job | 2.067*** (0.204) | 1.483*** (0.160) | 1.659** (0.262) | 1.364* (0.184) | | |
| Year (1991 omit.) | | | | | | |
| 1992 | 0.751 (0.251) | | 1.123 (0.758) | | 0.652 (0.271) | |
| 1993 | 1.359 (0.503) | | 1.845 (1.114) | | 1.304 (0.654) | |
| 1994 | 1.225 (0.426) | | 1.526 (0.922) | | 1.173 (0.555) | |
| 1995 | 1.107 (0.336) | | 1.062 (0.617) | | 1.209 (0.470) | |
| 1996 | 0.735 (0.250) | | 1.180 (0.701) | | 0.708 (0.316) | |
| 1997 | 1.129 (0.365) | | 2.371 (1.489) | | 0.863 (0.375) | |
| 1998 | 1.028 (0.319) | | 2.279 (1.395) | | 0.794 (0.302) | |
| 1999 | 0.957 (0.330) | | 1.852 (1.234) | | 0.947 (0.426) | |
| 2000 | 0.948 (0.273) | | 1.595 (0.964) | | 0.941 (0.342) | |
| 2001 | 0.764 (0.274) | | 1.270 (0.930) | | 0.725 (0.324) | |
| 2002 | 0.985 (0.337) | | 1.326 (0.789) | | 0.847 (0.344) | |
| 2003 | 0.840 (0.254) | | 1.046 (0.646) | | 0.797 (0.306) | |
| 2004 | 0.775 | | 1.134 | | 0.792 | |

| | <u>Gain (emp. curr.)</u> | | <u>Gain (emp. curr & prev.)</u> | | <u>Gain (non-emp. prev. emp. curr.)</u> | |
|-----------------------------|--------------------------|--------------|-------------------------------------|--------------|---|--------------|
| | Retro. | Panel | Retro. | Panel | Retro. | Panel |
| 2005 | (0.231) | | (0.673) | | (0.307) | |
| | 0.869 | | 2.296 | | 0.645 | |
| 2006 | (0.256) | | (1.349) | | (0.238) | |
| | 0.630 | | 1.061 | | 0.585 | |
| 2007 | (0.191) | | (0.637) | | (0.233) | |
| | 1.122 | | 2.010 | | 0.928 | |
| 2008 | (0.338) | | (1.208) | | (0.342) | |
| | 0.957 | | 2.272 | | 0.667 | |
| 2009 | (0.277) | | (1.328) | | (0.242) | |
| | 0.782 | | 1.456 | | 0.770 | |
| 2010 | (0.237) | | (0.931) | | (0.296) | |
| | 0.771 | | 1.225 | | 0.747 | |
| 2011 | (0.232) | | (0.734) | | (0.273) | |
| | 0.648 | | 1.120 | | 0.594 | |
| 2012 | (0.192) | | (0.680) | | (0.225) | |
| | 0.701 | | 0.946 | | 0.695 | |
| 2013 | (0.203) | | (0.554) | | (0.258) | |
| | 0.471** | | 0.721 | | 0.444* | |
| 2014 | (0.134) | | (0.427) | | (0.160) | |
| | 0.686 | | 1.176 | | 0.607 | |
| 2015 | (0.205) | | (0.666) | | (0.232) | |
| | 0.527* | | 0.736 | | 0.485 | |
| 2016 | (0.164) | | (0.428) | | (0.191) | |
| | 0.376** | | 0.865 | | 0.294** | |
| 2017 | (0.121) | | (0.515) | | (0.126) | |
| | 0.436** | | 0.594 | | 0.410* | |
| | (0.135) | | (0.360) | | (0.163) | |
| N (obs. person-year) | 156949 | 7217 | 147503 | 4726 | 9618 | 2501 |
| N (obs. person) | 14760 | | 12177 | | 8649 | |
| Pseudo R-sq. | 0.675 | 0.437 | 0.707 | 0.425 | 0.415 | 0.482 |

Notes: *p<0.05; **p<0.01; ***p<0.001. Cells are odds ratios. Standard errors in parentheses, clustered on the individual level in retrospective models.

Source: Authors' calculations based on ELMPS 2018 retrospective data and ELMPS 2012-2018 panel data

Table 2. Logit models of (1) Lose social insurance (had previous year); (2) Lose social insurance (had previous year, emp. current year) by data source

| | Lose (emp. prev.) | | Lose (emp. curr & prev.) | |
|--|--------------------|---------------------|--------------------------|---------------------|
| | Retro. | Panel | Retro. | Panel |
| Previous type of work (public wage omit.) | | | | |
| Private wage | 2.148* (0.666) | 2.688*** (0.415) | 2.084* (0.696) | 2.517*** (0.414) |
| Non-wage | 1.670 (1.014) | 4.215*** (1.153) | 1.765 (1.100) | 3.718*** (1.068) |
| Firm size (1-4 omit.) | | | | |
| 5-9 | 1.774 (1.188) | 0.926 (0.280) | 1.948 (1.236) | 0.889 (0.291) |
| 10-24 | 0.698 (0.359) | 0.686 (0.173) | 0.679 (0.361) | 0.607* (0.145) |
| 25-49 | 0.672 (0.415) | 0.642 (0.149) | 0.905 (0.526) | 0.569* (0.133) |
| 50-99 | 1.182 (0.629) | 0.461*** (0.108) | 1.180 (0.673) | 0.438*** (0.105) |
| 100+ | 1.463 (0.743) | 0.476*** (0.099) | 1.266 (0.644) | 0.434*** (0.090) |
| Don't Know | 1.580 (0.818) | 0.633 (0.176) | 1.484 (0.753) | 0.639 (0.178) |
| Establishment (out omit.) | | | | |
| In establishment | 2.359 (1.285) | 1.050 (0.352) | 2.180 (1.058) | 0.917 (0.320) |
| Stability (perm. omit.) | | | | |
| Temporary | 1.602 (0.474) | 0.852 (0.176) | 1.614 (0.492) | 0.789 (0.182) |
| Casual | 3.743* (2.308) | 2.405* (0.954) | 4.002* (2.554) | 2.252 (0.935) |
| Econ. act. (retail omit.) | | | | |
| Agriculture | 0.899 (0.802) | 1.532 (1.099) | 0.745 (0.683) | 1.480 (1.071) |
| Manufacturing & utilities | 0.500 (0.204) | 0.721 (0.191) | 0.460 (0.196) | 0.646 (0.177) |
| Construction | 1.196 (0.664) | 0.736 (0.288) | 1.044 (0.591) | 0.583 (0.216) |
| Transp. & storage | 0.636 (0.345) | 1.069 (0.351) | 0.482 (0.254) | 0.965 (0.327) |
| Accomm. & food serv. | 0.497 (0.374) | 2.010 (0.884) | 0.665 (0.428) | 1.811 (0.822) |
| Other Services | 0.347** (0.135) | 0.771 (0.191) | 0.350** (0.140) | 0.734 (0.185) |
| Occupation (manager omit.) | | | | |
| Professionals | 2.358 (1.316) | 1.284 (0.370) | 2.307 (1.379) | 1.163 (0.374) |
| Technicians and associate professionals | 1.766 (1.096) | 0.992 (0.284) | 1.483 (0.935) | 1.076 (0.343) |
| Clerical support workers | 2.097 | 0.912 | 1.801 | 1.011 |

| | Lose (emp. prev.) | | Lose (emp. curr & prev.) | |
|-------------------------------------|-------------------|----------|--------------------------|----------|
| | Retro. | Panel | Retro. | Panel |
| | (1.292) | (0.299) | (1.138) | (0.362) |
| Service and sales workers | 1.319 | 0.851 | 1.014 | 0.879 |
| | (0.858) | (0.269) | (0.637) | (0.291) |
| Skilled ag. | 0.200 | 0.849 | 0.153 | 0.956 |
| | (0.249) | (0.641) | (0.189) | (0.734) |
| Craft and related trades workers | 5.095* | 0.900 | 4.953* | 0.935 |
| | (3.438) | (0.323) | (3.280) | (0.361) |
| Plant and machine op. | 3.560* | 0.751 | 3.230 | 0.742 |
| | (2.303) | (0.250) | (2.060) | (0.269) |
| Elementary occupations | 6.066* | 0.542 | 5.120* | 0.603 |
| | (4.800) | (0.174) | (3.962) | (0.210) |
| Sex (male omit.) | | | | |
| Female | 1.240 | 0.441 | 0.832 | 0.323* |
| | (0.479) | (0.186) | (0.395) | (0.154) |
| Education (illit. omit.) | | | | |
| Reads & Writes | 0.538 | 0.440** | 0.641 | 0.506* |
| | (0.342) | (0.139) | (0.404) | (0.164) |
| Primary | 0.948 | 0.324*** | 0.943 | 0.373** |
| | (0.646) | (0.108) | (0.663) | (0.131) |
| Preparatory | 0.593 | 0.270*** | 0.608 | 0.388** |
| | (0.389) | (0.090) | (0.416) | (0.139) |
| General secondary | 0.165* | 0.265** | 0.126 | 0.344* |
| | (0.141) | (0.112) | (0.140) | (0.159) |
| Vocational secondary | 0.262* | 0.239*** | 0.295* | 0.342*** |
| | (0.140) | (0.060) | (0.158) | (0.089) |
| Post-secondary institute | 0.624 | 0.122*** | 0.676 | 0.189*** |
| | (0.394) | (0.040) | (0.438) | (0.066) |
| University & above | 0.143*** | 0.108*** | 0.162** | 0.173*** |
| | (0.080) | (0.031) | (0.090) | (0.052) |
| Ever married (no omit.) | | | | |
| Ever married | 0.611 | 0.460** | 0.585* | 0.497* |
| | (0.181) | (0.131) | (0.156) | (0.154) |
| Ever married # sex int. | | | | |
| Ever married # Female | 1.086 | 2.635* | 0.752 | 2.042 |
| | (0.537) | (1.146) | (0.586) | (1.015) |
| Year of age | 0.921 | 0.817** | 0.917 | 0.852* |
| | (0.091) | (0.054) | (0.083) | (0.060) |
| Year of age sq. | 1.001 | 1.002** | 1.001 | 1.002* |
| | (0.001) | (0.001) | (0.001) | (0.001) |
| Region (Greater Cairo omit.) | | | | |
| Alx. Sz C. | 0.757 | 1.334 | 0.822 | 1.283 |
| | (0.281) | (0.266) | (0.306) | (0.287) |
| Urb. Lwr. | 0.846 | 1.243 | 0.894 | 1.537* |
| | (0.305) | (0.232) | (0.328) | (0.303) |
| Urb. Upp. | 0.677 | 0.888 | 0.714 | 0.939 |
| | (0.272) | (0.166) | (0.297) | (0.188) |
| Rur. Lwr. | 3.604*** | 1.280 | 3.825*** | 1.585* |
| | (1.248) | (0.222) | (1.370) | (0.285) |
| Rur. Upp. | 1.449 | 0.894 | 1.423 | 1.036 |
| | (0.605) | (0.181) | (0.596) | (0.211) |

| | Lose (emp. prev.) | | Lose (emp. curr & prev.) | |
|---------------------------|------------------------|-------------------|--------------------------|------------------|
| | Retro. | Panel | Retro. | Panel |
| Abroad/missing | 131.425*** (60.214) | | 8.471*** (4.634) | |
| Ln of years in job | 0.818 (0.131) | 0.816* (0.082) | 0.787 (0.120) | 0.887 (0.085) |
| Year (1991 omit.) | | | | |
| 1992 | 0.596 (0.736) | | 0.529 (0.528) | |
| 1993 | 0.749 (0.950) | | 0.897 (0.863) | |
| 1994 | 0.101 (0.131) | | 0.052* (0.065) | |
| 1995 | 2.054 (2.464) | | 1.718 (1.514) | |
| 1996 | 1.841 (2.243) | | 1.436 (1.331) | |
| 1997 | 0.391 (0.606) | | 0.398 (0.434) | |
| 1998 | 1.387 (1.686) | | 0.904 (0.868) | |
| 1999 | 0.860 (1.141) | | 0.677 (0.745) | |
| 2000 | 0.627 (0.801) | | 0.523 (0.532) | |
| 2001 | 2.443 (2.989) | | 1.502 (1.430) | |
| 2002 | 0.534 (0.785) | | 0.597 (0.635) | |
| 2003 | 1.816 (2.250) | | 1.694 (1.644) | |
| 2004 | 1.099 (1.491) | | 0.804 (0.960) | |
| 2005 | 0.831 (0.990) | | 0.779 (0.719) | |
| 2006 | 0.520 (0.610) | | 0.279 (0.261) | |
| 2007 | 3.072 (4.134) | | 2.232 (2.409) | |
| 2008 | 1.505 (1.790) | | 1.232 (1.097) | |
| 2009 | 0.757 (0.894) | | 0.237 (0.234) | |
| 2010 | 1.954 (2.353) | | 1.681 (1.524) | |
| 2011 | 1.083 (1.347) | | 0.787 (0.775) | |
| 2012 | 2.357 (2.956) | | 1.824 (1.766) | |
| 2013 | 1.966 (2.330) | | 1.441 (1.331) | |
| 2014 | 1.837 | | 1.243 | |

| | Lose (emp. prev.) | | Lose (emp. curr & prev.) | |
|------------------------------|-------------------|------------------|--------------------------|-------------------|
| | Retro. | Panel | Retro. | Panel |
| 2015 | (2.192) 2.319 | | (1.146) 1.665 | |
| 2016 | (2.761) 2.042 | | (1.555) 1.663 | |
| 2017 | (2.372) 1.441 | | (1.468) 0.964 | |
| | (1.716) | | (0.913) | |
| Change job (no omit.) | | | | |
| Changed job | | 1.079 (0.176) | | 1.417* (0.226) |
| N (obs. person-year) | 1336 | 3519 | 949 | 3335 |
| N (obs. person) | 1139 | | 808 | |
| Pseudo R-sq. | 0.525 | 0.170 | 0.284 | 0.182 |

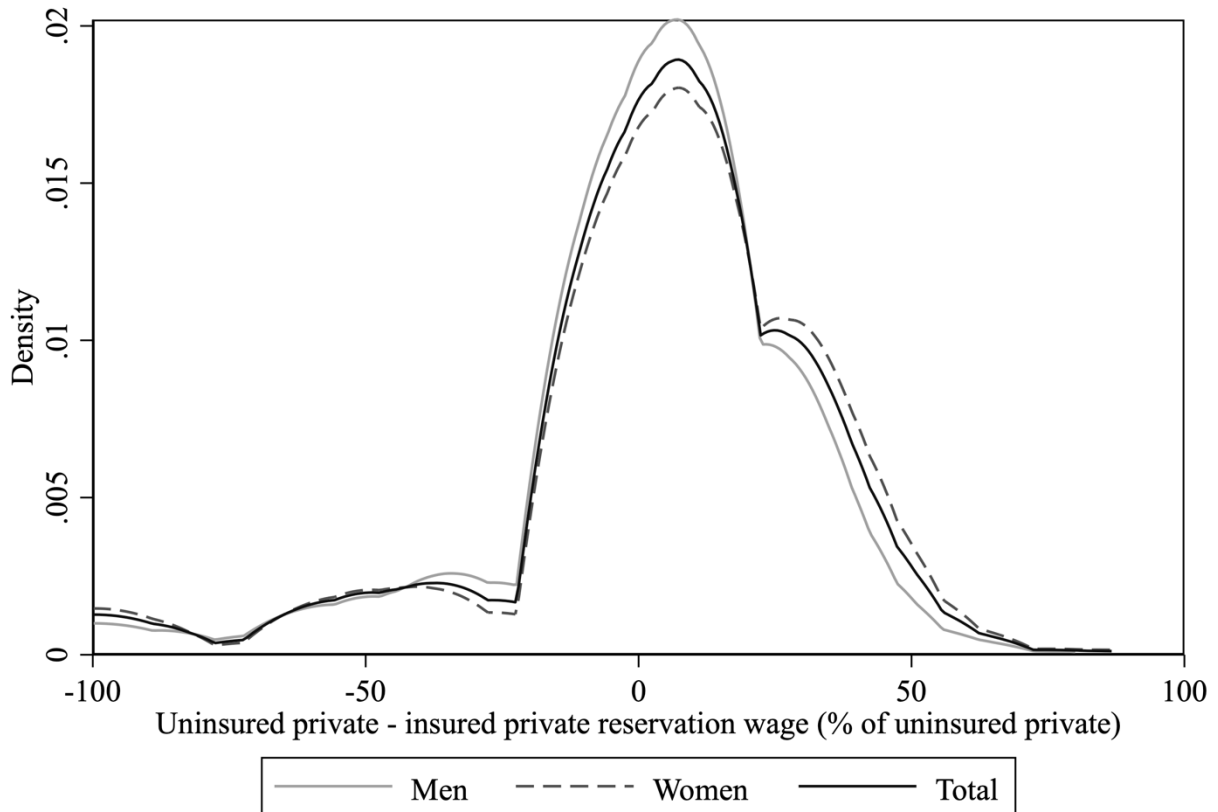
Notes: *p<0.05; **p<0.01; ***p<0.001. Cells are odds ratios. Standard errors in parentheses, clustered on the individual level in retrospective models.

Source: Authors' calculations based on ELMPS 2018 retrospective data and ELMPS 2012-2018 panel data

5.4 Do workers value social insurance? The private sector social insurance reservation wage premium

Figure 6 explores one potential reason behind low rates of social insurance coverage; the value that is placed on these benefits. Specifically, the figure looks at the private sector social insurance reservation wage premium. Unemployed workers are asked their reservation wage for a private sector job with social insurance, and then without social insurance, and this figure graphs private uninsured minus private insured wages, as a percent of the private uninsured wage. If workers valued social insurance, they would be willing to accept a lower wage for a socially insured job, and there would be a social insurance premium. The premium is in fact, on average, not a premium. The mean difference (uninsured reservation wage minus insured reservation wage as a percentage of uninsured reservation wage) is -18% and the median is 0%. The 25th percentile is 0% and the 75th percentile 20%.

Figure 6. Private sector social insurance reservation wage premium (as a percentage of uninsured private reservation wage) by sex, unemployed individuals aged 18-59, 2018



Source: Authors' calculations based on the ELMPS 2018 data

Notes: Private sector social insurance reservation wage premium is uninsured private reservation wage – insured private reservation wage. Using the broad market definition of unemployment

Men have a lower premium (median 0%, mean -28%) for social insurance than women (median 0%, mean -10%), which may relate to women's higher reservation working conditions generally (Dougherty, 2014). However, there are not systematic patterns of differences by education level (not shown, all education levels have a median of 0%). Likewise, both the new unemployed and unemployed who have worked before have a median 0% premium for social insurance. Those who have ever worked have a -11% mean premium, compared to -21% for those who never worked. These results at least suggests that level of understanding of the social insurance system, if correlated with education or work experience, is not a key driver of the low value workers place on social insurance.

6 Discussion and conclusions

Globally, more than half of workers (58%) lack social insurance coverage and are thus informal, missing out on a host of benefits and protections (International Labour Organization, 2023). The MENA region in general and Egypt in particular have more than two-thirds of workers (68%) who lack social insurance coverage (World Bank, 2023). Only 32% of workers were covered by social insurance in Egypt as of 2018, a decrease from the 52% covered in 1998 (Barsoum & Selwaness, 2022).

This paper explored the dynamics behind these troubling trends in social insurance in Egypt. We found a variety of dynamics all contributing to declining social insurance coverage. First, entrants are less likely to obtain social insurance when starting a job than they used to be, with a particular decline in the 2012-2018 period. When workers are working without social insurance, they have decreasing chances of obtaining social insurance while employed. Moreover a rising share of workers over time are losing social insurance – even when remaining employed (although not necessarily in the same job). The combined trends of lower initial coverage for entrants, lower rates of obtaining social insurance (if not obtained initially) while employed, and increases in the loss of social insurance all contribute to declines in social insurance coverage over time.

An important area for future research is to understand whether reforms to the social insurance system that took place after the period we study have had any effects on dynamics. Such research should be possible with a future, 2023 wave of the ELMPS. Although social insurance coverage rates had not increased substantially as of 2021 (Assaad & Wahby, 2023), it may take some time for the effects of reforms to be felt.

In multivariate models, we highlighted key predictors of gaining and losing social insurance coverage. Those working the public sector, in large firms, and in establishments, were more likely to obtain social insurance coverage. Workers who were in professional or operations occupations, who were more educated and older, and with more years in their current job were more likely to gain social insurance. These groups were also often, but not always, less likely to lose social insurance. Interestingly, working within a formal firm (one where other workers have social insurance) but not being insured only predicted significantly higher social insurance subsequently in one of the four models.

The design of the social insurance system may lead workers to place a low value on social insurance coverage, contributing to declines in coverage over time. Additional analyses showed that unemployed individuals placed, typically, zero value on a private sector job with social insurance, despite the benefits of social insurance. The regressive nature of social insurance – an issue in other LMICs as well (Palacios & Robalino, 2020) – may make social insurance unappealing for many workers.

A number of limitations of our analyses must be kept in mind. We present results from both retrospective and panel data. Each has distinct advantages and disadvantages. The retrospective data are subject to recall bias; although key states (e.g. employment and sector) tend to be recalled well (Assaad, Krafft, & Yassin, 2018), other details, such as the date of start of social insurance, may be subject to more error. The retrospective data do not capture loss of social insurance within

a job, but this is a dynamic we can capture with the panel. The panel data are, however, only for a few points in time, while the retrospective data capture annual trends.

We lack information on the reasons why workers gained, or lost, social insurance. Key questions for future research include: Why does social insurance coverage in Egypt keep falling? How are the (perceived) costs and benefits of social insurance changing? Future research could add particular value around understanding more carefully the value workers and employers place on social insurance and why they do (or do not) want social insurance. Understanding whether workers and employers fully understand the costs and benefits of social insurance – but do not value them – or have misunderstandings that are contributing to low coverage is an important future research question. Policy responses for an information problem would be very different than for a case where workers and employers understand the benefits and costs of social insurance. Experimental research could be done to elicit valuation in different ways, as with similar research in Egypt on other benefits (Feld, Nagy, & Osman, 2022), and subsequently explore the impacts of different approaches to increasing social insurance coverage, such as raising awareness.

Despite these limitations, the paper adds important evidence on the dynamics behind limited social insurance coverage. Research in other LMICs has highlighted how jobs without social insurance coverage tend to be a trap or “dead end” for workers, particularly for self-employment (Fields, Gindling, Sen, Danquah, & Schotte, 2023). Our results show similar, limited dynamics for those who were already employed, for instance only 16% of those who lacked social insurance in 2012 but were employed gaining it by 2018. Some other countries, however, have much more dynamic and frequent transitions between informality and formality (Bosch & Maloney, 2010).

A variety of approaches have been undertaken to try to increase uptake of social insurance in LMICs, including premium subsidies, additional/bundled benefits, information campaigns, and enrollment assistance (Canelas & Niño-Zarazúa, 2022a). Jobseekers may under-estimate wage growth in formal jobs, such that temporary wage incentives increased covered (formal) employment in an experiment in Mexico (Abel, Carranza, Geronimo, & Ortega, 2022). Sustained employment growth was a key pre-requisite, but one that interacted with the policy environment, in extending social insurance coverage in Latin America (Maurizio & Vásquez, 2019). Social insurance expansion contributed to declines in inequality in a number of (but not all) countries in the region (Maurizio, Beccaria, & Monsalvo, 2021).

Entrants may also value social insurance coverage at less than it costs, as was found in Mexico (Abel, Carranza, Geronimo, & Ortega, 2022). Our results on the social insurance premium suggest that, typically, unemployed workers require a similar wage for a socially insured job as an uninsured one. Research on the willingness to pay for social insurance highlights greater willingness to pay for less expensive and more flexible contributions, better benefits, and higher quality of administration (Miti, Perkio, Metteri, & Atkins, 2021). The time horizon and workers’ discount rates for benefits in old age may also come into play; workers were quite willing in one experiment with job seekers to accept substantially less in wages for a health insurance benefit (Feld, Nagy, & Osman, 2022), but that benefit was received contemporaneously.

How can social insurance coverage be increased in Egypt? Egypt has undertaken a number of reforms to both firm registration (a pre-requisite to social insurance coverage for workers) and the social insurance system. For instance, the new Micro, Small, and Medium Enterprise Law (No.

152 of 2020) has as a key goal formalizing informal firms (Shehata & Partners Law Firm, 2020). Although reforms to the social insurance system in 2019 reduced contribution rates, the system remains regressive (Barsoum & Selwaness, 2022). Transforming it into a progressive system could be particularly important for increasing coverage.

The shifts in the sectoral composition of Egypt's economy have not driven declines in social insurance coverage (Assaad & Wahby, 2023). Some groups of workers, such as irregular wage workers, are theoretically now included in the newly reformed system, but face substantial documentation barriers to social insurance coverage (Selwaness & Barsoum, 2023). Beyond regressivity, other aspects of the design of Egypt's firm registration laws and social insurance system may make the costs too high to be worth the benefits for many workers and firms. Rapid inflation may have eroded real wages in ways that make workers less willing to forgo current earnings for future pension benefits (Selwaness & Barsoum, 2023). Under-reporting of wages, which was historically common, may have also become more difficult under the new system, raising the costs of social insurance (Selwaness & Barsoum, 2023).

Further reforms, including progressivity and simplification of registration for both firms and workers could help grow formal employment. Efforts to simplify tax procedures and lower tax rates for micro firms in Brazil, for example, increased firm formality and employment (Fajnzylber, Maloney, & Montes-Rojas, 2011). Additional reforms that reduce costs, simplify procedures, and increase benefits of social insurance likewise merit consideration in Egypt.

One approach that has been proposed elsewhere that could more substantially reform the social insurance system is moving from payroll to consumption taxes as (at least part of) the financing source (Anton-Sarabia, Hernandez, & Levy, 2012; Esteban-Pretel & Kitao, 2021; Pagés, 2017). This change would essentially move social insurance from a contributory to non-contributory scheme. A similar approach could be a flat minimum old age benefit that is non-contributory and a contributory system for additional benefits (World Bank, 2023). One downside of this approach would be that, while more workers would receive benefits in old age, workers might become more willing to work for unregistered firms, or in situations without other benefits or protections. The literature shows mixed effects in this regard, in some cases no effects and in others small concentrated effects (Canelas & Niño-Zarazúa, 2022b, 2022a). This change could, however, be particularly valuable for encouraging labor mobility generally and entrepreneurship specifically, given our results on the persistence of social insurance states and transitions to non-wage work often leading to the loss of social insurance.

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