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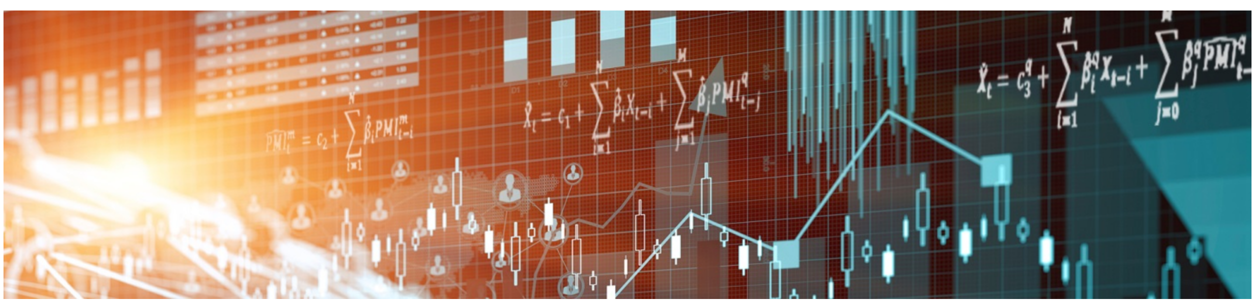

by Olena Kostyshyna and Etienne Lalé

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On the Evolution of Multiple Jobholding in Canada

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Abstract

The number of workers who hold more than one job (a.k.a. multiple jobholders) has increased recently in Canada. While this seems to echo the view that non-standard work arrangements are becoming pervasive, the increase has in fact been trivial compared with the long-run rise of multiple jobholding that has occurred since the mid-1970s. In this paper, we document this historical evolution and provide a comprehensive account of its underlying dynamics. To this end, we use restricted-access panel micro-data from the Canadian Labour Force Survey to construct transition probabilities into and out of multiple jobholding. We analyze these data through the lens of a trend decomposition that separates out the role of labor market inflows and outflows. The picture that emerges from our analysis is one of continued increases in the propensity of workers to take on second jobs. We argue that changes in technology and in preferences could both be responsible for this evolution.

Bank topics: Econometric and statistical methods; Labour markets
JEL codes: E24, J21, J22, J60

Résumé

Au Canada, le nombre de personnes occupant plus d’un emploi – une situation appelée le « cumul d’emplois » – a augmenté récemment. Bien que ce constat semble confirmer l’idée que les emplois atypiques soient en train de se généraliser, la hausse est en fait marginale si on la compare à la progression du cumul d’emplois enregistrée depuis le milieu des années 1970. Dans notre étude, nous documentons cette évolution de long terme et brossons un tableau détaillé des forces à l’œuvre. À partir de microdonnées longitudinales à accès limité tirées de l’Enquête sur la population active de Statistique Canada, nous estimons les probabilités qu’un travailleur passe du non-emploi ou d’un emploi unique à plusieurs emplois, et vice-versa. Nous avons ensuite recours à une décomposition en tendance qui permet d’isoler le rôle de chacune des probabilités d’entrée et de sortie du cumul d’emplois. Notre analyse montre que la propension des travailleurs à occuper un deuxième emploi a augmenté de façon continue. En conclusion, nous avançons que cette évolution pourrait être due à la fois au progrès technologique et à des changements de préférences à l’égard du travail.

Sujets : Méthodes économétriques et statistiques, Marchés du travail
Codes JEL : E24, J21, J22, J60

Non-technical summary

Motivation and question

The number of workers who hold more than one job (multiple jobholders) has increased since the mid-1970s in Canada. In this paper, we study long-term trend dynamics in the rate of multiple job holding: we document historical evolution and provide a comprehensive account of the underlying dynamics of inflows and outflows. The understanding of inflows into and outflows from multiple jobholding can deepen our understanding of the state of the labour market.

Methodology

We use restricted-access micro data from the Canadian Labour Force Survey to construct time series of inflows into and outflows from multiple jobholding for the first time in Canada. Using these series, we computed transition rates in and out of multiple jobholding and use them to understand the evolution of the multiple jobholding rate over the past four decades. The reason we focus on Canada is that, to our knowledge, its Labour Force Survey is the only source of data on multiple jobholding that covers such a long period of time – it started in 1976. For comparison, in the United States, the Current Population Survey (CPS) started collecting information on multiple jobholding in January 1994.

We analyze data through the lens of a trend decomposition that separates out the role of labour market inflows and outflows. Looking at worker flows allows us to distinguish between two non-exclusive explanations for the increase in multiple jobholding: that single jobholders have become more likely to take on a second job, or that multiple jobholders have become less likely to give up their second job.

Key results and contributions

The picture that emerges from our analysis is one of continued increases in workers' likelihood of taking on second jobs. First, from the mid-1970s until the 1990–92 recession, inflows and outflows are both important to understand the rapid increase in multiple jobholding. That is, single jobholders became more likely to take on second jobs, and at the same time multiple jobholders reduced their propensity to give up their second job. Second, from the 1990–92 recession until today, the evolution of multiple jobholding is mainly explained by the inflows – and especially by the probability of inflow transition of full-time workers. For instance, during the last decade, multiple jobholders became more likely to give up their second job. This change was offset by the continued increases in the propensity of single jobholders (especially full-timers) to take on second jobs.

We argue that changes in technology, preferences, and market structure could be responsible for this evolution.

1 Introduction

Participation in non-standard work arrangements has become an object of keen interest among scholars, policy makers, and the general public alike. The usual perception is that these arrangements are increasingly common in modern labor markets.[1] Yet we often lack measurements that span a long period of time to permit a broad view of the trends that affect non-standard work arrangements. In this paper, we focus on one such work arrangement, namely multiple jobholding, and illustrate the importance of studying its dynamics over the long run. Specifically, we use restricted-access panel data for Canada to estimate the time series that are necessary to understand the evolution of multiple jobholding over the past four decades. The picture that emerges from our analysis is one of continued increases in the propensity of Canadian workers to take on second jobs. Changes in technology and in preferences could both be responsible for this evolution, as we argue in this paper.

Key facts of interest are depicted in Figure 1. The employment share of workers who hold more than one job (whom we call multiple jobholders) has increased in the 2010s, but this change appears very modest once put in perspective using data from mid-1970s until today. A crucial first step to interpret the trend in the *stock*, or number, of multiple jobholders is to describe accurately the behavior of the gross worker *flows* that govern its evolution. As is well known at least since Akerlof and Main [1981], a picture of labor market dynamics based on stocks says little about the size and changes of the underlying inflows and outflows.[2] At a more substantive level, looking at worker flows allows us to distinguish between two (non-exclusive) explanations for the increase in multiple jobholding: that single jobholders have increased their propensity to take on a second job, or that multiple jobholders have become less likely to give up their second job quickly. After obtaining consistent estimates of inflow and outflow transition probabilities, we devise a statistical decomposition that enables us to disentangle and quantify the role of these two sources of changes.

[1]Non-standard work arrangements encompass a wide spectrum of alternatives to the traditional 'Monday–Friday 9am–5pm'. Typical examples are flexible scheduling, working from home, project-based employment, and working irregular schedules (for detailed examples, see Hamermesh and Stancanelli [2015] and Mas and Pallais [2017]). Interest in studying non-traditional, flexible work arrangements is largely related to research on the labor market effects of the 'gig economy' (Katz and Krueger [2019]).

[2]See, among numerous references, Darby et al. [1986], Blanchard and Diamond [1990], and Blanchard and Portugal [2001] for important early examples.

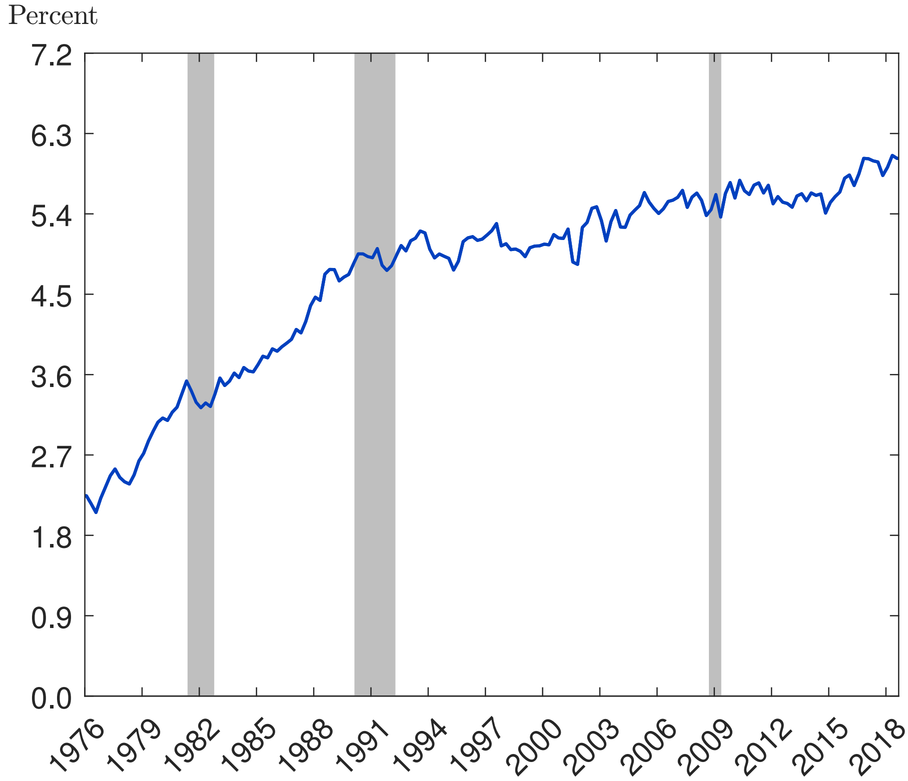


Figure 1: The multiple jobholding share: 1976–2018

Notes: LFS data, 1976–2018, time series cleared from seasonal variations. Gray-shaded areas indicate recession periods identified by the C.D. Howe Institute Business Cycle Council.

We reach the following conclusions by analyzing data separately for men and women, and by distinguishing between full-time and part-time employment. First, during the period from the mid-1970s until the 1990–92 recession, inflows and outflows are both important to understand the rapid increase in multiple jobholding. That is, single jobholders became more likely to take on second jobs, and at the same time multiple jobholders reduced their propensity to give up the second job quickly. The panel structure of the data does not permit us to track individuals over a sufficiently long period of time and control for unobserved heterogeneity, which is a common problem in the 'ins and outs' literature (e.g. Fujita and Ramey [2009], Shimer [2012], Elsby et al. [2015]). Yet we suspect that unobserved heterogeneity could be key to explaining those changes in transition probabilities. That is, the decrease in the propensity to give up the second job may well be driven by a 'mover-stayer phenomenon' if those workers who became more likely to take on second jobs have a longer expected duration of multiple jobholding. Second, from the 1990–92 recession until today, the evolution of multiple jobholding is predominantly explained by the inflows, and especially by the inflow transition probability of full-time workers. For instance, during the last decade multiple jobholders actually became more likely to give up their second job. Ceteris paribus, based on the behavior of outflow transition probabilities, multiple jobholding should have dropped substantially. That change was dwarfed by the continued increases in the propensity of single jobholders (especially full-timers) to take on second jobs. In sum, while the evolution of multiple jobholding veils substantial and complex changes in the underlying inflows and outflows, our statistical decomposition helps us to narrow down the picture to the most relevant source of variation.

What are the most likely explanations for the (hitherto undocumented) continued increases in the propensity of Canadian workers to take on second jobs? In the last section of the paper, we list several patterns that we view as potential candidate explanations. We informally discuss them by drawing auxiliary information from the Labor Force Survey and by using empirical evidence from the literature. We find that, holding individuals' demand for working more hours constant, certain changes in technology may have made it easier for workers to do so. These include changes in firms' ability to coordinate different work schedules of employees, enabling employers to provide workers with additional flexibility in hours. On the workers' side, lower commute times and set-up costs could also be responsible for the rise in the probability to take on a second job. Preference-based hypotheses are plausible, too, although our assessment favors the first set of explanations. One such example is that workers' valuation of flexible work arrangements and willingness to diversify their work experience has increased over time.

Our paper contributes to a growing body of literature that documents trends in non-standard work arrangements (Mas and Pallais [2017], Datta et al. [2019], Katz and Krueger [2019]). Several papers in this vein of literature have highlighted the challenges of measuring such work arrangements; see, e.g. Abraham et al. and Katz and Krueger [2019]. There is a longer tradition of measurement for the particular example on which we focus: namely, multiple jobholding. In the United States (U.S.) a series of contributions by Hirsch et al. [2016], Hirsch and Winters [2016], and Hirsch et al. [2017] has documented several interesting facts to characterize this outcome. Lalé [2015, 2016] complemented that work by studying worker inflows and outflows in U.S. data. It is worth mentioning that multiple jobholding has decreased over the past two decades in the U.S. labor market. This change took place following an increase in multiple jobholding during the 1980s, as reported by Stinson Jr [1990] and Kimmel and Powell [1999]. Kimmel and Powell [1999] also documented the levels and changes of multiple jobholding in Canada between 1981 and 1995. We substantially expand these studies by researching a longer period of time and by obtaining estimates of transition probabilities into and out of multiple jobholding. At a more substantive level, our paper contributes to studying the motives that govern multiple jobholding, and more generally the paths of adjustment in working hours. Related references include Shishko and Rostker [1976], Krishnan [1990], Paxson and Sicherman [1996], Conway and Kimmel [1998, 2001], and Hlouskova et al. [2017]. In Section 5, we explicitly build on the insights from these studies to provide potential explanations for the changing propensity of workers to take on second jobs.

We strike a note of caution before closing this introduction. Our analysis focuses on a single country and, as has just been noted, some of the trends that we uncover might be specific to that country. The reason we focus on Canada is that, to our knowledge, its Labor Force Survey (LFS) is the only source of data on multiple jobholding that covers such a long period of time.[3] We take advantage of this feature to offer long-run evidence on this specific example of non-traditional work arrangement. We do not claim that our results generalize to other countries. But since our empirical framework can be easily adapted to study multiple jobholding in other settings, we call on others to use it and enrich the body of evidence about the dynamics of non-standard work arrangements.

The rest of the paper is organized as follows. Section 2 presents the data, definitions, and preliminary facts about multiple jobholding in Canada. Section 3 introduces the statistical framework used to construct inflow and outflow transition probabilities and describes their behavior over time. In Section 4, we develop a statistical decomposition that partitions the trend in multiple jobholding into the contribution of the different inflows and outflows. Section 5 takes stock of the results by relating them to a number of labor market changes documented

[3]In the U.S., the Current Population Survey (CPS) started collecting information on multiple jobholding in January 1994 (Lalé [2015, 2016]). Some occasional supplements (called 'Work schedules supplements') of the CPS are available for earlier periods, but they provide information on multiple jobholding only as discrete snapshots. The U.S. Panel Study of Income Dynamics contains annual information on the number of jobs held in the previous calendar year, starting in 1976. It is, however, not always clear whether these data measure multiple jobs separately from job-to-job changes that occur over that window of time (Paxson and Sicherman [1996]). In European countries, most labor force surveys started collecting information only recently.

in the literature. The last part of Section 5 concludes.

2 Data, definitions, and preliminary facts

This section presents the data, definitions of the main concepts used in the analysis, and a set of preliminary facts about multiple jobholding.

2.1 Data source and frequency

We use LFS micro-data between January 1976 and December 2018. The LFS is a monthly household survey administered by Statistics Canada. It provides the official measure of unemployment used in the administration of the Employment Insurance program and is the most timely indicator of the state of the economy. The LFS is conducted nationwide, in provinces and territories. It is designed to be representative of the civilian non-institutionalized population in Canada. Each month, the survey collects labor force information from about 56,000 households for all household members aged 15 and over. It also collects demographic information such as gender, age, and education.

The LFS relies on a rotating panel design. Each household is interviewed for six consecutive months, and each month one-sixth of the sample (a panel) is replaced with a new panel. (Statistics Canada [2017]). Thus, about 83 percent of the sample overlaps between two adjacent months. This makes these data suitable for matching respondents over time to determine changes in their labor force status. We use the LFS as a series of cross-sections to measure labor market stocks, and we exploit the rotational structure of the survey to measure flows.

Throughout the analysis, we aggregate the monthly LFS data to the quarterly frequency. Quarterly aggregation serves several purposes. First, Statistics Canada recommends working with LFS data aggregated to the quarterly frequency to obtain more statistically precise estimates (Bernard and Gellatly [2014], Statistics Canada [2017]). Second, and more importantly, quarterly aggregation enables us to satisfy the data release requirements that apply to the LFS. Indeed, Statistics Canada is prohibited by law (under the *Statistics Act*) from releasing data that would divulge information about any identifiable person. In practice, this means that estimates that we compute inside the Federal Research Data Centre cannot be released if they are based on cells below a certain size level. A further issue comes from the so-called residuality requirements: the entire month of data estimates is suppressed if there is a single estimate based on a cell below the threshold level. These issues are particularly acute in what concerns our study. Some transitions are relatively 'rare' (for example, transitions from non-employment to multiple jobholding and vice versa), and as a result they have low counts in the data. By aggregating monthly data into quarterly, we can (partially) offset low counts in some months by higher counts in adjacent months. In addition, we were granted exception requests data on transition probabilities for certain subgroups of individuals.[4] To sum up, quarterly aggregation not only improves the precision of our estimates, but also allows us to report those estimates.

2.2 Definitions

A key operational definition in this paper is that of a multiple jobholder. We follows the LFS definition and count as multiple jobholders those individuals who hold more than one job during the reference week of the survey.[5] We also adopt the LFS definition of the main job, which is the job with the greatest number of hours worked during the reference week of the survey. The LFS collects information on hours for up to two jobs at each interview. This allows us to identify the main job of the vast majority of multiple jobholders (more than 90 percent) who hold 'only' two jobs. In the absence of additional information, we use the same approach for individuals who hold more than two jobs. Another important definition of the analysis is that of part-time employment. In labor market statistics, whether a job is considered part-time or full-time depends on the number of hours usually worked at this job. We use a threshold of 30 usual hours to distinguish between part-time and full-time jobs. This threshold is used by Statistics Canada and does not drive our results.[6]

On the various plots of the paper, we will denote recession periods using gray bands. To iden-

[4] Our empirical framework implies making a number of adjustments (see Section 3 and Appendix A) such that one cannot infer the value of the underlying stocks and flows in a given quarter from the value of a transition probability in that quarter. In other words, the transition probabilities we report pose no risk of identifying the individuals from the cells used to compute those probabilities.

[5] The reference week of the LFS is usually the week containing the 15th of the month, and LFS interviews are conducted during the week that follows the reference week.

[6] The results based on a 35-hour threshold (used in the US) to define part-time work are available upon request.

tify these episodes, we use dates determined by C.D. Howe Institute Business Cycle Council (see https://www.cdhowe.org/council/business-cycle-council). This council performs functions similar to the Business Cycle Dating Committee of the National Bureau of Economic Research in the U.S. The council has identified the following recession episodes: 1981Q3–1982Q4, 1990Q2–1992Q2 and 2008Q4–2009Q2. These dates are similar to those determined by the Economic Cycle Research Institute (see https://www.businesscycle.com).

2.3 Preliminary facts

To provide some preliminary background, Figure 2 reports number of workers who are not employed (N), single jobholders (S), or multiple jobholders (M). The numbers are averages calculated over the past five years. During this period, there are about 18 million individuals who are employed in a given quarter. Most of them are single jobholders, although multiple jobholders represent a fairly significant number (almost one million workers, or 5.46 percent of total employment). During this period, the employment rate is 61.3 percent and there are 11 million workers who are not employed (i.e. unemployed or inactive).

In Figure 2, we also display the average number of workers who move between non-employment, single jobholding, and multiple jobholding between two consecutive quarters. Single jobholders face a non-negligible probability of moving to multiple jobholding: the figure is 2.64 percent per quarter. Also, multiple jobholders are very likely to return to single jobholding in a given quarter (36.8 percent on average). They move to non-employment with a per-quarter probability of 2.40 percent, which is roughly 50 percent of the job separation rate among single jobholders (5.66 percent). The levels of quarterly worker flows between single and multiple jobholding are also not trivial: 450,979 and 362,582 individuals. Last, as one would expect, very few workers who are not employed in a given quarter become multiple jobholders in the quarter that follows; the corresponding probability is 0.19 percent (controlling for time-aggregation bias, as we explain in Subsection 3.1). Non-employed workers become single jobholders with a per-quarter probability of 8.62 percent.[7]

[7] This number is a weighted average between the probability of moving to single jobholding from unemployment and from nonparticipation (which are lumped together into a single category that we call 'non-employment'). The weights correspond to the shares of unemployed and inactive workers in the pool of non-employment.

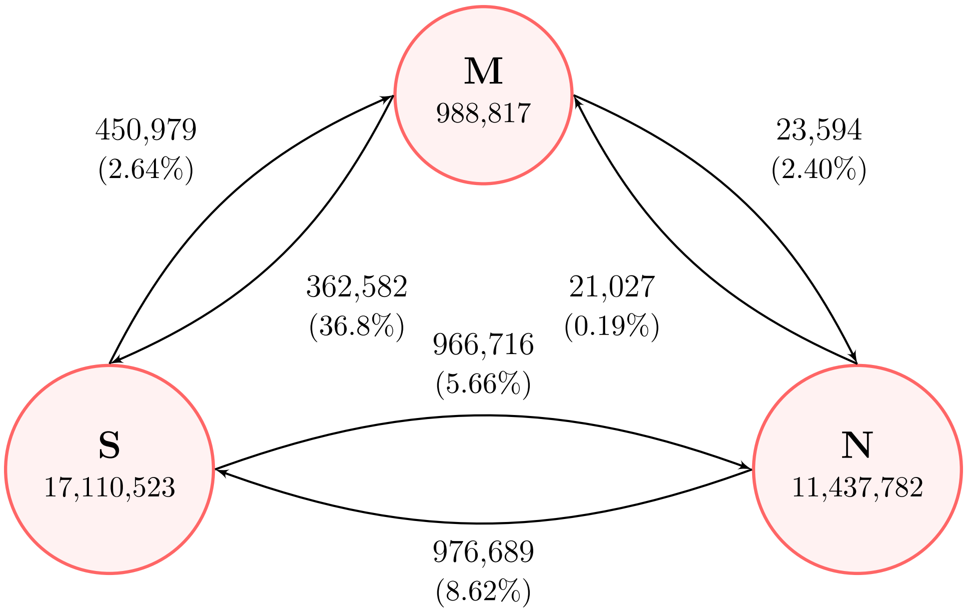
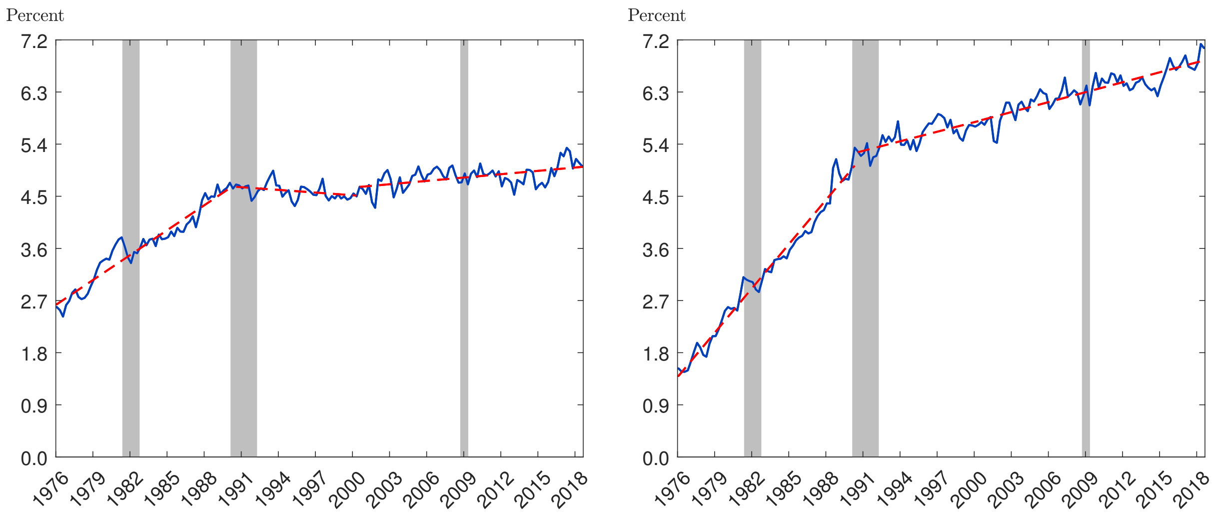


Figure 2: Worker flows across multiple jobholding, single jobholding, and non-employment

Notes: LFS data, 2013–2018. M: multiple jobholding; S: single jobholding; N: nonemployment. The numbers refer to individuals aged 15 and above and are computed as averages over the period considered. The figures in brackets are quarterly transition probabilities.

Individual characteristics. Next, Figure 3 reports the multiple jobholding share among men and women.[8] In the remainder of the analysis, instead of working with aggregate data, we present results separately by gender. We focus on this partition for two reasons mainly: one, the heterogeneity with respect to the incidence of part-time work (details follow); two, the different timing of the change in multiple jobholding, which is evidenced in Figure 3. At the beginning of the sample period in 1976, men were more likely to hold multiple jobs (2.5 percent) than women (1.5 percent) The opposite is true in 2018: the multiple jobholding share is at 7.0 percent among women vs. 5.1 percent among men. Their dynamics in between 1976 and 2018 are quite different. First, the increase in multiple jobholding throughout the 1980s was much steeper among women than among men. Second, during the 1990s, multiple jobholding plateaued for men (the Ordinary Least Squares (OLS) linear trend is actually negative), whereas it continued to increase for women, albeit at a slower rate compared with the 1980s. Third, the multiple jobholding share among men resumed its increase after the turn of the century. On the other hand, the upward trend for women in the 2000s and 2010s seems no different from that in

[8]The multiple jobholding share is the number of workers who hold more than one job divided by the total number of employed workers.



(a) Men

(b) Women

Figure 3: The multiple jobholding share: Men and women, 1976–2018

Notes: LFS data, 1976–2018, time series cleared from seasonal variations. The dashed lines denote the OLS linear trend calculated in each subperiod (1976 to 1990, 1990 to 2000, 2000 to 2018). Gray-shaded areas indicate recession periods identified by the C.D. Howe Institute Business Cycle Council.

the 1990s.[9] Motivated by this, in the next two sections we split the sample period into three subperiods: 1976–1990, 1990–2000, and 2000–2018. This helps us provide a clearer picture of the changes that took place over time.[10]

In Appendix B, we provide a more detailed analysis of multiple jobholding by worker characteristics in order to complement Figure 3. The lessons from that analysis are as follows. First, the dynamics and differences across gender in Figure 3 are similarly present when we leave out old and young workers and/or when we separate out workers based on their marital status or region of residence. Second, the levels of multiple jobholding vary mainly by educational levels and by workers' main industry of employment. In particular, multiple jobholding increases with educational attainment (as in Lalé [2015]). Third, and related, the changes over time and the differences between men and women when we condition by education or industry are essentially similar to those in Figure 3. In sum, the breakdown by gender seems to capture the interesting patterns of the dynamics of multiple jobholding over time. To illustrate and verify this idea,

[9]In Figure 3 for both men and women, the dashed lines display the linear trends calculated over each of the three subperiods. For women, the OLS coefficients of the 1990–2000 subperiod are virtually identical to those of the 2000–2018 subperiod, as can be surmised from Figure 3b.

[10]A more systematic approach to detect potential breaks in the time series is likely to suggest a similar partition of the sample period. Ours is also motivated by the fact that it yields three subperiods that each comprise only one recession.

we construct several counterfactual multiple jobholding shares that control for changes in the composition of employment with respect to gender interacted with age, education, marital status, or industry. The results, plotted in Figure B1, show almost no difference compared with the actual multiple jobholding share displayed in Figure 1. The reason for this is that, for each gender, the heterogeneity in multiple jobholding across different ages, education levels, marital status, and industry groups is quite limited.

Work schedule of the main job. The distinction between full-time and part-time employment plays an important role in the analyses presented in the next sections. Indeed, whether an individual is working full-time or part-time affects the flexibility with which s/he may combine the main job with a second job. More generally, part-time employment is a major channel of hours adjustments at the individual level (Borowczyk-Martins and Lalé [2019]), and many theories emphasize the relationship between such hours adjustments and multiple jobholding (Shishko and Rostker [1976], Krishnan [1990], Paxson and Sicherman [1996]). An additional motivation for distinguishing between full-time and part-time work is that we study the data separately by gender, and the incidence of part-time employment varies substantially across the two gender groups.

To describe the data briefly and lay foundations for our empirical framework, let us report the following facts (additional results are available in Table B2). First, on average over the sample period, 31 percent of multiple jobholders hold a part-time main job. In other words, the vast majority of these workers are working full-time on their main job and are adding more hours by holding a second job. Second, there is a significant degree of heterogeneity between men and women regarding this statistics: 71.5 percent of male multiple jobholders hold a full-time main job, while the corresponding figure for female multiple jobholders is 52.4 percent. Third, once again the breakdown by gender seems to capture much of the heterogeneity that is present in the data. For instance, the work schedule of the first job is quite similar among multiple jobholders who hold a university degree and among workers with at most eight years of education.

3 The ins and outs of multiple jobholding

Having described the stocks of male and female multiple jobholders, we introduce our empirical framework to measure transition probabilities of entering and leaving multiple jobholding. We then analyze the behavior of transition probabilities from the mid-1970s until today.

3.1 Empirical framework

We use a stock-flow framework to analyze transitions into and out of multiple jobholding. In each period (i.e. quarter) t, individuals are classified into one of the following states: multiple jobholding with a full-time main job (F_M), multiple jobholding with a part-time main job (P_M), single jobholding with a full-time job (F_S), single jobholding with a part-time job (P_S), and non-employment (N). We let the vector $\boldsymbol{\ell}_t$ contain the number of individuals (stocks) in each of these states:

$$\boldsymbol{\ell}_t = [\ \underbrace{F_M \quad P_M}_{M} \ \underbrace{F_S \quad P_S}_{S} \quad N\ ]'_t, \tag{1}$$

where $M = F_M + P_M$ (resp. $S = F_S + P_S$) is the number of multiple jobholders (resp. single jobholders) in period t. As is standard, the evolution of $\boldsymbol{\ell}_t$ is described by means of a discrete-time, first-order Markov chain:

$$\boldsymbol{\ell}_t = \boldsymbol{X}_t \boldsymbol{\ell}_{t-1}. \tag{2}$$

In this equation, $\boldsymbol{X}_t$ is the stochastic matrix of transition probabilities $p\,(i \to j)$ across labor market states i and j. Each of these transition probabilities is measured by the gross flow of workers from state i to state j at time t divided by the stock of worker in state i at time $t-1$.[11]

We implement several adjustments based on the Markov chain structure of this framework.[12] First, we perform a so-called margin-error adjustment of the transition probabilities

[11]Recall from Subsection 2.1 that we work with data aggregated to the quarterly frequency. To calculate flows between, say, quarters Q1 and Q2 in a given year, we proceed as follows. We follow the same respondents in January and April, February and May, and March and June and determine their labor force transitions (if any) between each pair of months spanning a quarter. We then add up the three values to calculate the gross worker flows for each type of transition between quarters Q1 and Q2.

[12]Prior to making these adjustments, we remove systematic seasonal variations using the Census Bureau's X-13ARIMA-SEATS program (https://www.census.gov/srd/www/x13as).

(Poterba and Summers [1986], Elsby et al. [2015]). This adjustment reconciles the changes in stocks predicted by the Markov chain with the actual changes in stocks between two consecutive periods.[13] Second, we correct transition probabilities to account for time-aggregation bias. Time-aggregation bias refers to the discrepancy between the transition probabilities measured at discrete intervals and the underlying continuous process which they seek to measure. Specifically, the competing risks structure of the process implies that the discrete-time (quarterly) probabilities miss some of the transitions that occur at a higher frequency. We adapt Shimer [2012]'s continuous-time correction to our set-up to address this bias. We refer the reader to Appendix A for a formal presentation of the adjustment procedures.

As we have already mentioned, our interest lies in understanding the behavior of the multiple jobholding share. To cast the discussion in the context of our five-state Markov chain, we can write this share, called m_t, as:

$$m_t = \frac{F_{M,t} + P_{M,t}}{F_{M,t} + P_{M,t} + F_{S,t} + P_{S,t}}. \tag{3}$$

m_t is what we plotted in Figure 1 of the Introduction and in Figure 3 for men and women.

3.2 A closer look at long-run trends

Before analyzing worker flows, in Table 1 we describe the dynamics of m_t in relation to that of two important ratios, namely the share of part-time employment among single jobholders $(\frac{P_{S,t}}{F_{S,t}+P_{S,t}})$ and the share of multiple jobholders who are employed part-time on their main job $(\frac{P_{M,t}}{F_{M,t}+P_{M,t}})$. First, the table reiterates, while offering a precise quantification, the findings that men's and women's multiple jobholding shares, m_t, have behaved differently over time. In particular, the increase in multiple jobholding is three times larger for women than for men during the early subperiod (1976 to 1990), and two times larger in the last subperiod (2010 to 2018). Second, the table highlights differences in the incidence of part-time employment across the two gender groups. Men are less likely to work part-time than women when they work only

[13] Five-sixths of the sample overlap between two adjacent months (see Subsection 2.1), which in principle should result in a 83.3 percent matching rate of respondents between two adjacent months. However, other errors, such as sample attrition, result in smaller matching rates, typically between 80 and 81 percent.

Table 1: Multiple jobholding and part-time employment shares

Men	1976–2018 Avg.	1976–1990 Avg.	1976–1990 △ (%)	1990–2000 Avg.	1990–2000 △ (%)	2000–2018 Avg.	2000–2018 △ (%)
m_t	4.38	3.69	84.5	4.59	-2.26	4.83	10.8
$\frac{P_{S,t}}{F_{S,t}+P_{S,t}}$	9.79	7.77	54.3	10.2	9.24	11.2	17.7
$\frac{P_{M,t}}{F_{M,t}+P_{M,t}}$	18.5	14.7	22.0	18.7	28.8	21.2	9.69
Women	**1976–2018 Avg.**	**1976–1990 Avg.**	**1976–1990 △ (%)**	**1990–2000 Avg.**	**1990–2000 △ (%)**	**2000–2018 Avg.**	**2000–2018 △ (%)**
m_t	5.09	3.28	248.7	5.53	10.3	6.32	21.9
$\frac{P_{S,t}}{F_{S,t}+P_{S,t}}$	26.9	26.3	11.0	27.5	4.76	27.2	-5.68
$\frac{P_{M,t}}{F_{M,t}+P_{M,t}}$	47.6	46.4	-5.62	48.2	13.0	48.2	-9.02

Notes: LFS data, 1976–2018. m_t: multiple jobholding share; F_S: single jobholding with a full-time main job; P_S: single jobholding with a part-time main job; F_M: multiple jobholding working full-time on the main job; P_M: multiple jobholding working part-time on the main job. The table reports averages (Avg.) and percentage changes (△ %) over the sample period and over specific subperiods. All table entries are expressed in percent.

one job (9.79 percent for men vs. 26.9 percent for women) but also when they hold two jobs (18.5 percent vs. 47.6 percent). Meanwhile, the incidence of part-time work has increased over time among male multiple jobholders ($\frac{P_{M,t}}{F_{M,t}+P_{M,t}}$): the average share of multiple jobholders with a part-time main job has increased by 50 percent from the first to the third subperiod. Those increases were not matched by changes of the same magnitude among male workers who hold only one job ($\frac{P_{S,t}}{F_{S,t}+P_{S,t}}$). Third and conversely, the composition of the women's employment pool appears to be more stable than that of men. The most noticeable change is the 1990–2000 shift in the composition of multiple jobholding towards women who hold a part-time main job, but this change is quite modest (a 13.0 percent increase). Despite this stable composition, the multiple jobholding share of women has increased substantially over time. Fourth, for both men and women, there is a clear association between working two jobs and holding a part-time main job. On average, the incidence of part-time work is two times higher among multiple jobholders than among single jobholders.

3.3 The dynamics of gross workers flows

Table 2 describes the dynamics of multiple jobholding through its interaction with other labor market states. Figures 4 and 5 complement this table by displaying, respectively, the transition probabilities in and out of multiple jobholding. There are two displayed time series in each plot, except for the plots at the bottom showing a transition to or from non-employment (N). For instance, in Figure 4 in the top left panel, the solid line denotes the probability to take on a second job by moving from F_S to either F_M or P_M, while the dashed line is the probability to take on a second job by moving from F_S only to F_M. Clearly, in each plot, the transition probability denoted by the dashed line is the main component of the transition probability indicated by the solid line.

Long-run averages. Each panel of Table 2 reports the averages of inflow and outflow transition probabilities.[14] The bottom row of each panel displays the sum of the inflow (resp. outflow) transition probabilities whose states of origin (resp. destination) exclude multiple jobholding. Three results stand out. The first one is that multiple jobholding is a transitory state of employment. When looking at individuals with a full-time main job (F_M), about one-half (42.8 percent for men, 52.7 percent for women) were in a different state in the previous quarter and a similarly large share leaves in the following quarter (36.9 percent for men, 45.3 percent for women). The figures are higher for multiple jobholders who work part-time on the main job (P_M). Second, there is a non-negligible share of workers who change status with respect to their main job upon moving into or out of multiple jobholding. This holds true especially for multiple jobholders with a part-time main job during the reference week (P_M): the probability that they hold a single full-time job (F_S) in the previous quarter or during the quarter that follows is between 8 and 11 percent. Third, transitions between multiple jobholding and non-employment (N) are mostly negligible. This feature dovetails well with our choice of studying the dynamics of m_t using a framework that lumps together unemployment and nonparticipation.

[14] $q\,(i \rightarrow j)$ denotes the inflow transition probability from state i to j. It is the ratio of the gross flow from state i to j between time $t-1$ and t over the stock of workers in state j at time t. The outflow transition probabilities are the elements of the Markov transition matrix from equation (2).

Table 2: The ins and outs of multiple jobholding: 1976–2018

Men							
F_M				P_M			
$q(P_M \to F_M)$	5.29	$p(F_M \to P_M)$	4.93	$q(F_M \to P_M)$	22.5	$p(P_M \to F_M)$	24.2
$q(F_S \to F_M)$	36.3	$p(F_M \to F_S)$	32.2	$q(F_S \to P_M)$	8.33	$p(P_M \to F_S)$	11.3
$q(P_S \to F_M)$	5.32	$p(F_M \to P_S)$	3.13	$q(P_S \to P_M)$	49.2	$p(P_M \to P_S)$	36.7
$q(N \to F_M)$	1.14	$p(F_M \to N)$	1.61	$q(N \to P_M)$	10.1	$p(P_M \to N)$	4.54
$\sum_{i \neq F_M} q(i \to F_M)$	42.8	$\sum_{j \neq F_M} p(F_M \to j)$	36.9	$\sum_{i \neq P_M} q(i \to P_M)$	67.7	$\sum_{j \neq P_M} p(P_M \to j)$	52.6
Women							
F_M				P_M			
$q(P_M \to F_M)$	13.1	$p(F_M \to P_M)$	11.4	$q(F_M \to P_M)$	12.5	$p(P_M \to F_M)$	14.6
$q(F_S \to F_M)$	38.4	$p(F_M \to F_S)$	35.1	$q(F_S \to P_M)$	8.25	$p(P_M \to F_S)$	8.58
$q(P_S \to F_M)$	12.3	$p(F_M \to P_S)$	7.73	$q(P_S \to P_M)$	45.6	$p(P_M \to P_S)$	35.7
$q(N \to F_M)$	1.93	$p(F_M \to N)$	2.45	$q(N \to P_M)$	5.81	$p(P_M \to N)$	3.87
$\sum_{i \neq F_M} q(i \to F_M)$	52.7	$\sum_{j \neq F_M} p(F_M \to j)$	45.3	$\sum_{i \neq P_M} q(i \to P_M)$	59.7	$\sum_{j \neq P_M} p(P_M \to j)$	48.2

Notes: LFS data, 1976–2018, quarterly transition probabilities cleared from seasonal variations, margin error, and time-aggregation bias. F_S: single jobholding with a full-time main job; P_S: single jobholding with a part-time main job; F_M: multiple jobholding working full-time on the main job; P_M: multiple jobholding working part-time on the main job; N: non-employment. The inflow transition from state j to k at time t, denoted $q(j \to k)$, is the ratio of the gross worker flow from j to k over the stock of workers in state k, i.e. $q(j \to k) = {}^{\#\{j \to k\}}/_{\#\{k\}}$ with $\#\{.\}$ indicating cardinality, and the numerator and denominator both measured at time t. The outflow transition probabilities are the elements of the Markov transition matrix (see equation (2)). All table entries are averages over the sample period expressed in percent.

Dynamic behavior. By simply comparing the bottom row of each panel in Table 2, we see that in all instances (i.e. for F_M and P_M among men and women), the inflows have exceeded the outflows over time, resulting in an increase in the multiple jobholding share between 1976 and 2018. However, this tells us little about the dynamics of the transition probabilities in and out of multiple jobholding. Figures 4 and 5 show that these probabilities have moved in diverse directions in diverse directions over the sample period, necessitating close scrutiny.

A first noteworthy pattern in Figure 4 is that transitions from both full-time (F_S) and part-time (P_S) single jobholding have become more frequent over time. This pattern is especially important for female multiple jobholders, whose probabilities to take on a second job have more than doubled since the mid-1970s (their $p\,(F_S \rightarrow M)$ increases from 1.04 to 2.23 percent, $p\,(P_S \rightarrow M)$ from 3.15 to 6.82 percent). An increase in the inflow transition probability implies ceteris paribus an increase in the number of multiple jobholders. In other words, Figure 4 offers a first candidate explanation for the upward trends shown in Figure 3: single jobholders have become more likely to take on second jobs. It is beyond our scope to identify the causes of this change, but nevertheless we can provide some observations. A central tenet of the analysis of multiple jobholding is that second jobs help alleviate constraints on hours that workers may be facing in their main job (Shishko and Rostker [1976], Krishnan [1990], Paxson and Sicherman [1996]). Thus, the change could be driven by an increased stringency of the 'hours constraint' motive. Another source of variation could relate to the 'job heterogeneity' motive (Conway and Kimmel [1998], Conway and Kimmel [2001]). Workers may be increasingly valuing a more diverse work experience, which they may acquire by working a second job.

Next, the upper and middle plots of Figure 5 show that the probability to give up the second job has decreased among multiple jobholders with either a full-time (F_M) or part-time (P_M) main job. This change is quantitatively important for both men and women throughout the sample period.[15] It would generate an increase in the number of multiple jobholders at a constant inflow rate. Thus, we have a second candidate explanation of the trends in multiple jobholding, namely that these employment episodes have become longer. As we pointed out in

[15] The probabilities to return to single jobholding from holding a full-time main (F_M) or part-time main (P_M) job are very high for women in 1976. Our estimates might be imprecise at the beginning of the sample period because of the very small pool of female multiple jobholders (recall that only 1.5 percent of employed women hold a second job in 1976).

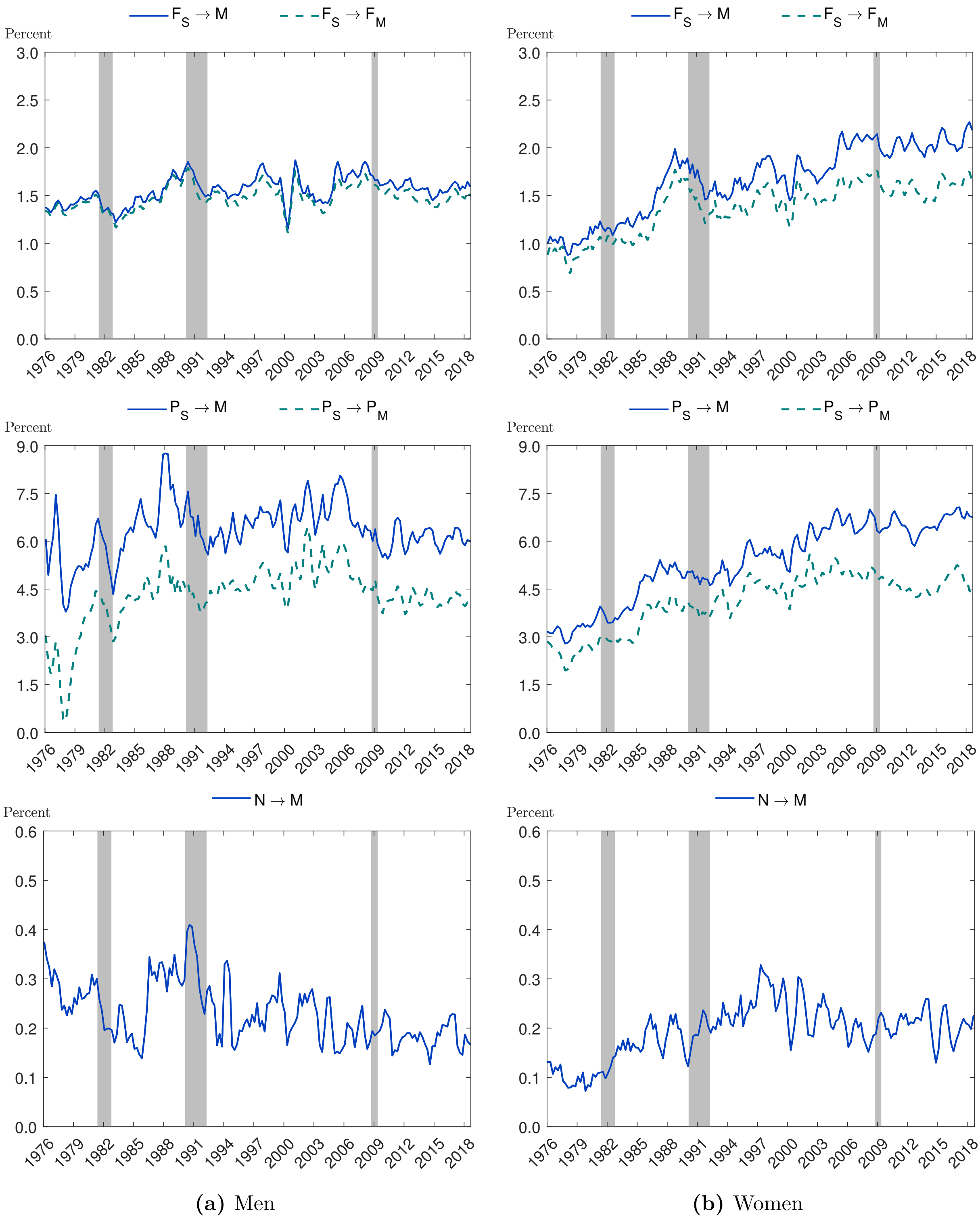
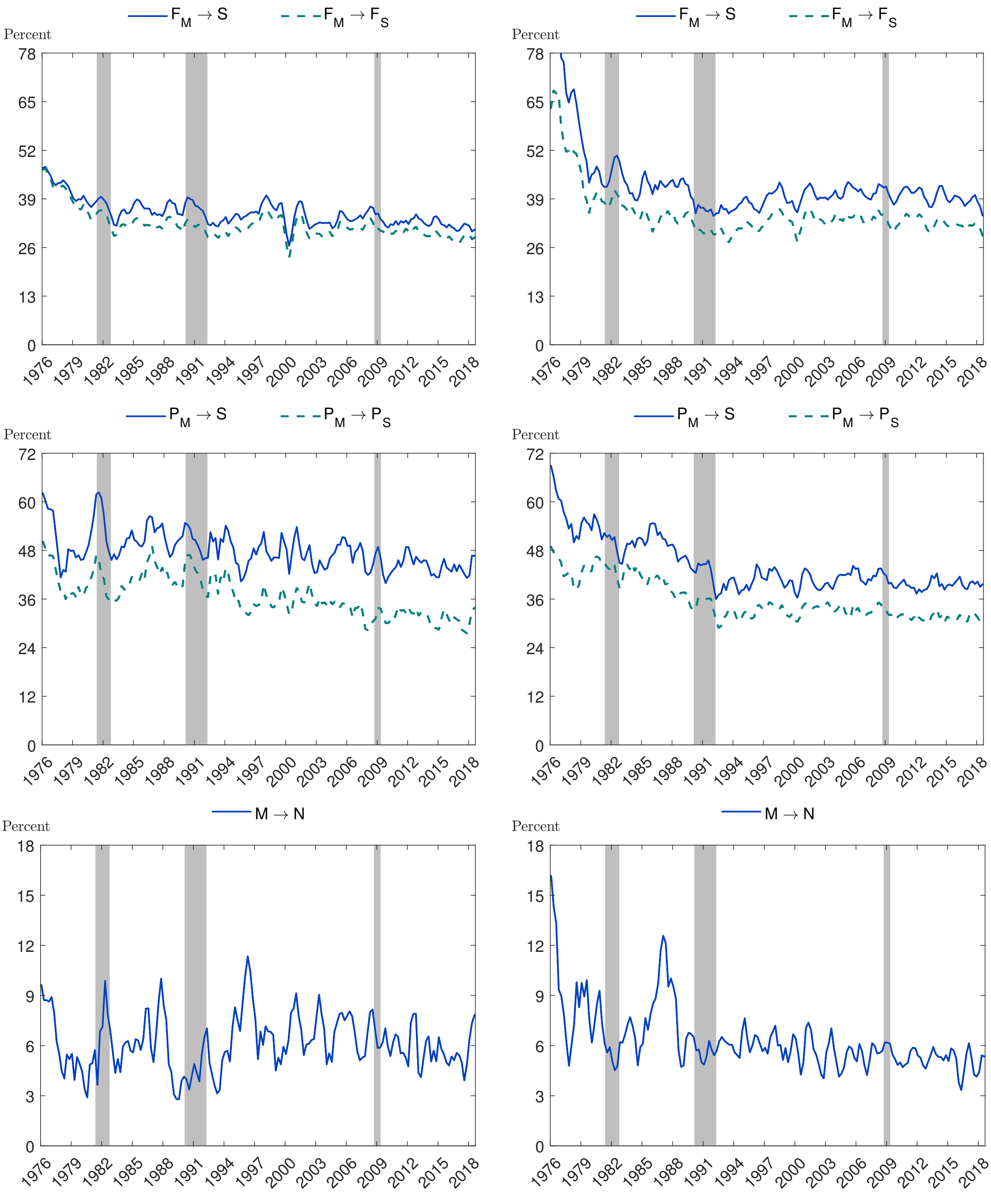


Figure 4: Transition probabilities into multiple jobholding: 1976–2018

Notes: LFS data, 1976–2018, quarterly transition probabilities cleared from seasonal variations, margin error, and time-aggregation bias (see Section 3 and Appendix A for details). All series are smoothed by one-period, two-sided moving averaging. Gray-shaded areas indicate recession periods identified by the C.D. Howe Institute Business Cycle Council.



(a) Men **(b)** Women

Figure 5: Transition probabilities out of multiple jobholding: 1976–2018

Notes: LFS data, 1976–2018, quarterly transition probabilities cleared from seasonal variations, margin error, and time-aggregation bias (see Section 3 and Appendix A for details). All series are smoothed by one-period, two-sided moving averaging. Gray-shaded areas indicate recession periods identified by the C.D. Howe Institute Business Cycle Council.

the introduction, we think this trend could be driven by self-selection into multiple jobholding. That is, if the flow into multiple jobholding shifts away from workers with a short expected duration of multiple jobholding, then we expect to see a decrease in the probability of returning to single jobholding (as per the mover-stayer phenomenon). This explanation would be consistent with the strengthening of the 'hours constraint' motive if individuals who take on a second job to mitigate the constraint on hours worked do so less temporarily than, say, workers who hold a second job for non-economic reasons (see Stinson Jr [1990] and Kimmel and Powell [1999]). It could also be that the type of jobs that workers hold as second jobs are more stable than in the past. For instance, in the U.S. labor market, jobs of very short durations are becoming scarcer (Hyatt and Spletzer [2017]).

4 Dissecting the trends in multiple jobholding

The above discussion identifies two candidate explanations of the trends reported in Figure 3. In this section, we develop a measurement framework that precisely quantifies their contribution to the dynamics of multiple jobholding. By applying this decomposition period by period, we can narrow down the picture to the most relevant source of variation.

4.1 A trend decomposition

We follow a common practice in the 'ins and outs' literature: we focus on steady-state approximations to quantify the role played by the dynamics of the different transition probabilities. The steady-state multiple jobholding share in period t, denoted as $\bar{m}_t$, is the share implied by the contemporaneous values of the flow hazards, which we define momentarily. The reason why it provides a good approximation to the actual multiple jobholding share is that convergence towards the steady state is nearly completed within each quarter due to the high levels of transitions across labor market states – and, as is shown below, we do find that the steady-state and actual multiple jobholding shares track each other closely.

To make the relationship between $\bar{m}_t$ and the transition probabilities explicit, we start by rewriting the Markov chain of equation (2) as

$$\widetilde{\boldsymbol{\ell}}_t = \widetilde{\boldsymbol{X}}_t \widetilde{\boldsymbol{\ell}}_{t-1} + \mathbf{x_t}. \tag{4}$$

Here we denote by $\widetilde{\boldsymbol{\ell}}_t$ the vector $\boldsymbol{\ell}_t$ normalized by the size of the population aged 15 and above $(F_{M,t} + P_{M,t} + F_{S,t} + P_{S,t} + N_t)$ and by $\widetilde{\boldsymbol{X}}_t$ the matrix $\boldsymbol{X}_t$ rearranged accordingly. Hence, the vector $\mathbf{x_t}$ is $\begin{bmatrix} p(N \to F_M) & p(N \to P_M) & p(N \to F_S) & p(N \to P_S) \end{bmatrix}_t'$. It is then possible to define the continuous-time counterpart of equation (4):

$$\dot{\widetilde{\boldsymbol{\ell}}}_t = \widetilde{\boldsymbol{H}}_t \widetilde{\boldsymbol{\ell}}_t + \mathbf{h_t}. \tag{5}$$

In this equation, the elements of $\widetilde{\boldsymbol{H}}_t$ and $\mathbf{h}_t$ are flow hazards, the continuous-time counterparts of the discrete-time transition probabilities.[16] λ^{ij} denotes the flow hazard from state i to state j; λ^{ij} can be computed using the relationship $p(i \to j) = 1 - e^{-\lambda^{ij}}$. To illustrate the role of flow hazards, let us write equation (5) in explicit form:

$$\begin{bmatrix} \dot{\widetilde{F}}_M \\ \dot{\widetilde{P}}_M \\ \dot{\widetilde{F}}_S \\ \dot{\widetilde{P}}_S \end{bmatrix}_t = \begin{bmatrix} -\sum\limits_{j \neq F_M} \lambda^{F_M j} - \lambda^{NF_M} & \lambda^{P_M F_M} - \lambda^{NF_M} & \lambda^{F_S F_M} - \lambda^{NF_M} & \lambda^{P_S F_M} - \lambda^{NF_M} \\ \lambda^{F_M P_M} - \lambda^{NP_M} & -\sum\limits_{j \neq P_M} \lambda^{P_M j} - \lambda^{NP_M} & \lambda^{F_S P_M} - \lambda^{NP_M} & \lambda^{P_S P_M} - \lambda^{NP_M} \\ \lambda^{F_M F_S} - \lambda^{NF_S} & \lambda^{P_M F_S} - \lambda^{NF_S} & -\sum\limits_{j \neq F_S} \lambda^{F_S j} - \lambda^{NF_S} & \lambda^{P_S F_S} - \lambda^{NF_S} \\ \lambda^{F_M P_S} - \lambda^{NP_S} & \lambda^{P_M P_S} - \lambda^{NP_S} & \lambda^{F_S P_S} - \lambda^{NP_S} & -\sum\limits_{j \neq P_S} \lambda^{P_S j} - \lambda^{NP_S} \end{bmatrix}_t$$

$$\times \begin{bmatrix} \widetilde{F}_M \\ \widetilde{P}_M \\ \widetilde{F}_S \\ \widetilde{P}_S \end{bmatrix}_t + \begin{bmatrix} \lambda^{NF_M} \\ \lambda^{NP_M} \\ \lambda^{NF_S} \\ \lambda^{NP_S} \end{bmatrix}_t . \tag{6}$$

At the steady state, equation (5) yields the following relationship between the stocks in

[16] The upper dot on $\widetilde{\boldsymbol{\ell}}_t$ in the left-hand side of equation (5) denotes its first-order time derivative. Notice that on the right-hand side of this equation, $\widetilde{\boldsymbol{H}}_t$ multiplies the time-t vector $\widetilde{\boldsymbol{\ell}}_t$ whereas $\widetilde{\boldsymbol{X}}_t$ multiplies the vector of stocks from time $t-1$ in equation (4).

vector $\widetilde{\boldsymbol{\ell}}_t$ and the underlying flow hazards:

$$\bar{\widetilde{\boldsymbol{\ell}}}_t = -\widetilde{\boldsymbol{H}}_t^{-1}\mathbf{h}_t. \tag{7}$$

One can then approximate each steady-state stock at time t, say $\bar{\widetilde{\ell}}_t$, with a Taylor expansion:

$$\bar{\widetilde{\ell}}_t - \bar{\widetilde{\ell}} \approx \sum_{i \neq j} \frac{\partial \bar{\widetilde{\ell}}_t}{\partial \lambda^{ij}} \left(\lambda_t^{ij} - \lambda^{ij} \right). \tag{8}$$

The notations without a time subscript t denote the sample mean of a variable and $\frac{\partial \bar{\widetilde{\ell}}_t}{\partial \lambda^{ij}}$ are partial derivatives. The last step is to relate the deviation of stocks from their respective sample mean to the evolution of the steady-state multiple jobholding share. By totally differentiating the steady-state counterpart of equation (3), we have

$$d\bar{m}_t = \frac{\left(d\bar{F}_{M,t} + d\bar{P}_{M,t}\right)(1 - \bar{m}_t) - \left(d\bar{F}_{S,t} + d\bar{P}_{S,t}\right)\bar{m}_t}{\bar{F}_{M,t} + \bar{P}_{M,t} + \bar{F}_{S,t} + \bar{P}_{S,t}} \tag{9}$$

where the letter d denotes the deviation of a stock from its mean. Then, we can combine equations (8) and (9) to construct counterfactual changes in the multiple jobholding share driven by changes in each flow hazard. Also, owing to the linearity of equation (8), we can construct counterfactual changes driven by changes in a *group* of flow hazards (e.g. inflows, outflows) by simply adding the individual counterfactual time series.

4.2 Understanding period-by-period changes

Our decomposition focuses on the steady-state multiple jobholding share. Before going further, we check that this focus is justified. Table 3 confirms this by reporting the correlation in levels between m_t and $\bar{m}_t$ and the correlation between first-differenced data (recall that the frequency of the data is one quarter). In all instances the correlations are very high, indicating that our decomposition accounts for the bulk of the variation of multiple jobholding over time.[17]

We use the framework developed in the previous subsection to understand the trends (or lack

[17] Although we do not pursue this route here, we can repeat the analysis using the time series cleared from their high-frequency variations. The results, which are available upon request, are robust to these modifications.

Table 3: Accuracy of the steady-state approximation

Men	1976–1990	1990–2000	2000–2018
$\mathbb{C}\text{orr}\,(m_t, \bar{m}_t)$	0.963	0.787	0.731
$\mathbb{C}\text{orr}\,(\Delta m_t, \Delta \bar{m}_t)$	0.854	0.875	0.864
Women	1976–1990	1990–2000	2000–2018
$\mathbb{C}\text{orr}\,(m_t, \bar{m}_t)$	0.990	0.735	0.844
$\mathbb{C}\text{orr}\,(\Delta m_t, \Delta \bar{m}_t)$	0.845	0.866	0.824
# quarters	60	44	76

Notes: LFS data, 1976–2018. m_t: multiple jobholding share; $\bar{m}_t$: steady-state multiple jobholding share; Δ: first-difference operator. The table reports correlations coefficients ($\mathbb{C}$orr) and the number of quarters (# quarters) used to calculate these coefficients in each subperiod.

thereof) of men's and women's multiple jobholding share over the three subperiods, 1976–1990, 1990–2000, and 2000–2018. Specifically, for each subperiod beginning in period t_0 and ending in t_1, we use equation (9) to compute various counterfactual changes, $D\bar{m}$, defined by

$$D\bar{m} = \sum_{\tau=t_0}^{t_1} d\bar{m}_\tau. \tag{10}$$

As we have already noted, we can compute the counterfactuals driven by a specific flow hazard or by a group of flow hazards.

Empirical results. The results of our trend decomposition are displayed in Table 4. To illustrate how the table works, let us describe the entries of the column labeled '1976–1990' in the panel for men. Between 1976 and 1990, the evolution of the transition probability $p\,(F_S \rightarrow M)$ per se implies a change of their multiple jobholding share by 0.90 percentage points (pp.). The corresponding figure for $p\,(P_S \rightarrow M)$ is 0.38 pp., and the figure for $p\,(N \rightarrow M)$ is 0.15 pp. Adding up the changes driven by the inflow probabilities ($F_S \rightarrow M$, $P_S \rightarrow M$, and $N \rightarrow M$), the impact is a change by 1.43 pp. of the multiple jobholding share. On the other hand, the predicted change based on the behavior of $p\,(M \rightarrow F_S)$ is an increase by 1.03 pp. while $p\,(M \rightarrow P_S)$ generates a decrease by -0.17 pp. The cumulated effect of the probabilities to multiple jobholding is an increase by 0.95 pp. Next, we add up the changes implied by the transition probabilities: together they result in a change of the multiple jobholding share by 2.39 pp. This is very close to the change of the actual multiple jobholding share during this period, namely 2.31 pp. (an 84.5 percent increase).

The first remark about Table 4 concerns the fit of the counterfactual time series. As can be seen at the bottom of each panel, the changes based on the behavior of the inflows and outflows capture the differences in the size of long-run changes between men and women, which we noted in Subsection 2.3, as well as the timing. That is, the increase of multiple jobholding is more important among women than among men, is very large during the first subperiod, and is interrupted for men during the period going from 1990 to 2000. Next, we note that, with the exception of the intermediary subperiod, the inflow transition probabilities contribute to raising the multiple jobholding share. This is in line with the discussion from Subsection 3.3. The outflow transition probabilities, on the other hand, increase the multiple jobholding share in the first two subperiods but not in the third one (the period from 2000 to 2018). During the 1990s, their effect is entirely offset by the negative contribution of the inflow transition probabilities among men. Indeed, the outflows would have generated an increase in men's multiple jobholding share by 1.06 pp., but multiple jobholding actually decreased because of the dynamics of the inflows. This pattern was less pronounced among women: their multiple jobholding share continued to increase in the 1990s because the negative contribution of the inflows was 'only' by -0.13 pp.

Next, we analyze Table 4 separately by gender. For men, the bulk of the increase (60 percent) in multiple jobholding between 1976 and 1990 is explained by the inflows: they account for a 1.43 pp. increase out of the 2.39 pp. change. During the second and third subperiods, the inflows overpredict the change of the multiple jobholding share. They predict a decrease by -1.30 pp. (vs. -0.24) during the 1990s and an increase by 0.65 pp. from 2000 to 2018 (vs. 0.42 pp.). Thus, their contribution is dampened by the dynamics of the outflows. Clearly, in all three subperiods changes in the propensity of single jobholders to take on second jobs is the main driver of men's multiple jobholding share. The inflows also account for a relatively large share of women's multiple jobholding share during the first subperiod. They explain 52 percent of the 3.37 pp. increase. During the 1990s, their role is quantitatively less important

Table 4: Counterfactual changes in the multiple jobholding share

Men	1976–1990	1990–2000	2000–2018
$D\bar{m}\,(F_S \to M)$	0.90	-0.96	0.67
$D\bar{m}\,(P_S \to M)$	0.38	-0.16	-0.02
$D\bar{m}\,(N \to M)$	0.15	-0.17	0.01
$\sum_{i \neq M} D\bar{m}\,(i \to M)$	1.43	-1.30	0.65
$D\bar{m}\,(F_M \to S)$	1.03	1.01	-0.22
$D\bar{m}\,(P_M \to S)$	-0.17	0.19	-0.00
$D\bar{m}\,(M \to N)$	0.10	-0.14	-0.02
$\sum_{j \neq M} D\bar{m}\,(M \to j)$	0.95	1.06	-0.24
$\sum_{i,j \neq M} D\bar{m}\,(i \to j)$	**2.39**	**-0.24**	**0.42**
Women	1976–1990	1990–2000	2000–2018
$D\bar{m}\,(F_S \to M)$	0.95	-0.30	0.94
$D\bar{m}\,(P_S \to M)$	0.72	0.13	0.59
$D\bar{m}\,(N \to M)$	0.09	0.04	0.02
$\sum_{i \neq M} D\bar{m}\,(i \to M)$	1.76	-0.13	1.55
$D\bar{m}\,(F_M \to S)$	0.90	-0.03	-0.01
$D\bar{m}\,(P_M \to S)$	0.59	0.31	-0.04
$D\bar{m}\,(M \to N)$	0.12	-0.02	-0.00
$\sum_{j \neq M} D\bar{m}\,(M \to j)$	1.61	0.26	-0.06
$\sum_{i,j \neq M} D\bar{m}\,(i \to j)$	**3.37**	**0.13**	**1.50**

Notes: LFS data, 1976–2018. $D\bar{m}$: counterfactual change in the multiple jobholding share; F_S: single jobholding with a full-time main job; P_S: single jobholding with a part-time main job; $S = F_S + P_S$: single jobholding; F_M: multiple jobholding working full-time on the main job; P_M: multiple jobholding working part-time on the main job; $M = F_M + P_M$: multiple jobholding; N: non-employment. For each time series the table reports average changes in levels, calculated as the difference between the average over the last year and the first year of each subperiod. All table entries are expressed in percent.

than that of the outflows. This is the only instance in the table when this occurs. Between 2000 and 2018, on the other hand, the dynamics among women is entirely explained by the inflows, which predict a 1.55 pp. increase to be compared with the 1.50 pp. change of the multiple jobholding share. Overall, the picture that emerges is that continued increases in the propensity of single jobholders to take on second jobs is the predominant driver of men's and women's multiple jobholding share.

Our approach distinguishes between full-time and part-time work when individuals hold either one or several jobs. This helps us refine the picture just described. As can be seen in Table 4, among men the dynamics of the inflows is overwhelmingly explained by the behavior of full-timers (F_S), and similarly the outflows are driven by the behavior of workers whose main job is full-time (F_M). Among women, the changes are more balanced between those occurring among part-time and full-time workers. For instance, during the last subperiod the increased propensity of full-time female workers to take on a second job predicts an increase by 0.94 pp. The corresponding figure among part-timers is 0.59. Therefore these transition probabilities explain respectively two thirds and one third of the increase in women's multiple jobholding share. These observations illustrate, again, the usefulness of this rich measurement framework. On a similar note, a strength of our statistical decomposition is that it detects changes that are partly masked by the 'stock-flow fallacy' illustrated in Table 4. That is, in several subperiods, the changes in stocks are lower than the changes implied by the gross flows taken in isolation. The decomposition exactly quantifies those differences.

5 Discussion of possible explanations

We documented long-run increases in the shares of multiple jobholders among employed men and women in Canada. These are no measurement artifacts: the trends are not accounted for by compositional changes or by time-aggregation bias. We devised a statistical procedure that disentangles the role of several sources of changes in multiple jobholding. That procedure showed that the main driver is the prolonged increase in the propensity of single jobholders to take on second jobs. In this section, we attempt to decipher what the underlying explanations might be.

Explanations on the supply side. The literature singles out two main explanations of workers' motivation for taking on a second job: one, the hours constraints that individuals may face in their main job (Shishko and Rostker [1976], Krishnan [1990], Paxson and Sicherman [1996]); and two, the 'job heterogeneity' motive, which may reflect the enjoyment that workers derive from a job that is different from their main job (Conway and Kimmel [1998, 2001]) or workers' willingness to diversify their skills (Panos et al. [2014], Pouliakas [2017]). In line with these explanations, in labor force surveys most workers report holding more than one job for economic reasons, but non-economic reasons also play a nonnegligible role.[18] For instance, according to Kimmel and Powell [1999], the split between economic and non-economic reasons in Canada is roughly two-thirds/one-third.[19] Motivated by this, we discuss whether the 'hours constraints' and 'job heterogeneity' motives could explain increases in the propensity of single jobholders to take on second jobs.

Hours considerations can play a role at different levels. First, workers may be prompted to take on a second job if earnings in the main job are not sufficiently (or not at all) responsive to increases in hours worked. However, we think this is unlikely to explain the secular trend in the inflow transition probabilities of multiple jobholding. A key reason is that wage contracts are increasingly more, not less, responsive to a worker's effort on the job (viz. performance-pay schemes); see Kuhn and Lozano [2008] and Champagne and Kurmann [2013].

Second, hours worked at the main job might not be sufficient and workers seek to boost their hours and earnings from additional job(s). The average number of hours worked in Canada has shown a declining trend (Figure B2). While this declining trend could be attributed to structural factors such as increasing participation of women in the labor force, aging population, and industrial shift towards services-producing industries, it is likely that falling hours are not welcomed by all workers, and some might prefer to work more hours.[20] While average hours

[18] Economic reasons listed in labor force surveys include 'meet regular household expenses', 'pay off debts', 'buy something special', and 'save for the future'. Non-economic reasons include 'gain experience/build business' and 'enjoys the work of second job'.

[19] See Table 7 in Kimmel and Powell [1999]. The authors use data from the Canadian Survey of Work Arrangements conducted in 1991 and 1995. Statistics Canada stopped conducting this survey, so unfortunately we cannot update Kimmel and Powell [1999]'s results.

[20] Average hours worked by women, senior workers, workers in the services-producing industries are lower

worked have been declining on average in the economy (Figure B2, panel a) and among full-time workers (Figure B2, panel b), they have been increasing among part-time workers and even more so among involuntary part-time workers, both single (Figure B2, panel c) and multiple (Figure B2, panel d) job holders. Hours worked at all jobs by involuntary part-time multiple job holders are getting closer to the hours by full-time single job holders (Figure B2, panel d), especially among women. These observations suggest that some workers might be 'job-packaging' (Kimmel and Powell [1999]) by combining several job(s) to obtain more working hours.

Third, holding individuals' demand for working more hours constant, it may be that they are increasingly able to do so due to changes in technology. First of all, it is conceivable that changes in workforce management technologies make it easier to coordinate different work schedules of employees nowadays. Thus, employers might be able to provide workers with additional flexibility in hours in their main job, facilitating the combination with another job.[21] Second, long-run changes in the employment composition could imply that workers are increasingly employed in jobs that offer a more flexible work schedule. One caveat, however, is that we find little support for explanations based on compositional changes (see Appendix B).[22] Third, a second job entails additional commute time, fatigue, set-up costs, etc. Again, it is conceivable that some of these costs have decreased over time. A telling example is the advent of the 'online gig economy', which makes it easy for workers to 'turn on' a second job at their own will.[23] Over the longer run, other technological changes may be reducing the costs of adding hours by working a second job.

A fourth plausible, supply-side factor is that workers' demand for non-standard and flexible work arrangements has increased over time. Kimmel and Powell [1999] cite evidence consistent

than those by men, prime-age workers, and workers in goods-producing industries

[21] This is a change on the demand side, but ultimately its impact on the multiple jobholding share is mediated by workers' ability and willingness to hold a second job in order to increase hours.

[22] For data availability reasons, we are only able to check whether compositional changes in the industry structure of employment could drive the trends in multiple jobholding. We find that these are extremely limited. We have little reason to believe that this result would be overturned by data on workers' occupation of employment.

[23] According to Abraham et al. and Katz and Krueger [2019], employment in the 'online gig economy' is not well measured by standard labor force surveys. Beyond the issue of measurement error, we think the role of the 'online gig economy' hypothesis is difficult to reconcile with the timing of the upward trends in multiple jobholding, which started in the mid-1970s.

with this explanation. For instance, they report that women may be increasingly willing to combine several jobs in order to deal with other responsibilities, such as child care. Prime-age participation rate in Canada has reached historical high at the end of 2018, as prime-age women participated at their highest rate ever. Related, there may be changes in workers' preferences with respect to the enjoyment derived from a second job or changes in their willingness to acquire new skills by diversifying their employment experience. While we have no reason to reject these hypotheses, a note of caution is in order. The literature has documented that, in U.S. data, there is a long-run shift *away* from allocating hours to market activities (e.g. Aguiar and Hurst [2007], Ramey and Francis [2009]). In Canada, average hours worked also have a downward trend as discussed above, with the exception of part-time workers and especially involuntary part-time.

Explanations on the demand side. So far, we have listed explanations related to technology and to preferences that relate to the supply side of the labor market. We do not rule out that the demand side could also play a role in driving the trend in multiple jobholding. We review these explanations before closing this section.

First, workers may hold specific job types as second jobs, and the availability of these jobs may change over time. One such example is remote contract work, which may offer the flexibility that is required in order to work two jobs at the same time. Another example is 'just-in-time work' that is typically used to accommodate demands for a few additional hours (for instance, by working during weekends). Kimmel and Powell [1999] piece together several pieces of evidence consistent with the view that such demand-side factors have prompted an increase in multiple jobholding. Increases in the shares of part-time and hourly paid employees as well as temporary employment (Figure B3 are suggestive of such demand-side factors playing a role. Firms hire more hourly paid and part-time workers likely because these jobs may offer more flexibility to the employer to change hours on demand. However, hourly paid and part-time workers work lower hours than salaried and full-time workers (Figure B4), and, therefore, might need additional job(s) to boost their hours and earnings.[24] The increase in these types of employment can be consistent with increase in the probability that a single jobholder moves

[24]Multiple job holders are more likely to be part-time at their main job (see Table 1).

into multiple jobholding, as discusses above.

Second, holding job types constant, firms may have faced changes in the policy environment that prompted incentives towards reducing labor costs and ultimately raised the probability that workers move into multiple jobholding. Kimmel and Powell [1999] point out that up until 1995, employers paid employment insurance taxes only for hours worked above a threshold of 15 hours per week. They also mention that occupational pensions and several other in-work benefits generate a wedge that should prompt employers towards employing workers at low hours. Notice, however, that if labor market policies were driving much of the trends in multiple jobholding, then we would expect to see sudden changes (concurrent or following policy changes) instead of the steady evolutions observed in the data. Also, we would expect to see larger differences across sectors or across regions than what is reported in Table B1. All in all, an interesting question for future work is whether tax reforms do have a significant impact on multiple jobholding.

Conclusion. From the mid-1970s until today, single jobholders in Canada have become more likely to work at a second job. As a result, the multiple jobholding share has increased substantially. After documenting and quantifying these evolutions, we established a list of candidate explanations. This list is by no means meant to provide final answers; it is intended to illustrate the relevance of our research for motivating further work. Our own assessment is that technology-based hypotheses provide the most promising explanations. In future work, we plan to delve into examining these explanations.

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Appendices

A Correction procedures

Our time series of stocks and gross worker flows are subject to several adjustments. We first correct the raw data for two discontinuities created by methodological changes in the LFS. Then we filter out systematic seasonal variations using the U.S. Census Bureau's X-13ARIMA-SEATS program. Using the filtered time series, we divide the gross flow of workers from state i to state j at time t by the stock of workers in state i at time $t-1$ to obtain the time-t transition probability $p\,(i \to j)$. Then we adjust the set of transition probabilities to account for margin error and time aggregation.

Changes in LFS data. There are discontinuities in the raw data of gross worker flows in 1994 and 2000. The dates coincide with significant revisions in the methodology of the LFS (see Usalcas and Kinack [2017]). In 1994, paper and pencil questionnaires were replaced by computer-assisted interviewing. In 2000, centralized computer-assisted telephone interviewing was adopted, and more importantly the individual survey weights were changed from a generalized regression to composite estimate survey weights. There is no standardized method to address these data discrepancies, so we simply correct them by using multiplicative adjustment factors. For each raw time series of gross worker flows, we calculate adjustment factors by taking the ratio of the mean value for the years before and after the 1994 and 2001 discontinuity.

Margin error. The goal of margin-error adjustments is to address the discrepancy between the stocks and gross worker flows data. The stocks are computed using cross-sectional data 'only'. On the other hand, the gross worker flows require longitudinal linking, and therefore their measurement suffers from sample attrition, imperfect matching, etc. The margin-error adjustment reconciles the changes in stocks predicted by the gross flows data with the actual changes calculated using cross-sectional data.

The starting point of margin-error adjustment is the Markov chain structure that underlies our approach in Section 3. For convenience, we repeat equation (2) here:

$$\boldsymbol{\ell}_t = \boldsymbol{X}_t \boldsymbol{\ell}_{t-1}. \tag{11}$$

In this equation, $\boldsymbol{\ell}_t$ is a vector of the stocks in each of the states of the Markov chain, and $\boldsymbol{X}_t$ is a stochastic matrix. We follow Elsby et al. [2015] and rewrite the dynamics of changes in stocks in the following way:

$$\Delta \boldsymbol{\ell}_t = \boldsymbol{S}_{t-1} \boldsymbol{p}_t. \tag{12}$$

$\boldsymbol{p}_t$ is a column vector containing all time-t $p\,(i \to j)$ such that $i \neq j$, and $\boldsymbol{S}_{t-1}$ is a conformable matrix of stocks in the previous period. At this point we have at hand only unadjusted transition probabilities, which we denote as $\widehat{\boldsymbol{p}}_t$. In equation (12), on the other hand, $\boldsymbol{p}_t$ denotes the 'true', i.e. stock-consistent transition probabilities. We recover $\boldsymbol{p}_t$ by minimizing the weighted sum of squares of margin-error adjustments under the constraint of equation (12), i.e. we solve:

$$\min \left(\boldsymbol{p}_t - \widehat{\boldsymbol{p}}_t\right)' \boldsymbol{W}_t^{-1} \left(\boldsymbol{p}_t - \widehat{\boldsymbol{p}}_t\right) \text{ s.t. } \Delta \boldsymbol{\ell}_t = \boldsymbol{S}_{t-1} \boldsymbol{p}_t. \tag{13}$$

In this minimization problem, $\boldsymbol{W}_t$ is a weighing matrix proportional to the covariance matrix of $\widehat{\boldsymbol{p}}_t$ (see Elsby et al. [2015] and Borowczyk-Martins and Lalé [2018]). The solution of this minimization problem, $\boldsymbol{p}_t$, is a function of $\widehat{\boldsymbol{p}}_t$, $\boldsymbol{S}_{t-1}$, $\Delta \boldsymbol{\ell}_t$, which we have already computed.

Time-aggregation bias. The idea behind the adjustment for time-aggregation bias is explained in Section 3. Our adjustment procedure is based on the continuous-time correction developed by Shimer [2012]. We describe it here briefly for completeness.

To maintain consistency with the notations of Section 4, denote by $\boldsymbol{H}_t$ the continuous-time analog of $\boldsymbol{X}_t$. It is known that if the eigenvalues of $\boldsymbol{H}_t$ are all distinct, then $\boldsymbol{H}_t$ can be written as $\boldsymbol{H}_t = \boldsymbol{V}_t \boldsymbol{C}_t \boldsymbol{V}_t^{-1}$, where $\boldsymbol{C}_t$ is a diagonal matrix of eigenvalues and $\boldsymbol{V}_t$ is the matrix of associated eigenvectors. Furthermore, one can show that $\boldsymbol{X}_t$ can be decomposed as $\boldsymbol{X}_t = \boldsymbol{V}_t \boldsymbol{D}_t \boldsymbol{V}_t^{-1}$, where $\boldsymbol{D}_t$ is a diagonal matrix whose elements are the exponentiated eigenvalues in $\boldsymbol{C}_t$, and that this relationship is unique if the eigenvalues of $\boldsymbol{D}_t$ are, in addition to distinct, real and non-negative. These relationships can be used to obtain time series of estimates of the adjusted hazard rates

λ_t^{ij}. So, in every period t, we compute the eigenvalues of the discrete transition matrix $\boldsymbol{X}_t$ and check whether they are all distinct, real, and non-negative. We then take their natural logarithm to obtain the eigenvalues of the continuous-time analogue $\boldsymbol{H}_t$. Finally, we compute $\lambda_t^{i,j}$ and use the relationship $p_t\,(i \to j) = 1 - e^{-\lambda_t^{ij}}$ to obtain a series of time-aggregation adjusted transition probabilities.

B Additional results

Table B1 reports the average levels and dynamics of the multiple jobholding share among several subgroups: we split the data by worker's age, educational attainment, marital status, main industry of employment, and by region. In Table B2, we adopt the same partitions to describe the share of multiple jobholders who work part-time on the main job. The main takeaways from Tables B1 and B2 are summarized in Subsection 2.3. In a nutshell, the key patterns of the dynamics of multiple jobholding shown in these tables are well captured by the partition by gender used in our analysis.

Tables B1 and B2 also provide a few additional details. First, there is a non-negligible degree of heterogeneity when we distinguish between different industries (Kimmel and Powell [1999]). This holds true especially for the share of multiple jobholders who work part-time on the main job (Table B2). Much of this heterogeneity is likely to be driven by differences in the mix of occupations across industries. Unfortunately, we do not have a consistent occupational classification over the whole sample period that would enable us to split the data by occupations. Second, differences across regions as well as across urban vs. rural areas are quite limited. This is somewhat in contrast with Hirsch et al. [2017] who find that multiple jobholding in the U.S. decreases substantially with city size.

Compositional changes. To investigate further the role played by heterogeneity in the dynamics of the multiple jobholding share, we look at the effects of compositional changes. Specifically, we construct counterfactual multiple jobholding share that control for changes in the composition of employment with respect to gender interacted with age (15 to 24 years;

Table B1: The multiple jobholding share

	1976–2018	1976–1990		1990–2000		2000–2018	
	Avg.	Avg.	△ (%)	Avg.	△ (%)	Avg.	△ (%)
Gender:							
Men	4.38	3.69	84.5	4.59	-2.26	4.83	10.8
Women	5.09	3.28	248.7	5.53	10.3	6.32	21.9
Age:							
15–24 years	5.39	3.50	205.2	6.17	20.7	6.60	14.0
25–34 years	4.76	3.60	112.2	5.17	4.81	5.55	18.8
35–44 years	4.64	3.86	110.9	4.99	-11.4	5.13	17.5
45–54 years	4.19	3.33	93.6	4.44	-2.25	4.81	20.3
55 years and above	3.40	2.49	68.3	3.43	19.4	4.15	25.8
Education:							
0–8 years	2.71	2.63	50.1	2.66	-11.2	2.85	6.03
Secondary school	4.07	3.06	133.7	4.57	2.07	4.70	7.89
Some post-secondary education	4.98	4.04	136.2	5.51	-4.97	5.51	12.4
University degree	5.48	4.76	96.9	5.81	-8.18	5.92	15.9
Marital status:							
Married or cohabiting	4.29	3.47	105.7	4.73	-2.56	4.77	15.1
Widowed, divorced, or separated	4.83	3.41	164.4	5.16	-4.40	5.91	17.9
Never married	5.04	3.52	179.9	5.54	8.29	6.09	14.6
Industry:							
Agriculture	7.68	6.80	76.5	8.55	-8.47	7.96	-5.86
Other primary	3.02	2.82	127.8	3.58	-12.6	2.88	-17.6
Construction	3.09	2.91	86.1	3.44	-22.0	3.04	5.72
Manufacturing	2.69	2.32	107.2	2.88	-17.6	2.92	27.3
Transportation	3.94	3.39	110.4	4.46	-12.0	4.17	-10.6
Wholesale trade	3.90	3.45	143.3	4.57	-25.1	3.93	11.2
Retail trade	4.45	3.18	149.8	5.09	18.9	5.19	3.81
Finance, insurance, real estate	3.78	2.86	168.6	4.07	-13.1	4.43	6.71
Professional, technical, and management services	4.59	3.84	142.9	4.88	-2.09	5.05	27.9
Educational and health services	6.50	4.48	142.0	7.08	12.9	7.97	11.5
Recreation, accommodation, and food services	5.18	3.70	145.9	5.51	9.61	6.30	22.2
Public administration	4.24	3.63	112.7	4.76	-8.87	4.50	11.8
Region and CMA(*)**:**							
Atlantic	3.58	2.54	74.5	3.70	12.6	4.44	26.7
Québec, excl. Montréal	3.31	2.42	120.2	3.30	4.33	4.10	45.0
Montréal QC	3.71			3.12	8.88	4.07	43.5
Ontario, excl. Toronto	4.92	3.63	158.2	5.54	-3.70	5.72	13.7
Toronto ON	4.27			3.72	-8.04	4.59	27.9
Prairie provinces	6.37	5.21	129.4	7.77	-5.68	6.60	-7.51
British Columbia, excl. Vancouver	5.32	3.40	191.1	6.30	20.3	6.46	3.61
Vancouver BC	5.28			5.13	13.7	5.35	24.1

Notes: LFS data, 1976–2018. (*): The Census metropolitan area (CMA) data is available only starting in 1987. The table reports averages (Avg.) and percentage changes (△ %) of the multiple jobholding share over the sample period and over specific subperiods. All table entries are expressed in percent.

Table B2: Share of multiple jobholders working part-time on the main job

	1976–2018	1976–1990		1990–2000		2000–2018	
	Avg.	Avg.	△ (%)	Avg.	△ (%)	Avg.	△ (%)
Gender:							
Men	18.5	14.7	22.0	18.7	28.8	21.2	9.69
Women	47.6	46.4	-5.62	48.2	13.0	48.2	-9.02
Age:							
15–24 years	50.0	39.8	26.7	52.2	25.8	57.3	2.17
25–34 years	26.2	20.3	44.3	27.8	29.2	30.2	4.49
35–44 years	25.3	19.8	80.2	27.7	24.2	28.8	-4.65
45–54 years	25.4	19.2	51.8	27.5	39.5	29.7	-8.68
55 years and above	31.0	25.2	16.4	31.5	29.8	35.6	2.47
Education:							
0–8 years	26.7	19.4	54.8	28.8	37.4	31.8	6.20
Secondary school	35.0	26.8	42.0	36.8	30.3	41.0	3.12
Some post-secondary education	29.3	25.7	10.3	29.8	32.2	32.1	2.71
University degree	28.2	21.3	56.9	29.9	30.9	33.2	-4.00
Marital status:							
Married or cohabiting	26.7	20.6	64.3	28.8	30.3	30.9	-4.74
Widowed, divorced, or separated	27.4	23.3	-7.49	28.5	34.7	30.5	-7.45
Never married	41.0	35.4	6.56	42.5	24.2	44.8	1.80
Industry:							
Agriculture	24.4	23.6	16.7	25.3	10.9	24.2	5.60
Other primary	7.96	5.22	85.5	9.98	89.4	9.29	-6.76
Construction	15.9	12.8	196.3	17.6	25.7	17.7	-28.4
Manufacturing	9.14	6.69	55.3	9.89	73.7	10.8	-6.75
Transportation	24.9	20.6	31.9	26.3	6.96	27.7	5.38
Wholesale trade	15.3	12.9	69.5	17.7	-11.5	15.9	21.2
Retail trade	44.6	38.0	28.4	46.9	21.0	49.1	-6.14
Finance, insurance, real estate	24.9	19.9	-6.47	28.0	53.9	27.4	-7.86
Professional, technical, and management services	29.2	25.7	-10.6	30.2	31.5	31.4	-6.58
Educational and health services	38.8	33.6	47.1	41.6	13.8	41.7	-12.1
Recreation, accommodation, and food services	42.2	36.3	6.27	41.9	23.3	47.3	8.24
Public administration	16.4	13.8	59.9	18.5	6.05	17.4	11.2
Region and CMA(*)**:**							
Atlantic	29.1	23.6	44.1	31.8	17.3	32.3	-5.48
Québec, excl. Montréal	33.8	23.6	102.4	36.8	39.1	41.0	-12.2
Montréal QC	38.4			35.3	25.5	40.3	9.85
Ontario, excl. Toronto	32.4	24.6	35.3	34.6	43.0	37.8	-1.15
Toronto ON	30.9			29.5	19.8	31.7	15.9
Prairie provinces	27.8	23.9	31.7	29.7	13.2	30.1	-5.28
British Columbia, excl. Vancouver	36.2	30.8	26.0	37.2	36.5	40.3	-13.0
Vancouver BC	35.5			32.9	45.7	37.1	-6.53

Notes: LFS data, 1976–2018. (*): The Census metropolitan area (CMA) data is available only starting in 1987. The table reports averages (Avg.) and percentage changes (△ %) of the share of multiple jobholders working part-time on the main job over the sample period and over specific subperiods. All table entries are expressed in percent.

25 to 54 years; 55 years and above), education, marital status, or industry (agriculture and other primary; construction, manufacturing, and transportation; trade; finance, insurance, real estate, professional, technical, and management services; other service industries and public administration). Letting g denote the subgroups in a given partition, the multiple jobholding share is:

$$m_t = \sum_g \omega_{g,t} m_{g,t}, \tag{14}$$

where $\omega_{g,t}$ is the employment share of subgroup g at time t and $m_{g,t}$ is g's own multiple jobholding share. To study compositional changes, we calculate counterfactual m_t's by holding the $\omega_{g,t}$'s constant over time (we fix them to their sample mean).

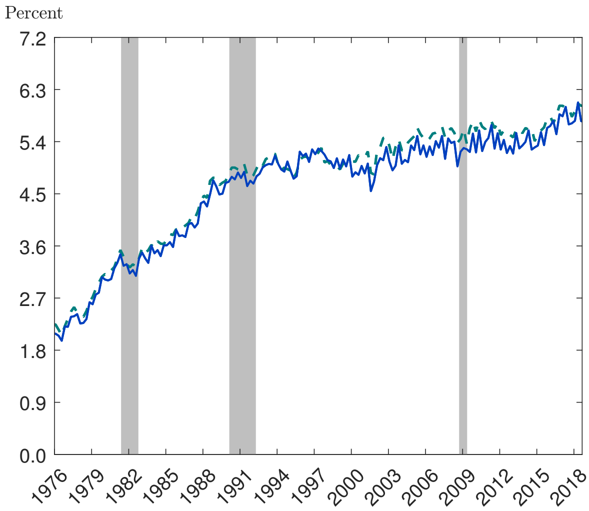
The four plots in Figure B1 compare the actual multiple jobholding share (denoted by the dashed line) with the counterfactual time series (denoted by the solid lines). Plot B1b shows that the increase in average educational attainment contributes positively to the increase in the multiple jobholding share, since multiple jobholding is higher among more educated workers. And Plot B1d indicates a positive role for the shift in employment towards service industries, as workers employed in these industries are more likely to be multiple jobholders (Kimmel and Powell [1999] find similar results). Overall, there is very little difference between the two time series displayed in each plot of Figure B1.

Additional figures. To complement Section 5, we display figures based on calculations we made using LFS data and data from the Survey of Employment, Payroll and Hours (SEPH):

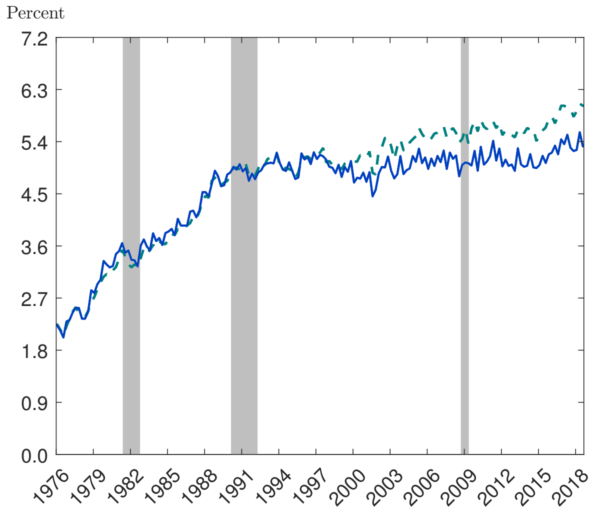
- Figure B2 reports weekly hours per worker in the aggregate and in full-time and part-time employment, distinguishing between hours on all jobs and hours on the primary job for multiple jobholders. The sample includes both men and women.

- Figure B3 reports the employment share of part-time workers, temporary workers, and workers who are paid by the hour. Information on hourly paid workers comes from SEPH data Cansim Table 281-0048 starting in 2001. The sample includes both men and women.

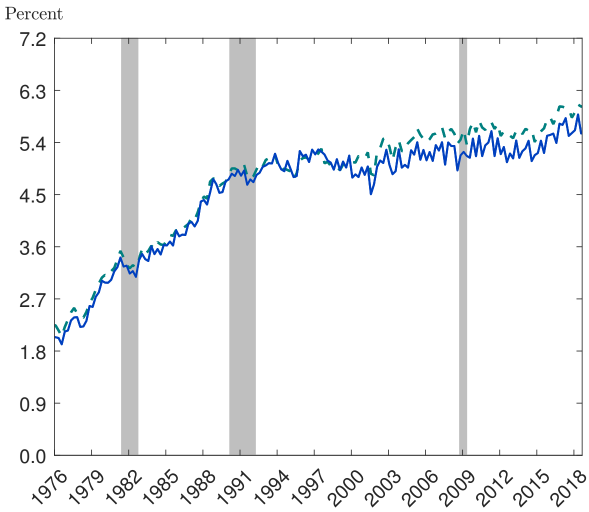
- Figure B4 reports weekly hours per worker among salaried workers and hourly paid workers. The sample includes both men and women.



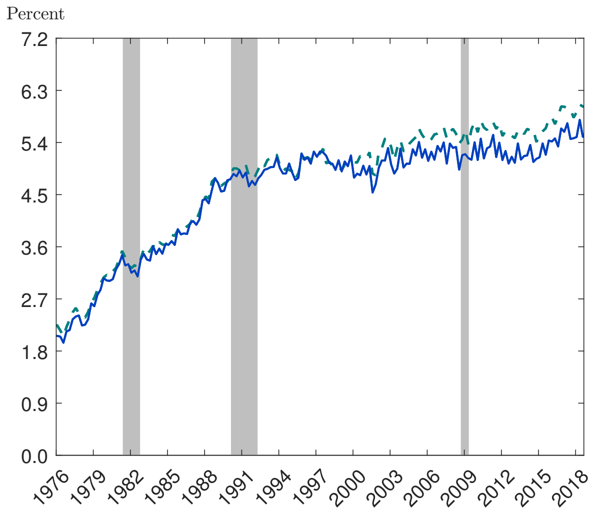
(a) Gender and age



(b) Gender and education



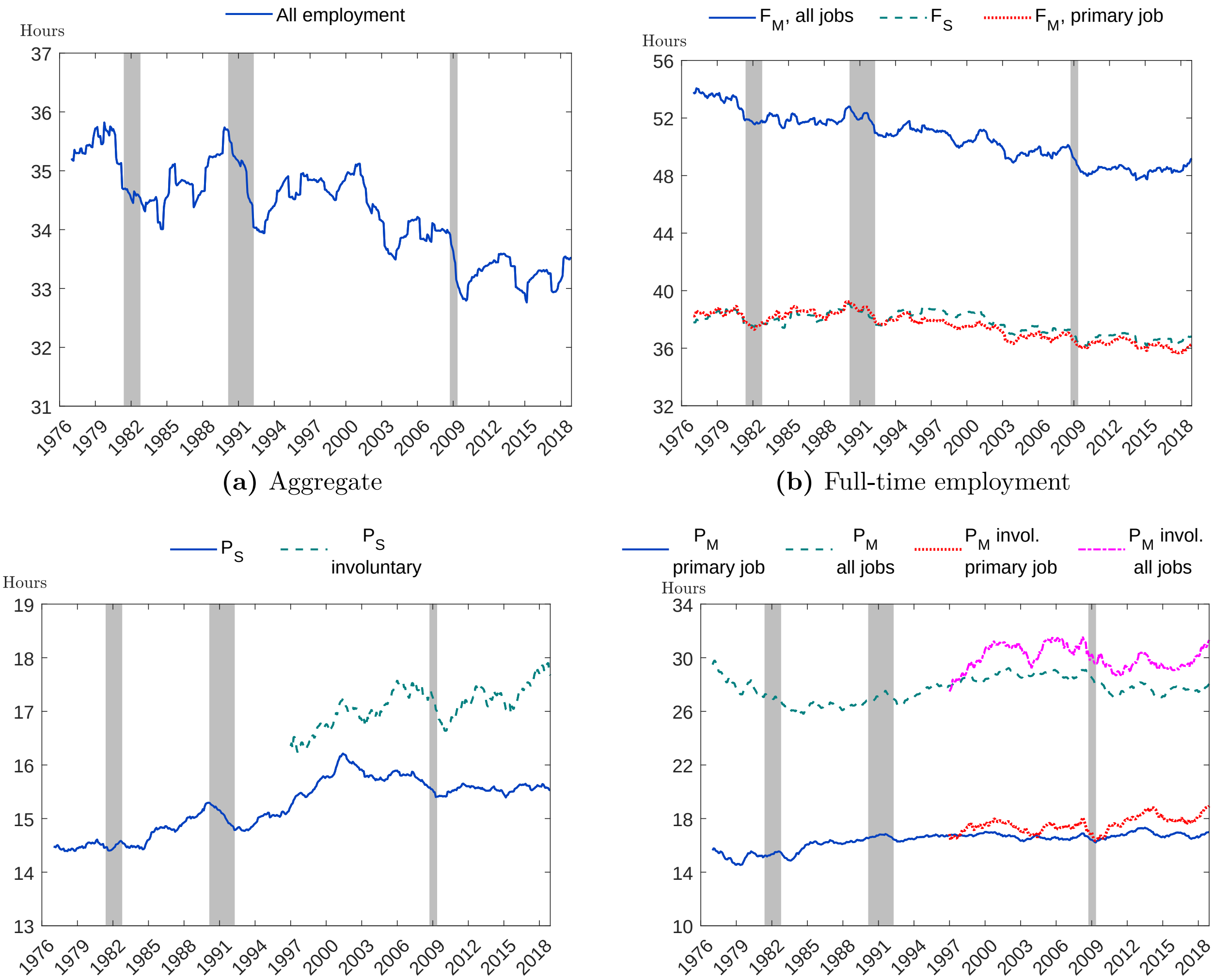
(c) Gender and marital status



(d) Gender and industry

Figure B1: The multiple jobholding share: Controlling for compositional changes

Notes: LFS data, 1976–2018, time series cleared from seasonal variations. The dashed lines denote the baseline multiple jobholding share plotted in Figure 1. The solid lines denote counterfactual multiple jobholding shares that control for changes in the composition of employment. Gray-shaded areas indicate recession periods identified by the C.D. Howe Institute Business Cycle Council.



(a) Aggregate **(b)** Full-time employment

(c) Part-time single jobholders **(d)** Part-time multiple jobholders

Figure B2: Hours worked, primary vs. all jobs, in full-time and part-time employment

Notes: LFS data, 1976–2018. F_S: single jobholding with a full-time primary job; P_S: single jobholding with a part-time primary job; F_M: multiple jobholding working full-time on the primary job; P_M: multiple jobholding working part-time on the primary job; Invol.: involuntary part-time work. All series are smoothed using a 12-month moving average. Gray-shaded areas indicate recession periods identified by the C.D. Howe Institute Business Cycle Council.

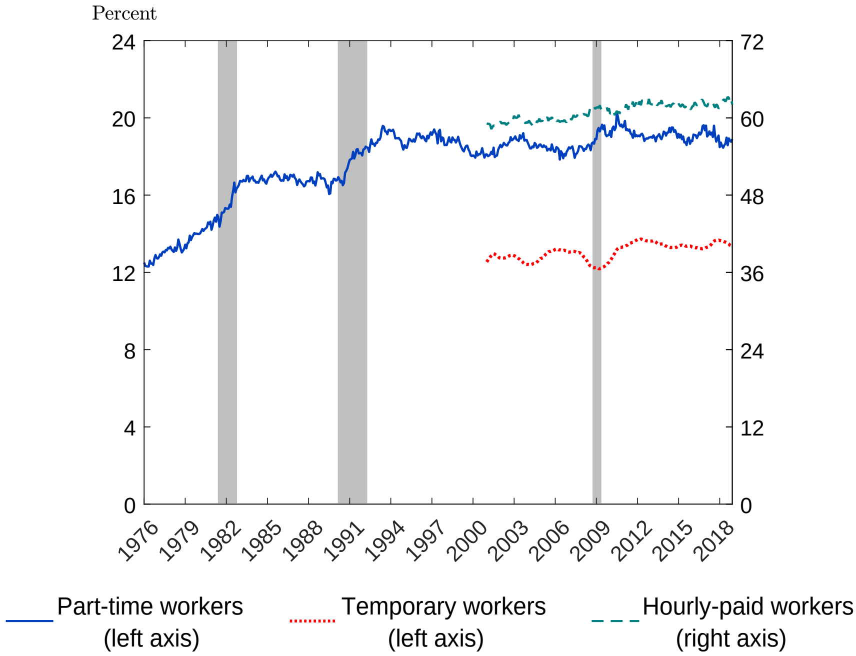


Figure B3: Part-time, temporary, and hourly paid workers

Notes: LFS data, 1976–2018 on the left axis, SEPH data, 2001–2018 on the right axis, time series cleared from seasonal variations. All series are smoothed using a 12-month moving average. Gray-shaded areas indicate recession periods identified by the C.D. Howe Institute Business Cycle Council.

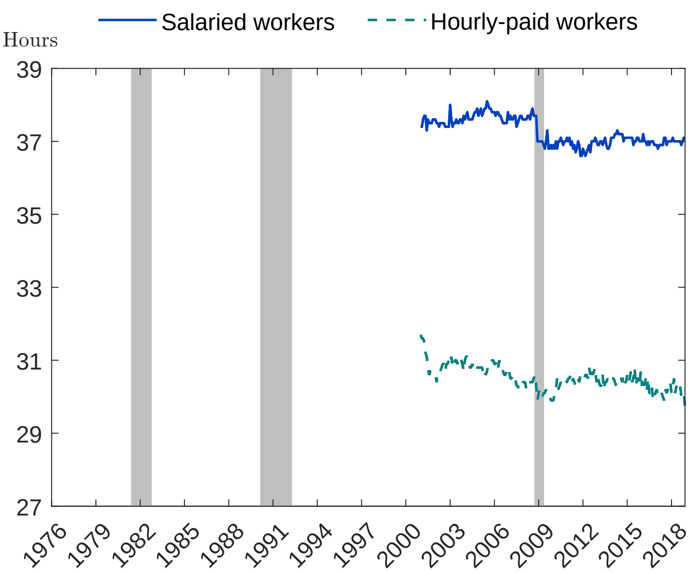


Figure B4: Hours worked, salaried vs. hourly paid workers

Notes: SEPH data, 2001–2018, time series cleared from seasonal variations. All series are smoothed using a 12-month moving average. Gray-shaded areas indicate recession periods identified by the C.D. Howe Institute Business Cycle Council.