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A New Measure of Multiple Jobholding in the U.S. Economy

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DISCUSSION PAPER SERIES

IZA DP No. 13693

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the U.S. Economy**

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SEPTEMBER 2020

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U.S. Census Bureau

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U.S. Census Bureau and IZA

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ABSTRACT

A New Measure of Multiple Jobholding in the U.S. Economy*

We create a measure of multiple jobholding from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics data. This new series shows that 7.8 percent of persons in the U.S. are multiple jobholders, this percentage is pro-cyclical, and has been trending upward during the past twenty years. The data also show that earnings from secondary jobs are, on average, 27.8 percent of a multiple jobholder's total quarterly earnings. Multiple jobholding occurs at all levels of earnings, with both higher- and lower-earnings multiple jobholders earning more than 25 percent of their total earnings from multiple jobs. These new statistics tell us that multiple jobholding is more important in the U.S. economy than we knew.

JEL Classification: J2, J3

Keywords: multiple jobholding, earnings, LEHD

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1) Introduction

There are unanswered questions about individuals who are increasingly stringing together multiple jobs in order to make ends meet. Although these discussions often refer to the growing gig economy, they also refer to individuals holding two or more wage and salary jobs. There are several reasons why we might expect multiple jobholding to have increased over the past two decades, such as the growing number of jobs in industries where part-time work is considered normal, stagnation of earnings at the lower end of the earnings distribution, and recent advances in technology which have made it easier and less costly for persons to take on a second job. Knowing the characteristics, level, and the trend of multiple jobholding is important to economists and policymakers.

The dominant source of data for research and published information on multiple jobholders in the United States is the Current Population Survey (CPS). The CPS is the nation's premier representative survey of households, providing monthly labor market statistics. Widely cited statistics from the CPS show that the multiple jobholding rate in the U.S has been declining during the past several decades. Yet several prominent studies in the past few years have suggested that the multiple jobholding rate in the CPS is biased downward.

In this research, we propose a new data source for research and analyses about multiple jobholding – the U.S. Census Bureau's Longitudinal Employer-Household Dynamics (LEHD). The LEHD are administrative data that nearly encompass the population of workers. The use of LEHD administrative data is both a uniquely-defining characteristic of our research and a significant advantage in quantifying and analyzing multiple jobholding in the U.S. In addition to the large sample size, two additional characteristics of LEHD data are: 1) LEHD combines demographic data from various sources to develop workforce information by characteristics such as gender and age, and 2) LEHD has earnings information for each job that an individual holds.

The reference period of the LEHD data is a calendar quarter. As such, the first step in our research is to define multiple jobholding based upon the available information in the quarterly administrative data. We define a multiple jobholder as an individual who holds two or more jobs in a quarter and at least one of the jobs is a long-lasting stable job.

We find that over the 1996:Q2 – 2018:Q1 time period, the LEHD multiple jobholding rate averages 7.2 percent of all employed individuals. This multiple jobholding rate has been

rising during the past several decades, from 6.8 percent in 1996:Q2 to 7.8 percent in 2018:Q1. The LEHD multiple jobholding rate is quite cyclical, declining in both the 2001 and the 2007-2009 recessions. These patterns are different from those measured by the CPS: the CPS multiple jobholding rate is much lower (which is likely due to differences in measuring multiple jobholding on a monthly versus a quarterly frequency), and the CPS multiple jobholding rate is declining over the past two decades with no evidence of cyclicalities. The different trends and different cyclical patterns in the LEHD suggest that multiple jobholding is becoming more important in the U.S. economy than the CPS data show.

The LEHD has earnings information for all jobs, rather than just the primary job as in the CPS. We document that earnings from all secondary jobs are, on average, 27.8 percent of a multiple jobholder's total quarterly earnings. This 27.8 percent is essentially constant over time with little if any evidence of cyclicalities. We also document that the multiple jobholding rate exhibits an inverted-U shape across the range of total full-quarter earnings, and at every percentile of total earnings, multiple jobholding provides on average more than 25 percent of total earnings for individuals who are multiple jobholders.

The roadmap of this paper is as follows. In section two, we discuss how to define multiple jobholding from quarterly administrative data that does not contain information on hours worked or weeks worked during the quarter. We provide a thorough description of the data in section three. In section four, we quantify the 7.2 percent average LEHD multiple jobholding rate, and we document the trend and cyclicalities of the LEHD multiple jobholding measure. We compare the LEHD multiple jobholding measure to the CPS multiple jobholding measure in section five. We concede that our research does not address why the quantification of multiple jobholding differs in the CPS and the LEHD. We present gender and age data, industry data, and duration data in section six. Section seven looks at earnings, including both simple tabulations and a regression analysis. Section eight offers some concluding thoughts and suggestions for next steps.

2) Defining Multiple Jobholders Using Quarterly Administrative Records

Estimates of multiple jobholding have traditionally been from household surveys, where employed individuals are asked whether they held more than one job during the reference period.

For example, in the CPS, employed individuals are asked “Last week, did you have more than one job, including part time, evening or weekend work?”

Defining multiple jobholding from administrative records is not as simple. Administrative records are collected for administration of government programs and are not designed for economic measurement purposes. When using quarterly administrative records such as the LEHD, the lack of a labor supply measure within the quarter is the major issue when attempting to use administrative records for economic measurement. Observing an employer-employee match in a given quarter does not tell us whether the individual was employed at the job for one week of the quarter or for all thirteen weeks of the quarter. When an individual is observed holding two jobs during the quarter, we do not know if the jobs were held simultaneously or consecutively.

To avoid the labor supply issue, analysts often link together three consecutive quarters of administrative data in order to create a measure known as “full-quarter” employment. Full-quarter employment is defined as the middle quarter of an employer-employee match that exists for three consecutive quarters. We assume that individuals in full-quarter jobs are working for the employer throughout the quarter. This assumption is fundamental to how we define multiple jobholding from the LEHD data.

Our definition of multiple jobholding constructed from the quarterly LEHD administrative records is as follows: an individual is a multiple jobholder if he or she holds two or more jobs in a quarter and at least one of the jobs is a full-quarter job. We believe this definition results in a conservative estimate of the number of multiple jobholders, and we expand on this in more detail in section 4b below.

The following matrix relates the number of full quarter jobs held during the quarter with the total number of jobs held during the quarter. The notation N_{xy} refers to the number of individuals in a given cell of the matrix defined by the number of full quarter jobs x and the number of total jobs y :

	1 job	2 jobs	3 or more jobs	
0 full-quarter jobs	N_{01}	N_{02}	N_{03}	N_{0y}
1 full-quarter job	N_{11}	N_{12}	N_{13}	N_{1y}
2 full-quarter jobs		N_{22}	N_{23}	N_{2y}
3 or more full-quarter jobs			N_{33}	N_{3y}
	N_{x1}	N_{x2}	N_{x3}	N

Let's examine each of the cells in the above matrix, starting with the two cells in the column titled "1 job." The cell N_{01} is the number of individuals who hold one job during the quarter and this job is not a full-quarter job. The cell N_{11} is the number of individuals who hold one full-quarter job during the quarter. Given that the individuals in cells N_{01} and N_{11} only hold one job during the quarter, these individuals are not multiple jobholders.

The two cells N_{02} and N_{03} in the top row of the matrix represent individuals who hold two or more jobs during the quarter, of which none of these jobs are full-quarter jobs. Our definition of multiple jobholding is that when an individual holds two or more jobs in the quarter, one of the jobs must be a full-quarter job. As such, persons in these two cells are not multiple jobholders. We have a more extended discussion of these two cells in section 4b below.

The two cells N_{12} and N_{13} in the matrix above represent individuals who hold two or more jobs during the quarter, of which one is a full-quarter job and the others are not. By definition, individuals in these two cells are multiple jobholders.

In the matrix above, N_{22} is the number of individuals who hold two jobs during the quarter, each of which is a full-quarter job. By definition, these individuals are multiple jobholders.

The final two interior cells in the matrix above, N_{23} and N_{33} , represent individuals who hold three or more jobs during the quarter, of which two or more of these jobs are full-quarter jobs. Individuals in these two cells are, by definition, multiple jobholders.

Summarizing this discussion, individuals in the cells $\{N_{12}, N_{13}, N_{22}, N_{23}, N_{33}\}$ are multiple jobholders. These are the shaded cells in the matrix above. These are the individuals who hold two or more jobs in a quarter and at least one of the jobs is a full-quarter job. The total

number of individuals is N (the bottom-right cell of the matrix above), and the multiple jobholding rate is $[(N_{12} + N_{13} + N_{22} + N_{23} + N_{33}) / N]$.

3) LEHD Data

We use data from the Longitudinal Employer-Household Dynamics (LEHD). The LEHD is derived from the Local Employment Dynamics (LED) partnership. The LED partnership relies on voluntary participation of U.S. states and territories – LED partners. Currently, 47 states and the District of Columbia share data through the LED partnership. The current LED partners' data covers 95% of the nation's private sector, state and local government employment.

The LEHD is a longitudinally linked employer-employee dataset created by the U.S. Census Bureau. The data are derived from state-submitted Unemployment Insurance (UI) wage records and the Quarterly Census of Employment and Wages (QCEW) data. Every quarter, employers who are subject to state UI laws are required to submit to the states information on their workers (the wage records, which lists the quarterly earnings of every individual in the firm) and their workplaces (the QCEW, which provides information on the industry and location of each establishment). The wage records and the QCEW data submitted by the states to the U.S. Census Bureau are enhanced with census and survey microdata in order to incorporate information about worker demographics (age and gender) and the firm (firm age and firm size). Abowd et al. (2009) provide a thorough description of the source data and the methodology underlying the construction of the LEHD data.

A job in the LEHD is defined as the presence of an individual-employer match, and earnings is defined as the amount earned from that job during the quarter. As described earlier, full-quarter jobs are a critical component in our analysis. A full-quarter job is defined as a contemporaneous employer-employee match that also exists in the previous quarter and in the following quarter. The underlying assumption is that individuals in full-quarter jobs are working for the employer throughout the quarter.

Because states have joined the LEHD program at different times and have provided various amounts of historical data upon joining the LEHD program, the length of the time series

of LEHD data varies by state. We use data from 18 states that have data available from 1996:Q1 through 2018:Q2, which gives us full-quarter data from 1996:Q2 to 2018:Q1.¹

Earnings in the LEHD data are the dollar amount earned from the individual-employer match. We impose two recodes on the earnings data. First, to minimize the effect of outliers and smooth the first two moments of the earnings time series, we topcode earnings at the 99.5th percentile of the state-year-quarter distribution. Second, we convert nominal earnings to real using the 2018:Q1 CPI-U-RS deflator.

We restrict the LEHD data to jobs in the private sector and to persons aged 16-99. The data we use in our analysis has 4.498 billion individuals pooled over the 88 quarters 1996:Q2 – 2018:Q1, which is an average of over 51 million persons per quarter.

One final note warrants mention. We define multiple jobholding across all 18 states in our dataset. For example, if an individual's primary job is in Connecticut, the second job could be in Connecticut, in New Jersey, in Rhode Island, or in any of the other 18 states. This quantification of multiple jobholding allows for the inclusion of cross-state employee-employer connections, and is an aspect that is not available to a LED partner absent data sharing agreements with other states.

4) Empirical Quantification of Multiple Jobholding in the LEHD

4a) Basic Quantification

We estimate the matrix that describes the number of full-quarter jobs and the number of total jobs using the 1996:Q2 – 2018:Q1 LEHD data. These estimates, averaged over all quarters and expressed as a percentage of all individuals, are given in Table 1. Most employed individuals are in the upper left cells of the matrix: 69.5 percent have one full-quarter job during the quarter (cell N₁₁), and 17.9 percent have one non-full-quarter job during the quarter (cell N₀₁). These individuals are not multiple jobholders. Individuals with two or more jobs during

¹ These 18 states are CA, CO, CT, HI, ID, IL, KS, LA, MD, MN, MT, NC, NJ, OR, RI, TX, WA, and WY. These 18 states account for roughly 43 percent of national employment. The time series of employment from these 18 states closely tracks the national time series of total private sector employment published by the Bureau of Labor Statistics (BLS).

the quarter, of which none of the jobs are full-quarter jobs, are 5.3 percent of the employed (cells N₀₂ and N₀₃). These persons are not multiple jobholders.

In Table 1, the multiple jobholders are in the shaded cells {N₁₂, N₁₃, N₂₂, N₂₃, N₃₃}. Averaged over all quarters 1996:Q2 – 2018:Q1, the multiple jobholding rate is 7.2 percent of all employed individuals in the LEHD. More than half of the multiple jobholders (3.8 percentage points of the 7.2%) are individuals with 1 full-quarter job and two or more total jobs during the quarter – these are cells N₁₂ and N₁₃. The other category with a large amount of multiple jobholders are persons with two full-quarter jobs – this is cell N₂₂ with 2.8 percentage points of the 7.2%. Persons with two or more full-quarter jobs and three or more total jobs, cells N₂₃ and N₃₃, are a small group of persons (0.6 percentage points of the 7.2%).

The seasonally adjusted quarterly time series of the multiple jobholding rate is given in Figure 1. The multiple jobholding rate as measured with LEHD data is rising during the past several decades, from 6.8 percent in 1996:Q2 to 7.8 percent in 2018:Q1. The multiple jobholding rate exhibits cyclical properties, rising in expansions and falling in recessions. Providing some quantification to this statement, the LEHD multiple jobholding rate declines by 0.4 percentage points during the 2001 recession (from 7.3 percent in 2000:Q4 to 6.9 percent in 2001:Q4) and declines by 0.6 percentage points during the 2007-2009 recession (from 7.6 percent in 2007:Q3 to 7.0 percent in 2009:Q2).

Multiple jobholding in the LEHD is very seasonal. Figure 2 presents the same seasonally adjusted quarterly series as in Figure 1 along with the non-seasonally adjusted series. In non-recessionary years, the non-seasonally adjusted series is always lowest in the first quarter of the year, and is monotonically rising through the year until its peak in the fourth quarter of the year.

Recall that the multiple jobholding rate is the sum of different cells in Table 1. The three components we have previously discussed are graphed in Figure 3. The top solid line shows the percent of employed individuals who hold two or more jobs during the quarter, of which one is a full-quarter job (this corresponds to cells N₁₂ and N₁₃ in Table 1). The middle dashed line shows the percent of individuals with a job who hold two full-quarter jobs during the quarter (this corresponds to cell N₂₂ in Table 1). The bottom dotted line shows the percent of individuals with a job who hold three or more jobs during the quarter, of which two or more are full-quarter jobs (this corresponds to cells N₂₃ and N₃₃ in Table 1).

The rising multiple jobholding rate between 1996 and 2018 is not due to one specific component. Between 1996 and 2009, the increase is attributable to the percent of persons with two full-quarter jobs. This dashed line increases from 2.3% in 1996:Q2 to 3.2% in 2009:Q2.² Between 2009 and 2018, the increase is attributable to the percent of persons with two or more jobs of which one is a full-quarter job. This solid line increases from 3.2% in 2009:Q3 to 3.8% in 2018:Q1.

The cyclicity of the LEHD multiple jobholding rate is due entirely to persons with two or more jobs where one is a full-quarter job (cells N₁₂ and N₁₃). The solid line in Figure 3 is rising slightly during the late 1990s, falling during the 2001 recession, rising gradually during the mid-2000s, falling during the 2007-2009 recession, and then rising during the decade of the 2010s. Neither the dashed line nor the dotted line in Figure 3 exhibits any cyclicity.

4b) Subtleties of Defining Multiple Jobholders

Our definition of multiple jobholding from the LEHD is based on an individual holding at least one full-quarter job. This definition ignores possible multiple jobholding by persons in cells N₀₂ and N₀₃ who hold two or more jobs during the quarter but do not hold a full-quarter job. Some notation is necessary in order to understand the complexity of jobs that can be in these two cells. Using the notation of Abowd et al. (2009), there are four types of jobs in the LEHD quarterly data: (1) full-quarter (FQ) jobs, (2) jobs that exist in the current and previous quarter but not the following quarter (beginning of quarter jobs, abbreviated as BQ jobs), (3) jobs that exist in the current and following quarter but not in the previous quarter (end of quarter jobs, abbreviated as EQ jobs), and (4) jobs that exist in only the current quarter (single quarter jobs, abbreviated as SQ jobs). In more intuitive words, BQ jobs are separations from a job held in the previous quarter, EQ jobs are hires into jobs that will last into the following quarter, and single quarter (SQ) jobs are jobs that both begin and end in the current quarter. For BQ jobs, we do not

² We find it interesting that the percentage of persons with two full quarter jobs is increasing from 1996 to 2009 but is flat after 2009. However, this is not an unusual finding when analyzing LEHD data. For example, McKinney and Abowd (2020) find that stable workers, defined as persons receiving the majority of their annual earnings from the same dominant employer in two consecutive years, has the exact same time series pattern. We have no immediate explanation for this change in trend and note this as a topic for future research.

know the date of separation within the quarter, and for EQ jobs, we do not know the date of hire within the quarter.

The most common combination of jobs in cells N₀₂ and N₀₃ is one BQ job and one EQ job. Given the lack of job start dates and job end dates in the LEHD data, we do not know whether persons with one BQ job and one EQ job are multiple jobholders. We hypothesize, but cannot prove, that many individuals leave their BQ job on a Friday and begin their new EQ job the following Monday, which is a job change rather than multiple jobholding.

An individual who holds two BQ jobs in the current quarter could be considered a multiple jobholder on the first day of the quarter. Similarly, an individual who holds two EQ jobs could be considered a multiple jobholder on the last day of the quarter. Our definition of multiple jobholding is conservative in that we do not consider individuals with either two BQ jobs or two EQ jobs to be multiple jobholders. Our justification for excluding these individuals from our multiple jobholding measure is twofold. First, our definition starts with a well-defined group of workers in long-term stable jobs (individuals with full-quarter jobs) and then asks how many of these individuals supplement their earnings by having a second job during the quarter. Second, individuals with full-quarter jobs have a well-defined quarterly earnings measure unaffected by labor supply issues, and in section 7 of this paper we will use full quarter earnings as a foundation for comparing earnings of multiple jobholders to earnings of non-multiple jobholders.

We can count how many individuals have two BQ jobs or two EQ jobs, and thus quantify how much multiple jobholding our conservative measure might be missing. Figure 4 presents the same multiple jobholding series as in Figure 1, as well as an alternative series that adds individuals who have two BQ jobs or two EQ jobs. The immediate conclusion from Figure 4 is that individuals in cells N₀₂ and N₀₃ who have two BQ jobs or two EQ jobs are roughly 0.6 percent of the employed. This percentage is roughly constant over time: it is 0.8 percent in the 1990s, 0.5 percent in the 2000s, 0.5 percent in the early 2010s, and 0.6 percent in the late 2010s. We conclude that the trend and cyclicity of our preferred LEHD multiple jobholding rate are not affected by not including persons with two BQ jobs or two EQ jobs as multiple jobholders.

This exercise of investigating alternative definitions of multiple jobholding in the LEHD data highlights the importance of definitions when using administrative data for statistical measurement purposes. In administrative data such as the LEHD, one can think of several

definitions for multiple jobholding. No one single definition is the correct definition, and none are inherently wrong. Our goal has been to create a measure that we believe most people will understand, and we suggest that additional labor earnings above and beyond the earnings of a long-term stable job is the simplest and the most intuitive. We have intentionally chosen a reference frame of the entire quarter for our multiple jobholding definition, rather than a specific point in time such as the first day of the quarter.

5) Comparison of LEHD and CPS Multiple Jobholding Rates

As mentioned earlier, almost everything we know about multiple jobholding in the U.S. is from the CPS data. The most recent publications from BLS regarding multiple jobholding are Hipple (2010) and Bureau of Labor Statistics (2018). In this section, we ask how our new measure of multiple jobholding from the LEHD compares to the published multiple jobholding rate from the CPS.

We begin with the CPS series LNS12026620 “Seasonally Adjusted Multiple Jobholders as a Percent of Employed.” We create a quarterly measure of multiple jobholding from this published monthly series by averaging three months of data (an alternative would be to use the third month of the quarter as the quarterly measure – we have done this and the two series are very similar).

Before turning to a comparison of the two measures, we need to remember that we are, to some extent, comparing apples and oranges. The LEHD and CPS multiple jobholding series have different definitions, different reference periods, and different coverage. The LEHD series measures a second UI-covered private sector job at any point during the quarter for persons with a full-quarter UI-covered private sector job. The CPS series measures a second job (wage and salary or self-employment) during the reference week of the 12th of the month for persons who are employed at any job.³ Furthermore, the LEHD series is measured for 18 states, whereas the CPS is a national survey of approximately 60,000 households.

³ To be exact, the definition of multiple jobholding in the CPS is an individual who responds affirmatively to the question “Last week, did you have more than one job including part-time, evening or weekend work” and (1) had a job as a wage and salary worker with two or more employers, (2) combined a wage and salary job with self-employment, or (3) combined a wage and salary job with one as an unpaid family worker. Excluded from this definition are people who were self-employed or unpaid family workers on their primary job and held a secondary job as a self-employed worker or an unpaid family worker.

The LEHD and CPS measures of multiple jobholding are shown in Figure 5. The two measures have different levels. During the 1996:Q2 to 2018:Q1 time period, the LEHD measure averages 7.2 percent whereas the CPS measure averages 5.3 percent. This difference in levels should not be surprising, since we are comparing a quarterly measure to a monthly measure. To understand how a longer reference period leads to a higher point estimate of multiple jobholding, assume for the moment that a given individual is a multiple jobholder in January but not in February or March. A quarterly measure of multiple jobholding created by averaging this person's multiple jobholding status in three months of CPS interviews would be one-third, whereas the LEHD and its quarterly reference period would result in a quarterly measure of multiple jobholding of one for this person. This simple example shows that it is not surprising that the LEHD multiple jobholding series in Figure 5 has a higher level than the CPS multiple jobholding series.

The LEHD and CPS measures of multiple jobholding are also very different in trend. The LEHD measure of multiple jobholding increases by 1.0 percentage points during the 1996:Q2 to 2018:Q1 time period (from 6.8 percent to 7.8 percent), whereas the CPS measure of multiple jobholding decreases by 1.1 percentage points (from 6.1 percent to 5.0 percent). Following the line of reasoning in the paragraph above, this difference in trends could result if some multiple jobholding events are short duration and some are long-lasting jobs, and the mix of the two is changing so that there are more short duration events over time. But we discount this possibility of a changing mix for two reasons. First, as we will show in section 6c, the durations of multiple jobholding in the LEHD are increasing over time. Second, any evidence of multiple jobs becoming shorter in duration would almost certainly be seen in declining average quarterly earnings for multiple jobs, and we do not see this in the LEHD data (we will present earnings series in section 7 of this paper).⁴ Thus while we can easily reconcile the different levels of the LEHD and the CPS multiple jobholding series as originating from quarterly versus monthly reference periods, we cannot reconcile the different trends of the two series as being due to different reference periods.

⁴ Additional evidence against the mix changing towards more short duration second jobs is provided by Hyatt and Spletzer (2017), who document that the incidence of SQ jobs in the LEHD – short duration jobs that begin and end in the same quarter – has been declining over the last several decades.

The LEHD and the CPS multiple jobholding series in Figure 5 have different cyclical patterns. Unlike the LEHD measure, the CPS measure does not exhibit any obvious cyclical patterns. The correlation of the LEHD and CPS multiple jobholding measures during the 1996:Q2 to 2018:Q1 time period is -0.45, which reflects different patterns of trend and cyclical patterns. A final observation from Figure 5 is that the LEHD series is much smoother than the CPS series, which is almost certainly due to the large sample size of the LEHD relative to the CPS.

We are not the first to compare the CPS multiple jobholding data to other data. Abraham, Haltiwanger, Sandusky, and Spletzer (2013) also find that the multiple jobholding rate from the LEHD exceeds that from the CPS and the trend of LEHD multiple jobholding exceeds that of the CPS. Frazis and Stewart (2008) compare hours per job in the CPS and the American Time Use Survey (ATUS), and one of their key findings is "An important difference between the two datasets is that the multiple jobholding rate is substantially higher in the ATUS (10-11% vs. 5-6% in the CPS)." This is a cross-sectional finding; Frazis and Stewart do not estimate the trend of multiple jobholding in the ATUS. Other research using the ATUS by Allard and Polivka (2018) finds that accounting for informal work such as income generated from hobbies and crafts would raise the multiple job-holding rate by between 3.0 and 20.7 percent.

Several other studies also have looked at possible mis-measurement of the multiple jobholding rate, with all results pointing to multiple jobholding rates in the CPS that underrepresent their occurrence. Hirsch and Winters (2016) document that rotation group bias in the CPS multiple jobholding measure is substantial and has worsened over time, and they note that "it is likely that the true MJH [Multiple Job Holding] rate is higher than the official rate and that measured decline is overstated." Two studies using Amazon Mechanical Turk – Abraham and Amaya (2019) and Katz and Krueger (2019) – probed respondents about employment not reported in the standard CPS questions, and both studies found that probing substantially increases the multiple jobholding rate. Abraham, Hershbein, and Houseman (2020) find evidence of much higher multiple jobholding rates in their Gallup telephone survey than in the CPS, with a large share of multiple jobholders combining employee and self-employment work; we note that self-employment is not measured in the LEHD.

We are cognizant of the apples-to-oranges issues when comparing the LEHD and the CPS multiple jobholding measures, but we believe these are minor relative to the big picture presented in Figure 5. The big picture is that, for the first time, we now have two measures of

multiple jobholding for the U.S. that both have a long time series. These two series present a different role of multiple jobholding in the U.S. labor market. What we have always believed is that 5.0 percent of individuals in the U.S. currently have a second job in a given month, this percentage is non-cyclical, and has been trending downward during the past twenty years. The new LEHD series is different, telling us that 7.8 percent of persons in the U.S. currently have a second job in a given quarter, this is quite cyclical, and has been trending upward during the past twenty years.

These differences matter for economic measurement, analysis, and policy. The different trends suggest, but do not prove given the apples versus oranges comparison, that the CPS is increasingly missing spells of multiple jobholding. The different cyclical patterns of the two series suggest that the CPS misses secondary jobs lost during recessions and misses secondary jobs gained during expansions. All in all, the new LEHD series suggests that during the past two decades, multiple jobholding is becoming more important in the U.S. economy than shown by the CPS data.

6) Additional Quantification of Multiple Jobholding in the LEHD

6a) The Demographics of Multiple Jobholding

How does the LEHD multiple jobholding rate vary across demographic groups? We present the multiple jobholding rate for males and females in Figure 6, and we present the multiple jobholding rate for various age groups (16-24, 25-34, 35-44, 45-54, 55-64, and 65+) in Figure 7.

Males and females have very different multiple jobholding rates. In 2018:Q1, 6.6 percent of males are multiple jobholders in the LEHD, whereas 9.1 percent of females are multiple jobholders in the LEHD. The trend of multiple jobholding for males has been relatively flat over the last twenty years, rising by 0.3 percentage points (from 6.3 percent to 6.6 percent), whereas the multiple jobholding rate for females has increased by 1.6 percentage points (from 7.5 percent to 9.1 percent).

Interestingly, these gender differences in the LEHD multiple jobholding rate are similar to the gender differences in the CPS. In the CPS, the multiple jobholding rate for males fell from

6.1 percent in 1996 to 4.6 percent in 2018 (a 1.5 percentage point decline), whereas the multiple jobholding rate for females fell from 6.2 percent in 1996 to 5.4 percent in 2018 (a 0.8 percentage point decline). While the levels and the trends differ between the LEHD and the CPS, both data sources indicate that multiple jobholding is currently larger for females than males, and this gender difference has been growing over time.

Figure 7 presents the multiple jobholding rate by age group. We see that, in 2018:Q1, the LEHD multiple jobholding rate is monotonically declining with age. The multiple jobholding rate of persons aged 16-24 is 8.9 percent, whereas the multiple jobholding rate of persons aged 65 and over is 5.6 percent. Each age group saw increases in their multiple jobholding rate by 0.9 percentage points or more between 1996:Q2 and 2018:Q1.

6b) Industries of Multiple Jobholders

We present the industry distribution of multiple jobholders in Table 2. There are three columns in Table 2. The first column is the industry distribution of full-quarter jobs for persons who have a full-quarter job and are not multiple jobholders (cell N₁₁ in Table 1). The second column is the industry distribution of the primary job for persons who have a full-quarter job and are multiple jobholders. The third column is the industry distribution of second jobs of multiple jobholders.⁵

Averaged over all quarters 1996:Q2 – 2018:Q1, the three most common industries of full-quarter jobs for persons who are not multiple jobholders are manufacturing (14.6 percent), retail trade (13.7 percent), and healthcare (13.2 percent). The industry distribution for persons who are multiple jobholders is different -- the three most common industries of primary full-quarter jobs for persons who are multiple jobholders are healthcare (19.2 percent), accommodation and food services (13.5 percent), and retail trade (12.7 percent). The industry distributions of the primary job for persons who are multiple jobholders versus those that are not multiple jobholders differ

⁵ Some technical details of Table 2 warrant mentioning. In column two, we define the primary full-quarter job of multiple jobholders as the full-quarter job for persons in cells N₁₂ and N₁₃ of Table 1, or the full-quarter job with the highest quarterly earnings for persons in cells N₂₂, N₂₃, and N₃₃ of Table 1. In column three, we define the second job as the non-full-quarter job with the highest quarterly earnings for persons in cells N₁₂ and N₁₃ of Table 1, or the full-quarter job with the second highest earnings for persons in cells N₂₂, N₂₃, and N₃₃ of Table 1.

by more than five percentage points for healthcare, manufacturing, and accommodation and food services.

Interestingly, for persons who are multiple jobholders, the industry distributions of primary full-quarter jobs and second jobs are similar. There is no particular industry that differs by more than five percentage points when comparing columns two and three of Table 2. This finding is consistent with a story that individuals are not using multiple jobholding to develop new skills that would allow them to switch jobs into other industries – see Pouliakas (2017) for an interesting article on why individuals are multiple jobholders.

6c) Duration of Multiple Jobholding

The literature has several mentions to the duration of multiple jobholding. For example, Pouliakas (2017) states that “many MJH [Multiple Job Holding] spells tend to be short-lived,” and Lale (2019) states “most workers hold a second job for only a short period of time (typically less than three months).” We now inquire about the duration of multiple jobholding spells in the LEHD data. We take a simple approach and examine how long multiple jobholders in a given quarter have been multiple jobholders.⁶

We start with multiple jobholders in 2018:Q1 and link backwards one quarter, which allows us to determine how many multiple jobholders in 2018:Q1 were also multiple jobholders in 2017:Q4. We link backwards one more quarter and determine how many multiple jobholders in 2018:Q1 were multiple jobholders in both 2017:Q4 and 2017:Q3. We do this repeatedly for 20 quarters. These percentages are the solid line in Figure 8. Looking at the persons who are multiple jobholders in 2018:Q1, 75 percent are multiple jobholders one quarter earlier, and approximately 50 percent are multiple jobholders each of the past three quarters (2017:Q4, 2017:Q3, and 2017:Q2). Looking backwards further, 25 percent of 2018:Q1 multiple jobholders are multiple jobholders each of the past nine quarters. When using a quarterly reference period such as that in the LEHD, which admittedly differs from the monthly reference period used by the CPS, the durations of multiple jobholding spells are much longer than that cited by Pouliakas (2017) and Lale (2019).

⁶ We have also estimated survivor functions. These are very similar to the duration statistics in Figure 8.

In addition to the duration statistics for multiple jobholding spells in 2018:Q1, we also present duration statistics for multiple jobholding spells in 2007:Q1 (the dashed line in Figure 8). The 2018:Q1 duration statistics are higher than the 2007:Q1 duration statistics. This implies that, on average, the durations of ongoing spells in 2018:Q1 are longer than the durations in 2007:Q1. This is important in that it refutes the possibility that short duration multiple jobs are becoming more prevalent over time – this was the assumption necessary to reconcile the downward trend of the CPS with the upward trend of the LEHD.

7) Earnings of Multiple Jobholders

7a) Basic Descriptive Statistics

One advantage of creating multiple jobholding data from the LEHD is that we have information about earnings on the primary full-quarter job as well as earnings for all secondary jobs. We present several average quarterly earnings series in Figure 9 (each earning series is in real 2018:Q1 dollars). The solid grey line at the top of the graph is average full-quarter earnings for persons who are not multiple jobholders (persons in cell N₁₁). The dashed line is average full-quarter earnings of the primary job for persons who are multiple jobholders. The dotted line is the earnings from all jobs other than the primary job for persons who are multiple jobholders. The solid black line is total quarterly earnings from all jobs for multiple jobholders (the sum of the dashed and dotted lines).

Individuals with full-quarter jobs who are not multiple jobholders earn, on average, \$15,750 in 2018:Q1. Individuals with full-quarter jobs who are multiple jobholders earn an average \$9,770 on their primary job in 2018:Q1 and an average \$3,780 in 2018:Q1 from all other jobs. Summing the two, individuals who are multiple jobholders earn, on average, \$13,550 from all jobs in 2018:Q1. In the next subsection, we analyze why the average earnings of multiple jobholders from all jobs is less than the average earnings of non-multiple jobholders from their single job.

Figure 10 plots how earnings from secondary jobs contributes to a multiple jobholder's total earnings. The dashed line in Figure 10 is the ratio of earnings from all secondary jobs to earnings from all jobs. This dashed line shows that earnings on all second jobs are, on average,

27.8 percent of a multiple jobholder's total earnings. This ratio is essentially constant over time with little if any evidence of trend or cyclicity.

The solid line in Figure 10 is the ratio of earnings from all secondary jobs to earnings from the primary job for multiple jobholders. This ratio averages 38.5 percent over the 1996:Q2 to 2018:Q1 time period, with little evidence of trend or cyclicity. This computation helps us with the following thought experiment: if the average hourly wage on the second job is the same as on the primary job, then hours of the second job are 38.5 percent those of the primary job. For example, if the primary job is 40 hours per week, then hours on the second job are 15 hours per week, or if the primary job is 32 hours per week, then hours on the second job are 12 hours per week. The LEHD data from our 18 states do not have information on hours worked during the quarter, so the calculations in this paragraph are all based on the assumption that the hourly wage on the second job is the same as on the primary job.⁷

7b) Multiple Jobholding by Level of Earnings

Our finding that earnings from all second jobs account for 27.8 percent of a multiple jobholder's total earnings leads to the follow-up question of how multiple jobholding varies by the level of earnings. Is multiple jobholding predominant amongst low-earnings workers, or do individuals across the earnings distribution take on second jobs? Figure 11 shows the percentage of persons who are multiple jobholders by percentiles of total earnings for those persons with full quarter earnings.⁸

Figure 11 shows that on average, 9.4 percent of persons with full-quarter jobs are multiple jobholders.⁹ Figure 11 also shows that the multiple jobholding rate exhibits an inverted non-symmetric U shape across the range of total full-quarter earnings: the multiple jobholding rate is rising from 6.5 to 11 percent for the lowest-earning individuals (from the first to the tenth

⁷ Several states in the LEHD infrastructure do contain hours data, since hours is used to determine eligibility for unemployment benefits. It is worth looking at the hours and hourly wage of multiple jobholders in these states.

⁸ In Figure 11, the first percentile is computed using all persons with earnings between the 0.5th and the 1.5th percentiles, the second percentile is computed using all persons with earnings between the 1.5th and the 2.5th percentiles, ..., and the 99th percentile is computed using all persons with earnings between the 98.5th and the 99.5th percentiles.

⁹ This 9.4 percent statistic is different than the 7.2 percent stated earlier. This difference reflects that we are only analyzing individuals with a full quarter job in Figure 11 rather than all persons (we do not use the cells in the top row of Table 1, N₀₁, N₀₂, nor N₀₃, in the denominator of the 9.4 percent).

percentiles), and is gradually falling after the 13th percentile. Individuals with full-quarter earnings between the 6th and 56th percentiles have a multiple jobholding rate above ten percent. The highest-earning individuals in the top ten percentiles have a multiple jobholding rate between 5.5 and 7 percent.

We now ask how multiple jobholding contributes to total earnings across the earnings distribution. In the previous section, we state that (on average) 27.8 percent of a multiple jobholder's total earnings are from multiple jobs. Figure 12 shows how this 27.8 percent varies across the earnings distribution. The average of 27.8 percent is a reasonable estimate for multiple jobholders with earnings in the middle of the total full-quarter earnings distribution. For multiple jobholders with full-quarter earnings at or below the 18th percentile, their second job(s) provides, on average, more than 30 percent of total earnings. For all other individuals, multiple jobholding provides just over 25 percent of their total earnings.

Most striking about Figure 12 is that conditional on being a multiple jobholder, the percent of total earnings derived from multiple jobholding does not continuously decline with earnings. For the 5.5 to 7 percent of individuals in the top 10 percentiles of the earnings distribution who are multiple jobholders, the multiple jobs held by these individuals contribute approximately one-quarter of their total earnings. This suggests that the average multiple job held by these individuals is not a minor one-off source of earnings, such as a professor receiving a small honorarium for making a speech, but is rather a serious and likely long-lasting job. Examples that come to mind are doctors who have one job in their practice and another job at the hospital. This issue warrants further research.

7c) Regression Analysis

One of the most interesting findings from Figure 9 is that, on average, multiple jobholders earn less from all jobs than non-multiple jobholders earn on their single job. There are several hypotheses for this result, such as differences in hours worked or differences in the composition of individuals who are and are not multiple jobholders. There is not much we can do to analyze differences in hours worked – the LEHD data from our 18 states do not have information on hours worked. However, we can analyze the composition differences.

Composition differences can arise from two sources. We saw in Figures 6 and 7 that females and young persons are more likely to be multiple jobholders, and we know that, on average, females earn less than males and younger persons earn less than older persons. The second source of composition differences is due to industry composition. We saw in Table 2 that multiple jobholders are more likely to work in accommodation and food services (generally a lower paying industry) and less likely to work in manufacturing (generally a higher paying industry). We analyze the earnings differentials in a regression framework where we can control for these compositional differences.

Table 3 presents the regressions using the sample of individuals with a full-quarter job. We have transformed the earning variable from levels (as presented in Figure 9) to natural logs, which allows us to interpret the coefficients as percent differences. In column 1 of Table 3, we regress $\ln(\text{real quarterly earnings})$ from all jobs on an indicator for multiple jobholding. The estimated coefficient is -0.0847, which indicates that multiple jobholders earn approximately 8.5 percent less on all jobs than do non-multiple jobholders.

Column 2 of Table 3 adds a gender indicator to the basic regression. In this specification, females earn less than males and the multiple jobholding coefficient has fallen (in absolute value) from -0.0847 to -0.0569. This says that when controlling for gender, multiple jobholders earn approximately 5.7 percent less on all jobs than do non-multiple jobholders. Including the gender indicator reduced the multiple jobholding earnings difference by about a third.

Column 3 adds indicators for age to the basic regression. Controlling for age reduces the multiple jobholding earnings difference to just about zero (-0.0058 to be exact). In results not reported in Table 3, including both age and gender in the basic regression results in a multiple jobholding coefficient of 0.0195, which says that total earnings of multiple jobholders are greater than total earnings of non-multiple jobholders when controlling for both age and gender.

The effects of industry composition differences are analyzed in column 4 of Table 3. Controls for industry of the primary job are added to the basic regression of column 1, and these controls turn out to be very important. Controlling for industry, multiple jobholders earn roughly four percent more than non-multiple jobholders. And finally, all explanatory variables are added to the regression in column 5 of Table 3, which further increases the coefficient on the multiple jobholding indicator.

The bottom line from this regression analysis is that when controlling for age, gender, and industry, multiple jobholders earn more at all jobs than do non-multiple jobholders. The finding from Figure 9 – that the average multiple jobholder earns less from all jobs than the average non-multiple jobholder earns on their single job – is due to compositional differences in demographic characteristics as well as compositional difference in industry of the primary job.

8) Summary and Next Steps

Our goal in this paper has been to present tabulations of multiple jobholding from the LEHD data. The first challenge was creating a definition of multiple jobholding from quarterly administrative records that do not contain a measure of labor supply. We define multiple jobholding as an individual who holds two or more jobs in a quarter and at least one of the jobs is a full-quarter job. This restriction to individuals holding a long-term stable job results in a conservative estimate of multiple jobholding.

We document three facts: (1) the LEHD multiple jobholding rate averages 7.2 percent over the 1996:Q2 – 2018:Q1 time period, (2) this multiple jobholding rate has been rising during the past several decades, from 6.8 percent in 1996:Q2 to 7.8 percent in 2018:Q1, and (3) the LEHD multiple jobholding rate exhibits cyclical properties, rising in expansions and falling in recessions. We are aware of the apples-to-oranges issues when comparing the LEHD and CPS multiple jobholding rates, yet we still conclude the LEHD presents a different picture of multiple jobholding in the U.S. labor market than does the CPS. The LEHD data tell us that multiple jobholding is becoming more important in the U.S. economy over the past two decades.

This paper also takes advantage of the earnings information that the LEHD collects for all jobs. We use this data to provide a comprehensive picture of the quarterly earnings that individuals receive from their primary job and from their secondary jobs. The data show that, on average, earnings from secondary jobs is 27.8 percent of an individual's total full-quarter earnings. This 27.8 percent is essentially constant over time with little if any evidence of trend or cyclicity. The data also show that multiple jobholding occurs at all levels of earnings, with both higher- and lower-earnings multiple jobholders earning more than 25 percent of their total earnings from multiple jobs.

The statistics presented in this paper define multiple jobholding from the LEHD administrative records. We have identified several topics that warrant further analysis. First, we could learn much more about LEHD – CPS multiple jobholding differences if we link the underlying microdata from both sources. It is a substantial amount of work to create an apples to apples comparison with the linked microdata, but this is something prioritized high on our “to do” list. Second, all tabulations in this paper are from a sample of 18 states in the LED partnership. It is possible to create state-specific tabulations if the conditions of data and privacy protection and terms of the states’ LED agreements are met. Hirsch, Husain, and Winters (2017) have used the CPS data to document the large variability of multiple jobholding rates vary across states, and we plan on conducting a similar analysis with the LEHD data.

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**Table 1: Number of Jobs and Full-quarter Jobs in the LEHD
Average Over All Quarters 1996:Q2 – 2018:Q1**

	1 job	2 jobs	3 or more jobs	
0 full-quarter jobs	17.9%	4.5%	0.8%	23.2%
1 full-quarter job	69.5%	3.3%	0.5%	73.3%
2 full-quarter jobs		2.8%	0.3%	3.1%
3 or more full-quarter jobs			0.3%	0.3%
	87.4%	10.7%	1.9%	

Sample size = 4,498,000,000.

Figure 1: LEHD Multiple Jobholding Rate
Seasonally Adjusted Quarterly Data 1996:Q2 – 2018:Q1

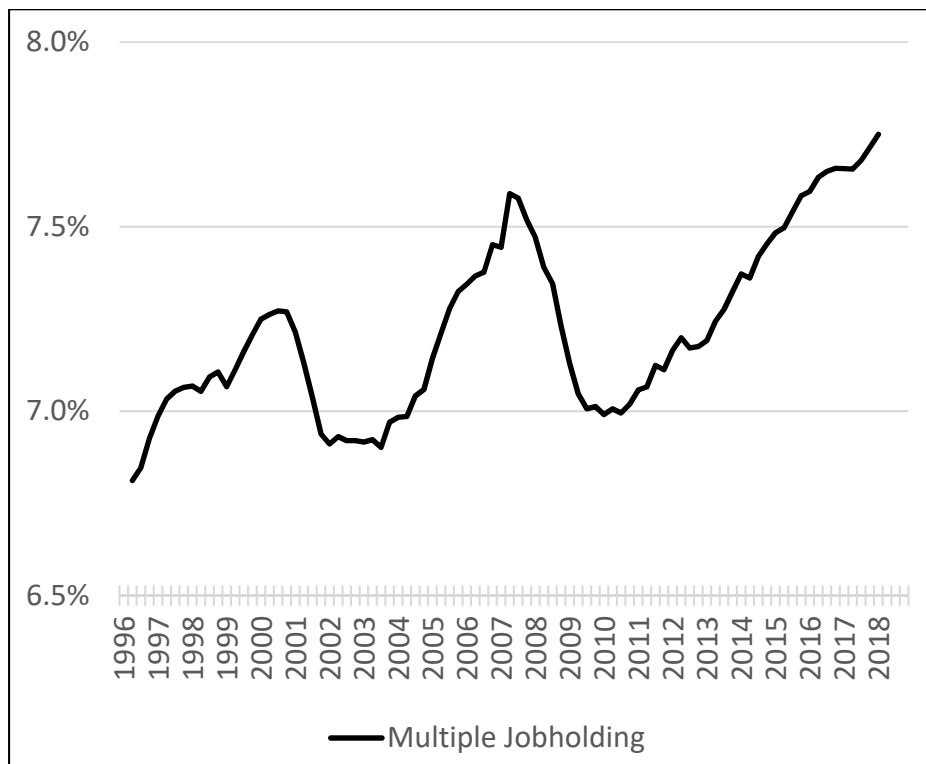


Figure 2: LEHD Multiple Jobholding Rate
Seasonally Adjusted and Non-Seasonally Adjusted Quarterly Data
1996:Q2 – 2018:Q1

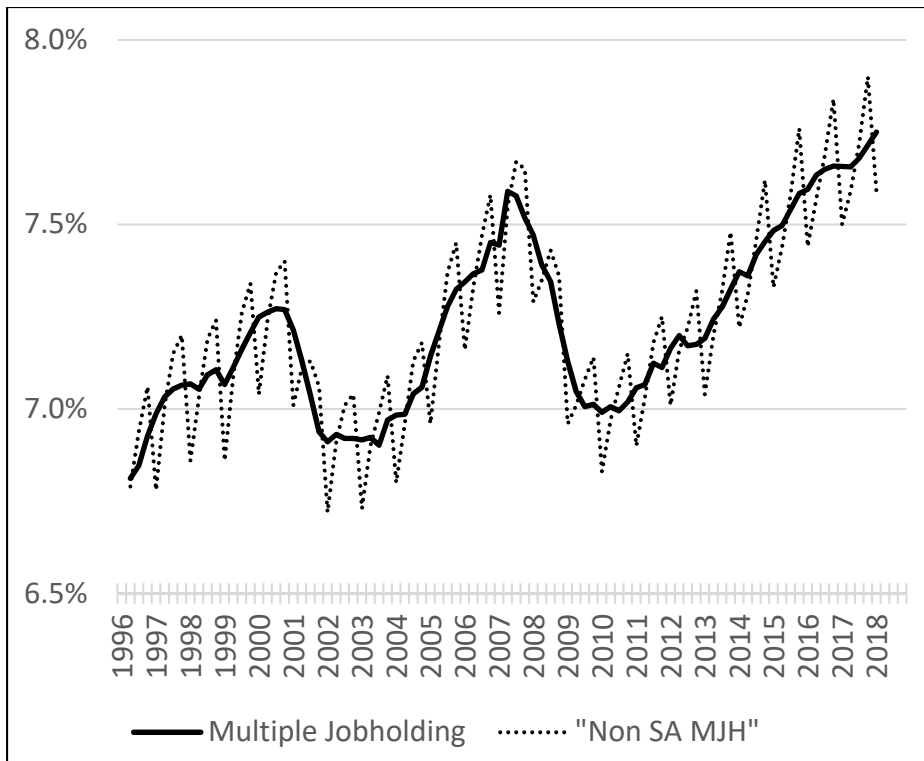


Figure 3: LEHD Multiple Jobholding Rate
Seasonally Adjusted Quarterly Data 1996:Q2 – 2018:Q1

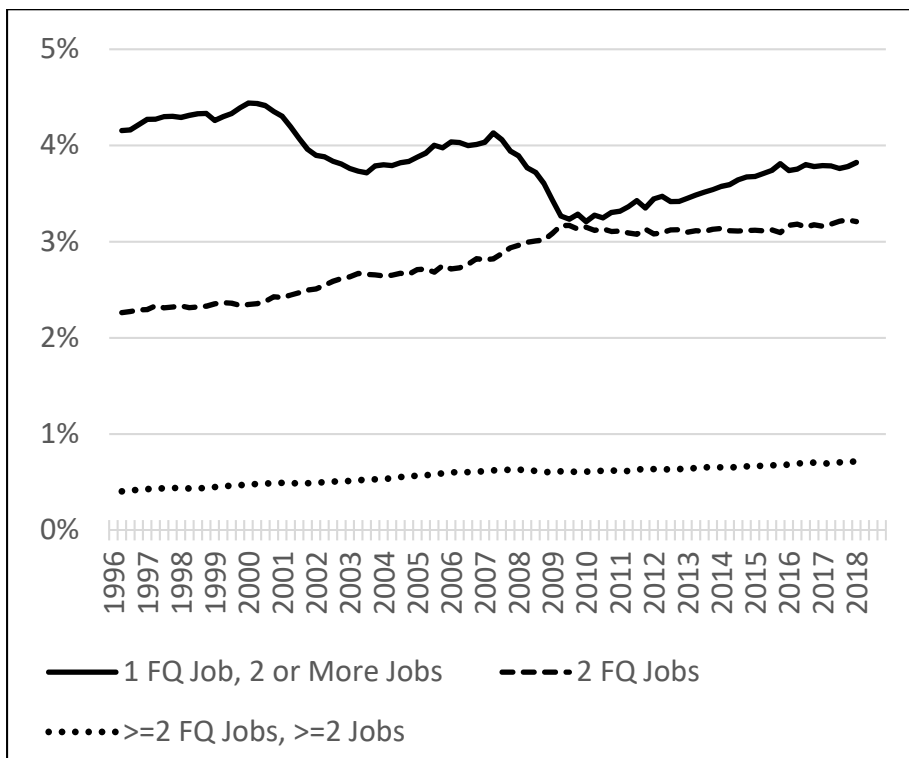


Figure 4: LEHD Multiple Jobholding Rate, Alternative Definitions
Seasonally Adjusted Quarterly Data 1996:Q2 – 2018:Q1

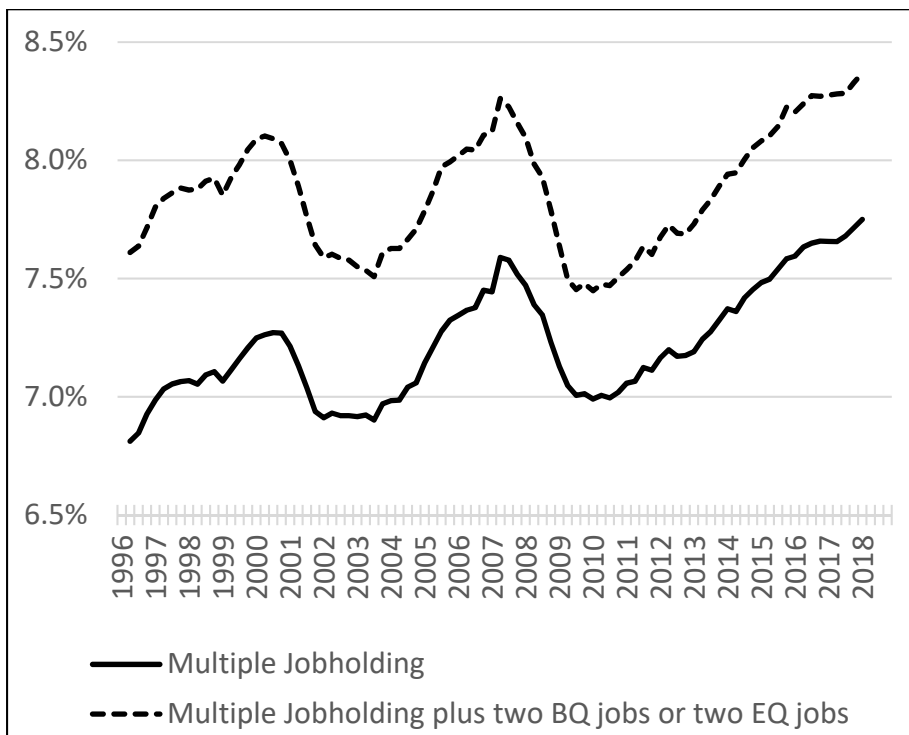


Figure 5: LEHD and CPS Multiple Jobholding Rates
Seasonally Adjusted Quarterly Data 1996:Q2 – 2018:Q1

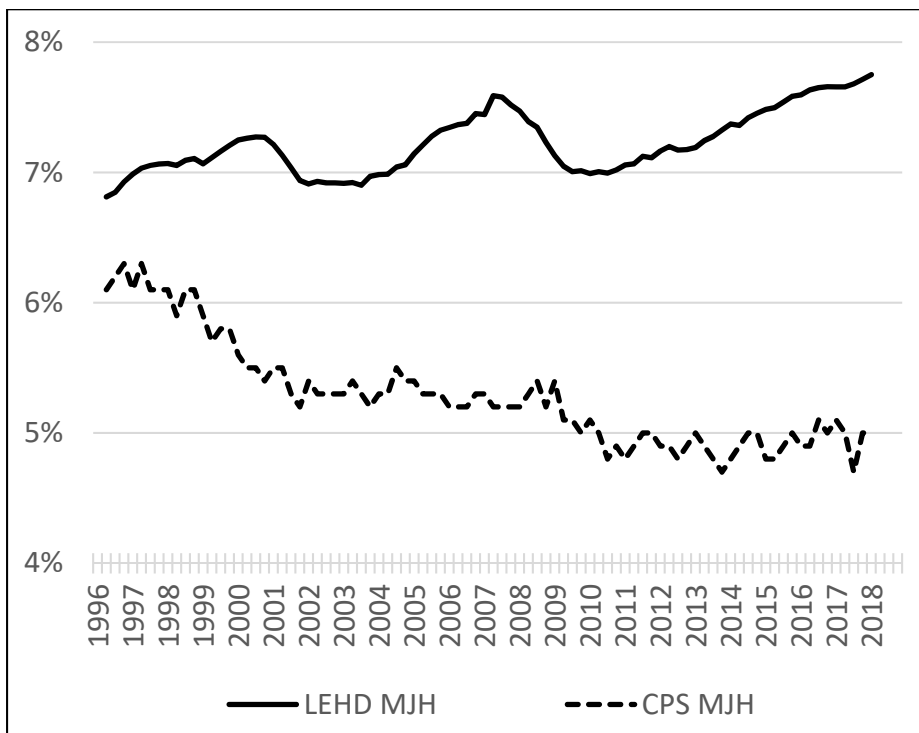


Figure 6: LEHD Multiple Jobholding Rate, by Gender
Seasonally Adjusted Quarterly Data 1996:Q2 – 2018:Q1

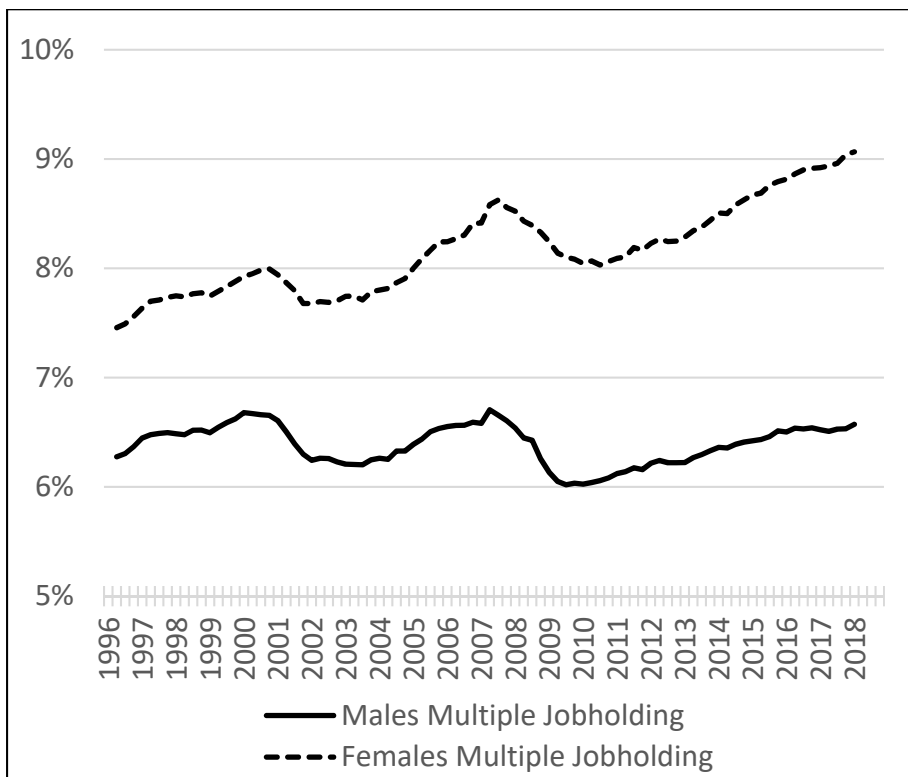


Figure 7: LEHD Multiple Jobholding Rate, by Age
Seasonally Adjusted Quarterly Data 1996:Q2 – 2018:Q1

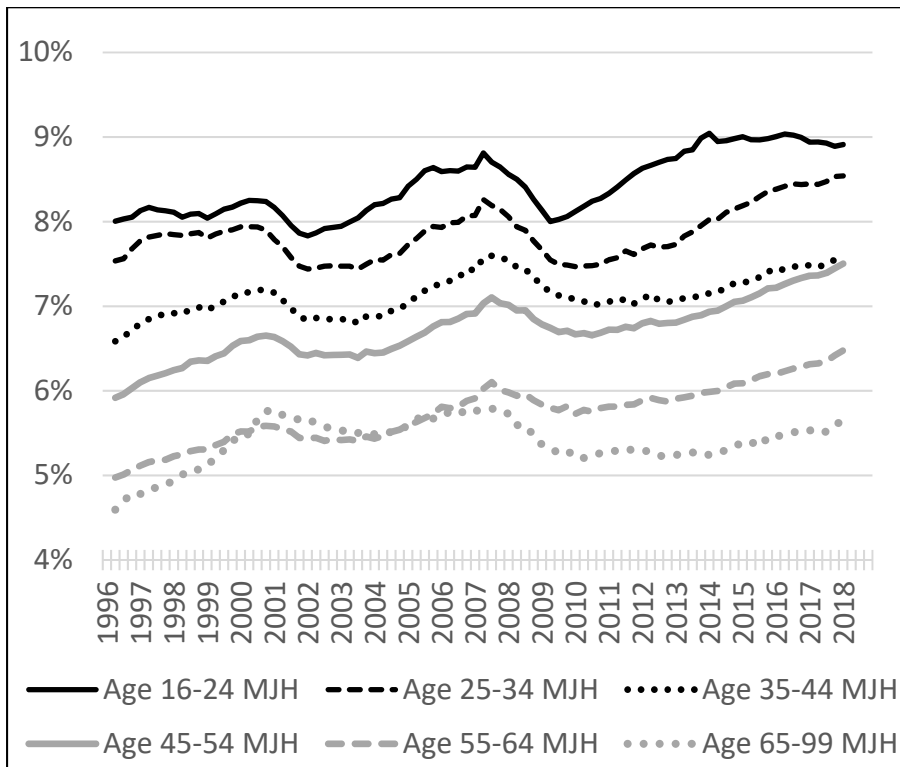


Table 2: Industries of Multiple Jobholders in the LEHD
Average Over All Quarters 1996:Q2 – 2018:Q1

	Persons with a full-quarter job and no 2 nd job	Persons with a full-quarter job and with a 2 nd job	
	Industry of full-quarter job	Industry of primary full-quarter job	Industry of 2 nd job
Agriculture, Forestry, ...	1.02	1.72	2.47
Mining	0.77	0.34	0.24
Utilities	0.62	0.23	0.08
Construction	5.91	5.12	4.61
Manufacturing	14.62	8.64	4.34
Wholesale Trade	6.15	3.98	2.56
Retail Trade	13.74	12.69	14.50
Transport & Warehouse	3.85	3.26	2.84
Information	3.22	3.23	2.98
Finance & Insurance	5.85	3.64	2.00
Real Estate	1.90	1.83	1.86
Prof, Scien, Tech Service	7.53	4.75	4.21
Management Company	1.39	0.78	0.43
Administrative Support	5.6	7.90	10.77
Educational Services	1.9	2.10	2.41
HealthCare	13.18	19.18	16.78
Arts & Entertainment	1.41	2.47	3.76
Accommodation & Food	7.57	13.50	16.67
Other Services	3.76	4.63	6.48

Shaded cells indicate that two neighboring cells differ by 5 percent or more.

Sample size for column 1 is 3,126,000,000.

Sample size for columns 2 and 3 is 326,000,000.

Figure 8: Multiple Jobholding Duration Statistics, 2007:Q1 and 2018:Q1
Percent of Multiple Jobholders who are a Multiple Jobholder all previous t
quarters, $t=\{1,2,3, \dots, 20\}$,

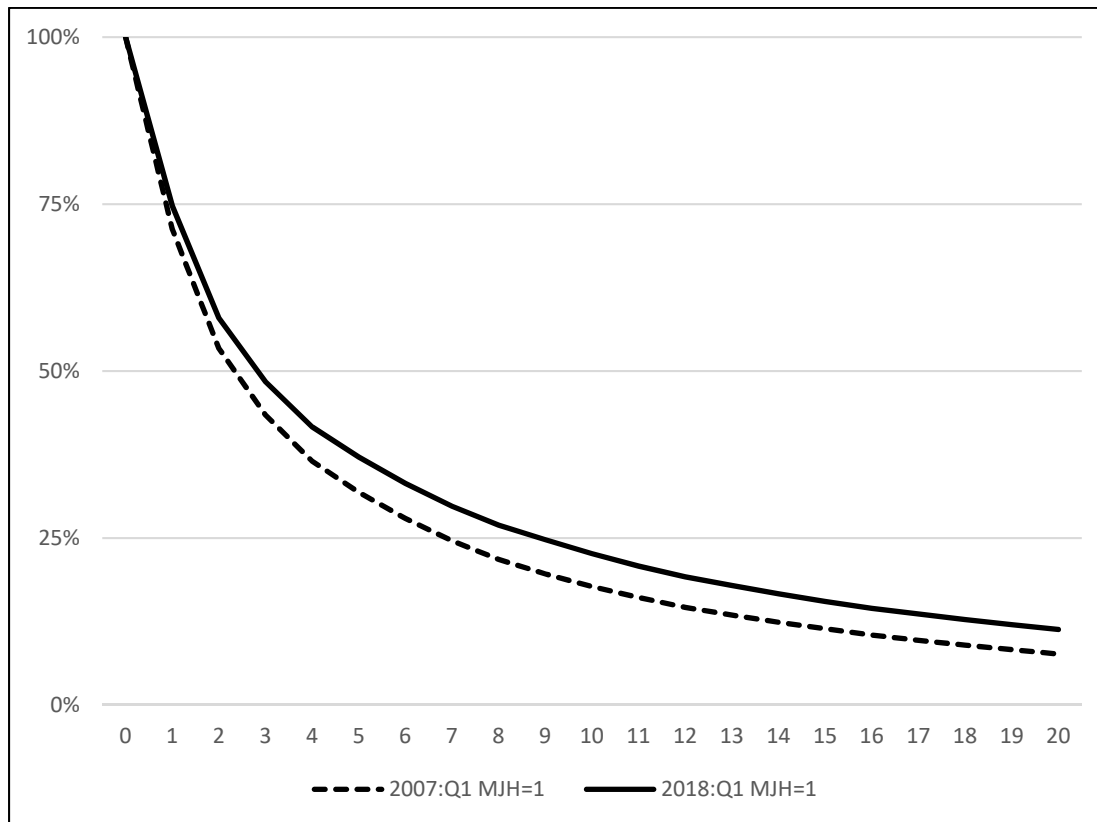


Figure 9: LEHD Real Earnings
Seasonally Adjusted Quarterly Data 1996:Q2 – 2018:Q1

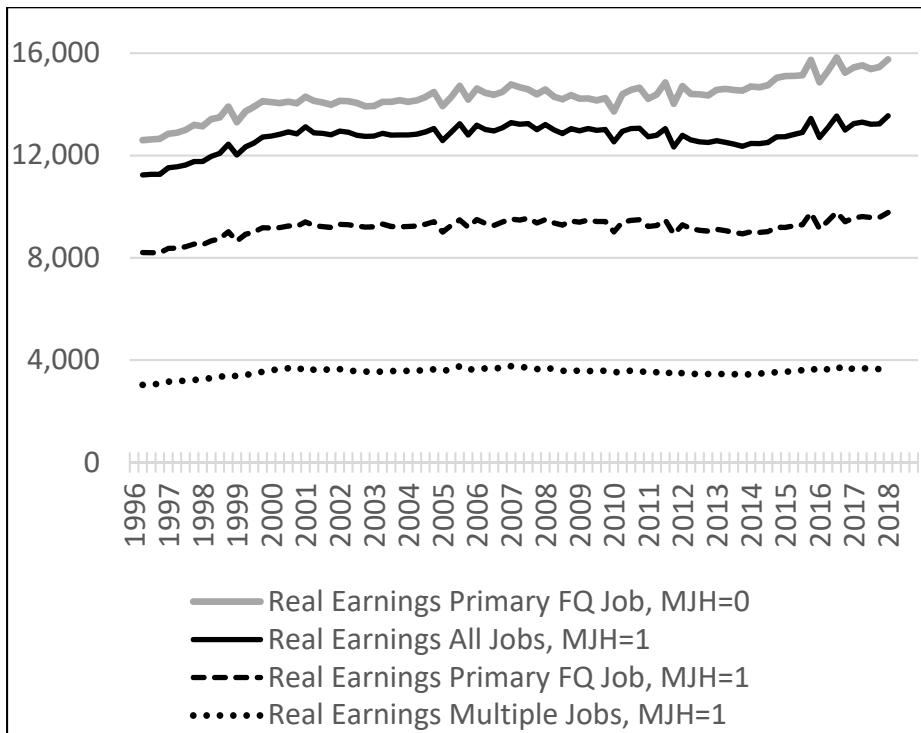


Figure 10: LEHD Real Earnings
Seasonally Adjusted Quarterly Data 1996:Q2 – 2018:Q1

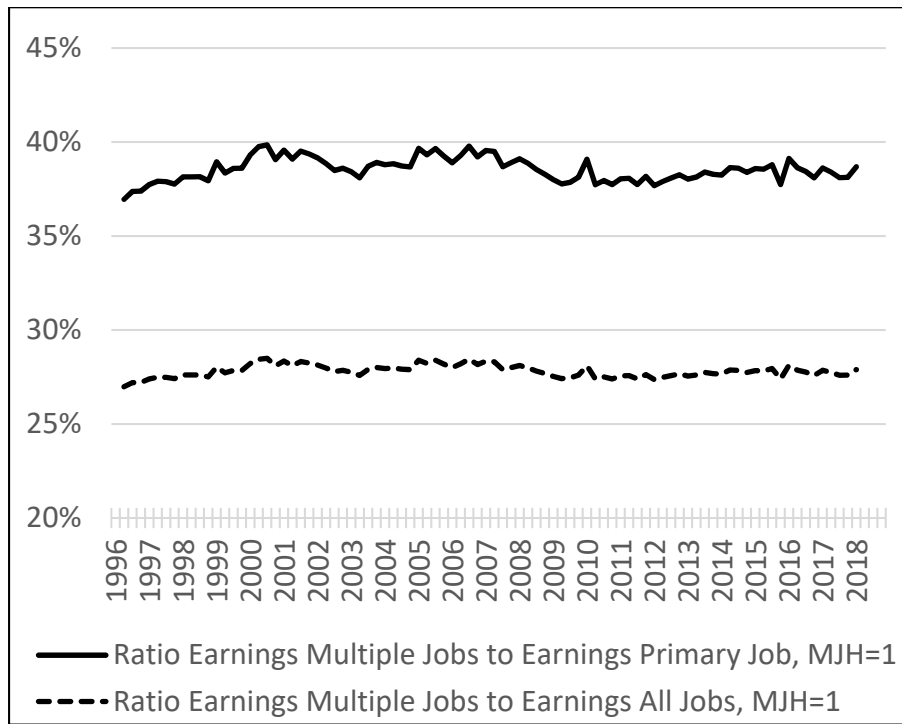
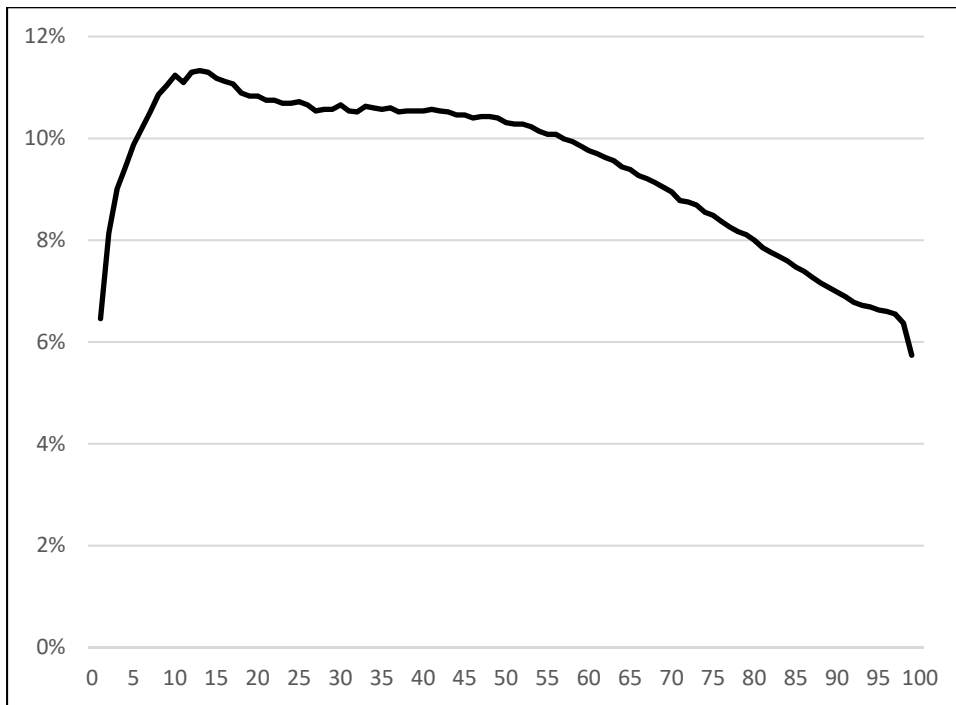


Figure 11: LEHD Multiple Jobholding Rate, by Percentiles of Total Earnings
Sample is individuals with a full-quarter job



**Figure 12: LEHD Multiple Jobholding Earnings as Percent of Total Earnings,
by Percentiles of Total Earnings
Sample is individuals with a full-quarter job**

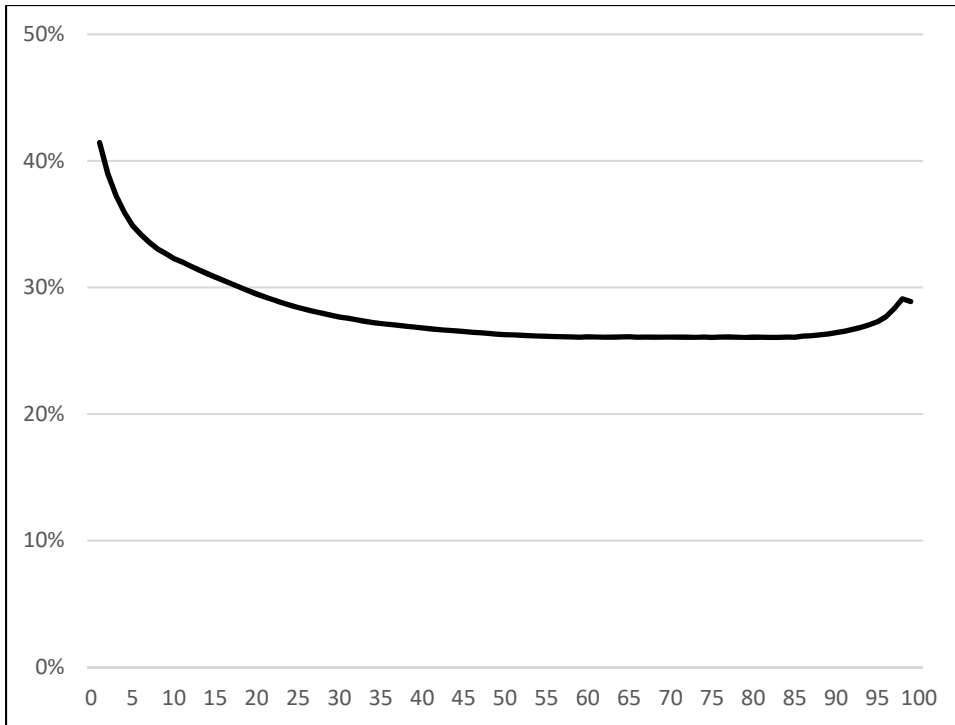


Table 3: Regression Analysis
Dependent Variable is LN real earnings from all jobs
Sample is individuals with a full-quarter job

	Mean	(1)	(2)	(3)	(4)	(5)
1 if Multiple Jobholder	0.0943	-0.0847	-0.0569	-0.0058	0.0405	0.0960
1 if female, 0 if male	0.4694		-0.4144			-0.3576
1 if Age 16-24	0.1340			-1.0820		-0.8613
1 if Age 25-34	0.2326			-0.2429		-0.2117
1 if Age 35-44	0.2408			-0.0276		-0.0286
1 if Age 45-54	0.2220					
1 if Age 55-64	0.1312			-0.1058		-0.0924
1 if Age 65-99	0.0395			-0.7055		-0.6132
01 Agriculture	0.0108				-0.6570	-0.5792
02 Mining	0.0073				0.4092	0.3700
03 Utilities	0.0059				0.4554	0.3931
04 Construction	0.0584				-0.1044	-0.1153
05 Manufacture	0.1406					
06 Wholesale	0.0594				0.0074	0.0264
07 Retail	0.1364				-0.7196	-0.4912
08 Transp Wareh	0.0379				-0.2078	-0.2043
09 Information	0.0322				0.0598	0.1243
10 Finance Ins	0.0564				0.0994	0.2396
11 Real Estate	0.0189				-0.3604	-0.2417
12 Prof Service	0.0727				0.1650	0.2468
13 Management	0.0134				0.2559	0.3149
14 Admin Supprt	0.0582				-0.5674	-0.4453
15 Educ Service	0.0192				-0.4932	-0.3314
16 HealthCare	0.1375				-0.3877	-0.1826
17 Arts Entert	0.0151				-0.9841	-0.7661
18 Accom Food	0.0813				-1.0810	-0.7579
19 Other Servic	0.0384				-0.7456	-0.5836
R-Squared		0.0014	0.0465	0.1376	0.1646	0.2767

Mean of the dependent variable is 9.159 (standard error = 0.973).

All regressions include year dummies (not reported).

All estimated coefficients have t-statistics greater than 50.

Sample size is 3,452,000,000.