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Abstract

Self-employment hours, as measured using the Current Population Survey (CPS), occasionally vary widely from one quarter to the next, and these variations can result in large fluctuations in measures of quarterly labor productivity produced by the U.S. Bureau of Labor Statistics. In this paper, we examine whether certain aspects of the CPS sample design, including sample weighting, the rotation group framework, imputation methods, and proxy-reporting, are associated with these large variations. We find that volatility in the number of self-employed is much higher when comparing changes in self-employment among workers who are not in the sample in two consecutive quarters compared with those who are in the sample in consecutive quarters. In addition, proxy-responses make larger contributions to self-employment growth in more quarters than do self-responses, and month-to-month changes in class-of-worker status occurring with transitions between proxy- and self-responses in the CPS panel contribute to increased volatility. Finally, imputed self-employment is more volatile than nonimputed self-employment, but there are few imputed responses.

JEL codes: J21; J24

Keywords: self-employment; productivity; imputation; proxy-response

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1 Introduction

Although unincorporated self-employed workers currently make up only six percent of the workforce, volatility in their aggregate hours worked sometimes has a disproportionate effect on quarterly labor productivity measures for the nonfarm business sector published by the U.S. Bureau of Labor Statistics (BLS). Productivity growth is measured as the difference between the growth in output and the growth in total hours worked. Thus, any change in hours will impact measured productivity growth. Figure 1 shows the annualized growth in quarterly hours for all workers, employees, and unincorporated self-employed/unpaid family workers (SEUFW) over the 2000–2019 period. (Data for all figures are available in table form in Supplemental Material.) The hours growth for SEUFW is much more volatile than that for employees and, in some quarters, we see spikes in the SEUFW hours series that lead to substantial gaps between the employee and all worker hours series.

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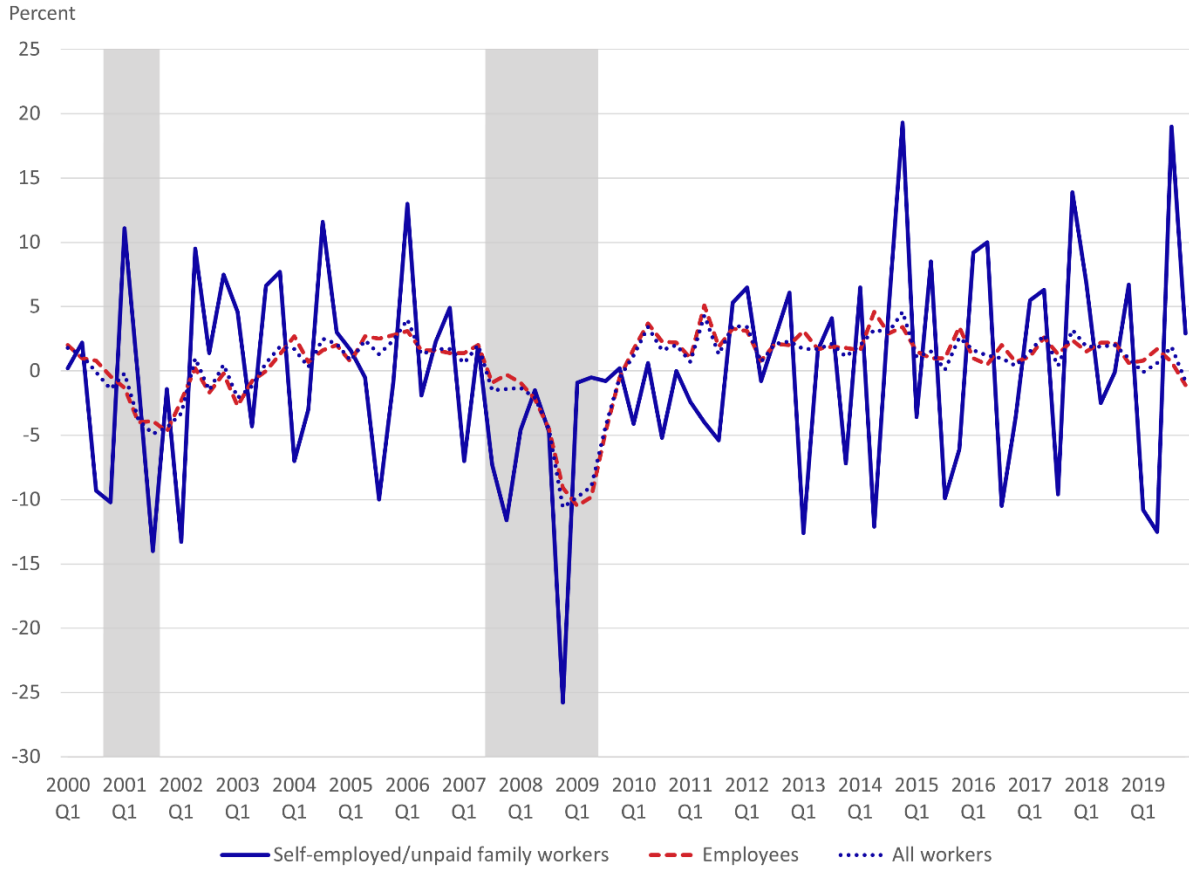


Figure 1. Annualized quarter-to-quarter percent change in hours for all workers, employees, and unincorporated self-employed/unpaid family workers in the nonfarm business sector, seasonally adjusted, first quarter 2000 to fourth quarter 2019

Note: All estimates use CPS survey weights. Shaded areas represent recessions as determined by the National Bureau of Economic Research. Source: U.S. Department of Labor (2023) and Federal Reserve Economic Data (2023), authors' calculations,

Figure 2 shows the percentage-point contributions to annualized quarterly growth in total hours worked in the nonfarm business sector by employees and SEUFW, where contributions are measured as the product of the percent change in hours of the relevant group and the share of total hours worked by that group in the previous quarter. The solid blue portion of the stacked bar represents the contribution

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of SEUFW hours to the growth in total hours worked, while the red and white lined portion represents the contribution of employee hours. The solid red dot represents the growth in total hours worked. Given SEUFW's relatively small share of the workforce, we would expect their impact to be minimal and the dot to be close to the end of the red and white lined bar. In most instances, the relative contribution of SEUFW compared with employees is quite small. However, in some quarters, their contribution is large relative to their size in the workforce, and in 9 of the 80 quarters shown in Figure 2, it even exceeds that of employees. For example, in the third quarter of 2019, total hours grew by about 1.9 percent, with SEUFW contributing 1.4 percentage points to the growth in hours worked and employees contributing only 0.6 percentage point to the growth in hours worked (a factor of 2.3 larger). We see that the growth in hours worked by SEUFW can even change the sign of the growth in total hours, as it did, for example, in the first quarter of 2019 when the contribution of employee hours was +0.7 percentage point, while the contribution of SEUFW hours was -0.8 percentage point, resulting in a total growth in hours worked of -0.1 percent. Another example of SEUFW's outsized growth is in the fourth quarter of 2014. In that quarter, total hours grew by 4.6 percent, with SEUFW contributing 1.5 percentage points to the growth in hours and employees contributing 3.1 percentage points to the growth in hours worked.

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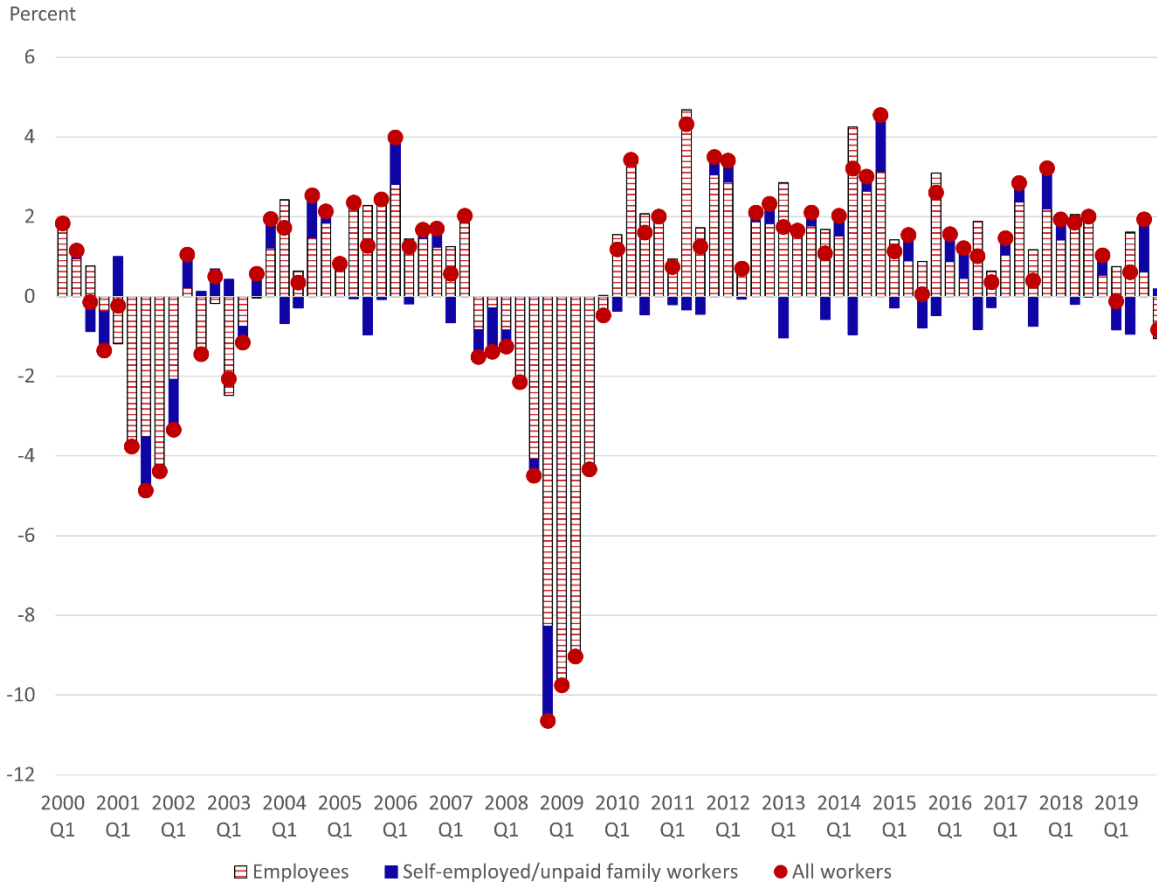


Figure 2. Contributions to the annualized quarter-to-quarter percent change in hours worked in the nonfarm business sector, by class of worker, seasonally adjusted, first quarter 2000 to fourth quarter 2019

Note: All estimates use CPS survey weights. Because of rounding, the contributions of employees and self-employed/unpaid family workers may not sum to the growth for all workers. Source: U.S. Department of Labor (2023), authors' calculations

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For BLS productivity measures, hours of work for employees are primarily obtained from establishment responses to the BLS Current Employment Statistics (CES) survey. The CES universe captures the incorporated self-employed, who are classified as employees of their own businesses, but it does not include SEUFW (Bowler and Morisi 2006). BLS obtains hours for SEUFW from the basic monthly Current Population Survey (CPS) using responses to the question about respondents' class of worker at the job(s) worked in the previous week.

Self-employment can appear volatile for two broad reasons. First, self-employment is genuinely volatile, because people open and close businesses and often use self-employment as a bridge between wage-and-salary job spells (Cahill et al. 2013; Fairlie and Fossen 2020; von Bonsdorff et al. 2017). People also become self-employed to have more flexibility, including flexibility in their hours, so their hours may vary more from one month to the next compared with those of employees. Second, because the unincorporated self-employed are a small share of the labor force, estimates of the number of self-employed will have higher variance than estimates of the number of employees.

Thus, the volatility in the SEUFW's hours could be due to volatility in the number of SEUFW, the volatility in their average hours worked, or both. Figure 3 shows that the majority of the growth in annualized aggregate SEUFW hours (red dot) is the result of changes in the number of SEUFW (shown in solid blue in the stacked bar) rather than changes in their average hours worked (shown in red and white lines in the stacked

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bar), although the latter is not economically insignificant. The average absolute value of the employment contribution is 5.3 percentage points, while the average absolute value of the average hours worked per person is 3.1 percentage points. In addition, in some of the quarters where we saw outsized growth in SEUFW hours, e.g., the fourth quarter of 2014, first quarter of 2019, and third quarter of 2019, the contribution of employment to the change greatly exceeds the contribution of hours. Henceforth, most of our analysis focuses on how the CPS survey design is related to changes in the number of self-employed. In addition, hereafter, even though the BLS productivity program combines hours of the SEUFW, our analyses focus on volatility in unincorporated self-employment (SEU) only, because unpaid family workers represent a very small percentage of the workforce. For example, in the fourth quarter of 2019, unpaid family workers' hours were only 0.05 percent of total hours in the nonfarm business sector.

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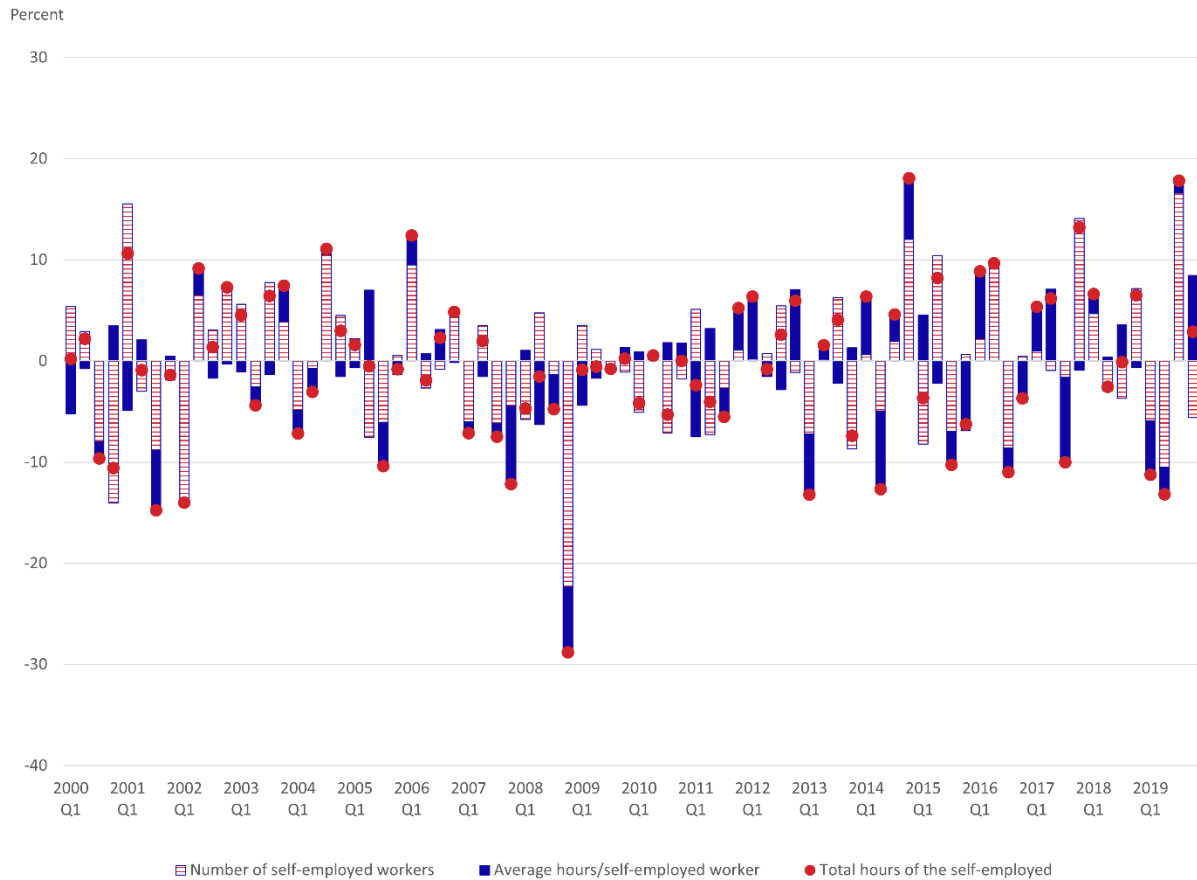


Figure 3. Contributions of the number of unincorporated self-employed/unpaid family workers and average hours per unincorporated self-employed/unpaid family worker to the quarter-to-quarter percent change in hours of the unincorporated self-employment/unpaid family workers in the nonfarm business sector, seasonally adjusted, first quarter 2000 to fourth quarter 2019

Note: All estimates use CPS survey weights. Source: U.S. Department of Labor (2023), authors' calculations

Several features of the CPS sample design might be related to the unincorporated self-employed's measured hours, including the sample rotation framework (with eight different rotation groups in each month and respondents in each rotation group in the sample for four consecutive months, then out of sample for eight months, and back in again for four additional consecutive months, where the months in

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the rotation are referred to as month in sample (MIS) 1 through 8), sample weighting, proxy-reporters answering on behalf of other household members, and imputation of class-of-worker status. These features have the potential to change total hours worked by changing the number of unincorporated self-employed workers, independent of changes to their average hours of work. Though, they also could change average hours of work.

We first examine volatility in the number of unincorporated self-employed jobs in the nonfarm business sector, which at least partially results from sampling error because of the small number of self-employed individuals in the CPS, to determine whether any adjustments could be made to reduce volatility in quarterly labor productivity measures. We begin by using cross-sectional data from 2000 through 2019, just before the turbulent effects of the COVID-19 pandemic began. We briefly describe how the number of unincorporated self-employed changed over the period and examine whether changes in CPS population weights as household response rates fell (and the population grew) impacted the volatility in the unincorporated self-employed series. We then show differences in SEU levels and growth rates by several other CPS design features: proxy- versus self-reporters; imputed versus nonimputed responses; and different rotation groups. Using the CPS panel feature, we examine workers' month-to-month transitions into and out of SEU to determine whether reported transitions might stem from reporter type transitions and/or imputation status transitions. We then experiment with editing imputed and proxy-responses to try to

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reduce volatility in SEU. Finally, we provide evidence that the unincorporated self-employed have greater variation in their average weekly hours worked compared with employees.

2 Volatility in the Number of Unincorporated Self-employed and the CPS Design Features

2.1 CPS Design Features

In this section, we first describe the basic monthly CPS sample design and its complexities and how it might be related to volatility in the number of unincorporated self-employed. Then, in the sections that follow, we investigate which of the design features contribute to the volatility in the number of unincorporated self-employed.

The CPS is the U.S. labor force survey jointly sponsored by the U.S. Census Bureau and BLS. Each month, about 60,000 households from all 50 states and the District of Columbia are eligible for the survey. The CPS has a rotating panel design that is designed to minimize volatility in monthly estimates by ensuring some degree of continuity of households across months and across years for the same month.

Sampled households are in the survey for four consecutive months, then are out of the sample for the next eight consecutive months before returning for a second set of four consecutive months. In each month, there are eight rotation groups. Two of the eight month-in-sample (MIS) groups are outgoing (MIS 4 and 8) and two are incoming (MIS 1 and 5). Approximately 75 percent of the sample continues from one month to the next. However, for its principal federal economic indicator, quarterly labor productivity, the

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BLS Productivity Program estimates the number of unincorporated self-employed workers as a simple three-month average over the quarter. In a quarter-to-quarter comparison of CPS respondents, of the respondents in the 24 MIS-month pairs (three months in a quarter times eight MIS groups in each quarter) in the second quarter, those in 12 of the pairs were present in at least one month during the previous quarter, while those in the other 12 pairs were not.

Figure 4 shows this rotation pattern for the first and second quarters of a year. Each letter represents a different cohort. The southeast-pointing arrows show how the cohorts move through the sample over time. For example, January is the first MIS for cohort “a,” February is the second MIS for cohort “a,” etc. The horizontal arrow indicates when a cohort is in MIS 4 or 8 (an outgoing rotation group) and will thus not appear in the next quarter. In the second quarter, the dot-shaded cohorts replace the outgoing cohorts (the gray-shaded groups from the first quarter). If the number of unincorporated self-employed workers differs between the 12 outgoing cohorts and the 12 incoming cohorts due to sampling variability, then some of the change in self-employment is spurious. When this difference is large, it can potentially dwarf the real

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change in self-employment.

MIS	Quarter 1			Quarter 2		
	Jan	Feb	Mar	Apr	May	Jun
1	a	i	k	m	o	q
2	b	a	i	<i>k</i>	m	o
3	c	b	a	<i>i</i>	<i>k</i>	m
4	d →	c →	b →	<i>a →</i>	<i>i →</i>	<i>k →</i>
5	e	j	l	n	p	r
6	f	e	j	<i>l</i>	n	p
7	g	f	e	<i>j</i>	<i>l</i>	n
8	h →	g →	f →	<i>e →</i>	<i>j →</i>	<i>l →</i>

Figure 4. Example of sample rotation group changes from one quarter to the next

Notes: The gray-shaded groups refer to those rotation groups that are present in the first quarter but not in the second quarter. The dot-shaded groups refer to those rotation groups that are present in the second quarter but not in the previous quarter. The unshaded groups refer to those rotation groups that are present in at least one month in both quarters. Source: Current Population Survey, authors' depiction

CPS provides several different survey weights. Each set of weights is designed so that the weighted sum of the respondents matches the U.S. civilian noninstitutionalized population over the age of 16 and certain subpopulations based on the latest decennial Census population with adjustments for births and deaths and net international migration. To calculate hours, the BLS Productivity Program uses second stage weights for main jobs to allow for the inclusion of 15-year-olds and outgoing rotation weights for secondary jobs, because respondents are asked about their class of worker on secondary jobs in outgoing rotation months only. Longitudinal weights are

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provided for analyses of labor force transitions from one month to the next. These latter weights are available in MIS 2–4 and 6–8 only. For more details on weighting, see U.S. Census Bureau (2019).

Self-employment status, like employment or unemployment status, is an outcome and is therefore not a stratifying variable in sampling or in the weighting process. Thus, self-employment estimates should be an unbiased estimate of the number of unincorporated self-employed, but the small number of unincorporated self-employed in the economy means that this estimate can vary quite a bit from month to month. In the next section, we explore whether an increase in household nonresponse and thus an increase in the CPS weights may be contributing to the volatility.

Usually, one household member, referred to as the household respondent, responds to the survey questions for all household members aged 15 and over; however, the household respondent may change from one month to the next. Thus, questions about one household member are self-reported, while questions about others are mostly answered by proxy. A teenager might answer for their parent, a parent for their children, one spouse for another, etc. We refer to the two reporter types for a household member as a proxy-reporter or self-reporter. In a limited number of cases, labor force questions are answered by both proxy and self, in which case, we treat the response as self-reported, assuming that household respondents consulted with other household members to provide more accurate responses. However, in those

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instances, we have no way to determine if the class of worker question specifically was reported by proxy or self.

Volatility in SEU might be related to proxy-reporting. Approximately half the responses to the class of worker question are reported by proxy, but the share of proxy-responses can vary somewhat from one month to the next. The different reporters may have different perspectives about what the class of worker type is. For example, while the CPS household respondent may be able to identify self-employment for a family member who clearly owns a small or medium-sized business (like a retail shop), for some work arrangements (like independent contractors receiving 1099-MISC forms from an “employer”), this identification may be more difficult and proxy-reporters may classify their family member in this case as an employee (Abraham et al. 2021; Abraham et al. 2024). Or a parent answering for their teenager or young adult may not know if their child, who is more likely to have intermittent employment during this stage in their life, is employed (or self-employed) and may be more likely to report non-employment on their behalf (Contreras et al. 2024). There is also some evidence that older workers who have retired from a career job but perform some informal work activities may be less likely to self-report that they are employed (Bracha and Burke 2023); and that proxy- and self-reporters differ on a significant portion of answers to labor force questions in the CPS and proxy-reporters miss informal work activities that may be happening sporadically (Boehm 1989; Abraham and Amaya 2019). Throughout the household’s time in sample, the respondent

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answering on behalf of the household may change, resulting in the reporter type for each member switching from self to proxy or vice versa. When there are transitions in the reporter type as households move through the CPS, it is possible that there are more likely to be transitions in reported SEU status, given these different perspectives.

Dependent interviewing was introduced in the CPS with the 1994 survey redesign, with the goals of reducing respondent burden and spurious month-to-month transitions across occupations and industries (Polivka and Rothgeb 1993). With dependent interviewing, in MIS 2–8 the interviewer asks the household respondent retrospective questions about whether each household member still works for the same employer that they worked for in the previous month, with the interviewer reading aloud the name of the household member’s employer. Naming the employer seems to reduce transitions between self-employment and other employment states from one month to the next (Fujita et al. 2024). However, from January 2008 to April 2009, the CPS phased in a Respondent Identification Policy (RIP) to protect the confidentiality of respondents’ information from other household members. Under the RIP, the original household respondent is asked in their initial interview whether their answers to survey questions, including answers about employer names, can be shared with other household members who may respond in their absence in subsequent months (U.S. Census Bureau 2015). Following the introduction of the RIP, many respondents declined to allow their information to be shared. This led to a sharp increase in the number of transitions across employers and transitions between SEU and employee

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statuses (Fujita et al. 2024). Fujita et al. (2024) also find some evidence that even those workers with the same employer across months may report switches between SEU and employee-type work. Although such a transition is possible, Fujita et al. (2024) conclude that the number of transitions in formal classification is implausibly high.

Sometimes, the household respondent does not answer the class-of-worker question because they do not know the answer to the question or refuse to answer it. In these cases, the Census Bureau imputes the response. The Census Bureau uses two imputation procedures to edit missing responses to the class of worker question: (1) longitudinal edits, where information from the previous month's entry is used if available and (2) hot deck imputation, where a value is assigned from a different respondent with similar age, race, and sex characteristics. The latter type of imputation could lead to volatility in the SEU series, while we would not expect a change in class of worker if there was a longitudinal edit. Hereafter, when we refer to imputations, we are referring to hot deck imputations.

2.2 Weighted versus Unweighted Unincorporated Self-employment

In this subsection, we begin by analyzing weighted and unweighted SEU series for those over the age of 15 in the nonfarm business sector from quarter one of 2000 to quarter four of 2019. We start the series in 2000 because productivity is consistently measured back to this year for detailed industries from which aggregate labor productivity measures are built up. The period following the start of the COVID-19 pandemic is excluded because the size of the changes in SEU during the COVID-19

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pandemic overshadows the normal volatility in the series, making it hard to see this volatility graphically.

To show the effects of weighting on volatility, Figure 5 presents counts of the unincorporated self-employed in the nonfarm business sector from the basic monthly CPS (averaged to quarters taking a simple average), with unweighted counts on the right axis and weighted counts on the left axis. See U.S. Bureau of Labor Statistics and U.S. Census Bureau (2013–2019) for CPS data. Note that in the third quarter of 2001, there is a spike in the unweighted series that is the result of a permanent one-time increase in the CPS sample size from about 50,000 to about 60,000 households in July 2001 (Helwig et al. 2001).

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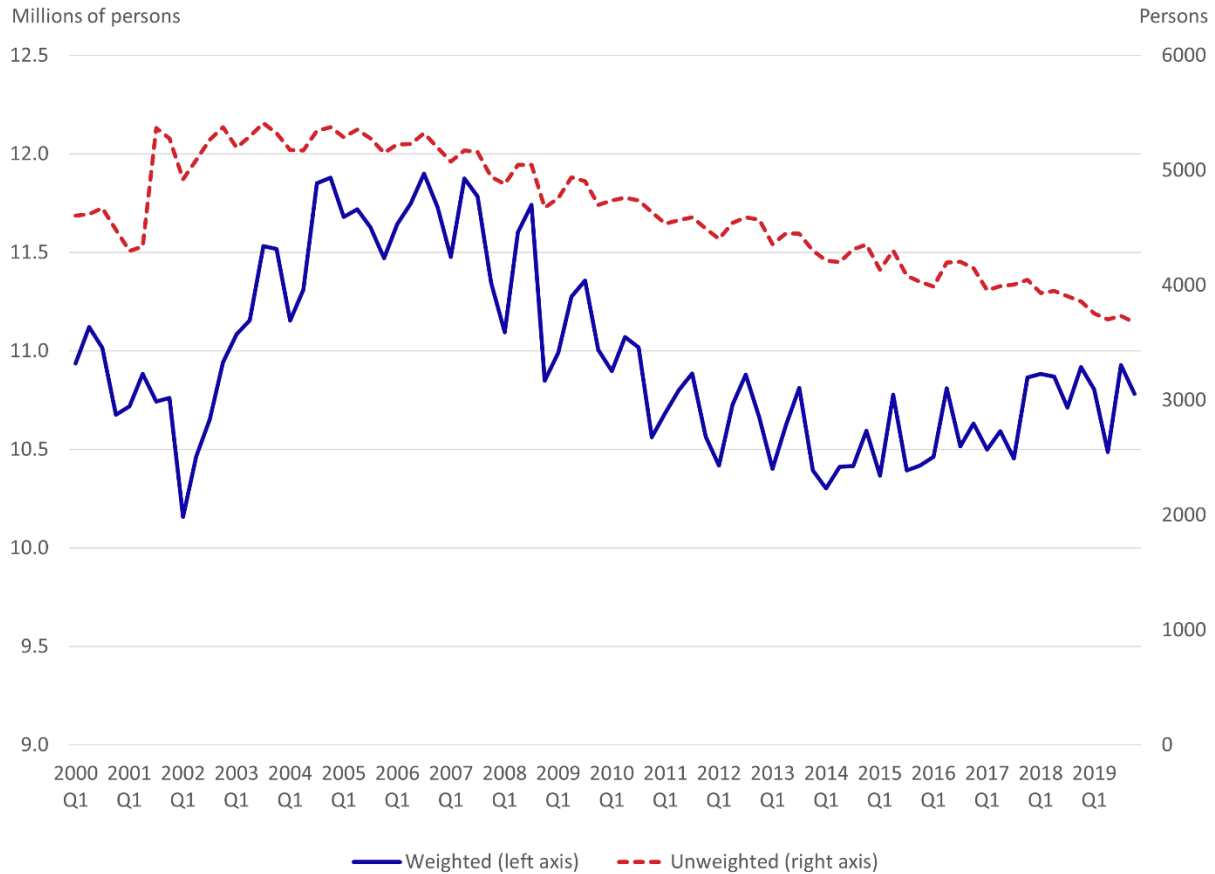


Figure 5. Weighted and unweighted unincorporated self-employment in the nonfarm business sector, first quarter 2000 to fourth quarter 2019

Note: The weighted estimates are calculated using CPS weights. Source: Current Population Survey, authors' calculations

One factor that may contribute to volatility in estimates of the number of self-employed is the recent decline in the number of respondents in the CPS relative to the U.S. population, resulting from a combination of an uptick in household nonresponse and an increasing population. The CPS household refusal rate rose gradually starting around 2010 from 8 percent to over 15 percent in 2019, with some households never responding and an increasingly greater share responding in some but not all months (Bernhardt et al. 2024). This resulted in a reduction in the number of respondents and

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an increase in population weights for all respondents. The impact of the decline in the number of CPS respondents can be seen in Figure 5. The unweighted series shows SEU falling steadily since the beginning of 2005. However, while the weighted series also begins to decline in 2005, it becomes essentially flat hovering around 10.7 million after 2010, reflecting the increased weight on each respondent. In addition to falling household response rates, respondent weights have been increasing over time because the US population has increased.

Figure 6 shows the average CPS weight for all respondents as well as for the nonfarm unincorporated self-employed. While the average weight is slightly lower for the unincorporated self-employed (because weights for demographic groups that are typically not self-employed are higher over the period), weights have been increasing fairly consistently for both groups since 2001, following the permanent one-time increase in the CPS sample size. Thus, there does appear to be something systematically different about the weights for the unincorporated self-employed. In addition, the increase in the weight does not appear to directly contribute to the volatility in the SEU hours series. Nevertheless, any volatility in the estimates will be magnified when there is an increase in the average weight that occurs when there are fewer respondents or as the U.S. population grows.

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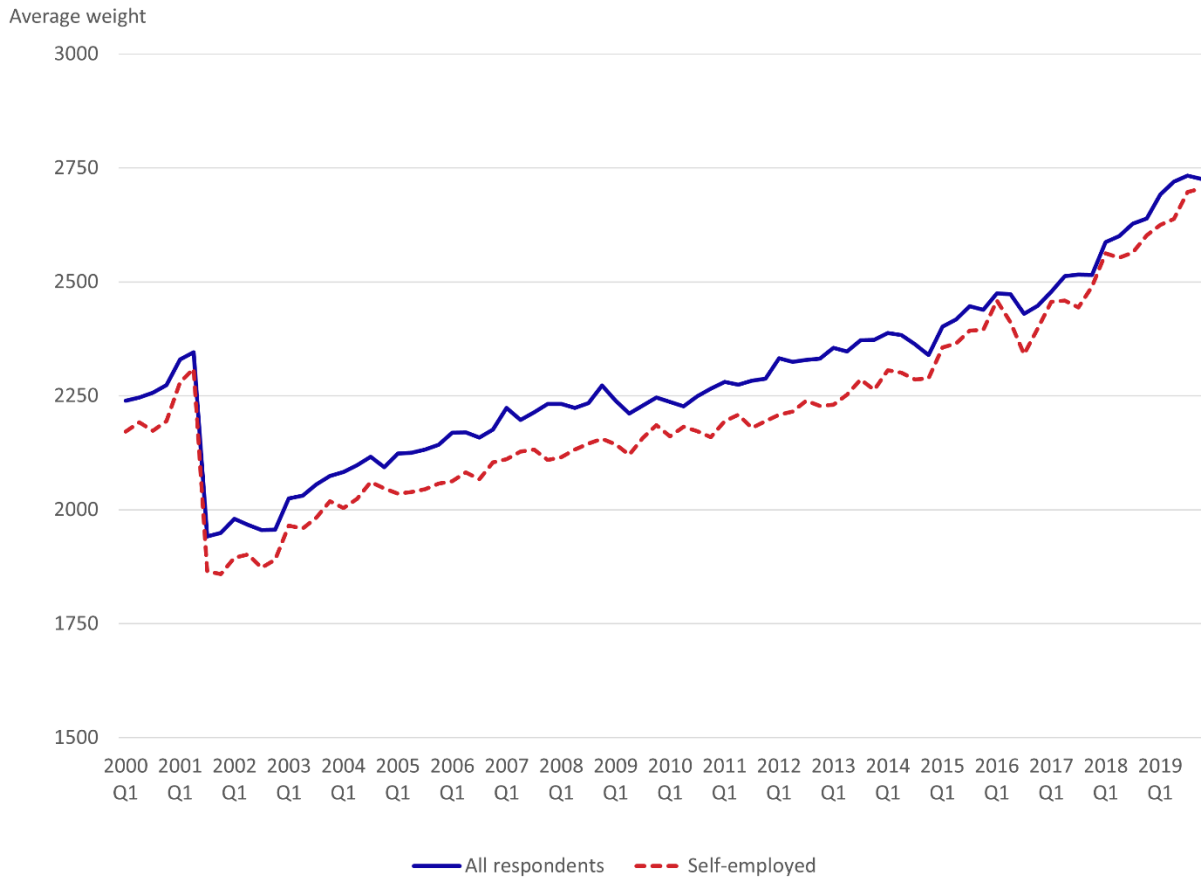


Figure 6. Average Current Population Survey final weight for all respondents and for the nonfarm unincorporated self-employed, first quarter 2000 to fourth quarter 2019

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

Figure 7 presents the weighted and unweighted quarter-to-quarter growth rates for SEU. The sharp increase observed in the unweighted count in the third quarter of 2001 is because of the previously-mentioned one-time increase in the CPS sample size. Otherwise, for the most part, the weighted and unweighted series are similarly volatile (varying \pm five percent), although there appears to be more volatility in the weighted series compared with the unweighted series after 2016. For example, in the third quarter of 2019, when there was an outsized change in SEU compared with the

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change in employees, the weighted series grew more than four times faster than the unweighted series (4.19 percent versus 0.83 percent).

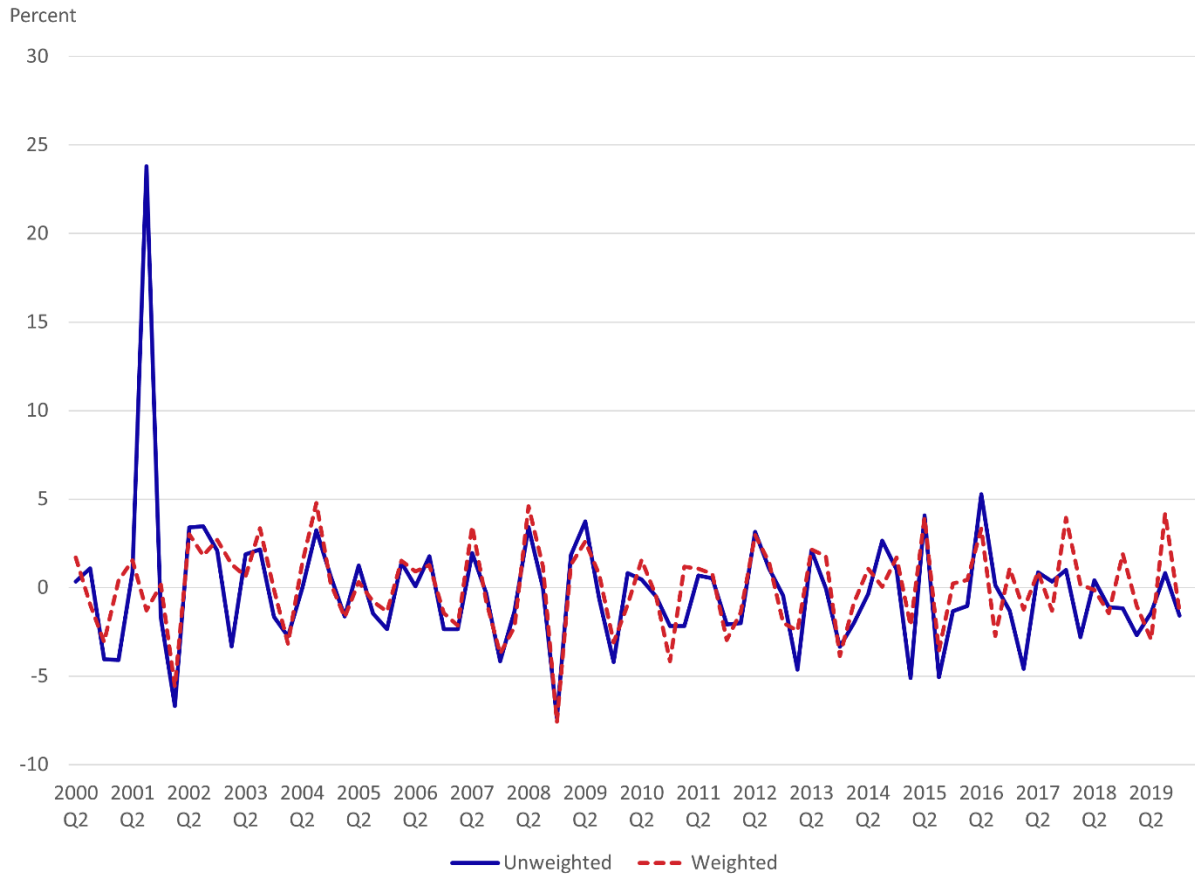


Figure 7. Weighted and unweighted growth in unincorporated self-employment in the nonfarm business sector, quarter-to-quarter percent change, second quarter 2000 to fourth quarter 2019

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

Our primary concern is volatility in the estimates that is not due to volatility in the SEU population. However, we note that Abraham et al. (2021) find that compared with their income tax records, a large and growing number of respondents to the Annual Social and Economic Supplement to the CPS (CPS-ASEC) did not report self-employment earnings, which they attribute to a growth in “gig” work that people forget

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to report or to people not perceiving themselves as independent contractors. Their research suggests that the true self-employed population may be higher than shown in Figure 5. In 2015, they estimated that annual self-employment from tax records was 19.4 million, whereas the average in the basic monthly CPS that year was 10.5 million. Remember here that our reference period is the quarter so you cannot directly compare our estimates with their annual ones; however, estimates from the CPS-ASEC are close to those from the basic monthly CPS. BLS also found that between 12 and 15 percent of independent contractors in February 2001 and 2005 were misclassified as wage and salary workers in the CPS (Bowler and Morisi 2006). On the other hand, it is also possible that some people are fabricating self-employment income on their taxes in order to claim the earned income tax credit (EITC). Using the universe of U.S. tax returns to compare taxpayer-reported self-employment and third-party-reported payments to “gig” and other contract workers, more recent research from Garin et al. (forthcoming) concludes that rather than the rise in self-employment rates observed in the tax data being an actual increase in “gig” work, the divergence between the CPS and the income tax records is primarily due to rising self-reports of self-employment income by individuals during the EITC phase-in range as people learn about the tax incentives of claiming the EITC.

2.3 Rotating Sample Design

Figure 8 compares the quarterly levels of SEU by whether the person was present in at least one month in the previous quarter. The sample here is restricted to

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main jobs only, because questions about secondary jobs are asked only in outgoing rotation months and thus there is no sample overlap between quarters. The quarterly estimates for each group (those not present in the previous quarter and those present in the previous quarter) are calculated by summing the unincorporated self-employed for the 12 MIS-month pairs and dividing them by 3. An upward spike in one quarter in SEU among those who were not present in the previous quarter is often followed the next quarter by a similar spike in SEU among those who **were** present the previous quarter, as the same underlying cohorts move through on their way out of the sample.

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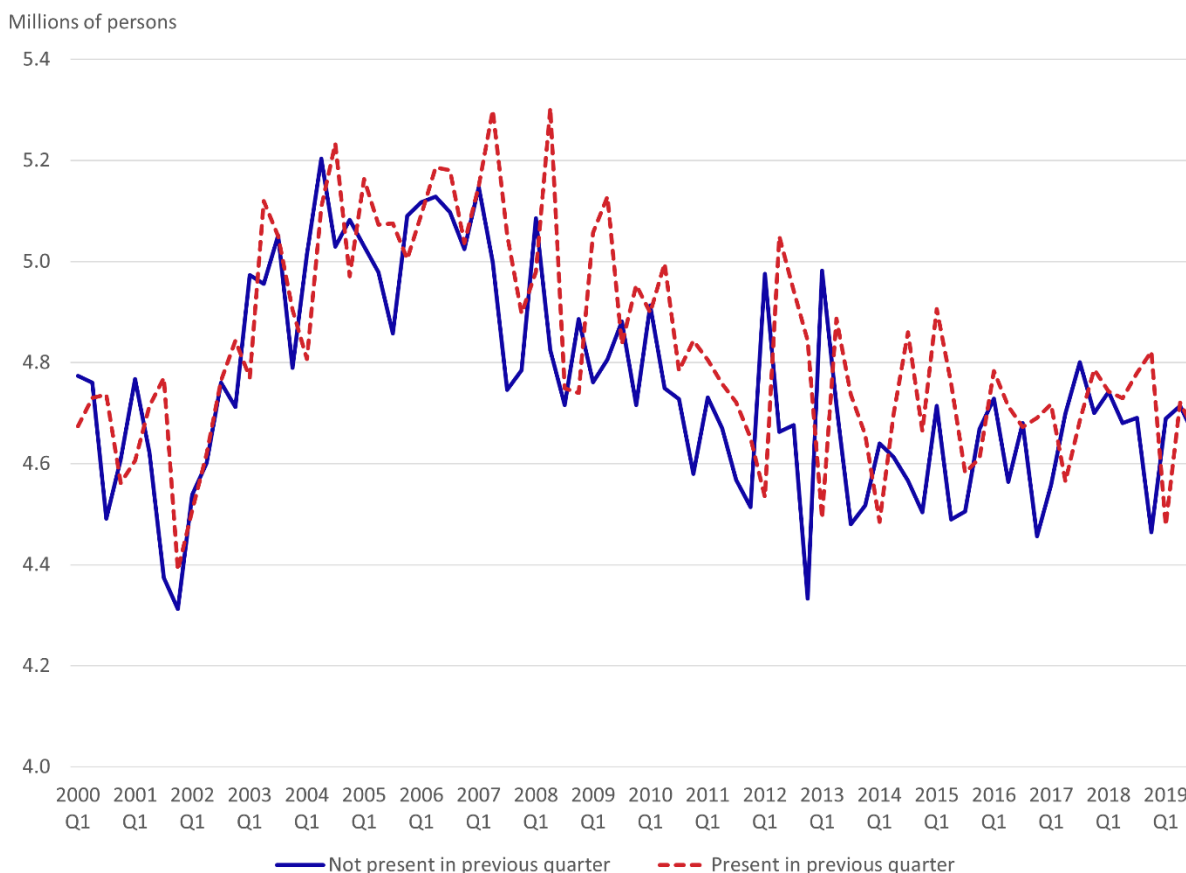


Figure 8. Unincorporated self-employment in the nonfarm business sector by whether present in previous quarter, first quarter 2000 to fourth quarter 2019

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

A quarterly change in SEU can be broken into two components: (1) the growth among respondents who were present in the sample in both quarters and (2) the growth among those who were not present in the sample in both quarters. The latter is the difference in SEU between the incoming and outgoing rotation groups. Figure 9 shows the overall growth in SEU, as well as these two components. Most of the downward spikes in overall growth seem to be driven by the difference in SEU between incoming and outgoing rotation groups. Except for one upward spike in the overall SEU growth rate in the second quarter of 2015, a large increase in the growth

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rate of overall SEU is most often associated with a spike in the difference in SEU between incoming and outgoing groups. Comparing the variance in the growth rates of the two components over the 2000–2019 period, we find that the standard deviation of the series for those who were present in both quarters is 1.04, but the standard deviation of the series for those who were not present in both quarters is much larger, 2.18. Thus, a large part of the volatility in the SEU growth series results from those who were not present in both quarters. It is important to note that volatility in SEU would be even larger in the absence of the sample rotation design.

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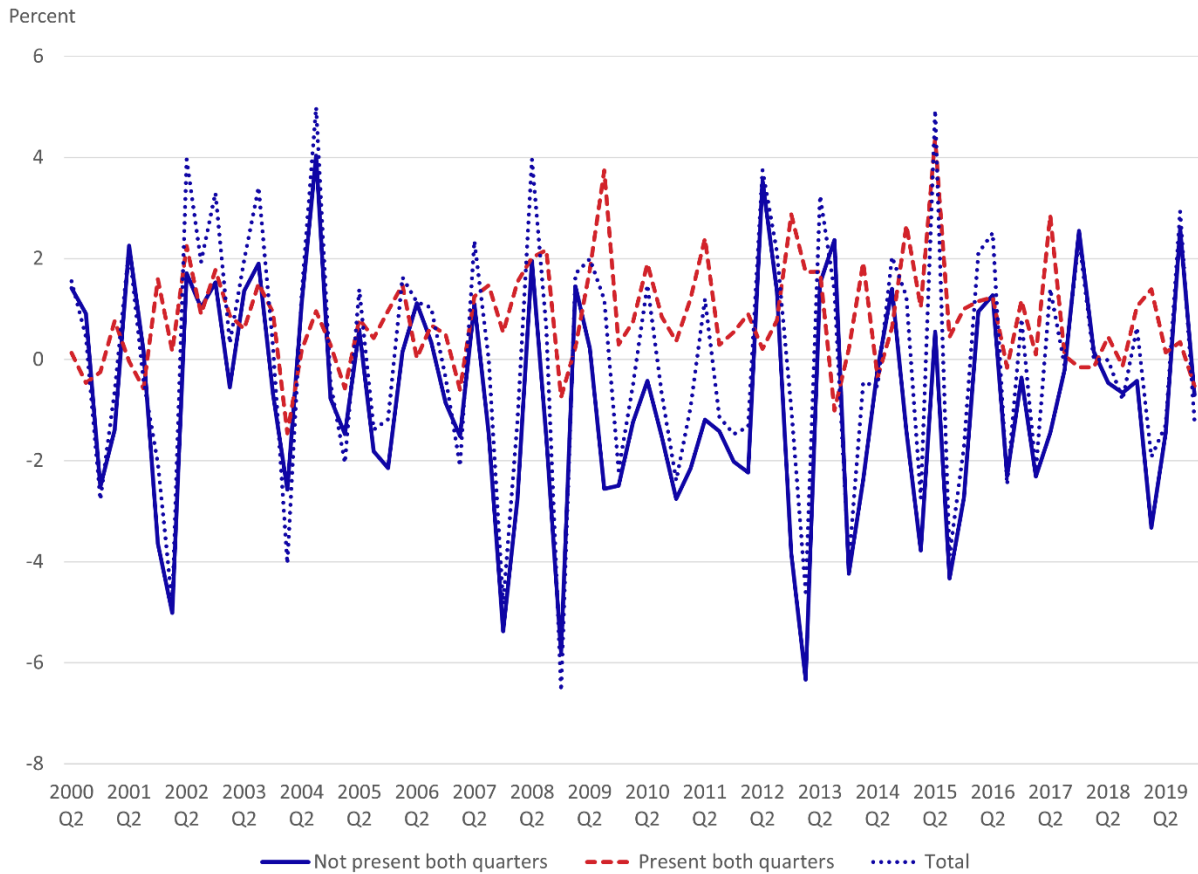


Figure 9. Growth in unincorporated self-employment in the nonfarm business sector, by whether present in the sample in both quarters, quarter-to-quarter percent change, second quarter 2000 to fourth quarter 2019

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

2.4 Proxy- versus Self-reporters

Figures 10 and 11 show the weighted levels and contributions to the quarter-to-quarter percent change for the unincorporated self-employed, respectively, for those responses obtained directly from the respondent compared with those obtained by proxy. There are significant differences in both reporting by reporter type and volatility in the reporting by reporter type. Household respondents report SEU less often for other household members than they do for themselves. This may not be random, as

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some worker characteristics, such as work-from-home capabilities, might be related to both the propensity to be a self-reporter and to be unincorporated self-employed. On average, 42% of the unincorporated self-employed are reported by proxy (Figure 10), even though about half of class of worker question responses come from proxies.

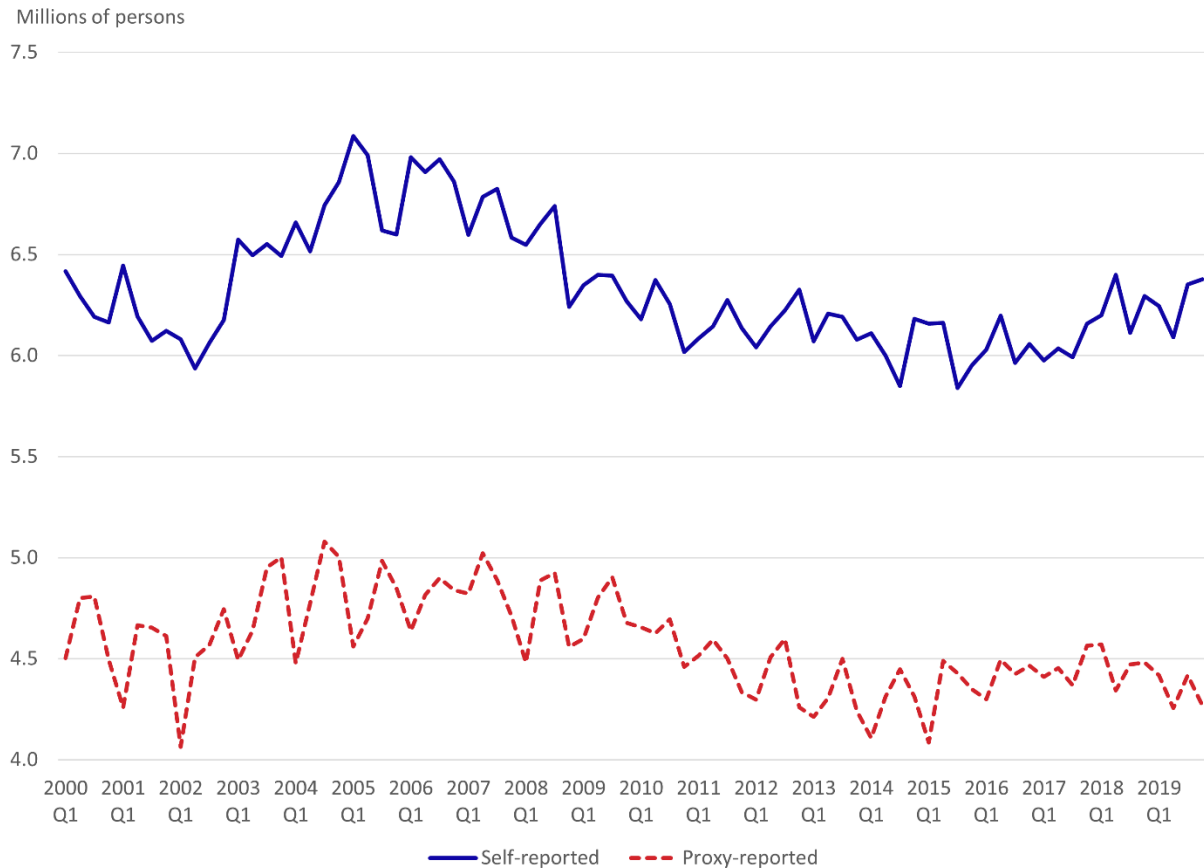


Figure 10. Unincorporated self-employment in the nonfarm business sector by reporter type, first quarter 2000 to fourth quarter 2019

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

There is greater volatility in the quarter-to-quarter percent change in the SEU series reported by proxy-reporters than there is in that reported by self-reporters—the standard deviation is 4.6 for proxy-reporters and 2.7 for self-reporters (Table 1). In addition, the tails of the distribution of the growth rates are much longer for proxy-

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reporters than they are for self-reporters. In Figure 11, we show the percentage-point contributions of self- and proxy-reporters to the total growth in SEU. The solid blue portion of the stacked bar represents the contribution of self-reporters to the growth in unincorporated self-employed, the red and white lined portion represents the contribution of proxy-reporters, and the red dot represents the total growth in SEU. On average, the unincorporated self-employed reported by proxy make much larger contributions to the quarter-to-quarter percent change in SEU than do the self-reported unincorporated self-employed despite there being fewer unincorporated self-employed workers reported by proxy. We also find many instances where the contributions of the two groups to SEU growth move in opposite directions, with one negatively contributing to the growth and the other positively contributing to growth.

Table 1. Distribution of quarterly growth rates for the unincorporated self-employed in the nonfarm business sector by reporter type, first quarter 2000 to fourth quarter 2019

Response Type	Average	Std. Dev.	Minimum	Maximum
All workers	0.011	2.413	-7.600	4.780
Proxy-reporters	0.039	4.647	-11.914	10.911
Self-reporters	0.028	2.694	-7.414	6.469
Proxy-reporters pre-2007	0.442	5.983	-11.914	10.911
Self-reporters pre-2007	0.286	2.839	-5.326	6.469
Proxy-reporters 2007+	-0.171	3.827	-7.457	9.894
Self-reporters 2007+	-0.106	2.633	-7.414	5.665

Notes: CPS weights are used. Source: Current Population Survey, authors' calculations

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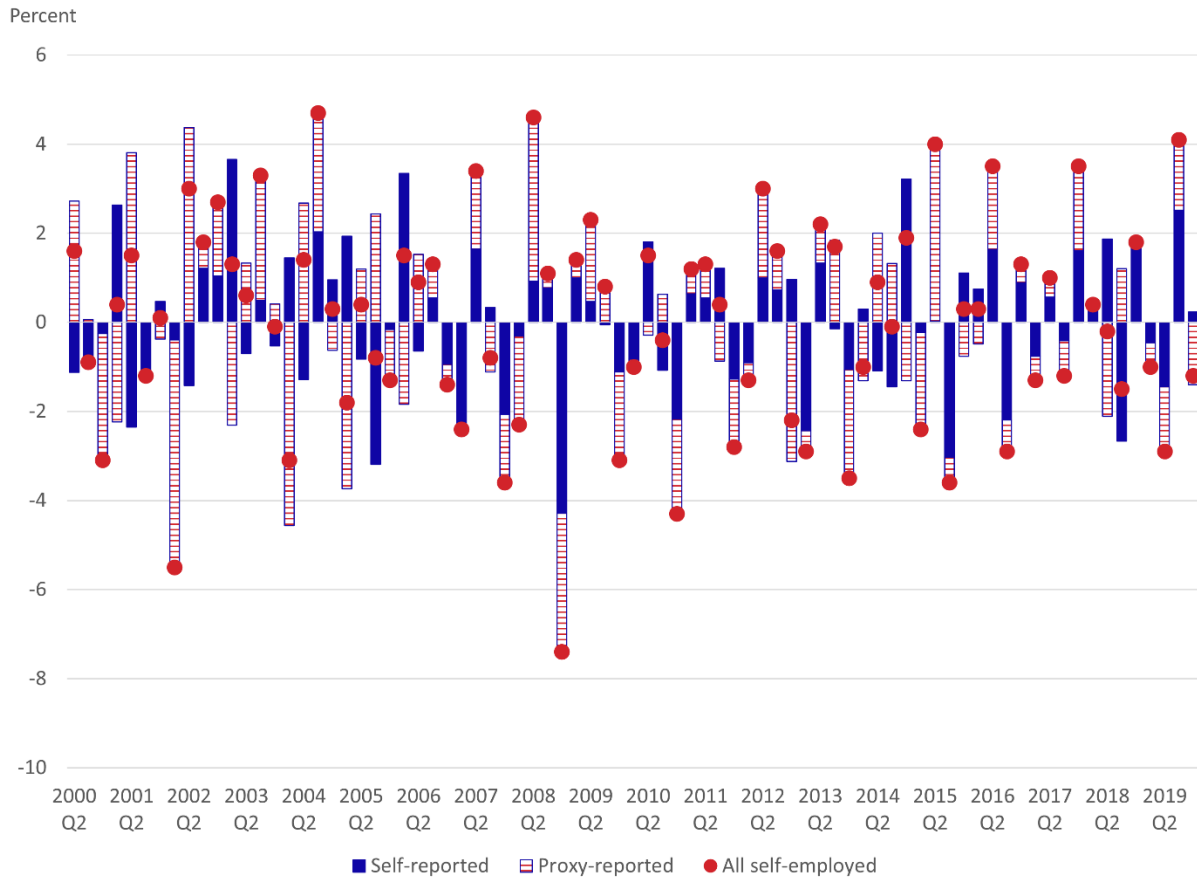


Figure 11. Contributions to the quarter-to-quarter percent change in unincorporated self-employment in the nonfarm business sector by reporter type, second quarter 2000 to fourth quarter 2019

Note: CPS weights are used. This figure shows the percentage-point contributions of proxy- and self-reports to the percent change in the sum of the proxy- and self-reported unincorporated self-employed and not the actual percent change for all unincorporated self-employed, because a small number of respondents are missing information about proxy status. Source: Current Population Survey, authors' calculations

It also is possible that some of the observed variation in the relative contributions of the two groups to the growth in SEU results from quarterly changes in the share of proxy-responses out of all responses. Digging deeper into the data, we found evidence that the share of proxy-responses fell each March prior to the introduction of the Windows BLAISE© software for data collection in 2007 that resulted

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in higher quality survey results overall (see Figures 12 and 13). (For more information on how the Windows BLAISE© software features improved survey quality, see p. 111 of U.S. Census Bureau [2019].) These dips in the proxy-response rate during the earlier period correspond with spikes in the self-proxy response rate (not shown), so there must have been something related to the prior survey instrument and the March CPS-ASEC that resulted in an increase in responses being recorded by the interviewer as being reported by both self and proxy (also remember we coded self-proxy responses as self-responses so there are spikes in the self-responses). However, after the Windows BLAISE© software was introduced, both the proxy-response rate dips and the self-proxy response rate spikes went away. In Figure 11, the contributions to the quarter-to-quarter percent change in SEU by the proxy-reporters are all positive moving from the first to second quarter of each year in the 2000–2006 period, while the contributions of the self-reporters are all negative, which is consistent with the dips in the proxy shares. However, proxy-reporters still contribute more to the growth than do self-reporters in the post-2007 period (Table 1).

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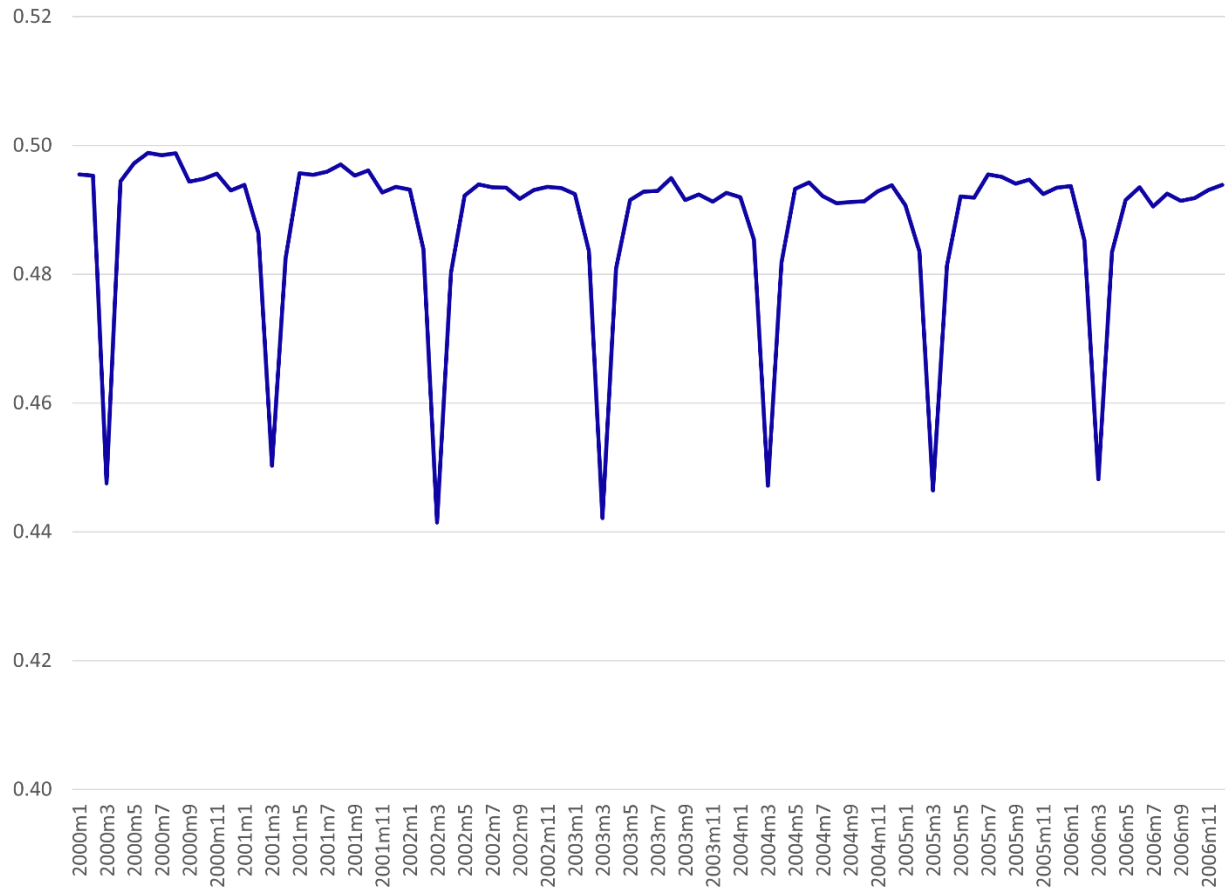


Figure 12. Share of proxy-responses, by month, 2000–2006

Note: CPS weights are used. The share falls each March. Source: Current Population Survey, authors' calculations

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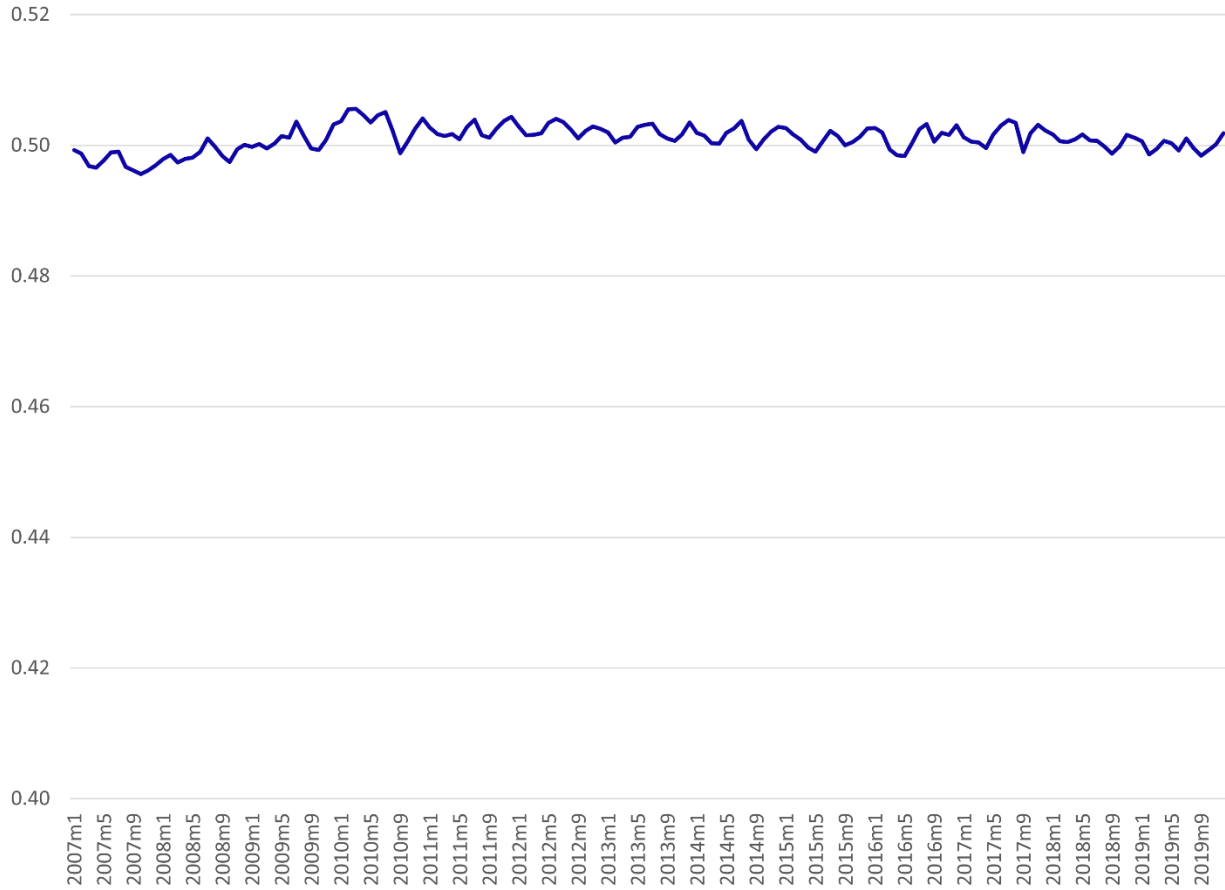


Figure 13. Share of proxy-responses, by month, 2007–2019

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

2.5 Imputed versus Nonimputed Responses

For the unincorporated self-employed, the number imputed by hot deck has been rising slowly since 2000, from 0.4 million in the first quarter of 2000 to 0.6 million in the fourth quarter of 2019, and it may be that SEU status is not missing at random (Eggleston et al. 2022). However, in 2019, the weighted count of the imputed self-employed was still less than 7 percent of the weighted count of the nonimputed self-employed (Figure 14). In Table 2, we find that growth rates are on average substantially larger for the imputed unincorporated self-employed than for the nonimputed

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unincorporated self-employed, and their standard deviation is almost four times the size of the standard deviation for the nonimputed unincorporated self-employed series. This is likely to some degree because of the substantially smaller number of imputed responses. In Figure 15, we examine the percentage-point contributions of the imputed and nonimputed unincorporated self-employed to the total growth in SEU. The red and white striped portion of the stacked bar represents the contribution of imputed values to the growth in SEU, the dark blue portion represents the contribution of the nonimputed values, and the solid red dot represents the total growth in SEU. We find in some quarters (9 out of the 79 quarters examined), the contributions of the imputed self-employed exceeded the contributions of the nonimputed.

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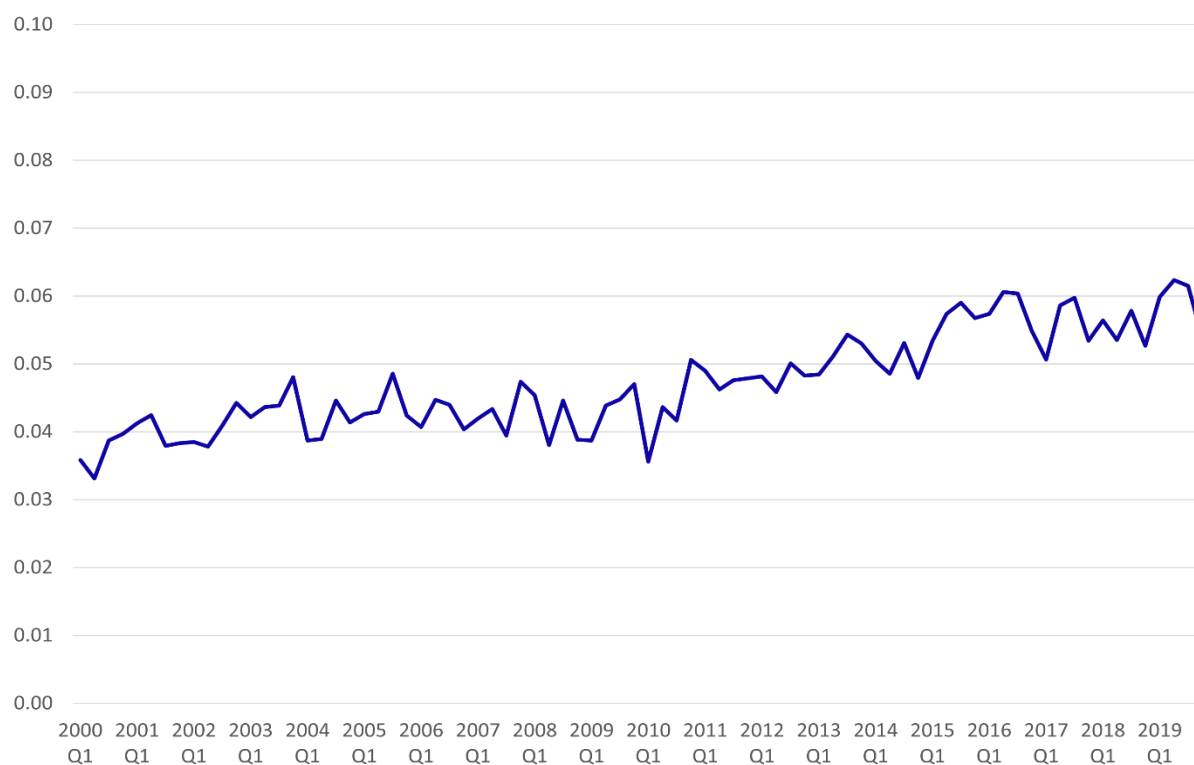


Figure 14. Share of imputed unincorporated self-employed in the nonfarm business sector, first quarter 2000 to fourth quarter 2019

Note: CPS weights are used. Imputed responses are imputed by hot-deck imputation.
Source: Current Population Survey, authors' calculations

Table 2. Distribution of quarterly growth rates for the unincorporated self-employed in the nonfarm business sector by imputation status, first quarter 2000 to fourth quarter 2019

Response Type	Average	Std. Dev.	Minimum	Maximum
All workers	0.011	2.413	-7.600	4.780
Imputed responses	0.959	9.641	-25.018	24.471
Nonimputed responses	-0.012	2.437	-7.043	5.398

Notes: CPS weights are used. Source: Current Population Survey, authors' calculations

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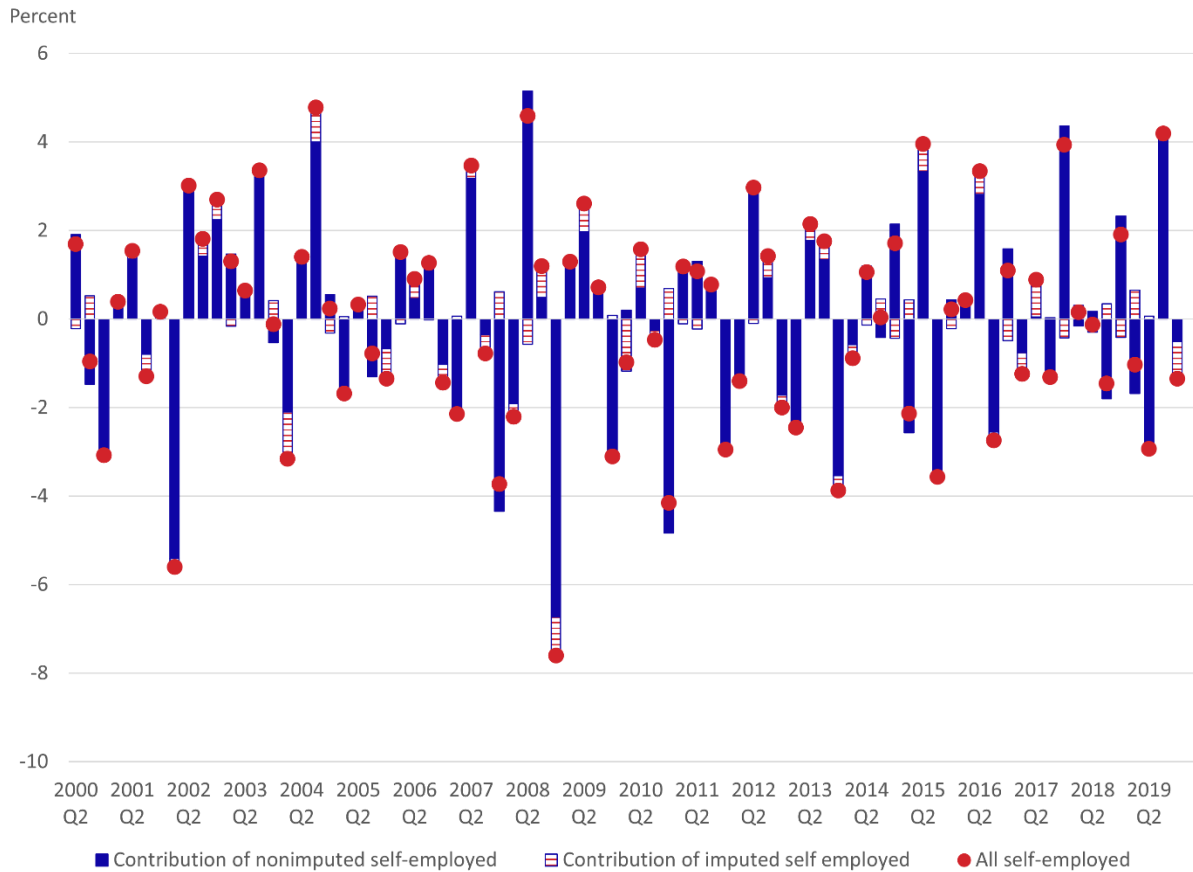


Figure 15. The contributions of imputed and nonimputed unincorporated self-employment to the growth in unincorporated self-employment in the nonfarm business sector, quarter-to-quarter percent change, second quarter 2000 to fourth quarter 2019

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

2.6 Panel Data Analysis: Respondent Transitions into and out of Unincorporated Self-employment

Although we have identified several survey-related reasons for quarter-to-quarter volatility in the number of unincorporated self-employed, there are reasons that workers do, in fact, move in and out of SEU. For example, workers sometimes use SEU as a bridge between wage-and-salary job spells so they can pay their bills while

Volatility in Measured Self-employment Hours

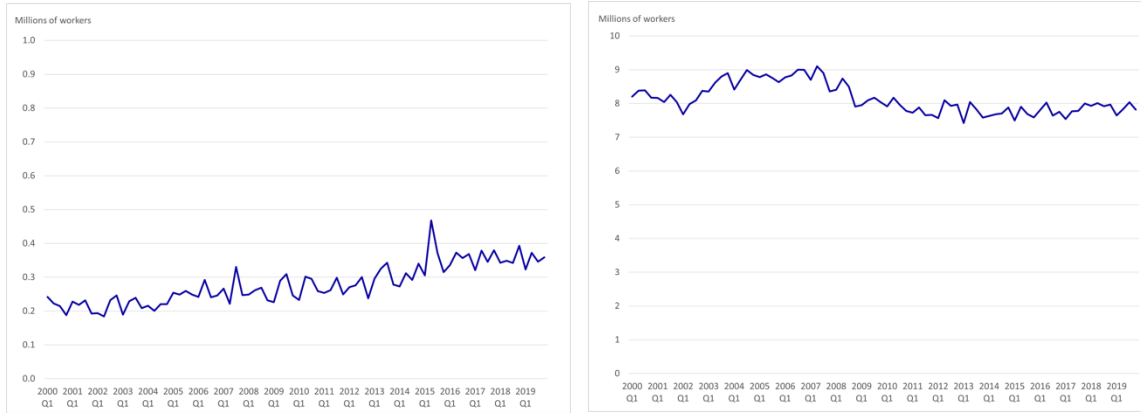
looking for a new job (Cahill et al. 2013; Fairlie and Fossen 2020; von Bonsdorff et al. 2017). Some unincorporated self-employed decide to incorporate their businesses, sometimes in response to changes in tax laws (Cole 2011). However, Fujita et al. (2024) also find that following the introduction of the RIP in 2008, employer-to-employer transitions increased dramatically among individuals with transitions in the reporter type in adjacent months as well as among those where there was a different proxy-reporter across months. Thus, it is important to examine not only cross-sectional changes in SEU, but also to look at transitions into and out of SEU from one month to the next.

To examine transitions, we match respondents' consecutive month-to-month responses using unique household and person identifiers and sex. We examine month-to-month transitions within MIS 1–4 and within MIS 5–8 of the CPS panel. We compare respondents' reported work status and class of worker across matched months and observe movements between SEU and other classes of work or non-employment.

In four panels, Figure 16 shows the quarterly average number of workers who reported one class of work in the current month and who reported being unincorporated self-employed in the previous month. These are month-to-month transitions **out of** SEU into another class of work or non-employment. The number of unincorporated self-employed in the current month who reported being unincorporated self-employed in the prior month fell from 8.2 million in 2000 to 7.8 million in 2019

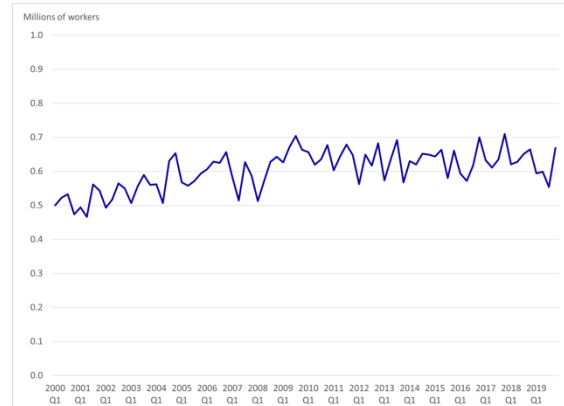
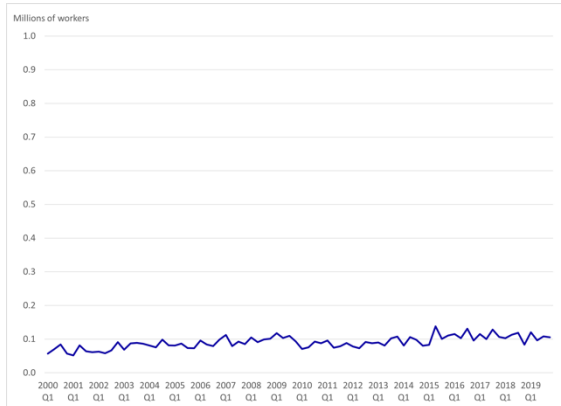
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(panel B). (This represents a shrinking share of the total unincorporated self-employed, from 0.92 to 0.89).



A. Employees

B. Unincorporated self-employed



C. Incorporated self-employed

D. Not employed

Figure 16. Transitions from unincorporated self-employment in the previous month to different classes of work or non-employment, first quarter 2000 to fourth quarter 2019

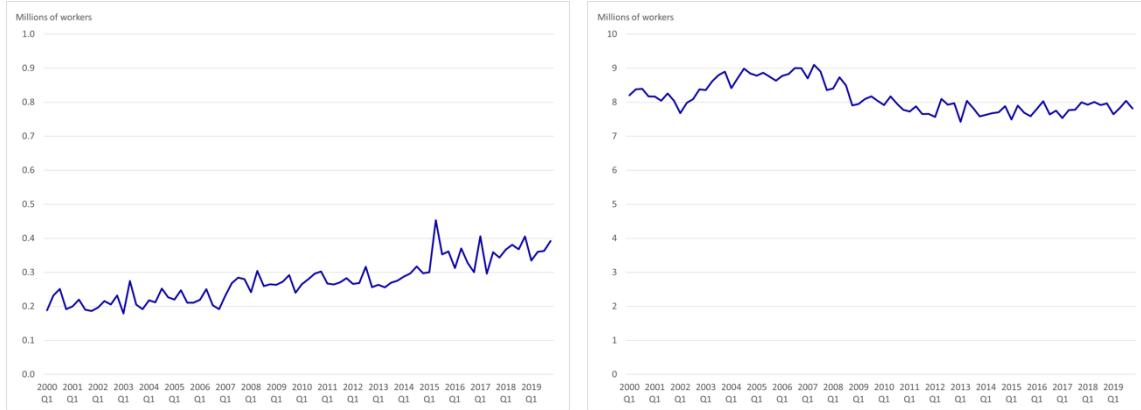
Note: CPS longitudinal weights are used. Source: Current Population Survey, authors' calculations

Figure 17 repeats the analysis but for workers who transition **into** SEU. Figure 17 Panel B is the same as Figure 16 Panel B but presented again for symmetry. Both Figures 16 and 17 show that the number of workers reporting being unincorporated

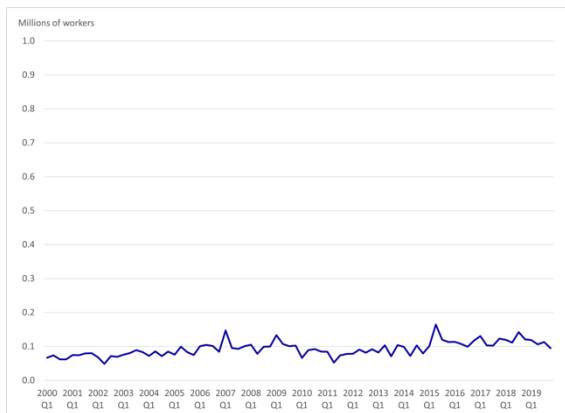
Volatility in Measured Self-employment Hours

self-employed in one month and some other class of worker in the next or previous month is small but has been increasing over time. About 120,000 more employees reported having been unincorporated self-employed the previous month in 2019 than in 2000, and 170,000 more nonemployed persons reported being unincorporated self-employed the prior month in 2019 than in 2000. Similarly, the number of unincorporated self-employed who reported having been employees in the previous month increased from 240,000 in 2000 to 360,000 in 2019.

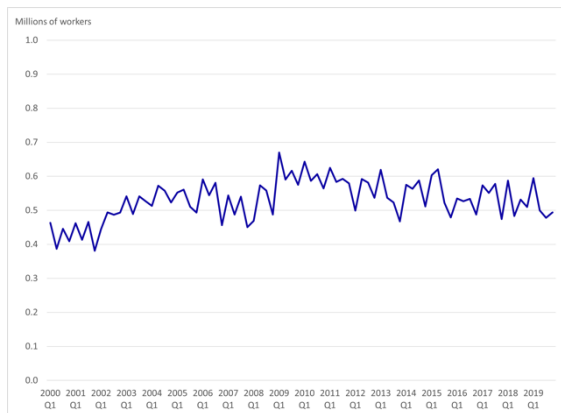
Volatility in Measured Self-employment Hours



A. Employees



B. Unincorporated self-employed



C. Incorporated self-employed

D. Not employed

Figure 17. Transitions from different classes of work and non-employment in the previous month to unincorporated self-employed, first quarter 2000 to fourth quarter 2019

Note: CPS longitudinal weights are used. Source: Current Population Survey, authors' calculations

Transitions between SEU and incorporated self-employment are also increasing over time. These transitions both into and out of SEU suggest either lots of experimentation with self-employment or inconsistent reporting month over month. Prior research (Cole 2011) suggests that the normal progression among the self-employed is to move from unincorporated to incorporated status rather than the reverse, and once established, it is rare for businesses to change their legal form of

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organization. While these transitions might be attributable to imputations or proxy-reporters, we also looked at consecutive months where neither month was imputed and consecutive months where both were self-reported and still find transitions in incorporation status for the self-employed in both directions (not shown). Therefore, there also is likely some confusion on the part of the self-employed about their incorporation status.

Because the household respondent can change from month to month in the sample, there is an opportunity to look at transitions when the reporter type changes. In Figure 18, we show quarterly average shares of the unincorporated self-employed in the current month who were reported as being employees, incorporated self-employed, or not employed in the previous month by each current and previous month reporter type pair (self in both months referred to as self-self hereafter, proxy in current month and self in previous month referred to as proxy-self hereafter, self in current month and proxy in previous month referred to as self-proxy hereafter, and proxy in both months referred to as proxy-proxy hereafter). We note that when there is a proxy reporter in consecutive months, which household member is the proxy-reporter could differ each month in households with over three people. However, we do not make any distinction about whether the proxy-reporter changed. (Here, we do not show transitions out of SEU to other work statuses. Because CPS longitudinal weights are designed to weight current period respondents to the population, a transition out of

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SEU must be measured as a share of the other work statuses respondents transition into. This results in a much larger denominator than in Figure 18 and miniscule shares.)

Figure 18 shows that transitions into SEU are rising. In almost all quarters, more than half of the transitions occur when there is also a change in reporter type or the response is reported by proxy in both months. Over the period, there is a rise in transitions occurring among the self-self group and the proxy-proxy group, but not among the reporter-type switchers.

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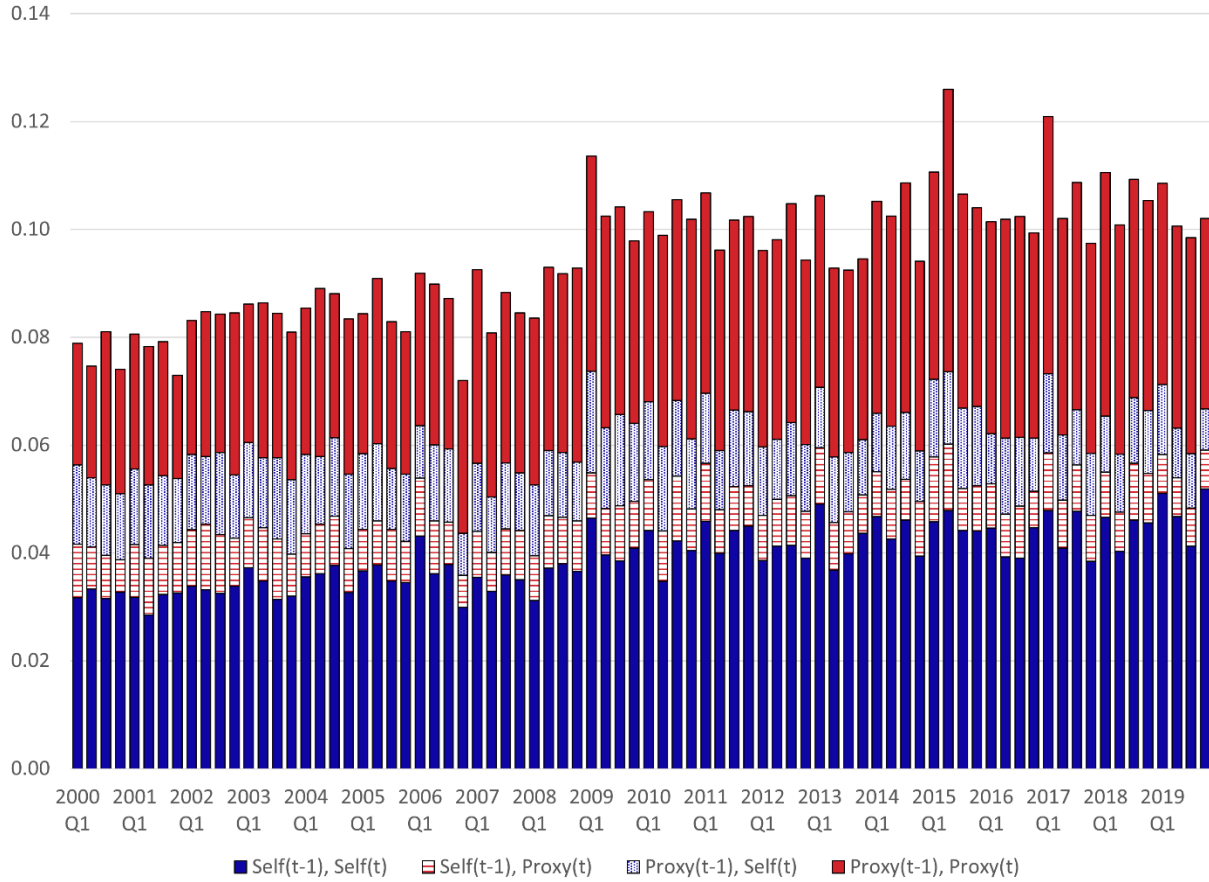


Figure 18. The share of unincorporated self-employed in the current month who were not unincorporated self-employed in the previous month by current and previous month reporter type, nonfarm business sector, first quarter 2000 to fourth quarter 2019

Note: CPS longitudinal weights are used. Source: Current Population Survey, authors' calculations

Figure 19 shows the quarterly average transitions into SEU from all other work statuses combined as a share of the unincorporated self-employed in the current month by the current and previous month imputation status pair (nonimputed in both months referred to as nonimpute-nonimpute hereafter, imputed in current month and nonimputed in previous month referred to as impute-nonimpute hereafter, nonimputed in current month and imputed in previous month referred to as nonimpute-impute

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hereafter, and imputed in both months referred to as impute-impute hereafter). There is a noticeable increase in transitions into SEU among those in the nonimpute-nonimpute group as well as among those in the nonimpute-impute group in the post-2008 period, the period following the adoption of the RIP.

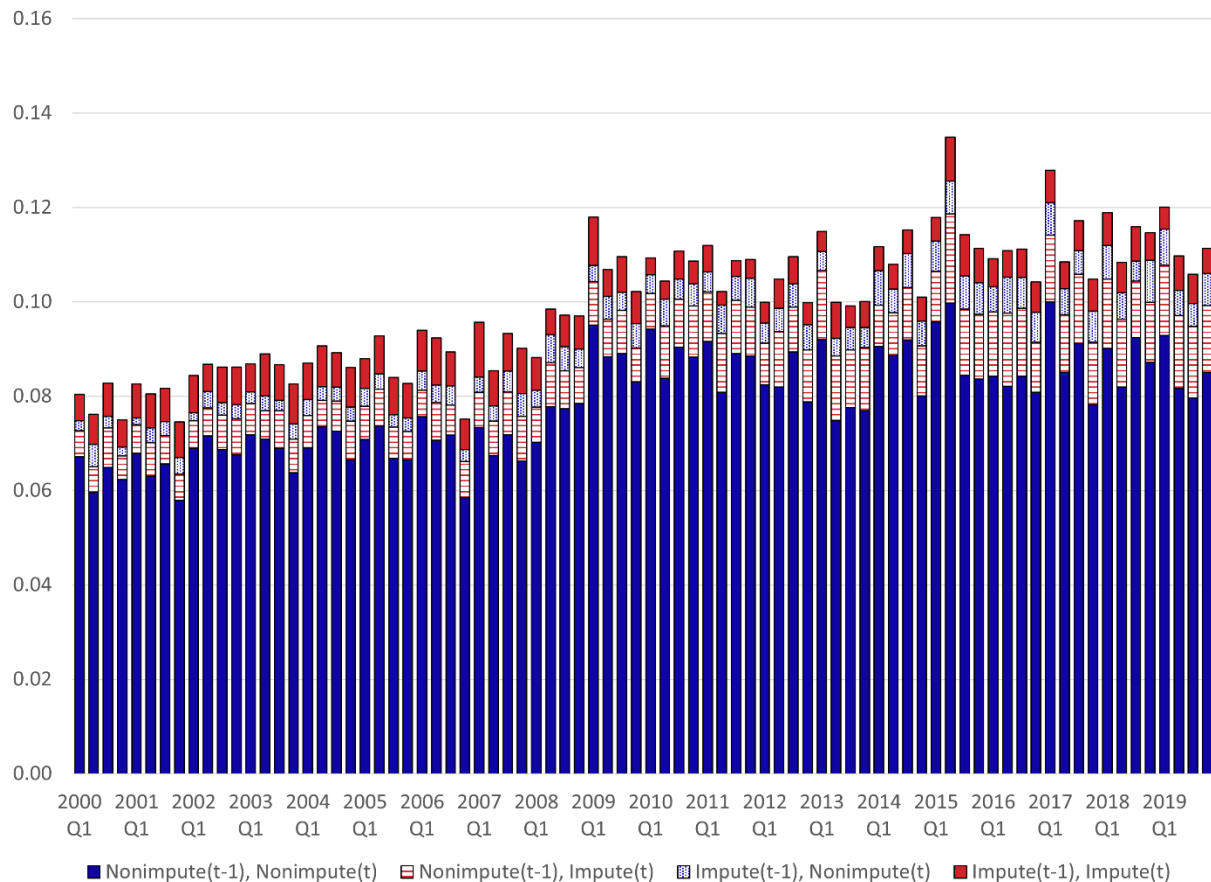


Figure 19. The share of unincorporated self-employed workers in the current month who were not unincorporated self-employed in the previous month by current and previous month imputation status, nonfarm business sector, first quarter 2000 to fourth quarter 2019

Note: CPS longitudinal weights are used. Source: Current Population Survey, authors' calculations

In Table 3, we present differences in predicted probabilities of transitioning into SEU from other employment statuses based on probit models that examine how

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reporter status and imputation status in adjacent months affect month-to-month transitions. These models control for both reporter status and imputation status, which are not mutually exclusive. They also control for other factors that may determine self-employment such as a quadratic in age, and indicators for sex, marital status, nonwhite, Hispanic ethnicity, education, metropolitan status, MIS, and month, and a linear time trend. The models are conditional on being unincorporated self-employed in the second month of the transition. Given the introduction of the RIP in 2008, we estimate models separately for those interviewed in the pre-2008 period and those interviewed in 2008 or later. We then test whether we can reject the hypothesis that the marginal effects are equal across time periods.

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Table 3. Differences in predicted probabilities of transitions into nonfarm unincorporated self-employment from another class of worker or non-employment by time period

Independent Variables	Pre-2008	2008+
Proxy→proxy	0.004* (0.001)	0.012 (0.001)
Proxy→self	0.055* (0.002)	0.093 (0.003)
Self→proxy	0.016* (0.002)	0.041 (0.003)
Impute→impute	0.239* (0.007)	0.148 (0.005)
Impute→nonimpute	0.270 (0.011)	0.276 (0.008)
Nonimpute→impute	0.796* (0.009)	0.762 (0.006)
Pseudo R-squared	0.108	0.110
N	312,149	420,229

Note: Probit model average marginal effects are reported. The sample is conditional on being unincorporated self-employed in month 2. CPS longitudinal weights are used. Standard errors are clustered at the household level (clusters = 91,052 and 129,277 in the pre-2008 period and 2008+ period). Models also include a quadratic in age and indicators for sex, marital status, nonwhite, Hispanic ethnicity, education (high school graduate or less, college degree, graduate school degree), metropolitan status, month in sample, and month, and a linear time trend. * indicates that we can reject the hypothesis that the marginal effects are equal across time periods at the 5% significance level. Source: Current Population Survey, authors' calculations

The set of reporter transition status variables measures the possible transitions between proxy- and self-responses, with the self-self group being the omitted reference group. Similarly, the set of imputation transition status variables measures the possible transitions between imputed and nonimputed responses, with the nonimpute-nonimpute group being the omitted reference group. Together, the set of imputation transition status variables contributes the most to explaining SEU transitions, increasing the pseudo *R*-squared substantially (Table 4). However, we note

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that only 5–7 percent of transitions are imputed in either or both months (Table 5), so the impact of these imputation status transitions on the transitions in self-employment is likely still minimal. We also note that we see a small increase across the time periods in the contribution of the reporter transition status variables in explaining transitions, which would be consistent with the introduction of the RIP.

Table 4. The relationship between transitions into unincorporated self-employment from other statuses and individual and survey characteristics by time period

Characteristics	Pre-2008	2008+
Demographic	0.026	0.025
Reporter	0.005	0.008
Imputation	0.077	0.080
Month in sample	0.002	0.002

Notes: N = 312,149 and 420,229 in the pre-2008 period and 2008+ period, respectively. Each cell shows the Pseudo *R*-squared from a separate probit regression. The sample is conditional on being unincorporated self-employed in month 2. CPS longitudinal weights are used. All regressions include a linear trend and month fixed effects. Demographic controls include quadratic in age, male, marital status, nonwhite, Hispanic, education (high school graduate or less, college degree, graduate school degree), and metropolitan status. Reporter controls include proxy→proxy, proxy→self, and self→proxy transitions. Imputation controls include impute→impute, impute→nonimpute, and nonimpute→impute transitions. Month in sample controls include months in sample 2, 3, 4, 6, and 7, with month in sample 8 being the base category. Source: Current Population Survey, authors' calculations

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Table 5. Proportions of self-employed workers in month 2 of a transition by proxy-reporter and imputation transition status from month 1 to month 2

Independent Variables	Pre-2008	2008+
Proxy→proxy	0.327	0.353
Proxy→self	0.098	0.066
Self→proxy	0.099	0.064
Self→self	0.472	0.505
Impute→impute	0.035	0.039
Impute→nonimpute	0.007	0.012
Nonimpute→impute	0.008	0.014
Nonimpute→nonimpute	0.949	0.934
N	312,149	420,229

Note: CPS longitudinal weights are used. Source: Current Population Survey, authors' calculations

We find that relative to when responses are not imputed in both months, respondents are 76–80 percentage points more likely to transition from any other status to SEU when their class of worker status is imputed in the second month (the probability is statistically significantly higher in the pre-2008 period). Respondents are about 27 percentage points more likely to transition from any other status to SEU when their class of worker status is imputed in the first month. And they are 15–24 percentage points more likely to transition when their class of worker status is imputed in both months (the probability is statistically significantly higher in the pre-2008 period). These results suggest that the imputed data may lead to additional noise in the series, although as stated in the previous paragraph, few observations are imputed in either or both months and so the overall contribution to volatility is likely minimal, which is consistent with Figure 19.

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Looking at the reporter transition status variables, we see that the probability of transitioning employment statuses is highest when the respondent transitions from proxy to self, or vice versa, relative to the self-self group. Compared with the self-self group, respondents are 6–9 percentage points more likely to report a transition when the reporter type changes from proxy to self and 2–4 percentage points more likely to report a transition when the reporter type changes from self to proxy (the probabilities are statistically significantly higher in the 2008+ period, which is consistent with the introduction of the RIP). Given that 6–10 percent of the observations are proxy-self or vice versa transitions (see Table 5), their overall contribution to volatility is likely larger than that of respondents imputed in either or both months, which is consistent with Figure 18.

2.7 Editing Proxy- and Imputed Responses

Using the CPS panel, we evaluate the potential for editing responses when transitions between SEU and other classes of work/non-employment are accompanied by changes in reporter type or imputation status. These edits have the potential to reduce volatility in the SEU series.

The BLS productivity program produces quarterly measures, but it processes the CPS data monthly. However, unlike the monthly CPS, which is not revised in subsequent months, productivity measures are revised in response to revisions to output numbers. Edits to responses in the final month in each quarter could be made using the subsequent month's responses before the first revision is released. There are

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many transition patterns over the eight months respondents are in the sample, with associated patterns of imputation or proxy-response that could plausibly be edited. Here we consider the impact of a rather conservative edit where the transitions are possibly spurious—editing class of worker reports where a reported class of worker in one month in sample is sandwiched between two matching but differently reported class of workers in surrounding months and there are concurrent changes in reporter type or imputation status.

In Table 6, we show the average annual number of transitions of two different types over each three-month consecutive calendar months in sample—unincorporated self-employment to not unincorporated self-employment and back to unincorporated self-employment [SEU→Non-SEU→SEU] and Non-SEU→SEU→Non-SEU. Not unincorporated self-employment includes employment and non-employment states. We also show the percentage of these transitions that coincide with a sandwich pattern in imputation status and/or proxy status where we edit the sandwiched response. The pattern could be one of the following four patterns: 1) imputed→not imputed→imputed, 2) not imputed→imputed→not imputed, 3) proxy→self→proxy, or 4) self→proxy→self.

There are only a small number of edits that can be made each year where the sandwich imputation status and/or proxy status pattern suggests replacing the sandwiched class of worker with the class of worker from surrounding months is a reasonable edit. On average, over the 2000–2019 period, 4,400 CPS respondents

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(unweighted) each year are classified as unincorporated self-employed. However, only 152 respondents per year on average are reported as being unincorporated self-employed in one month, another class of worker the following month, and then again being classified as unincorporated self-employed in the third consecutive calendar month. Of those, about 28 percent were accompanied by a sandwich pattern in imputation or reporter status. On average, 260 respondents were reported as not being unincorporated self-employed in surrounding months but being unincorporated self-employed in the sandwiched month. About 30 percent of these transitions are accompanied by a sandwich pattern in imputation or reporter status.

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Table 6. Average annual number of transitions across three consecutive calendar months in sample between self-employment status and other statuses, and the percent accompanied by a sandwich pattern in imputation status and/or reporter status

Panel A. SEU→Non-SEU→SEU	Average Number (%) of transitions
Avg. annual number of transitions	152.1
% accompanied by a sandwich pattern in imputation status and/or reporter status	27.8

Panel B. Non-SEU→SEU→Non-SEU	Average Number (%) Of transitions
Avg. annual number of transitions	259.7
% accompanied by a sandwich pattern in imputation status and/or reporter status	30.0

Note: Estimates are unweighted. SEU represents unincorporated self-employment. Non-SEU represents any class of worker other than unincorporated self-employment, or non-employment. Source: Current Population Survey, authors' calculations

Figure 20 plots quarterly SEU comparing the series without making edits to the series after making edits to sandwiched months for the transitions where there was a sandwiched change in class of worker that was accompanied by a sandwich pattern in imputation status and/or reporter status. We see that some of the peaks of the series are minimized after making these edits. However, we note that there would be a cost to making these edits, both in terms of the subjectivity required and the ease of replicability in official statistics. Although the changes to SEU after editing are small and would thus have minimal impact on productivity measures, editing the series might have a larger impact on other research, such as research on monthly self-employment dynamics, and so this editing process may be worth exploring in other work using the CPS.

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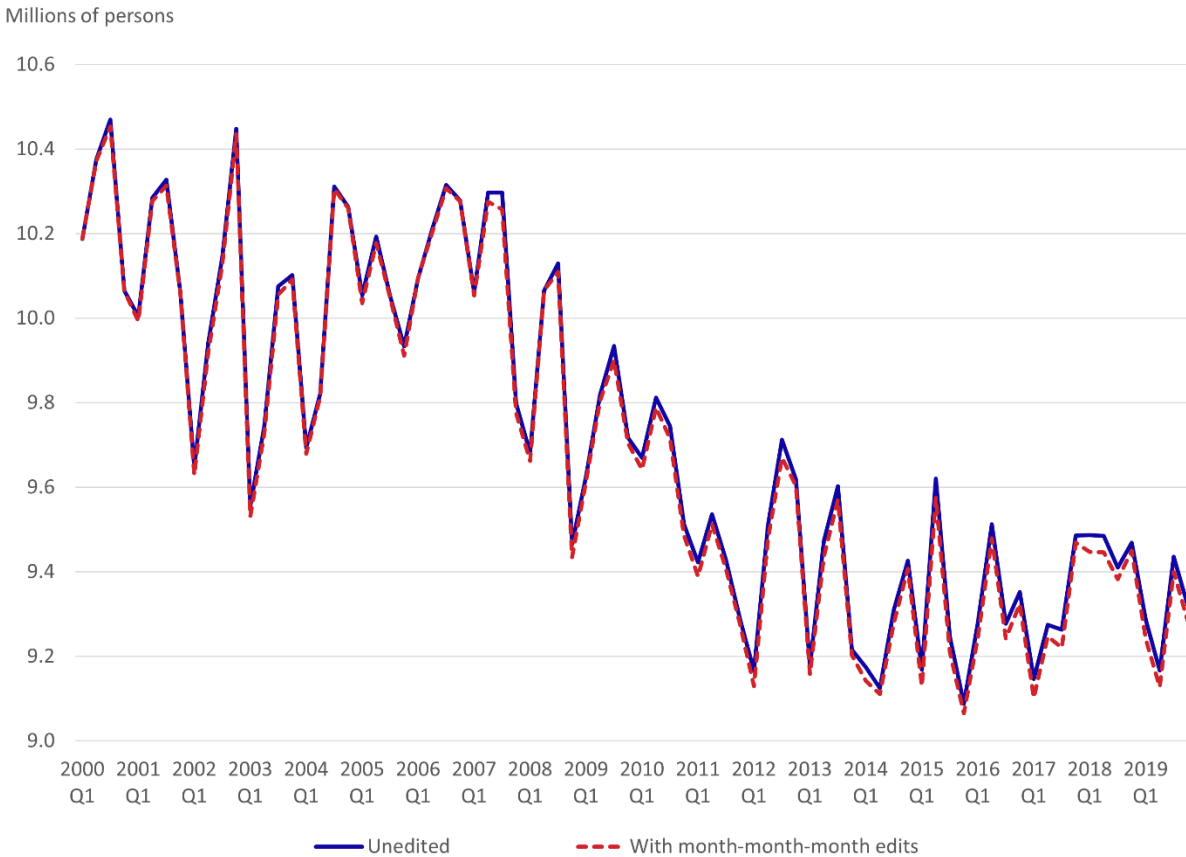


Figure 20. SEU with and without editing sandwiched transition months in transitions out of and into self-employment accompanied by transitions between reporter types or imputation statuses, nonfarm business sector, first quarter 2000 to fourth quarter 2019

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

3 Volatility in Average Weekly Hours Worked

In addition to volatility in SEU levels, fluctuations in average weekly hours worked by the unincorporated self-employed also contribute to volatility in their total hours worked. The unincorporated self-employed have more autonomy in their work than do employees, and many choose self-employment to gain hours flexibility (Lim 2019). Over the 2000–2019 period, 20 percent of the unincorporated self-employed

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reported that their usual hours varied, while only 7 percent of employees reported that their hours varied. Variability in hours could make it more difficult for respondents to report self-employment hours accurately, leading to increased noise in the estimates. We also expect the estimates for the unincorporated self-employed to be more volatile given the smaller sample sizes. The volatility in average weekly hours also may be driven by some of the same factors (rotation group framework, changes in reporter type, changes in imputation status) driving the volatility in SEU levels that we explored earlier.

Looking at main jobs only, we compare quarter-to-quarter percent changes in average weekly hours worked by the unincorporated self-employed with those worked by employees and find that the average weekly hours worked of the unincorporated self-employed are much more volatile (Figure 21). The standard deviation of the unincorporated self-employed series is over twice the size of the standard deviation of the employee series (1.42 percent versus 0.67 percent). This relatively larger volatility could be contributing to some of the outsized volatility in total hours observed in Figure 2. For example, three quarters in the post-Great Recession period (2016 Q2, 2019 Q1, and 2019 Q3) were especially concerning because the contribution to the growth in hours by the self-employed exceeded that of employees. In these quarters, the percent change in average weekly hours worked by the unincorporated self-employed was substantially greater than that for employees.

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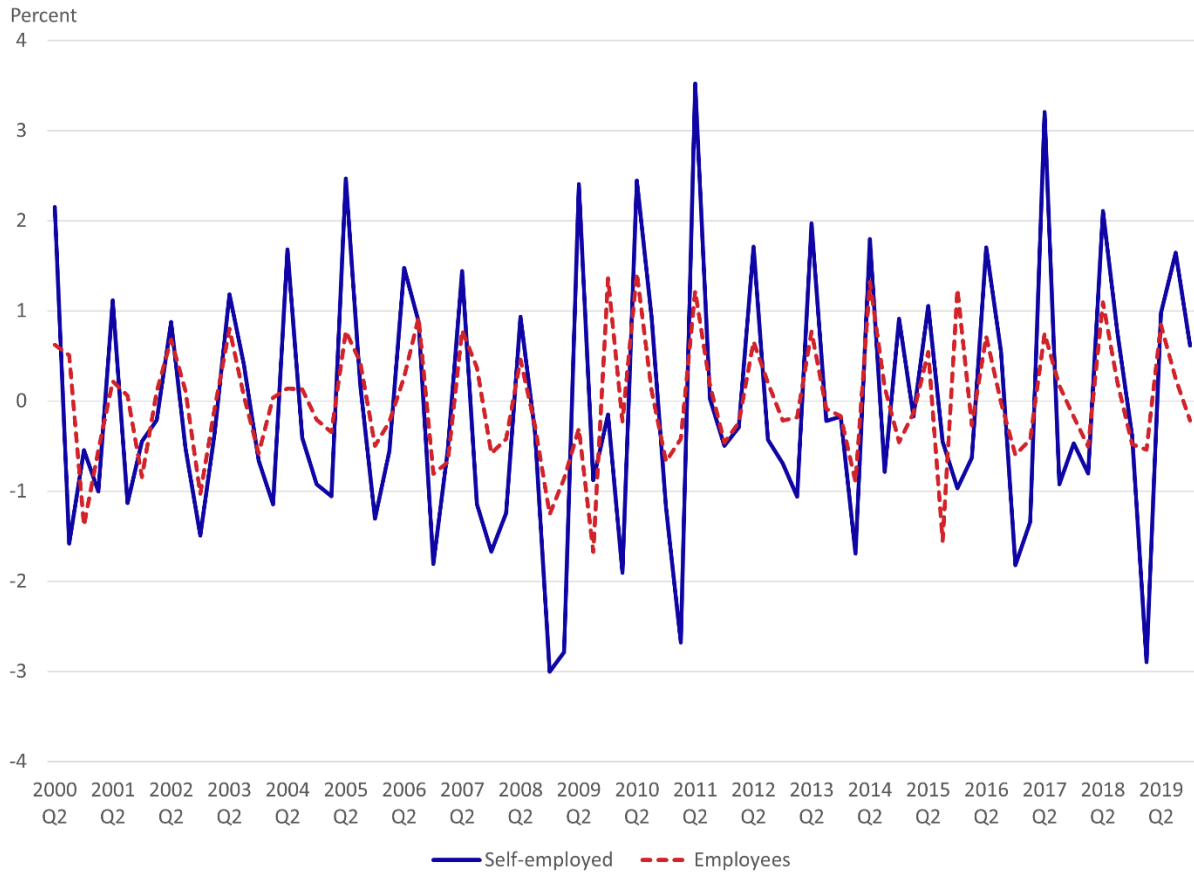


Figure 21. Quarter-to-quarter percent change in average weekly hours worked on main jobs by class of worker, nonfarm business sector, second quarter 2000 to fourth quarter 2019

Note: CPS weights are used. Source: Current Population Survey (CPS), authors' calculations

4 Concluding Remarks

SEU hours, as measured using the CPS, occasionally vary widely from one quarter to the next, and these variations can result in large fluctuations in BLS productivity measures. In this paper, we examined whether certain aspects of the CPS sample design, including sample weighting, the rotation group framework, imputation methods, and proxy-reporting, are associated with these large variations. As can be

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clearly seen in Figure 9, the difference in growth rates between those present in both quarters and those not present in both quarters due to sampling variation is a large contributor to volatility in quarter-to-quarter estimates of SEU. Transitions between proxy and self-responses also add to volatility and, to a lesser extent, so does imputed data. We experimented with editing class of worker responses when a reported class of work in one month was sandwiched between two matching but different classes of work in surrounding months and there was an accompanying sandwich pattern in reporter status or imputation status. However, this did not appear to substantially smooth the series. In addition, editing involves subjective decision making and would be nontrivial to implement in official statistics. Volatility in sampling weights after 2016 also may have magnified some of the volatility in SEU. The CPS is exploring introducing an online version of the questionnaire to increase response rates, which could potentially reduce volatility (U.S. Census Bureau 2024). In a companion article, Cunningham et al. (2023) discuss how the combination of directly compositing SEU hours—as is done to construct official employment and unemployment statistics—and removing part of the irregular component capturing primarily sampling error—as calculated part of the seasonal adjustment process—smooths the SEU series while preserving cyclical changes.

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Supplemental Data for “Why are Measures of Aggregate Hours Worked by the Unincorporated Self-employed So Volatile?”

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The following accessible tables contain data for the figures in the main document. Each table has the same number as the figure.

Table 1. Annualized quarter-to-quarter percent change in hours for all workers, employees, and unincorporated self-employed/unpaid family workers in the nonfarm business sector, seasonally adjusted, first quarter 2000 to fourth quarter 2019

Date	Self-employed/ unpaid family		All workers (percent)	Recession indicator
	Employees (percent)	workers (percent)		
2000 Q1	2.0	0.2	1.8	0
2000 Q2	1.0	2.2	1.2	0
2000 Q3	0.8	-9.3	-0.1	0
2000 Q4	-0.4	-10.2	-1.4	1
2001 Q1	-1.3	11.1	-0.2	1
2001 Q2	-4.0	-0.9	-3.8	1
2001 Q3	-3.9	-14.0	-4.9	1
2001 Q4	-4.7	-1.4	-4.4	0
2002 Q1	-2.3	-13.3	-3.3	0
2002 Q2	0.2	9.5	1.0	0
2002 Q3	-1.7	1.4	-1.5	0
2002 Q4	-0.2	7.5	0.5	0
2003 Q1	-2.7	4.6	-2.1	0
2003 Q2	-0.8	-4.3	-1.2	0
2003 Q3	0.0	6.6	0.6	0
2003 Q4	1.3	7.7	1.9	0
2004 Q1	2.7	-7.0	1.7	0
2004 Q2	0.7	-3.0	0.3	0
2004 Q3	1.6	11.6	2.5	0
2004 Q4	2.0	3.0	2.1	0
2005 Q1	0.7	1.6	0.8	0
2005 Q2	2.7	-0.5	2.4	0
2005 Q3	2.5	-10.0	1.3	0
2005 Q4	2.8	-0.8	2.4	0
2006 Q1	3.1	13.0	4.0	0
2006 Q2	1.6	-1.9	1.3	0
2006 Q3	1.6	2.3	1.7	0
2006 Q4	1.4	4.9	1.7	0
2007 Q1	1.4	-7.0	0.6	0

Date	Employees (percent)	Self-employed/ unpaid family workers (percent)	All workers (percent)	Recession indicator
2007 Q2	2.0	2.0	2.0	0
2007 Q3	-0.9	-7.3	-1.5	1
2007 Q4	-0.3	-11.6	-1.4	1
2008 Q1	-0.9	-4.6	-1.3	1
2008 Q2	-2.2	-1.5	-2.1	1
2008 Q3	-4.5	-4.7	-4.5	1
2008 Q4	-9.1	-25.8	-10.6	1
2009 Q1	-10.5	-0.9	-9.8	1
2009 Q2	-9.8	-0.5	-9.0	1
2009 Q3	-4.7	-0.8	-4.3	0
2009 Q4	-0.5	0.2	-0.5	0
2010 Q1	1.7	-4.1	1.2	0
2010 Q2	3.7	0.6	3.4	0
2010 Q3	2.3	-5.2	1.6	0
2010 Q4	2.2	0.0	2.0	0
2011 Q1	1.0	-2.4	0.7	0
2011 Q2	5.1	-4.0	4.3	0
2011 Q3	1.9	-5.4	1.3	0
2011 Q4	3.3	5.3	3.5	0
2012 Q1	3.1	6.5	3.4	0
2012 Q2	0.8	-0.8	0.7	0
2012 Q3	2.1	2.6	2.1	0
2012 Q4	2.0	6.1	2.3	0
2013 Q1	3.1	-12.6	1.7	0
2013 Q2	1.7	1.6	1.7	0
2013 Q3	1.9	4.1	2.1	0
2013 Q4	1.8	-7.2	1.1	0
2014 Q1	1.6	6.5	2.0	0
2014 Q2	4.6	-12.1	3.2	0
2014 Q3	2.9	4.7	3.0	0
2014 Q4	3.4	19.3	4.6	0
2015 Q1	1.5	-3.6	1.1	0
2015 Q2	1.0	8.5	1.5	0
2015 Q3	1.0	-9.9	0.1	0
2015 Q4	3.4	-6.1	2.6	0
2016 Q1	1.0	9.2	1.6	0
2016 Q2	0.5	10.0	1.2	0
2016 Q3	2.0	-10.5	1.0	0
2016 Q4	0.7	-3.6	0.4	0
2017 Q1	1.1	5.5	1.5	0
2017 Q2	2.6	6.3	2.8	0

Date	Employees (percent)	Self-employed/ unpaid family workers (percent)	All workers (percent)	Recession indicator
2017 Q3	1.3	-9.6	0.4	0
2017 Q4	2.4	13.9	3.2	0
2018 Q1	1.5	6.8	1.9	0
2018 Q2	2.2	-2.5	1.9	0
2018 Q3	2.2	-0.1	2.0	0
2018 Q4	0.6	6.7	1.0	0
2019 Q1	0.8	-10.8	-0.1	0
2019 Q2	1.7	-12.5	0.6	0
2019 Q3	0.7	19.0	1.9	0
2019 Q4	-1.1	2.9	-0.8	0

Note: All estimates use BLS survey weights. Shaded areas represent recessions as determined by the National Bureau of Economic Research. Source: U.S. Department of Labor (2023) and Federal Reserve Economic Data (2023), authors' calculations

Table 2. Contributions to the annualized quarter-to-quarter percent change in hours worked in the nonfarm business sector, by class of worker, seasonally adjusted, first quarter 2000 to fourth quarter 2019

Date	Employees (percent)	Self-employed/ unpaid family workers (percent)	All workers (percent)
2000 Q1	1.8	0.0	1.8
2000 Q2	0.9	0.2	1.2
2000 Q3	0.8	-0.9	-0.1
2000 Q4	-0.4	-0.9	-1.4
2001 Q1	-1.2	1.0	-0.2
2001 Q2	-3.7	-0.1	-3.8
2001 Q3	-3.5	-1.3	-4.9
2001 Q4	-4.3	-0.1	-4.4
2002 Q1	-2.1	-1.2	-3.3
2002 Q2	0.2	0.8	1.0
2002 Q3	-1.6	0.1	-1.5
2002 Q4	-0.2	0.7	0.5
2003 Q1	-2.5	0.4	-2.1
2003 Q2	-0.7	-0.4	-1.2
2003 Q3	0.0	0.6	0.6
2003 Q4	1.2	0.7	1.9
2004 Q1	2.4	-0.7	1.7
2004 Q2	0.6	-0.3	0.3
2004 Q3	1.5	1.1	2.5
2004 Q4	1.8	0.3	2.1
2005 Q1	0.7	0.2	0.8
2005 Q2	2.4	-0.1	2.4
2005 Q3	2.3	-1.0	1.3
2005 Q4	2.5	-0.1	2.4
2006 Q1	2.8	1.2	4.0
2006 Q2	1.4	-0.2	1.3
2006 Q3	1.5	0.2	1.7
2006 Q4	1.2	0.5	1.7
2007 Q1	1.3	-0.7	0.6
2007 Q2	1.8	0.2	2.0
2007 Q3	-0.8	-0.7	-1.5
2007 Q4	-0.3	-1.1	-1.4
2008 Q1	-0.8	-0.4	-1.3
2008 Q2	-2.0	-0.1	-2.1
2008 Q3	-4.1	-0.4	-4.5
2008 Q4	-8.3	-2.3	-10.6
2009 Q1	-9.7	-0.1	-9.8
2009 Q2	-9.0	0.0	-9.0
2009 Q3	-4.3	-0.1	-4.3

Date	Employees (percent)	Self-employed/ unpaid family workers (percent)	All workers (percent)
2009 Q4	-0.5	0.0	-0.5
2010 Q1	1.6	-0.4	1.2
2010 Q2	3.4	0.0	3.4
2010 Q3	2.1	-0.5	1.6
2010 Q4	2.0	0.0	2.0
2011 Q1	0.9	-0.2	0.7
2011 Q2	4.7	-0.3	4.3
2011 Q3	1.7	-0.4	1.3
2011 Q4	3.1	0.4	3.5
2012 Q1	2.9	0.5	3.4
2012 Q2	0.8	-0.1	0.7
2012 Q3	1.9	0.2	2.1
2012 Q4	1.8	0.5	2.3
2013 Q1	2.9	-1.0	1.7
2013 Q2	1.5	0.1	1.7
2013 Q3	1.8	0.3	2.1
2013 Q4	1.7	-0.6	1.1
2014 Q1	1.5	0.5	2.0
2014 Q2	4.2	-1.0	3.2
2014 Q3	2.6	0.4	3.0
2014 Q4	3.1	1.5	4.6
2015 Q1	1.4	-0.3	1.1
2015 Q2	0.9	0.7	1.5
2015 Q3	0.9	-0.8	0.1
2015 Q4	3.1	-0.5	2.6
2016 Q1	0.9	0.7	1.6
2016 Q2	0.5	0.8	1.2
2016 Q3	1.9	-0.8	1.0
2016 Q4	0.6	-0.3	0.4
2017 Q1	1.1	0.4	1.5
2017 Q2	2.4	0.5	2.8
2017 Q3	1.2	-0.7	0.4
2017 Q4	2.2	1.0	3.2
2018 Q1	1.4	0.5	1.9
2018 Q2	2.1	-0.2	1.9
2018 Q3	2.0	0.0	2.0
2018 Q4	0.5	0.5	1.0
2019 Q1	0.7	-0.8	-0.1
2019 Q2	1.6	-0.9	0.6
2019 Q3	0.6	1.4	1.9
2019 Q4	-1.1	0.2	-0.8

Note: All estimates use BLS survey weights. Because of rounding, the contributions of employees and self-employed/unpaid family workers may not sum to the growth for all workers. Source: U.S. Department of Labor (2023), authors' calculations

Table 3. Contributions of the number of unincorporated self-employed/unpaid family workers and average hours per unincorporated self-employed/unpaid family worker to the quarter-to-quarter percent change in hours of the unincorporated self-employed/unpaid family workers in the nonfarm business sector, first quarter of 2000 to fourth quarter 2019

Date	Number of unincorporated self-employed/unpaid family workers (percent)	Average hours/ unincorporated self-employed or unpaid family worker (percent)	Total hours of unincorporated self-employed/unpaid family workers (percent)
2000 Q1	5.4	-5.2	0.2
2000 Q2	2.9	-0.7	2.2
2000 Q3	-8.0	-1.6	-9.6
2000 Q4	-14.0	3.5	-10.6
2001 Q1	15.5	-4.9	10.7
2001 Q2	-3.0	2.1	-0.9
2001 Q3	-8.8	-6.0	-14.8
2001 Q4	-1.9	0.5	-1.4
2002 Q1	-13.8	-0.2	-14.0
2002 Q2	6.5	2.6	9.1
2002 Q3	3.1	-1.7	1.4
2002 Q4	7.6	-0.3	7.3
2003 Q1	5.6	-1.0	4.6
2003 Q2	-2.6	-1.8	-4.4
2003 Q3	7.8	-1.3	6.4
2003 Q4	3.9	3.5	7.4
2004 Q1	-4.9	-2.3	-7.2
2004 Q2	-0.7	-2.3	-3.1
2004 Q3	10.5	0.6	11.1
2004 Q4	4.5	-1.5	3.0
2005 Q1	2.2	-0.6	1.6
2005 Q2	-7.5	7.0	-0.5
2005 Q3	-6.1	-4.3	-10.4
2005 Q4	0.5	-1.4	-0.8
2006 Q1	9.5	2.9	12.4
2006 Q2	-2.7	0.7	-1.9
2006 Q3	-0.8	3.1	2.3
2006 Q4	5.0	-0.2	4.9
2007 Q1	-6.0	-1.2	-7.1
2007 Q2	3.5	-1.5	2.0
2007 Q3	-6.2	-1.3	-7.5
2007 Q4	-4.5	-7.7	-12.2
2008 Q1	-5.8	1.1	-4.7
2008 Q2	4.8	-6.3	-1.5
2008 Q3	-1.3	-3.4	-4.8

Date	Number of unincorporated self-employed/unpaid family workers (percent)	Average hours/ unincorporated self-employed or unpaid family worker (percent)	Total hours of unincorporated self-employed/unpaid family workers (percent)
2008 Q4	-22.4	-6.4	-28.8
2009 Q1	3.5	-4.4	-0.9
2009 Q2	1.2	-1.7	-0.5
2009 Q3	-0.6	-0.2	-0.8
2009 Q4	-1.1	1.3	0.2
2010 Q1	-5.1	0.9	-4.2
2010 Q2	0.0	0.5	0.6
2010 Q3	-7.1	1.8	-5.3
2010 Q4	-1.8	1.8	0.0
2011 Q1	5.1	-7.5	-2.4
2011 Q2	-7.2	3.2	-4.0
2011 Q3	-2.7	-2.8	-5.5
2011 Q4	1.1	4.1	5.2
2012 Q1	0.2	6.2	6.4
2012 Q2	0.7	-1.5	-0.8
2012 Q3	5.5	-2.8	2.6
2012 Q4	-1.1	7.1	6.0
2013 Q1	-7.2	-6.0	-13.2
2013 Q2	0.2	1.4	1.6
2013 Q3	6.3	-2.2	4.1
2013 Q4	-8.7	1.3	-7.4
2014 Q1	0.7	5.7	6.4
2014 Q2	-4.9	-7.7	-12.7
2014 Q3	1.9	2.6	4.6
2014 Q4	12.0	6.0	18.1
2015 Q1	-8.2	4.5	-3.6
2015 Q2	10.4	-2.2	8.2
2015 Q3	-7.0	-3.3	-10.3
2015 Q4	0.6	-6.9	-6.2
2016 Q1	2.2	6.7	8.9
2016 Q2	9.3	0.3	9.7
2016 Q3	-8.6	-2.4	-11.0
2016 Q4	0.4	-4.1	-3.7
2017 Q1	1.0	4.4	5.4
2017 Q2	-0.9	7.1	6.2
2017 Q3	-1.6	-8.4	-10.0
2017 Q4	14.1	-0.9	13.2
2018 Q1	4.7	1.9	6.6
2018 Q2	-3.0	0.4	-2.6
2018 Q3	-3.7	3.6	-0.1

Date	Number of unincorporated self-employed/unpaid family workers (percent)	Average hours/ unincorporated self-employed or unpaid family worker (percent)	Total hours of unincorporated self-employed/unpaid family workers (percent)
2018 Q4	7.2	-0.7	6.5
2019 Q1	-5.9	-5.3	-11.2
2019 Q2	-10.5	-2.7	-13.2
2019 Q3	16.6	1.2	17.8
2019 Q4	-5.6	8.5	2.9

Note: All estimates use BLS survey weights. Source: U.S. Department of Labor (2023), authors' calculations

Table 5. Weighted and unweighted unincorporated self-employment in the nonfarm business sector, first quarter 2000 to fourth quarter 2019

Date	Unweighted self-employment (persons)	Weighted self-employment (millions of persons)
2000 Q1	4605	10.94
2000 Q2	4621	11.12
2000 Q3	4672	11.02
2000 Q4	4483	10.68
2001 Q1	4299	10.72
2001 Q2	4337	10.88
2001 Q3	5369	10.74
2001 Q4	5277	10.76
2002 Q1	4924	10.16
2002 Q2	5092	10.46
2002 Q3	5268	10.65
2002 Q4	5377	10.94
2003 Q1	5199	11.09
2003 Q2	5297	11.16
2003 Q3	5411	11.53
2003 Q4	5322	11.52
2004 Q1	5176	11.15
2004 Q2	5175	11.31
2004 Q3	5343	11.85
2004 Q4	5377	11.88
2005 Q1	5290	11.68
2005 Q2	5356	11.72
2005 Q3	5278	11.63
2005 Q4	5154	11.47
2006 Q1	5227	11.64
2006 Q2	5231	11.75
2006 Q3	5323	11.90
2006 Q4	5198	11.73
2007 Q1	5076	11.48
2007 Q2	5175	11.88
2007 Q3	5160	11.78
2007 Q4	4945	11.34
2008 Q1	4880	11.09
2008 Q2	5047	11.60
2008 Q3	5047	11.74
2008 Q4	4675	10.85
2009 Q1	4760	10.99
2009 Q2	4939	11.28
2009 Q3	4907	11.36
2009 Q4	4701	11.01

Date	Unweighted self-employment (persons)	Weighted self-employment (millions of persons)
2010 Q1	4740	10.90
2010 Q2	4762	11.07
2010 Q3	4739	11.02
2010 Q4	4636	10.56
2011 Q1	4536	10.69
2011 Q2	4567	10.80
2011 Q3	4591	10.89
2011 Q4	4495	10.57
2012 Q1	4405	10.42
2012 Q2	4543	10.73
2012 Q3	4592	10.88
2012 Q4	4571	10.66
2013 Q1	4359	10.40
2013 Q2	4452	10.63
2013 Q3	4450	10.81
2013 Q4	4301	10.39
2014 Q1	4215	10.30
2014 Q2	4201	10.41
2014 Q3	4312	10.42
2014 Q4	4356	10.59
2015 Q1	4134	10.37
2015 Q2	4303	10.78
2015 Q3	4085	10.39
2015 Q4	4030	10.42
2016 Q1	3988	10.46
2016 Q2	4199	10.81
2016 Q3	4204	10.52
2016 Q4	4149	10.63
2017 Q1	3959	10.50
2017 Q2	3993	10.59
2017 Q3	4007	10.45
2017 Q4	4047	10.87
2018 Q1	3933	10.88
2018 Q2	3950	10.87
2018 Q3	3906	10.71
2018 Q4	3861	10.92
2019 Q1	3757	10.81
2019 Q2	3704	10.49
2019 Q3	3734	10.93
2019 Q4	3675	10.78

Note: The weighted estimates are calculated using CPS weights. Source: Current Population Survey, authors' calculations

Table 6. Average Current Population Survey weight for all respondents and for the nonfarm unincorporated self-employed, first quarter 2000 to fourth quarter 2019

Date	All respondents	Self-employed
2000 Q1	2239.03	2171.98
2000 Q2	2246.56	2191.37
2000 Q3	2256.56	2173
2000 Q4	2273.72	2194.29
2001 Q1	2330.13	2279.35
2001 Q2	2345.40	2309.73
2001 Q3	1941.76	1864.64
2001 Q4	1949.74	1858.48
2002 Q1	1980.25	1894.95
2002 Q2	1967.26	1901.82
2002 Q3	1955.64	1872.75
2002 Q4	1956.27	1890.76
2003 Q1	2025.03	1965.33
2003 Q2	2031.02	1959.03
2003 Q3	2055.46	1982.51
2003 Q4	2073.66	2018.87
2004 Q1	2082.83	2003.59
2004 Q2	2097.89	2023.69
2004 Q3	2116.35	2061.2
2004 Q4	2093.21	2047.17
2005 Q1	2122.97	2035.24
2005 Q2	2124.78	2038.52
2005 Q3	2132.07	2044.85
2005 Q4	2142.22	2057.07
2006 Q1	2169.25	2062.73
2006 Q2	2170.27	2081.76
2006 Q3	2158.13	2066.89
2006 Q4	2175.76	2103.74
2007 Q1	2223.81	2111.22
2007 Q2	2197.16	2127.48
2007 Q3	2214.00	2132.07
2007 Q4	2232.44	2109.09
2008 Q1	2232.61	2115.72
2008 Q2	2223.26	2132.05
2008 Q3	2234.06	2144.89
2008 Q4	2272.34	2156.09
2009 Q1	2238.89	2143.75
2009 Q2	2211.03	2120.9
2009 Q3	2228.30	2157.81
2009 Q4	2246.31	2185.49
2010 Q1	2236.23	2161.4
2010 Q2	2227.10	2182.3

Date	All respondents	Self-employed
2010 Q3	2248.89	2172.53
2010 Q4	2265.33	2159.54
2011 Q1	2280.35	2194.24
2011 Q2	2274.74	2208.18
2011 Q3	2283.29	2179.46
2011 Q4	2287.91	2194.31
2012 Q1	2331.95	2208.35
2012 Q2	2324.07	2215.57
2012 Q3	2328.61	2239.55
2012 Q4	2331.52	2228.02
2013 Q1	2355.33	2230.61
2013 Q2	2346.91	2252.31
2013 Q3	2372.02	2285.8
2013 Q4	2372.86	2263.24
2014 Q1	2388.10	2305.85
2014 Q2	2383.16	2300.96
2014 Q3	2363.28	2285.91
2014 Q4	2339.26	2288.39
2015 Q1	2401.75	2355.71
2015 Q2	2417.90	2364.45
2015 Q3	2447.03	2393.36
2015 Q4	2438.76	2394.75
2016 Q1	2475.12	2459.11
2016 Q2	2472.57	2411.41
2016 Q3	2429.58	2341.1
2016 Q4	2447.07	2397.59
2017 Q1	2478.57	2455.92
2017 Q2	2512.64	2459.08
2017 Q3	2515.58	2444.21
2017 Q4	2515.14	2489.48
2018 Q1	2586.74	2562.56
2018 Q2	2600.21	2553.15
2018 Q3	2627.74	2564.09
2018 Q4	2638.81	2601.84
2019 Q1	2691.65	2624.89
2019 Q2	2719.80	2638.02
2019 Q3	2732.90	2696.82
2019 Q4	2726.17	2705.33

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

Table 7. Weighted and unweighted growth in unincorporated self-employment in the nonfarm business sector, quarter-to-quarter percent change, second quarter 2000 to fourth quarter 2019

Date	Growth in unweighted self-employment (percent)	Growth in weighted self-employment (percent)
2000 Q2	0.35	1.69
2000 Q3	1.09	-0.95
2000 Q4	-4.05	-3.07
2001 Q1	-4.09	0.39
2001 Q2	0.88	1.54
2001 Q3	23.80	-1.29
2001 Q4	-1.71	0.17
2002 Q1	-6.68	-5.60
2002 Q2	3.40	3.02
2002 Q3	3.46	1.81
2002 Q4	2.08	2.70
2003 Q1	-3.31	1.31
2003 Q2	1.88	0.64
2003 Q3	2.15	3.36
2003 Q4	-1.64	-0.12
2004 Q1	-2.75	-3.16
2004 Q2	-0.02	1.41
2004 Q3	3.25	4.78
2004 Q4	0.63	0.23
2005 Q1	-1.62	-1.68
2005 Q2	1.25	0.33
2005 Q3	-1.46	-0.78
2005 Q4	-2.34	-1.34
2006 Q1	1.41	1.51
2006 Q2	0.08	0.91
2006 Q3	1.77	1.27
2006 Q4	-2.34	-1.44
2007 Q1	-2.35	-2.14
2007 Q2	1.96	3.47
2007 Q3	-0.30	-0.77
2007 Q4	-4.15	-3.73
2008 Q1	-1.32	-2.21
2008 Q2	3.43	4.59
2008 Q3	-0.01	1.20
2008 Q4	-7.38	-7.60
2009 Q1	1.83	1.30
2009 Q2	3.75	2.61
2009 Q3	-0.65	0.72
2009 Q4	-4.19	-3.10
2010 Q1	0.82	-0.98

Date	Growth in unweighted self-employment (percent)	Growth in weighted self-employment (percent)
2010 Q2	0.46	1.57
2010 Q3	-0.48	-0.47
2010 Q4	-2.16	-4.15
2011 Q1	-2.17	1.18
2011 Q2	0.69	1.08
2011 Q3	0.52	0.78
2011 Q4	-2.08	-2.95
2012 Q1	-2.00	-1.40
2012 Q2	3.14	2.97
2012 Q3	1.06	1.43
2012 Q4	-0.44	-2.00
2013 Q1	-4.64	-2.45
2013 Q2	2.12	2.15
2013 Q3	-0.04	1.76
2013 Q4	-3.34	-3.87
2014 Q1	-2.00	-0.88
2014 Q2	-0.35	1.06
2014 Q3	2.65	0.04
2014 Q4	1.03	1.71
2015 Q1	-5.10	-2.14
2015 Q2	4.08	3.96
2015 Q3	-5.07	-3.56
2015 Q4	-1.34	0.22
2016 Q1	-1.03	0.43
2016 Q2	5.27	3.34
2016 Q3	0.13	-2.74
2016 Q4	-1.31	1.10
2017 Q1	-4.59	-1.24
2017 Q2	0.86	0.89
2017 Q3	0.34	-1.31
2017 Q4	1.00	3.94
2018 Q1	-2.80	0.16
2018 Q2	0.42	-0.12
2018 Q3	-1.10	-1.45
2018 Q4	-1.16	1.91
2019 Q1	-2.69	-1.03
2019 Q2	-1.42	-2.93
2019 Q3	0.83	4.19
2019 Q4	-1.59	-1.34

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

Table 8. Unincorporated self-employment in the nonfarm business sector by whether present in previous quarter, first quarter 2000 to fourth quarter 2019

Date	Not present in previous quarter (millions of persons)	Present in previous quarter (millions of persons)
2000 Q1	4.66	4.64
2000 Q2	4.77	4.67
2000 Q3	4.76	4.73
2000 Q4	4.49	4.74
2001 Q1	4.61	4.56
2001 Q2	4.77	4.61
2001 Q3	4.62	4.71
2001 Q4	4.37	4.77
2002 Q1	4.31	4.39
2002 Q2	4.54	4.51
2002 Q3	4.60	4.62
2002 Q4	4.76	4.76
2003 Q1	4.71	4.84
2003 Q2	4.97	4.77
2003 Q3	4.96	5.12
2003 Q4	5.05	5.05
2004 Q1	4.79	4.90
2004 Q2	5.01	4.81
2004 Q3	5.20	5.11
2004 Q4	5.03	5.23
2005 Q1	5.08	4.97
2005 Q2	5.03	5.16
2005 Q3	4.98	5.07
2005 Q4	4.86	5.08
2006 Q1	5.09	5.00
2006 Q2	5.12	5.09
2006 Q3	5.13	5.19
2006 Q4	5.10	5.18
2007 Q1	5.02	5.04
2007 Q2	5.15	5.15
2007 Q3	5.00	5.30
2007 Q4	4.75	5.05
2008 Q1	4.78	4.90
2008 Q2	5.09	4.98
2008 Q3	4.82	5.30
2008 Q4	4.72	4.75
2009 Q1	4.89	4.74
2009 Q2	4.76	5.06
2009 Q3	4.81	5.13
2009 Q4	4.88	4.84
2010 Q1	4.72	4.95

Date	Not present in previous quarter (millions of persons)	Present in previous quarter (millions of persons)
2010 Q2	4.91	4.90
2010 Q3	4.75	5.00
2010 Q4	4.73	4.78
2011 Q1	4.58	4.84
2011 Q2	4.73	4.81
2011 Q3	4.67	4.76
2011 Q4	4.57	4.72
2012 Q1	4.51	4.65
2012 Q2	4.98	4.53
2012 Q3	4.66	5.05
2012 Q4	4.68	4.94
2013 Q1	4.33	4.84
2013 Q2	4.98	4.49
2013 Q3	4.72	4.89
2013 Q4	4.48	4.74
2014 Q1	4.52	4.66
2014 Q2	4.64	4.48
2014 Q3	4.61	4.70
2014 Q4	4.57	4.86
2015 Q1	4.50	4.66
2015 Q2	4.71	4.91
2015 Q3	4.49	4.76
2015 Q4	4.51	4.58
2016 Q1	4.67	4.61
2016 Q2	4.73	4.78
2016 Q3	4.56	4.71
2016 Q4	4.68	4.67
2017 Q1	4.46	4.69
2017 Q2	4.56	4.72
2017 Q3	4.70	4.56
2017 Q4	4.80	4.69
2018 Q1	4.70	4.79
2018 Q2	4.74	4.74
2018 Q3	4.68	4.73
2018 Q4	4.69	4.78
2019 Q1	4.46	4.82
2019 Q2	4.69	4.48
2019 Q3	4.71	4.72
2019 Q4	4.66	4.67

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

Table 9. Growth in unincorporated self-employment in the nonfarm business sector, by whether present in the sample in both quarters, quarter-to-quarter percent change, second quarter 2000 to fourth quarter 2019

Date	Not present in previous quarter (percent)	Present in previous quarter (percent)	Total growth
2000 Q2	1.42	0.14	1.55
2000 Q3	0.91	-0.46	0.45
2000 Q4	-2.52	-0.25	-2.77
2001 Q1	-1.38	0.76	-0.62
2001 Q2	2.25	-0.03	2.22
2001 Q3	0.17	-0.57	-0.40
2001 Q4	-3.64	1.59	-2.05
2002 Q1	-5.01	0.17	-4.85
2002 Q2	1.71	2.25	3.96
2002 Q3	1.03	0.90	1.93
2002 Q4	1.53	1.77	3.30
2003 Q1	-0.55	0.87	0.32
2003 Q2	1.36	0.61	1.97
2003 Q3	1.90	1.51	3.41
2003 Q4	-0.67	0.93	0.26
2004 Q1	-2.58	-1.46	-4.04
2004 Q2	1.13	0.19	1.32
2004 Q3	4.04	0.96	4.99
2004 Q4	-0.77	0.29	-0.47
2005 Q1	-1.47	-0.57	-2.04
2005 Q2	0.59	0.80	1.39
2005 Q3	-1.81	0.42	-1.39
2005 Q4	-2.14	0.96	-1.18
2006 Q1	0.15	1.48	1.63
2006 Q2	1.11	0.03	1.14
2006 Q3	0.35	0.68	1.02
2006 Q4	-0.86	0.50	-0.36
2007 Q1	-1.52	-0.59	-2.11
2007 Q2	1.10	1.25	2.35
2007 Q3	-1.47	1.47	0.00
2007 Q4	-5.37	0.53	-4.84
2008 Q1	-2.74	1.54	-1.20
2008 Q2	1.95	2.01	3.97
2008 Q3	-1.54	2.17	0.63
2008 Q4	-5.81	-0.75	-6.55
2009 Q1	1.45	0.25	1.70
2009 Q2	0.22	1.78	2.00
2009 Q3	-2.56	3.74	1.18
2009 Q4	-2.49	0.30	-2.19

Date	Not present in previous quarter (percent)	Present in previous quarter (percent)	Total growth
2010 Q1	-1.24	0.75	-0.49
2010 Q2	-0.42	1.90	1.48
2010 Q3	-1.53	0.85	-0.68
2010 Q4	-2.75	0.36	-2.39
2011 Q1	-2.15	1.21	-0.94
2011 Q2	-1.19	2.40	1.21
2011 Q3	-1.42	0.29	-1.13
2011 Q4	-2.02	0.55	-1.47
2012 Q1	-2.23	0.90	-1.33
2012 Q2	3.54	0.21	3.75
2012 Q3	1.36	0.78	2.14
2012 Q4	-3.84	2.87	-0.97
2013 Q1	-6.34	1.73	-4.60
2013 Q2	1.51	1.74	3.25
2013 Q3	2.36	-1.01	1.36
2013 Q4	-4.24	0.21	-4.03
2014 Q1	-2.38	1.92	-0.45
2014 Q2	-0.18	-0.35	-0.53
2014 Q3	1.40	0.63	2.03
2014 Q4	-1.41	2.66	1.25
2015 Q1	-3.78	1.04	-2.74
2015 Q2	0.55	4.39	4.94
2015 Q3	-4.33	0.45	-3.88
2015 Q4	-2.73	1.01	-1.72
2016 Q1	0.95	1.16	2.11
2016 Q2	1.27	1.24	2.51
2016 Q3	-2.31	-0.16	-2.47
2016 Q4	-0.36	1.17	0.81
2017 Q1	-2.31	0.10	-2.20
2017 Q2	-1.45	2.85	1.40
2017 Q3	-0.20	0.08	-0.12
2017 Q4	2.55	-0.15	2.40
2018 Q1	0.16	-0.15	0.01
2018 Q2	-0.46	0.45	-0.01
2018 Q3	-0.66	-0.13	-0.79
2018 Q4	-0.42	1.05	0.63
2019 Q1	-3.32	1.40	-1.93
2019 Q2	-1.44	0.14	-1.30
2019 Q3	2.59	0.35	2.94
2019 Q4	-0.69	-0.52	-1.22

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

Table 10. Unincorporated self-employment in the nonfarm business sector by reporter type, first quarter 2000 to fourth quarter 2019

Date	Self-reported self-employment (millions of persons)	Proxy reported self-employment (millions of persons)
2000 Q1	6.42	4.50
2000 Q2	6.29	4.80
2000 Q3	6.19	4.81
2000 Q4	6.16	4.50
2001 Q1	6.45	4.26
2001 Q2	6.19	4.67
2001 Q3	6.07	4.65
2001 Q4	6.12	4.61
2002 Q1	6.08	4.06
2002 Q2	5.94	4.51
2002 Q3	6.06	4.57
2002 Q4	6.17	4.74
2003 Q1	6.57	4.49
2003 Q2	6.50	4.64
2003 Q3	6.55	4.95
2003 Q4	6.49	5.00
2004 Q1	6.66	4.48
2004 Q2	6.52	4.78
2004 Q3	6.74	5.08
2004 Q4	6.86	5.00
2005 Q1	7.09	4.56
2005 Q2	6.99	4.70
2005 Q3	6.62	4.98
2005 Q4	6.60	4.85
2006 Q1	6.98	4.64
2006 Q2	6.91	4.82
2006 Q3	6.97	4.90
2006 Q4	6.86	4.84
2007 Q1	6.60	4.82
2007 Q2	6.78	5.02
2007 Q3	6.82	4.89
2007 Q4	6.58	4.71
2008 Q1	6.55	4.48
2008 Q2	6.65	4.89
2008 Q3	6.74	4.93
2008 Q4	6.24	4.56
2009 Q1	6.35	4.60
2009 Q2	6.40	4.80
2009 Q3	6.39	4.90
2009 Q4	6.27	4.68

Date	Self-reported self-employment (millions of persons)	Proxy reported self-employment (millions of persons)
2010 Q1	6.18	4.66
2010 Q2	6.37	4.63
2010 Q3	6.26	4.69
2010 Q4	6.02	4.46
2011 Q1	6.08	4.52
2011 Q2	6.14	4.60
2011 Q3	6.27	4.50
2011 Q4	6.14	4.34
2012 Q1	6.04	4.30
2012 Q2	6.14	4.51
2012 Q3	6.22	4.60
2012 Q4	6.33	4.26
2013 Q1	6.07	4.21
2013 Q2	6.21	4.30
2013 Q3	6.19	4.50
2013 Q4	6.08	4.24
2014 Q1	6.11	4.11
2014 Q2	6.00	4.31
2014 Q3	5.85	4.45
2014 Q4	6.18	4.31
2015 Q1	6.16	4.09
2015 Q2	6.16	4.49
2015 Q3	5.84	4.43
2015 Q4	5.95	4.35
2016 Q1	6.03	4.30
2016 Q2	6.20	4.50
2016 Q3	5.96	4.42
2016 Q4	6.06	4.47
2017 Q1	5.98	4.41
2017 Q2	6.04	4.45
2017 Q3	5.99	4.37
2017 Q4	6.16	4.56
2018 Q1	6.20	4.57
2018 Q2	6.40	4.34
2018 Q3	6.11	4.47
2018 Q4	6.29	4.48
2019 Q1	6.24	4.42
2019 Q2	6.09	4.26
2019 Q3	6.35	4.42
2019 Q4	6.38	4.27

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

Table 11. Contributions to the quarter-to-quarter percent change in unincorporated self-employment in the nonfarm business sector by reporter type, second quarter 2000 to fourth quarter 2019

Date	All self-employed (percent)	Self-reported (percent)	Proxy-reported (percent)
2000 Q2	1.6	-1.1	2.7
2000 Q3	-0.9	-0.9	0.1
2000 Q4	-3.1	-0.2	-2.8
2001 Q1	0.4	2.6	-2.2
2001 Q2	1.5	-2.3	3.8
2001 Q3	-1.2	-1.1	-0.1
2001 Q4	0.1	0.5	-0.4
2002 Q1	-5.5	-0.4	-5.1
2002 Q2	3.0	-1.4	4.4
2002 Q3	1.8	1.2	0.6
2002 Q4	2.7	1.0	1.7
2003 Q1	1.3	3.7	-2.3
2003 Q2	0.6	-0.7	1.3
2003 Q3	3.3	0.5	2.8
2003 Q4	-0.1	-0.5	0.4
2004 Q1	-3.1	1.5	-4.6
2004 Q2	1.4	-1.3	2.7
2004 Q3	4.7	2.0	2.7
2004 Q4	0.3	1.0	-0.6
2005 Q1	-1.8	1.9	-3.7
2005 Q2	0.4	-0.8	1.2
2005 Q3	-0.8	-3.2	2.4
2005 Q4	-1.3	-0.2	-1.2
2006 Q1	1.5	3.3	-1.8
2006 Q2	0.9	-0.6	1.5
2006 Q3	1.3	0.6	0.7
2006 Q4	-1.4	-0.9	-0.5
2007 Q1	-2.4	-2.3	-0.2
2007 Q2	3.4	1.6	1.7
2007 Q3	-0.8	0.3	-1.1
2007 Q4	-3.6	-2.1	-1.5
2008 Q1	-2.3	-0.3	-2.0
2008 Q2	4.6	0.9	3.7
2008 Q3	1.1	0.8	0.3
2008 Q4	-7.4	-4.3	-3.1
2009 Q1	1.4	1.0	0.4
2009 Q2	2.3	0.5	1.9
2009 Q3	0.8	0.0	0.9

Date	All self-employed (percent)	Self-reported (percent)	Proxy-reported (percent)
2009 Q4	-3.1	-1.1	-2.0
2010 Q1	-1.0	-0.8	-0.2
2010 Q2	1.5	1.8	-0.3
2010 Q3	-0.4	-1.1	0.6
2010 Q4	-4.3	-2.2	-2.1
2011 Q1	1.2	0.6	0.5
2011 Q2	1.3	0.5	0.8
2011 Q3	0.4	1.2	-0.9
2011 Q4	-2.8	-1.3	-1.5
2012 Q1	-1.3	-0.9	-0.4
2012 Q2	3.0	1.0	2.0
2012 Q3	1.6	0.7	0.9
2012 Q4	-2.2	1.0	-3.1
2013 Q1	-2.9	-2.4	-0.4
2013 Q2	2.2	1.3	0.9
2013 Q3	1.7	-0.1	1.8
2013 Q4	-3.5	-1.1	-2.4
2014 Q1	-1.0	0.3	-1.3
2014 Q2	0.9	-1.1	2.0
2014 Q3	-0.1	-1.4	1.3
2014 Q4	1.9	3.2	-1.3
2015 Q1	-2.4	-0.2	-2.2
2015 Q2	4.0	0.0	3.9
2015 Q3	-3.6	-3.0	-0.6
2015 Q4	0.3	1.1	-0.8
2016 Q1	0.3	0.7	-0.5
2016 Q2	3.5	1.6	1.9
2016 Q3	-2.9	-2.2	-0.7
2016 Q4	1.3	0.9	0.4
2017 Q1	-1.3	-0.8	-0.5
2017 Q2	1.0	0.6	0.4
2017 Q3	-1.2	-0.4	-0.8
2017 Q4	3.5	1.6	1.9
2018 Q1	0.4	0.4	0.1
2018 Q2	-0.2	1.9	-2.1
2018 Q3	-1.5	-2.7	1.2
2018 Q4	1.8	1.7	0.1
2019 Q1	-1.0	-0.5	-0.6
2019 Q2	-2.9	-1.4	-1.5
2019 Q3	4.1	2.5	1.6
2019 Q4	-1.2	0.2	-1.4

Note: CPS weights are used. This figure shows the percentage point contributions of proxy- and self-reports to the percent change in the sum of the proxy- and self-reported unincorporated self-employed and not the actual percent change for all unincorporated self-employed, because a small number of respondents are missing information about proxy status. Source: Current Population Survey, authors' calculations

Table 12. Shares of proxy-responses, by month, 2000–2006

Date	Share of proxy responses
2000m1	0.495
2000m2	0.495
2000m3	0.448
2000m4	0.494
2000m5	0.497
2000m6	0.499
2000m7	0.498
2000m8	0.499
2000m9	0.494
2000m10	0.495
2000m11	0.496
2000m12	0.493
2001m1	0.494
2001m2	0.486
2001m3	0.450
2001m4	0.482
2001m5	0.496
2001m6	0.495
2001m7	0.496
2001m8	0.497
2001m9	0.495
2001m10	0.496
2001m11	0.493
2001m12	0.494
2002m1	0.493
2002m2	0.484
2002m3	0.441
2002m4	0.480
2002m5	0.492
2002m6	0.494
2002m7	0.494
2002m8	0.493
2002m9	0.492
2002m10	0.493
2002m11	0.494
2002m12	0.493
2003m1	0.492
2003m2	0.484
2003m3	0.442
2003m4	0.481
2003m5	0.492
2003m6	0.493

Date	Share of proxy responses
2003m7	0.493
2003m8	0.495
2003m9	0.492
2003m10	0.492
2003m11	0.491
2003m12	0.493
2004m1	0.492
2004m2	0.485
2004m3	0.447
2004m4	0.482
2004m5	0.493
2004m6	0.494
2004m7	0.492
2004m8	0.491
2004m9	0.491
2004m10	0.491
2004m11	0.493
2004m12	0.494
2005m1	0.491
2005m2	0.484
2005m3	0.446
2005m4	0.481
2005m5	0.492
2005m6	0.492
2005m7	0.495
2005m8	0.495
2005m9	0.494
2005m10	0.495
2005m11	0.492
2005m12	0.493
2006m1	0.494
2006m2	0.485
2006m3	0.448
2006m4	0.483
2006m5	0.492
2006m6	0.493
2006m7	0.491
2006m8	0.493
2006m9	0.491
2006m10	0.492
2006m11	0.493
2006m12	0.494

Note: CPS weights are used. The share falls each March. Source: Current Population Survey, authors' calculations

Table 13. Share of proxy-responses, by month, 2007–2019

Date	Share of proxy responses
2007m1	0.499
2007m2	0.499
2007m3	0.497
2007m4	0.497
2007m5	0.498
2007m6	0.499
2007m7	0.499
2007m8	0.497
2007m9	0.496
2007m10	0.496
2007m11	0.496
2007m12	0.497
2008m1	0.498
2008m2	0.499
2008m3	0.497
2008m4	0.498
2008m5	0.498
2008m6	0.499
2008m7	0.501
2008m8	0.500
2008m9	0.498
2008m10	0.497
2008m11	0.499
2008m12	0.500
2009m1	0.500
2009m2	0.500
2009m3	0.500
2009m4	0.500
2009m5	0.501
2009m6	0.501
2009m7	0.504
2009m8	0.501
2009m9	0.500
2009m10	0.499
2009m11	0.501
2009m12	0.503
2010m1	0.504
2010m2	0.506
2010m3	0.506
2010m4	0.505
2010m5	0.504
2010m6	0.505

2010m7	0.505
2010m8	0.502
2010m9	0.499
2010m10	0.501
2010m11	0.502
2010m12	0.504
2011m1	0.503
2011m2	0.502
2011m3	0.501
2011m4	0.502
2011m5	0.501
2011m6	0.503
2011m7	0.504
2011m8	0.502
2011m9	0.501
2011m10	0.503
2011m11	0.504
2011m12	0.504
2012m1	0.503
2012m2	0.502
2012m3	0.502
2012m4	0.502
2012m5	0.503
2012m6	0.504
2012m7	0.504
2012m8	0.502
2012m9	0.501
2012m10	0.502
2012m11	0.503
2012m12	0.503
2013m1	0.502
2013m2	0.500
2013m3	0.501
2013m4	0.501
2013m5	0.503
2013m6	0.503
2013m7	0.503
2013m8	0.502
2013m9	0.501
2013m10	0.501
2013m11	0.502
2013m12	0.503
2014m1	0.502
2014m2	0.502
2014m3	0.500

2014m4	0.500
2014m5	0.502
2014m6	0.503
2014m7	0.504
2014m8	0.501
2014m9	0.499
2014m10	0.501
2014m11	0.502
2014m12	0.503
2015m1	0.503
2015m2	0.502
2015m3	0.501
2015m4	0.500
2015m5	0.499
2015m6	0.501
2015m7	0.502
2015m8	0.501
2015m9	0.500
2015m10	0.500
2015m11	0.501
2015m12	0.503
2016m1	0.503
2016m2	0.502
2016m3	0.499
2016m4	0.498
2016m5	0.498
2016m6	0.500
2016m7	0.502
2016m8	0.503
2016m9	0.501
2016m10	0.502
2016m11	0.502
2016m12	0.503
2017m1	0.501
2017m2	0.501
2017m3	0.500
2017m4	0.500
2017m5	0.502
2017m6	0.503
2017m7	0.504
2017m8	0.503
2017m9	0.499
2017m10	0.502
2017m11	0.503
2017m12	0.502

2018m1	0.502
2018m2	0.501
2018m3	0.500
2018m4	0.501
2018m5	0.502
2018m6	0.501
2018m7	0.501
2018m8	0.500
2018m9	0.499
2018m10	0.500
2018m11	0.502
2018m12	0.501
2019m1	0.501
2019m2	0.499
2019m3	0.499
2019m4	0.501
2019m5	0.500
2019m6	0.499
2019m7	0.501
2019m8	0.500
2019m9	0.498
2019m10	0.499
2019m11	0.500
2019m12	0.502

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

Table 14. Share of imputed unincorporated self-employed in the nonfarm business sector by imputed status, first quarter 2000 to fourth quarter 2019

Date	Share of imputed self-employed
2000 Q1	0.036
2000 Q2	0.033
2000 Q3	0.039
2000 Q4	0.040
2001 Q1	0.041
2001 Q2	0.042
2001 Q3	0.038
2001 Q4	0.038
2002 Q1	0.038
2002 Q2	0.038
2002 Q3	0.041
2002 Q4	0.044
2003 Q1	0.042
2003 Q2	0.044
2003 Q3	0.044
2003 Q4	0.048
2004 Q1	0.039
2004 Q2	0.039
2004 Q3	0.045
2004 Q4	0.041
2005 Q1	0.043
2005 Q2	0.043
2005 Q3	0.049
2005 Q4	0.042
2006 Q1	0.041
2006 Q2	0.045
2006 Q3	0.044
2006 Q4	0.040
2007 Q1	0.042
2007 Q2	0.043
2007 Q3	0.039
2007 Q4	0.047
2008 Q1	0.045
2008 Q2	0.038
2008 Q3	0.045
2008 Q4	0.039
2009 Q1	0.039
2009 Q2	0.044
2009 Q3	0.045
2009 Q4	0.047
2010 Q1	0.036
2010 Q2	0.044

Date	Share of imputed self-employed
2010 Q3	0.042
2010 Q4	0.051
2011 Q1	0.049
2011 Q2	0.046
2011 Q3	0.048
2011 Q4	0.048
2012 Q1	0.048
2012 Q2	0.046
2012 Q3	0.050
2012 Q4	0.048
2013 Q1	0.048
2013 Q2	0.051
2013 Q3	0.054
2013 Q4	0.053
2014 Q1	0.050
2014 Q2	0.049
2014 Q3	0.053
2014 Q4	0.048
2015 Q1	0.053
2015 Q2	0.057
2015 Q3	0.059
2015 Q4	0.057
2016 Q1	0.057
2016 Q2	0.061
2016 Q3	0.060
2016 Q4	0.055
2017 Q1	0.051
2017 Q2	0.059
2017 Q3	0.060
2017 Q4	0.053
2018 Q1	0.056
2018 Q2	0.054
2018 Q3	0.058
2018 Q4	0.053
2019 Q1	0.060
2019 Q2	0.062
2019 Q3	0.061
2019 Q4	0.054

Note: CPS weights are used. Imputed responses are imputed by hot-deck imputation. Source: Current Population Survey, authors' calculations

Table 15. The contributions of imputed and nonimputed unincorporated self-employment to the growth in unincorporated self-employment in the nonfarm business sector, quarter-to-quarter percent change, second quarter 2000 to fourth quarter 2019

Date	Contribution of nonimputed self-employed (percent)	Contribution of imputed self-employed (percent)	All self-employed (percent)
2000 Q2	1.9	-0.2	1.7
2000 Q3	-1.5	0.5	-1.0
2000 Q4	-3.1	0.0	-3.1
2001 Q1	0.2	0.2	0.4
2001 Q2	1.4	0.2	1.5
2001 Q3	-0.8	-0.5	-1.3
2001 Q4	0.1	0.0	0.2
2002 Q1	-5.4	-0.2	-5.6
2002 Q2	3.0	0.0	3.0
2002 Q3	1.4	0.4	1.8
2002 Q4	2.2	0.5	2.7
2003 Q1	1.5	-0.2	1.3
2003 Q2	0.5	0.2	0.6
2003 Q3	3.2	0.2	3.4
2003 Q4	-0.5	0.4	-0.1
2004 Q1	-2.1	-1.1	-3.2
2004 Q2	1.3	0.1	1.4
2004 Q3	4.0	0.8	4.8
2004 Q4	0.5	-0.3	0.2
2005 Q1	-1.7	0.1	-1.7
2005 Q2	0.3	0.0	0.3
2005 Q3	-1.3	0.5	-0.8
2005 Q4	-0.7	-0.7	-1.3
2006 Q1	1.6	-0.1	1.5
2006 Q2	0.5	0.4	0.9
2006 Q3	1.3	0.0	1.3
2006 Q4	-1.0	-0.4	-1.4
2007 Q1	-2.2	0.1	-2.1
2007 Q2	3.2	0.3	3.5
2007 Q3	-0.4	-0.4	-0.8
2007 Q4	-4.3	0.6	-3.7
2008 Q1	-1.9	-0.3	-2.2
2008 Q2	5.2	-0.6	4.6
2008 Q3	0.5	0.7	1.2
2008 Q4	-6.7	-0.9	-7.6
2009 Q1	1.3	0.0	1.3
2009 Q2	2.0	0.6	2.6
2009 Q3	0.6	0.1	0.7
2009 Q4	-3.2	0.1	-3.1

Date	Contribution of nonimputed self- employed (percent)	Contribution of imputed self- employed (percent)	All self-employed (percent)
2010 Q1	0.2	-1.2	-1.0
2010 Q2	0.7	0.9	1.6
2010 Q3	-0.2	-0.2	-0.5
2010 Q4	-4.8	0.7	-4.1
2011 Q1	1.3	-0.1	1.2
2011 Q2	1.3	-0.2	1.1
2011 Q3	0.6	0.2	0.8
2011 Q4	-2.8	-0.1	-3.0
2012 Q1	-1.4	0.0	-1.4
2012 Q2	3.1	-0.1	3.0
2012 Q3	0.9	0.5	1.4
2012 Q4	-1.7	-0.3	-2.0
2013 Q1	-2.3	-0.1	-2.4
2013 Q2	1.8	0.4	2.1
2013 Q3	1.3	0.4	1.8
2013 Q4	-3.5	-0.3	-3.9
2014 Q1	-0.6	-0.3	-0.9
2014 Q2	1.2	-0.1	1.1
2014 Q3	-0.4	0.5	0.0
2014 Q4	2.1	-0.4	1.7
2015 Q1	-2.6	0.4	-2.1
2015 Q2	3.3	0.6	4.0
2015 Q3	-3.5	0.0	-3.6
2015 Q4	0.4	-0.2	0.2
2016 Q1	0.3	0.1	0.4
2016 Q2	2.8	0.5	3.3
2016 Q3	-2.5	-0.2	-2.7
2016 Q4	1.6	-0.5	1.1
2017 Q1	-0.8	-0.5	-1.2
2017 Q2	0.0	0.8	0.9
2017 Q3	-1.3	0.0	-1.3
2017 Q4	4.4	-0.4	3.9
2018 Q1	-0.2	0.3	0.2
2018 Q2	0.2	-0.3	-0.1
2018 Q3	-1.8	0.3	-1.5
2018 Q4	2.3	-0.4	1.9
2019 Q1	-1.7	0.7	-1.0
2019 Q2	-3.0	0.1	-2.9
2019 Q3	4.0	0.2	4.2
2019 Q4	-0.5	-0.8	-1.3

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

Table 16. Transitions from unincorporated self-employment in the previous month to different classes of work or non-employment, first quarter 2000 to fourth quarter 2019

Date	Employees (millions of persons)	Unincorporated self-employed (millions of persons)	Incorporated self-employed (millions of persons)	Not employed (millions of persons)
2000 Q1	0.24	8.20	0.06	0.50
2000 Q2	0.22	8.38	0.07	0.52
2000 Q3	0.21	8.39	0.08	0.53
2000 Q4	0.19	8.17	0.06	0.47
2001 Q1	0.23	8.16	0.05	0.49
2001 Q2	0.22	8.04	0.08	0.47
2001 Q3	0.23	8.25	0.06	0.56
2001 Q4	0.19	8.04	0.06	0.54
2002 Q1	0.19	7.68	0.06	0.49
2002 Q2	0.18	7.98	0.06	0.52
2002 Q3	0.23	8.09	0.07	0.56
2002 Q4	0.25	8.38	0.09	0.55
2003 Q1	0.19	8.35	0.07	0.51
2003 Q2	0.23	8.61	0.09	0.55
2003 Q3	0.24	8.79	0.09	0.59
2003 Q4	0.21	8.90	0.09	0.56
2004 Q1	0.22	8.41	0.08	0.56
2004 Q2	0.20	8.71	0.08	0.51
2004 Q3	0.22	8.99	0.10	0.63
2004 Q4	0.22	8.85	0.08	0.65
2005 Q1	0.25	8.78	0.08	0.57
2005 Q2	0.25	8.86	0.09	0.56
2005 Q3	0.26	8.76	0.07	0.57
2005 Q4	0.25	8.63	0.07	0.59
2006 Q1	0.24	8.77	0.10	0.61
2006 Q2	0.29	8.83	0.08	0.63
2006 Q3	0.24	9.00	0.08	0.63
2006 Q4	0.25	9.00	0.10	0.66
2007 Q1	0.27	8.70	0.11	0.58
2007 Q2	0.22	9.10	0.08	0.51
2007 Q3	0.33	8.90	0.09	0.63
2007 Q4	0.25	8.36	0.08	0.59
2008 Q1	0.25	8.40	0.10	0.51
2008 Q2	0.26	8.74	0.09	0.57
2008 Q3	0.27	8.50	0.10	0.63
2008 Q4	0.23	7.91	0.10	0.64
2009 Q1	0.23	7.95	0.12	0.63
2009 Q2	0.29	8.09	0.10	0.67
2009 Q3	0.31	8.17	0.11	0.70

Date	Employees (millions of persons)	Unincorporated self-employed (millions of persons)	Incorporated self-employed (millions of persons)	Not employed (millions of persons)
2009 Q4	0.25	8.04	0.09	0.66
2010 Q1	0.23	7.91	0.07	0.66
2010 Q2	0.30	8.17	0.08	0.62
2010 Q3	0.30	7.96	0.09	0.64
2010 Q4	0.26	7.78	0.09	0.68
2011 Q1	0.25	7.72	0.10	0.60
2011 Q2	0.26	7.88	0.07	0.64
2011 Q3	0.30	7.65	0.08	0.68
2011 Q4	0.25	7.66	0.09	0.65
2012 Q1	0.27	7.57	0.08	0.56
2012 Q2	0.28	8.09	0.07	0.65
2012 Q3	0.30	7.93	0.09	0.62
2012 Q4	0.24	7.97	0.09	0.68
2013 Q1	0.30	7.42	0.09	0.57
2013 Q2	0.32	8.04	0.08	0.63
2013 Q3	0.34	7.83	0.10	0.69
2013 Q4	0.28	7.58	0.11	0.57
2014 Q1	0.27	7.63	0.08	0.63
2014 Q2	0.31	7.68	0.11	0.62
2014 Q3	0.29	7.70	0.10	0.65
2014 Q4	0.34	7.88	0.08	0.65
2015 Q1	0.31	7.49	0.08	0.64
2015 Q2	0.47	7.90	0.14	0.66
2015 Q3	0.37	7.69	0.10	0.58
2015 Q4	0.32	7.59	0.11	0.66
2016 Q1	0.34	7.81	0.11	0.59
2016 Q2	0.37	8.03	0.10	0.57
2016 Q3	0.36	7.64	0.13	0.62
2016 Q4	0.37	7.75	0.10	0.70
2017 Q1	0.32	7.54	0.12	0.63
2017 Q2	0.38	7.77	0.10	0.61
2017 Q3	0.35	7.78	0.13	0.63
2017 Q4	0.38	8.00	0.11	0.71
2018 Q1	0.34	7.93	0.10	0.62
2018 Q2	0.35	8.01	0.11	0.63
2018 Q3	0.34	7.92	0.12	0.65
2018 Q4	0.39	7.96	0.08	0.66
2019 Q1	0.32	7.65	0.12	0.59
2019 Q2	0.37	7.83	0.10	0.60
2019 Q3	0.35	8.04	0.11	0.55
2019 Q4	0.36	7.82	0.11	0.67

Note: CPS longitudinal weights are used. Source: Current Population Survey, authors' calculations

Table 17. Transitions from different classes of work and non-employment in the previous month to unincorporated self-employed, first quarter 2000 to fourth quarter 2019

Date	Employees (millions of persons)	Unincorporated self-employed (millions of persons)	Incorporated self-employed (millions of persons)	Not employed (millions of persons)
2000 Q1	0.19	8.20	0.07	0.46
2000 Q2	0.23	8.38	0.07	0.39
2000 Q3	0.25	8.39	0.06	0.45
2000 Q4	0.19	8.17	0.06	0.41
2001 Q1	0.20	8.16	0.07	0.46
2001 Q2	0.22	8.04	0.07	0.41
2001 Q3	0.19	8.25	0.08	0.47
2001 Q4	0.19	8.04	0.08	0.38
2002 Q1	0.20	7.68	0.07	0.44
2002 Q2	0.22	7.98	0.05	0.49
2002 Q3	0.21	8.09	0.07	0.49
2002 Q4	0.23	8.38	0.07	0.49
2003 Q1	0.18	8.35	0.08	0.54
2003 Q2	0.27	8.61	0.08	0.49
2003 Q3	0.21	8.79	0.09	0.54
2003 Q4	0.19	8.90	0.08	0.53
2004 Q1	0.22	8.41	0.07	0.51
2004 Q2	0.21	8.71	0.09	0.57
2004 Q3	0.25	8.99	0.07	0.56
2004 Q4	0.23	8.85	0.08	0.52
2005 Q1	0.22	8.78	0.08	0.55
2005 Q2	0.25	8.86	0.10	0.56
2005 Q3	0.21	8.76	0.08	0.51
2005 Q4	0.21	8.63	0.07	0.49
2006 Q1	0.22	8.77	0.10	0.59
2006 Q2	0.25	8.83	0.10	0.54
2006 Q3	0.20	9.00	0.10	0.58
2006 Q4	0.19	9.00	0.08	0.46
2007 Q1	0.23	8.70	0.15	0.54
2007 Q2	0.27	9.10	0.10	0.49
2007 Q3	0.28	8.90	0.09	0.54
2007 Q4	0.28	8.36	0.10	0.45
2008 Q1	0.24	8.40	0.10	0.47
2008 Q2	0.30	8.74	0.08	0.57
2008 Q3	0.26	8.50	0.10	0.56
2008 Q4	0.27	7.91	0.10	0.49
2009 Q1	0.26	7.95	0.13	0.67
2009 Q2	0.27	8.09	0.11	0.59
2009 Q3	0.29	8.17	0.10	0.62

Date	Employees (millions of persons)	Unincorporated self-employed (millions of persons)	Incorporated self-employed (millions of persons)	Not employed (millions of persons)
2009 Q4	0.24	8.04	0.10	0.58
2010 Q1	0.27	7.91	0.07	0.64
2010 Q2	0.28	8.17	0.09	0.59
2010 Q3	0.30	7.96	0.09	0.61
2010 Q4	0.30	7.78	0.08	0.56
2011 Q1	0.27	7.72	0.08	0.62
2011 Q2	0.26	7.88	0.05	0.58
2011 Q3	0.27	7.65	0.07	0.59
2011 Q4	0.28	7.66	0.08	0.58
2012 Q1	0.27	7.57	0.08	0.50
2012 Q2	0.27	8.09	0.09	0.59
2012 Q3	0.32	7.93	0.08	0.58
2012 Q4	0.26	7.97	0.09	0.54
2013 Q1	0.26	7.42	0.08	0.62
2013 Q2	0.26	8.04	0.10	0.54
2013 Q3	0.27	7.83	0.07	0.52
2013 Q4	0.28	7.58	0.10	0.47
2014 Q1	0.29	7.63	0.10	0.58
2014 Q2	0.30	7.68	0.07	0.56
2014 Q3	0.32	7.70	0.10	0.59
2014 Q4	0.30	7.88	0.08	0.51
2015 Q1	0.30	7.49	0.10	0.60
2015 Q2	0.45	7.90	0.16	0.62
2015 Q3	0.35	7.69	0.12	0.52
2015 Q4	0.36	7.59	0.11	0.48
2016 Q1	0.31	7.81	0.11	0.53
2016 Q2	0.37	8.03	0.11	0.53
2016 Q3	0.33	7.64	0.10	0.53
2016 Q4	0.30	7.75	0.12	0.49
2017 Q1	0.41	7.54	0.13	0.57
2017 Q2	0.30	7.77	0.10	0.55
2017 Q3	0.36	7.78	0.10	0.58
2017 Q4	0.34	8.00	0.12	0.47
2018 Q1	0.37	7.93	0.12	0.59
2018 Q2	0.38	8.01	0.11	0.48
2018 Q3	0.37	7.92	0.14	0.53
2018 Q4	0.41	7.96	0.12	0.51
2019 Q1	0.34	7.65	0.12	0.59
2019 Q2	0.36	7.83	0.11	0.50
2019 Q3	0.36	8.04	0.11	0.48
2019 Q4	0.39	7.82	0.10	0.49

Note: CPS longitudinal weights are used. Source: Current Population Survey, authors' calculations

Table 18. The share of unincorporated self-employed in the current month who were not unincorporated self-employed in the previous month by current and previous month reporter type, nonfarm business sector, first quarter 2000 to fourth quarter 2019

Date	Self(t-1), Self(t)	Self(t-1), Proxy(t)	Proxy(t-1), Self(t)	Proxy(t-1), Proxy(t)
2000 Q1	0.032	0.010	0.015	0.023
2000 Q2	0.033	0.008	0.013	0.021
2000 Q3	0.032	0.008	0.013	0.028
2000 Q4	0.033	0.006	0.012	0.023
2001 Q1	0.032	0.010	0.014	0.025
2001 Q2	0.029	0.010	0.014	0.026
2001 Q3	0.032	0.009	0.013	0.025
2001 Q4	0.033	0.009	0.012	0.019
2002 Q1	0.034	0.010	0.014	0.025
2002 Q2	0.033	0.012	0.013	0.027
2002 Q3	0.033	0.011	0.015	0.026
2002 Q4	0.034	0.009	0.012	0.030
2003 Q1	0.037	0.009	0.014	0.026
2003 Q2	0.035	0.010	0.013	0.029
2003 Q3	0.031	0.011	0.015	0.027
2003 Q4	0.032	0.008	0.014	0.027
2004 Q1	0.036	0.008	0.015	0.027
2004 Q2	0.036	0.009	0.013	0.031
2004 Q3	0.038	0.009	0.015	0.027
2004 Q4	0.033	0.008	0.014	0.029
2005 Q1	0.037	0.008	0.014	0.026
2005 Q2	0.038	0.008	0.014	0.031
2005 Q3	0.035	0.010	0.011	0.027
2005 Q4	0.035	0.008	0.012	0.026
2006 Q1	0.043	0.011	0.010	0.028
2006 Q2	0.036	0.010	0.014	0.030
2006 Q3	0.038	0.008	0.014	0.028
2006 Q4	0.030	0.006	0.008	0.028
2007 Q1	0.035	0.009	0.013	0.036
2007 Q2	0.033	0.007	0.010	0.030
2007 Q3	0.036	0.009	0.012	0.032
2007 Q4	0.035	0.009	0.011	0.030
2008 Q1	0.031	0.008	0.013	0.031
2008 Q2	0.037	0.010	0.012	0.034
2008 Q3	0.038	0.009	0.012	0.033
2008 Q4	0.037	0.009	0.011	0.036
2009 Q1	0.046	0.008	0.019	0.040
2009 Q2	0.040	0.009	0.015	0.039
2009 Q3	0.039	0.010	0.017	0.039
2009 Q4	0.041	0.009	0.014	0.034

Date	Self(t-1), Self(t)	Self(t-1), Proxy(t)	Proxy(t-1), Self(t)	Proxy(t-1), Proxy(t)
2010 Q1	0.044	0.009	0.014	0.035
2010 Q2	0.035	0.009	0.016	0.039
2010 Q3	0.042	0.012	0.014	0.037
2010 Q4	0.040	0.008	0.013	0.041
2011 Q1	0.046	0.011	0.013	0.037
2011 Q2	0.040	0.008	0.011	0.037
2011 Q3	0.044	0.008	0.014	0.035
2011 Q4	0.045	0.007	0.014	0.036
2012 Q1	0.039	0.008	0.013	0.036
2012 Q2	0.041	0.009	0.011	0.037
2012 Q3	0.041	0.009	0.014	0.041
2012 Q4	0.039	0.009	0.012	0.034
2013 Q1	0.049	0.010	0.011	0.036
2013 Q2	0.037	0.009	0.012	0.035
2013 Q3	0.040	0.008	0.011	0.034
2013 Q4	0.044	0.007	0.010	0.034
2014 Q1	0.047	0.008	0.011	0.039
2014 Q2	0.043	0.009	0.012	0.039
2014 Q3	0.046	0.008	0.012	0.043
2014 Q4	0.039	0.010	0.009	0.035
2015 Q1	0.046	0.012	0.014	0.038
2015 Q2	0.048	0.012	0.013	0.052
2015 Q3	0.044	0.008	0.015	0.040
2015 Q4	0.044	0.008	0.015	0.037
2016 Q1	0.045	0.008	0.009	0.039
2016 Q2	0.039	0.008	0.014	0.041
2016 Q3	0.039	0.010	0.013	0.041
2016 Q4	0.045	0.007	0.010	0.038
2017 Q1	0.048	0.011	0.015	0.048
2017 Q2	0.041	0.009	0.012	0.040
2017 Q3	0.048	0.009	0.010	0.042
2017 Q4	0.038	0.009	0.011	0.039
2018 Q1	0.047	0.008	0.010	0.045
2018 Q2	0.040	0.007	0.011	0.043
2018 Q3	0.046	0.011	0.012	0.041
2018 Q4	0.046	0.009	0.012	0.039
2019 Q1	0.051	0.007	0.013	0.037
2019 Q2	0.047	0.007	0.009	0.037
2019 Q3	0.041	0.007	0.010	0.040
2019 Q4	0.052	0.007	0.008	0.035

Note: CPS longitudinal weights are used. Source: Current Population Survey, authors' calculations

Table 19. The share of unincorporated self-employed workers in the current month who were not unincorporated self-employed in the previous month by current and previous month imputation status, nonfarm business sector, first quarter 2000 to fourth quarter 2019

Date	Nonimpute(t-1), Nonimpute(t)	Nonimpute(t-1), Impute(t)	Impute(t-1), Nonimpute(t)	Impute(t-1), Impute(t)
2000 Q1	0.067	0.006	0.002	0.006
2000 Q2	0.060	0.005	0.005	0.006
2000 Q3	0.065	0.008	0.002	0.007
2000 Q4	0.062	0.005	0.002	0.006
2001 Q1	0.068	0.006	0.001	0.007
2001 Q2	0.063	0.007	0.003	0.007
2001 Q3	0.066	0.006	0.003	0.007
2001 Q4	0.058	0.006	0.003	0.008
2002 Q1	0.069	0.006	0.002	0.008
2002 Q2	0.072	0.006	0.003	0.006
2002 Q3	0.069	0.007	0.003	0.008
2002 Q4	0.068	0.008	0.003	0.008
2003 Q1	0.072	0.007	0.002	0.006
2003 Q2	0.071	0.006	0.003	0.009
2003 Q3	0.069	0.008	0.002	0.008
2003 Q4	0.064	0.007	0.003	0.008
2004 Q1	0.069	0.007	0.003	0.008
2004 Q2	0.074	0.006	0.003	0.009
2004 Q3	0.073	0.006	0.003	0.007
2004 Q4	0.066	0.008	0.003	0.008
2005 Q1	0.071	0.007	0.004	0.006
2005 Q2	0.074	0.008	0.003	0.008
2005 Q3	0.067	0.007	0.003	0.008
2005 Q4	0.067	0.006	0.003	0.007
2006 Q1	0.076	0.006	0.004	0.009
2006 Q2	0.071	0.008	0.004	0.010
2006 Q3	0.072	0.006	0.004	0.007
2006 Q4	0.059	0.008	0.003	0.006
2007 Q1	0.073	0.007	0.003	0.012
2007 Q2	0.067	0.007	0.003	0.007
2007 Q3	0.072	0.009	0.004	0.008
2007 Q4	0.066	0.009	0.005	0.010
2008 Q1	0.070	0.008	0.003	0.007
2008 Q2	0.078	0.009	0.006	0.005
2008 Q3	0.077	0.008	0.005	0.007
2008 Q4	0.078	0.008	0.004	0.007
2009 Q1	0.095	0.009	0.003	0.010
2009 Q2	0.088	0.008	0.005	0.006
2009 Q3	0.089	0.009	0.004	0.008

Date	Nonimpute(t-1), Nonimpute(t)	Nonimpute(t-1), Impute(t)	Impute(t-1), Nonimpute(t)	Impute(t-1), Impute(t)
2009 Q4	0.083	0.007	0.005	0.007
2010 Q1	0.094	0.008	0.004	0.004
2010 Q2	0.084	0.011	0.006	0.004
2010 Q3	0.090	0.010	0.004	0.006
2010 Q4	0.088	0.011	0.005	0.005
2011 Q1	0.092	0.011	0.004	0.006
2011 Q2	0.081	0.012	0.006	0.003
2011 Q3	0.089	0.011	0.005	0.003
2011 Q4	0.089	0.010	0.006	0.004
2012 Q1	0.082	0.009	0.004	0.004
2012 Q2	0.082	0.012	0.005	0.006
2012 Q3	0.089	0.010	0.005	0.006
2012 Q4	0.079	0.011	0.005	0.005
2013 Q1	0.092	0.015	0.004	0.004
2013 Q2	0.075	0.014	0.004	0.008
2013 Q3	0.078	0.012	0.005	0.005
2013 Q4	0.077	0.013	0.004	0.006
2014 Q1	0.091	0.009	0.007	0.005
2014 Q2	0.089	0.009	0.005	0.005
2014 Q3	0.092	0.011	0.007	0.005
2014 Q4	0.080	0.011	0.005	0.005
2015 Q1	0.096	0.011	0.006	0.005
2015 Q2	0.100	0.019	0.007	0.009
2015 Q3	0.084	0.014	0.007	0.009
2015 Q4	0.084	0.014	0.007	0.007
2016 Q1	0.084	0.014	0.005	0.006
2016 Q2	0.082	0.016	0.008	0.006
2016 Q3	0.084	0.014	0.006	0.006
2016 Q4	0.081	0.011	0.006	0.006
2017 Q1	0.100	0.014	0.007	0.007
2017 Q2	0.085	0.012	0.005	0.006
2017 Q3	0.091	0.015	0.005	0.006
2017 Q4	0.078	0.013	0.007	0.007
2018 Q1	0.090	0.015	0.007	0.007
2018 Q2	0.082	0.014	0.006	0.006
2018 Q3	0.092	0.012	0.004	0.007
2018 Q4	0.087	0.013	0.009	0.006
2019 Q1	0.093	0.015	0.008	0.005
2019 Q2	0.082	0.015	0.005	0.007
2019 Q3	0.080	0.015	0.005	0.006
2019 Q4	0.085	0.014	0.007	0.005

Note: CPS longitudinal weights are used. Source: Current Population Survey, authors' calculations

Table 20. Unincorporated self-employment with and without editing sandwiched transition months in transitions out of and into self-employment accompanied by transitions between reporter types or imputation statuses, nonfarm business sector, first quarter 2000 to fourth quarter 2019

Date	Unedited (millions of persons)	With month-month-month edits (millions of persons)
2000 Q1	10.187	10.188
2000 Q2	10.376	10.372
2000 Q3	10.470	10.454
2000 Q4	10.065	10.064
2001 Q1	10.004	9.993
2001 Q2	10.285	10.277
2001 Q3	10.327	10.313
2001 Q4	10.062	10.060
2002 Q1	9.646	9.629
2002 Q2	9.941	9.920
2002 Q3	10.145	10.126
2002 Q4	10.447	10.435
2003 Q1	9.555	9.531
2003 Q2	9.743	9.727
2003 Q3	10.075	10.056
2003 Q4	10.102	10.091
2004 Q1	9.694	9.679
2004 Q2	9.821	9.815
2004 Q3	10.312	10.306
2004 Q4	10.263	10.261
2005 Q1	10.053	10.035
2005 Q2	10.193	10.178
2005 Q3	10.052	10.048
2005 Q4	9.933	9.911
2006 Q1	10.095	10.096
2006 Q2	10.210	10.202
2006 Q3	10.315	10.307
2006 Q4	10.278	10.276
2007 Q1	10.061	10.054
2007 Q2	10.297	10.275
2007 Q3	10.297	10.258
2007 Q4	9.799	9.775
2008 Q1	9.681	9.662
2008 Q2	10.065	10.066
2008 Q3	10.129	10.110
2008 Q4	9.465	9.435
2009 Q1	9.626	9.615
2009 Q2	9.818	9.805

Date	Unedited (millions of persons)	With month-month-month edits (millions of persons)
2009 Q3	9.935	9.901
2009 Q4	9.717	9.704
2010 Q1	9.669	9.642
2010 Q2	9.812	9.788
2010 Q3	9.745	9.715
2010 Q4	9.512	9.486
2011 Q1	9.423	9.390
2011 Q2	9.536	9.512
2011 Q3	9.428	9.406
2011 Q4	9.289	9.276
2012 Q1	9.165	9.130
2012 Q2	9.509	9.478
2012 Q3	9.713	9.669
2012 Q4	9.619	9.604
2013 Q1	9.176	9.158
2013 Q2	9.474	9.437
2013 Q3	9.603	9.570
2013 Q4	9.216	9.202
2014 Q1	9.174	9.142
2014 Q2	9.125	9.110
2014 Q3	9.310	9.280
2014 Q4	9.426	9.407
2015 Q1	9.168	9.129
2015 Q2	9.621	9.576
2015 Q3	9.247	9.210
2015 Q4	9.088	9.065
2016 Q1	9.280	9.244
2016 Q2	9.512	9.480
2016 Q3	9.278	9.242
2016 Q4	9.353	9.324
2017 Q1	9.146	9.102
2017 Q2	9.275	9.247
2017 Q3	9.263	9.221
2017 Q4	9.486	9.469
2018 Q1	9.486	9.447
2018 Q2	9.485	9.447
2018 Q3	9.410	9.382
2018 Q4	9.469	9.450
2019 Q1	9.286	9.241
2019 Q2	9.166	9.128
2019 Q3	9.435	9.400
2019 Q4	9.321	9.284

Note: CPS weights are used. Source: Current Population Survey, authors' calculations

Table 21. Quarter-to-quarter percent change in average weekly hours worked on main jobs by class of worker, nonfarm business sector, second quarter 2000 to fourth quarter 2019

Date	Self-employed (percent)	Employees (percent)
2000 Q2	2.2	0.6
2000 Q3	-1.6	0.5
2000 Q4	-0.5	-1.4
2001 Q1	-1.0	-0.5
2001 Q2	1.1	0.2
2001 Q3	-1.1	0.1
2001 Q4	-0.4	-0.8
2002 Q1	-0.2	0.1
2002 Q2	0.9	0.7
2002 Q3	-0.5	0.1
2002 Q4	-1.5	-1.0
2003 Q1	-0.4	-0.1
2003 Q2	1.2	0.8
2003 Q3	0.4	0.1
2003 Q4	-0.7	-0.6
2004 Q1	-1.1	0.0
2004 Q2	1.7	0.1
2004 Q3	-0.4	0.1
2004 Q4	-0.9	-0.2
2005 Q1	-1.1	-0.3
2005 Q2	2.5	0.8
2005 Q3	0.2	0.4
2005 Q4	-1.3	-0.5
2006 Q1	-0.6	-0.2
2006 Q2	1.5	0.3
2006 Q3	0.9	0.9
2006 Q4	-1.8	-0.8
2007 Q1	-0.5	-0.7
2007 Q2	1.4	0.8
2007 Q3	-1.1	0.4
2007 Q4	-1.7	-0.6
2008 Q1	-1.2	-0.4
2008 Q2	0.9	0.5
2008 Q3	-0.3	-0.3
2008 Q4	-3.0	-1.3
2009 Q1	-2.8	-0.9
2009 Q2	2.4	-0.3
2009 Q3	-0.9	-1.7

Date	Self-employed (percent)	Employees (percent)
2009 Q4	-0.1	1.4
2010 Q1	-1.9	-0.2
2010 Q2	2.4	1.4
2010 Q3	0.9	0.1
2010 Q4	-1.2	-0.7
2011 Q1	-2.7	-0.4
2011 Q2	3.5	1.2
2011 Q3	0.0	0.2
2011 Q4	-0.5	-0.5
2012 Q1	-0.3	-0.2
2012 Q2	1.7	0.7
2012 Q3	-0.4	0.2
2012 Q4	-0.7	-0.2
2013 Q1	-1.1	-0.2
2013 Q2	2.0	0.8
2013 Q3	-0.2	-0.1
2013 Q4	-0.2	-0.2
2014 Q1	-1.7	-0.9
2014 Q2	1.8	1.3
2014 Q3	-0.8	0.2
2014 Q4	0.9	-0.5
2015 Q1	-0.2	-0.1
2015 Q2	1.1	0.5
2015 Q3	-0.5	-1.5
2015 Q4	-1.0	1.2
2016 Q1	-0.6	-0.3
2016 Q2	1.7	0.7
2016 Q3	0.5	0.0
2016 Q4	-1.8	-0.6
2017 Q1	-1.3	-0.4
2017 Q2	3.2	0.7
2017 Q3	-0.9	0.2
2017 Q4	-0.5	-0.2
2018 Q1	-0.8	-0.5
2018 Q2	2.1	1.1
2018 Q3	0.8	0.2
2018 Q4	-0.4	-0.5
2019 Q1	-2.9	-0.5
2019 Q2	1.0	0.8
2019 Q3	1.6	0.2

Date	Self-employed (percent)	Employees (percent)
2019 Q4	0.6	-0.2

Note: CPS weights are used. Source: Current Population Survey (CPS), authors' calculations