Who Counts as Employed? Informal Work, Employment Status, and Labor Market Slack

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Working Paper 17-18

June 2017

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Abstract

Several recent studies find that as of 2015, a significant share of working-age adults in the United States participates in nonstandard work arrangements. Such arrangements tend to lack long-term employment contracts and are often referred to as "gig economy" jobs. This paper investigates the implications of nonstandard or "informal" work for the measurement of employment status and labor market slack. Using original survey data, we find that as of 2015 roughly 37 percent of nonretired U.S. adults participated in some type of informal work, and roughly 20 percent participated in informal income-generating activities that did not exclusively involve renting out their own property or selling their own goods. The survey also elicits an individual's employment status according to the definitions of the Bureau of Labor Statistics (BLS). While not the majority, a significant share of those who engage in informal work are classified as not being in the labor force; if all informal workers were counted as employed, the U.S. labor force participation rate (as of 2015) would have been 2 percentage points higher. In addition, individuals who are classified as working "part-time for economic reasons"—those who would like a full-time job but cannot obtain full-time hours—have the highest participation rate in informal work and the highest average hours per month. This latter finding suggests that informal work embodies labor market slack, and we offer several pieces of evidence that support the thesis that workers engage in informal work as a way to compensate for weak labor demand and may therefore drop informal work as formal labor market conditions improve. To estimate the amount of labor market slack embodied in informal work, we convert the total hours of informal work performed by those classified as employed part-time into a number of full-time job equivalents. This exercise yields a figure that ranges from roughly 275,000 to roughly 400,000, depending on the specifics of the calculation. At the same time, we point out that a significant share of informal work hours offer higher wages than what the same individuals earn in their formal jobs. Therefore, formal wages may need to increase by a relatively large margin moving forward in order to attract additional labor into the formal sector.

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1. Introduction

A handful of recent papers and reports use survey responses to measure participation in nonstandard work arrangements in the United States; these jobs are often referred to as informal work, independent work, contract work, contingent work, on-demand work, and/or gig work (Bracha, Burke, and Khachiyan 2015; Katz and Krueger 2016; McKinsey Group International 2016; U.S. Government Accountability Office 2015). While the survey methods differ across studies, all find that as of 2015 among working-age adults in the United States, a significant share participates in nonstandard work arrangements. This paper investigates the implications of informal work for the measurement of employment status and labor market slack. We use original survey data (from the SCE-SIWP 2014–2015[1]) to compare an individual's employment status based on the official Bureau of Labor Statistics (BLS) definitions to her employment status as revealed by participation in paid informal work activities. We use these findings to consider whether the official BLS estimates may understate U.S. labor force participation and to consider the extent to which informal work embodies labor market slack.

Our key findings are as follows:

- Among our analysis sample—survey respondents 21 years of age and older who are not retired—37 percent participate in paid informal work (not including survey work). When we remove those who engage exclusively in informal renting and selling activities, we find that 20 percent of the respondents engage in informal work.
- Among individuals classified by the BLS as employed on a part-time basis, the total amount of informal work performed represents an estimated 403,174 full-time job equivalents. Among those classified as employed part-time for economic reasons, informal work represents 320,992 full-time job equivalents (FTEs).
- If all informal workers were classified as employed, as of 2015 the employment-to-population ratio would have been higher by 2.5 percentage points and the labor force participation rate would have been just over 2 percentage points higher.
- If informal workers with at least 20 hours of informal work per week were counted as employed, both the employment-to-population ratio and the labor force participation rate would increase by between 0.5 and 1 percentage point.
- In order to better capture informal work activities in official employment statistics, employment surveys might ask about work performed in the previous month in addition to work performed in the previous week, because informal work schedules, for example, may be concentrated within one or two weeks of the month rather than taking place each week.
- While not all informal work represents labor market slack, the extent of work that is not captured by the BLS definitions is significant. Among the informal participants who experienced a job loss or other economic loss during or after the Great Recession, 40 percent report engaging in informal work out of economic necessity, and 8.5 percent of all informal workers report that they

would like to have a formal job. Both of these facts suggest that such individuals would take a formal job if offered one.

2. Background and Related Literature

The visibility of nonstandard work arrangements has received a significant boost from the rise of Uber, Lyft, AirBnB, and TaskRabbit, among others. These firms invented mobile platforms that facilitate on-demand work that eschews formal employment contracts. Gig economy work falls within a broad set of alternative work arrangements that go beyond just Internet-mediated work, and encompasses work that departs from the standard employer-employee relationship involving regular hours, a fixed wage or salary, benefits, and a long-term employment contract.[2] A growing body of evidence finds that the prevalence of these alternative work arrangements has increased since 2005. For example, Bracha, Burke, and Khachiyan (2015) find that as of early 2015, roughly 55 percent of Americans had engaged in informal work during the previous two years, and this figure represented an increase over the comparable figure of 40 percent from late 2013; Katz and Krueger (2016) find that the share of contingent workers— which includes temporary help agency workers, on-call workers, contract workers, and freelancers— increased from roughly 11 percent to almost 16 percent between 2005 and 2015 (despite being flat between 1995 and 2005). A study by McKinsey Global Institute (2016) finds that 27 percent of working-age adults in the United States are engaged in "independent work," which this study defines as entailing high worker autonomy, payment by task rather than by hour or salary, and short-term relationships between workers and clients. The U.S. Government Accountability Office (2015) reports that, as of 2010, about 40 percent of employed workers could be characterized as "contingent" according to a very broad definition of that term, and roughly 8 percent of employed workers could be characterized as "core contingent workers" when using a narrower concept of contingent work.[3]

The growing prevalence of participation in nonstandard forms of work raises numerous questions, such as whether workers are better off under such arrangements than under more standard forms of work (by mid- to late-twentieth century norms at least). This paper discusses the implications of informal work participation for the measurement of labor market slack and the measurement of employment status in the United States. According to the Bureau of Labor Statistics' Current Population Survey (the CPS or what is also referred to as the "household employment survey"), an individual is considered to be employed if he or she did any work for pay or profit in the previous week.[4] There are a few reasons why those

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[2] This standard represents an obvious simplification, and furthermore this standard only became dominant in the second half of the twentieth century.

[3] See Bracha, Burke, and Khachiyan (2015) for a detailed analysis of the changes in informal work in the United States between December 2013 and January 2015.

[4] Someone who did not work for pay or profit in the previous week might still get counted as employed, for example if they were on a temporary leave from a job.

informal workers who are not also employed in a formal job might be less likely to count as employed based on this criterion: their work may follow an irregular or intermittent schedule, such individuals may not believe that such informal activities "count" as work (see Abraham et al. 2015), or they may not want to report that they are working for reasons related to taxes or immigration status.

Given these several possibilities, an increase in nonstandard work arrangements might result in decreased estimates of the employment-to-population ratio and the labor force participation rate, even with no change in the actual number of people engaged in some type of work. Among those informal workers who also have a formal job, their total hours might be understated to the extent that their informal hours are underreported, and thus the aggregate share of workers employed on a full-time basis might be understated. On the other hand, to the extent that informal workers do get counted as employed in the official BLS statistics, increases in employment that are driven by increases in informal work might be valued differently than similar increases in formal employment, just as part-time and temporary payroll employment are valued differently from full-time or long-term payroll employment. Finally, measures of informal work participation may offer additional insights into the extent of labor market slack in the U.S. economy.

3. Defining Informal Work and Measuring Informal Work Participation

Anat Bracha, Mary Burke, and Arman Khachiyan designed the Survey of Informal Work Participation (SCE-SIWP), administered within the Federal Reserve Bank of New York's Survey of Consumer Expectations (SCE). The survey was fielded in December 2013 (SCE-SIWP 1), January 2015 (SCE-SIWP 2), and December 2015 (SCE-SIWP 3) on three separate and nationally representative samples. In an earlier paper based on SCE-SIWP 1 and 2, Bracha, Burke, and Khachiyan (2015) reported that the informal work participation rate increased from an estimated 40 percent of nonretired workers 21 years of age and older in SCE-SIWP 1 to roughly 55 percent of the corresponding population in SCE-SIWP 2. In that earlier study, an informal participant was defined as someone who (1) reported that they engaged in some type of informal work (other than paid survey completion[5]) during the previous two years,[6] and (2) reported nonzero "typical hours per month" of paid informal work during the previous two-year period.

In addition to asking whether individuals had engaged in paid informal work during the preceding two years, our three surveys also asked whether individuals were *currently* engaged in paid informal

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[5] We exclude paid survey work because all of our survey respondents would qualify as informal participants simply by participating in our survey.
[6] Individuals were presented with a list of examples of informal work, such as babysitting, dog-walking, and driving for a ride-sharing service, as well as a write-in option to indicate some other type of informal work. An individual had to check at least one item on the list, including the "other" option, to potentially be considered an informal worker. For the complete text of the questions, see the Appendix.

work, again based on a checklist of specific activities. In SCE-SIWP 2 and 3 only, a respondent who indicated that he or she was currently engaged in informal work was asked—separately for each type of informal work selected from the list of current activities—to quantify his/her typical hours and earnings per month in the given activity.[7] The responses to the questions about current informal work participation naturally offer a more accurate measure of the extent of informal work participation at a given point in time than do responses to the questions about participation in the preceding two years; the same responses have the added benefit of containing information on earnings and hours by type of informal work. However, a snapshot of the informal participation rate within a specific month may reflect seasonal labor market influences to a greater extent than would an informal participation rate based on activities performed at any time in the preceding two-year period. Consistent with monthly seasonal patterns in payroll employment, we find that informal participation rates based on current engagement are lower in SCE-SIWP 2, fielded in the month of January, than for either SCE-SIWP 1 or SCE-SIWP 3, both of which were fielded in the month of December.

For our present purposes, we believe that the benefits of defining informal participation based on current engagement outweigh the drawbacks. Hereafter in this paper, a survey respondent is defined as an informal participant if the individual (1) reports being "currently engaged" in some type of informal work (not including the exceptions described below), and (2) across the informal work activities in which the individual reports being currently engaged, the total number of paid informal hours is strictly positive (not including hours spent on excluded activities, described below). To minimize the seasonality problem, we combine the (weighted) responses from SCE-SIWP 2 and 3 and report the average participation rates between the surveys. As a result, our estimates represent an average of the "current" participation rate (or current hours, earnings, and so on) between January 2015 and December 2015.[8]

To focus on alternative paid work activities that require significant labor input and that do not rely on owning valuable assets, we do not count someone as an informal participant if their informal work consisted exclusively of renting out their own property and/or selling their own used goods.[9] Consistent with this decision, average informal work hours are lower among individuals who engage exclusively in renting and selling than among those who engage in other activities. We continue to exclude those who engaged only in paid survey work, and again we restrict the sample to nonretired individuals 21 years of

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[7] In choosing to use these questions from SCE-SIWP 2 and 3 to help define informal work participation and to measure these hours and earnings, we drop SCE-SIWP 1 from most of the current analysis because comparable questions are not available in that survey.

[8] Due to the potential seasonality issue in the estimates of the current informal work participation rates, we do not make pronouncements about changes in participation between SCE-SIWP 2 and SCE-SIWP 3.

[9] Among those respondents who engaged in informal labor, such as babysitting, in addition to renting property and/or selling their own used goods, hours and earnings for the renting/selling tasks are excluded from our calculations of the individual's total informal hours and total informal earnings. Such exclusions are not possible in Survey 1, which did not ask respondents to report hours and earnings separately by task.

age and older.[10] Based on the differences between the definition of informal participation employed in the present study and the definition used in Bracha, Burke, and Khachiyan (2015), the estimates of informal participation rates are not comparable between these two studies. Nonetheless, all the previous results remain accurate based on the definitions employed at the time.

In addition to asking questions about participation in informal work activities, the survey collected basic demographic information about the respondents and their households. A subset of questions taken from the CPS enable us to determine an individual's detailed employment status according to the official definitions used by the BLS.[11] Based on the answers to these questions we calculate the labor force participation rate, the unemployment rate, and the employment-to-population ratio within our unrestricted survey sample (N=2,233), taking averages between SCE-SIWP 2 and 3. As shown in Figure 1, the employment statistics for our survey population are comparable to the BLS's published employment statistics for the United States for the same time period (taking an average of the employment statistics from January 2015 and December 2015).[12] The 2015 labor force participation rate in our sample is 2.8 percentage points higher than the BLS's official U.S. participation rate, but the 95 percent confidence interval for our estimate includes (at the lower bound) a value that almost matches the official U.S. rate. Similarly, the employment-to-population ratio for our sample is somewhat higher than the U.S. rate but most likely does not differ significantly from it, and our unemployment rate is slightly lower than the U.S. rate.[13] These results indicate that our sample is reasonably representative of the U.S. population with regard to employment status.

For the purposes of analyzing informal work participation, we restrict the samples from SCE-SIWP 2 and SCE-SIWP 3 to respondents 21 years of age and older who are not retired, as we are primarily interested in the activities of potential candidates for participation in the formal U.S. labor market. We also exclude a small number of respondents who reported individual incomes (from a formal job) of $600,000 per year or more, as well as those with missing values for the responses of interest. The resulting analysis sample consists of a total of 1,377 respondents—690 from SCE-SIWP 2 and 687 from SCE-SIWP 3. Table 1 describes some selected characteristics of the analysis sample, combining the results from SCE-SIWP 2 and SCE-SIWP 3.[14] Unlike the unrestricted sample, the analysis sample is not

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[10] Additional sample restrictions are described below.

[11] We did not include all the questions related to employment status that are included in the CPS household survey. See the Appendix for the set of questions used to determine BLS employment status.

[12] Our survey data are not seasonally adjusted. Therefore we use nonseasonally adjusted BLS data to calculate the comparable employment statistics for the United States.

[13] We do not have confidence intervals for the U.S. employment statistics and therefore we cannot test formally for whether our estimates differ significantly from the U.S. labor market statistics generated by the BLS.

[14] The statistics from the combined surveys are calculated by taking the weighted mean (or other weighted statistic) within each survey and then taking the simple average of the statistics from the two surveys. In this way, each survey is given equal weight in the calculation of the combined statistics. The weights for a given survey are designed so that a selected set of the weighted sample characteristics match those of the Current Population Survey for the same time period.

representative of the overall U.S. population in terms of average employment status because we select only nonretired individuals who are 21 years of age and older. In addition, the analysis sample population has a relatively high level of educational attainment compared with the U.S. population, and a slightly higher average income compared with total population estimates.[15]

Within the analysis sample, roughly 37 percent of the respondents are "currently engaged" in some type of paid informal work, not including survey work.[16] Excluding those who engage only in informal renting and selling activities, roughly 20 percent of the analysis sample (241 individuals) are then classified as informal work participants.[17] (From this point forward, the discussion of "informal work participants" will refer only to this latter group.) As shown in Figure 2, Panel A, the informal labor force participation rate is significant within all the BLS employment categories, including those classified as being not in the labor force (NILF), and yet the informal participation rate is the highest for those who are classified as being employed part-time for economic reasons (PTER). To give a conservative estimate—based on the lower bound of the 95 percent confidence interval—at least 30 percent of those classified as PTER participate in informal work based on our definition.

As shown in Figure 2, Panel B, monthly income from informal work—calculated among the subset of informal participants only—is statistically and economically significant across all employment classes. Across all groups, the average monthly informal earnings amount to $405. The average informal earnings per month appears somewhat greater among employed individuals compared with those who are either unemployed or not in the labor force. Among employed individuals, those employed part-time have higher average earnings than those employed full-time, and those classified as PTER may have higher earnings than other part-time employees. However, given that some of these estimates are imprecise, we cannot be confident that the earnings from informal paid work are significantly different across the different employment classes.

4. Does Informal Work Represent Labor Market Slack?

Participation in informal work raises the question: what is labor market slack? Defining slack as the available labor hours that are not utilized in the formal labor market, the number of informal work hours may be indicative of the amount of slack that exists in the formal labor market. To determine whether there is indeed substitution between formal and informal hours—in which case informal hours would represent slack—we examine the relationship between changes in informal work (participation and informal hours) and formal labor market conditions for different demographic groups and for two broad

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[15] The population estimates refer to 2015 Current Population Survey, Table PINC-04.

[16] Consistent with the definition given above, we also require that respondents indicated nonzero hours per month in at least one informal activity other than survey work.

[17] Again, these statistics represent simple averages of the weighted statistics from SCE-SIWP 2 and 3, respectively.

groups of states that differ in their formal labor market conditions. We also examine informal work patterns among part-time workers, especially those who are working part-time for economic reasons, because the informal work performed by these individuals may be more likely to represent labor market slack than the informal work performed by members of some other employment groups, such as those who are already employed full-time or those who are not in the labor force and are not interested in finding work. We then attempt to quantify how much slack may be embodied in the informal work performed by part-time workers. This estimate is done by calculating the full-time job equivalent of the informal work hours reported by part-time workers.

On balance, our results suggest that informal work does embody a significant amount of labor market slack. In particular, we find that formal labor market conditions are negatively correlated with informal work hours, and those who are employed part-time for economic reasons are especially likely to turn to informal work, as might be expected if informal hours represent a substitute for formal work. We find that most informal workers (regardless of their formal work status) engage in this work for the money; informal workers who lost a job or experienced other negative economic fallout from the Great Recession state directly that their decision to engage in informal work represented a response to those economic shocks. The total number of informal work hours performed by all part-time workers represents 403,174 full-time job equivalents (FTEs), and the total informal hours performed by those who are working part-time for economic reasons amounts to 320,992 FTEs. Considering the recent payroll employment growth estimates from the BLS, these numbers represent between two and three months' worth of nonfarm payroll employment gains. However, since the official job growth figures do not differentiate between full-time and part-time jobs, the average payroll job represents less than one FTE. In the next section we show that the average earnings from informal work are substantial for all the BLS employment groups.

4.1. Formal and Informal Labor Substitution

If informal work serves as a substitute for formal or traditional employment, informal work participation and informal work hours should vary negatively with labor demand in the formal sector. Our survey data do not allow us to observe directly whether a given individual substitutes away from informal work as formal labor demand improves over time (or vice-versa). Instead, we test for substitution between formal and informal work within aggregated groups of individuals, as the labor market conditions specific to those groups change over time. Separately, we analyze patterns in informal work participation among individuals who work part-time, especially those who are working part-time for economic reasons, including the relationship between the formal and informal wages of such workers. Finally, the survey

contains suggestive evidence on the individual level related to the substitutability of informal and formal work, which we describe below.

4.1.1. Group-Level Analysis

State Groups

To link formal labor market conditions to informal work behavior, we first define two separate measures of a state's formal labor market conditions as of 2015 (averaging between January 2015 and December 2015). The first measure is the state's unemployment rate gap in 2015, defined as the difference between its 2015 unemployment rate and its average unemployment rate over the 2005–2007 period. (The latter measure is a proxy for the state's natural rate of unemployment.) The second measure will be referred to as the state's "PTER gap" in 2015, which is defined as the difference between the state's share of employed workers classified as part-time for economic reasons as of 2015 and the average value of this share in the state for the 2005–2007 period. Given these measures, we first split states into a "high" unemployment gap group and a "low" unemployment gap group, where the high-gap states have zero or positive unemployment gaps and the low-gap states have strictly negative unemployment gaps. Separately, we partition states into a "high" PTER gap group and a "low" PTER gap group, where the PTER gaps are greater than 1 in the high-PTER-gap states and less than or equal to 1 in the low-PTER-gap states.[18] For a given partition—for example, between those states with high unemployment gaps and those states with low unemployment gaps—we place each observation in our survey sample into either the high-gap group or the low-gap group based on each respondent's state of residence. For both groups we then calculate the change in the average informal work participation rate and the change in average informal hours between January 2015 and December 2015. We proceed analogously in the case of the partition based on the PTER gaps.

We find, consistent with the assertion of substitutability between formal and informal work, that the "low" unemployment gap states (meaning those with better formal labor market conditions) experienced smaller changes in both informal work participation and informal hours compared with the "high" unemployment gap states. As shown in Table 2, the informal participation rate actually declined in the low unemployment gap states and increased in the high unemployment gap states. The average informal hours increased in both groups of states, but such hours increased by only a very slight margin in the low-gap states and increased by a much larger amount in the high-gap states.

When we compare states with high PTER gaps to those with low PTER gaps, again we find that between January and December 2015, the low-gap states experienced smaller changes in informal work

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[18] A list of the states that belong to each group—high unemployment gap, low unemployment gap, high PTER gap, low PTER gap—is provided in the Appendix.

participation and informal hours compared with the high-gap states. As shown in Table 2, the informal participation rate increased in both groups of states, but increased by a larger margin in the group of states with high PTER gaps, while informal hours decreased by a small amount in the low PTER gap group and increased significantly in the high PTER gap group.

Demographic Groups

In this subsection we use the variability in formal labor market conditions across demographic groups within our analysis sample to examine how informal work responds to business cycle fluctuations. First we divide the analysis sample into 16 demographic groups based on combinations of gender, education level (split between those with at least some college and those with no college), and age group (25–39 years, 40–54 years, 55–64 years, and 65 years and older).[19] Based on its small sample size, we drop the group of females 65 years of age and older with at least some college. Then, using regression analysis we relate group-level changes in informal work outcomes between January 2015 and December 2015 to contemporaneous changes as well as one-year lagged changes in formal labor market conditions within the same groups.[20, 21] The informal work outcomes examined are the informal participation rate by group and (separately) the average informal work hours by group.

Several measures of formal job market conditions are included as explanatory variables: (1) the percent change between January 2014 and December 2014 in the share of workers (by demographic group) that are classified as working part-time for economic reasons, (2) the percent change in the unemployment rate within each demographic group between January and December 2014, and (3) the percent change by demographic group in average "formal" hours (across all individuals regardless of employment status), again between January 2014 and December 2014. These three variables are constructed using the monthly micro-data from the BLS's Current Population Survey (Flood et al. 2015) and are not seasonally adjusted. Each pertains to a one-year lag relative to the time period over which the dependent variables are measured, since informal work outcomes are likely to respond to changes in formal labor market conditions with a lag, and because contemporaneous changes in labor market

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[19] We omit those who are 21–24 years old from the regression analysis because individuals in that age range tend to have different formal labor market behavior than those who are 25–39 years old, and our sample size of those who are 21–24 years of age (especially when subdivided by sex and education) is too small to form a separate group.

[20] The reader may be concerned about any seasonal changes in informal participation between January 2015 and December 2015. Assuming that seasonality affected all of our demographic groups similarly in terms of percent changes in informal work habits between those dates, the common seasonal component of the dependent variables should be captured in the constant term of the regression. Even if seasonal effects differ across our demographic groups, the fact that we use nonseasonally adjusted data to construct our explanatory variables helps to control for that possibility.

[21] The three waves of our survey give rise to two changes in (average) informal work outcomes for each age-education-sex demographic group—from December 2013 to January 2015, and from January 2015 to December 2015. Based on the aforementioned changes in the survey design over time, some of the relevant explanatory variables cannot be constructed for the period between the first two survey waves. Therefore we can only make use of the group-level changes in informal work for the period between January 2015 and December 2015.

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conditions might be endogenous—that is, they might depend on unobserved factors that also affect informal work outcomes. Three additional explanatory variables are constructed using our survey data: the percent change between January 2015 and December 2015 in the average formal wage by demographic group (included as an explanatory variable in the model of the informal work participation rate); the percent change between January and December 2015 in the average formal wage by demographic group, restricted to each group's informal workers (included in the model of informal work hours); and the percent change over the same time period in the average informal wage by demographic group (among informal workers only). Of necessity these factors pertain to the same time period as do the dependent variables, as we do not have data on these factors for the one-year lagged period.

The regression results are presented in Table 3. Because the dependent variables as well as the independent variables represent percent changes, the coefficients represent elasticities. We observe no significant relationship between formal labor market conditions (whether one-year-lagged or current) and changes in informal work *participation* between early and late 2015 (the table's first three columns). Although the point estimates are statistically insignificant, they suggest that there might be a positive relationship between the lagged share of workers who are classified as PTER and the extent of informal work participation as well as a positive relationship between the lagged unemployment rate and informal participation. While the results pertaining to the extensive (participation) margin are insignificant throughout the regressions, these results might reflect the small number of groups in the analysis and limited variation across the groups in the explanatory variables.

However, there is evidence of a significant relationship between formal labor market conditions and informal work along the intensive (hours) margin, as shown in the last three columns of Table 3. Specifically, we find that a one-year-lagged increase in the share of workers classified as part-time for economic reasons is strongly associated with a current increase in the group's informal work hours. Likewise, a lagged increase in a group's unemployment rate predicts a current increase in informal hours for the group. These results do not prove that changes in formal labor demand cause subsequent changes in the supply of informal work hours. One reason why is that the changes in formal as well as informal labor market conditions are changes in equilibrium outcomes, which may reflect changes in both supply and demand. Nonetheless, the results are consistent with the hypothesis that an improvement (or alternatively, a deterioration) in formal labor market demand could subsequently lead individuals to reduce (alternatively, to increase) the amount of informal work they undertake.

We also find a negative and significant relationship between the lagged percent change in formal hours (across 2014) and the current percent change in informal hours (across 2015), suggesting that individuals may substitute formal hours for informal hours and vice versa. Interestingly, the change in the informal wage seems to be negatively related to the change in informal hours. This result suggests that

individuals adjust informal hours in the opposite direction to movements in informal wages, perhaps in order to target a fixed level of informal income. This finding agrees with prior evidence that taxicab drivers and some other types of workers with flexible hours engage in income-targeting behaviors, such as stopping work for the day once a given amount of money has been earned (see Camerer et al. 1997). In contrast, the change in formal wages is positively related to the change in informal hours. This result seems puzzling at first but it may indicate that an increase in formal wages also signals an improvement in informal job opportunities—for example, if demand for output in both the formal and informal sectors increases at the same time. We indeed find a positive correlation of 0.29 between the change in the formal wage and the change in the informal wage. Reverse causality is another potential explanation for the positive relationship between formal wages and informal hours—an increase in informal hours within a particular demographic group might result in fewer slack hours available to the formal sector, which in turn would necessitate greater wage increases in the formal sector to attract the marginal hour of work.

In sum, the results of the group-level analyses are consistent with the hypothesis that individuals substitute at the margin between working in the formal and informal sectors as labor market conditions in the formal sector fluctuate over the business cycle. In particular, these results suggest that individuals might increase the number of informal hours they work if they cannot secure enough hours in the formal sector.[22]

4.1.2. Individual-Level Analysis

Direct Evidence

All the survey respondents were asked whether they personally (or their spouse or partner) experienced any negative economic consequences resulting from the Great Recession, such as a job loss, a reduction in work hours, a pay cut, a home foreclosure, bankruptcy, or other shocks. Subsequently, the informal work participants who reported that they had experienced at least one such shock were asked two additional questions: first, whether their decision to engage in informal work had been influenced at all by the negative economic circumstances they had suffered, and second, whether their choice of how many hours to work informally was influenced by the same circumstances. On average between SCE-SIWP 2 and 3, about 40 percent of the respondents said that their decision to engage in informal work was influenced by having experienced negative economic consequences stemming from the recession, and 41 percent said that the number of informal hours they chose to work had been influenced by these adverse

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[22] The finding that informal work participation rates are higher among the employed than the unemployed (or than those not in the labor force) does not contradict the results of the regression analysis. The reason is that the regression analysis relates changes in hours and participation rates to changes in employment statistics, and these results are independent of the pre-existing levels of participation by employment status. Also, bear in mind that in each of the demographic groups there are both employed and unemployed individuals.

consequences. These responses strongly suggest that some individuals turn to informal work as a substitute for formal employment following the loss of a formal job or a reduction in formal work hours.

An additional question in the survey asks informal workers about the reasons for why they work informally. Respondents were asked to mark their main reason or reasons (as many as were applicable) for working informally from a list of possible reasons such as a hobby, maintain or acquire new skills, meet people, earn extra money, main source of income, or to specify any other reason not on the list. The overwhelming majority (78.5 percent on average between SCE-SIWP 2 and 3) indicate that making money—whether extra money or the main source of income—was a reason for working informally. Moreover, 56.7 percent of the respondents in SCE-SIWP 3 who engage in informal work report that this employment was similar to their formal job(s) in terms of the types of tasks performed.[23] Together, these results further suggest some substitutability between formal and informal labor.

Informal Work by Employment Status

Additional evidence concerning the relationship between labor market conditions and informal work can be seen by examining informal work by employment status in Figure 2, Panel A. We find that part-time workers, especially those who are PTER, have the highest participation rate of all employment status groups ($p=0.00$), and work the most informal hours ($p=0.01$). These facts further support the hypothesis of substitutability between formal and informal work because part-time workers are likely experiencing worse formal labor market conditions than full-time employees, and at the same time, their participation in the informal labor market reveals that they are capable and willing to work. Moreover, examining the subset of individuals who are classified as PTER, we find that members of this group have an even higher participation rate and more informal work hours than the remaining part-time workers ("PTNER," meaning part-time for noneconomic reasons), and that this difference is marginally significant ($p=0.07$ when comparing hours and $p=0.09$ when comparing the participation rates between the PTER and the PTNER employment groups).

4.2. Various Measures of Slack

Labor market slack is an important indicator of the amount of (payroll) employment growth that can occur before wage growth begins to accelerate, an estimate that in turn helps to predict the future time paths of wage and price inflation. Generally speaking, the greater the slack, the easier it is for employers to fill additional payroll jobs at the going wages and hence expected wage growth is lower. Labor market slack is typically measured as the gap between the full (or "potential" or "trend") employment level and the actual employment level with employment measured in terms of payroll jobs (see Aaronson, Brave,

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[23] The question pertaining to the similarity between an individual's formal and informal jobs was only asked in SCE-SIWP 3 and not in previous editions of the survey.

and Kelley 2016). As such, unemployed individuals and some of those who are not in the labor force—such as those who would like a job but have given up searching—are typically counted as slack labor. Individuals classified as PTER are also seen as contributing to labor market slack to the extent that their hours fall short of a full-time schedule; those who are working part-time for noneconomic reasons are typically not considered a source of labor market slack.

The traditional measure of labor market slack—taking the difference between full and actual employment—assumes that all of that difference represents unpaid hours. However, our survey shows that the amount of paid informal work is nonnegligible, which implies that some of the supposedly slack labor hours are being devoted to income-generating activities. It may be more expensive to recruit hours devoted to informal work into the formal labor market than to hire slack labor that is not earning a money wage. Therefore, the traditional measure of labor market slack should be adjusted to reflect this fact. If this adjustment does not occur, the traditional measure of slack could underestimate the amount of payroll employment growth that can take place before wage pressures intensify. Accordingly, in Section 4.2.1 we offer an illustration of the extent to which a standard measure of labor market slack is reduced when informal work participation is taken into account. In doing so, we focus exclusively on the contribution to slack made by part-time workers, for the reasons explained below.

The traditional measure of slack can be viewed as an upper bound, since it assumes that all individuals who would like to work more hours are willing to take a full-time job. Alternatively, informal work hours as measured in our survey can be interpreted as a lower-bound estimate of the actual additional hours individuals are willing to supply. This interpretation represents a revealed preference approach, in which the observed behavior regarding informal work is seen as revealing individuals' preferences for supplying additional labor hours. In calculating this lower-bound estimate of labor market slack, we focus on those individuals classified as employed on a part-time basis.[24] We set aside unemployed individuals as well as labor force nonparticipants for the following reasons: (1) the unemployed individuals make up only a small share of our survey sample and they perform, on average, only a small amount of informal work,[25] and (2) among the informal workers in our sample, those individuals who are not in the labor force are the most likely to give "as a hobby" as a reason for working informally. Accordingly, the informal work performed by those classified as nonparticipants is less likely to represent labor market slack than is the informal work performed by part-time employees.

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[24] This calculation includes both those who are classified as PTER and those who are classified as PTNER. While the traditional measure of labor market slack excludes those who are PTNER, even this type of worker reveals a willingness to supply additional labor to the extent that the individual is engaging in informal work.

[25] Unemployed individuals may be reluctant to participate in informal work so as not to disqualify themselves from receiving unemployment insurance benefits, and/or they may be reluctant to report engaging in such work for similar reasons. Taking at face value the reports of informal work among the unemployed, the total amount of informal work performed by such individuals is very small in comparison with the total amount of informal work performed by part-time employees.

The following two sections, 4.2.1 and 4.2.2, describe in detail the calculations of the upper-bound and lower-bound estimates, respectively, of labor market slack among part-time workers.

4.2.1 The Upper-Bound or Traditional Estimate of Slack

Labor market slack among part-time workers is typically measured by the FTE of the hours that would be gained if all those classified as part-time were to work full-time. (Typically such calculations are restricted to those classified as PTER. However, for the purposes of comparison with our lower-bound estimates we make calculations for all part-time workers and then only for those who are working PTER.) To calculate this measure, one takes the difference between full-time hours—defined as 40 hours per week—and the average hours per week reported by part-time employees, and multiplies that difference by the total number of part-time workers. Using CPS data for December 2015, this measure of slack comes to 8.45 million FTEs. Making a similar calculation that is restricted only to PTER workers, the estimate of slack comes to 2.82 million FTEs.

However, this approach implicitly treats all the work hours not currently employed in the formal sector (among part-time employees) equally, when in fact some of these supposedly slack hours are generating income—the hours devoted to paid informal work—while other hours measured as slack are not generating income.[26] To account for the fact that the labor market slack that is currently engaged in informal work may be categorically different from the slack that is not so engaged, from the above (upper-bound) slack estimate we subtract the total informal hours performed by part-time workers. Considering all part-time employees, the adjusted estimate equals 6.43 million FTEs. Making a similar adjustment among workers who are PTER, the adjusted number of FTEs equals 1.69 million. Based on these revised calculations, participation in informal work arrangements potentially negates 24 percent of the conventional measure of slack for those who are employed part-time and 40 percent of the conventional measure of slack for those who are employed part-time for economic reasons.

Of course, factors other than wages may also drive the decision of whether, at the margin, to work an extra hour in the formal sector versus in the informal sector. Even at a lower wage, some individuals might prefer to engage in informal work because it offers more flexible work hours and perhaps the possibility of evading income taxes. At the same time, the choice between formal and informal work will also depend on the nonwage forms of compensation offered in the formal job, such as healthcare and retirement savings benefits and possibly a more steady income stream. Regardless of these other considerations, it seems reasonable to assume that the wage offers needed to lure informal hours into the formal sector will be higher than the wage offers required to lure currently idle hours into formal work.

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[26] These hours may nonetheless have value in the form of leisure or home production.

4.2.2 The Lower-Bound Estimate of Slack

In this section, we make a conservative estimate of labor market slack by taking the amount of informal work performed by part-time employees as a revealed amount of desired additional work, i.e., slack. We first consider all part-time employees and then consider only those classified as PTER. A justification for making a calculation that includes all part-time workers (rather than just PTER workers) is that even those who would not be willing to work a full-time formal job may still prefer to supply more formal hours than they are currently doing. Engaging in informal work in addition to having a part-time job in the formal labor market may in fact reveal such a preference.

To quantify the extent of labor market slack represented by informal work among part-time workers, we calculate the number of full-time job equivalents (FTEs) embodied in such work. Given that full-time employees also work informally, albeit to a lower extent compared with part-time employees, in calculating the slack represented by informal work among part-timers we assume that the part-time employees would continue to do informal work to the same extent as full-time employees even if these part-time workers were to be employed full-time in the formal sector. In our calculations we therefore include only the amount of informal work done by part-time employees that is above and beyond the amount of informal work done by those individuals who also have a full-time job.

The actual calculation then is straightforward: we take the average participation rate in informal work among all part-time employees and multiply it by the number of individuals working part-time in the United States (18.98 million). This calculation is an estimate of the actual number of part-time employees that engage in informal work in the United States. We then calculate the difference between the average monthly informal hours performed by part-time employees (among those who participate) and the corresponding figure for full-time employees and multiply that difference by the estimated number of U.S. part-time workers who engage in informal work. The result represents an estimate of the aggregate number of extra informal work hours per month performed by part-time workers (relative to full-time workers). Assuming that a full-time job equals 160 hours per month (based on a 40-hour work week and four weeks per month), we divide the latter figure by 160 to arrive at the number of FTEs that are likely to constitute slack in the formal labor market.

We find that:

- The extent of slack among all part-time U.S. workers amounts to 403,174 full-time jobs, and

- If we restrict attention only to those who work part-time for economic reasons (PTER), the resulting measure of labor market slack amounts to 320,992 full-time jobs.

These estimates are naturally much lower than the upper-bound estimates given above. A key reason for the difference between the lower-bound estimate and the upper-bound estimate is that, for the average

part-time employee in our survey, the informal work hours which are observed amount to much less than the difference between full-time hours and their current part-time formal hours. If the actual supply of informal work represents a reliable gauge of the willingness to supply additional labor, our calculations suggest that among those classified as PTER, labor market slack is lower than the standard measures indicate. In contrast, among those classified as PTNER the amount of slack is greater than is indicated by conventional measures, which often assume that workers of this type are not indicative of labor market slack.

In the calculations just made, the assumption we have maintained is that once formal job market conditions improve, individuals would forgo informal work for more formal work. However, if individuals earn more per hour working informally than they can command in the formal labor market, they may not substitute formal for informal work, even if the opportunity arises. To take this possibility into account, we use self-reported information on the relationship between a given individual's formal wage and his/her informal wage to assess the likelihood that people will be willing to work more hours in the formal sector at the existing formal wage.[27] We find that for 42 percent of the part-time employees who work informally, their average informal wage is higher than their average formal wage.[28] If we assume that individuals will substitute away from informal work towards formal work only if their formal wage is higher, then only those individuals who meet this criterion should contribute to the calculation of the revealed amount of slack embodied in informal work. Adopting this approach, we again calculate the number of FTEs embodied in the informal work done by part-time employees, but only include the informal work hours performed by part-time employees whose average informal wage is lower than their formal wage. Considering all part-time employees, this even more conservative estimate of labor market slack comes to 275,510 full-time jobs.[29] Among those considered PTER, the corresponding estimate of slack equals 180,792 FTEs.

5. The Effect of Informal Work on Official Labor Market Estimates

As of September 2016, the 5 percent U.S. unemployment rate represents a significant improvement over its 10 percent peak, reached in October 2009 in the aftermath of the Great Recession. Yet over this almost seven-year period during which unemployment fell by 5 percentage points, the employment-to-population

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[27] The exact question is "How do you think the average pay you receive for informal paid activities or side jobs compares to what you would expect to earn (or do earn) in the same amount of time in a salaried job?"

[28] However, our survey data also allows us to calculate, for each informal worker and each type of informal work performed, the hourly wage earned by the given worker in the given informal job. Examining these hourly wage data among those who reported separately that their average informal wage was lower than their formal wage, we find that only 24 percent of the informal hours worked by this group entailed an hourly wage that was lower than their formal wage.

[29] Note that, unlike in the previous calculation, we include all informal hours worked by the group under consideration, rather than the difference between their informal hours and the average informal hours of full-time employees. This approach assumes that, because the informal wage is lower than the formal wage for these individuals, they would substitute all informal hours for formal hours if given the chance.

ratio increased by just 1.3 percentage points and the U.S. labor force participation rate fell by more than 2 percentage points. Both of these latter indicators remain significantly depressed compared with their respective pre-recession peaks. Although population aging made a large contribution to the decline in labor force participation since the Great Recession, the participation rate declined significantly since 2007 among prime working-age individuals, meaning those who are 25–54 years old.[30]

This decline in prime-age labor force participation, which has been most pronounced among individuals with a completed high school education or less, is not yet fully understood. According to a study by the Council of Economic Advisers (CEA 2016), a fall in the demand for low-skilled labor is a leading cause of the decline in workforce participation among less-educated prime-age males, while only a small portion of that decline is due to increases in Social Security disability insurance (SSDI) claims. Taking these results at face value, one is left wondering how prime-age nonparticipants make ends meet, and whether they might actually be earning income and yet not be counted as employed by the BLS.

As previously stated, our survey contains several questions that are either identical to or similar to the questions contained in the CPS that are used to determine an individual's employment status according to the BLS definitions. We use the responses to these questions to predict how the respondents in our survey would get classified (in terms of their employment status) under the BLS system. As seen in Figure 3, Panel B, the overwhelming majority (almost 80 percent) of informal work participants in our survey are classified as employed under the BLS definitions, roughly equal to the employed share for the overall analysis sample (Figure 3 Panel A). However, informal workers are significantly less likely to be employed on a full-time basis compared with the members of the analysis sample in general, and accordingly are more likely to be employed on a part-time basis, whether for economic reasons or other reasons. In addition, 16 percent of informal participants are classified as not in the labor force, despite the fact that they perform a nonnegligible number of informal work hours and earn significant sums of money from engaging in informal work. An additional 4 percent are classified as unemployed, but that figure could be much lower (almost zero) based on the wide confidence interval around this result. As shown in Figure 4, the informal work participants who are classified as not in the labor force work an average of 22 hours per month in informal jobs, or more than five hours per week. As illustrated in Figure 2, Panel B, members of this same group earn close to $340 per month on average from informal work.

There are a few possible reasons why informal workers may not be included in the labor force according to the BLS definition, which requires that an individual report either that during the previous week they did work for pay (or profit) or that they were on temporary leave from a job. First, informal work might occur intermittently, such that informal workers are less likely to have worked in the previous

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[30]According to recent work by Aaronson et al. (2014), roughly half of the total decline in the U.S. labor force participation rate between 2007 and 2013 can be explained by population aging.

week than someone in a more regular job, even if both individuals work the same total hours per month. Second, many people might believe that informal work doesn't really count as work—according to Abraham et al. (2013), individuals working in temporary positions or less secure forms of employment are less likely to report their work hours than those who are employed in permanent, traditional jobs. Third, informal workers might choose not to report engaging in informal work because they are not reporting this income to the Internal Revenue Service. While in the case of our survey this last possibility seems contradictory because these individuals were willing to report their informal work to us in separate questions, it may apply to individuals filling out the actual Current Population Survey.

Because the CPS does not intend to discriminate among different types of work, one could argue that informal workers ought to get counted as employed, especially if they performed informal work in the previous week and simply failed to report doing so. To estimate how much difference such a reclassification would make to the official BLS employment statistics, within our sample we simulate the effect that classifying informal workers as employed has on the employment-to-population ratio, the labor force participation rate, and the unemployment rate. To do so, we begin with the BLS-defined employment statistics for our unrestricted sample—all the respondents who are 16 years of age and older. We then calculate simulated employment statistics for the unrestricted sample based on classifying *all* (nonretired) informal work participants as employed, regardless of their BLS-defined status.[31] We use the unrestricted sample so that our employment statistics are comparable to the published data for the United States. As shown in Figure 5, Panel A, the employment-to-population ratio increases by 2.6 percentage points, the unemployment rate falls by 1 percentage point, and the labor force participation rate increases by just over 2 percentage points. While the differences between the simulated measures and the official measures are not necessarily statistically significant, they are economically significant.

Taking a more conservative approach, we classify informal work participants as employed, provided that they work a total of at least 20 hours per month across their informal jobs. Under this alternative re-classification (Figure 5, Panel B), the employment-to-population ratio increases by 0.8 percentage point, labor force participation increases by 0.7 percentage point, and the unemployment rate edges down just 0.1 percentage point, compared with the corresponding statistics based on the BLS definitions.

While some informal workers in our sample are classified as not being in the labor force according to the BLS definition, other informal workers in our sample do appear to get counted as being employed on the basis of informal work alone. Among the individuals in our analysis sample who are classified as employed under the BLS definition, close to 4 percent are informal work participants who, judging from their responses to other survey questions, appear to lack formal employment. Based on this

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[31]The informal work participants who reported extreme incomes (described in Section 3 above) are not reclassified as employed.

latter evidence, informal work seems to make at least a modest contribution to both the labor force participation rate and the employment-to-population ratio.

The estimates of how many workers are employed full-time versus part-time also change if we include the hours worked in informal jobs. Similar to the exercise above, we start by calculating the share of employed individuals in our analysis sample who are classified as employed on a full-time basis and the share employed on a part-time basis, according to our approximated BLS definitions for full-time employment and part-time employment.[32] Using the same underlying population—those defined as employed based on the BLS definition—we then classify individuals as being employed "full-time," provided the sum of their formal hours and their informal hours equals 160 hours per month or more. (As part of the SCE-SIWP, individuals are asked separately about the hours worked in their formal job/s and the hours worked in their informal jobs.) As shown in Figure 6, the share of employed individuals who are classified as "full-time" increases by 4.6 percentage points when informal hours are included in the total hours they worked, and of necessity the share designated as "part-time" decreases by the same amount. This exercise suggests that, although informal workers are more likely than the average member of our sample to be classified as working on a part-time basis, some informal workers may achieve full-time status by virtue of participating in informal work in addition to having a formal job.

6. Conclusion

Our findings suggest that informal work participation complicates the official U.S. measurement of employment status. In particular, a significant share of those who report being currently engaged in informal work also report separately that they performed no work for pay or profit in the previous week. This apparent discrepancy may occur either because informal work is irregular, or because individuals do not believe that informal work counts as labor unless asked directly about specific informal activities. In light of such potential underreporting of informal work, the BLS's official labor force participation rate might be too low by an economically meaningful (if modest) margin, and the share of employed workers with full-time hours is also likely to be higher than indicated by the official employment statistics. In light of the more intermittent nature of informal work, one potential remedy is for the BLS employment surveys to ask individuals about their work activities in the previous month in addition to asking about paid activities undertaken during the previous week. Moreover, it may be beneficial to explicitly inform

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[32]Our measures are approximated because we use a smaller set of questions to determine part-time status compared to what is included in the complete CPS. In SCE-SIWP 2, full-time status is defined as reporting 35 work hours or more spent last week in an individual's "main job," and part-time status is defined as reporting less than 35 hours in the main job. However, those who report working less than 35 hours are classified as "full-time" if they separately indicate that their "regular hours" are full-time. In SCE-SIWP 3 we apply a similar method except that individuals are asked about the hours worked last week in all of their jobs if they have more than one job.

respondents that in answering these questions they should consider all kind of paid work, whether or not this income was earned from a formal job. Our findings also suggest that, to the extent that informal work represents labor market slack, such slack is concentrated among part-time workers, and especially among those who are employed part-time for economic reasons. Going beyond the informal work that is done by those who are officially counted as full-time workers, we quantify the amount of informal work done by those individuals who exclusively work part-time, and find that such informal work amounts to over 400,000 full-time equivalent jobs We also find that about 70 percent of all informal work is done for a wage that is either similar to the individual's formal wage or is even higher. This result suggests that while we find evidence for the substitutability of formal for informal work, formal pay may need to increase substantially to attract the hours currently devoted to informal work into the formal labor market.

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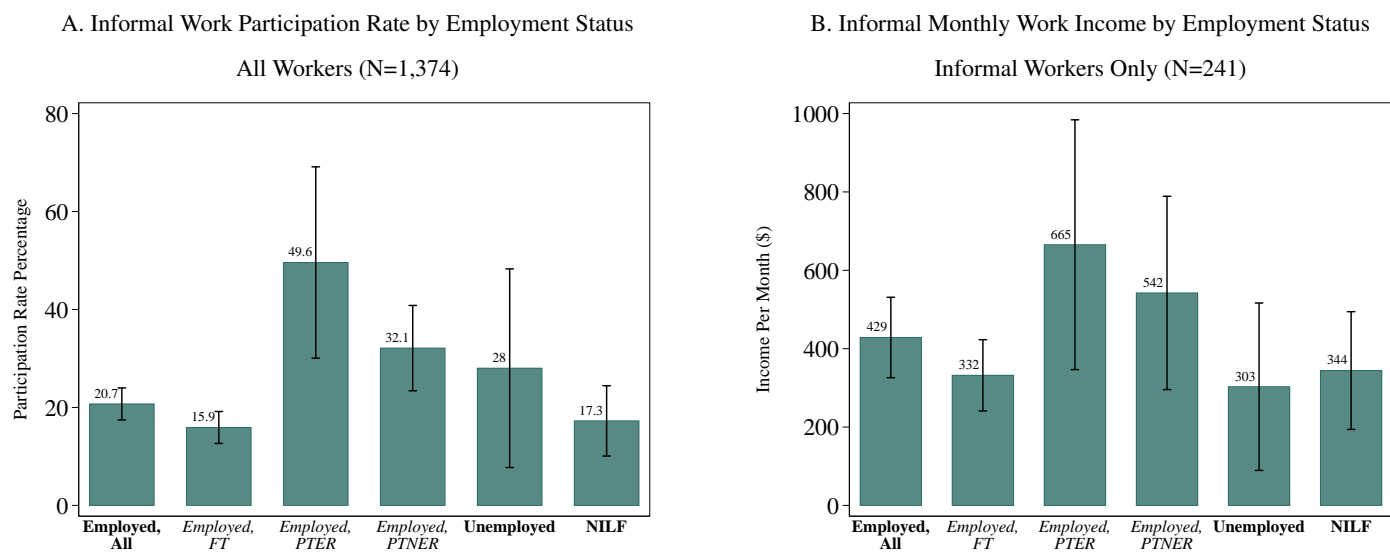U.S. Government Accountability Office. 2015. "Contingent Workforce: Size, Characteristics, Earnings, and Benefits." Available at http://www.gao.gov/assets/670/669766.pdf.

Figure 1. **2015 U.S. Employment Measures:**

BLS v. Unrestricted SCE-SIWP Sample
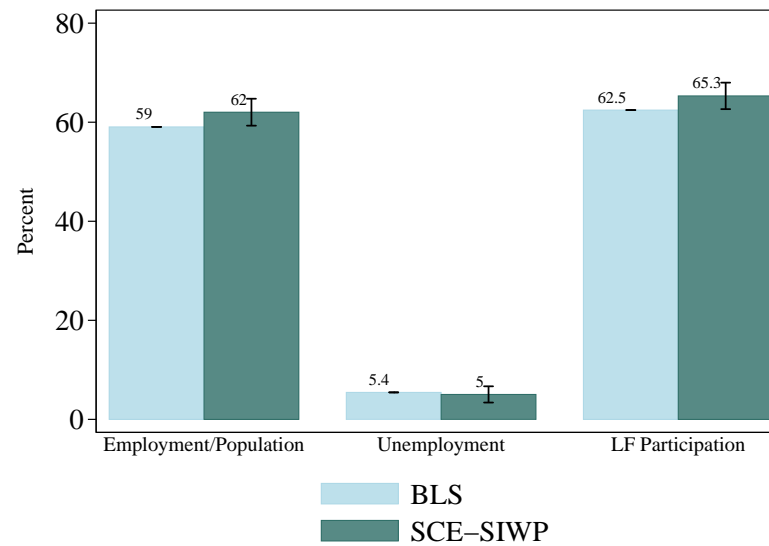
Source: Survey of Informal Work Participation within the Survey Consumer Expectations (SCE-SIWP), ©2013 Federal Reserve Bank of New York (FRBNY) and the Bureau of Labor Statistics.
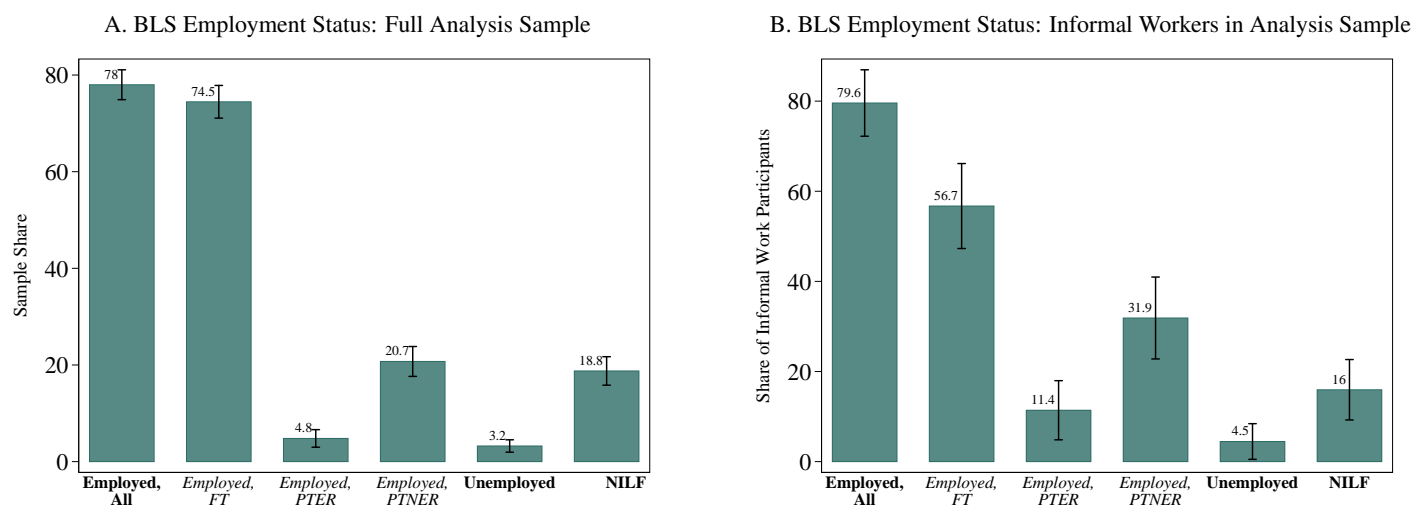
Notes: The black lines through each bar show a 95 percent confidence interval around each estimated mean. The unrestricted sample consists of all survey respondents 16 years of age and older. The values for the SCE-SIWP refer to averages between SCE-SIWP 2 and SCE-SIWP 3, fielded in January 2015 and December 2015 respectively. The BLS values refer to average between NSA data for January 2015 and December 2015.

Figure 2. **2015 Informal Participation Rates and Informal Income by Employment Status**

A. Informal Work Participation Rate by Employment Status

All Workers (N=1,374)

B. Informal Monthly Work Income by Employment Status
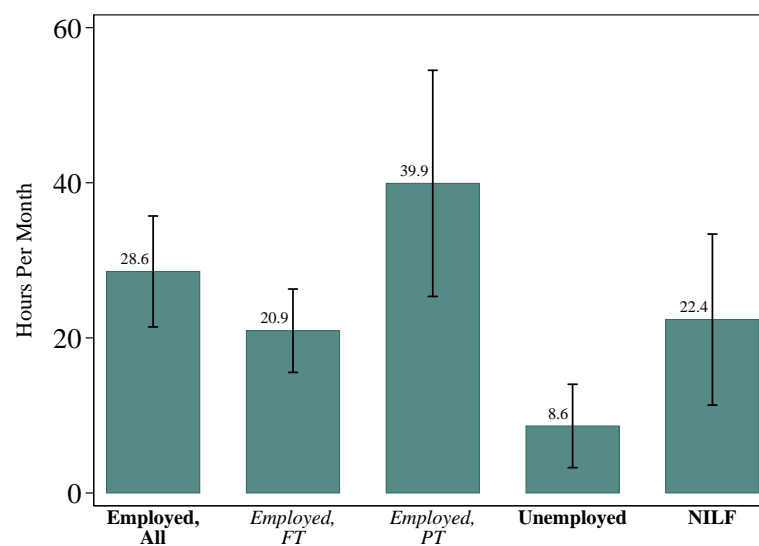
Informal Workers Only (N=241)

Source: Survey of Informal Work Participation within the Survey Consumer Expectations (SCE-SIWP), ©2013 Federal Reserve Bank of New York (FRBNY).
Notes: The black lines through each bar show a 95 percent confidence interval around each estimated mean. The values refer to averages between SCE-SIWP 2 and SCE-SIWP 3, fielded in January 2015 and December 2015 respectively.

Figure 3. **BLS Employment Status: Full Analysis Sample v. Informal Workers Only**

A. BLS Employment Status: Full Analysis Sample

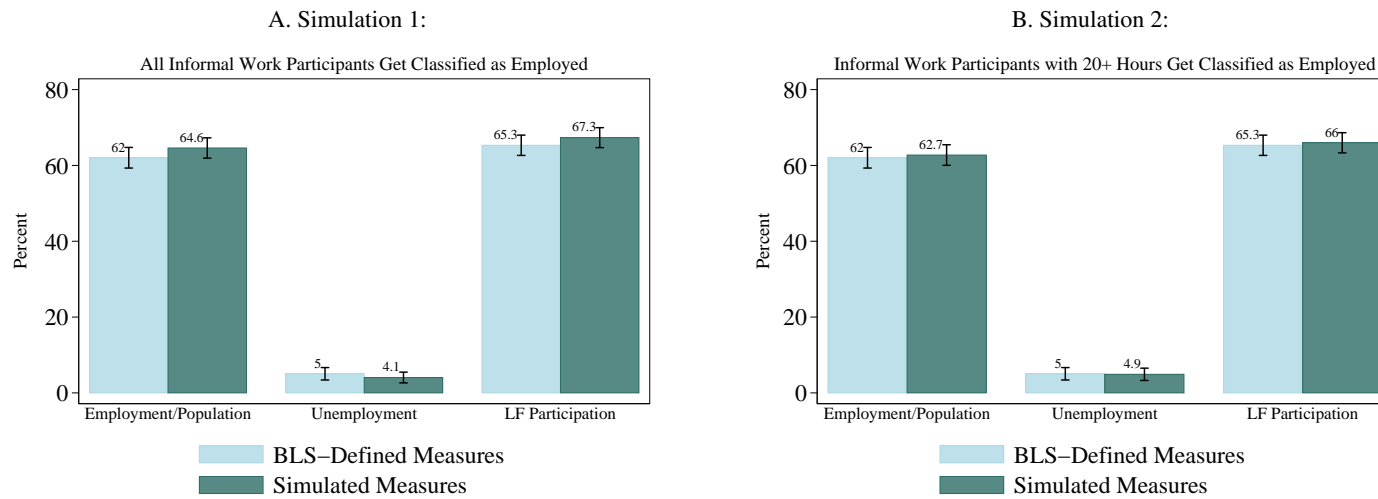B. BLS Employment Status: Informal Workers in Analysis Sample

Source: Survey of Informal Work Participation within the Survey Consumer Expectations (SCE-SIWP), ©2013 Federal Reserve Bank of New York (FRBNY).
Notes: The black lines through each bar show a 95 percent confidence interval around each estimated mean. The values refer to averages between SCE-SIWP 2 and SCE-SIWP 3, fielded in January 2015 and December 2015 respectively. The analysis sample consists of survey respondents 21 years of age and older who are not retired and not excluded for the reasons described in Section 3.

Figure 4. **Informal Work Hours by BLS Employment Status**

Figure 5. **Simulated Employment Measures Including Informal Work**

A. Simulation 1:

All Informal Work Participants Get Classified as Employed

B. Simulation 2:

Informal Work Participants with 20+ Hours Get Classified as Employed

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Figure 6. **Simulated Measure of Full-Time v. Part-Time Employment Including Informal Work Hours**

"Full-Time" if Total Monthly Hours (Informal and Formal) Equals 160 or More
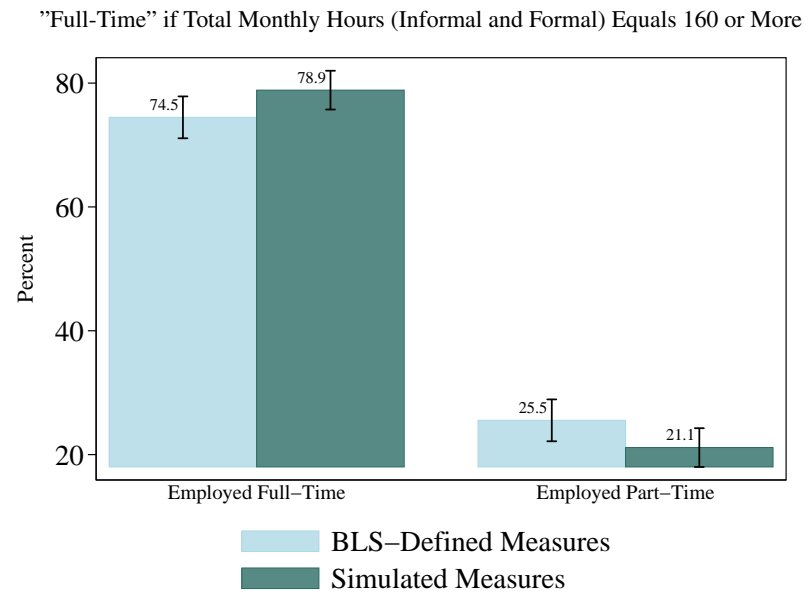

Source: Survey of Informal Work Participation within the Survey Consumer Expectations (SCE-SIWP), ©2013 Federal Reserve Bank of New York (FRBNY).
Notes: The black lines through each bar show a 95 percent confidence interval around each estimated mean. The values refer to averages between SCE-SIWP 2 and SCE-SIWP 3, fielded in January 2015 and December 2015 respectively.

Table 1: **Weighted Summary Statistics for Analysis Sample**

SCE-SIWP 2 and 3 Combined

	Count	Mean	SD	Min	Max
Participation (excl. surveys)	1,377	0.37	0.48	0	1
Participation (excl. surveys and rent/sell)	1,377	0.20	0.40	0	1
Age	1,377	46	13	21	81
High School or Less	1,377	0.34	0.47	0	1
Some College	1,377	0.31	0.46	0	1
Bachelors or More	1,377	0.35	0.48	0	1
BLS: Employed*	1,374	0.78	0.41	0	1
BLS: Full Time**	1,374	0.56	0.50	0	1
BLS: Part Time**	1,374	0.19	0.39	0	1
BLS: Unemployed	1,374	0.03	0.18	0	1
BLS: Not In Labor Force	1,374	0.19	0.39	0	1
Formal Income, Annual	1,377	47,171	47,785	0	550,000
Formal Hours, Weekly	1,377	35	16	0	80
Formal Wage, Hourly	1,377	23	23	0	383
Household Income, Annual	1,373	50-60k	2.90	1	11
Informal Income, Monthly***	241	409	545	2	4,000
Informal Hours, Monthly***	241	27	34	0.25	139
Informal Wage, Hourly***	241	27	39	0.63	245
Self Employed	1,377	0.12	0.32	0	1
Non-White	1,377	0.27	0.44	0	1
Married or Living with Partner	1,377	0.66	0.47	0	1
Owns Home	1,377	0.64	0.48	0	1

Sources: Flood et al. 2015, and Survey of Informal Work Participation within the Survey Consumer Expectations (SCE-SIWP), ©2013 Federal Reserve Bank of New York (FRBNY).

Notes: *Due to missing data we cannot identify the basic BLS employment status for three individuals. **Among those classified as employed, we cannot determine part-time versus full-time employment status for 44 individuals due to missing data. ***Informal income, hours, and wage are calculated only among informal work participants with nonmissing values of informal income. Income, hours related to survey work, and renting and selling activities are excluded from the calculations of informal income, hours, and wages. Household income values are coded by numbers 1 through 11, which refer to income ranges. The minimum, maximum, and standard deviation (SD) of household income are shown in terms of the code numbers, while the mean value of household income shows the income range that corresponds to the median categorical response.

Table 2: **Changes in Informal Participation and Hours based on State Unemployment Gaps**

	Unemployment Rate Gap		PTER Gap	
	Low-Gap States	High-Gap States	Low-Gap States	High-Gap States
(Number of Respondents)	(396)	(981)	(482)	(895)
Average Unemployment Gap (Percent)	–0.30	1.08		
	(0.10)	(0.12)		
Average PTER Gap (Percent)			0.40	1.64
			(0.09)	(0.11)
Change in Informal Participation (Survey 3 – Survey 2)	–1.39	8.14	1.35	7.60
Change in Informal Hours (Survey 3 – Survey 2)	0.19	4.02	–0.97	4.98

Sources: Flood et al. 2015, and Survey of Informal Work Participation within the Survey Consumer Expectations (SCE-SIWP), ©2013 Federal Reserve Bank of New York (FRBNY).
Notes: Standard errors, when available, are in parentheses.

Table 3: **Testing the Cyclical Response of Informal Work Participation and Hours by Demographic Group**

	Participation	Participation	Participation	Hours	Hours	Hours
Formal Hours % Change, 1/14-12/14		0.732	0.620	−101.493*	−119.370**	−63.743**
		(5.42)	(5.86)	(50.36)	(46.55)	(26.99)
PTER / Employed % Change, 1/14-12/14	0.702	0.732	0.746	38.042***	40.910***	18.893**
	(0.80)	(0.87)	(0.93)	(8.32)	(7.69)	(5.92)
Unemp. Rate % Change, 1/14-12/14	0.461	0.475	0.531	65.049***	73.559***	34.194**
	(2.13)	(2.23)	(2.44)	(17.47)	(16.45)	(11.62)
% Change in Formal Wage (Inf. Work Participants)						6.210***
						(1.21)
% Change in Formal Wage	0.354	0.387	0.382			
	(0.61)	(0.68)	(0.72)			
% Change in Informal Wage, No Rent/Sell			−0.015		−2.771*	−2.151**
			(0.18)		(1.49)	(0.80)
Constant	36.397	34.054	36.097	2502.356***	2821.079***	1483.128***
	(51.78)	(56.97)	(64.60)	(396.22)	(397.29)	(335.07)
AIC	166.47	168.44	170.43	236.75	234.30	215.75
BIC	169.30	171.98	174.67	239.58	237.84	219.99
No. of Demographic Groups	15	15	15	15	15	15

Sources: Flood et al. 2015, and Survey of Informal Work Participation within the Survey Consumer Expectations (SCE-SIWP), ©2013
Federal Reserve Bank of New York (FRBNY).

List of States by Group

High Unemployment Gap	Low Unemployment Gap
Alabama	Arkansas
Alaska	Colorado
Arizona	Indiana
California	Iowa
Connecticut	Kentucky
Delaware	Maine
District of Columbia	Michigan
Florida	Minnesota
Georgia	Nebraska
Hawaii	New Hampshire
Idaho	North Dakota
Illinois	Ohio
Kansas	South Carolina
Louisiana	Texas
Maryland	Vermont
Massachusetts	Wisconsin
Mississippi	
Missouri	
Montana	
Nevada	
New Jersey	
New Mexico	
New York	
North Carolina	
Oklahoma	
Oregon	
Pennsylvania	
Rhode Island	
South Dakota	
Tennessee	
Utah	
Virginia	
Washington	
West Virginia	
Wyoming	

High PTER Gap	Low PTER Gap
Alabama	Alaska
Arizona	Arkansas
California	Colorado
Connecticut	District of Columbia
Delaware	Idaho
Florida	Indiana
Georgia	Iowa
Hawaii	Kansas
Illinois	Michigan
Kentucky	Minnesota
Louisiana	Missouri
Maine	Nebraska
Maryland	North Dakota
Massachusetts	Ohio
Mississippi	Oklahoma
Montana	South Dakota
Nevada	Texas
New Hampshire	Washington
New Jersey	Wisconsin
New Mexico	
New York	
North Carolina	
Oregon	
Pennsylvania	
Rhode Island	
South Carolina	
Tennessee	
Utah	
Vermont	
Virginia	
West Virginia	
Wyoming	

Survey Appendix:

Quarterly #7 Employment: Selected Questions

Q27g1 - Q27g1

For each of the informal paid activities or side jobs listed in the table below, please respond to the following question:

	Q27a - Are you currently engaged in this activity?	
	Yes (1)	No (0)
Babysitting (1)	○	○
House sitting (2)	○	○
Dog walking (3)	○	○
Yard or lawn care (i.e., mowing, weeding, etc.) (4)	○	○
Housecleaning (5)	○	○
House painting (6)	○	○
Eldercare services (7)	○	○
Providing services to other people (for example picking up their dry cleaning, helping people move houses, running errands, booking travel, or other personal assistance) (8)	○	○
Selling goods at consignment shops (9)	○	○
Selling goods on eBay, craigslist, or similar websites (10)	○	○
Renting out property such as your car, your place of residence, or other items you own (11)	○	○
Driving for a ride sharing service like Uber, Lyft, or Sidecar (12)	○	○
Responding to surveys, including phone surveys, online surveys, and in-person surveys (13)	○	○
Getting paid to complete tasks online through websites such as Amazon Mechanical Turk, Fiverr, or similar sites (examples of such tasks include, but are not limited to, editing documents, reviewing resumes, writing songs, creating graphic designs, rating pictures, etc.) (14)	○	○
Posting videos, blog posts, or other content online, such as on YouTube, and receiving pay (including ad revenues or commissions) as a result (15)	○	○
Other informal paid activity or side jobs (please specify) (98)_____	○	○

Q27g2 - Q27g2

For each of the informal paid activities or side jobs listed in the table below, please respond to the following question:

	Q27b - Have you engaged in this activity at any time during the past two years?	
	Yes (1)	No (0)
Babysitting (1)	❍	❍
House sitting (2)	❍	❍
Dog walking (3)	❍	❍
Yard or lawn care (i.e., mowing, weeding, etc.) (4)	❍	❍
Housecleaning (5)	❍	❍
House painting (6)	❍	❍
Eldercare services (7)	❍	❍
Providing services to other people (for example picking up their dry cleaning, helping people move houses, running errands, booking travel, or other personal assistance) (8)	❍	❍
Selling goods at consignment shops (9)	❍	❍
Selling goods on eBay, craigslist, or similar websites (10)	❍	❍
Renting out property such as your car, your place of residence, or other items you own (11)	❍	❍
Driving for a ride sharing service like Uber, Lyft, or Sidecar (12)	❍	❍
Responding to surveys, including phone surveys, online surveys, and in-person surveys (13)	❍	❍
Getting paid to complete tasks online through websites such as Amazon Mechanical Turk, Fiverr, or similar sites (examples of such tasks include, but are not limited to, editing documents, reviewing resumes, writing songs, creating graphic designs, rating pictures, etc.) (14)	❍	❍
Posting videos, blog posts, or other content online, such as on YouTube, and receiving pay (including ad revenues or commissions) as a result (15)	❍	❍
Other informal paid activity or side jobs (please specify) (98)_____	❍	❍

Q27h

Have you engaged in any of the following activities during the past two years?

Answer yes or no to each option.

Providing professional services such as legal, accounting, photography, design, engineering, or programming services on a freelance basis (1)

Providing other professional services on a freelance basis. If yes, please specify _____ (2)

Q27i [if Q27h = yes for any of the options]

You said that you provided professional services on a freelance basis during the past two years. In answering the following questions, these activities should be included as an informal work activity, along with any other informal work you engaged in during the past two years.

Q28 - Q28

Did you engage in any such informal paid activities or side jobs before 2011?

○ Yes (1)
○ No (0)

Q29

Please consider all informal paid activities or side jobs in which you participated in the past two years, including paid survey work. On average, how much time did you typically spend per month on informal paid activities or side jobs?

(1)   _____   hours per month (1)

Q30

Consider all informal paid activities or side jobs in which you participated in the past two years, including paid survey work. How much money in total did you earn on all such activities, on average, per month?

(1)   _____   dollars per month (1)

If an individual indicates that they engaged in an informal work activity (either currently or in the past two years), they are asked Q31new through Q31c in relation to that activity.

Q31New

Considering the past two years or 24 months, in how many months did you engage in this activity?

(1) _____ months out of 24 (1)

The following questions (Q31a1 through Q31c) refer to a typical month (within the past two years) in which you engaged in this activity.

In a typical month in which you engaged in this activity, how much time do/did you spend on this activity? If less than one hour, report only in minutes.

Q31a1

(1) _____ hours and (1)

Q31a2

(1) _____ minutes per month (1)

Q31b

In a typical month in which you do/did this activity, how much money do/did you typically earn doing this activity?

(1) _____ dollars per month (1)

Q31c

Do/did you use websites and/or mobile platforms in the course of doing this work, and/or finding such work?

❍ Yes (1)
❍ No (0)

Q32x1 - Q32x1 [if Q27g2 has at least one response | Q28==1]

You indicated that you engaged in informal paid activities or side jobs before 2011. What were the reasons why you engaged in these informal paid activities or side jobs before 2011?

❑ To earn money as a primary source of income (1)
❑ To earn extra money on top of pay from a current job, retirement, pension, disability, or other regular source of income (2)
❑ To maintain existing job-related skills (3)
❑ To acquire new job-related skills (4)
❑ To network/meet people (5)
❑ Just for fun (as a hobby) (6)
❑ Other (please specify) (7)_____

Q32x2 [if Q27g2 has at least one response | Q28==1]

You indicated that you have engaged in informal paid activities or side jobs in the past two years. What are the reasons why you have engaged in these informal paid activities or side jobs in the past two years?

❑ To earn money as a primary source of income (1)
❑ To earn extra money on top of pay from a current job, retirement, pension, disability, or other regular source of income (2)
❑ To maintain existing job-related skills (3)
❑ To acquire new job-related skills (4)
❑ To network/meet people (5)
❑ Just for fun (as a hobby) (6)
❑ Other (please specify) (7)_____

Q32x3 [if Q32x2==1 | Q32x2==2]

You mentioned that you did informal work or side jobs for the money. Did you need to earn this money because of negative consequences of the recession such as job loss, reduced hours, reduced pay, or similar events?

○ Yes (1)
○ No (0)

Q32x4

In your informal paid side jobs, did you do work similar to your work in current or past formal jobs (if applicable)?

○ Yes (1)
○ No (0)

Q33

You responded earlier that you have never engaged in informal paid activities or side jobs. What is the MAIN reason why you have not engaged in such activities?

○ I was not previously aware of such opportunities. (1)
○ I am aware of such activities, but I never seriously considered engaging in them. (2)
○ I am aware of such activities, but it seemed too complicated. (3)
○ I seriously considered engaging in such activities, but decided it was not worth my time (4)
○ Other (please specify) (5)_____

Q34

How do you think the average pay you receive for informal paid activities or side jobs compares to what you would expect to earn (or do earn) in the same amount of time in a salaried job?

◯ Informal pay is higher (1)
◯ Informal pay is about the same (2)
◯ Informal pay is lower (3)

Q35 [if Q34==1]

How much higher?

◯ Up to 1.5 times as much as the pay in a salaried job (1)
◯ Between 1.5 and 2 times as much as the pay in a salaried job (2)
◯ More than 2 times as much as the pay in a salaried job (3)

Q36 [if Q34==3]

How much lower?

◯ Less than 1/2 as much as the pay in the salaried job (1)
◯ Between 1/2 as much and just below the pay in the salaried job (2)

Q38

To what extent has paid informal work or side jobs helped you to offset the negative effects of unemployment spells, loss of working hours, loss of benefits, or stagnant wages in a formal job? If you have not experienced any of the negative events just described, simply choose "does not apply" below.

◯ Very much (1)
◯ Somewhat (2)
◯ Not at all (3)
◯ Does not apply (4)

Q39

In what ways, if at all, were you affected by the economic recession and its aftermath? Consider events that took place (or conditions that prevailed) at any time since 2008.

❑ I lost a job (1)
❑ Had hours reduced in a job (2)
❑ Had pay cut (3)
❑ Wage freeze (4)
❑ Spouse or partner lost a job (5)
❑ Spouse/partner had hours cut (6)
❑ Spouse/partner had pay cut (7)
❑ Spouse/partner had wage freeze (8)
❑ My home went into foreclosure (9)
❑ I filed for personal bankruptcy (10)
❑ A business I own(ed) filed for bankruptcy (11)
❑ I was not directly affected (12)
❑ My spouse/partner was not directly affected (13)
❑ Other (please specify) (14)_____

Q40

Was your decision to participate or not in informal work influenced by the negative consequences of the recession that you indicated earlier?

❍ Yes (1)
❍ No (0)

Q41

Was your choice of how much time to spend in informal work influenced by the negative consequences of the recession that you indicated earlier?

❍ Yes (1)
❍ No (0)

Q42

Which of following did you do in response to the negative consequences of the economic recession?

❑ Bought fewer goods and/or services in general (1)
❑ Reduced overall household spending, not including rent or mortgage payment (2)
❑ Spent more time shopping around and/or searching for lower prices in order to get the best deal (3)
❑ Spent more time at home doing activities such as housework, home maintenance, food preparation or household financial management (4)
❑ Spent more time caring for my child(ren) (for example, instead of hiring a babysitter, keeping them in daycare or enrolling them in other paid activities, etc.) (5)
❑ Spent more time caring for other household members such as a parent or relative (for example, driving them to appointments instead of paying for a cab, staying with them instead of hiring a caretaker, etc.) (6)
❑ Other (please specify) (7)_____
❍ None of the above (8)

Q43

During the past 12 months, has the financial situation of your household changed?

○ Yes (1)
○ No (0)

Q43x1 [if Q43==1]

Would you say that your household's financial situation has:

○ Improved somewhat in the last 12 months (1)
○ Improved a lot in the last 12 months (2)
○ Gotten somewhat worse in the last 12 months (3)
○ Gotten a lot worse in the last 12 months (4)

The next few questions ask about your work situation. These questions cover some of the exact same topics that were covered in previous questions, but they are worded differently and go into greater detail. Please answer them to the best of your ability.

Q44

LAST WEEK, did you do ANY work for either pay or profit?

○ Yes (1)
○ No (0)
○ Unable to work in ANY job for at least the next 6 months. This is due to a medical condition or disability (4)

Q45

LAST WEEK, did you have a job either full or part time? Include any job from which you were temporarily absent. ^f('qhidInst')[5].label()^

○ Yes (1)
○ No (0)
○ Unable to work in ANY job for at least the next 6 months. This is due to a medical condition or disability (4)

Q46

LAST WEEK, did you do 15 hours or more of unpaid work in a family business or farm? ^f('qhidInst')[5].label()^

○ Yes (1)
○ No (0)

Q47

What was the main reason you were absent from work last week?

○ On layoff (temporary or indefinite) (1)
○ Slack work/business conditions (2)
○ Waiting for new job to begin (3)
○ Vacation/personal days (4)
○ Own illness/injury/medical problems (5)
○ Child care problems (6)
○ Other family/personal obligation (7)
○ Maternity/paternity leave (8)
○ Labor dispute (9)
○ Weather affected job (10)
○ School/training (11)
○ Civic/military duty (12)
○ Other (please specify) (13)_____

Q48

Has your employer given you a date to return to work?

○ Yes (1)
○ No (0)

Q49

Have you been given any indication that you will be recalled to work within the next 6 months?

○ Yes (1)
○ No (0)

Q50

Have you been doing anything to find work during the last 4 weeks?

○ Yes (1)
○ No (0)

Q51

What are all of the things you have done to find work during the last 4 weeks?

Please type these in the box below.

Q52

Last week, could you have started a job if one had been offered?

◯ Yes (1)
◯ No (0)

Q52x1

Why not?

◯ Waiting for new job (1)
◯ Own temporary illness (2)
◯ Going to school (3)
◯ Other (please specify) (4)_____

Q53New

How many hours per week do you USUALLY work at [if Q13=1: your job] [if Q13>1: all your jobs combined] ?

(1) _____   hour(s) (1)

Q54

Do you want to work a full time workweek of 35 hours or more per week?

◯ Yes (1)
◯ No (0)
◯ Regular hours are full-time (2)

Q55

Some people work part-time because they cannot find full time work or because business is poor. Others work part time because of family obligations or other personal reasons. What is your MAIN reason for working part-time?

◯ Slack work/business conditions (1)
◯ Could only find part-time work (2)
◯ Seasonal work (3)
◯ Child care problems (4)
◯ Other family/Personal obligations (5)
◯ Health/medical limitations (6)
◯ School/training (7)
◯ Retire/Social Security limit on earnings (8)
◯ Full-time workweek is less than 35 hours (9)
◯ Other (please specify) (10)_____

Q56

Last week, could you have worked full time if the hours had been available?

◯ Yes (1)
◯ No (0)