

Reservation Wages and Work Arrangements: Evidence From The American Life Panel

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RESERVATION WAGES AND WORK ARRANGEMENTS: EVIDENCE FROM THE
AMERICAN LIFE PANEL

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Dissertation Chapter

Abstract: This study relates the rise of alternative work arrangements, particularly among older workers, with low reservation wages, a result of low bargaining power brought on by decreased attachment to career jobs and growing retirement income inadequacy. I utilize a linked sample between the RAND-Princeton Contingent Worker Survey and the American Life Panel's Health and Retirement Study, to estimate reservation wages via a two step process. I first estimate market wages on offer for non-employed people, then estimate the gap between market and reservation wages via a probit explaining probability of employment. I first confirm that my estimations for reservation wages follow expected patterns as exemplified in Hofler and Murphy (1995)'s "seven tests." I then show that work in alternative work arrangements (on-call, temp agency, contract firm and gig work) is associated with a decrease in reservation wages of \$4.47-\$4.53 per hour, whereas work as an independent contractor or self-employed worker is associated with increased reservation wages by \$3.72-\$3.89 per hour. Whereas prior literature focuses on firm-centric explanations for an increase in alternative work, these findings point to supply-side factors which also contribute to an increase. Proposals to reform established surveys to better track work arrangements and policies to increase financial preparedness for retirement are discussed.

I. Introduction

This study relates the rise of alternative work arrangements (independent contractors, on-call workers, temp agency workers, and contract firm workers), particularly at older ages, with low reservation wages. The share of workers ages 55 and older who reported working in an alternative work arrangement increased from 15 percent in 2005 to 17 percent in 2017, according to calculations using the Bureau of Labor Statistics' Contingent Worker Survey (CWS). Katz and Krueger (2019) fielded a near word-for-word equivalent to the CWS questionnaire, the RAND-Princeton Contingent Worker Survey (RPCWS) and found a larger increase, to 22 percent, in 2015. Both surveys find most of the growth comes not from independent contractors, but from low-paid, precarious forms of employment such as on-call, temp agency, contract firm and gig jobs, which make up the majority of alternative work arrangements (AWAs).¹ Katz and Kreuger (2019) conclude that "94 percent of net employment growth in the U.S. economy from 2005 to 2015 appears to have occurred [in AWAs]." Applying their method to workers ages 55-75, I find the figure is between 61 percent (2005-2017 using the CWS-derived rate) and 99 percent (2005-2015 using the RPCWS-derived rate). Either figure shows that AWAs dominated growth in employment among older workers in the years following the Great Recession.

I hypothesize that low reservation wages explain the increase. I utilize a sample of respondents in the American Life Panel (ALP) who completed the RPCWS and a word-for-word equivalent to the Health and Retirement Study (HRS) core questionnaire. I estimate the reservation wages of each individual using a method proposed by Mohanty (2005). Then, I create four groups of workers based on work arrangement: (1) traditional work, (2) traditional self-employed, (3) independent contractor and (4) other alternative work arrangements (on-call, temp agency, contract firm and gig jobs). I predict those in alternative work arrangements will have lower estimated reservation wages than the other three groups. Secondly, I also predict traditional self-employed and independent contractors to have equal reservation wages and higher reservation wages than traditional workers. Finally, I predict that factors beyond observed market wages will explain a significant portion of the difference in reservation wages across work arrangements.

Findings from this study can inform discussions of the interaction between financial preparedness for retirement, income shocks and labor force participation at older ages. Financial precarity and job loss at older ages could be pushing workers into precarious jobs at ages typically associated with retirement.

II. Literature Review

a. A New Taxonomy for Work Arrangements

Definitional and classification differences across the literature complicate analyses of alternative work; one relevant example concerns the phrase "gig economy." Economists have

¹ Two methodological differences could be driving the difference. First, half of the observations in the BLS survey came from proxy respondents who may be unaware of non-traditional arrangements of other household members. Second, the ALP survey was conducted online, whereas the CWS was conducted over the phone and in-person. Katz and Kreuger (2019) find cyclical effects on employment in AWAs to be minor.

defined this term as broadly as to include all forms of contingent and alternative work (e.g., Friedman, 2014) and as narrow as to include only “direct sales to clients through an online intermediary” (Katz & Kreuger, 2019). The Rand-Princeton Contingent Worker Survey (RPCWS) shows the narrow definition would comprise 0.5 percent of the older labor force, and the broadest definition 12-15 percent. Still others have utilized a definition which considers any job that does not provide healthcare and/or does not provide a retirement plan to be a gig job (Munnell, Hou & Sanzenbacher, 2019). These definitions could include as many as 40 to 50 percent of the workforce.

App- or platform-based work ought to be considered separately from traditional self-employed work, independent contracting or other forms of alternative work, lending credence to the narrow definition. Nonetheless, the common thread between the various forms of alternative work is a trade-off posed to workers: in exchange for giving up the ability to bargain over one aspect of employment, a worker can gain greater autonomy over another and/or an easier hiring process (Spreitzer, Cameron & Garrett, 2017). For example, a gig worker can choose their number of hours and schedule and many avoid a traditional hiring process but have no bargaining power over wages. Firms offering on-call jobs may be less selective in who they hire, but in exchange can vary a worker’s schedule and number of hours. A temp agency worker finds work more easily, but very few have any prospect of promotions or raises (David & Houseman, 2010). And nearly all workers in alternative arrangements require giving up the ability to bargain for benefits. This reformulation of the preference-based explanation gets at the heart of the differences between traditional and alternative work.

Another necessary consideration concerns independent contract work and self-employed workers. The bargaining process for contractors is more comparable to self-employed workers, which are not considered to be alternative workers, than to other alternative arrangements for three reasons (Wilkin, 2013). First, contractors provide services on a short-term basis to other firms. Second, they are not expected to integrate or form an identity around their service to the firm, as they often have multiple clients. Third, contractors and the self-employed often own their own means of production (i.e. tools and materials needed to perform their work), whereas employees are provided the means of production by their employer. Indeed, the difference between an independent contractor and self-employed worker is primarily a tax code distinction; the latter treats their income as business revenue, the former treats their income as earnings. However, the dynamics of the bargaining process provide reason for treating independent contractors as separate from other alternative arrangements and perhaps identically to the traditionally self-employed.

This study considers four categories of workers. The first and largest group, are the traditionally employed, comprising 78 percent of employed workers. The second group are the traditionally self-employed, comprising 8 percent. The third are independent contractors, comprising 9 percent. The fourth group combines all other forms of alternative work – on-call, contract firm, temp agency and gig work. This final group comprises 11 percent of employed workers. Figure 1 compares the four groups on the basis of demographic and education makeup, as well as indicators which will be used in the study to estimate each group’s mean reservation wage. Taking earnings as an example, I find that the self-employed record the highest wages, with independent contractors significantly lower but not far behind. Traditional workers earn about a third less than independent contractors, with alternative workers earning significantly

less than traditional workers. A similar gradient is found by education, race, gender, wealth and indicators of financial desperation.

b. The Growing Market for Alternative Work Arrangements

Two common explanations emerge from prior literature for the increase in AWAs. One set of explanations concern the demand side. According to these explanations, alternative workers are cheaper, flexible staffing allows for better adaptability to fluctuations in demand, and new technologies, particularly in the realm of scheduling and management software, have increased firms' capacity to take on these new employment arrangements (Abraham, 1993; Houseman, 2001; Houseman, Kalleberg & Erickcek, 2003). Moreover, the erosion of union density and the financialization of the economy has weakened the enforcement strong internal labor markets, allowing firms to outsource entire ancillary departments to contract firms (Davis, 2016; Spreitzer, Cameron & Garrett, 2017; Weil, 2014). But the consideration of supply of labor to alternative jobs is not particularly engaged with, particularly the fact that nearly all the growth in alternative arrangements comes from older workers (see Milkman (2018) for an exception).

Prior literature has considered the possibility that workers prefer flexibility and autonomy over aspects of their jobs, even if it means surrendering bargaining power over others (Lincoln & Raftery, 2011). However, if workers are truly taking up alternative work due to preferences, one would expect evidence for this to show up in the Contingent Worker Survey, which directly asks workers why they chose alternative work and whether they would prefer an equivalent occupation in the traditional labor market. My analysis of the 2017 Contingent Worker Survey finds that flexibility indeed ranks highly among reasons provided by workers ages 55 to 75, at 20 percent. Another 7 percent cite a preference for seasonal work or a lack of a long-term commitment. However, 22 percent say their current job is the only job they could find, and an additional 30 percent cite other economic reasons. Taken together, these responses show that most alternative workers would prefer to be in equivalent jobs which provided traditional employment. When asked this question directly, a majority of workers in each alternative work arrangement, ranging from 63 to 87 percent, say they prefer a traditional job over their current job, whereas just 23 percent of independent contractors say they would like a traditional job.

Given the above evidence, a compelling case can be made for outside factors pushing workers toward alternative arrangements, as well as for treating independent contractors separately from the rest of the alternative arrangements. If workers are indeed choosing alternative work over traditional work, we would expect no difference in the reservation wages of alternative and traditional workers. However, if alternative workers have lower reservation wages than traditional workers, it is likely that alternative work is a second-best solution to traditional work. And in the case of older workers, alternative work may instead be a third-best solution to retirement and traditional work.

c. Reservation Wages and Labor Demand in the Labor-Leisure Model

An extensive literature has shown workers pay a wage penalty in exchange for a flexible work schedule or nonconventional quantity of hours (e.g., Golden (2001); Kostiuk (1990)). Figure 1A depicts a typical labor-leisure model of labor supply with a compensating wage differential for working the traditional work schedule, which encourages clustering around the traditional schedule. However, consider a worker who is highly pessimistic about their labor market prospects. Workers clustering around the conventional work schedule correctly perceive

that a job offer exists that will compensate them for accepting the conventional schedule. If a worker perceives, even incorrectly, that these offers are not available to them, they are more likely to accept nontraditional forms of employment, as shown in Figure 1B. Responses in the American Life Panel (see Data for details) provide reason to believe this to be the case for a significant portion of workers in alternative work arrangements (excluding independent contractors). Among traditional workers earning below the median, 5 percent report losing their previous job involuntarily. This figure is more than triple, at 17 percent, among workers in alternative arrangements. Moreover, when respondents are asked about the probability of being able to find an equally good job if they were to be fired today, traditional workers earning below median wages provide an average probability of 0.34, nearly equal to those earning above the median as well as independent contractors and self-employed workers (all of which are at 0.35). Workers in on-call, temp agency, gig, and contract firm jobs provide an average probability of 0.21. Workers in on-call, temp agency, contract firm and gig jobs find themselves less employable, even compared to workers earning similar wages in the traditional sector.

Another consideration regarding older workers is non-labor income. Today's older workers have lower retirement wealth, both in real dollar terms and relative to lifetime earnings, than prior generations (Fang, Brown & Weir, 2016). Much of this is fueled by the replacement of defined benefit pensions with defined contribution plans for most workers (Munnell & Webb, 2015). Additionally, fewer firms offer retirement plans to their employees now than when defined benefit plans were more popular, and workers rarely save according to predictions from prior models of defined contributions plans (Ghilarducci, Fisher, Radpour & Webb, 2018). Bowles (2004) shows that firms can gain rents, even without cutting wages, when non-labor income is undermined. Despite a large majority of workers at all income levels having inadequate incomes for retirement (Ghilarducci, Papadopoulos & Webb, 2017), the problem is more acute for alternative workers; workers in traditional jobs earning below the median were 10 percentage points more likely to report a wealth-income ratio above 1.50 (39 percent vs 29 percent) and 8 percentage points more likely to expect defined benefit pension income in retirement from either a current or past job (19 percent vs 11 percent).

d. Estimating Reservation Wages

The approach introduced by Hofler and Murphy (1994) and Mohanty (2005) is a useful improvement over prior methods. Heckman (1974) introduces a well-known method for estimating reservation wages. However, Heckman (1974) and others following a similar methodology (Fishe, 1982; Kiefer & Neumann, 1979) were primarily interested in developing a reliable and robust method for estimating reservation wages – instead their primary research questions concerned the impact of, say, unemployment benefits or a change in marital status, on one's reservation wages. Later literature finds the Heckman (1974) method to produce unreliably wide distributions of which do not concord with observed wages and with much lower values than implied by the job offer non-workers reported having turned down (Ferber & Green, 1985). Blau (1992) reports reservation wages for more than a third of employed workers in the sample to be higher than their actual wages. Hofler and Murphy (1994) propose six tests for reliable estimates of reservation wages: reservation wages increase with time preference, non-labor income, educational attainment, and wealth and decrease with increases in cost of living, and they should be lower than observed wages for all observations. Mohanty (2005) proposes a method that passes all six tests elicited by for reliable estimates of reservation wages.

III. Methodology

This study utilizes the method from Mohanty (2005) to compare workers in various work arrangements estimate the reservation wages of traditional workers, independent contractors, self-employed workers and alternative workers.

a. Econometric Model

I follow the methodology in Mohanty (2005), which derives an estimation of the reservation wage from a three-equation model. The first equation concerns an individual's decision to participate in the labor force:

$$y_{1i} = w_{mi} - w_{ri} \quad (1)$$

where w_{mi} is the market wage on offer to the i th person, and w_{ri} is their reservation wage. If y_{1i} is positive, the individual decides to enter the labor force. The market wage on offer to an individual will be determined by their personal and human capital characteristics, and the reservation wage is also influenced by other variables, specifically those which can be concealed from a potential employer during a typical interview process. For example, the firm may not know whether a worker is claiming Social Security benefits, or whether or not a worker has faced food insecurity in recent times, both of which the worker can take into account when determining their reservation wage. Equation 1 can therefore be re-written as the following:

$$y_{1i} = x_{1i}\beta_1 + \varepsilon_{1i} \quad (2)$$

where x_{1i} includes all variables that influence either the market or reservation wage.

The second equation in the model concerns a firm's willingness to hire an individual:

$$y_{2i} = x_{2i}\beta_2 + \varepsilon_{2i} \quad (3)$$

where x_2 is a vector containing predictors of marginal productivity: namely the same personal and human capital variables included x_1 . If y_2 is positive, the firm is willing to hire the individual. The third equation concerns the market wage, which is only observed for an employed person:

$$\begin{aligned} \ln(w_{mi}) &= x_3\beta_3 + \varepsilon_{3i} \text{ if } y_{2i} > 0 \\ &= 0, \text{ otherwise} \end{aligned} \quad (4)$$

where x_3 is a vector containing the same personal and human capital variables as above, as well as variables pertaining to the characteristics of a particular job (physical demands, union coverage, industry and occupation, etc.). This allows us to re-write equation 1 such that specifying a set of personal and human capital variables, as well as a set of other variables that affect reservation wages but not market wages, leads to an estimation of reservation wages:

$$\widehat{w}_{ri} = \widehat{w}_{mi} - x_{1i}\widehat{\beta}_1 \quad (5)$$

Tunali (1986) shows that if one makes standard assumptions for the error terms at the population level (means equal to zero, $V(\varepsilon_1) = V(\varepsilon_2) = 1$, $V(\varepsilon_3) = \sigma_3^2$), I can conduct a two-step process for the above estimation. First β_1 is estimated using equation (3), which is operationalized as a probit explaining the probability of being employed.

$$P(\text{employed}) = F(x_{1i}\beta_1; x_{2i}\beta_2; \rho) \quad (6)$$

where F is the bivariate standard normal distribution and $\rho = \text{Cov}(x_{1i}, x_{2i})$. This provides the $\widehat{\beta}_1$ to be used in equation 5.

Next, $\ln(w_m)$ is estimated using equation 4 on a sample of employed workers. I then use the betas from this estimation to predict market wages on offer to those who are unemployed. A simple OLS estimation of equation 4 at this stage would introduce selection bias, so I alter equation 4 to include selectivity variables as described in both Heckman (1979) and Tunali (1986).

$$\ln(w_{mi}) = x_3\beta_3 + \frac{\sigma_{13}\varphi(x_{1i}\beta_1)\Phi\left(\frac{x_{2i}\beta_2 - \rho(x_{1i}\beta_1)}{\sqrt{1-\rho^2}}\right)}{F(x_{1i}\beta_1; x_{2i}\beta_2; \rho)} + \frac{\sigma_{23}\varphi(x_{2i}\beta_2)\Phi\left(\frac{x_{1i}\beta_1 - \rho(x_{2i}\beta_2)}{\sqrt{1-\rho^2}}\right)}{F(x_{1i}\beta_1; x_{2i}\beta_2; \rho)} + u_i \quad (7)$$

where φ and Φ are the univariate normal distribution and density functions, respectively. I then take the antilog of the estimated log-wages. With both components on the right-hand side of equation 5 having been estimated, calculating reservation wages is a matter of simple subtraction.

b. Data

The sample comprises 2,988 respondents in the RAND American Life Panel. The American Life Panel is a longitudinal panel of respondents from 7,000 households. Academics can field their own questionnaires, including close equivalents to established questionnaires. This study uses a sample of respondents that have completed equivalents to two such questionnaires: the Contingent Worker Survey and the Health and Retirement Study.

The first questionnaire of interest is the RAND-Princeton Contingent Worker Survey, a near-equivalent of the Bureau of Labor Statistics survey of the same name, conducted by Katz and Kreuger (2019). Using the RPCWS, I will classify workers based on employment arrangement. The other questionnaires of interest comprise Wave 2 of the ALP version Health and Retirement Study. Sections of the 2012 Health and Retirement Study were given verbatim to ALP respondents across a set of six separately conducted questionnaires. This study uses variables from three of these six questionnaires (see Appendix). The HRS core questionnaire contains variables which are important to establishing whether an older worker has a high or low reservation wage. These variables include: wealth-income ratio, defined benefit plan access, Social Security claim status, whether a worker lost their previous job involuntarily, recent food insecurity experience (a proxy for short-term financial hardship), and self-perceived employability (measured by responses to “What do you think are the chances that you could find an equally good job in the same line of work within the next few months?”). Respondents completed all requisite surveys between May 2014 and May 2016, and all respondents completed the surveys within a period of one year. There were 480 respondents who completed all the requisite surveys, but over a time period of more than one year. These respondents are not included. Another 103 report having changed jobs at some point between the time they started their first survey and the time they completed their final survey. These respondents are also not included in our final sample.

Of the 2,988 respondents, 1,457 are ages 55 and older and 2,107 are working. Within the 2,107 workers, 305 are in alternative work arrangements, 225 are independent contractors, 255 are self-employed and 1,322 are traditional employees. A re-weighting process will be utilized, similar to the one performed in Katz and Kreuger (2019), to correct for an undersampling of traditional employees in the ALP when benchmarked against the Current Population Survey (CPS). Figures 2a and 2b show the income distributions in this study's sample (after re-weighting) and a pooled sample of the 2015-2017 Current Population Survey March supplements (which ask about income in the previous calendar years, i.e. 2014-2016) respectively. The CPS sample has been altered to take on the lower top-coding of income used in the ALP sample. A series of F-tests found the distributions to not be significantly different in terms of mean, median, 25th percentile, 75th percentile, skewness or kurtosis at the 5 percent level (see Appendix for other metrics benchmarking this study's sample to the CPS). Furthermore, No differences were found in the racial, gender, age, education, or geographic makeup between the two samples (see Appendix for more information about dataset construction).

IV. Results

I discuss the results in three sections. First, I assess whether or not the above methodology produces estimates of the reservation wage which are (1) lower than observed wages, which should be the case by definition, and (2) follow sensible patterns as discussed in Hofler and Murphy (1994). Next, I analyze the OLS regression results relating work arrangement to estimated reservation wages. Finally, I compare mean and median reservation wages across work arrangements.

a. Application of Hofler and Murphy (1994)'s Seven Tests for Sensible Reservation Wage Estimations

Similar to Mohanty (2005), reservation wages are lower than observed wages for all workers in the sample. The mean observed wage is \$23.95 per hour, whereas the mean reservation wage is \$18.82 per hour for employed workers. Moreover, the distribution of reservation wages resembles that of observed wages. A series of F-tests found the distributions to not be significantly different in terms of skewness or kurtosis at the 5 percent level, but did find differences in mean, median and 25th and 75th percentiles, as expected.

Figure 3 shows a list of comparisons which suggest our estimations of reservation wage follow expected patterns. Reservation wages increase with education and wealth, decrease with cost of living, and are higher for unemployed workers who receive unemployment benefits than those who do not receive benefits, reflecting similar findings in Mohanty (2005) and more established methods used in Heckman (1979) and others. Two tests proposed by Hofler and Murphy (1994), relating to time preference and cost of living, could not be conducted due to a lack of variables in the dataset. An additional test shows that those who were receive Social Security benefits have higher reservation wages than those who do not, reflecting prior findings regarding the relationship between non-labor income and reservation wages.

b. Descriptive Statistics for Reservation Wages

To put these results into perspective, Figure 4a compares the mean reservation wages across four groupings by work arrangement: alternative workers, independent contractors, self-employed and traditional employees. A clear gradient emerges when comparing mean

reservation wages, with alternative workers at the bottom (\$7.61 per hour), followed by traditional workers (\$14.44 per hour), then independent contractors (\$18.70) and the self-employed (\$18.97). All differences are significant at the 5 percent level except between the independent contractors and the self-employed.

Because our specification of the reservation wage is heavily regulated by the market wage, Figure 4b similarly compares the four groups of workers based on the ratio between the reservation wage and market wages. A smaller ratio implies market wages well above reservation wages, a result of many employment opportunities and greater ability to exit the labor force. A similar gradient emerges here, with alternative workers having the largest ratio between reservation and market wages (93.4%), followed by traditional workers (91.2%), independent contractors (88.3%) and the self-employed (88.1%).

c. Regression Results

Figure 5 shows the results from an OLS regression on a sample of employed workers, relating work arrangements to reservation wages. Work in on-call, temp agency, contract work or gig jobs is associated with a decrease in reservation wages by \$4.73 per hour. Independent contract or self-employed work was not associated with an increase in one's reservation wage by \$3.72 per hour. College-educated workers reported significantly higher reservation wages. Controls for race and gender were not significant. The findings are robust to a sample which includes workers of all ages, rather than only those ages 55 and older.

V. Discussion

The above results converge toward two overall findings. First, I replicate the Mohanty (2005) finding, showing reliability for estimates of reservation wages. Secondly, I find a clear bifurcation among people officially considered by the Bureau of Labor Statistics to be alternative workers, with independent contractors having among the highest reservation wages, and workers in the other arrangements having among the lowest reservation wages. Thirdly, I find no difference in the reservation wages of self-employed and independent contractors. These findings point to a need for greater precision in the language used to describe work arrangements, both in survey questionnaires and in academic literature.

In the model there are only potential two sources for differences in the reservation wage: market wages and factors that influence reservation wages but not market wages. This study considers two types of such factors: indicators of financial desperation, which serve to lower reservation wages, and sources of non-labor income, which serve to increase the reservation wage. Because this study finds that being in an alternative work arrangement is associated with a decreased reservation wage, even after controlling for market wages, it must be that differences in these factors drive down alternative workers' reservation wages. The evidence for this is most clear in Figure 1, which shows alternative workers being much more likely to fall into a financial state of desperation and with adequate retirement income.

Most prior studies have focused on the demand for alternative workers as an explanation for the increase in employment in this sector, and those who have discussed supply have provided explanations rooted in preferences. This study provides an explanation rooted in desperation. Workers in either of these situations may seek low-wage, nontraditional jobs because they are easier jobs to obtain. The rise of AWAs could thus be a factor contributing to an

increased in labor force participation at older ages. Providing an additional option to older people in dire financial circumstances would be a beneficial function of alternative work, despite the precarity of these jobs. However, the nature of these jobs makes them unlikely to improve these workers' retirement prospects. Moreover,

Finally, it is unclear whether alternative work is being provided in addition to or instead of more well-paying jobs with traditional schedules. This question is outside the scope of this study but nonetheless an important concern regarding the future of work at older ages.

a. Limitations

While the data utilized in this study is perhaps the only viable source for answering the research question, it is far from ideal. The primary concern is that of a small sample size, a function of linking samples from two, separate surveys in the ALP, an already small panel. This limitation prevents separate analyses of reservation wages of on-call, temp agency, contract firm and gig workers, because the individual sample sizes of these categories is prohibitively small. It also is the reason the sample in most places includes all workers, except in the regression where only older workers are considered. Nonetheless, this study's findings are robust to an exclusion of workers ages 54 and younger, as shown in Figure 6. Another consequence of the linked sample is the necessary step of re-weighting to account for an oversample of self-employed workers. Finally, the methodology used in the ALP involves surveys conducted using a computer or a phone application, whereas the HRS utilizes face-to-face interviews, and the CPS and its supplements involve interviews over the phone. On the other hand, the ALP has no proxy responses, while as many as half of the responses in a given CPS survey could be from proxy respondents (Katz & Kreuger, 2019). While the ALP surveys are near word-for-word equivalent questionnaires, these differences cannot be accounted for, and while it may be clear how these differences influence the sample construction or influence the results in other ways, for example false recall of the particulars of one's own work arrangement.

Moreover, a trend-based analysis of non-labor income or retirement income adequacy by employment arrangement is not possible. The only dataset which combines questions on alternative work arrangements with questions on sources of retirement income are the one-off surveys in the American Life Panel used in this study.

b. Policy Recommendations

Two sets of policy recommendations can be derived from this study. The first recommendation concerns the paucity of data researchers have at their disposal to study alternative work arrangements. Katz and Krueger (2019) as well as Abraham, Haltiwanger, Sandusky & Spletzer (2019) have highlighted some of the more glaring issues of prior implementations of the CWS and other household surveys, including the large number of proxy responses. The Contingent Worker Survey was conducted semi-regularly 1995 and 2005, with a one-off revival of the survey in 2017. While some have called for a regularly-conducted CWS survey with less reliance on proxy responses, the findings in this study instead point to a reorganizing of the worker classification questions in the basic monthly CPS questionnaire, to include contingent and alternative work arrangements.

Moreover, just as the Department of Labor contains a bureau dedicated to women in the labor market, an older workers' bureau is necessary to help analyze the current and future trends in the structure of the labor force and of employment resulting from our aging society.

The second set of recommendations concern helping near-retirement workers who lack adequate retirement savings or are fired or laid off. If older workers predominantly choose alternative work out of financial desperation rather than a desire for flexible work, then policies such as enhanced unemployment benefits for laid off older workers or guaranteed pensions. If policymakers have a goal to induce work at older ages, policies should be oriented toward the development of well-paying jobs rather than the proliferation of low-paying jobs with high turnover. This would also create more opportunities for younger workers to save for retirement, which allows them to take greater advantage of compound interest.

VI. Conclusion

This study proposes a new framework for understanding the institutions surrounding the bargaining process for alternative work arrangements, and finds convincing evidence to show that low reservation wages, rather than preferences, are driving older workers into alternative work arrangements. A framework is proposed for considering the institutions surrounding the bargaining process and ownership of the means of production as central to job classification schemes in survey data.

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Appendix

The dataset was constructed by merging variables from several surveys in the American Life Panel, with individual respondents identified using the variable *prim_key*.

The ALP's Household Information file functions similarly to the HRS's tracker file. It contains basic demographic data as well as the method used to recruit the respondent.

The RAND-Princeton Contingent Work Survey is survey #441 in the panel. From here I draw the variables needed to classify workers by work arrangement for our primary analyses, and variables regarding reasons for being in alternative work and relative preference of alternative or traditional work for supplementary analyses.

The remaining variables are drawn from the battery of questionnaires which make up Wave 2 of the Health and Retirement Study equivalent. These questionnaires follow the same sequence as in the Surveys 300, 301 and 336 are readily compiled in the ALP's "User-Friendly File." The remaining files were separately merged in.

Appendix Figure A1: Comparing ALP Surveys to Established Equivalents

Survey Number	Survey Name	Fielded	Equivalent Survey	Equivalent Sections if Applicable	Used in This Study?
N/A	Household Information	Upon respondent recruitment	None	None, most similar to HRS Section A	Yes
300	HRS 2012 Modules A-D	2012-12-29 to 2016-05-02	Health and Retirement Study 2012 Core	- Coverscreen - Demographics - Physical Health - Cognition	No
301	HRS 2012 Modules E-H	2013-03-07 to 2016-05-02		- Family Structure - Parents, Siblings, Transfers - Functional Limitations and Helpers - Housing	No
324	HRS 2012 Modules J-M	2013-05-21 to 2016-05-02		- Pension - Last Job - Job History - Disability	Yes
334	HRS 2012 Modules N-P	2013-06-12 to 2016-05-02		- Health Services and Insurance - Expectations	Yes
336	HRS 2012 Modules Q-R	2013-06-24 to 2016-05-02		- Assets and Income - Asset Change	Yes
337	HRS 2012 Module T	2016-02-17 to 2016-05-02		- Wills and Life Insurance	No
441	RAND-Princeton Contingent	2015-10-19 to 2015-11-04		2005 Contingent	

	Worker Survey		Worker Survey		
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Appendix Figure A2: Sample construction

Respondents to RAND-Princeton Contingent Worker Survey	3,860
Respondents to ALP Health and Retirement Study Wave 2	4,239
...excluding those who did not respond to sections needed for this study	3,977
Common respondents to both surveys...	3,571
...excluding those who took more than one year to complete the surveys	3,091
...excluding those who report changing jobs within year of survey completion	2,988

Figures

Figure 1: Descriptive Statistics

	Traditional employees	Self-employed	Independent contractors	Alternative workers	Unemployed	Not in Labor Force
<i>Personal and Human Capital Variables</i>						
Average Age	47.7	48.5	48.4	53.4	38.1	58.5
Share Female	0.53	0.49	0.48	0.46	0.47	0.62
Share Nonwhite	0.26	0.14	0.17	0.25	0.49	0.2
Share with College Education	0.29	0.40	0.38	0.31	0.15	0.26
Share with Graduate Education	0.12	0.16	0.19	0.13	0.05	0.11
<i>Current Job</i>						
Average tenure in years	8.8	5.3	3.7	2.1	N/A	N/A
Average earnings	\$31,957	\$54,870	\$46,275	\$28,472	N/A	N/A
Average probability of finding equally good job	0.17	0.20	0.29	0.21	N/A	N/A
<i>Non-Labor Income</i>						
Share expecting pension income	0.29	0.46	0.36	0.14	0.12	N/A
Share with wealth to income ratio > 1.5	0.39	0.41	0.41	0.29	0.27	N/A
<i>Indicators of Financial Desperation</i>						
Share lost previous job involuntarily	0.06	0.03	0.02	0.17	0.72	0.33
Share experiencing recent food insecurity	0.09	0.05	0.04	0.12	0.22	0.27

Source: Own calculations.

Figure 2A: Labor Supply Decision With a Compensating Wage Differential for Traditional Work Schedule

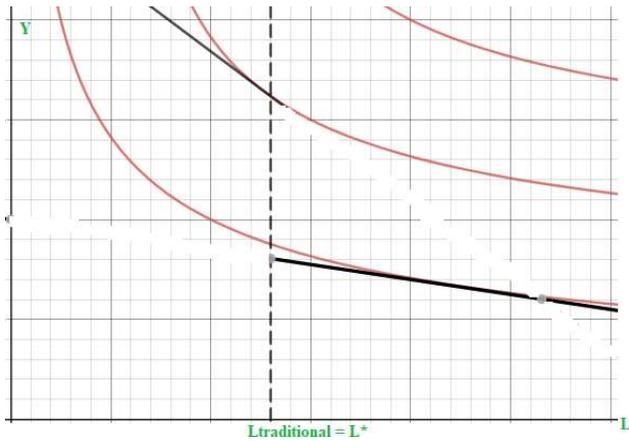
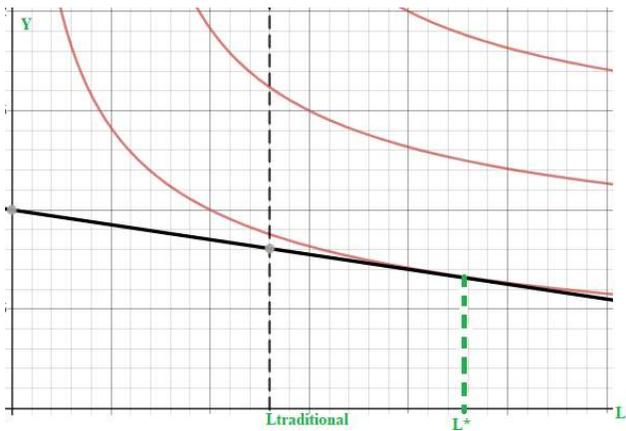
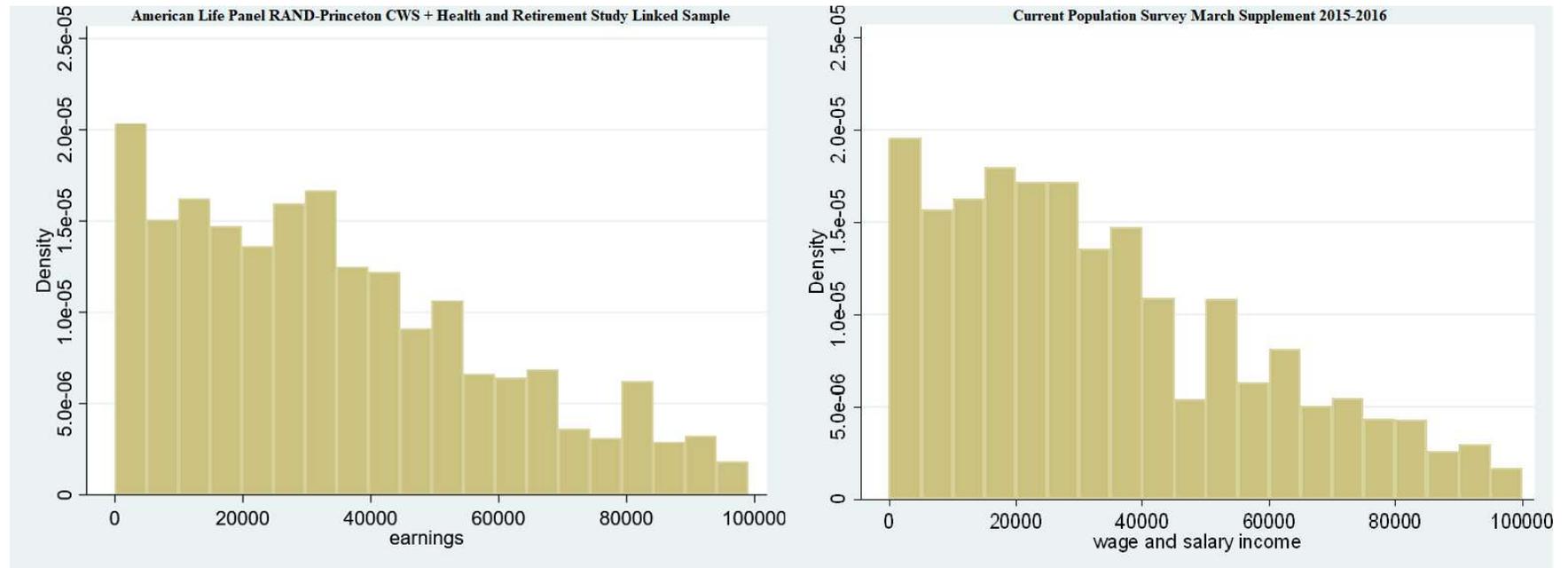


Figure 2B: Labor Supply Decision Without a Compensating Wage Differential



Notes: Red curves indicate indifference curves, L denotes amount of leisure time and Y denotes total income (labor + non-labor income), and black solid line denotes the possibilities frontier. $L_{\text{traditional}}$ denotes the conventional work week (for example, 40 hours/week), and L^* denotes the utility maximizing amount of leisure time. Figure 1B shows the removal of a compensating wage differential for working a conventional work week is associated with a lower utility level and utility maximized with fewer hours of work than the traditional schedule.

Figure 3: Income Distribution of This Study’s Sample (Left) Benchmarked Against the Current Population Survey March Supplement (Right)



Source: Author’s calculation

Notes: Both samples’ x-axes are truncated with the upper limit of \$100,000 for ease of visual comparison.

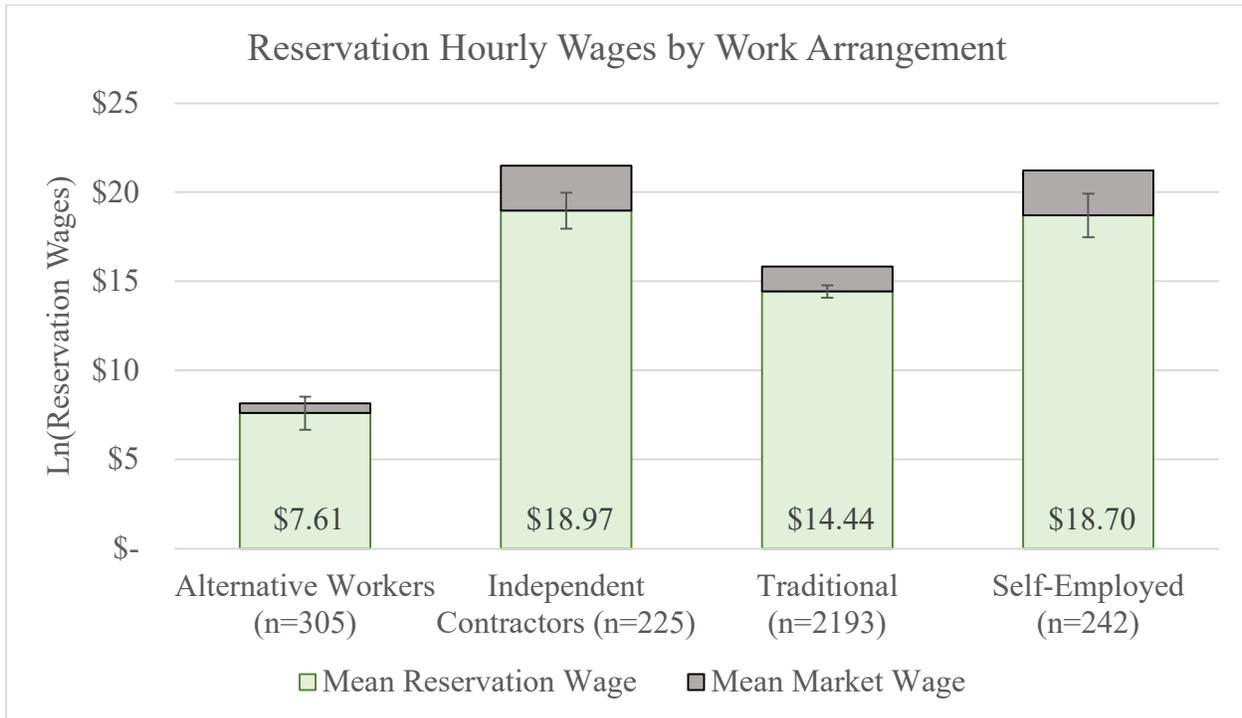
Figure 4: Tests for Reliable Estimations of Reservation Wages

Estimated reservation wages should...	Mean Reservation Hourly Wage (unless otherwise noted)			
...be lower than observed wages	Reservation Wages	\$14.43	Observed Wages	\$18.24
...be higher for unemployed benefit recipients than non-recipients	Recipients	\$13.32	Non-recipients	\$11.15
...increase with education	College	\$18.35	Less than College	\$12.25
...increase with wealth	Wealth/Inc Ratio > 3.0	\$27.25	Wealth to Income < 3.0	\$12.23

Source: Author’s calculation

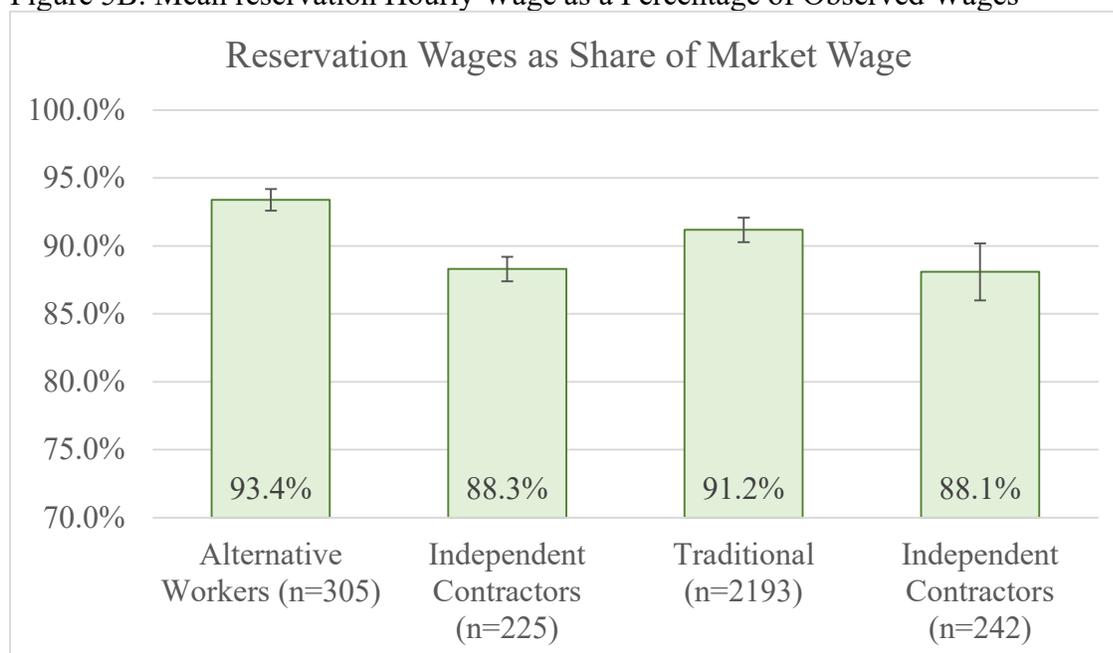
Notes: All differences significant at the 5 percent level. Wealth includes stocks, bonds, CDs, money market accounts, IRAs, and 401(k)-type accounts.

Figure 5A: Mean Reservation Hourly Wage by Work Arrangement



Source: Author’s calculation

Figure 5B: Mean reservation Hourly Wage as a Percentage of Observed Wages



Source: Author's calculation

Figure 6: Ordinary Least Squares Regression Explaining Reservation Wage as a Function of Work Arrangement

Explanatory Variable	Full Sample	Ages 55+ Only
Alternative Work Arrangement	-4.73*** (1.88)	-4.42** (2.10)
Independent Contractor/Self-Employed	3.72*** (1.22)	3.89** (1.57)
Individual Annual Earnings (\$10,000s)	3.27*** (1.03)	3.11** (1.45)
Unemployed	-3.44*** (1.72)	-2.99 (2.01)
Female	-1.44* (0.73)	-2.01* (0.99)
Nonwhite	-1.37* (0.66)	-1.12* (0.55)
Married	0.43 (0.56)	0.88 (0.67)
Constant	3.25	2.24
r-squared	.18	.14

Source: Author's calculation

Notes: Standard errors in parentheses. One, two and three asterisks represent significance at the 5 percent, 1 percent and 0.1 percent level, respectively. Controls for industry and occupation, none of which are significant, are not shown.