

Labor Market Flexibility and Poverty Dynamics: Evidence from Spain*

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Abstract

The past decades have witnessed a rapid growth in contingent employment that may expose workers to a higher poverty risk via limited job stability, few advancement opportunities, and low wages. Using Spanish data from the European Community Household Panel and maximum-likelihood binary models that account for state dependence and unobserved heterogeneity, we examine the poverty implications of past and current temporary employment. Our findings suggest that fixed-term contracts raise the poverty exposure of women and older men relative to open-ended contracts. Furthermore, the poverty implications of temporary employment are long lasting due to feedback effects operating via employees' current work statuses. Finally, the adverse impact of temporary employment seems to be linked to contracts of short duration, thus signaling the importance of work attachment.

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1 Introduction

One of the major labor market developments of the past decades has been the rapid growth of jobs lacking an explicit or implicit contract for long-term employment. The increased prevalence of these contingent jobs has delivered some benefits, such as maintaining a low unemployment rate,¹ providing a second household income, or serving as a stepping-stone to better paid jobs for many individuals.

However, these benefits have not come without costs. First, workers in temporary work arrangements often endure limited job stability, experience fewer opportunities for advancement, and earn lower wages than employees with open-ended contracts in so-called permanent jobs. Second, temporary employees suffer frequent unemployment spells due to the short-term nature of their work arrangements, which result in sharp income shortfalls endangering their economic self-sufficiency. These factors enhance the poverty risk of temporary workers contemporaneously and in the near future. While the increasing availability of longitudinal surveys has fostered a series of poverty studies that examine employees' poverty dynamics,² very few studies have directly assessed the link between temporary employment and poverty. This is surprising considering the prevalence of temporary employment in some economies and its often poor working conditions.³

In this paper, we examine the link between temporary work and poverty using Spanish individual level data from the European Community Household Panel (ECHP). The Spanish labor market constitutes a remarkable case with approximately one third of its workforce employed in temporary jobs

¹For instance, in the U.S., Katz and Krueger (1999) have estimated that the unemployment rate would be fourteenths of a percentage higher if not for the expansion of temp agencies, which is estimated to account for approximately 10 percent of the job growth in the 1990s (Wessel (2001)).

²For instance, in the US, Hill (1981), Plotnick (1983), Duncan (1984), Bane and Ellwood (1986), Sawhill (1988), Gottschalk and Moffitt (1994), Hoynes and MaCurdy (1994), Huff Stevens (1994), and Duncan et al. (1996), among other ones, use the Panel Study of Income Dynamics (PSID). Other authors, such as Blank and Ruggles (1994) and Klawitter et al. (2000), use the Survey of Income and Program Participation (SIPP) and the 1979 National Longitudinal Survey of Youth, respectively. For Spain, see Canto (1996, 2002).

³As we shall discuss in what follows, the exceptions are studies focusing on the U.S. and, often, on specific types of fixed-term contracts. In particular, Heinrich et al. (2002) examine the link between temporary help agency employment and welfare dependency, and Bansak and Amuedo-Dorantes (2003) analyze the relationship between various forms of contingent employment and poverty.

and a high unemployment rate (Encuesta de Población Activa 2000, INE).⁴ As a result, the more frequent unemployment spells endured by temporary workers increase the poverty risk associated with holding a fixed-term contract. Using maximum-likelihood limited dependent variable models that account for state dependence, individual heterogeneity correlated with the regressors and feedback effects, we examine the impact of past and current temporary employment of varying duration on the likelihood of being poor. The distinction between contemporaneous and future poverty implications of temporary employment is particularly important since policy implications may differ depending on whether the welfare effects of fixed-term contracts are long lasting. We also distinguish between the direct poverty effect of past temporary employment (i.e. controlling for *present* work status) and the indirect poverty impact of past temporary employment through its link to the individual's current work status. In particular, we relax the unrealistic assumption of temporary employment being exogenous and, instead, allow for any feedback effects from past temporary employment on poverty via job instability or transition to work statuses characterized by higher poverty hazards. Finally, we investigate possible differences in the poverty implications of temporary employment by gender, age, and the duration of the fixed-term contract held by the employee. This analysis is of special interest given the diverse implications of short-term versus longer term temporary work depending on the employee's gender and age.⁵

In sum, this project provides insight into whether temporary employment constitutes an effective means of supporting individuals and their families contemporaneously. Additionally, we examine whether temporary employment strengthens or, rather, dampens temporary workers' economic opportunities in the near future relative to permanent employment. We find that temporary employment raises the poverty exposure of women and older men relative to permanent employment. The contemporaneous adverse effect of temporary employment seems to be driven by the harmful impact of short

⁴As of the third quarter of 2005, the unemployment rate was approximately 8.42 percent (Encuesta de Población Activa, INE).

⁵For instance, short-lived contracts are more likely to be representative of precarious work arrangements with a lower level of employee and employer commitment. Yet, the poverty implications of holding short-lived contracts may differ with the worker's age. For example, short-term contracts may not be linked to poverty when held by younger workers as a stepping-stone to better employment. Likewise, as we discuss later on, men and women may use fixed-term contracts with different purposes.

lived fixed-term contracts, thus signaling the importance of work attachment. Additionally, past temporary employment adds to men's and women's poverty risk via significant feedback effects. As such, while lower salaries and worse working conditions endured by temporary workers may contribute to their contemporaneous poverty risk, it is the inherent lack of job stability endured by past temporary employees that seems to reinforce their future poverty risk. These findings underscore the value of longer lived work contracts and policies aimed at facilitating the transition from fixed-term to open-ended contracts in fighting poverty.

2 Background on Temporary Employment in Spain

2.1 The Spanish Labor Market

Following Franco's regime, the Spanish economic infrastructure was obsolete and its system of industrial relations was characterized by strong government intervention and centralized bargaining that protected lifetime jobs (Jimeno and Toharia (1993)). The need for flexibility and modernization of labor market institutions and employment contracts became evident. The Workers' Statute (1980) and its 1984 reform accommodated the needs of a changing labor market and an economy in recession by deregulating the use of temporary work contracts by firms. In particular, the new employment regulation introduced an array of work relationships that implied a complete breakthrough from the highly paternalistic employment regulation contained in the 1976 Law of Labor Relations, the Spanish Jurisprudence, and various labor ordinances protecting lifetime jobs. Fixed-term contracts offered firms the possibility to hire and dismiss workers at a much lower cost compared to open-ended contracts. In addition to the new types of work contracts, the Workers' Statute regulated working conditions for temporary and permanent workers –requiring equal wages for the same type of job⁶– via collective bargaining. Nonetheless, despite the legislation's mandate to pay equal wages,

⁶The unconstitutionality of paying different wages to workers carrying out the same type of job has been repeated in various occasions by the Supreme Courts, see: TS 13-5-91, RJ 3909, RJ 5483, and RJ 118. Additionally, the Constitutional Courts in TCo 177/1993 have stated that the shorter contract duration is not sufficient to justify a lower rate of pay.

temporary workers have been found to earn lower wages than their counterparts in more stable jobs (Jimeno and Toharia (1993), Bentolila and Dolado (1994)).

As pointed out by Dolado et al. (2002), temporary employment quickly grew from less than 10 percent in the early 1980s to approximately 30 percent of the workforce by the second half of the decade. In response to its rapid growth, several reforms were passed during the 1990s and in 2001 aimed at reducing firms' extensive use of fixed-term contracts. However, temporary employment has shown considerable resilience, only declining from 35 percent in the mid 1990s to approximately one third of the Spanish workforce as of today.

2.2 Links to Poverty

According to human capital theory, limited on-the-job training and frequent unemployment spells characteristic of fixed-term contracts impede the continuous accumulation of work skills and, instead, favor the depreciation of acquired human capital.⁷ Coupled with temporary workers' commonly lower wages and frequent ineligibility for unemployment benefits, these factors may contribute to temporary workers' contemporaneous and future poverty risk. Moreover, the differential treatment that the early regulation of temporary and permanent employment granted to workers in each of these work arrangements, together with unions' clout and traditionally high unemployment rates, favored the emergence of a segment of rationed well-paid permanent jobs and another segment of contingent jobs with worse working conditions (Bentolila and Dolado (1994)). According to the theory on dual labor markets, the limited mobility between these two labor market segments may have further favored the involuntary confinement of temporary workers into jobs with lower wages and poorer working conditions; hence, enhancing their future poverty risk. Finally, in the case of women, interrupted work patterns may have also fostered statistical discrimination by employers, impairing women's advancement career-wise and, thereby, raising their future poverty risk.⁸

⁷Bartik (1997) finds evidence that welfare recipients in the U.S. who stay longer in the job benefit from more work experience and opportunities for general and firm-specific skills training compared to those who take short-duration temporary jobs.

⁸The higher labor market withdrawal rate exhibited by women relative to men may foster employers' beliefs of female candidates as being less committed to their jobs.

Alternatively, temporary work may provide families with income relief and reduce their poverty risks by facilitating the employment of secondary household income earners with less labor market attachment, as it is often the case for women and older workers. Additionally, temporary employment may function as a stepping-stone for inexperienced workers, providing a path towards self-reliant employment and reducing the likelihood of poverty in the near future relative to low-skill dead-end permanent employment.

2.3 Literature Review

While both poverty and temporary employment have been the focus of an extensive body of literature, few studies have linked the type of work contract held by the worker to the individual's likelihood of life in poverty. Some exceptions, although focusing on the U.S. experience, are the studies on contingent work and welfare dependency by Heinrich et al. (2002) using data on Missouri and North Carolina, and the analysis by Bansak and Amuedo-Dorantes (2003) examining the relationship between poverty and a variety of contingent work arrangements using the 1979 National Longitudinal Survey of Youth (NLSY79).⁹ Nonetheless, the regulation and magnitude of temporary employment in Spain make the study of any poverty implications of fixed-term employment in this country of special interest.

Focusing on Spain, there are three different strands of literature that shed light on the relationship between poverty and contingent work: (i) Research on poverty determinants, (ii) studies of low wages and poverty, and (iii) research on low wages, limited training, and high turnover rates among temporary workers. Within the first category, Canto (1996, 2002) provides some insight into the determinants of poverty incidence and duration, as is the case with the part-time work status of the household head.¹⁰ Canto also finds that there is evidence of poverty state dependence for as long as fifteen months. However, her work does not address the poverty implications of

⁹Bansak and Amuedo-Dorantes (2003) investigate how past employment in alternative types of contingent jobs may affect the likelihood of living in poverty, although without accounting for individual heterogeneity. Using NLSY79 data, they find that the type of work contract does not, by itself, increase the individual's likelihood of life in poverty in the near future.

¹⁰Canto (1996) estimates logit regressions with poverty duration dummies. Canto (2002) uses n-order logit Markov model of poverty and non-poverty spells to jointly estimate poverty exit and re-entry determinants.

contingent work. In a related study, Poggi (2003) examines the persistence of social exclusion using the Spanish data from the ECHP. She estimates a dynamic random effects logit model following Wooldridge (2000). By using time-invariant covariates, she circumvents the assumption of exogenous regressors and also finds a significant degree of state dependence. However, the use of time-invariant regressors rules out the possibility of assessing the existence of any feedback effects from past work statuses to poverty via job instability or via the transition to work statuses with greater poverty hazards.

Other studies have focused on the incidence of poverty among low-wage workers. While there are no studies exclusively focusing on Spain, Marx and Verbist (1999) use European data to show that poverty rates for the working age population tend to be consistently higher in countries where low-wage work is more prevalent.¹¹

Finally, a third strand of research has examined the link among low wages, limited training, high turnover rates and temporary employment. For instance, Jimeno and Toharia (1993) use a cross-section of temporary and permanent workers and find that temporary workers earn between 7 percent and 11 percent less than permanent workers. Bentolila and Dolado (1994) estimate that the widespread use of temporary contracts accounts for the growing wage gap between “perms” and “temps.” More recently, Amuedo-Dorantes and Serrano-Padial (2005) examine the effect of the duration of temporary employment on workers’ current and future wages. They find that, while temporary workers earn significantly less than their permanent counterparts contemporaneously, their wages quickly improve if they are able to keep their jobs. Other studies emphasize the limited on-the-job training and high turnover rates experienced by temporary workers. With respect to training opportunities, Adam and Canziani (1998) provide evidence of employers’ lack of training incentives for temporary workers in Spain, while Dolado et al. (2002) further suggest that the high turnover rates exhibited by temporary workers may be responsible for their reduced probability of receiving firm specific training. Lastly, García Serrano and Jimeno (1999) discuss how the significantly higher turnover rates among temporary workers may lead to a vicious cycle of low-pay jobs and unemployment.¹²

¹¹They use 1989-94 data from the U.S., Canada, Europe and Australia.

¹²In this vein, Amuedo-Dorantes (2000) finds that 17.5 percent of temporary workers in Spain end up unemployed a year later relative to only 2.8 percent of permanent workers. These findings are in line with Boeri (1998), who finds that job finding probabilities for the unemployed decrease with the incidence of temporary employment.

In sum, the existing research suggests that, relative to permanent employment, fixed-term work may increase temporary workers' exposure to poverty through low wages, limited on-the-job training and restricted job security. However, fixed-term jobs could help lower temporary workers' poverty likelihood if they provide inexperienced and unskilled workers with a stepping-stone to more promising placements or if they help individuals earn a second household income. In what follows, we examine which of these two predicted effects is supported empirically by the data with an analysis of the poverty implications of past and current temporary employment that accounts for individual heterogeneity, poverty state dependence and feedback effects.

3 Data and Descriptive Evidence on Poverty and Temporary Employment

We use Spanish data from eight consecutive waves (1994-2001 inclusive) from the European Community Household Panel (ECHP) -a longitudinal survey started by the European Union member countries in 1994. The survey collects information from approximately 70,000 households, of which 8,000 reside in Spain. In addition to household and individual demographic and work related characteristics, the dataset collects information on the labor force status and earnings of each individual when employed. The survey questionnaire allows us to categorize respondents into one of the following groups: out of the labor force, unemployed, self-employed, and employed as wage and salary workers. Within the last category, we distinguish temporary workers with fixed-term contracts from permanent workers with open-ended contracts and from *other* workers. *Other* workers can be: (1) employees working less than 15 hours/week for who we lack information on the type of work contract held, or (2) employees working 15 or more hours/week without a contract or with an apprenticeship, a training contract or a similar type of work arrangement.¹³

Table 1 shows the means and standard deviations of the main variables

¹³Overall, we thus classify workers into one of the following six categories: permanent, temporary, *other*, self-employed, unemployed and inactive. When we further distinguish according to the duration of the fixed-term contract held by the temporary worker, we consider four categories: workers with up to a 6-month contract, workers with a 7 to 12-month contract, workers with a fixed-term contract lasting over 1 year, and workers lacking a written contract.

used in the analysis and informs on some of the characteristics of poor and non-poor individuals in the sample.¹⁴ Since men and women usually display different labor force participation patterns, we examine them separately. According to the figures in Table 1, poverty displays a higher incidence on women than men. Overall, eighteen percent of individuals are considered poor, with few differences between the poor and the non-poor in terms of age or family size. The main discrepancies between poor and non-poor individuals are found with regards to their educational attainment and work statuses. Non-poor individuals are better-educated and more likely to be employed than their poor counterparts. Indeed, approximately 47 percent of poor men work, whereas only 17 percent of poor women are employed.

Even though working respondents are less likely to live in poverty, contingent workers (temporary employees as well as *other* workers with limited work attachment) endure higher poverty incidence rates than permanent workers. As shown in Table 2, only 4 percent of permanent workers are considered poor relative to 13 percent of temporary workers and 23 percent of *other* contingent workers. The incidence of poverty among male temporary and *other* contingent workers is even higher (15 percent and 25 percent, respectively) than among women in those work statuses (10 percent and 21 percent, respectively). Nonetheless, women on temporary and *other* contingent jobs have poverty rates five to ten times greater than their permanent counterparts.

The higher incidence of poverty among temporary workers may be less worrisome if income mobility is relatively high. Table 3 displays a poverty transition matrix across work statuses. The main finding that emerges from Table 3 is the existence of relatively high poverty persistence. On one hand, apart from unemployed individuals, poverty entry rates are the largest for non-poor respondents who were self-employed in the past, with 11 percent of them considered poor a year later. In contrast, only 2 percent of non-poor permanent workers are poor a year later. Temporary and *other* contingent workers fall somewhere in between, enduring poverty entry rates two to four times greater than permanent workers' poverty entry rates. Poverty exit rates, on the other hand, range between 62 percent for permanent employees

¹⁴Following the poverty definition of EUROSTAT, we deem an individual in a given household as poor if the household *equivalent* income is below the poverty line, set at $0.6 \times (\text{median equivalent income})$. Equivalent income is equal to the household disposable income divided by the number of equivalent adults according to the modified OECD equivalence scale ($\# \text{ of equivalent adults} = 1 + 0.5 \times (\# \text{ of adults} - 1) + 0.3 \times (\# \text{ of children})$).

and 51 percent for *other* contingent workers. This implies that between 38 percent and 49 percent of workers remain poor one year later. Specifically, only 28 percent of temporary workers and 13 percent of *other* contingent workers escape poverty within the period of one year while they are still employed in temporary or contingent jobs. These percentages compare to 42 percent of permanent workers who exit poverty during the same time period while they are still employed on a permanent basis.

The persistence of poverty among temporary and *other* contingent workers may be linked to their limited upward employment mobility. Indeed, only 6 to 12 percent of contingent workers living in poverty become employed on a permanent basis a year later. The transition rates to permanent employment for non-poor contingent workers are higher: 26 percent among temporary workers and 16 percent among *other* contingent workers. Overall, these figures are indicative of limited upward employment mobility. Additionally, the differential transition rates exhibited by non-poor relative to poor temporary and *other* contingent workers point to the importance of individual heterogeneity in explaining poverty. Finally, it is worth noting that temporary workers also endure the highest transition rate to unemployment.

Summarizing, preliminary descriptive statistics corroborate the hypothesis that temporary work, alike other forms of contingent employment, raises workers' poverty risk relative to permanent employment. In particular, temporary workers display higher poverty incidence rates, higher poverty entry rates, and lower poverty exit rates a year later than permanent workers. As a result, temporary workers exhibit a significant degree of poverty state dependence partially due to their work status dependence and their high transition rate to unemployment. Because poverty incidence may be explained, to a large extent, by individual level characteristics associated to the work status held by the worker as well as by poverty state dependence, we next turn to a more in-depth analysis that accounts for all these factors.

4 Empirical Methodology

In estimating the impact of past and present temporary work on the likelihood of falling below the poverty line, we encounter three important econometric problems. First, poverty is likely to show strong state dependence. However, if we do not account for unobserved heterogeneity, it is not possible to distinguish *true* state dependence from the role played by unob-

served individual characteristics. Secondly, since unobserved heterogeneity is likely to be correlated with most explanatory variables, such as work status, our parameters' estimates will likely be inconsistent. Finally, work status itself cannot be treated as strictly exogenous in the presence of state dependence since: (i) past poverty can influence the current work status, and (ii) past work status is likely to indirectly affect the likelihood of being poor via feedback effects operating through the employee's current work status.

In order to appropriately address the aforementioned problems, we estimate a nonlinear dynamic panel data model that controls for unobserved heterogeneity, state dependence and feedback effects of predetermined variables, such as past work status. Few analyses do this. One exception is the study of Biewen (2004) on the poverty effects of changes in employment status using data from Germany. He proposes a dynamic random effects probit model following Wooldridge's (2000) framework. Our econometric model differs from Biewen's (2004) in that it allows for work status to take on various values instead of being a dichotomous variable (*employed/unemployed*).

We estimate our model using the conditional maximum likelihood approach for limited dependent variables proposed by Wooldridge (2000). Alternatively, one could use pooled random effects methods (see Wooldridge (2002a)) or the semi-parametric estimators proposed in Honoré and Lewbel (2002) and Arellano and Carrasco (2003). The pooled random effects methods, like the semi-parametric estimators proposed by Honoré and Lewbel (2002), do not allow us to estimate the feedback effects of past temporary work on poverty. Yet, gauging the poverty impact of these indirect effects is important to the extent that, as we show below, their magnitude largely exceeds the size of the direct effect of past temporary employment on poverty. Finally, the GMM approach of Arellano and Carrasco (2003) runs into feasibility issues in the presence of large number of regressors, as noted by Biewen (2004). While Wooldridge's correlated random effects framework requires modeling the relationship between unobserved heterogeneity and the regressors, a linear specification saturated with interaction terms will likely capture this relationship provided most of our regressors are binary.¹⁵ Furthermore, the treatment of initial conditions in Wooldridge (2000) avoids the strong identification assumptions used in alternative correlated random

¹⁵Additional flexibility is introduced by estimating separate regressions for four different age-gender groups.

effects specifications, e.g. Chay and Hyslop (2000).¹⁶

4.1 The Conditional Likelihood

Let y_{it} denote the poverty status of individual $i = 1, \dots, n$ in period $t = 1, \dots, T$. We assume that y_{it} is given by the following model:

$$y_{it} = 1\{\beta_z z_{it} + \beta_{ws} ws_{it} + \beta_{ws-1} ws_{it-1} + \beta_y Y_{it-1} + c_i + e_{it} \geq 0\}, \quad (1)$$

where z_{it} is a vector of strictly exogenous personal and household variables, ws_{it} is a set of (weakly exogenous) work status dummy regressors, and $Y_{it-1} = (y_{it-1}, y_{it-2}, \dots, y_{it-k})'$ is a vector of k lags of poverty status aimed at capturing state dependence. Finally, c_i and e_{it} represent the unobserved time-invariant individual effect and the idiosyncratic error, respectively. Assuming the cdf of e_{it} , $G(\cdot)$, is symmetric about zero, we have that:

$$P(y_{it} = 1 | z_{it}, ws_{it}, ws_{it-1}, Y_{it-1}, c_i) = G(\beta X_{it} + c_i), \quad (2)$$

where $\beta = (\beta_z, \beta_{ws}, \beta_{ws-1}, \beta_y)$ and $X_{it} = (z_{it}, ws_{it}, ws_{it-1}, Y_{it-1})'$. Therefore, the conditional density of y_{it} is given by:

$$f(y_{it} | X_{it}, c_i; \beta) = [G(\beta X_{it} + c_i)]^{y_{it}} [1 - G(\beta X_{it} + c_i)]^{(1-y_{it})}. \quad (3)$$

If $g(\cdot | z_{it}, ws_{it-1}, Y_{it-1}, c_i; \delta)$ is the conditional density of ws_{it} , we can write the joint density of $((y_{iT}, ws_{iT}), \dots, (y_{i1}, ws_{i1}))$ conditional on $(Z_{iT}, ws_{i0}, y_{i0}, c_i)$ as:¹⁷

$$p((y_{iT}, ws_{iT}), \dots, (y_{i1}, ws_{i1}) | Z_{iT}, ws_{i0}, y_{i0}, c_i; \beta, \delta) = \prod_{t=1}^T f(y_{it} | X_{it}, c_i; \beta) g(ws_{it} | z_{it}, ws_{it-1}, Y_{it-1}, c_i; \delta). \quad (4)$$

In order to perform maximum-likelihood estimation, we need to obtain a conditional density that does not depend on the unobserved individual effect. Accordingly, Wooldridge (2000) suggests modeling the distribution of the individual effect conditional on the exogenous variables and on the initial

¹⁶Wooldridge (2000) shows that no assumptions on the distribution of initial conditions are needed to estimate the model. See Hsiao (2003) for an overview of the traditional approaches to initial conditions in random effects models.

¹⁷ $Z_{iT} = (z_{iT}, \dots, z_{i1})'$.

conditions $(h(c_i|Z_{iT}, ws_{i0}, y_{i0}; \theta))$ to then integrate out the individual effect. Thus, the joint distribution of $((y_{iT}, ws_{iT}), \dots, (y_{i1}, ws_{i1}))$ conditional only on observables is given by:

$$l_i(\beta, \delta, \theta) = p((y_{iT}, ws_{iT}), \dots, (y_{i1}, ws_{i1})|Z_{iT}, ws_{i0}, y_{i0}; \beta, \delta, \theta) = \int_{\mathbb{R}} \prod_{t=1}^T f(y_{it}|X_{it}, c; \beta)g(ws_{it}|z_{it}, ws_{it-1}, Y_{it-1}, c; \delta)h(c|Z_{iT}, ws_{i0}, y_{i0}; \theta)dc. \quad (5)$$

Therefore, the log-likelihood for the whole sample can be written as:

$$\mathcal{L}(\beta, \delta, \theta) = \sum_{i=1}^n \ln[l_i(\beta, \delta, \theta)]. \quad (6)$$

4.2 A Logit Approach

We need to provide specific functional forms for the conditional densities of poverty status, work status and the individual effect. Since work status is a multinomial variable taking on $J > 2$ different values,¹⁸ obtaining ML estimates for β and δ is computationally very expensive. Therefore, for tractability purposes, we use a logit approach to model the distribution of poverty status and the multinomial distribution of work status. Accordingly, the conditional density of poverty status is defined as:

$$f(y_{it}|X_{it}, c; \beta) = \frac{[\exp(\beta X_{it} + c)]^{y_{it}}}{1 + \exp(\beta X_{it} + c)} \quad (7)$$

Likewise, the distribution of work status is given by the multinomial logit density:¹⁹

$$g(ws_{it}|z_{it}, ws_{it-1}, Y_{it-1}, c; \delta) = \frac{\prod_{j=1}^J [\exp(\delta_z^j z_{it} + \delta_{ws}^j ws_{it-1} + \delta_y^j y_{it-1} + \delta_c^j c)]^{\mathbf{1}_{\{ws_{it}=j\}}}}{\sum_{m=1}^J \exp(\delta_z^m z_{it} + \delta_{ws}^m ws_{it-1} + \delta_y^m y_{it-1} + \delta_c^m c)}, \quad (8)$$

¹⁸Specifically, $J = 9$ or 6 , depending on whether we distinguish by contract type or not.

¹⁹A limitation of the multinomial logit is the so called Independence of Irrelevant Alternatives assumption, which imposes strong restrictions on the covariance matrix of the error terms. However, allowing for a more flexible structure when we have a large number of possible work status categories would render the estimation intractable.

where we normalize $\delta^1 = 0$ so that $\delta^j, j = 2, \dots, J$ are identified. Note that *past* work status affects the likelihood of being poor in two ways: (i) via a *direct* effect captured by β_{ws-1} , and (ii) via an *indirect* effect captured by δ_{ws}^j that operates through the likelihood of currently holding a specific work status (i.e. the *feedback* effect).

To complete the specification, we assume that the individual effect is normally distributed with variance σ and with mean:

$$h(c|Z_{iT}, ws_{i0}, y_{i0}; \theta) = \frac{1}{\sigma} \phi \left(\frac{c - \gamma_z \bar{Z}_i - \gamma_{ws} ws_{i0} - \gamma_y y_{i0}}{\sigma} \right), \quad (9)$$

where $\phi()$ denotes the standard normal density.²⁰

In all our estimation models, z_{it} includes: age, health status, marital status, educational attainment, family size, number of additional workers in the household, regional unemployment rates and a constant term. We also include up to three lags of poverty status ($k = 3$). We choose “permanent employment” as the baseline work status ($ws_{it} = 1$), i.e. $\beta_{ws_1} = 0$. Finally, we approximate the integral in (5) using the Gauss-Hermite quadrature.²¹

4.3 Average Partial Effects

To facilitate the interpretation of our estimates, we calculate the average partial effects (APE). Wooldridge (2002b) proposes alternative methods to compute APEs in the presence of unobserved heterogeneity. We follow the most general method, which requires no additional identification assumptions in the calculation of the *direct* APEs and *total* APEs. Direct APEs measure the impact of a regressor on poverty *ceteris paribus*. For instance, the direct APE of being unemployed relative to being employed on a permanent basis during the previous period is computed as the difference between the expected poverty status (conditional on the respondent’s present work status) when unemployed and the expected poverty status when employed on a permanent basis during the previous period. Total APEs estimate the average impact of a lagged variable (e.g. past temporary work) on the individual’s likelihood of being poor. It includes both *direct* and *indirect* or feedback effects. Using the previous example, it is computed as the difference between the expected poverty status when unemployed and the expected

²⁰Additional interaction terms between \bar{Z}_i , ws_{i0} and y_{i0} were included in the estimated regressions.

²¹We use twelve quadrature points.

poverty status when employed on a permanent basis during the previous period, independently of the respondent's current work status.

According to Wooldridge (2002b), a consistent estimator of the direct APE for a binary regressor x_r in our model is given by:

$$\begin{aligned}
\widehat{APE}_d(x_r) &= \frac{1}{n} \sum_{i=1}^n \int_{\mathbb{R}} \left[E(y_{it} | X_{-r} = \bar{X}_{-r}, x_r = 1, c; \hat{\beta}) \right. \\
&\quad \left. - E(y_{it} | X_{-r} = \bar{X}_{-r}, x_r = 0, c; \hat{\beta}) \right] h(c | Z_{iT}, ws_{i0}, y_{i0}; \hat{\theta}) dc \\
&= \frac{1}{n\hat{\sigma}} \sum_{i=1}^n \int_{\mathbb{R}} \left[\frac{\exp(\hat{\beta}_{-r}\bar{X}_{-r} + \hat{\beta}_r + c)}{1 + \exp(\hat{\beta}_{-r}\bar{X}_{-r} + \hat{\beta}_r + c)} \right. \\
&\quad \left. - \frac{\exp(\hat{\beta}_{-r}\bar{X}_{-r} + c)}{1 + \exp(\hat{\beta}_{-r}\bar{X}_{-r} + c)} \right] \phi \left(\frac{c - \hat{\gamma}_z \bar{Z}_i - \hat{\gamma}_{ws} ws_{i0} - \hat{\gamma}_y y_{i0}}{\hat{\sigma}} \right) dc, \tag{10}
\end{aligned}$$

where \bar{X}_{-r} represents the regressors in X_{it} , with the exception of x_r .²²

²²For multinomial variables represented by a set of dummy variables, such as work status, the direct APE for category j is obtained by replacing in the above expression “ $x_r = 1$ ” with “ $x_{r_1} = 0, x_{r_2} = 0, \dots, x_{r_j} = 1, \dots$ ” and “ $x_r = 0$ ” with “ $x_{r_1} = 0, x_{r_2} = 0, \dots, x_{r_j} = 0, \dots$ ”, where x_{r_j} is the dummy variable associated with category j .

Total APE effects can be consistently estimated by:

$$\begin{aligned}
\widehat{APE}_T(x_r) &= \\
&= \frac{1}{n} \sum_{i=1}^n \int_{\mathbb{R}} \left[\sum_{j=1}^J [E(y_{it} | \bar{X}_{-r,ws}, w_{st}=j, x_r=1, c; \hat{\beta}) P(w_{st}=j | \bar{X}_{-r,ws}^*, x_r=1, c; \hat{\delta}) \right. \\
&\quad \left. - E(y_{it} | \bar{X}_{-r,ws}, w_{st}=j, x_r=0, c; \hat{\beta}) P(w_{st}=j | \bar{X}_{-r,ws}^*, x_r=0, c; \hat{\delta}) \right] \\
&\quad \cdot h(c | Z_{iT}, w_{s_{i0}}, y_{i0}; \hat{\theta}) dc \\
&= \frac{1}{n\hat{\sigma}} \sum_{i=1}^n \int_{\mathbb{R}} \left[\sum_{j=1}^J \left[\frac{\exp(\hat{\beta}_{-r,ws} \bar{X}_{-r,ws} + \hat{\beta}_{ws_j} + \hat{\beta}_r + c)}{1 + \exp(\hat{\beta}_{-r,ws} \bar{X}_{-r,ws} + \hat{\beta}_{ws_j} + \hat{\beta}_r + c)} \frac{\exp(\hat{\delta}_{-r}^j \bar{X}_{-r}^* + \hat{\delta}_r^j + \hat{\delta}_c^j c)}{\sum_{m=1}^J \exp(\hat{\delta}_{-r}^m \bar{X}_{-r}^* + \hat{\delta}_r^m + \hat{\delta}_c^m c)} \right. \right. \\
&\quad \left. \left. - \frac{\exp(\hat{\beta}_{-r,ws} \bar{X}_{-r,ws} + \hat{\beta}_{ws_j} + c)}{1 + \exp(\hat{\beta}_{-r,ws} \bar{X}_{-r,ws} + \hat{\beta}_{ws_j} + c)} \frac{\exp(\hat{\delta}_{-r}^j \bar{X}_{-r}^* + \hat{\delta}_c^j c)}{\sum_{m=1}^J \exp(\hat{\delta}_{-r}^m \bar{X}_{-r}^* + \hat{\delta}_c^m c)} \right] \phi \left(\frac{c - \hat{\gamma}_z \bar{Z}_i - \hat{\gamma}_{ws} w_{s_{i0}} - \hat{\gamma}_y y_{i0}}{\hat{\sigma}} \right) \right] dc,
\end{aligned} \tag{11}$$

where $\bar{X}_{-r,ws}$ includes all the regressors in \bar{X}_{-r} , except for \bar{w}_{st} , and \bar{X}_{-r}^* represents the subset of elements of \bar{X}_{-r} in equation (8). In addition, $\hat{\beta}_{ws_j}$ is the coefficient estimate of the present work status dummy associated to the j th work status category. The above integrals are approximated using the Gauss-Hermite quadrature.

5 Poverty Implications of Temporary Employment by Gender, Age, and Work Contract Length

In this section, we examine the poverty implications of current and past temporary employment. The APEs allow us to distinguish between a direct and an indirect or feedback effect of past temporary employment on poverty. Feedback effects are of particular interest in the case of past temporary employment since they can raise workers' poverty exposure via job instability or via their transition to work statuses with a high poverty risk.

We estimate our model separately for men and women to capture gender differences in the use of fixed-term contracts as well as in their poverty

implications. Additionally, we carry out the estimation separately for individuals less than 35 years old and for individuals 35 years of age and older to address any distinctions in the temporary jobs held by younger versus older workers. This is of interest if younger workers accept temporary jobs with mediocre working conditions as a means to enter and advance in internal labor markets. Finally, we further differentiate according to the duration of the work contract held by the worker. Longer lasting temporary work contracts may signal a higher level of work commitment between the worker and the firm and, possibly, a higher likelihood of contract conversion to a permanent work status in the near future. If that is the case, we would expect workers with longer lasting work contracts to enjoy greater work attachment and a lower likelihood of life in poverty than their counterparts with short-lived fixed-term contracts.

The estimated coefficients and standard errors for men and women are displayed in Tables 4 and Table 5, respectively. Table 6 and Table 7 show the corresponding APEs. Given the purpose of this study, we center our discussion on the coefficients for current and past temporary work statuses that are statistically different from zero.

5.1 Poverty Implications of Temporary Employment Among Men

We first look at the estimates for men in Table 4 and Table 6. The figures in Table 4 indicate that only current temporary employment has a direct impact on the poverty exposure of male workers. If we do not distinguish by the type of temporary work contract held, temporary work only seems to raise the poverty risk of older men. The differential poverty impact of current temporary employment among younger versus older men hints on the potentially dissimilar usage of fixed-term contracts by workers in these two age groups. In particular, younger male temporary workers may use fixed-term contracts as a stepping-stone. Table 6 facilitates the interpretation of the aforementioned effect. To serve as a reference, the first row in Table 6 shows that the predicted poverty rate of older men with permanent jobs is 6.66 percent. The likelihood of life in poverty among older men with fixed-term contracts is 2.37 percentage points higher than for their counterparts with open-ended contracts. As such, the predicted poverty rate of older male temporary workers is 9.03 percent. As we further distinguish according

to the duration of the fixed-term contract held by the worker, we find that the contemporaneous poverty risk endured by older temporary workers is largely driven by the higher poverty risk associated to short-lived temporary contracts. Indeed, relative to their counterparts with open-ended contracts, younger men with short-term contracts have a contemporaneous predicted poverty rate of 9.24 percent (5.37 percent plus 3.87 percentage points). In contrast, the contemporaneous predicted poverty rate endured by older male temporary workers is approximately 13 percent (6.66 percent plus 6.34 percentage points). Likewise, relative to permanent work arrangements, one-year fixed-term contracts raise older male employees' poverty risk up to 9.94 percent contemporaneously (6.66 percent plus 3.28 percentage points).

What are the poverty implications of past temporary work? Irrespective of their small and non-statistically different from zero direct impact, past temporary work raises the poverty risk endured by older men relative to similar permanent employees by 1.61 percentage points (from 6.66 percent to 8.27 percent). Therefore, temporary employment has long lasting poverty implications among older men as reflected by the slow reduction in their poverty rate from 9.03 percent to 8.27 percent over a one year period. When we distinguish according to the duration of the fixed-term contract held by the worker in the past we find, once more, that short-term fixed-term contracts have long lasting poverty consequences among older men. Specifically, despite having a small direct poverty impact, six-month contracts raise the predicted poverty rate of older men by 4.18 percentage points to approximately 10.84 percent. Hence, the poverty implications of holding a six-month contract among older workers do not vanish rapidly, i.e. the predicted poverty rate only drops from 13 percent to approximately 11 percent in a one-year period. Likewise, relative to permanent work arrangements, one-year fixed-term contracts raise older male employees' poverty risk to 10.03 percent a year later (6.66 percent plus 3.37 percentage points).

5.2 Poverty Implications of Temporary Employment Among Women

Table 5 and Table 7 display our results for women. Unlike previously seen for men, temporary employment raises the likelihood of life in poverty among all women between 4.34 and 4.51 percentage points relative to permanent employment. As a result, the contemporaneous predicted poverty rate

for female temporary workers ranges between 7.46 percent among younger women and 12.30 percent among their older counterparts. To serve as a reference, it is worth mentioning that the magnitude of the contemporaneous poverty impact of temporary work is about half the impact of being unemployed. Furthermore, the poverty impact of temporary employment only drops to 4.91 percent (3.12 percent plus 1.79 percentage points) for younger women and to 11.07 percent (7.79 percent plus 3.28 percentage points) for their older counterparts within a one-year period. Therefore, the poverty implications of temporary work appear to be long lasting.

As we distinguish according to the length of the work contract held by the employee, we find that, as with men, it is short-term employment that raises women's poverty risk the most. Specifically, fixed-term contracts lasting up to six months are associated to contemporaneous predicted poverty rates of 9.72 percent (3.12 percent plus 6.60 percentage points) for younger women and 16.49 percent (7.79 percent plus 8.70 percentage points) for their older counterparts. Six-month contracts also have a long lasting impact on poverty rates, which only drop to 6.66 percent (3.12 percent plus 3.54 percentage points) for younger women and to 10.68 percent (7.79 percent plus 2.89 percentage points) for older women in a one-year period. Likewise, one year contracts raise women's contemporaneous exposure to life in poverty by 3.27 percentage points to an average predicted poverty rate of 6.39 percent relative to permanent employment. This effect, which is also long lasting, is exclusively observed among younger women.

5.3 Gender Differences

Overall, there are various gender similarities as well as differences in terms of the poverty implications of temporary work worth noting. Among the similarities, we first find that short-lived temporary employment of up to 6-months' duration significantly raises the poverty risk endured by all men and women. Second, past temporary employment never has a significant direct effect on the poverty risk borne by either men or women. Yet, past temporary employment has significant feedback effects on male and female poverty exposure as can be seen in Table A in the appendix.²³ As such, the poverty implications of short-term employment are relatively long lasting.

Perhaps the most notable gender difference is the fact that temporary

²³A similar table distinguishing by type of work contract is available from the authors.

work only raises the poverty likelihood of older male workers contemporaneously. In contrast, temporary work increases the poverty risk of all women contemporaneously. The differential impact of temporary work by age can be understood on the basis of a distinctive usage of temporary contracts as a stepping-stone among younger workers. Likewise, gender differences could be explained by a differential use of fixed-term contracts by men and women. For instance, it may be the case that a higher percentage of younger women use temporary employment to provide a secondary household income compared to younger men, who may most commonly use temporary employment as a stepping-stone in their careers. Additionally, gender differences could be explained, to some extent, by gender discrimination in the labor market, women's lesser involvement in unions and work councils, and/or to women's more interrupted career and labor force participation patterns.

Finally, it is important to note that the results in Tables 4 through 7 reveal long-lived poverty state dependence for both men and women. However, poverty state dependence is often larger in magnitude among women relative to men, possibly signaling the greater employment and income growth opportunities available to men as opposed to women. As with poverty state dependence, we also find that individual heterogeneity -captured by the parameter σ - plays a significant role in explaining the likelihood of life in poverty.

6 Conclusions

This paper examines the poverty implications of past and current temporary employment while accounting for state dependence and unobserved heterogeneity possibly correlated with the regressors.

Our results indicate that women, particularly younger women, as well as older men holding temporary jobs are more likely to live in poverty than their permanent counterparts. Much of the contemporaneous negative impact of temporary employment is linked to short-lived temporary work contracts, which appear more harmful than longer temporary contracts. Specifically, temporary work contracts lasting up to six months raise the poverty risk of all men and women between 4 to 9 percentage points relative to permanent work contracts. As a result, the predicted contemporaneous poverty rate of temporary workers reaches 13 percent among older males, 10 percent among younger women, and up to 16 percent among older women. The ad-

verse impact of temporary employment relative to permanent employment is further seen among older men and younger women holding one-year contracts, who endure a 3 percentage point higher contemporaneous likelihood of life in poverty than their permanent counterparts. As such, the predicted contemporaneous poverty rates among one-year temporary workers reach 10 percent among older men and 6 percent among younger women. Finally, in all instances, the overall poverty impact of temporary employment is long lasting due to its large and significant feedback effects, which perpetuate any poverty exposure via job instability and/or transition to work statuses with high poverty risks.

We discuss the differential welfare impact of temporary employment among younger versus older male workers, which may be possibly linked to the divergent usage of temporary employment by each group. For instance, younger men may use temporary work contracts as a stepping-stone, whereas their older counterparts may resort to temporary employment as a means to earn an additional income. In contrast, gender differences in the poverty implications of temporary work for younger women relative to younger men could be due to a variety of factors. These could range from gender discrimination in the labor market, to women's lesser involvement in unions and work councils, and/or to women's more interrupted career and labor force participation patterns. Alternatively, it is possible that a higher percentage of younger women use temporary employment to provide a secondary household income versus as a stepping-stone in their careers relative to younger men. Lastly, the study underscores the role of contract duration on worker's poverty exposure as shorter-lived contracts drive the adverse impact of contemporaneous and past short-term employment on the poverty risk of women and older men.

Finally, we are able to document a significant degree of state dependence for both men and women. In particular, poverty state dependence seems to last well beyond a one year period. In particular, being poor three years ago raises respondents' poverty likelihood between 6 and 9 percentage points to 13 percent among all men, 12 percent among younger women, and 16 percent among older women.

In sum, temporary work appears to raise the poverty exposure of women and older men relative to permanent employment. Furthermore, the poverty implications of temporary employment are long lasting via its *indirect* or feedback effects. The adverse impact of temporary work relative to permanent employment seems to be primarily driven by the harmful effect of short-lived fixed-term contracts, thus signaling the importance of work at-

tachment. As such, from a policy-wise perspective, our findings underscore the value of longer lived work contracts and policies aimed at facilitating the transition from fixed-term to open-ended contracts in fighting poverty.

Appendix

Tables

Table 1
Summary Statistics

| Variable | All | Non-Poor | Poor | | |
|--------------------------------|------------------|------------------|-----------------------|-----------------------|-------------------------|
| | Mean (s.d.) | Mean (s.d.) | All Mean (s.d.) | Men Mean (s.d.) | Women Mean (s.d.) |
| Age | 38.25 (0.077) | 38.46 (0.093) | 37.95 (0.186) | 37.92 (0.278) | 37.97 (0.2502) |
| Male | 49.76% | 50.09% | 46.81% | | |
| Married | 55.79% | 56.30% | 59.06% | 59.83% | 58.37% |
| Family Size | 4.24 (0.011) | 4.21 (0.014) | 4.42 (0.026) | 4.54 (0.037) | 4.31 (0.036) |
| <i>Education</i> | | | | | |
| Middle School | 24.60% | 23.68% | 28.01% | 27.59% | 28.37% |
| Occupational Training | 12.48% | 12.87% | 8.04% | 9.03% | 7.18% |
| High School | 14.11% | 15.52% | 8.73% | 8.24% | 9.15% |
| College | 14.31% | 15.89% | 3.47% | 2.82% | 4.03% |
| <i>Work Status</i> | | | | | |
| Permanent Worker | 24.43% | 27.41% | 5.57% | 10.20% | 1.49% |
| Temporary Worker | 10.96% | 11.31% | 7.82% | 12.15% | 4.00% |
| Other Worker | 4.24% | 3.85% | 5.37% | 5.35% | 5.38% |
| Self-employed/ Family Business | 11.42% | 10.99% | 12.85% | 19.74% | 6.78% |
| Unemployed | 11.34% | 9.70% | 22.22% | 22.86% | 21.65% |
| Out of the Labor Force | 37.62% | 36.74% | 46.18% | 29.69% | 60.69% |
| No. of Observations | 49825 | 40983 | 8842 | 4086 | 4756 |

Table 2
Poverty Incidence by Work Status

| Work Status | All | Men | Women |
|--------------------------------|---------------|---------------|---------------|
| Permanent Worker | 4.15% | 5.38% | 1.75% |
| Temporary Worker | 12.85% | 14.47% | 9.89% |
| Other Worker | 22.93% | 25.37% | 21.15% |
| Self-employed/ Family Business | 19.95% | 20.08% | 19.63% |
| Unemployed | 32.81% | 35.47% | 30.68% |
| Out of the Labor Force | 21.14% | 20.57% | 21.40% |
| Total | 17.58% | 16.62% | 18.52% |

Table 3
Poverty Transition Matrix by Work Status

| Past Work Status | Present Work Status | | | | | | | | | | Total | | | |
|--------------------|---------------------|-------|-------|-------|-------|-------|---------------|--------|-------|-------|-------|-------|-------|---------------|
| | Perm | Temp | Other | Self | Unem | OutLF | Total | Perm | Temp | Other | | Self | Unem | OutLF |
| <i>Non-Poor</i> | | | | | | | | | | | | | | |
| Permanent Worker | 0.867 | 0.045 | 0.011 | 0.016 | 0.016 | 0.027 | 98.17% | 0.012 | 0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 1.81% |
| Temporary Worker | 0.257 | 0.481 | 0.057 | 0.019 | 0.097 | 0.042 | 95.27% | 0.005 | 0.017 | 0.003 | 0.003 | 0.016 | 0.003 | 4.73% |
| Other Worker | 0.156 | 0.200 | 0.239 | 0.044 | 0.140 | 0.132 | 91.04% | 0.006 | 0.012 | 0.030 | 0.004 | 0.022 | 0.016 | 8.95% |
| Self-employed | 0.042 | 0.026 | 0.019 | 0.730 | 0.019 | 0.057 | 89.14% | 0.001 | 0.005 | 0.002 | 0.084 | 0.005 | 0.012 | 10.86% |
| Unemployed | 0.060 | 0.179 | 0.073 | 0.042 | 0.337 | 0.193 | 88.47% | 0.004 | 0.010 | 0.010 | 0.006 | 0.056 | 0.029 | 11.52% |
| Out of Labor Force | 0.009 | 0.028 | 0.023 | 0.018 | 0.065 | 0.780 | 92.32% | 7.3E-5 | 0.001 | 0.002 | 0.002 | 0.009 | 0.063 | 7.69% |
| <i>Poor</i> | | | | | | | | | | | | | | |
| Permanent Worker | 0.424 | 0.094 | 0.012 | 0.032 | 0.037 | 0.022 | 62.01% | 0.254 | 0.044 | 0.013 | 0.037 | 0.014 | 0.018 | 38.00% |
| Temporary Worker | 0.081 | 0.278 | 0.045 | 0.021 | 0.117 | 0.060 | 60.09% | 0.042 | 0.181 | 0.034 | 0.009 | 0.099 | 0.035 | 39.93% |
| Other Worker | 0.035 | 0.116 | 0.128 | 0.034 | 0.117 | 0.078 | 50.80% | 0.027 | 0.070 | 0.106 | 0.027 | 0.155 | 0.106 | 49.18% |
| Self-employed | 0.022 | 0.023 | 0.008 | 0.483 | 0.024 | 0.052 | 61.28% | 0.008 | 0.016 | 0.012 | 0.265 | 0.035 | 0.052 | 38.73% |
| Unemployed | 0.018 | 0.098 | 0.034 | 0.031 | 0.203 | 0.102 | 48.59% | 0.007 | 0.052 | 0.043 | 0.020 | 0.281 | 0.112 | 51.41% |
| Out of Labor Force | 0.007 | 0.024 | 0.017 | 0.016 | 0.053 | 0.406 | 52.27% | 0.001 | 0.009 | 0.010 | 0.007 | 0.060 | 0.391 | 47.74% |

Table 4
Poverty Equation (Males)

| Variable | By Work Status | | By Contract Type | |
|---|----------------------------|----------------------------|----------------------------|----------------------------|
| | Age<35 Coeff. (S.E.) | Age>35 Coeff. (S.E.) | Age<35 Coeff. (S.E.) | Age>35 Coeff. (S.E.) |
| <i>Work Status</i> | | | | |
| Temporary Worker | 0.1015 (0.1544) | 0.3233** (0.1540) | | |
| Six Month Contract | | | 0.5866*** (0.2211) | 0.7414*** (0.2323) |
| 7-12 Month Contract | | | 0.0533 (0.2003) | 0.4377** (0.2225) |
| 13+ Month Contract | | | -0.2513 (0.2680) | 0.1608 (0.2523) |
| Other Temporary Contract | | | -0.0802 (0.2052) | 0.4602** (0.1927) |
| Other Worker | 0.8115*** (0.1983) | 1.0266*** (0.2192) | 0.8119*** (0.1980) | 1.1077*** (0.2176) |
| Self-employed / Family Business | 0.9149*** (0.1865) | 0.3160* (0.1845) | 0.8968*** (0.1843) | 0.5344*** (0.1873) |
| Unemployed | 0.6643*** (0.1849) | 0.9287*** (0.1714) | 0.6664*** (0.1813) | 0.7856*** (0.1700) |
| Out of the Labor Force | 0.8607*** (0.2034) | 0.1586 (0.1873) | 0.8753*** (0.1997) | -0.0082 (0.1829) |
| Temporary Worker Last Year | -0.0332 (0.1624) | -0.0563 (0.1534) | | |
| Six Month Contract Last Year | | | 0.0753 (0.2272) | 0.1346 (0.2381) |
| 7-12 Month Contract Last Year | | | 0.1166 (0.1990) | 0.1764 (0.2191) |
| 13+ Month Contract Last Year | | | -0.1711 (0.2641) | -0.0672 (0.2511) |
| Other Temporary Contract Last Year | | | -0.4661** (0.2281) | 0.1073 (0.1939) |
| Other Contract Last Year | 0.5223*** (0.1995) | 0.0918 (0.2266) | 0.4877** (0.1990) | 0.1826 (0.2247) |
| Self-employed / Family Business Last Year | 0.4347** (0.1959) | 0.1660 (0.1791) | 0.3814** (0.1937) | 0.3149* (0.1822) |
| Lagged Unemployed | 0.2824* (0.1713) | 0.2509 (0.1610) | 0.2241 (0.1703) | 0.3139** (0.1594) |

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| Variable | Coeff. (S.E.) | Coeff. (S.E.) | Coeff. (S.E.) | Coeff. (S.E.) |
|-------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Lagged Out of the Labor Force | 0.1685 (0.1862) | 0.3468* (0.1778) | 0.1142 (0.1841) | 0.3315* (0.1752) |
| <i>State Dependence</i> | | | | |
| Poor Last Year | 1.4427*** (0.0825) | 1.4642*** (0.0733) | 1.4355*** (0.0827) | 1.4933*** (0.0724) |
| Poor Two Years Ago | 0.8675*** (0.0856) | 1.0172*** (0.0760) | 0.8716*** (0.0859) | 1.0321*** (0.0756) |
| Poor Three Years Ago | 0.8007*** (0.0841) | 0.6860*** (0.0765) | 0.7933*** (0.0843) | 0.6918*** (0.0763) |
| σ | 0.1626** (0.0737) | 0.3746*** (0.0650) | 0.1659** (0.0758) | 0.1263** (0.0521) |
| Log likelihood | -11295.1 | -9484.9 | -13788.5 | -10792.8 |
| Wald Test p-value | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| No. of observations | 9158 | 11732 | 9158 | 11732 |

Note: *** denotes statistical significance at the 1% level, ** indicates 5% significance level, and * represents 10% significance level. All the regressions include a constant term, age, a health status dummy, marital status, family size, number of additional workers in the household, educational attainment dummies, the regional unemployment rate, and year dummies. The baseline group is permanent workers.

Table 5
Poverty Equation (Females)

| Variable | By Work Status | | By Contract Type | |
|---|----------------------------|----------------------------|----------------------------|----------------------------|
| | Age<35 Coeff. (S.E.) | Age>35 Coeff. (S.E.) | Age<35 Coeff. (S.E.) | Age>35 Coeff. (S.E.) |
| <i>Work Status</i> | | | | |
| Temporary Worker | 0.9030*** (0.2693) | 0.4999* (0.2778) | | |
| Six Month Contract | | | 1.2090*** (0.3114) | 0.8492** (0.3839) |
| 7-12 Month Contract | | | 0.7524** (0.3150) | -0.0778 (0.3973) |
| 13+ Month Contract | | | 0.6172 (0.3803) | 0.6496 (0.4576) |
| Other Temporary Contract | | | 0.5989 (0.4144) | 0.7428* (0.3872) |
| Other Worker | 1.2469*** (0.2865) | 0.5592** (0.2652) | 1.2539*** (0.2879) | 0.5755** (0.2651) |
| Self-employed / Family Business | 1.4363*** (0.3140) | 0.6858** (0.2855) | 1.4414*** (0.3154) | 0.7640*** (0.2857) |
| Unemployed | 1.3974*** (0.2800) | 0.4645* (0.2548) | 1.4370*** (0.2798) | 0.4288* (0.2538) |
| Out of the Labor Force | 1.4393*** (0.2840) | 0.1334 (0.2477) | 1.4826*** (0.2824) | 0.1542 (0.2488) |
| Temporary Worker Last Year | 0.0596 (0.2757) | 0.2591 (0.2816) | | |
| Six Month Contract Last Year | | | 0.1281 (0.3270) | 0.2969 (0.4020) |
| 7-12 Month Contract Last Year | | | 0.2254 (0.3080) | 0.3643 (0.3647) |
| 13+ Month Contract Last Year | | | -0.4921 (0.4441) | 0.0553 (0.4919) |
| Other Temporary Contract Last Year | | | -0.7001 (0.5404) | 0.4127 (0.4509) |
| Other Contract Last Year | 0.3243 (0.2877) | 0.6783*** (0.2609) | 0.2863 (0.2889) | 0.7097*** (0.2596) |
| Self-employed / Family Business Last Year | 0.6476** (0.3159) | 0.7175** (0.2806) | 0.6102* (0.3169) | 0.7989*** (0.2794) |
| Lagged Unemployed | 0.3662 (0.2662) | 0.6631*** (0.2477) | 0.3320 (0.2666) | 0.6649*** (0.2480) |

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| Variable | Coeff. (S.E.) | Coeff. (S.E.) | Coeff. (S.E.) | Coeff. (S.E.) |
|-------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Lagged Out of the Labor Force | 0.3591 (0.2680) | 0.4816* (0.2473) | 0.3285 (0.2676) | 0.5272** (0.2468) |
| <i>State Dependence</i> | | | | |
| Poor Last Year | 1.4928*** (0.0778) | 1.6323*** (0.0672) | 1.4914*** (0.0781) | 1.6376*** (0.0672) |
| Poor Two Years Ago | 0.8966*** (0.0820) | 1.0605*** (0.0712) | 0.8931*** (0.0822) | 1.0640*** (0.0712) |
| Poor Three Years Ago | 0.8624*** (0.0798) | 0.8000*** (0.0710) | 0.8645*** (0.0800) | 0.8000*** (0.0709) |
| σ | 0.1356 (0.0908) | 0.1153 (0.0754) | 0.1854** (0.0868) | 0.0483 (0.0749) |
| Log likelihood | -11131.4 | -10511.9 | -12706.7 | -10992.0 |
| Wald Test p-value | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| No. of observations | 9119 | 12517 | 9119 | 12517 |

Note: *** denotes statistical significance at the 1% level, ** indicates 5% significance level, and * represents 10% significance level. All the regressions include a constant term, age, a health status dummy, marital status, family size, number of additional workers in the household, educational attainment dummies, the regional unemployment rate, and year dummies. The baseline group is permanent workers.

Table 6
Average Partial Effects (Males)

| | Age \leq 35 | | Age $>$ 35 | |
|---|---------------|--------------------|------------|--------------------|
| | Contemp | Lagged | Contemp | Lagged |
| $\hat{P}(\text{poor} = 1 X = \bar{x}, \text{permanent worker})$ | 5.37% | | 6.66% | |
| <i>Work Status</i> | | | | |
| Temporary Worker | 0.54% | -0.21% [0.49%] | 2.37% | -0.38% [1.61%] |
| Six Month Contract | 3.87% | 0.52% [1.89%] | 6.34% | 0.94% [4.18%] |
| 7-12 Month Contract | 0.28% | 0.82% [1.68%] | 3.28% | 1.25% [3.37%] |
| 13+ Month Contract | -1.14% | -1.07% [-0.50%] | 1.07% | -0.43% [0.97%] |
| Other Temporary Contract | -0.39% | -2.57% [-1.31%] | 3.48% | 0.74% [3.15%] |
| Other Worker | 5.94% | 4.02% [5.72%] | 11.04% | 1.30% [4.79%] |
| Self-employed / Family Business | 6.81% | 3.01% [8.18%] | 4.18% | 2.37% [5.20%] |
| Unemployed | 4.56% | 1.65% [3.80%] | 6.84% | 2.36% [6.23%] |
| Out of the Labor Force | 6.58% | 0.80% [3.64%] | -0.05% | 2.51% [3.66%] |
| <i>State dependence</i> | | | | |
| Poor Last Year | | 15.92% [16.38%] | | 16.97% [19.00%] |
| Poor Two Years Ago | | 8.16% | | 10.32% |
| Poor Three Years Ago | | 7.22% | | 6.28% |

Note: *Direct* and *Total* (direct plus feedback) average partial effects reported. *Total* average partial effects in squared brackets.

Table 7
Average Partial Effects (Females)

| | Age \leq 35 | | Age $>$ 35 | |
|---|---------------|--------------------|------------|--------------------|
| | Contemp | Lagged | Contemp | Lagged |
| $\hat{P}(\text{poor} = 1 X = \bar{x}, \text{permanent worker})$ | 3.12% | | 7.79% | |
| <i>Work Status</i> | | | | |
| Temporary Worker | 4.34% | 0.40% [1.79%] | 4.51% | 1.76% [3.28%] |
| Six Month Contract | 6.60% | 0.90% [3.54%] | 8.70% | 1.98% [2.89%] |
| 7-12 Month Contract | 3.27% | 1.64% [3.54%] | -0.54% | 2.51% [3.66%] |
| 13+ Month Contract | 2.51% | -2.65% [-0.71%] | 6.13% | 0.33% [1.29%] |
| Other Temporary Contract | 2.41% | -3.46% [-1.37%] | 7.29% | 2.90% [5.32%] |
| Other Worker | 7.00% | 2.14% [5.62%] | 5.27% | 5.68% [8.01%] |
| Self-employed / Family Business | 8.83% | 5.25% [10.83%] | 7.56% | 6.65% [9.85%] |
| Unemployed | 8.78% | 2.54% [6.46%] | 3.69% | 5.22% [6.67%] |
| Out of the Labor Force | 9.27% | 2.51% [7.40%] | 1.18% | 3.90% [4.07%] |
| <i>State dependence</i> | | | | |
| Poor Last Year | | 17.67% [19.52%] | | 21.50% [22.49%] |
| Poor Two Years Ago | | 9.05% | | 12.15% |
| Poor Three Years Ago | | 8.66% | | 8.52% |

Note: *Direct* and *Total* (direct plus feedback) average partial effects reported. *Total* average partial effects in squared brackets.

Table A
Work Status Equations (Multinomial Logit Coefficient Estimates)

| Variable | <i>Present Work Status</i> | | | | |
|---------------------------|----------------------------|---------------------------|---------------------------|----------------------------|----------------------------|
| | Temp Coeff. (S.E.) | Other Coeff. (S.E.) | Self. Coeff. (S.E.) | Unemp. Coeff. (S.E.) | Out LF Coeff. (S.E.) |
| Males Aged ≤ 35 | | | | | |
| <i>Past Work Status</i> | | | | | |
| Temporary Worker | 2.5526*** (0.0990) | 2.5153*** (0.2460) | 1.2931*** (0.2042) | 2.1280*** (0.2328) | 1.7796*** (0.3323) |
| Other Worker | 2.4318*** (0.1688) | 3.4990*** (0.2884) | 2.2449*** (0.2771) | 2.8210*** (0.2910) | 3.0644*** (0.3736) |
| Self-employed | 1.9746*** (0.1973) | 3.0456*** (0.3307) | 5.4730*** (0.2254) | 2.5483*** (0.3165) | 2.8525*** (0.4140) |
| Unemployed | 3.0499*** (0.1460) | 3.7093*** (0.2712) | 3.0435*** (0.2242) | 4.1305*** (0.2542) | 3.8222*** (0.3378) |
| Out of Labor Force | 2.7365*** (0.1743) | 3.6920*** (0.2914) | 3.0580*** (0.2595) | 3.7481*** (0.2755) | 5.2402*** (0.3497) |
| Poor Last year | 0.6333*** (0.1337) | 0.6844*** (0.1769) | 0.8710*** (0.1726) | 0.4327** (0.1772) | 0.1989 (0.1968) |
| c_i | -0.1472 (0.0912) | -0.5171*** (0.1306) | -0.8015*** (0.1510) | -1.8391*** (0.1739) | -2.2114*** (0.1963) |
| Males Aged > 35 | | | | | |
| <i>Past Work Status</i> | | | | | |
| Temporary Worker | 3.6602*** (0.1560) | 2.7210*** (0.2495) | 1.0700*** (0.2605) | 3.7848*** (0.2293) | 2.1104*** (0.2850) |
| Other Worker | 3.0082*** (0.2457) | 4.1017*** (0.3025) | 2.5288*** (0.3314) | 4.0253*** (0.3221) | 3.0752*** (0.3928) |
| Self-employed | 2.0707*** (0.2491) | 3.3525*** (0.3113) | 5.7251*** (0.2338) | 4.1717*** (0.3255) | 4.6338*** (0.3076) |
| Unemployed | 4.2799*** (0.1981) | 3.6389*** (0.2979) | 3.5125*** (0.2657) | 6.1950*** (0.2378) | 4.8483*** (0.2532) |
| Out of Labor Force | 4.2286*** (0.3680) | 4.4538*** (0.4666) | 5.0015*** (0.3974) | 6.0909*** (0.3673) | 7.6400*** (0.3483) |
| Poor Last year | 0.7026*** (0.1443) | 0.8141*** (0.1983) | 0.4720*** (0.1781) | 0.4558*** (0.1673) | 0.3769** (0.1901) |
| c_i | -0.8437*** (0.1325) | -0.6535*** (0.1754) | -1.7038*** (0.1681) | 0.4074* (0.2206) | 0.9783*** (0.2133) |

Continued on next page

| Variable | Temp Coeff. (S.E.) | Other Coeff. (S.E.) | Self. Coeff. (S.E.) | Unemp. Coeff. (S.E.) | Out LF Coeff. (S.E.) |
|-----------------------------|--------------------------|---------------------------|---------------------------|----------------------------|----------------------------|
| Females Aged ≤ 35 | | | | | |
| <i>Past Work Status</i> | | | | | |
| Temporary Worker | 2.7582*** (0.1364) | 1.6862*** (0.2458) | 1.1490*** (0.3780) | 1.7644*** (0.2876) | 1.7059*** (0.3246) |
| Other Worker | 2.7235*** (0.2070) | 4.1567*** (0.2692) | 2.7192*** (0.4123) | 3.2752*** (0.3349) | 3.1835*** (0.3710) |
| Self-employed | 2.2681*** (0.3351) | 2.5214*** (0.4513) | 6.6014*** (0.3733) | 2.9550*** (0.4364) | 3.6727*** (0.4545) |
| Unemployed | 3.2871*** (0.1804) | 3.6911*** (0.2591) | 3.5567*** (0.3407) | 4.2451*** (0.3081) | 3.9188*** (0.3401) |
| Out of Labor Force | 3.6245*** (0.2457) | 4.2958*** (0.3105) | 4.6314*** (0.3785) | 4.7241*** (0.3496) | 6.4813*** (0.3814) |
| Poor Last year | 0.5674*** (0.1999) | 0.2515 (0.2267) | 0.5339* (0.2606) | 0.2251 (0.2378) | -0.0004 (0.2424) |
| c_i | -0.3322** (0.1325) | -0.8332*** (0.1963) | -0.6818*** (0.2409) | -2.2983*** (0.2333) | -2.5377*** (0.2603) |
| Females Aged > 35 | | | | | |
| <i>Past Work Status</i> | | | | | |
| Temporary Worker | 4.5182*** (0.2137) | 2.3900*** (0.2836) | 1.4280*** (0.5466) | 3.4659*** (0.3061) | 2.5040*** (0.2948) |
| Other Worker | 3.2623*** (0.2903) | 4.6603*** (0.2758) | 2.7584*** (0.4981) | 4.0300*** (0.3404) | 3.7009*** (0.3032) |
| Self-employed | 2.9209*** (0.5016) | 3.1929*** (0.5103) | 5.7153*** (0.4996) | 4.5999*** (0.5060) | 4.5115*** (0.4920) |
| Unemployed | 4.9018*** (0.2728) | 4.6354*** (0.2774) | 4.9146*** (0.4263) | 6.3750*** (0.3136) | 5.8497*** (0.2715) |
| Out of Labor Force | 4.6974*** (0.3679) | 5.0444*** (0.3804) | 4.6451*** (0.4715) | 6.9792*** (0.3709) | 7.9153*** (0.4028) |
| Poor Last year | 1.2988*** (0.2580) | 0.7203*** (0.2529) | 1.0248*** (0.2883) | 0.7223*** (0.2532) | 0.5373** (0.2407) |
| c_i | -0.0760 (0.3141) | -0.3055 (0.3529) | -2.3988*** (0.3754) | 1.0703*** (0.3909) | -0.7674** (0.3789) |

Note: *** denotes statistical significance at the 1% level, ** indicates 5% significance level, and * represents 10% significance level. All the equations regressions include a constant term, age, a health status dummy, marital status, family size, number of additional workers in the household, educational attainment dummies, the regional unemployment rate, and year dummies. The baseline group is permanent workers.

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