Job Quality and Economic Independence of Welfare Users

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Abstract

In this paper, we identify dimensions that make a job a good "stepping stone" towards economic independence. We utilize five job characteristics to estimate a duration model of time before achieving economic independence and to generate a quality index for each job using the latest Occupational Projections and Training Database. These characteristics are: median earning level and forecast of employment growth of an occupation, unemployment rate and ratio of part-time workers within an occupation, and degree and certificate requirements of the job. Economic independence is defined as holding a full-time job that pays more than the state minimum wage or a job that pays at least 80 percent of the state minimum wage but has employer provided health insurance, for more than four consecutive months. Using less skilled single mothers who have been on welfare from several Survey of Income and Program Participation (SIPP) panels, we find that controlling for wage and work intensity, employment in high quality jobs is highly correlated with the likelihood of economic independence. Moreover, with high quality stepping stone jobs, these women gain economic independence faster.

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1 Introduction

Policy makers in the U.S. have long stressed the importance of promoting work among less skilled single mothers. The Earned Income Tax Credit (EITC) and its subsequent expansions in 1986, 1990 and 1993 have increased tax incentives to work. Since the early 1990s, many individual states brought in the "work first" approach in their welfare waiver programs aimed to reduce welfare dependence by increasing employment among welfare recipients. These efforts were culminated in 1996 by the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA). The new, Temporary Assistance for Needy Families (TANF) program ended the welfare entitlement by introducing a five-year welfare time limit and a work requirement for the participants.

Many of these "work first" policy initiatives emphasized immediate employment without much regard for quality or stability of the employment. For example, TANF requires that welfare recipients must work as soon as they are job-ready or no later than two years after first welfare use.[1] As these less skilled welfare users, most of them single mothers, lack marketable skills, available jobs for them are likely to be at the lower end of the job distribution. It is unclear whether unsolicited employment will help them accumulate much needed human capital and thus strengthen their labor market attachment or increase their future earnings. Litt et al. (2000) point out that even though the welfare rolls declined after PRWORA welfare leavers still face low wages and lack of advancement opportunities in jobs. Furthermore, they continue to rely on income support programs and kin and treat cash benefits under the five-year time limit as a new safety net. Acs and Loprest (2004) and Author and Houseman (2009) also find that temporary work are often accompanied by high turnover rates in both employment and welfare recidivism. It might be inferred that immediate employment regardless of job quality does not improve the long-term economic independence of previous welfare users, even during the economic expansion of the 1990s.

With the weakening of the economy after 2001, jobs are not as abundant as they were in

[1] Single parents must participate in work activities for 30 hours per week, or an average of 20 hours per week if they have a child under age six. Two-parent families need to work for an average of 35 hours a week. If they also receive Federal child care assistance, they must work for an average of 55 hours a week.

the 1990s. The vulnerable nature of these less-skilled workers in an economic downturn may make them even harder to leave welfare through employment and also easier to get back on the roll. It is thus crucial to understand what kind of jobs are "good" among these low end jobs in the sense that they provide a stepping stone for a better prospect.

In this study, we investigate how long it takes for a less skilled single mother to achieve economic independence through work. We follow the tradition in the literature of transition into good jobs and define economically independent as holding a full-time job (≥ 35 hours per week) which pays at least minimum wage, or a job that is full-time and pays at least 80 percent of the minimum wage with an employer provided health insurance, for more than four consecutive months. The empirical specification models the length of time before achieving economic independence by a Cox Proportional Hazard Model.

This study adds to the studies of the likelihood of transition into a good job (for example, Pavetti and Acs (2001), Johnson and Corcoran (2003), Wood et al., 2008) by adding a novel dimension of job characteristics obtained from publicly available data set. Besides the current wage level of a particular job and work intensity, we are particularly interested in how earning potential, job security and its difficulty of entry affect the process of achieving economic independence. Five indicators of *each* occupation held by less skilled workers, including median earning level, ratio of part-time workers, unemployment rate, forecasted employment growth, and requirement of a vocational certificate, other awards or an associate or higher degree, listed in the 2006 Occupational Projections and Training Database (OPTD), are used to proxy quality of a job.

The rationale is straightforward. First, median earning of an occupation serves as a proxy for the earning potential of a job. The higher is the median earning, the better is the job. However, even if the earning potential is high, if the ratio of part-time workers within a particular occupation is high, it may take longer for a mother to get to the full earning potential of this job. This is likely even though in the short run part-time jobs may give her more flexibility and may be desirable for that reason. Furthermore, if the unemployment rate of an occupation is high, or if the projected employment growth of an occupation is low, it may mean that this job is relatively insecure. Finally, if an occupation is "degree based," it may be difficult to enter but also induce more job attachment once the "degree"

is obtained.

This study also contributes to the literature of stepping-stone jobs (for example, Connolly and Gottschalk (2001), Booth et al. (2002) and Autor and Houseman, 2009) by adding dimensions of nonmonetary job quality measures. To our knowledge, this research is one of the first to differentiate between low-end jobs by incorporating factors other than current or past levels of earning and work experiences. Finally, we also document changes in occupation patterns in response to federal and state level policy changes.

Our analysis provides evidence that not all low end jobs are dead end, and there are significant differences among jobs that were held by welfare users in terms of being a gateway for economic independence. We find that conditional on earnings, employment in "higher" quality jobs is highly correlated with the likelihood of economic independence. Not only these women employed in such jobs that are more likely to achieve economic independence, they are also faster to do so. For example, about 60 percent of the mothers who work in the "best" jobs can achieve economic independence within 48 months. The same likelihood for mothers who work in jobs in the middle range is about 40 percent. However, even after working for more than 48 months, mothers who work on the worst jobs only have about a 20 percent likelihood of ever achieving economic independence. This result has important policy implications in that we have identified the "quality" of each job and its correlation with the economic independence. Our results clearly indicate that women in jobs that require training (such as hairdressers) exit much faster. On the other hand, occupations such as cashiers, cooks, and waiters and waitresses (at least for the entry-level jobs in these occupations) are rather dead end and lead to nowhere. Furthermore, we see that mothers who reside in states with work requirements appear to have a lower likelihood of achieving economic independence. These results suggest that if women are not aware of the opportunities provided by the PRWORA to train for a career, they may be pushed to quicker careers which are not as good a stepping stone jobs.

The importance of full-time work is also re-confirmed in the data. Even in the "worst" job, a woman who has always worked full-time is 200% more likely (30 percent as opposed to 10 percent) to achieve economic independence within a 45 months period than

another mother who only works full time for a quarter of the same period of time, controlling for weeks worked and labor earnings.

A crucial issue in this study is the selection into jobs. Since some jobs are better than others, they do not provide the same "treatment" and the selection into each treatment is not random. To this end, we adopt the following strategy to examine the seriousness of selection into jobs. First, we estimate a duration model treating job characteristics as exogenous. Then, we treat selection into jobs as a missing variable problem, where the endowed ability of a mother is missing. Using the annual state welfare program parameters, including tax rates on earned income, unearned income and guarantee level according to specific family size, we estimate a less skilled single mother's probability of work with a standard probit model and use this estimated probability as a proxy for the unobserved ability. The duration model that includes the estimated probability of work is then used to compare with the model that treats jobs as exogenous to investigate the seriousness of selection bias. We find that models that treat job characteristics as exogenous over-emphasized the importance of these measures.

We describe our empirical approach in the following section. We will first introduce a conceptual framework and then introduce the details of the econometric model.

2 Empirical Approach

2.1 Conceptual Framework

The empirical model is motivated by a dynamic job search model. Given the goal of this study, we restrict the sample to less skilled single mothers who have ever reported work. Following the tradition in the literature, we assume that a job is offered to a less skilled single mother in each period based on her observed characteristics and the skills she has acquired from previous and current jobs. She then chooses to work or not. Once she chooses to work, the pecuniary and non-pecuniary job aspects of a job affect the production of human capital. Given same hours of work, a high quality job "produces"

more human capital and/or is also more secure. In our model, unemployment will cause her acquired human capital to depreciate and affect her likelihood of receiving better job offers and achieving economic independence. However, we assume all unemployment is voluntary for simplicity.

In this model, there are two channels for a single mother to achieve economic independence. First, she can remain in the same job (hence job characteristics remain the same) and accumulates her work experience (and hence wage will increase). Second, she can switch to a better job (hence enjoy a better set of job characteristics).

2.2 Econometric Framework

Since we are interested in probability of achieving economic independence and the length of time it takes to do so, duration analysis is a proper empirical framework. In estimating hazard, Johnson and Corcoran (2003) and Wood, Moore, and Rangarajan (2008) all use logistic hazard models. As an event can happen at any period, time has to be parametrically modeled in a logistic hazard model. Also, censored duration is not dealt with in a logistic model. We, instead, use a Cox proportional hazard model:[2]

$$h(t, X_t) = \lambda_0(t)\phi(X_t, \beta).$$

Following Cox (1972, 1975), we do not estimate the baseline hazard, but recover it after the $\beta' s$ are estimated. Using the terminology of the duration analysis, an individual "leaves" the pool of "stayers" when she achieves economic independence (and hence is considered as a "leaver"). Suppose $R(t_j)$ denotes the risk set that includes all individuals who are at risk to leave just before t_j. $D(t_j)$ is the set of individuals who leave at time t_j, with the the total number of leavers in t_j, d_j. When ties (more than one leaver in a given period of month) occur, $d_j > 1$. Probability of any individual at the risk set failing is

[2]Corrente, Chalita, and Moreira (2003) state that both logistic and Cox PH models are valid ways when there are many leavers at a given time (multiple ties). They proposes further an AIC method to determine proper model under specific circumstances.

given as the conditional probability defines as follows

$$\begin{aligned}\Pr(T_j &= t_j|R(t_j)) = \frac{\Pr(T_j = t_j|T_j \geq t_j)}{\sum \Pr(T_j = t_j|T_j \geq t_j)} \\ &= \frac{\lambda_0(t)\phi(X,\beta)}{\sum \lambda_0(t)\phi(X,\beta)} \\ &= \frac{\phi(X,\beta)}{\sum \phi(X,\beta)},\end{aligned}$$

where the denominator is the sum of conditional probability of failure for each individual in the risk set. Note that, since we are using a PH model we cannot identify an intercept. We use Breslow and Peto (1984, in Cox and Oakes, 1984) to deal with ties, which gives

$$\Pr(T_j = t_j|R(t_j)) \tilde{} \frac{\prod_{m\in D(t_j)} \phi(X_m,\beta)}{\left[\sum_{l\in R(t_l)} \phi(X_l,\beta)\right]^{d_j}},$$

and the *partial* likelihood function defined by Cox is

$$L_p(\beta) = \prod_{j=1}^{k} \frac{\prod_{m\in D(t_j)} \phi(X_m,\beta)}{\left[\sum_{l\in R(t_l)} \phi(X_l,\beta)\right]^{d_j}},$$

for k ordered possible failure times. The log likelihood is:

$$\ln L_p(\beta) = \sum_{i=1}^{N} \delta_i \left[\ln \phi(X_m,\beta) - d_j \ln\left(\sum_{l\in R(t_l)} \phi(X_l,\beta)\right)\right], \tag{1}$$

where $\delta_i = 1$ if the observation is uncensored and zero otherwise. Note that in Cox Proportional Hazard model, the censored observations only contribute through the size of the risk set.[3]

[3]We note that, when there are too many ties (too many women exiting at the same period), Cox PH model with Efron (1977) approximation (rather than the Breslow and Peto in our original version) should be used. Efron performs better because it deals with N ties by incorporating all possible pools of ties,

An crucial issue is selection into employment. Since some jobs are better than others, they do not provide the same "treatment" and the selection into each treatment is not random. Some women possibly have unobserved characteristics that affect their job prospects. A standard way to deal with this issue is to use instrumental variables (IV). A set of valid instruments in this scenario would have been state and county characteristics. That is, observationally equivalent mothers who reside in counties (or states) with different economic conditions will face different job pools that are not related to their own (unobserved) ability but affect their chances of getting a good job. So far as we know, econometric theories have not yet developed procedures dealing with unobserved variables using instrumental variables within a duration analysis framework. To this end, we adopt the following strategy to examine the seriousness of selection into jobs. First, we estimate a duration model treating job characteristics as exogenous. Then, we treat selection into jobs as a missing variable problem, where the endowed ability of a mother is missing. Using the annual state welfare program parameters, including tax rates on earned income, unearned income and guarantee level for according the size of a particular family, we estimate a less skilled single mother's probability of work with a standard probit model and use this estimated probability as a proxy for the unobserved ability.[4] The duration model that includes the estimated probability of work is then used to compare with the model that treats jobs as exogenous to investigate the seriousness of selection bias.

rather than Breslow and Peto, who assume that the pool of ties never change when each tie happens. An empirical difficulty using our sample is that although each individual coefficient passes the proportional hazard hypothesis, the overall model using Enfron method violates this assumption. On the other hand, the Breslow and Peto model passes the hypothesis testing procedure. Furthermore, empirical results of the two models behave similar. As a result, we choose the Breslow and Peto approximation.

[4]See Section 7.2 for more detailed description of the model. Note that under the specification of the Cox PH model, baseline hazard can be viewed as the hazard rate when all explanatory variables are zero. When we treat the unobserved heterogeneity as an omitted variable problem, we essentially assume that the unobserved heterogeneity does not affect the baseline hazard, which can be unrealistic.

2.3 Explanatory Variables

Based on the above discussion, we include the following explanatory variables in our estimation:

(i) Job characteristics: natural log of the occupational median earning, which we use as a measure of the job's earning potential; ratio of part-time workers, which is used to measure how soon a single mother who works at the entry level can achieve the earning potential; unemployment rate and projected growth of the occupation in the next decade, which we use as measures of job security; and finally, whether this job requires a vocational certificate, other award or an associate or higher degrees, which is used to measure the difficulty of entry of a particular occupation.

(ii) Employment-related variables: the number of periods since first observed job that a mother worked more than 10 hours per week and hourly wage rate, which we use as a measure of reservation wage. The reservation wage rate captures how far a single mother has achieved in terms of human capital accumulation at the moment. Without controlling for reservation wage, the contribution of a job's earning potential would capture part of the effect and may hence erroneously overemphasize the importance of a job's earning potential. An important concern, as we have mentioned above, is that not all mothers work continuously in all observed months. To this end, we include months of unemployment as a measure of depreciation of human capital. We further incorporate estimated probability of work as a proxy for the unobserved ability.[5]

(iii) Individual characteristics: real income, not including welfare income and labor earnings (deflated by PCED-nondurable), age and age squared - which we use as a "penalty" for mothers who are older and may already have prior work experiences before the start of the SIPP panels- , a dummy variable indicating whether the mother has received twelve years of schooling, a dummy for race (1=Black, 0=other), dummy indicators for having a child that is younger that five or older thirteen years old.

[5]If a mother is not working in the current period, we use the wage rate of the closest job as her reservation wage rate.

Finally we also include,

(iv) Welfare policy initiatives: a dummy for existence of a work requirement or time limit by either a state waiver program or the federal welfare reform, and annual state guarantee levels and welfare taxes on earning and other income, provided in Ziliak (2007).

We estimate this econometric specification using a sample from Survey of Income and Program Participation (SIPP) data. Next section gives a detailed description of the sample construction.

3 Sample

3.1 Sample Construction

Our data come from the SIPP 1990, 1991, 1992, 1993, and 1996 panels. SIPP has many advantages; It provides rich monthly information on employment and welfare use and various sources of income, including transfer incomes. Moreover, it is conducted every four months, requiring shorter recall period which presumably reduces recall errors. However, there are two important drawbacks of this data set. First, the length of each panel is fixed. The longest one, the 1996 panel, covers 48 months while most of other panels last only 32 months. These short windows create serious censoring problem. This is one of the reasons why we choose to analyze the data in a duration analysis framework. Unlike logistic hazard model, Cox proportional hazard model allows us to formally address the censoring issue. Another problem with the SIPP data is the lack of county information in the SIPP public files. County information provides controls for local job pools that may affect the likelihood of getting a specific job. For example, Fitzgerald (1995) and Hoynes (2000) discuss the importance of local job pools in determination of welfare duration.

We construct the sample for the analysis as follows: First, we include only less skilled mothers who have ever been on welfare. We restrict sample to only welfare users in order to form a homogenous sample. That is, since all mothers in our sample have ever been on

welfare, we do not have to worry about the unobserved welfare stigma that affects both work decisions and economic independence. Empirically, however, this restriction does not affect the qualitative results.

A mother is defined as single in a given month if there is no spouse or partner present in the same household in the month. It is well known that marriage is a valid way for single mothers to leave welfare. For example, O'Neill, Bassi, and Wolf (1987) find that about a third of single mothers who left welfare in the late 1970s to the mid 1980s did so via marriage. Conversely, dissolution of marriage can lead to economic hardship and temporary welfare use. To control for the first channel yet including welfare users due to dissolve of marriage in our population, we use the last observed status to define whether a mother is single.[6]

We further restrict our sample to mothers between ages 15 and 55. There are two main reasons: First, older mothers who have young children may be systematically different than younger mothers. Second, it is very likely that older mothers have worked before we observe them on SIPP panels and potentially retired. Ideally, we should start following an individual as soon as she enters the job market. Given the restrictions of the SIPP panel design, we observe only a "window" of an individual's work history, and the first observed work month may well not be the first month in the labor force. To this end, a better sampling strategy may be one such as Pavetti and Acs (2001)'s, who follow a group of mothers who are between ages 18 and 21 from NLSY 1979, and examine their work history until they turn 27. However, this age restriction will severely reduce our sample size (only 60 percent of our sample, 972 out of 1641 mothers, are younger than 30 years old when we observe their first jobs). As a result we stick with the age group 15 to 55 but we penalize being older by including age and age squared terms as explanatory variables. Moreover, we include an indicator variable for having a youngest child who is older than thirteen.

Within this restricted sample, 37 percent of the mothers have never been employed. As

[6]Less than 6% of person-months and 2% of all sample mothers have months with spouses or partners present. A single mother indicator was included initially as explanatory variable in Equation 1. Since it is not statistically significant in any of the specifications, we drop the variable in the equation presented here.

will be seen later in Table 6, their observed characteristics are very different from mothers with work experience. Wood and Rangarajan (2003) note that in any given month, people who are neither employed nor on TANF mostly likely: (i) are cohabiting with spouses or partners, or (ii) are receiving SSI or UI, (iii) have worked in last 3 months but not (i) or (ii), or (iv) have no income from any of the above sources, who are also the most likely to stay in this status long. The last group is the most worrisome, as they are most likely to be the least advantaged group of people and are most vulnerable to change in the labor market tightness. However, they are not in our sample since they do not have any work experience.

As mentioned above, a single mother is considered economically independent if she holds a full-time job ($\geq$ 35 hours per week) which pays at least 2009 state minimum wage, or a job that is full-time and pays at least 80 percent of the minimum wage with an employer provided health insurance, for more than four consecutive months.

We deflate the current and state minimum wages using PCED-nondurable to 2000 dollars and compare whether a job makes more than the minimum wage. For example, the federal minimum wage in 2009 is $7.25. However, more than 50 U.S. cities, counties and states have its own living wage ordinances (Johnson and Corcoran, 2003). For example, Washington state has the highest ($8.55), while Kansas has the lowest at $2.25 (We hence use the federal minimum wage to define good job for that state). Whenever a state does not have its own minimum wage ordinance, we use the federal one. The federal level actually remained the same between 1997 and 2007 (at $5.15), while state minimum wages varied some during the same period of time. Qualitative results do not vary much when only annual level of state minimum wages are used to define good jobs, but using 2009 minimum wage as baseline definition of a good job implies fewer people will be defined as working in good jobs than it would have been had current-year state-level minimum wage was used.

Given our definition of economic independence, it is important to know how many people have worked on a good job for less than four months. Since we first observe them working, 17 percent of the sample person-months and 33 percent of all sample mothers have worked on good jobs for less than four months. Including a control for whether a

single mother worked on a good job before economic independence will create statistical difficulties. First, if this variable takes the value one in the month of economic independence, it dominates the whole model and become the single most powerful predictor. Second, if it takes the value zero in the month of economic independence but one in the month prior to economic independence, it creates an inconsistency in the duration model. Empirically, the second treatment shows a statistically significant estimate (at a 10 percent confidence level) without sacrificing the significance of coefficient estimates of job characteristics. Given that we have also controlled current wage level, we choose to exclude this control.[7]

3.2 Sample Patterns

To better present sample patterns of jobs that are held by less skilled mothers, we employ cluster analysis (Stata Press, 2007a), which is commonly used to extract patterns in complicated data, and identify three different "quality types" of jobs based on the five dimensions described above.[8] Table 1 lists the mean patterns of these three different "types" of jobs. The first type of jobs, the best jobs, are held by about 27 percent of the sample.[9] These jobs have the highest earnings potentials, lowest unemployment rates, and highest projected growth rates. On the other hand, about 43 percent of the sample is employed in occupations with the lowest median earnings, highest part-time ratios, and the highest unemployment rates. These are the "worst" jobs. The rest of the sample, 30 percent of the observations, works in jobs in the middle group. As seen in Table 1 the worst jobs have an

[7] An alternative definition of a good job is based on making more than the federal poverty threshold. Defining a good job using this approach leads to even fewer good jobs.

[8] The occupations surveyed in the SIPP panels use Census Occupation Codes (COC) , while the 2006 OPTD uses Standard Occupation Classification (SOC) codes. SOC and COC systems do not have a one-to-one mapping. Furthermore, the SIPP 1990 and 1991 panels use the 1980 COC while later years use 1990 COC. In Section 7.1, we discusses how we map the occupations in these classifications.

In general, number of clusters is exogenous in the algorithm of grouping clusters. There is a literature on how to choose the most appropriate number of groups. See, for example, Goutte, Hansen, Liptrot, and Rostrup (2001) and Sugar and James (2003). Since the exact number of clusters is not the focus of this study, we choose three different clusters because groups of more than three return unstable results, with occupations moving across clusters when we execute the same algorithm.

[9] This is in person-months, meaning taking each mother each month as an individual observation, 27% of the observations in the sample are holding such jobs

average median earning level that is almost half of the earning potential of the best jobs, a much higher ratio of part-time workers and a higher unemployment rate compared to the other two types of jobs. They also have much lower projected employment growth rates.

Table 2 shows the top three occupations in each quality type. The best of the best jobs are hairdresser and cosmetology (account for about 19 percent of all the "best jobs"), being a supervisor and a proprietor in sales (10 percent) or being a health aide - excluding nursing- (6.6 percent). We need to note that not all of these jobs are entry-level jobs, which are true stepping stones. We control for the experience in the job market by adding age and age squared terms in the econometric models to penalize mothers who are older and presumably have more work experiences prior to the beginning of the SIPP panels.

Based on the quality levels of jobs, Figure 1 shows the raw survival probabilities of each of the three types of jobs. As we can see, the worst jobs are associate with a much lower raw likelihood of achieving economic independence. Table 3 further shows the summary statistics of sample mothers according to the types of jobs that they held within the duration. Compared with other types of jobs, people who worked on the best jobs are more likely to achieve economic independence. If they work, they also worked more than people in other jobs (34.9 hours as opposed to less than 34 hours of all other types of jobs). Both the best jobs and jobs in the middle are also more likely to have received twelve years of schooling than the worst jobs, which indicate the importance of a high school diploma (or GED) in the less skilled labor market. Again, both best jobs and jobs in the middle are more likely to be located in states with higher guarantee levels. An indication that different economic environment across states does play a role in finding a "good job."

There are 1,644 mothers in our data. 535 of them have ever achieved economic independence. Using cluster analysis, we further separate leavers into fast leavers, slow leavers, and the group in between. Table 4 clearly suggests that there is a great deal of heterogeneity in speed of achieving economic independence. About 12 percent of the sample leavers have achieved economic independence within 8 months (fast leavers). However, another 40 percent of leavers do not achieve that independence for at least 21 months (slow leavers). Moreover, 67 percent of the sample mothers have never achieved

economic independence within 48 months after their first observed jobs. Another thing to note is that even though 33 percent of all mothers achieved economic independence, they contribute to only 19 percent of all the person-months used in the duration analysis. As a result, the identification relies heavily on observations from people who have never achieved economic independence.

Table 5 shows detailed statistics according to the speed single mothers achieve economic independence. Compared to the mothers who never achieve economic independence (the last column), slow leavers appear to work more (80 percent as opposed to 50 percent of all person months), if they work, slow leavers also report more hours of work per week (35 hours) than mothers who never leave (31 hours). On the other hand, mothers who never leave are slightly younger than mothers who at some point achieve economic independence (average age 28 versus 29). Mothers who never achieve economic independence also spend more time on welfare. In comparison, fast leavers are most likely to work (indeed, they have reported work in all their person months). They also have a much higher mean hourly wage rate than other groups ($11 versus $6). They are more likely to have twelve years of schooling (80 percent as opposed to 67 and 60 percent for medium and slow leavers, respectively). Interestingly, they also live in the states with higher levels of welfare guarantee. This fact may indicate that states with more generous benefits are also states that are easier to find a job that pays better. Or alternatively, generosity of a state's benefits may also be an indicator of the services that it provides to facilitate better employment.

In our framework, there are four different "undesirable" states; slow exit to economic independence, worst jobs as career jobs, never achieving economic independence ("never leave") and no observed employment. The last group is actually not in our sample, as we follow all mothers who have ever worked. Table 6 shows the summary statistics based on these states. As we can see, mothers who have the worst jobs and who have never failed tend to be younger than slow leavers. On the other hand, mothers who have never worked are much more likely to have less than twelve years of schooling. They also spent most of their time on welfare (80 percent of all their observed person-months as opposed to 60 percent of people who have never fail). Also, they live in states with much higher welfare

guarantees but also welfare taxes on earnings and other income, which reduces incentives to work.

4 Results

Proportional hazard function is a fundamental assumption of the Cox PH model. Before discussing the estimation results, Table 7 reports the p-values of a null hypothesis that the proportional hazards assumption is appropriate. (See Grambsch and Therneau (1994) and also Stata Press, 2007b for detailed χ^2 statistics). Most coefficients do not violate the null hypothesis, which indicates that Cox PH model is appropriate. Only two variables, including the indicator for degree-based jobs and the estimated probability of work, do not satisfy the proportional hazards assumption. Overall, for the complete model proportional hazards assumption is correct.

Table 8 lists the estimation results for the individual hazard coefficients ($\hat{\beta}$). First we note that, even after controlling for work intensity as well as hourly wages, most job characteristics are statistically significant at least at the 10 percent confidence level. Among these characteristics, ratio of part-time workers is the most statistically significant (at 0.1 percent confidence level). A job with a higher part-time ratio, even after controlling for its earning potential (significant at a 10 percent confidence level) and a mother's own reservation wage, is associated with a lower likelihood of achieving economic independence. On the other hand, job security variables, including unemployment rate and projected percentage of growth of a job, are not as statistically significant.[10]

To visualize the effects of different job characteristics, Figure 2 plots the survival probabilities (probability of not achieving economic independence after t months) using the characteristics of a representative job for each "type" including hair-dresser and cosmetology (the best), being a nursing aide, orderly, or attendant (the middle), and being a cashier (the worst), keeping all else at their mean levels. As we can see, employment in

[10]One may worry that the unemployment rate and part-time ratio of a job are highly correlated. If this is the case, statistically insignificance may result from near multi-collinearity.

the best job is associated with a much higher likelihood of achieving economic independence than employment in any of the other two types of jobs. About 60 percent of the mothers who work as hairdressers can achieve economic independence within 48 months. The same likelihood for mothers who work in jobs in the middle is about 40 percent. However, even after working for more than 48 months, mothers who work on the worst jobs only have about a 20 percent likelihood of ever achieving economic independence. This result has important policy implications in that we have identified the "quality" of each job and its correlation with economic independence. Occupations such as cashiers, cooks, and waiters and waitresses (at least for the entry-level jobs in these occupations) are rather "dead-end" and lead to nowhere.

Among the mother's own economic and demographic characteristics, amount of other income (real family income other than earning and welfare income) is strongly correlated with probability of achieving economic independence. As expected, age is positively correlated (in a concave manner) with economic independence. On the other hand, when wage rate and other job characteristics are controlled for, having twelve years of schooling is no longer statistically significant. Moreover, there is no significant difference among races. Controls for the age of youngest children are not significant, either.

Looking at the welfare policy variables, we see that once state and year fixed effects are controlled for, the significant correlation between guarantee levels and economic independence shown in Table 5 no longer exists. However, mothers who reside in states with work requirements appear to have a lower likelihood of achieving economic independence. This may imply that the "work first" approach indeed (at least initially) push people to work on jobs that do not pay as well. The coefficient of the welfare time limit indicator is also negative, but is statistically insignificant.

Figure 3 plots the mean hazard rate estimated from the benchmark Cox PH model. In a continuous time model, the hazard rate can be considered as the instantaneous rate of achieving economic independence at time t. The estimated hazard decreases fast initially and then smooths out with time. This fact indicates that a group of people (who work in good jobs) achieve economic independence rather quickly. While for people with worse jobs, economic independence comes slowly or never.

When work is defined as at least part-time (≥ 10 hours per week), work experience is positive, but only marginally significant (at a 10 percent confidence level). As expected, the higher the received wage, the more likely a single mother achieves economic independence. To evaluate the sensitivity of the results to different work intensity definitions, we define work as work more than full-time (≥ 35 hours per week) and re-estimate the model in Table 10. After imposing several different specifications, we find once work is defined as at least full-time, job security measures are no longer significant. As a result, job characteristics reported here include only natural log of median earnings, proportion of part-time workers, and the indicator for degree-based jobs. The estimation results show that the effects of earning potential, ratio of part-time workers and difficulty of entry on the likelihood of economic independence are all statistically significant. Furthermore, work experience, defined as number of full-time work periods, is also statistically significant at the 1 percent level. The signs of other regressors are not affected by the change in the definition of work.

Finally, we use estimated probability of work (estimated outside the model) as a proxy for the unobserved ability. It is highly correlated with the likelihood of achieving economic independence.Table 9 estimates a model without the controls for mother's probability of working (hence essentially treat job characteristics as exogenous). We see that, in comparison to estimates of the model with controls reported in Table 8, a model that does not address the importance of selection into work (or jobs) over-emphasizes the importance of whether a job is degree-based. Coefficient estimates of work experience, hourly wage rate and the indicator variable that shows if the mother has twelve years of schooling are also higher than the estimates in the model with selection control. As age is highly correlated with both work and likelihood of economic independence, we expect and upward bias of age. It is also confirmed in Table 9.

Using the estimates from this model, we can further investigate the implication of the "work first" approach. Figure 4 plots the survival probability of a mother who works as a cashier, the worst type of job, at different intensities: working full-time all the time and working full-time for 25 percent of the time. As we can see from the graph, a mother with mean characteristics who works full-time all the time is expected to have a 30 percent

probability to achieve economic independence within 48 months, while a same mother works full-time only 25 percent of the time has a 10 percent probability.

5 Conclusion

In this study, we investigate how long it takes for a welfare user to gain economic independence through work. We identify job characteristics that separate dead end jobs from stepping stone ones. The results suggest that not all low end jobs are dead end. Among jobs that were held by less skilled single mothers, employment in occupations with higher median earnings, lower ratios of part-time workers and unemployment rate and occupations that require certificate or degree requirements are highly correlated with the likelihood of economic independence, even after controlling for wage level and work intensity. Our results clearly indicate that women in jobs that require training (such as hairdressers) exit much faster.

Using the estimates from this model, we further investigate the implication of the "work first" approach. Looking at the welfare policy variables, we see that mothers who reside in states with work requirements appear to have a lower likelihood of achieving economic independence. This may imply that the "work first" approach indeed (at least initially) push people to work on jobs that do not pay as well. As a result, if women are not aware of the opportunities provided by the PRWORA to train for a career they may be pushed to quicker careers which are not as good a stepping stone jobs.

These results have important policy implications. By comparing welfare hires and nonwelfare hires of similar positions within the same firm,[11] Fitzpatrick and Hotchkiss (2009) find that welfare hires are equally likely as nonwelfare hires to transition to another jobs after separation. However, welfare hires experience a much lower wage gain. This suggests that welfare hires would benefit more than nonwelfare hires from focused assistance with job search and transition skills. Our research complements theirs in the sense that we provide specific dimensions of jobs that are more likely to lead to economic

[11] Welfare hires are defined by whether employers collect Work Opportunity Tax Credit (WOTC) benefits.

independence. It facilitates policy makers in designing more focused policy initiatives that better direct welfare recipients into pursuing such careers. This will enable quick transition to work and eventually to economic independence.

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7 Appendices

7.1 Mapping the OPTD data to SIPP occupations

The 2006 Occupational Projections and Training Database (OPTD) provides on the various characteristics of more than 800 SOC (Standard of Occupation Classification) occupations. However, SIPP 1990 and 1991 panels use the 1980 Census Occupation Codes (COC 1980) and the 1992 to 1996 panels use the COC 1990. We first use crossroad map downloaded from the Census Bureau website (http://web3.access.gpo.gov/eeoc/stats/census/eeo-file-crosswalk.html) to convert the SOC occupations to the COC 2000 occupations. Then we use the road maps to convert the

COC 1990 and 1980 to the COC 2000. The road map between COC 1990 to COC 2000 is downloaded from the Census Bureau website. The link between COC 1980 and COC 1990 is provided by Author, Levy and Murnane (2003). Finally we merge the OPTD 2006 data with the respective COC 1990 and COC 1980 occupations.

SOC classification is more detailed than the COC occupational classification. In many cases, one COC occupation corresponds to more than one SOC codes. Whenever this happens, we use the SOC occupation employment shares as weights and calculate a weighted average for job characteristics. However, we use the minimum job requirement in all SOC occupations that map to a COC occupation as that of the COC occupation. One of the consequences is that most of less skilled single mothers (more than 90 percent of the person-months) work on jobs that require only short-term on-the-job training. The OPTD categorizes job requirement into eleven groups: "First professional degree," "Doctoral degree," "Master's degree," "Bachelor's or higher degree, plus work," "Bachelor's degree," "Associate degree," "Postsecondary vocational award," "Work experience in a related occupation," "Long-term on-the-job training," "Moderate-term on-the-job training," and "Short-term on-the-job training." The last one is the lowest level of job requirement in the OPTD categorization. We define that a job is degree-based if it requires more than post-secondary vocational award in the data.

7.2 Estimating a single mother's likelihood of work

We estimate a probit model of work using the annual state welfare program parameters, including the guarantee levels and welfare taxes on earning and other income as exogenous variations. The explanatory variables (besides welfare parameters) include the job characteristics of the latest job, number of periods of part-time work and no work, lagged earning, other income, age and age squared terms, education level, race(=1 black, =0 otherwise), age of the youngest child (below five or above thirteen), and whether she has experienced welfare time limits or work requirement in either the state waiver programs or welfare reform. The sample includes all mothers with twelve or less years of schooling who are working when we first observed them. Estimation results are available upon

request.

8 Tables and Graphs

Table 1: Types of job held before leaving welfare

Job Types	Median Earning	Part-time (%)	Unemploy. (%)	Growth (%)	Degree (%)
Highest Earning, Lowest Unemployment Highest Growth	32,420	23.82	4.86	14.98	1
Middle	24,224	21.69	6.99	4.94	2
Lowest Earning, Highest Unemployment Highest Part-time Ratio	18,306	33.09	7.81	8.18	0
Total	23,926	27.11	6.76	9.04	1

Table 2: Top three occupations by types of jobs

Types	Occupations
Best Jobs	– Hairdressers and cosmetologists (19%) – Supervisors and proprietors, sales occupation (10) – Health aides, except nursing (6.6)
In the Middle	– Nursing aides, orderlies, and attendants (23%) – Assemblers (6.9) – Sales Workers, other commodities (6.3)
Worst Jobs	– Cashiers (19%) – Cooks (10) – Waiters and waitress (7.4)

Table 3: Summary statistics by types of jobs

	Best Jobs		In the Middle		Worst Jobs		All Jobs	
	mean	(SD)	mean	(SD)	mean	(SD)	mean	(SD)
Ever "Fail"	0.4	(.5)	0.4	(.5)	0.2	(.4)	0.3	(.5)
Work Variables								
Ever Work	0.6	(.5)	0.5	(.5)	0.5	(.5)	0.5	(.5)
Ever Full-time	0.3	(.5)	0.3	(.5)	0.2	(.4)	0.3	(.4)
Hours of Work‡	34.9	(15.0)	33.6	(14.1)	30.3	(13.0)	32.6	(14.1)
Hourly Rate‡	7.0	(6.4)	6.7	(6.0)	6.6	(22.7)	6.7	(15.5)
Earning‡	727.7	(519.6)	658.6	(1110.1)	585.9	(426.5)	647.0	(725.2)
Demographic Variables								
Age	29.1	(7.9)	28.7	(7.8)	28.5	(8.0)	28.7	(7.9)
High School	0.7	(.5)	0.7	(.5)	0.5	(.5)	0.6	(.5)
Black	0.4	(.5)	0.4	(.5)	0.4	(.5)	0.4	(.5)
Single	0.9	(.3)	0.9	(.2)	0.9	(.2)	0.9	(.2)
On Welfare	0.5	(.5)	0.5	(.5)	0.6	(.5)	0.5	(.5)
Other Income	1.7	(5.0)	1.6	(4.0)	1.4	(4.2)	1.5	(4.4)
Youngest Kid < 5	0.6	(.5)	0.6	(.5)	0.5	(.5)	0.6	(.5)
Older than 13	0.1	(.3)	0.1	(.3)	0.1	(.4)	0.1	(.3)
Policy Experiences								
Work Requirement	0.2	(.4)	0.3	(.5)	0.2	(.4)	0.2	(.4)
Time Limit	0.2	(.4)	0.3	(.4)	0.2	(.4)	0.2	(.4)
Guarantee	410.1	(168.1)	405.6	(185.5)	381.1	(177.6)	396.0	(178.0)
Welfare Tax–								
On Other Income	21.6	(18.3)	20.3	(17.7)	20.4	(18.0)	20.7	(18.0)
On Earning	31.4	(12.8)	30.7	(13.5)	30.5	(13.3)	30.8	(13.2)
Sources of Health Insurance								
No Insurance	30.4		25.8		32.2		29.8	
Employment-Based	4.1		2.7		2.4		2.9	
Medicaid	60.6		68.3		62.7		63.8	
Other	5.0		3.2		2.7		3.5	

‡ : Conditional on work

Table 4: Summary statistics by Speed of Welfare Exit

	Fast leavers	Middle	Slow leavers	Never leave	All leavers
Month Leaving Welfare					
mean	5	15	32		20†
p(25)	5	11	27		11†
median	5	13	31		21†
p(75)	5	18	37		29†
p(99)	8	21	45		45†
Person-months	167	2,183	4,012	27,595	33,967
Observations	64	262	209	1,109	1,644

† Conditional on having left.

Table 5: Summary statistics by speed of Achieving Economic Independence

	Fast		Middle		Slow		Never	
	mean	(SD)	mean	(SD)	mean	(SD)	mean	(SD)
How Long?	5.1	(1.1)	15.3	(4.2)	31.8	6.0	-	-
Work Variables								
Ever Work	1.0	(.2)	0.8	(.4)	0.8	0.4	0.5	0.5
Ever Full-time	0.7	(.5)	0.6	(.5)	0.4	0.5	0.2	0.4
Hours of Work‡	35.3	(12.1)	37.4	(15.2)	35.2	13.5	31.2	13.8
Hourly Rate‡	11.3	(14.7)	9.3	(45.4)	6.8	6.5	6.3	5.6
Earning‡	755.1	(575.4)	791.1	(555.7)	715.8	1066.4	608.6	636.0
Demographic Variables								
Age	29.3	(7.8)	29.7	(7.2)	29.6	7.9	28.3	8.0
High School	0.8	(.4)	0.7	(.5)	0.6	0.5	0.6	0.5
Black	0.5	(.5)	0.4	(.5)	0.4	0.5	0.4	0.5
Single	0.9	(.3)	1.0	(.2)	1.0	0.2	0.9	0.2
On Welfare	0.3	(.4)	0.4	(.5)	0.4	0.5	0.6	0.5
Other Income	1.8	(3.5)	2.1	(4.7)	1.8	4.6	1.5	4.3
Youngest Kid < 5	0.6	(.5)	0.5	(.5)	0.5	0.5	0.6	0.5
Older than 13	0.0	(.2)	0.2	(.4)	0.1	0.3	0.1	0.3
Policy Experiences								
Work Requirement	0.1	(.3)	0.2	(.4)	0.5	0.5	0.2	0.4
Time Limit	0.1	(.3)	0.3	(.4)	0.6	0.5	0.2	0.4
Guarantee	476.5	(202.3)	424.4	(175.6)	375.2	145.2	396.3	181.9
Welfare Tax–								
On Other Income	23.9	(18.4)	23.4	(17.0)	17.2	18.8	21.0	17.9
On Earning	37.3	(13.5)	33.9	(12.1)	27.3	13.6	31.0	13.2
Sources of Health Insurance								
No Insurance	24.6		25.5		26.8		30.7	
Employment-Based	26.4		9.9		4.1		2.1	
Medicaid	44.3		61.7		66.7		63.7	
Other	4.8		3.0		2.4		3.6	

‡ : Conditional on work

Table 6: Comparison of types of undesirable states

	Slow		Worst Job		Never Fail		Never Worked	
	mean	mean	(SD)	(SD)	mean	(SD)	mean	(SD)
Ever Leave?	31.8	(6.0)	0.2	(.4)	-	-	-	-
Work Variables								
Ever Work	0.8	(.4)	0.5	(.5)	0.5	(.5)	-	-
Ever Full-time	0.4	(.5)	0.2	(.4)	0.2	(.4)	-	-
Hours of Work‡	35.2	(13.5)	30.3	(13.0)	31.2	(13.8)	-	-
Hourly Rate‡	6.8	(6.5)	6.6	(22.7)	6.3	(5.6)	-	-
Earning‡	715.8	(1066.4)	585.9	(426.5)	608.6	(636.0)	-	-
Demographic Variables								
Age	29.6	(7.9)	28.5	(8.0)	28.3	(8.0)	29.2	(8.2)
High School	0.6	(.5)	0.5	(.5)	0.6	(.5)	0.4	(.5)
Black	0.4	(.5)	0.4	(.5)	0.4	(.5)	0.4	(.5)
Single	1.0	(.2)	0.9	(.2)	0.9	(.2)		(.5)
On Welfare	0.4	(.5)	0.6	(.5)	0.6	(.5)	0.8	(.4)
Other Income	1.8	(4.6)	1.4	(4.2)	1.5	(4.3)	1.2	(3.9)
Youngest Kid < 5	0.5	(.5)	0.5	(.5)	0.6	(.5)	0.2	(.4)
Older than 13	0.1	(.3)	0.1	(.4)	0.1	(.3)	0.0	(.2)
Policy Experiences								
Work Requirement	0.5	(.5)	0.2	(.4)	0.2	(.4)	0.2	(.4)
Time Limit	0.6	(.5)	0.2	(.4)	0.2	(.4)	0.1	(.3)
Gauranttee	375.2	(145.2)	381.1	(177.6)	396.3	(181.9)	467.9	(195.0)
Welfare Tax–								
On Othe Income	17.2	(18.8)	20.4	(18.0)	21.0	(17.9)	25.1	(18.2)
On Earning	27.3	(13.6)	30.5	(13.3)	31.0	(13.2)	34.3	(12.7)
Sources of Health Insurance								
No Insurance	26.8		32.2		30.7		28.1	
Employment-Based	4.1		2.4		2.1		0.1	
Medicaid	66.7		62.7		63.7		70.6	
Other	2.4		2.7		3.6		1.3	

‡ : Conditional on work

Table 7: Hypothesis testing of PH hypothesis: H_0 : PH assumption is correct

Variables	Estimates	Variables	Estimates
Job characteristics		Individual characteristics	
ln(Median earning)	-0.1	Other	-0.04
	(.11)	income	(.39)
Part-time	-0.04	Age	0.03
proportion	(.32)		(.52)
Unemployment	-0.03	Age	-0.03
rate	(.45)	squared	(.49)
Growth	0.1	High	-0.003
percentage	(.12)	school?	(.93)
Degree-	0.1**	Black	0.05
based?	(.01)		(.26)
Work intensity		Age of Youngest Child	
Periods working	-0.01	Below 5	-0.03
at least part-time	(.90)		(.37)
Prob. Of	0.1**	Above 13	-0.01
Work	(.03)		(.89)
Hourly	0.03		
rate	(.78)		
Periods not	0.05	Guarantee	0.1
working	(.26)		(.17)
Welfare reform		Welfare taxes on -	
Work	-0.03	Other	0.02
requirement	(.37)	income	(.62)
Time	-0.01	Earning	-0.04
limit	(.89)		(.33)

*** : significant at a 1% confidence level; **: significant at a 5% confidence level; *: significant at a 10% confidence level.

$^{-}$: State and year fixed-effects are included but not presented in the table.

Table 8: Cox coefficient estimates: Benchmark model

Variables	Estimates	Variables	Estimates
Job characteristics		Individual characteristics	
ln(Median earning)	.57*	Other	.029***
	(.308)	income	(.005)
Part-time	-.021***	Age	.09*
proportion	(.007)		(.048)
Unemployment	-.077*	Age	-.001*
rate	(.04)	squared	(.0007)
Growth	-.008	High	.144
percentage	(.005)	school?	(.096)
Degree-	.743**	Black	.014
based?	(.329)		(.106)
Work intensity		Age of Youngest Child	
Periods working	.08*	Below 5	-.092
at least part-time	(.043)		(.135)
Hourly	.04**	Above 13	.107
Rage	(.02)		(.148)
Prob. Of	1.341***	Guarantee	-.0003
Work	(.313)		(.0007)
Periods not	.051		
working	(.044)		
Welfare reform		Welfare taxes on -	
Work	-.454**	Other	.0002
requirement	(.195)	income	(.004)
Time	-.043	Earning	.006
limit	(.233)		(.005)
Observations	Persons	Person-months	
Leavers	535	6,362	
Stayers	1,109	27,595	
Total	1,644	33,957	

*** : significant at a 1% confidence level; **: significant at a 5% confidence level; *: significant at a 10% confidence level.

– : State and year fixed-effects are included but not presented in the table.

Table 9: Cox coefficient estimates: Benchmark model - excluding probability of work

Variables	Estimates	Variables	Estimates
Job characteristics		Individual characteristics	
ln(Median earning)	.5	Other	.027***
	(.31)	income	(.005)
Part-time	-.022***	Age	.11**
proportion	(.007)		(.048)
Unemployment	-.076*	Age	-.002**
rate	(.04)	squared	(.0007)
Growth	-.006	High	.161*
percentage	(.005)	school?	(.097)
Degree-	.904***	Black	
based?	(.316)		
Work intensity		Age of Youngest Child	
Periods working	.095**	Below 5	-.087
at least part-time	(.043)		(.135)
Hourly	.06***	Above 13	.114
Rate	(.02)		(.149)
Periods not	.009	Guarantee	-.0003
working	(.044)		(.0007)
Welfare reform		Welfare taxes on -	
Work	-.427**	Other	-.0003
requirement	(.195)	income	(.004)
Time	-.059	Earning	.006
limit	(.234)		(.005)

*** : significant at a 1% confidence level; **: significant at a 5% confidence level; *: significant at a 10% confidence level.

– : State and year fixed-effects are included but not presented in the table.

Table 10: Cox coefficient estimates: Define work by full=time ($\geq$ 35 hours/week)

Variables	Estimates	Variables	Estimates
Job characteristics		Individual characteristics	
ln(Median earning)	.923***	Other	.03***
	(.175)	income	(.005)
Part-time	-.018***	Age	.094*
proportion	(.005)		(.048)
Degree-	.724**	Age	-.001**
based?	(.337)	squared	(.0007)
		High	.145
		school?	(.097)
		Black	.013
			(.106)
Work intensity		Age of Youngest Child	
Periods working	.04***	Below 5	-.102
full-time	(.01)		(.136)
Prob. Of	1.184***	Above 13	.098
Work	(.315)		(.148)
Hourly	.04*	Guarantee	-.0006
rate	(.02)		(.0007)
Periods not	-.01		
working	(.017)		
Welfare reform		Welfare taxes on -	
Work	-.454**	Other	.0003
requirement	(.194)	income	(.004)
Time	-.057	Earning	.005
limit	(.233)		(.005)

*** : significant at a 1% confidence level; **: significant at a 5% confidence level; *: significant at a 10% confidence level.

– : State and year fixed-effects are included but not presented in the table.

Figure 1: Raw survivals by different job characteristics

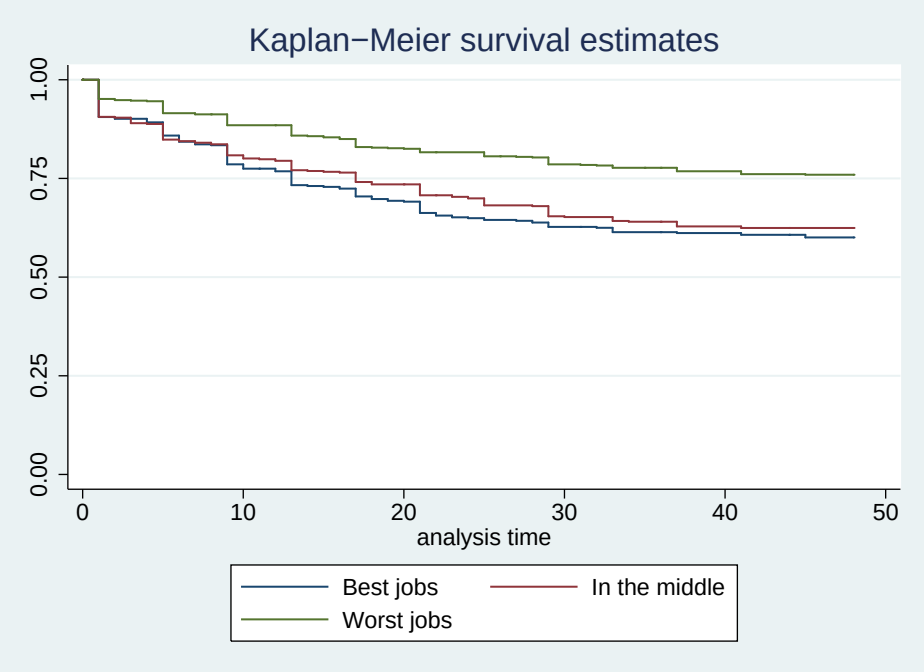

Figure 2: Survival of three different jobs

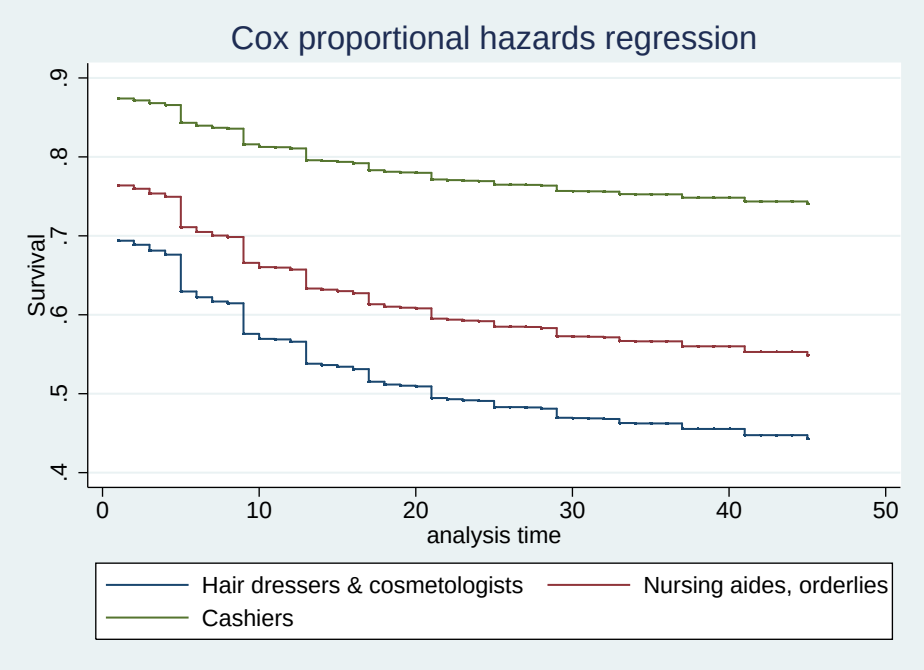

Figure 3: Estimated hazard

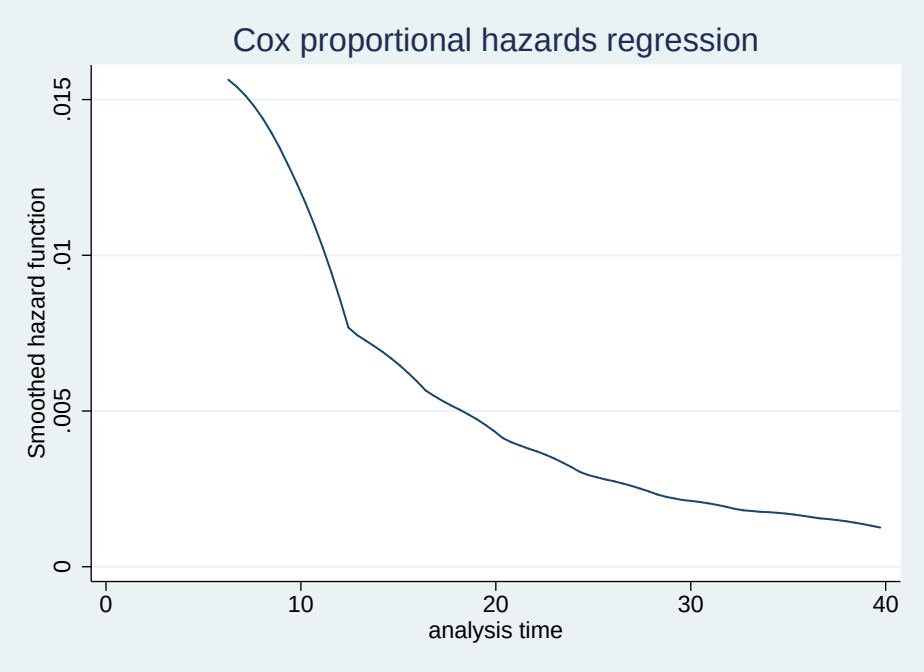

Figure 4: Survival function - different work intensity as a cashier