

# Labour Transition in 21<sup>st</sup> Century American Economy

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*To all my families, for making everything possible from the beginning with their  
unconditional sacrifice*

*To all my professors, for leading me to the frontier of possibilities through the path of  
humbleness*

*To Clea Lerner'18 & Tatiana Delgado-Khan'18, for their critique and patience*

*To Darron-Ann Richardson, for teaching me that precious moments in life are not  
forever*

*To all my friends, for showing me that only in the mysterious equation of love is  
where any logic and reasons can be found*

# 1 Abstract<sup>1</sup>

The American labour market experienced fundamental changes in the since the turn of the millennium as workers are becoming more precarious, experiencing higher dismissal rates and lower job-retention rates. This trend has been captured by the literature since the 1970s and has extended into the 2000s (Stewart 2002, 1999). On the other hand, with the recent raise of the gig economy, This study first plots the probability of any worker either not in the labour force, employed, or unemployed in the previous survey year transitioning into one of either three possible categories in the next survey year. This visualization shows the increasing polarity between employed and unemployed/exited workers<sup>2</sup>. I find that the probability of previously unemployed/exited workers securing employment in the current survey year is decreasing, while the probability of employed workers being employed in the next survey year is increasing. Employed workers' chances of dropping out of the labour force is also decreasing. Secondly, I investigate the decreasing trend by comparing the marginal effects of various ethnic and gender groups in American society provided by the March Current Population Survey (March CPS) with a probit model. I find that high school dropouts face the most difficult circumstance in a traditional labour market. Meanwhile, other demographic groups such as black, female, and single workers saw their transition probability almost unchanged from 2002 to 2016. This study shines light on the experience of different demographic groups in America, and hopefully informs readers about the current economic and political climate.

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<sup>2</sup>Workers who exited the labour market earlier

## 2 Introduction

The global economy has seen much change since the turn of the century. With the rise of globalization and the Great Recession in 2008 participants in the global marketplace such as workers and job seekers are experiencing a more challenging, dynamic, and fluid environment in the labour market. Recently, the phrase 'gig-economy' has entered the vocabularies of commentators, researchers, and journalists soon after the Great Recession (Caldbeck, Labonte, Mohindra 2014). The expansion of the gig-style labour market, is the results of the gig-method of completing business transactions in the economy. Large numbers of temporary contracts between service providers and consumers also lead to an increasing share of temporary contracts between employers and employees. In many non-manufacturing sectors, this versatility renders labour a more variable and elastic input, raising the curtain for the emergence of an alarming reality where companies institute hiring freezes and cut salaries. This seems to describe what most workers are experiencing in Europe (Brady & Biegert 2017)<sup>3</sup> and in North America (Picchi 2015; Mojtehdzadeh & Monesebraaten 2015)<sup>4</sup>.

Meanwhile, some authors argue that the labour force in fact becomes more flexible for those looking for freelancing work (Alton 2017). Indeed, the flexibility of the gig-economy does offer an employment seeking worker freedom from a fixed schedule, and the liberty to choose specific tasks that fit their expertise. However, the gradual erosion of traditional employment leads to inconsistency of income and the loss of transitional benefits such as pensions, employer-provided insurance, and paid-leave. Despite the different opinions regarding this new development, it does not seem like the 'gig' is showing any signs of departure from our economy, even with the arrival of the Great Recession in 2008 and the recent political change based on grievances surrounding a perceived decline in the American economy and labour market. Instead of praising the benefits of this new breed of 'gig-labour model', however, I intend to investigate what does this entail for the traditional labour market that required consistent working hours from nine to five, and offered stable employment and promotions?

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<sup>3</sup>The authors find that in Germany, despite the praises the nation received for its robust market institutions and apprenticeship systems, low wage working women have increased from 2.2% in 1989 to 5.3% in 2013. Temporary employment among women rose from 13.3% in 1994 to 17.2% in 2007.

<sup>4</sup>The news report confirms that a finding from McMasters University in Canada finds that 52% of the workers sample in Greater Toronto Area do not have full time, or traditionally considered permanent employment. In America, Economic Policy Institute finds that at least 17% of workers have unstable schedules.

My interest in the issue is specifically concentrated on the period from 2002 to 2016. This time period is crucial as it includes the years of the Great Recession. Through juxtaposition of the gig and the traditional labour model, it seems that the rise of the new is as much as the fall of the old (Calbick, Labonte, Mohindra, & Ruckert 2014; Nugent 2017)<sup>5</sup>. In this paper, I analyze the ability the traditional economy to continue providing stable employment for workers with different ethnic, gender, education background, and marital status.

Despite the fact that it is a global issue, there is scant literature that devotes substantial attention to the measurement of the duration of employment or occupational stability in America. The first discussion was Hall's (1980) paper titled "The Importance of Lifetime Jobs in the U.S. Economy" in which he bluntly states that "... the U.S. labor market is justly notorious for high turnover and consequent high unemployment ...", asserting high volatility's routine existence in the U.S. labour market as quotidian. Given the fact that America was the source of the Great Recession, and has has one of the world's largest labour market, there are sufficient reasons to suspect that the American labour market will continue to experience higher volatility and instability in its labour market. In this paper, I utilize theoretic framework formulated by previous literature on methods to capture labour transition rates and apply them through empirical analysis (Marston 1976). Furthermore, I use data from the March Current Population Survey (March CPS) to calculate the transition rates of different categories of participants in the labour market.

And as I will show later in the paper, different groups in the labour market experience different levels of volatility, and changes in labour transition rates are highly influenced with educational attainment and to a lesser extent by other factors such as race, marital status, or age. High school dropouts who are unemployed, not in labour force, or employed face higher volatility in the labour market as they are less likely than their counterparts with higher education attainment rates to be absorbed or retained by the traditional labour market. For other demographic groups such as women or unmarried workers, their experience in the traditional labour market has not changed drastically over the years.

The paper is organized as follows. The next section provides an overview of the literature on the measurement and investigation of labour transitions

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<sup>5</sup>According to Nugent 2017, the number of workers in Ireland who would rather work full-time has risen significantly over the past decade (about 16% of part-timers would rather work full-time in 2016). After the Great Recession in 2008, many countries in Europe de-regulated their labour market in order to regain access to credit markets in the wake of festering sovereign debt crisis, increasing precariousness in the labour market.

in the past. This section also explains the data used in this study. The third section discusses different types of transition rates through visualization of the data. The fourth section explains the empirical methodology. The fifth section presents results. The sixth section explores the economic implications of the paper's findings.

### **3 Background & Literature Review**

Research examining the modern American labour security began in the 1990s. Federal Reserve Chairman Alan Greenspan, recognizing the role of labour security in monetary policy, had identified rising worker job insecurity as a potential inflationary factor in 1997 and 1998 (Valletta 1999). By definition, labor security implies a worker's economic security in the labor market from dropping out of the labour force due to the competition of the market system. These outcomes include voluntary or involuntary dismissal, transition out of the labor force, acceptance of lower wages, and lack of opportunities of upward career-mobility. Subsequently, multiple academic papers have attempted to measure labour transition rates in order to monitor the development of employment insecurity. However they failed to draw a singular measurement or theoretical framework collectively. In addition, Diebold, Neumark, & Poisky (1994) also insist there exists very little research on labor security. Before Hall (1980), very little attention had been paid to this concept until the 1990s. Given the broad concept of labor security, there is also an inconsistency in the already scarce literature about what exactly constitutes a standardized measurement of labor security. Earlier literature finds that there is higher unemployment for nonwhites, women, and teenagers, a result of excessive voluntary withdrawal and involuntary dismissal (Marston 1976).

Below are a list of selected papers that have attempted to measure employment transition, job retention rates, and other measures of labor transition. These have the most concrete and robust results. Moreover, their data-set are easily accessible and replicable.

Author(s)	Main data-set(s)	Finding(s) in short
Jaeger & Stevens 1999	PSID & CPS Tenure and Employee Benefits Supplements	Share of workers with <10 years of tenure increased in late 1980's
Neumark, Polsky, & Hanson 1997	CPS Tenure and Contingent Work Supplements 83, 87, 98, 95, 96	Job retention rates for high-tenure whites and blacks decreased in 1990's.
Neumark, Polsky, & Diebold 1997	CPS Tenure Supplements 73, 78, 81, 83, 87, 91	Job retention rate decreased for high school graduates and blacks relative to college graduates and whites respectively.
Valletta 1999	PSID & March CPS 76-93	Upward time trend in dismissal probability
Stewart 1998	March CPS 67-97	Job loss is higher for all men, less-educated women, and all experience groups
Schmidt 1999	General Social Survey (GSS) 77-96	Workers in 1990's were more pessimistic about involuntary and costly job loss than in earlier periods

The most significant contribution made to the existing labor security literature is the paper by Diebold, Neumark & Polsky (1994), one of the first papers to use the Current Population Survey (CPS)<sup>6</sup> data to examine job tenure. Diebold, Nuemark & Polsky (1994) find that workers with fewer than 6 years of tenure have a lower retention rate while workers with more than 6 years of experience have increasing retention rates. Starting with the usage of CPS and also the Panel Study of Income Dynamics (PSID)<sup>7</sup>, researchers began to find a

<sup>6</sup>The March CPS is jointly sponsored by the U.S. Census Bureau and the U.S. Bureau of Labour Statistics (BLS). The data-set is specifically collected in the month of March by the Census Bureau and it is a primary source of labour force statistics of America. The March CPS data-set used by this study, though, is organised by the Center for Economics and Policy Research (CEPR), a non-profit headquartered in Washington D.C. and it obtained the data through a purchase from the Unicon Research Corporation, the creator of the original March CPS extract.

<sup>7</sup>The PSID is a longitudinal household survey conducted by the Survey Research Center at the University of Michigan.

consistent, if not sharp, decreases in labor security (Stewart 1998, 2002). Another study by Neumark, Polsky, & Hanson (1997) utilized the CPS Job Tenure data which is collected over a 4-year cycle. Stewart addresses the disadvantage of using the CPS Job Tenure data in Stewart (2007), which I will elaborate later.

Furthermore, there is evidence suggesting that the implication for decreasing labor security affects a wider demographic including all male and white-collar women in America (Valletta 1999). Evidence overwhelmingly seems to suggest that having lower educational attainment rate, being a woman or a minority, and having low professional experience are strongly correlated with lower job retention (Newmark, Polsky, & Hansen 1999). College educated graduates saw increases in job retention rate while high school graduates experienced a slight decrease, according to Diebold et al. (1994). There are other studies with findings that do not discriminate any demographic groups, suggesting that job security decreases for all members with less than 10 or 18 months of experience in the labor market. Indeed, job retention rate is only one measure of labor security (Jeager & Stevens 1999).

These papers measured retention rates, tenure, probability of dismissal, etc. yet these studies all seem to only focus on the worker's chance of transition from employment to unemployment. They failed to paint a complete picture of the dynamics of a labour market, which is more than just the ability to absorb the labour supply, albeit Marston (1976)'s earlier critique of this method. This has been the preferred method of most studies listed above as they simply categorized labor-flows into two labor-market states: "unemployed" and "not unemployed" or "working" and "not working". Labor security remained an integrated subject in the wider field of unemployment in macroeconomics with very little attention invested in its significance beyond a phenomenon in the labour market. To improve upon this model, Marston (1976) made the suggestion to expand the two kinds of changes into nine kinds of changes in a worker's employment status. By including the flows from and to unemployment (U) and not-in-labor-force (N), the measurement expands to include labor-force exit, an important factor to consider when disadvantaged demographic groups such as minorities and women are often excluded from the labor force altogether, resulting in an insecure economic status in society.

I would like to assert that in the labour market, there are indeed nine kinds of transitions based on Marston's analysis (1976). I illustrate this by replicating his table below in Table 1. In the table, E denotes employment, U denotes unemployment, and N denotes not-in-labor-force. EE would stand for transitioning from employment in a former time period to employment in the



current time period. Respectively, EU stands for transitioning from employment in a former time period to unemployment in the current time period and so on. All workers in the labor force would experience one or many of these kinds of labor transition at some point in their tenure in the labor market.

	E	U	N
E	EE	EU	EN
U	UE	UU	UN
N	NE	NU	NN

Table 1: Labour Market Flow-chart in Marston (1976)

As mentioned above, Marston employed a measurement of labor security with employment to unemployment / not-in-labor-force transition rates to measure labor security. Stewart (2002) uses the same measurement with the March CPS data and found similar conclusion to the other studies mentioned above. Evidence shows that rate of job losses, which is transition rates, was higher in the 1980s. Given the time-frame Stewart picked from 1967 to 1997, he was able to incorporate the 1990 recession and discovered that job loss was severe among college educated men, men with more than 21 years of experience, and white-collar workers. In comparison, these groups were better off during the 1982 recessions. Levenson (1996) added another crucial investigating lens as he documented that involuntary part-time work, using March CPS data, has grown faster for low-skill men and women than for high-skill men and women. As part-time job employers are less likely to offer their employees benefits and insurance, involuntary part-time workers remain the most precarious working population.

Of course, economic security is also a matter of perspective. This led another group of researchers who were interested in psychology to investigate whether workers perceive their economic circumstance as insecure, or whether they feel safe given their current employment status (Schmitt 1999, Hank & Erlinghagen 2011). Schmitt (1999) used the General Social Survey (GSS)<sup>8</sup> to measure perceived likelihood of job loss or layoff in the following 12 months. The result shows that workers' perception was highly correlated with how the economy was performing and with the pattern of actual job loss in the economy. This method, indeed, is very subjective because different workers have different definition of what satisfaction means (Clark, Postel-Vinay 2009).

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<sup>8</sup>The GSS is conducted by the National Opinion Research Center at the University of Chicago and funded by the National Science Foundation

## 4 Data & Empirical Methodology

### 4.1 March CPS

Stewart (2007) addresses some of the potential pros and cons of using March CPS. Unlike other data-sets such as the CPS Job Tenure Data or the Panel Study of Income Dynamics (PSID), the March CPS is unmatched, which possibly explain the lack of its popularity among traditional literature. The data-sets used by most authors keep track of same respondents to a survey over a long period of time. Nevertheless, in Stewart (2007), the author argues that using unmatched data avoids the possibility of any attrition in the data. Since the data-sets are collect at a single point in time, researchers always have a large sample size to work with. Attrition is an issue that many previous researchers have to deal with. In Valletta (1999), for example, the author used a combination of PSID and March CPS to complete the empirical analysis. It is evidently clear from Valletta (1999) as well that there were issues with using PSID as a measurement of job change over time as there are changes in survey instrument over time in the PSID. March CPS has an advantage here since there are no gaps in the data (unlike the CPS Tenure Data, the PSID is not published annually). The March CPS has been consistently published annually from the 1970s until 2016 with transition variables consistently defined over the time period 2002 to 2016. The drawback, though, is that one cannot track the changes in covariates such as marital or union status.

Another concern is whether the CPS mainly captures voluntary or involuntary dismissals should a worker reports that he or she left his occupation. Stewart (2002) addressed this concern by pointing out the results of his study indicates that EU transitions are largely counter cyclical, implying that most of the dismissals are involuntary. His results are reproduced in figure 1. The dotted-line on the bottom is the EE transition rate and the thin solid line is EU transition rate, and one can clearly see that they are counter cyclical. Being able to identify involuntary and voluntary dismissal was crucial to Stewart's (2002) study, yet for this study, the difference does not truly matter. The traditional market's capacity to retain workers includes keeping workers from voluntarily dropping out, and involuntarily dismissed by their respective employers. Hence, in this study, I did not identify involuntary or voluntary dismissals, nor am I concerned that this difference will yield biased results.

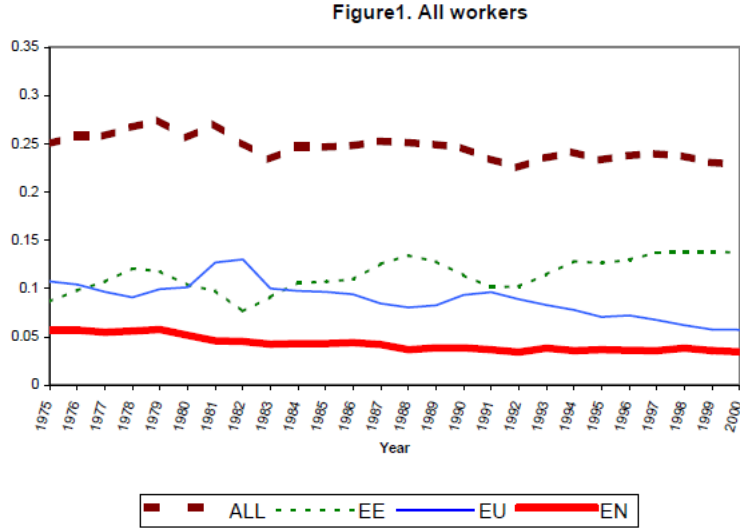


Figure 1: EU Transition of all workers in Stewart (2002)

In terms of creating my sample I merged the March CPS data from 2002 to 2016 (annual) in order to analyze the change of transition rates over time. I restricted the sample to men and women who worked at least one week in the previous and current year, worked less than 35 hours per week in the previous and current year, and were 18 to 54<sup>9</sup> years old in March of that year. I also only used samples from months-in-sample 5-8 to keep the data-set manageable. This also avoids issues with having repeated samples in the same year. I dropped individuals whose longest jobs were either 'self-employed unincorporated / incorporated' from the data-set, which is what Stewart (2007) did not do in his research<sup>10</sup>. This allows me to identify those, to a very large extent, still relying on conventional employment and capture the traditional labour market. I also dropped those serving in the military since it is impossible to identify if they were likely to be dismissed from duty or not in the given sample year given their long term continuous employment. This leaves me with a sample of 619,342 observations. Finally, I incorporate Marston's conclusion on labour force transition and generated four transition variables corresponding to the nine flows described in Marston (1976).

<sup>9</sup>I intentionally selected 54 instead of 55, which is the conventional retirement age, to incorporate workers who worked until they have reached retirement

<sup>10</sup>Stewart 2007; 2002; only dropped samples with longest job as 'self-employed unincorporated'

Table 2: Sample Means March CPS 2002-2016

	(N=275,564)		(N=273,144)	
	Women		Men	
	Mean	SD	Mean	SD
HS dropout	.069	.254	.077	.266
HS graduate	.295	.456	.341	.474
College dropout	.294	.455	.322	.467
College graduate	.197	.397	.216	.411
Graduate School	.093	.289	.099	.296
Nonwhite	.302	.459	.341	.474
Married	.593	.491	.563	.496

Concerning the dependent variables, since the March CPS documents a worker's employment situation in the current and the previous period, I was able to use the data-set to trace the worker's transition and calculate the transition rates. With this information, I was able to create dummy binary transition variables by matching different workers' states together and created four variables. Table 2 lists descriptive statistics for the four dependent variables. The March CPS data-set includes the sample worker's labour status in  $t_n$  and  $t_{n-1}$ . I only provide four variables EE, UE, NE and EN transition rate. Similarly, in my graphical analysis, I will only use these four binary variables in the data-set as independent variables. This is because the marginal effects of EE, UE, NE, and EN truly captures the possible deterioration of the traditional labour market. UE and NE respectively captures the ability of the traditional labour market to respond to labour demand by providing them with employment while EE and EN captures the traditional labour market's ability to keep workers from falling out of the labour market. Table 4 shows the total number of sample sizes from 2002 to 2016 in three different states.

## 4.2 Identifying Labour Transition

Marston's analysis of the nine flows in the labour market provides researchers with the necessary tools to paint a complete and holistic picture of the changes of labour force status in the labour market. However, I am interested in studying the volatility of the traditional labour market. Hence, to pinpoint and discover potential instability, the extent of the traditional market to absorb labour supply and prevent workers from falling out of the traditional market is truly

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rated', but kept 'self-employed incorporated'.

Table 3: Transition Variable Means March CPS 2002-2016

	(N=275,564)		(N=273,144)	
	Women		Men	
	mean	SD	mean	SD
EE	.645	.478	.789	.408
UE	.004	.066	.004	.062
NE	.020	.140	.011	.106
EN	.028	.164	.022	.146

what this study should concentrate on. To visualize the changes of these rates in the sample, I graph these transitions from 2002 to 2016 through the years of the Great Recession. Table 4 shows the number of workers in each state from 2002 to 2016.

First, I calculated the transition rate by using the number of workers in a given labour-force status (which I will use *state* to describe from now on) in  $t_{n-1}$  as denominator and the number of workers in the former given state that experienced transition to another given state in  $t_n$  as the numerator. To further elaborate, I present the following Transition Rate (*TR*) formula:

$$\frac{\tau_{t_n}}{\rho_{t_{n-1}}} = TR_{t_n}, \quad \text{where} \quad \begin{cases} t_n & = \text{current survey year} \\ t_{n-1} & = \text{past survey year} \end{cases}$$

Number of workers in the previous state is denoted by  $\rho_{t_{n-1}}$  and the number of workers in  $\rho$  that experienced a transition to another state in the current time period is denoted by  $\tau_{t_n}$ . For example, to calculate the transition rate of all workers in state E in the previous time period that transitioned into state U in the current time period, one produces the following equation:

$$\frac{UE_{t_n}}{U_{t_{n-1}}} = TR_{t_n}, \quad \text{where} \quad \begin{cases} UE_{t_n} & = \text{unemployed workers that} \\ & \text{became unemployed in } t_n \\ U_{t_{n-1}} & = \text{unemployed workers in } t_{n-1} \end{cases}$$

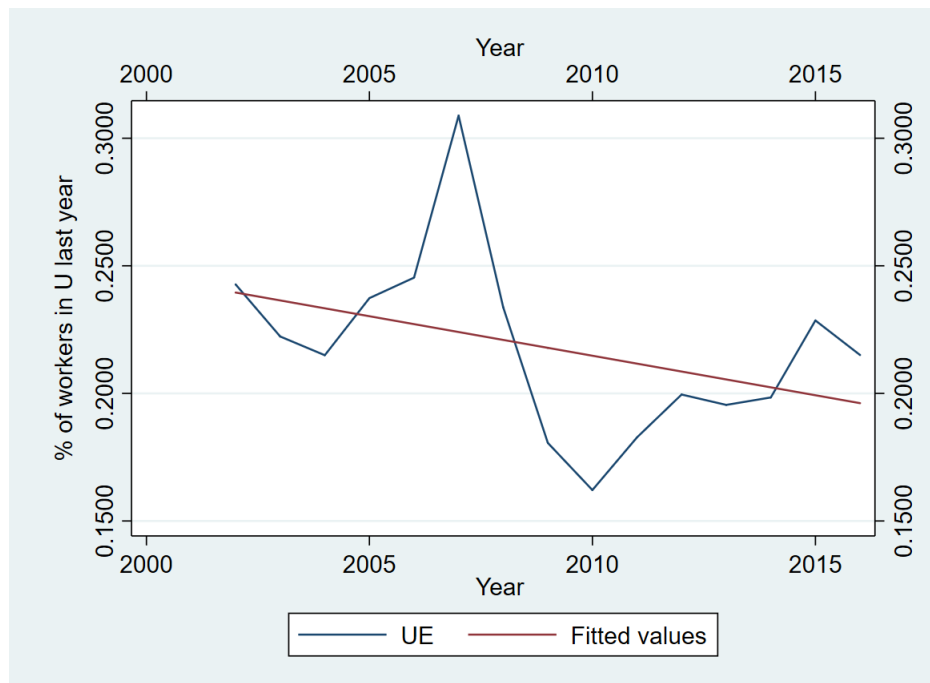


Figure 2: UE Transition Rate



Figure 3: NE Transition Rate

Table 4: Sample Sizes by Year & State

Year	E	U	N	Total
2002	34,667	521	7,933	43,121
2003	33,201	668	8,310	42,179
2004	32,394	704	8,608	41,706
2005	31,887	595	8,525	41,007
2006	31,286	544	8,362	40,192
2007	62,184	858	16,404	79,446
2008	31,407	468	8,220	40,095
2009	30,553	716	8,376	39,645
2010	29,489	1,345	8,906	39,740
2011	28,260	1,502	9,156	38,918
2012	27,585	1,382	9,167	38,134
2013	27,811	1,229	9,145	38,185
2014	18,014	637	5,910	24,561
2015	27,151	790	9,136	37,077
2016	26,232	650	8,454	35,336
Total	472,121	12,609	134,612	619,342

Figure 1 & 2 shows the transition rate of workers that were unemployed in a previous time period to employment in the next time period. UE transition rate decreased from 24.27% to 21.51% while NE transition rate decreased from 8.21% to 7.56% . In other words, American workers who were unemployed or not in the labour force in the previous period were increasingly less likely to transition to employment in the current time period. Moreover, this trend has been decreasing since 2002. Another statistical element worth mentioning is that within the sample, there are more people who identify as unemployed or not a participant of the labour force. Table 4 shows the number of workers in each state from 2002 to 2016. As the total sample size and number of workers in state E decreased from 2002 to 2016, the number of workers in state U and N increased. Comparing with the decreasing percentage of a worker in state U and N to transition to state E, more workers are trapped in these two states. Figure 4 & 5 shows the transition rate of EE and NE. The transition rate of EE has been increasing from 89.6% to 91.95% while the rate of EN has been decreasing from 5.64% to 4.57%.

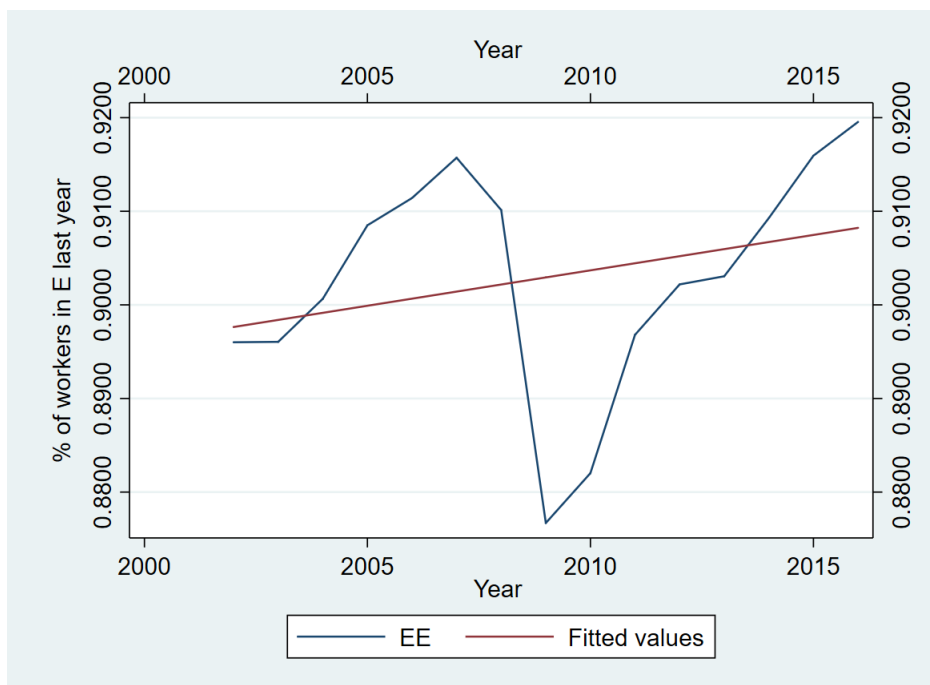


Figure 4: EE Transition Rate

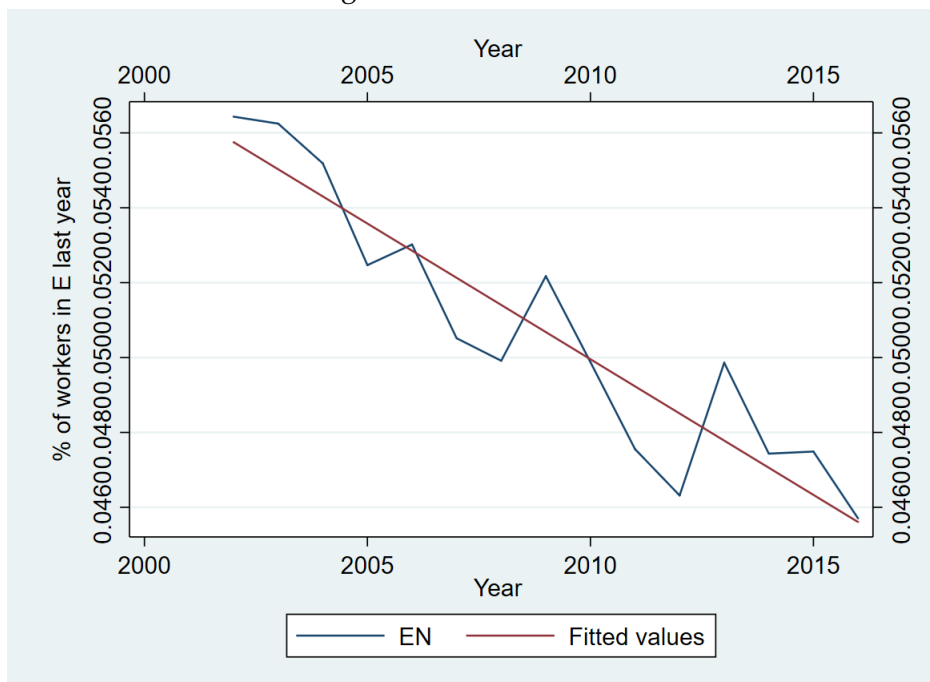


Figure 5: EN Transition Rate



According to Figure 3, the labour market shows a strong recovery since the Great Recession in 2008. Workers who were employed were more likely to stay employed and less likely to drop out of the labour force the following year. By referring back to Table 4, with fewer people maintaining their state in E and the decreasing probability of a worker transitioning from E to N and an increasing probability of maintaining their state, the shrinking size of state E is concerning. This is because within this smaller pool of employed workers, they are less likely to exit and more likely to stay employed, while in the larger pool of state U and N, the workers or job-seekers are less likely to join the smaller pool of workers in state E. The increasing polarity and inequality is clear.

Other trends such as EU or UN transition rate are not presented here as they do not hold crucial clues to the topic that I am interested in here. If a worker in the traditional labour market transition from E to U, his or her probability to transition back to employment (EU transition) would suffice in measuring the traditional market's ability to absorb labour supply. In short, UE, NE, EE, and EN inform us on whether the traditional labour market keeps or pushes workers away.

### 4.3 Probit Model

In order to examine the transition rates of different demographic groups by race, educational attainment levels, gender, and marital status while controlling for occupation, state, and year, I employ a probit model which has been utilized by authors before (Stewart 2002, Valletta 1999, Clark & Postel-Vinay 2009). The empirical approach of the paper. Probit allows me to use a binary dummy variable as the dependent variable and on the right hand side of the equation, all the independent variables are all dummy variables as well. Consider the following econometric probit equation:

$$Z_i = \Phi^{-1}(P_i(TV_i = 1)) = \alpha_{it} + F_{it}\beta_1 + M_{it}\beta_2 + R_{it}\beta_3 + E_{it}\beta_4 + O_{it}\gamma + T_t\delta_t + u_{it}$$

where

$TV_i$  = Transition rate variables UE, NE, EE & NE.

$F_{it}$  = Dummy variable for Female (Female = 1 & Male = 0)

$M_{it}$  = Dummy variable for Marital Status (Single = 1 & Married = 0)

$R_{it}$  = Matrix of 3 dummy variables for race (Black, Hispanic & Other)<sup>11</sup>

$E_{it}$  = Matrix of 4 dummy variables for educational attainment rate (HS dropout, HS completion, College dropout, College Completion)<sup>12</sup>

$O_{it}$  = Matrix of 3 control variables (State, 2-digit industry code<sup>13</sup> & CPS sample personal weight.)

$T_t$  = Matrix of 5 dummy variables representing 5 timeframes (Year1 to Year5)<sup>14</sup>

$u_{it}$  = Error term, capturing all other omitted factors, with  $E(u_{it}) = 0$  for all  $i$  and  $t$ .

All estimates presented in the next section are presented as marginal effects. All regressions are computed with robust variance estimator.

## 5 Results

Table 5 shows the results of the transition probability of UE. Most of the coefficients in the first two rows in table 5 are statistically insignificant, underlining the lack of difference between genders and marital status in terms of transitioning from unemployment to employment. For the racial variables, Hispanics seem to fare better than white Americans, and the advantage is clear and significant from column 1 to column 5. As time progresses, however, the magnitudes of the coefficients decreased.

Black transition probabilities seem to be insignificant except for column 2 and 4, hinting at the lack of difference both unemployed black and white Americans face in terms of transitioning to employment. In terms of educational attainment rate, most of the results are insignificant too, which again highlights the lack of difference across any demographic groups when unemployed workers try to transition to employment. This finding, in fact, is consistent, to a certain extent, with that of Jeager & Stevens (1999), which concludes that a decreasing job retention rate does not significantly discriminate across any societal categories such as race or gender. Likewise, the decreasing

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<sup>11</sup>White is another racial variable not included in this equation since it is the reference group neglected for comparison purposes

<sup>12</sup>Advance degree (Master's or PhD degrees) is the fifth category but it is neglected for comparison purposes

<sup>13</sup>Categorization comes from 2003 standard issued by NACIS (North American Cartographic Information Society)

<sup>14</sup>Year1 contains year 2002-2004, Year2 contains year 2005-2007, Year3 contains year 2008-2010, Year4 contains year 2011-2013, Year5 contains year 2014-2016

UE transition rate shown above affects all workers replying on the traditional labour market in America.

Table 5: Probit Estimates of UE Transition by Race

	(1) 02-04	(2) 05-07	(3) 08-10	(4) 11-13	(5) 14-16
Female	-0.040 (0.02)	0.033 (0.02)	-0.000 (0.02)	-0.009 (0.01)	-0.049** (0.02)
Single	-0.033 (0.02)	0.012 (0.02)	0.005 (0.02)	-0.000 (0.01)	-0.005 (0.02)
Black	-0.059 (0.03)	-0.078** (0.03)	-0.007 (0.02)	-0.051** (0.02)	0.008 (0.03)
Hispanic	0.131*** (0.03)	0.124*** (0.03)	0.056* (0.02)	0.043* (0.02)	0.075** (0.03)
HS Dropout	-0.034 (0.06)	-0.141** (0.05)	-0.036 (0.05)	-0.113*** (0.03)	-0.050 (0.05)
HS	-0.012 (0.06)	-0.100* (0.05)	-0.061 (0.04)	-0.090** (0.03)	-0.041 (0.04)
College Dropout	0.007 (0.06)	-0.104* (0.05)	-0.040 (0.04)	-0.086** (0.03)	-0.028 (0.04)
College	0.022 (0.06)	-0.006 (0.06)	-0.027 (0.05)	-0.084* (0.03)	0.029 (0.05)
<i>N</i>	1338	1997	2529	4113	2069

standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 6 below shows the NE transition rate. In terms of re-entering the traditional labour market, women seems to have a lower chance as the coefficients are all negative. The probability in column 5 in fact returns to the level in column 1, hinting at the lack of improvement. The same applies to Single and Hispanic, which the lack of improvement in transition probability is obvious. The probability for high school dropout to re-enter the traditional labour market, though, has consistently decreased in comparison to workers with advanced degrees. Unlike other demographic groups, high school dropouts' transition probability in fact worsened throughout the years, and the same applies to workers without any higher education but a high school degree. Coefficients for college dropout also decreased steadily, albeit at lower magnitudes, signaling a general decreasing ability for traditional labour market to accommodate non-college graduates.

In both Table 5 and 6, coefficients for black Americans are mostly insignificant, eliminating the difference in their probability in transitioning from either U or N to E. The difference across education level, however, is much more distinct.

Table 6: Probit Estimates of NE Transition by Educational Attainment

	(1) 02-04	(2) 05-07	(3) 08-10	(4) 11-13	(5) 14-16
Female	-0.026*** (0.00)	-0.021*** (0.00)	-0.022*** (0.00)	-0.017*** (0.00)	-0.026*** (0.00)
Single	0.026*** (0.00)	0.031*** (0.00)	0.024*** (0.00)	0.027*** (0.00)	0.025*** (0.00)
Black	-0.015* (0.01)	-0.016** (0.01)	-0.008 (0.01)	-0.027*** (0.01)	0.000 (0.01)
Hispanic	0.035*** (0.01)	0.032*** (0.00)	0.022*** (0.00)	0.028*** (0.00)	0.031*** (0.00)
HS Dropout	-0.038*** (0.01)	-0.053*** (0.01)	-0.046*** (0.01)	-0.056*** (0.01)	-0.055*** (0.01)
HS	-0.020 (0.01)	-0.033*** (0.01)	-0.023** (0.01)	-0.039*** (0.01)	-0.047*** (0.01)
College Dropout	-0.010 (0.01)	-0.024** (0.01)	-0.018* (0.01)	-0.028*** (0.01)	-0.034*** (0.01)
College	0.004 (0.01)	-0.029*** (0.01)	0.006 (0.01)	-0.021** (0.01)	-0.012 (0.01)
<i>N</i>	16918	33291	25502	27468	23500

standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 7 illustrates the EE transition probabilities. In terms of maintaining employment in the traditional labour market, there are statistical significance across all columns. Women's probability, alongside single and college educated workers have increased from 2002 to 2016 in comparison to their respective reference groups. For other groups, on the other hand, transition probabilities remained almost unchanged with slight decreases. One could also observe a trend among educational levels, which the lower the educational attainment rate a workers has, the less likely he or she can re-enter employment or maintain employment in the traditional labour force, as confirmed in Table 5, 6, & 7. The correlation with lower educational attainment rate with lower transition probabilities echoes, to a certain extent, findings in other lit-

erature as well (Stewart 1998, Stewart 2002). Hispanics coefficients are largely insignificant in table 7, meaning white and hispanic Americans have similar experience in the traditional labour market as employees. In both Table 5 and 6, hispanic Americans also tend to fare better than white Americans as well.

Table 7: Probit Estimates of EE Transition by Race

	(1) 02-04	(2) 05-07	(3) 08-10	(4) 11-13	(5) 14-16
Female	-0.020*** (0.00)	-0.023*** (0.00)	-0.017*** (0.00)	-0.018*** (0.00)	-0.016*** (0.00)
Single	-0.042*** (0.00)	-0.034*** (0.00)	-0.037*** (0.00)	-0.034*** (0.00)	-0.030*** (0.00)
Black	-0.024*** (0.00)	-0.021*** (0.00)	-0.026*** (0.00)	-0.024*** (0.00)	-0.022*** (0.00)
Hispanic	-0.004 (0.00)	0.003 (0.00)	-0.008** (0.00)	-0.002 (0.00)	-0.001 (0.00)
HS Dropout	-0.069*** (0.01)	-0.085*** (0.00)	-0.094*** (0.01)	-0.087*** (0.01)	-0.064*** (0.00)
HS	-0.040*** (0.00)	-0.054*** (0.00)	-0.066*** (0.00)	-0.064*** (0.00)	-0.044*** (0.00)
College Dropout	-0.042*** (0.00)	-0.055*** (0.00)	-0.058*** (0.00)	-0.058*** (0.00)	-0.044*** (0.00)
College	-0.004 (0.01)	-0.024*** (0.00)	-0.019*** (0.00)	-0.026*** (0.00)	-0.012** (0.00)
<i>N</i>	65595	125357	91449	83656	71397

standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Finally, table 8 shows EN transition probabilities, and the findings are consistent with the conclusion one could draw from table 7. Female and single workers' transition probability improved over time in comparison with their reference groups, meaning improving employment security for these two groups. They are less likely then men or married couples respectively to be pushed out of voluntarily dropout of the traditional labour market. However, high school dropout continues to show signs of increasing precariousness as they are the most likely to exit the traditional labour market among all educational attainment groups. Across ethnic lines, the probabilities are insignificant, eliminating any differences shared by these groups.

To paint the overall pictures of the traditional labour market, I begin with

Table 8: Probit Estimates of EN Transition by Educational Attainment

	(1) 02-04	(2) 05-07	(3) 08-10	(4) 11-13	(5) 14-16
Female	0.019*** (0.00)	0.023*** (0.00)	0.019*** (0.00)	0.020*** (0.00)	0.016*** (0.00)
Single	0.019*** (0.00)	0.016*** (0.00)	0.012*** (0.00)	0.013*** (0.00)	0.012*** (0.00)
Black	0.002 (0.00)	-0.000 (0.00)	-0.000 (0.00)	0.006** (0.00)	0.001 (0.00)
Hispanic	0.000 (0.00)	-0.002 (0.00)	0.002 (0.00)	0.001 (0.00)	-0.000 (0.00)
HS Dropout	0.030*** (0.00)	0.043*** (0.00)	0.036*** (0.00)	0.038*** (0.00)	0.035*** (0.00)
HS	0.016*** (0.00)	0.030*** (0.00)	0.024*** (0.00)	0.027*** (0.00)	0.020*** (0.00)
College Dropout	0.023*** (0.00)	0.038*** (0.00)	0.031*** (0.00)	0.034*** (0.00)	0.027*** (0.00)
College	0.000 (0.00)	0.018*** (0.00)	0.009** (0.00)	0.015*** (0.00)	0.007* (0.00)
<i>N</i>	65595	125357	91449	83656	71397

standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

its capacity to absorb labour supply. Regarding UE and NE, those who are in the labour market (unemployed workers) all face equal difficulty re-entering employment, regardless of educational level, ethnicities, marital status and gender. As for those who are outside of the labour market, the traditional market has a higher chance of excluding workers who are less educated. Whereas for other workers such as women or unmarried workers, their chance of re-entering labour force has not improved over the years.

Conversely, for employed workers, low educated workers face similar difficulty in maintaining their employment as their equals who are outside of the labour force trying to obtain employment. Single or female employed workers show a larger improved transition probability in the labour market as their coefficients decreased over time, while probabilities by educational attainment rate has hardly improved. Finally, concerning the traditional labour market's ability to retain employed workers, low educated workers are more like to fall out of the labour market, while female or single workers' coefficients show

signs of improvement of their chances of staying employed. Suffice to say, in terms of transitioning to employment, all unemployed workers face similar difficulties, while it is substantially more difficult for workers with low education outside of the labour force to secure employment. In terms of keeping employed workers employed, it is just as difficult for women or single workers to maintain their state before the Great Recession than it was before it.

## 6 Conclusion

The analysis of labour transition rates show a polarity between those who are employed, and those who are not employed or in the traditional labour market. Referring back to figure 4, employed individuals are more like to stay employed. Low educated workers, though, may not enjoy the rising employment retainment. Notwithstanding the lack of difference across ethnic lines in EN, black Americans continue to face lower probability of retaining their employment status in the traditional labour market. Referring back to figure 2 and 3, the growing polarity is confirmed by a simple comparison in time trend and the probit model.

As employed workers are more likely to stay employed while workers who are unemployed / not in labour force are less likely to be employed, findings in this study may serve as a continuum of empirical evidence for a growing inequality addressed in papers such as Hogan & Ragan (1995). The authors found that in developed countries including USA, job security for the employed may be beneficial, but the lower job turnover constitutes a negative externality as it may increase the length of unemployment spell for unemployed workers. Hogan & Ragan's (1995) conclusion may also apply to low-educated workers outside of the labour market as this study shows. Indeed, a thorough study of labour transition would require a combined data-set from the earliest date accessible in the data until the latest survey. Stewart 2002, 1999, and 1998 have continuously, with the similar and consistent empirical methodology, studied labour transition among different demographic groups from the 1970s up until the early 2000s, and drawing the pessimistic conclusion that labour transition has continued to decrease for certain groups throughout the decades and the turn of the millennium. Adding to the narrative, this paper confirms that the widening polarity has increased.

Stewart (1998) finds no significant support for drastically decreasing job stability from the 1970s to the 1990s, which is reflected in the results in this study. Female, single, or black worker's coefficients in table 7 for EE transition hardly changed from column 1 to column 5. However, the finding of higher job insecurity among high school dropouts in this study is consistent with

Stewart's (1998, 1999) findings. This study also confirms, partially, Jeager & Stevens' (1999) finding that all workers experience lower tenure in the data. Ethnicity seems to not play a significant role statistically in this study except for hispanic Americans who seem to have a higher probability than white Americans to experience UE.



## Reference:

- Alton, L. (2017). Can't Wait to Freelance in the Gig Economy? Read This First. Huffington Post.
- Brady, D. and T. Biegert (2018). "The Rise of Precarious Employment in Germany." SOEPaper(No. 936).
- Caldbeck, S., et al. (2014). "Globalization and the rise of precarious employment: the new frontier for workplace health promotion." *Global Health Promotion* 21(2).
- Clark, A. and F. Postel-Vinay (2009). "Job Security and Job Protection." *Oxford Economic Papers, New Series* 61(2): 207-239.
- Diebold, F., et al. (1997). "Job Stability in the United States." *Journal of Labor Economics* 15(2): 206-233.
- Hall, R. (1980). "The Importance of Lifetime Jobs in the U.S. Economy." NBER Working Paper Series(560).
- Hogan, S. and C. Ragan (1995). "Job Security and Labour Market Flexibility." *Canadian Public Policy* 21(2): 174-186.
- Levenson, A. (1996). "Recent Trends in Part-Time Employment." *Contemporary Economic Policy* 14: 78-89.
- Marston, S. (1976). "Employment Instability and High Unemployment Rates." *Brookings Papers on Economic Activity* 1.
- Mojtehdzadeh, S. and L. Monsebraaten (2015). Precarious work is now the new norm, United Way report says. The Star.
- Neumark, D. (2000). "Changes in Job Stability and Job Security: A Collective Effort to Untangle, Reconcile, and Interpret the Evidence." NBER Working Paper Series(7472).
- Neumark, D., et al. (1997). "Has Job Stability Declined Yet? New Evidence for the 1990's." NBER Working Paper Series(6330).
- Nugent, C. (2017). "A time-series analysis of precarious work in the elementary professions in Ireland." New Economic Research Institute Working Paper(No. 43).
- Picchi, A. (2016). Behind the rise in America's workforce dropouts. CBS Money Watch.
- Stewart, J. (1998). "Has Job Mobility Increased? Evidence form the Current Population Survey: 1975-1995." Bureau of Labor Statistics.
- Stewart, J. (1999). "Did Job Security Decline in the 1990s?" Bureau of Labor Statistics.
- Stewart, J. (2002). "Recent Trends in Job Stability and Job Security: Evidence form the March CPS." Bureau of Labor Statistics Working Papers(356).
- Stewart, J. (2007). "Using March CPS data to analyze labor market transitions." *Journal of Economic and Social Measurement* 32: 177-197.
- Valletta, R. (1999). "Declining Job Security." *Journal of Labor Economics* 17(S4): S170-S197.