Job Turnover and Health Insurance

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ABSTRACT

The United States practices an unique system of health care that places the responsibility of providing health insurance upon employers. For decades, scholars have set forth numerous inquiries into this topic to understand the effects of employer-provided insurance on the labor force. A popular theory is that of decreased job mobility as a consequence of work-related insurance. Researchers have provided findings over the years that seem to support this theory of "job lock," and my research follows along these lines of inquiry.

This analysis also investigates the particular effects of employer-provided insurance on voluntary and involuntary turnover, a distinction not previously considered in previous research. Using logistic regression, the results of this work contradicted my expectations of a positive association between work-related insurance and the likelihood of involuntary turnover. In fact, these preliminary findings indicate support for job lock across both types of turnover. The probabilities of both voluntary and involuntary turnover share a negative association with employer-provided health insurance in my results.

In this report I also calculate the probabilities of turnover for each year from 1997 to 2008, and the trends for these probabilities are consistent with the economic conditions during those years. Furthermore, my findings also suggest possible age discrimination in the labor force against older workers.

INTRODUCTION

The relationship between health insurance and employment in the United States traces back to the 1942 Stabilization Act. Passed by Congress during the Franklin D. Roosevelt administration, the Act was implemented to stabilize wages during the end of the Great Depression by limiting wage increases. It did, however, allow employers to offer health benefits as an incentive to secure workers. A later 1945 ruling by the War Labor Board prohibited employers from terminating health benefits to service members during the duration of their contract, and, in 1949, the National Labor Relations Board ruled that pensions and health benefits were included in the definition of "wages." Thus, the bond between health insurance and employment was recognized and reinforced.

These rulings helped to establish the provision of health insurance as a responsibility of employers, but it was the tax incentives that led employers to embrace that role. A 1954 Internal Revenue Code[1] declared that an employer's contributions to an employee's health package were exempt from taxability. Both employers and employees were not required to pay taxes on the wages that went toward health plans. The survival of the health insurance-employer relationship has been in large part due to the monetary incentives that both employers and employees reap from participating in this system.

[1] This code expanded on an earlier, more restrictive ruling from twenty-two years earlier.

By tethering health coverage to the employer, the United States has become a unique case. Many other Western countries have socialized systems of health care, as is the case in Canada and Great Britain. As a result of the United States' singular practice, most of the research that investigates the effect of employer-provided insurance on job mobility and labor market outcomes (such as wage determination and labor force participation) are based on observations of the United States' work force. My research continues in this tradition and uses survey data to ascertain the degree of health insurance's effect on employment turnover in the United States.

PREVIOUS RESEARCH ON HEALTH CARE AND EMPLOYMENT

The research conducted by Mitchell (1982) on the effects of employer-provided health insurance on job mobility can be considered one of the first important investigations on that topic insurance-related job lock. Using probit analysis to analyze data from the 1973-1977 Quality of Employment Survey, she found non-significant negative effects of employer-provided insurance on job mobility. When the Clinton administration attempted to universalize health care provision in the United States, the research on health care and employment increased, and Mitchell's work was often cited by her predecessors in the 1990's.

Also heavily cited is Madrian (1994), who found evidence of health insurance-related job lock using data from the National Medical Expenditure Survey. Unlike Mitchell, her results achieved statistical significance and she found substantial decreases in voluntary turnover rates amongst those covered by employer-provided health insurance versus groups without work-related coverage. Madrian estimated a 30% to 31%decrease in voluntary turnover rates between those with insurance and those without insurance. Mobility rates decreased even more amongst married men with large families (33-37%), and even more so for those with a pregnant wife (67%).

Monheit and Cooper (1994), also found support for Madrian's findings on job lock using the NMES. They found evidence to suggest that the expected change in insurance status at prospective jobs also play an important factor in workers' decisions to relocate to a new job. Like Madrian, they also found statistically significant decreases in worker mobility as affected by employer-provided insurance, with the effect varying across gender and marital status. However, they also estimated that insurance-related job lock affected only one out of sixty-one million workers, suggesting that the effect may be more limited in scope than earlier researchers had previously expected. Buchmueller and Valletta (1996) also found evidence of a gendered difference in job lock. By taking into account job tenure and individual pensions, their research indicated a greater negative effect on the mobility of female workers as opposed to male workers' mobility.

Scott, Berger, and Garen (1995) also considered the effect of pension plans on employment and examined the possible relationship of employer-provided health insurance and pension plans to age discrimination. The authors discovered a significant, negative effect of health insurance plans employers' likelihood of hiring older workers in three years. However, they found that the availability of a pension plan had no significant effect on hires of older

workers, which they suggest is evidence that health insurance costs deter employers from hiring older workers, while pension plans do not contribute toward similar discriminatory practices. Meanwhile, Even and Macpherson (1996) found evidence to support their theory of a relationship between the effects of firm size and pension plans. Using the Current Population Survey, they discovered that the traditionally negative effect of firm size on turnover loses significance in the absence of a pension plan.

Some findings, however, contradict the job lock theory. Berger, Black, and Scott (2004) do not find evidence of job lock—as measured by job lock's negative effect on workers' wages—in their research. Using the Survey of Income and Program Participation, their analysis takes into account respondents' wages, health status, family size, health insurance, and their spouses' employer-provided health insurance. Their results show that the likeliest candidates for job lock, such as men and women with large families, actually report higher wages than their counterparts with smaller families or who enjoy dual insurance coverage with a spouse. This finding contradicts their expectation of lower wages as a result of job lock (with higher wages thus being an indication of job mobility). Berger and his associates do concede, however, that respondents with large families also reported longer lengths of job tenure, which could also be seen as both support for job lock and as an explanation for the wage differentials.

The effect of health insurance on job mobility (and, by association, turnover) has been and continues to be a subject of scholarly inquiry. My attempt to examine the effect of health care on specific types of turnover is based upon previous researchers' support for the existence of health care's effect on employment factors.

THEORY AND HYPOTHESIS

Employment Turnover

Turnover is a difficult phenomenon to measure because, in research, it is often determined through inference. It is most often indicated through the measure of related occurrences, such as employment or unemployment rates. On the surface, turnover seems analogous to unemployment, however, if turnover can also refer to movement within the labor force, then unemployment measures are inappropriate to use because it may also capture individuals who have exited the labor force altogether. Furthermore, turnover is not necessarily followed with unemployment, as individuals often leave one job for another (and often within the same firm) and never experience unemployment in the interim. When one considers the distinction between voluntary and involuntary turnover, unemployment rates become an even poorer substitute for turnover because it cannot distinguish between voluntary and involuntary turnover.

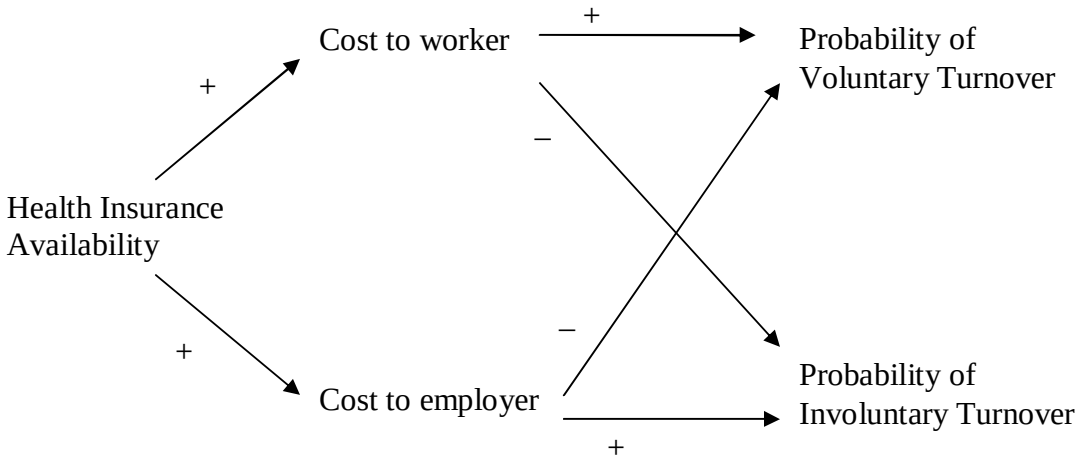
Unfortunately, the information that is necessary for piecing together an accurate understanding of unemployment is often found scattered across numerous types of surveys. Many questions must be asked of respondents to accurately assess not only turnover, but type of turnover. Therefore, its study calls upon an examination of closely related phenomenon, such as employment rates, changes in employment, job turnover, hiring rate, labor force participation,

reason for leaving a job, duration of unemployment, etc. These are some examples from the constellation of variables that, together, help us to understand turnover.

Job turnover estimates also provide valuable insight into the labor force. Its estimates allow for inferences to be made about worker satisfaction toward their jobs, the job mobility of certain groups, the expansion or contraction of certain industries or occupations in the economy, labor force trends, and economic conditions in general. Businesses—who lose money in the process of replacing employees—are also interested in turnover estimates to help assess the cost of turnover to their companies. The estimates for turnover are useful for a diverse range of inquiry.

Health Insurance and Turnover

Decisions on turnover may be reached through basic cost-benefit analysis. For the worker, when the benefit to staying at a job exceeds the cost of staying, it is likelier that the individual will stay rather than voluntarily leave. Similarly, when the benefit of retaining a worker outweighs the cost of keeping the worker, an employer is unlikely to terminate the employee. This research examines the role that work-provided health insurance plays in affecting the perception of costs to workers and to employers. When the employer does not offer health insurance, the cost of health insurance falls upon the worker, while the cost falls upon employers when they offer their workers health coverage. Therefore, this report hypothesizes that health insurance is negatively associated with the likelihood of voluntary turnover and positively associated with the chances of involuntary turnover.



This diagram depicts the hypothesis that the shifting of health insurance costs between employers and workers will result in either increasing or decreasing the probabilities of voluntary or involuntary turnover, depending on who is responsible for the cost of the insurance. In the case that the responsibility to provide health insurance falls upon the worker, the probability of voluntary turnover increases because the worker assumes the cost of health insurance, which diminishes his or her overall gain from being employed at that position. When the costs fall upon the employer, however, I hypothesize that the reverse will occur and that the

probability of involuntary turnover will increase because the employer's gains are diminished from assuming the responsibility for health insurance. This is, of course, assuming that the cost of health insurance is such that it is greater than the benefits both employers and their employees gain from their arrangement. Therefore, this model tests the magnitude of health insurance costs on employment decisions. If these expectations are confirmed, then it may be true that the perceived cost of health insurance outweighs the perceived benefits of employment.

DATA AND METHODS

Until 1986, the Bureau of Labor Statistics provided worklife tables that estimated the length of the remaining worklife for people according to their age. The BLS's earlier efforts to estimate worklife during the 1980's only took into account age and gender, while subsequent efforts also considered the effects of race and education (Smith 1985). Unfortunately, the limitations of the time made the inclusion of additional, important variables unfeasible. The Bureau of Labor Statistics today provides estimates of both annual and monthly turnover rates, but these are descriptive data that should not be used alone to predict future probabilities of turnover. These rates are calculated as percentages of the total number of cases of job separation to total employment. While this information is certainly useful to know, its predictive power is limited.

In 1995 and 2003, Trout proposed that estimates for the duration of employment in the cases of wrongful termination could be modeled as a function of race, gender, job tenure, occupation, education, and family income. To estimate these durations, he calculated the odds of a person staying employed with an employer (had he or she not been terminated) using these characteristics as explanatory variables. This method improved upon previous attempts because it included more variables that are important to turnover research.

Despite the improvement of Trout's predictive model over previous methods of estimation, certain aspects of Trout's analyses are problematic. First, the analyses were based upon data that was outdated even for the time of publishing. The 2003 article was based upon a twelve-year-old survey, while the original 1995 article was based upon an eight-year-old survey. Furthermore, both analyses also incorporated estimates published by the BLS in 1986. Second, the model is simplistic and does not account for the effects of variables that researchers have since documented (e.g., firm size). Third, Trout does not differentiate between unemployment and turnover. His analyses offer predictions of the likelihood of *employment* and not of actual turnover.

The Current Population Survey gathers a wide range of information. Variables captured by the CPS include age, race, education, family and personal income, work, family composition, home ownership, location, employment, health, and health insurance information on large samples of residents across the United States. These sizeable samples are representative of the general population and are available for every year, starting at 1962. This research utilizes data from the Current Population Survey's annual March supplement, which best captures the

information in which I am interested.[1] I include CPS-March data from 1997 to 2008 for this analysis, as prepared by the Minnesota Population Center.[2]

While I base my specifications on that of Trout, there are differences between our approaches. Altogether, my research draws information from three categories of variables: 1) personal variables, work variables, and health-related variables. (My selection includes all of Trout's variables from his more recent 2003 article.) The personal category includes demographic variables (age, education, marital status, and race), geographic variables (home ownership, urban setting), and income variables (family income and individual income). The work category captures all the work-related variables, such as pension plan participation, worker class, whether the worker worked full-time or part-time in the previous year, occupation in the previous year, and firm size. And, finally, the health variables account for employer-provided health insurance and the respondent's self-reported health status.

To increase the chances of accurately capturing turnover, I include only labor force participants (i.e. the employed and the unemployed who are still in the labor force) and eliminate non-participants from my sample (i.e. the unemployed who are not in the labor force). Also eliminated are the respondents who were not working at least part time in the previous year, since they could not have experienced turnover if they were not employed during the year leading up to the survey. Finally, the respondents who report being unemployed were separated into two turnover groups based on their reason for unemployment. Those who were categorized as job leavers comprised the group of voluntary turnovers, while those who were fired, laid off, or left as a result of their temporary job ending made up the group of involuntary turnovers. New entrants into the labor force and re-entrants were eliminated from the sample. Overall turnover comprises of people who responded positively to being currently unemployed *and* reported to being unemployed for at least one week in the year prior to the survey, while the voluntary and involuntary turnover groups comprise only of those who were currently unemployed at the time of the survey. The categories of voluntary and involuntary turnover are nested within overall turnover.

The variable coding for employer-provided health insurance, pension plans, and perceptions of health also warrants some explanation. All three are coded as dichotomous variables. Health insurance is coded as "1" if the survey respondent is included in an employer-provided group health plan, the employer pays either full or partial contribution toward the cost of health insurance, or if the respondent is covered another person's (e.g. spouse) employer-provided or -subsidized insurance plan. The pension variable describes those individuals whose employers offer a pension plan *and* are themselves included in that plan. And, finally, the health variable describes respondents who considered themselves healthy.

Like Trout, I employ logistic regression to estimate the logged odds of the explanatory variables. Using STATA, I run separate regressions using data across all years to analyze

[1] Except job tenure, which is captured by the CPS' January "Displaced Worker and Job Tenure" supplement. However, the January supplement does not ask for information regarding firm size, pension, and individuals' perception of their health. Attempts to merge the January and March supplements were abandoned as they yielded an insufficient number of useable cases.

[2] http://cps.ipums.org/

voluntary turnover, involuntary turnover, and overall turnover. Turnover, therefore, is function of the selected variables such that:

$$\ln(P/1\text{-}P) = \alpha + \beta_1 + \beta_2 + \beta_3 + \ldots + \beta_k + \varepsilon$$

In addition, I also perform twelve separate regressions to produce year-specific estimates of the predicted probabilities of voluntary, involuntary, and overall turnover. Individual-level person weights are also applied to each regression to produce results that are more likely to be representative of the population at large; thus, standard error estimates are reported as robust standard errors.

FINDINGS

The predicted yearly probabilities of turnover (see Table 1) show that the probability of involuntary turnover is consistently higher than each year's voluntary counterpart. These values are the predicted probabilities calculated by STATA when the mean values of the CPS-March data for each year are set to the specifications of the logit model. The predicted probabilities for involuntary turnover were highest in early 2002 and 2003, which corresponds with the recession of the early 1990's. The probability of voluntary turnover, on the other hand, was the highest in early 2000. The data also report greater fluctuations in the probability of involuntary turnover across years than in the probabilities of voluntary turnover, suggesting that most turnover occurs involuntarily.

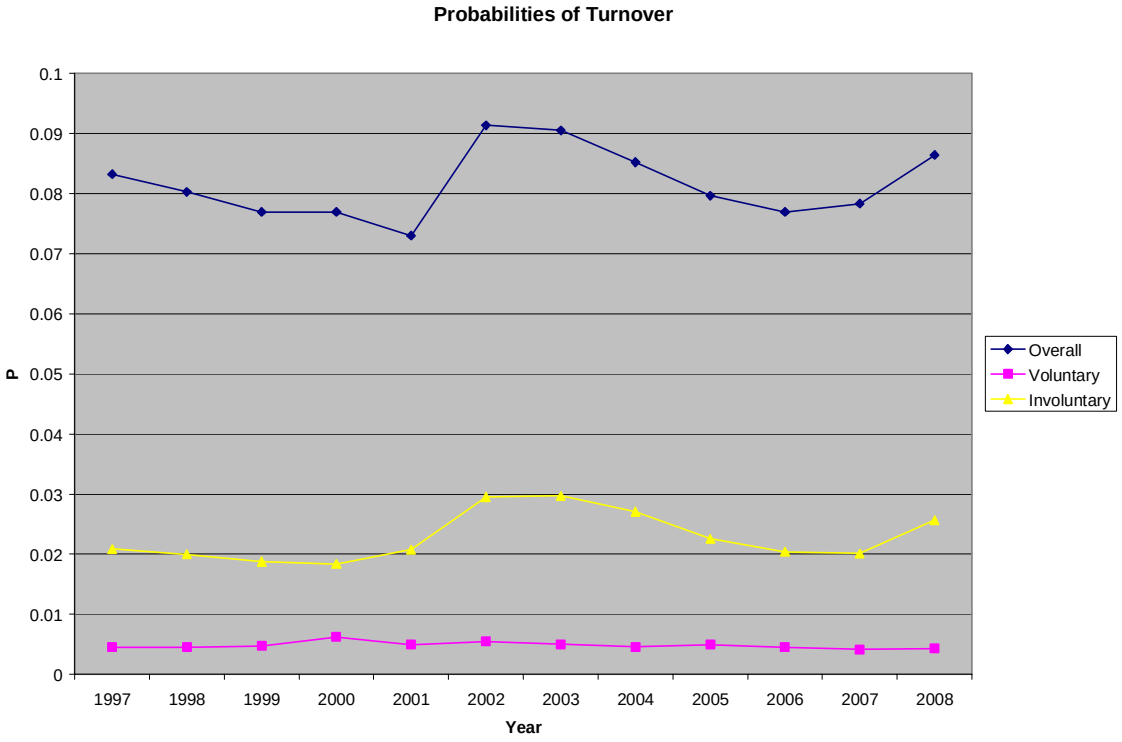


Figure 1. Probabilities of Turnover in the United States, 1997-2008: A Comparison of Overall, Involuntary, and Voluntary Turnover.

Table 1. Predicted probabilities of voluntary, involuntary, and overall turnover by year. Current Population Survey-March supplement (1997-2008).

Year	Voluntary	Involuntary	Overall[1]
1997	.0045	.0210	.0832
1998	.0046	.0200	.0803
1999	.0047	.0188	.0770
2000	.0063	.0184	.0770
2001	.0050	.0208	.0730
2002	.0055	.0300	.0913
2003	.0050	.0300	.0905
2004	.0046	.0270	.0852
2005	.0049	.0226	.0796
2006	.0046	.0204	.0769
2007	.0042	.0201	.0783
2008	.0043	.0257	.0864

Indeed, when the probabilities of turnover are charted, it is clear that voluntary turnover probabilities fluctuate very little compared to that of involuntary turnover (see Graph 1). Also noticeable is the steadiness of the line depicting the probabilities of voluntary turnover, thus suggesting only minute fluctuations. The overall trends also most closely mimic that of involuntary turnover.

Certain similarities and differences between the actual logits of voluntary versus involuntary turnover become evident once the estimates are compared side-by-side (see Table 2). A selection of variables maintained a similar effect across types of turnover. For example, both family and personal income have a weak effect on the likelihood of each type of turnover, despite achieving high significance in most of its regressions. Also, marital status, metropolitan setting, home ownership, employer-provided health insurance, perceived health status, and participation in pension plans all seem to have consistently negative and significant effects across categories of turnover.

[1] Since the estimates for overall turnover take into account individuals who reported being unemployed in the previous year—but not necessarily unemployed at present—the estimates for overall turnover will be greater than the what the voluntary and involuntary turnover estimates would suggest. The trends for overall turnover closely match that of the probabilities for involuntary turnover, however.

Table 2. Logit coefficients of selected variables regressed on the likelihoods of voluntary, involuntary and overall turnover, CPS 1997-2008.

Variables	Voluntary	Involuntary	Overall
Metropolitan	-.163 (.047) ***	-.060 (.021) **	-.024 (.012) *
Homeowner	-.348 (.043) ***	-.154 (.019) ***	-.207 (.011) ***
Family income	$3.10e^{-6}$ *** ($8.09e^{-12}$)	5.13e-7 ($4.00e^{-7}$)	-3.38e-7 ($7.88e^{-14}$)
Family income-squared	$-5.89e^{-12}$ ** ($-2.18e^{-12}$)	-2.14e-12 ($1.10e^{-12}$)	7.88e-14 ($5.56e^{-13}$)
Personal income	-.00002 *** ($1.75e^{-6}$)	-.00001 *** ($6.80e^{-7}$)	-.00002 *** ($4.93e^{-7}$)
Personal income-squared	$3.14e^{-11}$ *** ($3.24e^{-12}$)	2.02e-11 *** ($1.55e^{-12}$)	4.11e-11 *** ($1.25e^{-12}$)
Age	-.012 (.010)	.053 (.004) ***	.027 (.002) ***
Age-squared	-.0001 (.0001)	-.0006 (.00005) ***	-.0004 (.00003) ***
Male	-.049 (.042)	.292 (.021) ***	.232 (.011) ***
Marital status	-.308 (.044) ***	-.374 (.018) ***	-.276 (.010) ***
White	-.081 (.046)	-.206 (.020) ***	-.037 (.012) **
Education	.009 (.012)	-.060 (.006) ***	.021 (.003) ***
Firm size	.0003 (.00004) ***	-.0001 (.00002) ***	.00007 (.00001) ***
Government worker	.026 (.006) ***	.044 (.044) ***	.033 (.001) ***
Health insurance	-.680 (.043)***	-.518 (.019) ***	-.417 (.011) ***
Full time last year	.472 (.054) ***	.332 (.026) ***	.086 (.014) ***
Pension	-.627 (.054) ***	-.482 (.023) ***	-.595 (.013) ***
Healthy	-.471 (.062) ***	-.329 (.028) ***	-.344 (.017) ***
Average price of oil	-.002 (.0007) *	.0008 (.0003) *	.0001 (.0002)
Constant	-4.01	-4.99	-2.16
N=	993,463	993,463	986,439

Note: Robust standard errors in parentheses. * $p < .05$ ** $p < .01$ *** $p < .001$ *(Two-tailed tests.)*

The effects of other variables either lost significance or changed direction. Family income gains significance only in the voluntary turnover regression, while educational attainment, age, and white racial identity lost significance in that same regression. Firm size, on the other hand, maintains significance in each regression, but changes signs from a positive effect (voluntary turnover) to a negative one (involuntary turnover).

The following graphs (see graph 2 and graph 3) depict the predicted probabilities of each type of turnover as they change across age. It is apparent that the direction of the probability curves change depending on whether it's predicting voluntary or involuntary turnover. The predicted probabilities of voluntary turnover decrease with age, while the predicted probabilities of involuntary turnover increase across the same ages. The trends for the predicted probabilities of overall turnover across ages also closely resembles that of involuntary turnover, which, again, indicates that involuntary turnover has a greater effect on turnover in general.

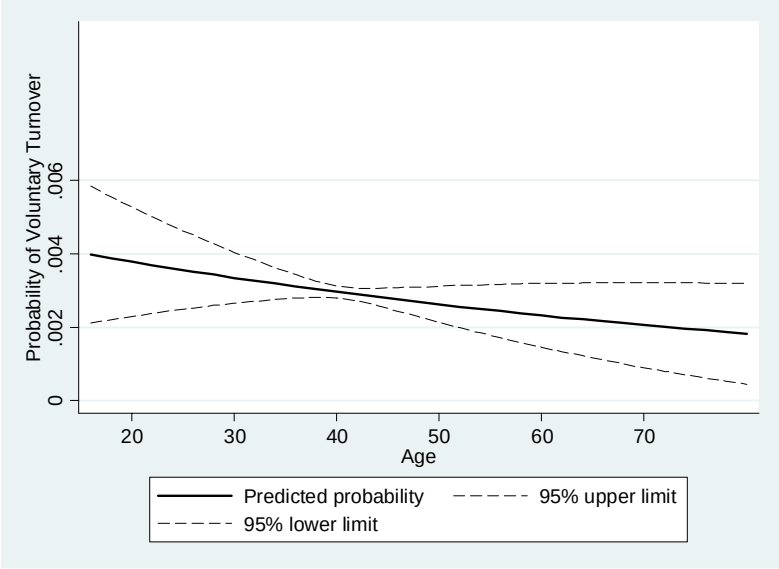


Figure 2. The Predicted Probability of Voluntary Turnover Across Age.

The suggestion of possible age-driven differences between voluntary and involuntary turnover warrants an examination of the effects on turnover within categories of age groups. Using the same data, I perform three separate regressions for each type of turnover: one including only respondents under the age of 40, one that includes respondents ages 40 to 59, and one that includes only respondents who are over 60 years old. This results in nine separate regressions.

As the probability of voluntary and involuntary turnover changes as age increases, we see the effects of the explanatory variables also change. Some variables gain or lose significance across age groups; therefore, instead of simply observing the differences between effects across types of turnover, these regressions allow us to take into account the differences within and across age groups, as well.

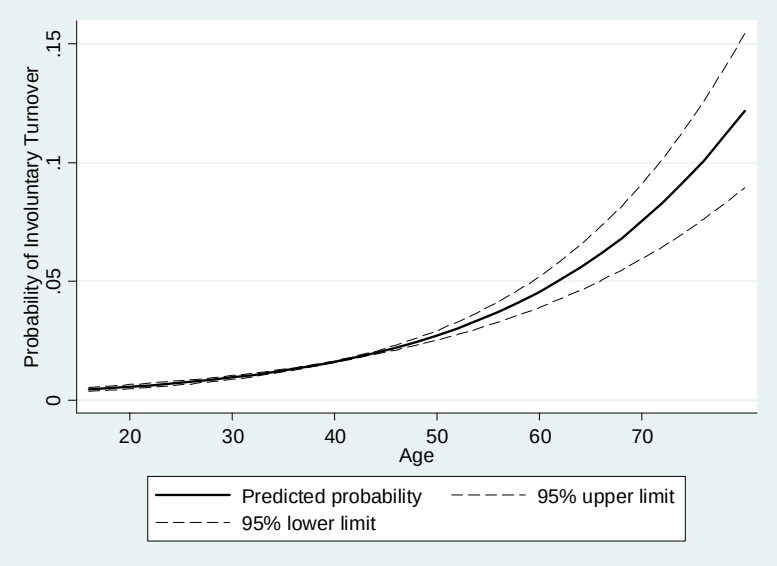


Figure 3. The Predicted Probability of Involuntary Turnover Across Age.

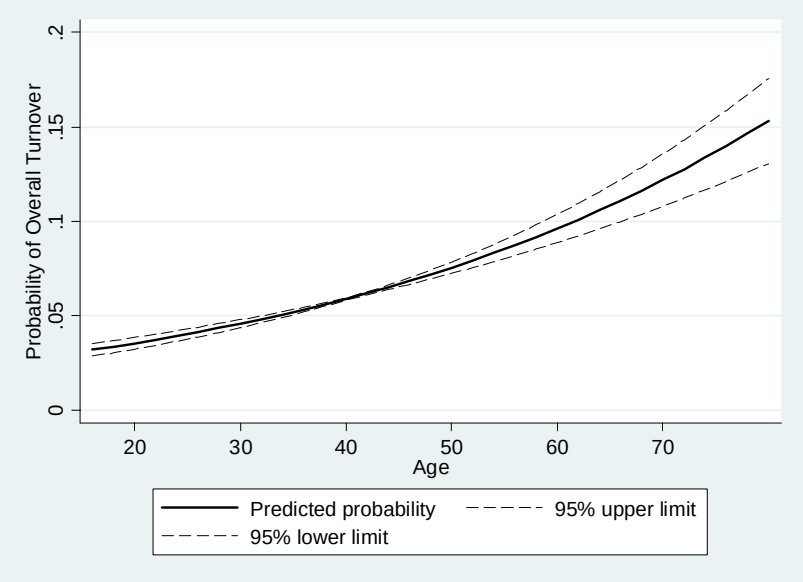


Figure 4. The Predicted Probability of Overall Turnover Across Age.

For voluntary turnover, the estimated logits of the independent variables present some discernable trends (see Table 3). For example, the explanatory power of metropolitan setting, home ownership, family income, marital status, white racial identity, firm size, worker class, full time employment in the previous year, and the yearly average price of oil seem to diminish with increasing age, losing significance across age groups. Among these variables, family income and the average price of oil lose significance early and only achieve significance in the youngest age group. Metropolitan setting, home ownership, marital status, white racial identity, government work, and full time employment in the previous year lose significance only in the oldest age group. Interestingly, white racial identity changes signs from a negative, significant effect in the youngest category (ages 20 to 39) to a positive, significant effect in the middle category (ages 40 to 59). Meanwhile, personal income, health insurance, pension plans, and perceived health status are significant across all ages, with each of these variables exercising a negative effect on the likelihood of voluntary turnover. (The negative effect of personal income, however, is very weak.)

The regressions for involuntary turnover exhibit both similar and distinct trends in the logits. For example, some findings echo the trends in the results from the voluntary turnover regressions. Home ownership maintains a significant, negative effect across all categories of age, as does personal income, health insurance, pensions, health status, firm size, and marital status. Metropolitan setting also reports the same significant, negative logits, but only for the youngest category. Important differences from voluntary turnover also emerge in these regressions. The most noticeable differences are that age and education gain explanatory power in the younger age groups (whereas they did not in the voluntary regression). Also, the formerly positive effect of oil on voluntary turnover for the youngest group turns into a significant, negative effect for the same group when estimating for the likelihood of involuntary turnover.

The estimates for the effects on overall turnover across age groups report some similarities to its two turnover counterparts, but more variables achieve significance in the oldest category in this set of analyses. The estimates for age in this set describe a significant effect on turnover for the middle and the oldest age groups, with the logits for the oldest group indicating a positive effect that increases at an increasing rate. Both male gender and white racial identity also achieve significance in the oldest category (they were previously insignificant), and seem to exert positive effects on overall turnover for this group.

The health care variable does produce significant effects across types of turnover and age categories, however, they stay consistently negative in every regression.

Table 3. Logit coefficients of selected variables on the likelihood of voluntary turnover over selected age categories. (Controls for occupation not shown.)

Variables	20 to 39	40 to 59	60 and over
Metropolitan	-.224 (.060) ***	-.199 (.086) *	.387 (.295)
Homeowner	-.270 (.055) ***	-.536 (.083) ***	- .439 (.264)
Family income	$4.73e^{-6}$ *** ($1.12e^{-6}$)	3.27e-6 ($1.80e^{-6}$)	4.71e-6 ($4.78e^{-6}$)
Family income-squared	$-8.58e^{-12}$ * ($3.52e^{-12}$)	- 4.69e-12 ($3.76e^{-12}$)	- 9.53e-12 ($1.08e^{-11}$)
Personal income	-.00002 *** ($2.53e^{-6}$)	- 1.64e-5 *** ($2.81e^{-6}$)	$-2.53e^{-5}$ * ($1.03e^{-5}$)
Personal income-squared	$3.43e^{-11}$ *** ($4.74e^{-12}$)	$2.93e^{-11}$ *** ($5.05e^{-12}$)	$4.09e^{-11}$ * ($1.83e^{-11}$)
Age	-.105 (.048) *	- .043 (.119)	.317 (.427)
Age-squared	.001 (.001)	.0002 (.001)	-.003 (.003)
Male	-.094 (.054)	.054 (.086)	.566 (.252) *
Marital status	-.300 (.056) ***	-.417 (.087) ***	- .155 (.276)
White	-.184 (.057) **	.296 (.095) **	.477 (.310)
Education	-.018 (.076)	.037 (.020)	.020 (.056)
Firm size	.0002 (.00006) ***	.0002 ($9.25e^{-5}$)	.0006 (.0003) *
Government worker	.018 (.008) *	.044 (.010) ***	.063 (.038)
Health insurance	-.665 (.055) ***	-.673 (.084) ***	- .795 (.252) **
Full time last year	.458 (.069) ***	.247 (.108) *	.342 (.293)
Pension	-.529 (.068) ***	-.790 (.093) ***	- .708 (.273) *
Health	-.566 (.083) ***	-.323 (.105) **	- .719 (.261) **
Oil	-.002 (.0009) ***	-.002 (.001)	- .002 (.004)
Constant	-2.30	-3.72	- 16.997
N =	436,199	447,326	65,700

Note: Robust standard errors in parentheses. * $p < .05$ ** $p < .01$ *** $p < .001$

Table 4. Logit coefficients of selected variables on the likelihood of involuntary turnover over selected age categories. (Controls for occupation not shown.)

Variables	20 to 39	40 to 59	60 and over
Metropolitan	-.132 (.030) ***	.019 (.033)	-.059 (.092)
Homeowner	-.070 (.026) **	-.247 (.031) ***	-.243 (.099) *
Family income	$1.19e^{-6}$ ($5.92e^{-7}$) *	$2.70e^{-7}$ ($7.17e^{-7}$)	$4.73e^{-6}$ * ($2.21e^{-6}$)
Family income-squared	$-2.50e^{-1}2$ ($1.84e^{-12}$)	-2.89e-12 ($1.77e^{-12}$)	$-1.10e^{-11}$ * (5.17e-12)
Personal income	-1.42e-5 *** ($1.19e^{-6}$)	-8.69e-6 *** ($1.02e^{-6}$)	-.00001 *** ($3.09e^{-6}$)
Personal income-squared	2.51e-11 *** ($2.55e^{-12}$)	1.98e-11 *** ($2.37e^{-12}$)	$2.09e^{-11}$ ** ($7.60e^{-11}$)
Age	.129 (.024) ***	.018 (.043)	-.017 (.136)
Age-squared	-.002 (.0004) ***	-.0001 (.0004)	-.00005 (.0010)
Male	.234 (.029) ***	.318 (.034) ***	.417 (.096) ***
Marital status	-.427 (.026) ***	-.353 (.031) ***	-.274 (.091) **
White	-.284 (.029) ***	-.129 (.032) ***	.207 (.107)
Education	-.119 (.009) ***	-.024 (.008) **	-.041 (.023)
Firm size	-.0001 (.00003) **	-.0002 *** (.00004)	-.0001 (.0001)
Government worker	.032 (.004) ***	.053 (.003) ***	.074 (.010) ***
Health insurance	-.516 (.027) ***	-.464 (.031) ***	-.399 (.088) ***
Full time last year	.361 (.037) ***	.124 (.044) **	.546 (.097) ***
Pension	-.390 (.034) ***	-.562 (.034) ***	-.574 (.103) ***
Health	-.314 (.046) ***	-.345 (.038) ***	-.267 (.104) *
Oil	.001 (.0005) *	.0005 (.0005)	.002 (.001)
Constant	-5.56	-4.46	-4.049
N =	436,199	447,326	58,291

Note: Robust standard errors in parentheses. ** p < .05 ** p < .01 *** p < .001*

Table 5. Logit coefficients of selected variables on the likelihood of overall turnover over selected age categories. (Controls for occupation not shown.)

Variables	20 to 39	40 to 59	60 and over
Metropolitan	-.010 (.016)	.044 (.019) *	.087 (.056)
Homeowner	-.194 (.014)	-.256 (.019) ***	-.217 (.058) ***
Family income	$2.36e^{-7}$ ($2.99e^{-7}$)	$-.102e^{-6}$ ** ($3.71e^{-7}$)	$2.41e^{-6}$ ($1.24e^{-6}$)
Family income-squared	$-5.16e^{-14}$ ($7.93e^{-13}$)	$2.85e^{-13}$ ($8.52e^{-13}$)	$-7.48e^{-12}$ * ($3.50e^{-12}$)
Personal income	-.00003 *** ($8.30e^{-7}$)	-.00002 *** ($6.86e^{-7}$)	-.00002 *** ($1.83e^{-6}$)
Personal income-squared	$5.41e^{-11}$ *** ($2.37e^{-12}$)	$3.29e^{-11}$ *** ($1.63e^{-12}$)	$2.86e^{-11}$ *** ($4.68e^{-12}$)
Age	.002 (.013)	.064 (.026) *	.321 (.080) ***
Age-squared	-.00005 (.0002)	-.0007 (.0003) **	.002 (.0006) ***
Male	.196 (.015) ***	.284 (.019) ***	.449 (.054) ***
Marital status	-.268 (.014) ***	-.286 (.018) ***	-.293 (.054) ***
White	-.123 (.016) ***	.093 (.020) ***	.209 (.063) **
Education	.011 (.004) *	.028 (.004) ***	.011 (.013)
Firm size	.00007 *** (.00002)	.00002 (.00002)	.0001 (.00006)
Government worker	.023 (.002) ***	.046 (.002) ***	.053 (.006) ***
Health insurance	-.404 ***	-.419 (.019) ***	-.321 (.006) ***
Full time last year	.152 (.019) ***	-.680 (.020) ***	.239 (.053) ***
Pension	-.507 (.018) ***	-.680 (.020) ***	-.643 (.061) ***
Health	-.391 (.027) ***	-.332 (.024) ***	-.238 (.061) ***
Oil	.00006 (.0003)	.00007 (.0003)	.002 (.0008) *
Constant	-1.26	-3.55	8.16
N =	432,579	445,946	68,603

Note: Robust standard errors in parentheses. ** p < .05* *** p < .01* **** p < .001*

DISCUSSION

The similarities and differences between the results of the various regression analyses are just as interesting as the estimates themselves and are worth discussing. The similarities include the variables whose effects remained consistent across categories, both in direction of the association and in significance. On the other hand, all the differences between the various regressions can be categorized into two kinds: 1) differences in the results between the types of turnover and 2) differences in the results across age groups.

Similarities Across Categories

Some variables exerted a constant, similar effect on turnover probability across all (or nearly all) categories. The results of the regression analyses indicate that home owners, for example, are significantly less likely to experience any type of turnover. It is reasonable to think that home owners, who are likely to carry the burden of home mortgages, would be less inclined to voluntarily leave their jobs and sources of income. On the other hand, most people who can afford to buy homes and are able to be approved to receive a home loan are likely individuals of financial means. It is likely that people of such means are also individuals who possess other characteristics or skills that are positively associated with employment.

The findings support the theory that health care negatively affects job mobility. In each regression, the effect of health care is both significant and negative, indicating that those who enjoy work-related health coverage are less likely to leave their jobs. Its effect seems robust. On the other hand, the results do not support the hypothesis that health care would be positively associated with involuntary turnover; therefore, there is insufficient evidence in these findings to suggest that employers are more likely to layoff or fire employees to save health care costs. (It is important to note, however, that the regressions performed in this analysis attempt to measure *turnover* and not *hiring*. Should employers exercise discriminatory hiring practices that prevent the hiring of individuals who most need health care—such as the elderly—then it would come as little surprise that there would be little variation in the effect of health care on turnover.)

Similar to the effect of health insurance, membership in a pension plan and perceived health status yielded consistently negative and significant results. Therefore, workers who enjoy work-related health coverage, perceive themselves to be healthy, or participate in a pension plan are less likely to voluntarily leave their jobs. These people are also less likely to be forced out of their jobs involuntarily.

When considering the effect of income, the personal income of respondents seems to be a better predictor of turnover than their family income. The regression analyses estimate a very weak yet significant effect of personal income on all forms of turnover. Trout's models only accounted for family income and did not include personal income, so these significant results seem to suggest that it is important to include personal income in future analyses of turnover, as its predictive power seems to surpass that of family income in analyses that consider all labor force participants.

Finally, marriage seems to be negatively associated with both types of turnover and in nearly all the age groups. It can be inferred from the findings, therefore, that married people seem less likely than unmarried people to leave their jobs, either voluntarily or involuntarily, and supports popular theories of matrimony's stabilizing effect.

Differences Across Categories

Educational attainment and firm size exert different effects on the two types of turnover. It seems that educational attainment, while not a reliable predictor of voluntary turnover, serves as a deterrent effect against involuntary turnover. It is negatively associated with involuntary turnover in every regression. This suggests that employers are less likely to let go of their most educated workers, while educated workers themselves are neither significantly more or less likely to voluntarily leave their jobs than less educated workers.

The effect of firm size was the only significant variable whose effect changed directionality across types of turnover. Workers in larger firms seem more likely to voluntarily leave their jobs than workers in smaller firms, while workers in larger firms seem *less* likely to leave involuntarily than those in smaller firms. One possible explanation for this may be that larger firms lack the ability to monitor their employees' performance as closely as their smaller counterparts.

As with educational attainment, male gender also seems to be a predictor of involuntary turnover more so than of voluntary turnover. Whereas educated persons seem to be at less risk of involuntary turnover, males seem to be at more risk of involuntary turnover than females. Since the voluntary and involuntary turnover variables are calculated based on unemployment variables, it can also be said that males are more likely than their female counterparts to be unemployed.[1]

And, lastly, the significant effect of oil for the youngest age group changes signs across types of turnover. This could be interpreted to mean that the younger workers (or the jobs more often held by younger workers) are more sensitive to the fluctuations of economic activity. The results suggest that younger workers are less likely to leave their jobs voluntarily in years of higher oil prices. At the same time, they are more likely to be forced to leave involuntarily under the same circumstances.

Differences Across Age Categories

As suspected, the effect of age varies across age groups. In other words, the effect of age changes depending where a person lies on the age continuum. By separating the samples into

[1] The same inference cannot be made for the overall turnover estimates, since it includes those individuals who reported being unemployed for at least one week in the previous year, regardless of whether or not they are still currently unemployed. Also, further interpretation of this effect on male employment and turnover needs to first consider the effect of occupation and industry, since it is likely that a larger male presence in some occupations and industries may be explain the difference.

three age groups, we see that age does not significantly predict voluntary turnover. However, its association to involuntary turnover is significant in the youngest age group. It is also associated to overall turnover in the middle age group and the oldest group. Since these types of turnover capture nested samples that are related but not comparable, it is best to offer two separate explanations.

Age, as regressed on involuntary turnover, seems to be most capable of explaining turnover in the youngest category. The effect of age in this category is curvelinear and positive, increasing at an decreasing rate (β_{age}= .129 - .004*age). So, for the respondents in this group, the likelihood of involuntary turnover increased as their ages increased, but less so at the oldest ages in this group than at the youngest ages.

For the regression on overall turnover, we find significance in the two older age groups. Age for the middle group also exerts an effect that is positive and that increases at a decreasing rate (β_{age}= .002 - .00010*age). However, in the oldest group, this effect changes to one that increases at an *increasing* rate, which means that the likelihood of turnover becomes greater with increasing age (β_{age}= .321 + .004*age). This finding, as well as the results from the earlier depictions of the effect of age on turnover (see Graphs 3 and Graph 4), suggest the presence of age discrimination in the termination decisions of employers. There is evidence that the effect of age becomes salient in determining overall turnover amongst older workers.

CONCLUSION

My results show insufficient support for the hypothesis that work-related health coverage increases the chances of involuntary turnover. On the contrary, I find that the opposite may be true, as health insurance seems to lower the probability of both voluntary and involuntary turnover, therefore, these findings do support the "job lock" theory of previous researchers. There is also evidence of age discrimination, since the likelihood of turnover for older labor force participants are significantly higher than that of younger workers in my analysis.

These are preliminary findings that should be taken as suggestions for future inquiry. The goal of this research is threefold: 1) it tests health insurance's effect on involuntary turnover, 2) it proposes a model upon which to predict the probabilities of turnover, and 3) it highlights the need for surveys to gather information that is directly relevant to turnover.

Ideally, this research can be replicated with data that captures all of the variables of interest—including job tenure. Health-related data sets often lack key demographic variables necessary to conduct turnover analyses, while more general datasets do not capture health or health insurance variables. According to my research, a dataset collects information on all of the variables of interest is the National Health Interview Survey. Unfortunately, its data is spread across separate samples that make linking the information into one cohesive sample impossible. Even the CPS separates information on job tenure and displaced workers into a January supplement that is separate from its extensive March supplement. (These supplements are also difficult to link and often yield an insufficient amount of useable cases once linked). For an

accurate estimate of turnover, research would need to first be conducted on a superior source of data.

The ideal survey for turnover research would be part of longitudinal research that collects the same information from the same groups of people over an extended period of time. Although they are more time consuming and costly to conduct, basing findings upon longitudinal research allows for making stronger causal inferences. Regarding variable selection, an ideal data set such as this would essentially consolidate the information from the January and the March supplements of the CPS. The March supplement is an excellent source for explanatory variables, but its limits in regards to work history information forces researchers to manufacture turnover variables based on related work variables because it does not expressly ask if a respondent changed jobs or about job tenure. Without knowing whether or not a job change occurred, we can only base our measure of turnover on those who experienced unemployment and, therefore, would fail to capture all those cases of respondents who relocated to another job directly from the previous one. Even a cross-sectional survey that combines the January and March supplements of the CPS would be a great improvement. Ultimately, a longitudinal study on turnover would be preferred because this type of research seeks to establish causality.

This ideal survey is worth undertaking because turnover estimation benefits research across several disciplines. Turnover affects businesses adversely when it is high, and managers, psychologists, and counselors are attentive to the personal and environmental factors that contribute to turnover. It affects the very economy that economists study, and its causes and consequences are associated with several areas of sociological interest. Business, economics, sociology, and criminology would all have a vested interest in such a survey, and that illustrates just how embedded the turnover topic is in the variety of issues that affect people, the choices they make, and the choices that are offered them.

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