

Understanding Self-Employment Dynamics Among Individuals Nearing Retirement

by

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Executive Summary

The self-employment rate among those aged 55-64 has dropped substantially in the past 20 years. This study addresses two questions about this decline. First, has the decline in self-employment rates among near-retirees been driven by lower rates of entry into self-employment during these years, by greater exit rates from self-employment during these years, or by fewer individuals being self-employed when entering these years? Second, what economic and policy variables help to explain the change in these factors over time?

To address these questions, a Markov Chain model is used to relate the self-employment rate in a particular year to rates of continuation within self-employment, entry into self-employment, exit from self-employment, and the self-employment rate among individuals who turn 55 in that year. That model shows that a decline in the self-employment rate will result from some combination of the following:

- A decline in the continuation rate within self-employment, or increases in exit rates from self-employment to wage and salary employment or to not working
 - A decline in entry rates into self-employment from wage and salary employment or not working
 - A decline in the self-employment rate among new entrants into the 55-64 year old cohort
 - A shift in the composition of workers in the cohort (between entrant and non-entrants) to whoever has a lower self-employment rate.

Using data from the 1994-2012 waves of the Annual Social and Economic (ASEC) supplements to the Current Population Survey (CPS) – commonly known as the March CPS – with annual samples ranging in size from 13,000 to 26,000 observations, each of these rates are tabulated for each year of the sample. These tabulations imply that continuation rates and entry rates have not changed significantly over this time period. However, the exit rate to wage and salary employment exhibits a statistically significant increase over the sample period, particularly among the unincorporated self-employed, and particularly to the private sector. This increase is apparent across all regions of the country and across retail and service industries.

In addition, the rate of self-employment among 55 year olds decreased over the sample period, the rate among this group is lower than in the full 55-64 year old cohort, and the share of 55 year olds in the 55-64 year old cohort increased, which also served to decrease the rate of self-employment among near-retirees. These declines were particularly notable among the unincorporated self-employed and those in the retail sector.

To examine what demographic, economic, and policy variables are associated with entries to or exits from self-employment during the pre-retirement years, and which variables are associated with the level of self-employment among 55 year olds, a set of multinomial logit estimations was run. These estimations found that health insurance coverage and after-tax prices of health insurance were significantly associated with entry to self-employment and exit from self-employment to not working, though they were not significantly related to exit to wage and salary employment. This same set of variables was, however, significantly related to self-employment at age 55.

Simulations are then performed to examine the extent to which changes in economic and policy variables may have led to changes in rates of continuation, entry, exit, and self-employment at age 55. The simulation results suggest that of the two sets of variables that were found to be statistically significantly associated with the exit rate to wage and salary work and the rate of self-employment at age 55 (the after-tax prices of health insurance and health insurance coverage variables), only the changes in after tax prices of health insurance were found to appreciably influence the trends in these rates, and for the rate of self-employment at age 55 the impact was in the opposite direction of the actual declining trend.

Since the empirical work suggests that the decline in self-employment has been driven by an increase in exits to wage and salary employment and a decline in self-employment rates at age 55, policy efforts aimed at dampening the decline in self-employment among near retirees are likely to be more successful if they are aimed at reducing exits from self-employment to wage and salary employment among near retirees, and at increasing entrepreneurship among younger cohorts. The estimation results suggest that increasing the availability and affordability of private health insurance may serve these purposes. However, it is possible that other economic and social factors, such as increased economies of scale, are fueling the decline, in which case it is unclear whether a policy response would be desirable.

Introduction

The self-employed constitute a substantial and important part of the workforce in the United States. Hipple (2010) estimates that the annual total nonagricultural self-employment rate (including unincorporated and incorporated businesses) has generally exceeded 10 percent over the past 20 years. In addition, several papers (including Fuchs (1982) and Evans and Leighton (1989)) have shown that the rate of self-employment increases as individuals near retirement. However, since 1994, the self-employment rate among those nearing retirement (which will be defined as individuals age 55-64)¹ has steadily declined.

Figure 1 presents the annual non-farm self-employment rate over the years 1994-2012. The squared line shows the overall self-employment rate for those 25 years old and above. Starting at just under 11 percent in 1994, the overall self-employment rate dipped down to around 10 percent during the recession in the early 2000's, increased back up to around 10.5 percent during the mid-late 2000's, but has decreased in recent years to just below 10 percent. In contrast, the diamond line, which presents the self-employment rate among near-retirees, displays a general decline over these same years. The self-employment rate among those aged 55-64 was above 18 percent in 1994, but dropped to around 16 percent in the early 2000's, and dropped further to 14.3 percent in 2012. However, no existing study has examined the reasons for this substantial decline in self-employment among near-retirees.

This project, then, will address two questions. First, has the decline in self-employment rates among near-retirees been driven by fewer individuals being self-employed when entering pre-retirement years, lower rates of entry into self-employment during these years, or greater exit rates from self-employment during these years? Second, what demographic, economic, and policy variables help to explain the change in these rates over time?

To address these questions, data from the Current Population Survey (CPS) are used to tabulate self-employment entry and exit rates during the pre-retirement years, as

¹ In the literature, several different age cuts have been used when examining behavior of individuals nearing retirement. Generally, the upper bound is age 64, since age 65 is the age of eligibility for Medicare and was for many years the full retirement age for receiving Social Security. A variety of ages have been used for the lower bound, from 51 in studies like Zissimopoulos and Karoly (2007) to 55 for tabulations in Hipple (2010). Since the data used in this study is most similar to those used in Hipple (2010), this study uses the higher age cut of 55.

well as the rate of self-employment among cohorts entering the pre-retirement years, to examine these variables for trends consistent with lower rates of self-employment over time. Multinomial logit estimation models are then used to identify which demographic, economic, and policy variables are associated with changes in these rates.

The study proceeds as follows. In the next section, the relevant literature is reviewed. Following that, the model is described, and trends in self-employment are presented. These trends are then decomposed to examine the extent to which changes in continuation rates, entry rates, exit rates, and rates of self-employment among 55 year olds are driving the trends. Tabulations are also presented for a number of subsamples, including by incorporation status, private versus public sector, industry, and region.

The study then uses multinomial logit estimation models to examine what economic and policy variables are associated with changes in the rates of continuation, entry, exit, and self-employment among 55 year olds, and counterfactual simulations are presented to examine what the trends would have looked like had these variables not changed over the roughly twenty year study period. Finally, the study concludes with a discussion of limitations of this study, policy implications, and directions for future research.

Literature Review

The most comprehensive tabulations of self-employment rates and trends can be found in Fairlie (2004) and Hipple (2010). These tabulations use data from the Current Population Survey, with Fairlie (2004) spanning 1979-2003 and Hipple (2010) spanning 1989-2009. Fairlie's tabulations suggest that the self-employment rate is higher for men, whites and Asians, veterans, and residents of western states. Prior to 2000, immigrants had higher rates of self-employment, but this gap has closed. Hipple (2010) presents trends in self-employment rates by sex, race or ethnicity and age, and the tabulations by sex and race are similar to those in Fairlie (2004).

However, the tabulations by age, which are presented in Figure 1, reveal two patterns. (The tabulations used to create these figures are presented in Appendix Table 1.) First, self-employment rates increase with age. For example, in 1994, 17.6 percent of workers 55-64 were self-employed, while only 14 percent of workers 45-54 and 11.4 percent of workers 35-44 were self-employed. Second, the self-employment rates among all age cohorts have tended to decrease,² but this decrease has been relatively larger for older cohorts. By 2012, for example, the self-employment rate among workers 55-64 had dropped to 14.3 percent, while the rate among workers age 45-54 and 35-44 experienced smaller declines to 11.9 percent and 10.0 percent, respectively. The self-employment rate among those aged 65 and older exhibits a drop similar in magnitude to that for the 55-64 year old cohort, albeit from a higher starting point.

In a paper closely related to this study, Evans and Leighton (1989) note that the self-employment rate at a given time is a function the rates of entry into and out of self-employment. In a simple Markov Chain model with time- and age-invariant entry and exit rates, they show that the probability of self-employment will increase with age at a decreasing rate, eventually converging to a plateau. Tabulations from Current Population Survey from 1968-87 appear to be consistent with this prediction, though the self-employment rate increases after age 60 in their data. They also find that entry rates stay fairly constant between ages 25-50, but decrease thereafter, while exit rates fall with the duration of self-employment.

² Explanations that have been offered for this overall decline include the costs of health insurance while self-employed and increasing economies of scale making it more difficult for small businesses to compete. See Stodola (2012) and Shane (2008).

A number of papers have tried to ascertain what variables impact the decision to be self-employed. Some of these studies have examined the impact of the amount of capital available for a business. For example, Evans and Jovanovic (1989) used data from the National Longitudinal Survey of Young Men and found that the individuals with higher asset values were more likely to become self-employed and to have higher self-employment earnings.³ In two papers, Holtz-Eakin, Joulfaian, and Rosen (1994a, 1994b) found that receiving an inheritance increased the probability of self-employment, the probability of continuing self-employment, and the amount of receipts from self-employment.⁴ Using data from the National Longitudinal Surveys of Labor Market Experience, Dunn and Holtz-Eakin (2000) found that own assets had a small positive impact on self-employment, but being the child of a self-employed parent had a large positive impact on the probability of self-employment.

A growing literature suggests that several health insurance-related factors have significant impacts on the decision of whether to be self-employed. Two papers have found that the after tax price of health insurance while self-employed affects the probability of self-employment. Velamuri (2012) finds that the rate of self-employment among women who were not covered under a spousal plan rose by between 14 percent and 25 percent after the Tax Reform Act of 1986, which lowered the after tax price of health insurance for the self-employed by roughly 25 percent. Heim and Lurie (2010) find that an approximately 7 percent drop in the after tax price of health insurance while self-employed between 1999 and 2002 led to a 10.4 percent increase in the probability of taxpayers reporting some self-employment income. Some additional papers have examined whether having health insurance coverage available from a spouse's job increases self-employment. Though Holtz-Eakin et al. (1996) find imprecise results consistent with no, positive, or negative effects, Madrian and Lefgren (1998), Wellington (2001), and Fairlie et al. (2011) find that spousal coverage increases the probability of self-employment. Finally, Heim and Lurie (forthcoming-a, forthcoming-b) examine whether changes in health insurance regulations impact self-employment. They find that state-level implementation of guaranteed issue and community rating regulations in the 1990s (which tend to lead to a relative decline in premiums for older individuals) and the health reform in Massachusetts in 2006 led to increases in self-employment among individuals nearing retirement, though these were offset by a decline among younger individuals.

Other papers have focused specifically on examining determinants of self-employment in the years in which a worker is nearing retirement.⁵ The first such study,

³ Similar findings are presented in Evans and Leighton (1989) and Meyer (1990).

⁴ Blanchflower and Oswald (1998) also find that receiving an inheritance or gift leads to an increased probability of self-employment.

⁵ This literature review focuses on studies that examine self-employment behavior in the United States. An increasing number of studies have examined self-employment transitions in other countries. See, for example, Tervo (2007), Kautonen (2008), Kautonen et al. (2010), and Tervo (2011).

by Fuchs (1982), used data from the Retirement History Study from 1969-73. He found that previous self-employment experience, being a manager, professional, or in sales, and working less than 35 or more than 50 weekly hours at a current job all increased self-employment, while the presence of a pension made respondents less likely to switch to self-employment.

More recently, Bruce, Holz-Eakin, and Quinn (2000) use Health and Retirement Study data from 1992-1996, and find that having more wealth increases transitions to self-employment, but that employer-provided health insurance does not impact transitions to self-employment. Zissimopoulos and Karoly (2007) use Health and Retirement Study data from 1992-2000 to examine transitions into and out of self-employment among workers who are 51 and older. They also find that higher wealth holdings increase transitions to self-employment, as do the receipt of an inheritance, flexibility at a wage and salary job, and poor health. However, they find health insurance coverage at a current employer and having retiree health insurance decrease transitions to self-employment as does pension coverage. They also find that demographic characteristics do not appear to impact transitions to self-employment. Finally, they find that the long-term self-employed and self-employed with six or more employees are less likely to exit the labor force. Zissimopoulos, Maestas, and Karoly (2007) specifically examine transitions from self-employment to retirement, and find that access to non-employment linked health insurance increases self-employment exits. Giandrea, Cahill, and Quinn (2008) examine similar issues focusing on individuals who had career jobs. For men, they find that having a white-collar job increased transitions to self-employment, while fair or poor health and the presence of a pension decreased transitions. For women, in addition to similar effects of job status, health, and pension, they find that employer provided health insurance and home ownership decreased transitions to self-employment.

Throughout this literature, however, the data utilized generally cover only the beginning of the recent decline in self-employment rates. In addition, though previous papers provide some useful information about the determinants of self-employment among near-retirees, no paper to date has used a unified framework (like that in Evans and Leighton (1989)) to model flows into and out of self-employment among near-retirees.

Modeling the Self-Employment Rate as the Result of a Dynamic Process

In this study, a Markov Chain is used to model the dynamics of the self-employment rate among near-retirees in a manner similar to Evans and Leighton's (1989) study of the full self-employed population, Klerman and Haider's (2004, 2005) modeling of Aid for Families with Dependent Children/Temporary Assistance for Needy Families (AFDC/TANF) caseloads, and Heim and Lurie's (2013) modeling of Earned Income Tax Credit (EITC) recipients.

To do so, note that in a given year, an individual could be either self-employed, a wage and salary worker, or not working. Figure 2 depicts graphically how the numbers of self-employed age 55-64 are related to the number of self-employed in the next year, while a mathematical representation of this model is presented in the Appendix. Among each of the groups (self-employed, wage and salary, and not working) in years $t-1$, some fraction will still be age 55-64 and be self-employed in year t . The fraction of self-employed that remain self-employed in the next year is called the "continuation rate," while the fractions of wage and salary and nonworking individuals who become self-employed in the next year are called "entry rates." Further, some fraction of those who are self-employed in year $t-1$ who are still age 55-64 in year t will switch to either wage and salary employment or to not working. These fractions are called "exit rates." Note, also, that some self-employed individuals age 55-64 in year $t-1$ will not be in the 55-64 age range in year t , either because they age out of the cohort, are deceased, or leave the sample for some other reason (for example, due to moving out of the country). Finally, there will be some self-employed individuals in year t who just turned 55, and so were not in the 55-64 year old range in year $t-1$.

Examining this model shows that a decline in the self-employment rate will result from some combination of the following:

- A declining continuation rate (a decline in the fraction of self-employed remaining in business)
- Increased exit rates (more self-employed leaving to work for another employer or stopping working)
- Decreased entry rates (a decline in business formation among wage and salary workers or those not working)
- Declining self-employment rates among new entrants into the 55-64 cohort

- A shift in the composition of workers in the cohort (between entrant and non-entrants) to whoever has a lower self-employment rate in year t

In the next section, each of these rates will be tabulated for each year of the data. The rates will then be examined for any trends that would be consistent with a falling level of self-employment among near-retirees. For example, it may be the case that the decline in self-employment has primarily been driven by increases in exits from self-employment to not working. Or, it may be the case that fewer workers have been transitioning to self-employment during pre-retirement years. Finally, it may be the case that entrants into the near-retired cohort tend to have a lower self-employment rate, and their share of the 55-64 cohort has grown over time as baby boomers near retirement.

Decomposing the Decline in Self-Employment Rates

Magnitude of the Decline

This study defines the self-employed as those who report their “class of worker” in the Current Population Survey (CPS) as either unincorporated or incorporated self-employment. In order to match the definition of self-employment used in Fairlie (2004) and Hipple (2010), individuals for whom the major industry is agriculture are excluded from the group of self-employed. The self-employment rates below, then, denote non-agricultural self-employment rates. Wage and salary workers consist of individuals who report their labor force status as being employed (either at work or absent) and are coded as having class of worker either private or government (federal, state, or local). Finally, those who are unemployed, who are not in the labor force, or whose industry is agriculture are considered as not working (in the non-agricultural labor force).

Tabulations from the March CPS of self-employment rates by year are presented in Figure 3.⁶ This figure displays a notable decline in self-employment rates, from 18.8 percent in 1994 to 14.4 percent in 2012.

To examine whether this decline was statistically significant, two methods were used. The first examines whether the mean rate in 2012 is significantly different from the mean rate in 1994, while the second examines whether a linear time trend enters significantly in a regression in which the dependent variable is an indicator variable for being self-employed. These results are presented in Table 1. This table shows that the decline in the self-employment rate is statistically significant in both methods, with the self-employment rate in the full sample declining by a statistically significant 4.39 percentage points between 1994 and 2012, and the coefficient on the time trend suggesting a statistically significant decline in the self-employment rate of 0.16 percent each year.

Further, Figure 4 shows that the decline in self-employment among near-retirees was a phenomenon among the unincorporated self-employed, with the rate of unincorporated self-employment declining from above 13 percent in 1994 to just under 9 percent in 2012, and this decline was statistically significant (Table 1). At the same time,

⁶ Figure 3 presents trends calculated using the full March CPS. Details on the sample construction are presented in the Appendix. Sample sizes are presented in Appendix Table 2, and sample statistics are presented in Appendix Table 3. The tabulations used to create this figure are presented in Appendix Table 4. Comparisons of these rates to rates found in Hipple (2010) and rates among individuals in the second year of the matched CPS sample are presented in Appendix Figure 1.

the rate of incorporated self-employment was relatively flat, and hovered around 5-6 percent.

Factors Contributing to the Decline

This study next looks at various trends to determine the factors that contributed to the decline in self-employment among 55 to 64 year olds. These factors might include:

- A decline in the fraction of self-employed remaining in business
- More self-employed leaving to work for another employer or stopping working
- A decline in business formation among wage and salary workers or those not working
- Declining self-employment rates among new entrants into the 55-64 cohort
- A shift in the composition of workers in the cohort (between entrant and non-entrants) to whoever has a lower self-employment rate

Each of these rates was tabulated using data from individuals who were in the March CPS in two consecutive years.⁷ In addition, separate tabulations were performed by incorporation status, private or public sector, industry,⁸ and region of the country.⁹

These tabulations first show that the decline in self-employment among the 55-64 age cohort was not driven by changing rates of individuals continuing to be self-employed from year to year. Figure 5, which presents continuation rates, shows that

⁷ These rates were calculated using the reweighted matched CPS sample. Details of the reweighting procedure are presented in the Appendix. The tabulations used to create these figures are presented in Appendix Tables 5-10.

⁸ In tabulations by industry, in order to ensure sufficient sample sizes in each group, respondents were separated according to whether they reported their industry being:

- manufacturing (including mining, construction, manufacturing, transportation and utilities),
- wholesale and retail trade, or
- service (including information, financial activities, professional and business, educational and health services, leisure and hospitality, and other services).

For transition rates, observations are classified according to the industry of the individual in the first year of the two year pair.

⁹ In tabulations by region of the country, in order to ensure sufficient sample sizes in each group, respondents were separated into four regions:

- Northeast (including Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont),
- Midwest (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota and Wisconsin),
- South (Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Virginia, Texas and West Virginia), and
- West (Arizona, Alaska, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming).

these rates do not exhibit a clear declining trend, and instead appear to be relatively constant. Though the continuation rate was 2 percentage points lower in 2012 as compared to 1995, this difference is not statistically significant.¹⁰

Similarly, a decline in business formation among those aged 55-64 also does not appear to be a contributing factor to the decline in self-employment. If business formation were declining, entry rates from wage and salary work or from not working would trend downward over the time period under analysis. On the contrary, these rates have followed a stable or increasing trend from 1995-2012.¹¹

Further, the decline was not driven by an increase in the self-employed leaving work altogether. Figure 6 presents these rates, and shows that rate of exit from self-employment to not working in the non-agricultural labor force actually declined slightly during this period.¹²

However, an increase in self-employed individuals ceasing operations and taking a job with an employer does help to explain the overall decline in self-employment, as exits to wage and salary work appear to have increased substantially. As can be seen in Figure 6, the exit rate to wage and salary work among the self-employed in 1995 was below 14 percent, while toward the end of the sample this rate hovered around 18 percent, and this increase was statistically significant.¹³

This increase appears particularly acute among the unincorporated self-employed. In the top panel of Figure 7, exits to wage and salary employment among the unincorporated self-employed increased from 12 percent to between 15 and 20 percent by the end of the sample. In this figure, the exit rate from incorporated self-employment to wage and salary employment appears to have increased as well, though it was offset somewhat by a declining exit rate to not working.

In addition, the increase in exits was primarily to wage and salary employment in the private sector. Figure 8 shows that the rate of exit from self-employment to the private sector is substantially higher than the rate of exit to the public sector, with a difference that is generally in excess of 13 percentage points. Further, the exit rate to wage and salary employment in the private sector exhibits a clear increase, while the exit

¹⁰ These results are presented in Table 1. In addition, in a regression in which an indicator variable for continuing in self-employment is regressed against a linear time trend, the coefficient on the linear time trend is actually positive, though small and statistically insignificant. Continuation rates did not differ noticeably across incorporation status, industry, or region of the country

¹¹ In Table 1, neither coefficient on a linear time trend is statistically significant, and the difference in the entry rate from wage and salary employment exhibits a statistically significant increase of 0.7 percentage points between 1995 and 2012. Though the entry rate from not working declined between 1995 and 2012, this decline was not statistically significant. Similar trends were also found within incorporation statuses, industries, and regions.

¹² Similar trends were found within incorporation statuses and industries. Looking by region, exits to not working increased in the Northeast, but these increases were offset by declines in other regions.

¹³ Table 1 shows that both the 5.2 percentage point difference in rates between 1995 and 2012 and the coefficient of 0.198 on the linear time trend are statistically significant at the 5 percent level.

rate to the public sector displays no such increase. Finally, Figure 9 shows that the increase in exits to wage and salary jobs is clearest in the service industry, though the rate appears to have also increased in retail as well. The exit rate from manufacturing, on the other hand, was relatively flat. These exit rates were, however, similar across regions of the country.

Lower rates of business ownership among individuals entering their pre-retirement years, both over time and compared to other members of the 55-64 year old cohort, also help to explain the overall decline in self-employment. Figure 10 presents the self-employment rate among 55 year olds (who are newly in the 55-64 year old age cohort), and demonstrates that the self-employment rate among 55 year olds declined during the sample period, from about 17 percent at the beginning of the sample to around 13 percent toward the end of the sample, and this decline was statistically significant.¹⁴

When the self-employed are examined separately by incorporation status, Figure 11 shows that, similar to the trends in overall self-employment rates, the rate of unincorporated self-employment among 55 year olds declined over the sample period, from 12 percent in 1994 to 8 percent in 2012, while the incorporated self-employment rate stayed relatively stable, hovering between 4 and 6 percent. When the self-employed are separated by industry, Figure 12 shows that the self-employment rate among 55 year olds fell over time for all industries. However, the decline in the retail sector was particularly steep.¹⁵

Finally, a shift in the composition of the 55-64 cohort contributed to the decrease in the self-employment rate in this cohort. In 1995, 55 year olds constituted 10.7 percent of the 55-64 year old cohort. However, beginning in 2002 and every year after, 55 year olds made up over 12 percent of this group.

Summary of Trends

Taken together, the tabulations imply that continuation rates and entry rates have not changed significantly over this time period. However, the exit rate to wage and salary employment exhibits a statistically significant increase over the sample period, particularly among the unincorporated self-employed, and particularly to the private sector. This increase is apparent across all regions of the country and across retail and service industries.

¹⁴ Table 1 shows that the decline between 1994 and 2012 of 4.4 percentage points was statistically significant, as is the coefficient of -0.216 on the linear time trend, which implies that the self-employment rate decreased by about 0.2 percentage points per year over this period.

¹⁵ Tabulations by region of the country showed that the self-employment rate among 55 year olds declined across all regions of the country.

In addition, the rate of self-employment among 55 year olds decreased over the sample period, the rate among this group is lower than in the full 55-64 year old cohort, and the share of 55 year olds in the 55-64 year old cohort increased, which also served to decrease the rate of self-employment among near-retirees. These declines are particularly notable among the unincorporated self-employed and those in the retail sector.

Variables Associated with a Declining Self-Employment Rate

Now that the sources of the overall decline in the self-employment rate have been identified, the study will examine what variables are associated with these changes.

To examine what variables are associated with entries to or exits from self-employment during the pre-retirement years, a set of multinomial logit models were estimated. Detailed information on these estimation specifications is presented in the Appendix. The independent variables in these models included:

- demographic characteristics (including sex, age, education, race, marital status, and presence of children),
- income variables (including investment income, which will proxy for the wealth of the individual,¹⁶ and labor and transfer income)
- macroeconomic and policy variables (including the state unemployment rate, the state average weekly wage, the after tax prices of the health insurance while self-employed and while wage and salary workers,¹⁷ measures of state-level health insurance regulation,¹⁸ and measures of state disability insurance policy¹⁹) and individual economic variables (including health insurance and pension variables).²⁰

Detailed information on the definitions and sources of each of these variables are presented in Appendix Table 11.

¹⁶ Unfortunately the CPS does not contain detailed wealth information, and so using such a proxy is necessary. One should note that investment income is a relatively poor proxy for wealth, as it includes wealth for which a return was not realized in the given year, as well as housing wealth.

¹⁷ For the derivation of these variables, see Appendix Table 11. As can be seen in this table, the after-tax price for wage and salary workers is proportional to the share of income that an individual would keep after taxes (i.e. one minus their combined marginal federal, state and payroll tax rates). As a result, it is not possible to enter tax rates directly into the estimation equation, as the two variables are almost perfectly collinear. Instead, the after-tax price for wage and salary workers will capture the combined effects of changes in the cost of health insurance while a wage and salary worker and changes in tax rates per se.

¹⁸ These include whether a state's individual insurance market had community rating regulations (which limit the extent to which insurance companies may charge different premiums based on health status) or guaranteed issue regulations (which prevent insurance companies from excluding anyone because of pre-existing conditions), or both.

¹⁹ For these variables, the approach is to use the state-level average Disability Insurance benefit among disabled workers, and the state-level Disability Insurance disabled worker receipt rate among adults age 18-64.

²⁰ Because these variables are partly a function of whether an individual is self-employed, a wage and salary worker, or not working, the approach is to use the value of these variables in the first year of the two year pair (that is, the year before a transition, if any, is made).

Since declines in self-employment rates among 55 year old workers also appear to be driving the overall self-employment trends, a multinomial logit model of employment mode choice is used to estimate correlates of self-employment among this age group. Detailed information on this estimation specification is presented in the Appendix. The same independent variables as those noted above were included in this specification.

Transitions to and from Self-Employment

Table 2 presents the coefficients from the set of multinomial logit models that estimated which variables are associated with transitioning from one status (self-employed, wage and salary worker, or not working) in one year to another status in the next year. The dependent variable in each of these models reflects whether the individual remained in that state (for example, remained self-employed), or switched to one of the other two states (wage and salary employment or not working).

The leftmost panel presents the estimation for transition from being self-employed. Looking first at the demographic coefficients, consistent with the prior literature, women are more likely to leave self-employment for either a wage and salary job or not working and older individuals are less likely to leave self-employment for wage and salary employment and more likely to leave for not working. Those who have at least some college education were less likely to exit to not working. Finally, African-Americans are more likely to leave self-employment for either wage and salary employment or not working. However, in contrast with most studies, which find insignificant effects of marital status, being married is positively associated with exits to not working.

Looking at the income variables, individuals with greater amounts of investment income (which proxies for wealth) are less likely to leave self-employment for wage and salary work (perhaps because they have greater amounts of assets that would cushion them against a loss), though are not less likely to leave for retirement.²¹ Individuals with more labor and transfer income are more likely to leave self-employment for wage and salary work but less likely to leave for not working.

Turning next to the state-level policy and economic variables, neither an improving economy (as measured by lowered unemployment rates or higher average wages) nor stricter disability insurance policy (as measured by a lower average benefit or receipt rate) significantly impact the rate of exit from self-employment to wage and salary work nor not working. An increase in the after tax price of health insurance while self-employed, however, is estimated to significantly increase exits to not working,²² as

²¹ This is in contrast to results found in Zissimopoulos, Maestas, and Karoly (2007), though it is consistent with results in Bruce, Holtz-Eakin, and Quinn (2000). It should be noted that both of these studies used the Health and Retirement Study, which contains better information on wealth than the proxy that is used here.

²² Similar findings are reported in Heim and Lurie (2010).

is an increase in the after-tax price of health insurance while a wage and salary worker (which also captures the direct effect of lower marginal tax rates).²³ On the other hand, regulations in the individual health insurance market do not have a significant impact.

Health insurance and pension related variables from the prior year come last. Among the health insurance variables,²⁴ private health insurance is significant and negatively associated with exiting self-employment to not working, while being on Medicare or Medicaid is significantly positively related to exiting self-employment to not working.²⁵ However, the presence of a pension is not significantly related to exits from self-employment.

Looking at the middle and right group of columns in Table 2, which estimate specifications that reflect transitions from wage and salary employment and not working, similar results are found. Again, consistent with the prior literature, women and African-Americans are less likely to enter into self-employment, individuals with higher levels of education are more likely to enter self-employment, and older individuals are less likely to enter self-employment from not working.

Turning to the economic and policy variables, neither the disability insurance variables nor the macroeconomic variables have a statistically significant association with a change in entrance to self-employment. A higher after-tax price of self-employed health insurance, on the other hand, is associated with decreases in entries to self-employment among both wage and salary workers and among those not working (though the latter is statistically insignificant).²⁶ Further, a higher after-tax price of health insurance while working at a wage and salary job, which also captures the direct effect of lower marginal tax rates,²⁷ is associated with higher rates of entry into self-employment from wage and salary work. Individual health insurance market regulations are statistically insignificant.

Looking at the health insurance variables from the prior year, among wage and salary workers, having employer-sponsored health insurance or health insurance through a number of other types of insurance (including the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), Department of Veterans Affairs (VA), Military, the Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA), and Indian Health) are both associated with lower rates of entry into self-employment,²⁸ while individuals who have private insurance are more likely to enter

²³ See footnote 17.

²⁴ Unfortunately, it is not possible in the CPS to determine whether employer-sponsored health insurance is from a current or former employer or union.

²⁵ This is in contrast to Bruce, Holtz-Eakin, and Quinn (2000), who find that health insurance variables have insignificant effects on exits from self-employment. One possibility for the difference could be the earlier time period (1992-1996) examined in their study.

²⁶ These results are consistent with Heim and Lurie (2010).

²⁷ See footnote 17.

²⁸ Similar results are reported in Zissimopoulos and Karoly (2007).

from wage and salary employment.²⁹ Among individuals who aren't working, having health insurance in the prior year through Medicare, Medicaid, as a dependent on a policy, through an employer,³⁰ or through some other non-private source are all associated with lower rates of entry into self-employment. Finally, having an employer pension plan in the prior year is negatively related to entry from a wage and salary job³¹ but positively associated with entry from not working.

Propensity to Be Self-Employed At Age 55

Table 3 presents coefficients from the multinomial logit specification that estimates which variables are associated with the level of self-employment among 55 year olds.³² The results here are similar to the results in the multinomial logit models described above. Demographic characteristics again enter significantly, with the propensity to be self-employed lower for women and African-Americans, and increasing with the education level and the amount of labor and transfer income of the individual.

The macroeconomic and disability insurance variables again do not enter significantly. The after-tax price of health insurance while self-employed is negatively related to the level of self-employment, though individual health insurance market regulations are not significantly associated with the rate of self-employment among 55 year olds.

Finally, several of the health insurance variables from the prior year enter significantly. Individuals who were covered in the prior year by Medicare, Medicaid, employer-sponsored insurance, as a dependent on another individual's policy, or through one of the other types of insurance were less likely to be self-employed, while individuals who were covered by private health insurance were more likely to be self-employed. However, having an employer pension plan in the prior year is not significantly related to self-employment at age 55.

Simulations

²⁹ This is in contrast to Giandrea, Cahill and Quinn (2008) and Bruce, Holtz-Eakin, and Quinn (2000). Both of those papers, however, study time periods (1992-1996 and 1992-2004) that are earlier than that examine here, and examined transitions over a longer period, which may account for the difference.

³⁰ This could take the form of retiree health insurance through a former employer.

³¹ Similar findings are reported in Giandrea, Cahill, and Quinn (2008) and Zissimopoulos and Karoly (2007).

³² Because the health insurance and pension variables come from the previous year, in order to be in the estimation sample, an individual must be in the matched sample and be 55 in the second year of the matched pair (so that health insurance and pension information from the prior year is available). However, the results in this specification are similar to those when the full sample of 55 year olds and health insurance variables from the contemporaneous year are used.

Given the estimates in the models above, it is possible to run counterfactual simulations. This type of analysis explores whether an outcome of interest would have been different had the past unfolded differently than it actually did. For example, suppose that a law passed in 1998 led to continuation rates declining by one percentage point in 1999 and beyond. A counterfactual simulation could be performed to examine what the continuation rates over time would have been had the law not passed. In this example, the counterfactual trend in continuation rates would have been the same as the actual trend in continuation rates up to 1998, but would be one percentage point higher than the actual trend in 1999 and beyond. The difference between these two trends (counterfactual and actual) would be the simulated impact of the 1998 law.

What follows, then, uses counterfactual simulations to examine the extent to which changes in each of the economic and policy factors included in the estimation methods are associated with changes in rates of continuation, exit, entry, and self-employment at age 55. To do so, the estimation results are used to simulate counterfactual trends in these rates over the 1994-2012 period had a subset of variables remained fixed at 1994 levels (in other words, had not changed) while the remaining variables followed their actual path over time.³³ The difference between the actual trend and the counterfactual simulated trend is the simulated impact of the subset of variables following their actual path instead of staying fixed.

In the estimation results above, several variables were found to be statistically significant determinants of changes in states (or choice of employment mode, in the estimation of employment mode among 55 year olds). In presenting the results of the simulations below, the simulated impact of these variables are indicated by solid lines, while impacts of variables that were statistically insignificant are indicated by dashed lines.

Figure 13 presents these counterfactual simulations for the continuation rate. Recall that the continuation rate was relatively flat over the 1994-2012 time period, and the simulations imply that changes in economic and policy variables had offsetting impacts on this trend. On the one hand, changes in the after-tax prices of health insurance and health insurance coverage would have served to increase the continuation rate, but this impact was dampened by changes in the generosity and coverage of Disability Insurance (though the estimated coefficients on these variables were not statistically significant).

Figure 14 presents counterfactual simulations for entry rates. Again, no clear pattern was found in these rates over the full sample, and the simulations imply that changes in economic and policy variables over time again served to offset one another. Changes in Disability Insurance generosity and coverage, wages and unemployment, health insurance coverage, and pension coverage are simulated to have decreased entry

³³ Similar simulations were performed in Heim and Lurie (2013) to simulate counterfactual changes in Earned Income Tax Credit caseloads.

from wage and salary employment (though only the health insurance coverage variables were statistically significant), but these were offset by changes in the after-tax price of health insurance. Similarly, changes in Disability Insurance and wages and unemployment variables, though estimated to be statistically insignificant, would have led to declining rates of entry from not working, but changes in the after-tax prices of health insurance offset this trend.

Figure 15 presents counterfactual simulations for exit rates. Recall that an increase in the exit rate to wage and salary employment was one of the factors found above to be consistent with the decline in the self-employment rate. The counterfactual simulations for exit to wage and salary work in the top panel imply that changes in the after-tax prices of health insurance served to increase this exit rate by around 3 percentage points, more than half of the total increase of around 5 percentage points. Changes in wages and unemployment are simulated to have offset this impact somewhat in the earlier years of the sample (though the coefficients were statistically insignificant), but the impact became positive after the onset of the Great Recession. In the bottom panel, changes in the after-tax prices of health insurance are simulated to have decreased exits to not working, as are changes in health insurance coverage, while this simulated impact was offset by changes in Disability Insurance generosity and coverage, wages and unemployment (though these variables carried statistically insignificant coefficients).

Finally, Figure 16 presents counterfactual simulations for self-employment rates at age 55. Recall that this rate dropped over the sample period by around 4 or 5 percentage points. These simulations imply that the drop would have been even steeper absent changes in the after-tax prices of health insurance (which generally decreased over this time period), while changes in Disability Insurance and pension coverage (though the estimated impacts were statistically insignificant) are predicted to have decreased this rate of self-employment, albeit modestly.

Taken together, the simulation results suggest that of the two sets of variables that were found to have a statistically significant association with the exit rate to wage and salary work and the rate of self-employment at age 55 (the after-tax prices of health insurance and health insurance coverage variables), only the changes in after-tax prices of health insurance were found to appreciably influence the trends in these rates. For the rate of self-employment at age 55 the impact was in the opposite direction of the actual declining trend. These results, then, suggest that the decline in self-employment at age 55, and the remainder of the increase in exits to wage and salary employment, must be explained by some combination of changing demographic characteristics and other changing economic or social factors that are not captured by the policy variables included in these simulations.

Conclusion

This study examined the decline in self-employment among 55-64 year olds over the 1994-2012 period, and found that this decline was driven by three factors:

- The exit rate to wage and salary employment increased over the sample period, particularly among the unincorporated self-employed, and particularly to the private sector. This increase is apparent across all regions of the country and across retail and service industries.
- The rate of self-employment among 55 year olds decreased over the sample period, and these declines were particularly notable among the unincorporated self-employed and those in the retail sector. Further, the rate among this group is lower than in the full 55-64 year old cohort
- The share of 55 year olds in the 55-64 year old cohort increased.

A series of multinomial logit estimations found that health insurance coverage and after-tax prices of health insurance were significantly associated with entry to self-employment and exit from self-employment to not working, though they were not significantly related to exit to wage and salary employment. This same set of variables was, however, significantly related to self-employment at age 55.

Simulations, however, suggested that only the changes in after-tax prices of health insurance were found to appreciably influence the trends in these rates, and for the rate of self-employment at age 55 the impact was in the opposite direction of the actual declining trend.

One limitation to this study should be noted. Although some prior research has found that wealth and inheritances significantly impact business formation and continuation, the CPS data used in this study unfortunately do not contain information on inheritances, and only a rough proxy for wealth can be utilized. If inheritances and wealth among near-retirees have declined over the sample period, such changes may help to explain the overall decline in self-employment.

Another possibility is that larger economic forces have been driving the increase in exits to wage and salary work. For example, Scott Shane argues that increasing economies of scale have made it more difficult for small businesses to compete, which may have led to the increase in exits from self-employment among this cohort.³⁴ To the extent that this effect has been greater in the retail and service sectors, such an explanation could be consistent with the results presented here.

³⁴ See interview in Stodola (2012) and Shane (2008)

To the extent that policymakers are concerned about declining rates of self-employment among near-retirees and are interested in forming a policy response, it is crucial to know what is driving those declines. If decreases in continuation rates had been found to be driving the decline, then policies to help entrepreneurs to continue running their business may serve to dampen or reverse the decline in self-employment. Similarly, if decreases in entry were driving the decline, then policies that encourage business formation would be indicated.

As noted above, however, the decline in self-employment has been driven by an increase in exits to wage and salary employment and a decline in self-employment rates at age 55. As such, policy efforts aimed at dampening the decline in self-employment among near retirees are likely to be more successful if they are aimed at reducing exits from self-employment to wage and salary employment among near-retirees, and at increasing entrepreneurship among younger cohorts.

Unfortunately, this is not likely to take the form of simply reversing some change in policy over the past twenty years. As the counterfactual simulations demonstrate, few of the policy and economic variables had a statistically or economically significant relation to these rates.

The estimation results do, however, offer some guidance as to changes that may dampen the decrease in self-employment among near-retirees. First, increasing the availability and affordability of private health insurance may decrease the rate of exits from self-employment, increase rates of entry to self-employment, and increase self-employment rates among new entrants into the 55-64 year old cohort. An important area for future research, then, will be to evaluate the extent to which recent changes in health insurance cost and coverage due to the implementation of the Affordable Care Act of 2010 affected rates of self-employment in this cohort. Second, though the simulated impacts of the after-tax prices of health insurance were associated with increasing exits to wage and salary work, they were also associated with increased self-employment rates among 55 year olds. Thus, a further reduction in the after-tax price of health insurance while self-employed³⁵ may help to slow or reverse the declining trend in self-employment at age 55.

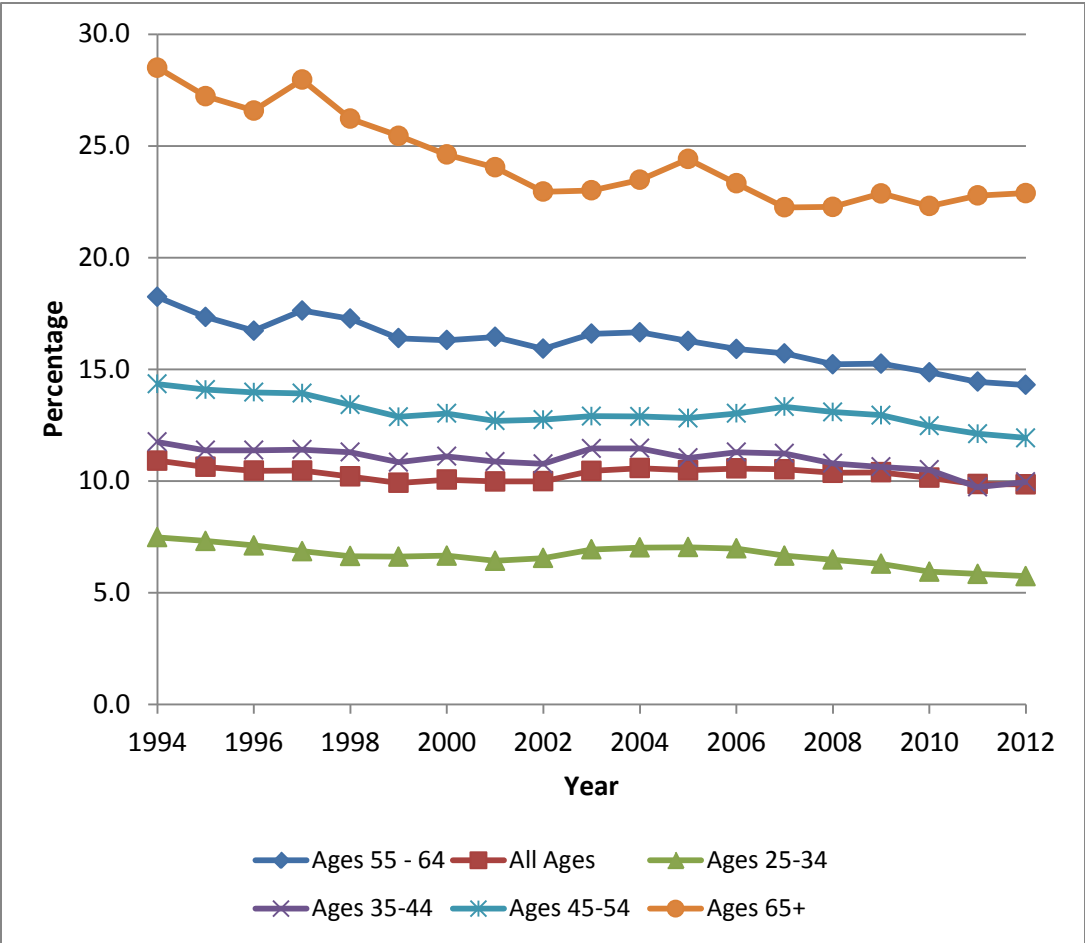
On the other hand, to the extent that the increase in exits to wage and salary work has been driven by increases in economies of scale making small business less able to compete, it is unclear whether a policy response to counteract such trends would be desirable. Such a response may result in a decline in the efficiency and productivity of the economy.

Nevertheless, it is an open question whether the increase in exits from self-employment among near-retirees and the lower rate of self-employment among those entering this cohort are good or bad for the individuals themselves. It may be that some

³⁵ For example, by allowing self-employed health insurance premiums to be deductible when figuring Self Employment Contributions Act (SECA) taxes.

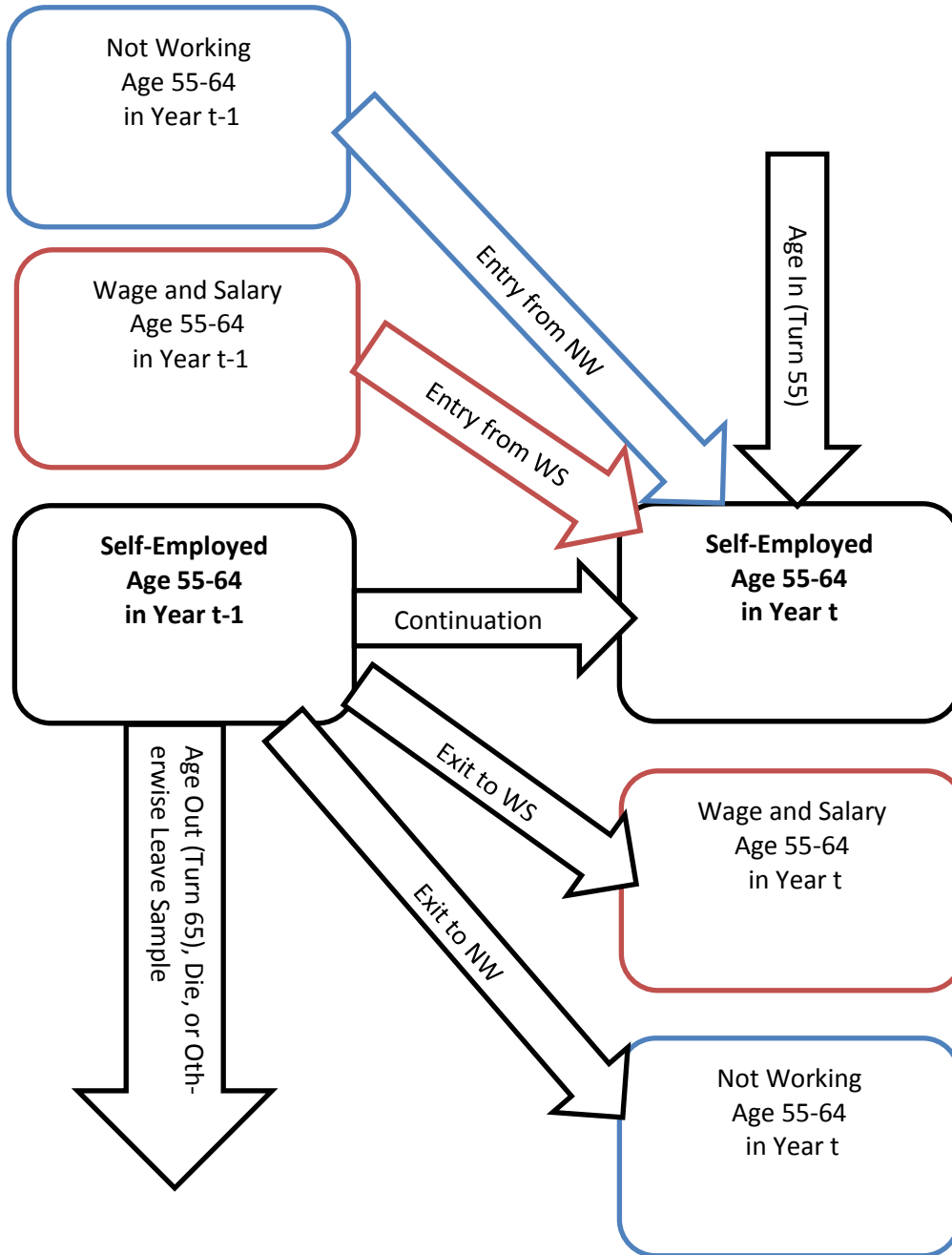
of these individuals were driven out of self-employment by forces beyond their control, and would be happier and more productive working for themselves. A productive direction for future research might be to study the impact that these trends have had on the incomes and well-being of individual entrepreneurs to shed more light on these issues.

Figure 1. Non-Farm Self-Employment Rate, Various Age Cohorts



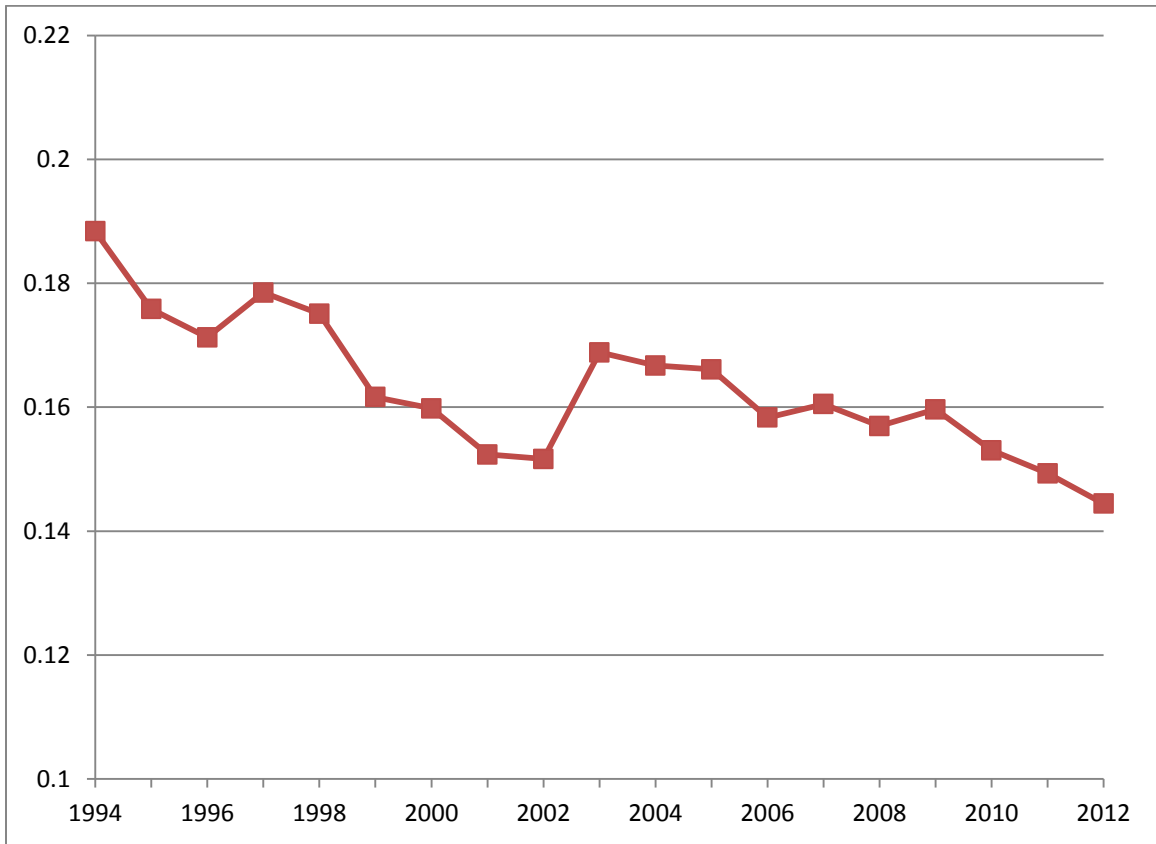
Source: Hipple (2010) extended through 2012 via communication with Steve Hipple.

Figure 2. Graphical Depiction of a Markov Chain Model



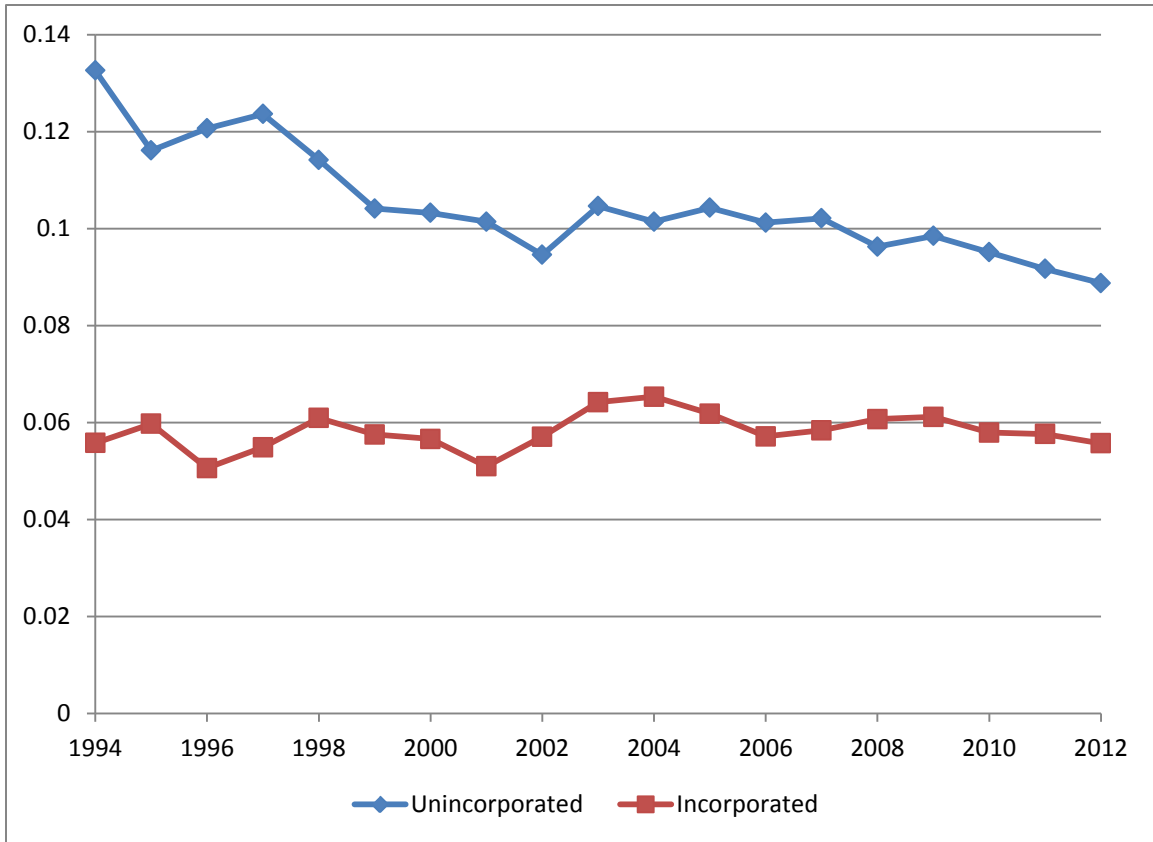
Notes: Transitions in the Markov Chain model that do not involve self-employment have been omitted from this figure.

Figure 3. Self-Employment Rates - 55-64 Year Olds



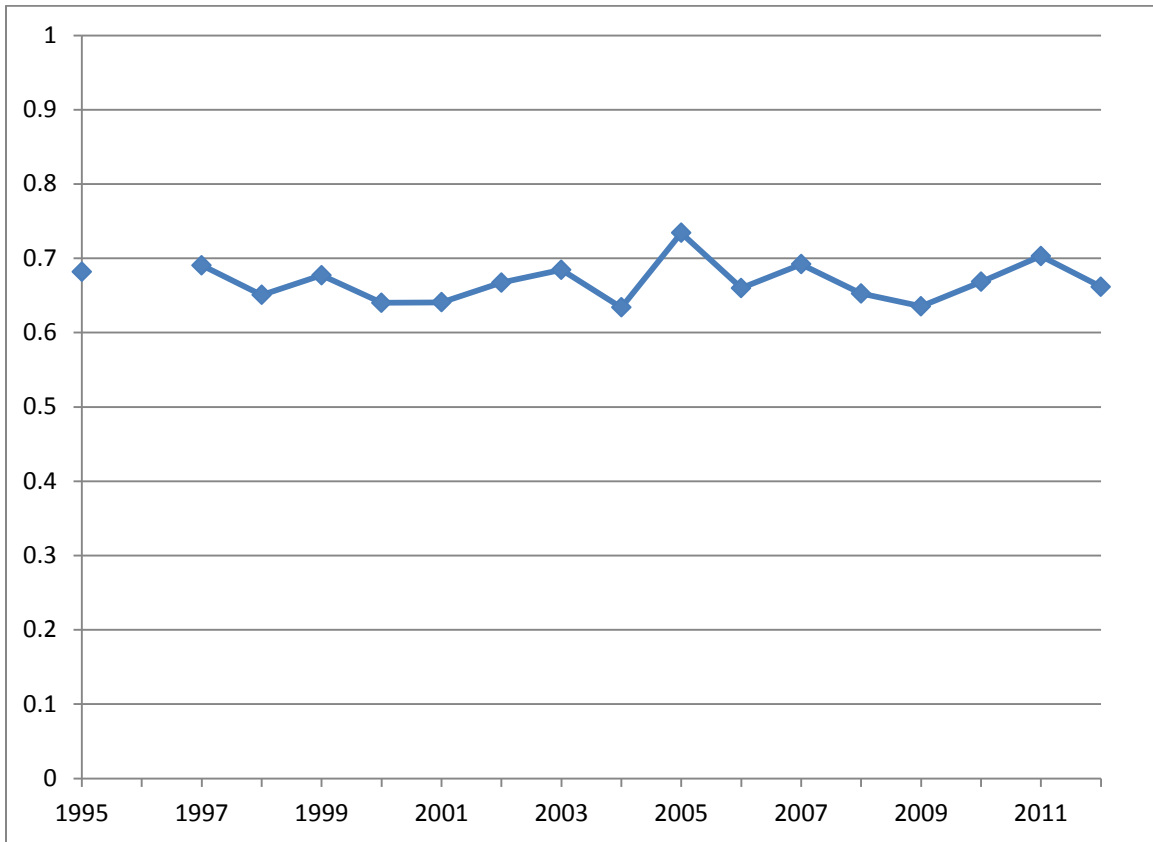
Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)

Figure 4. Self-Employment Rate – by Incorporation Status



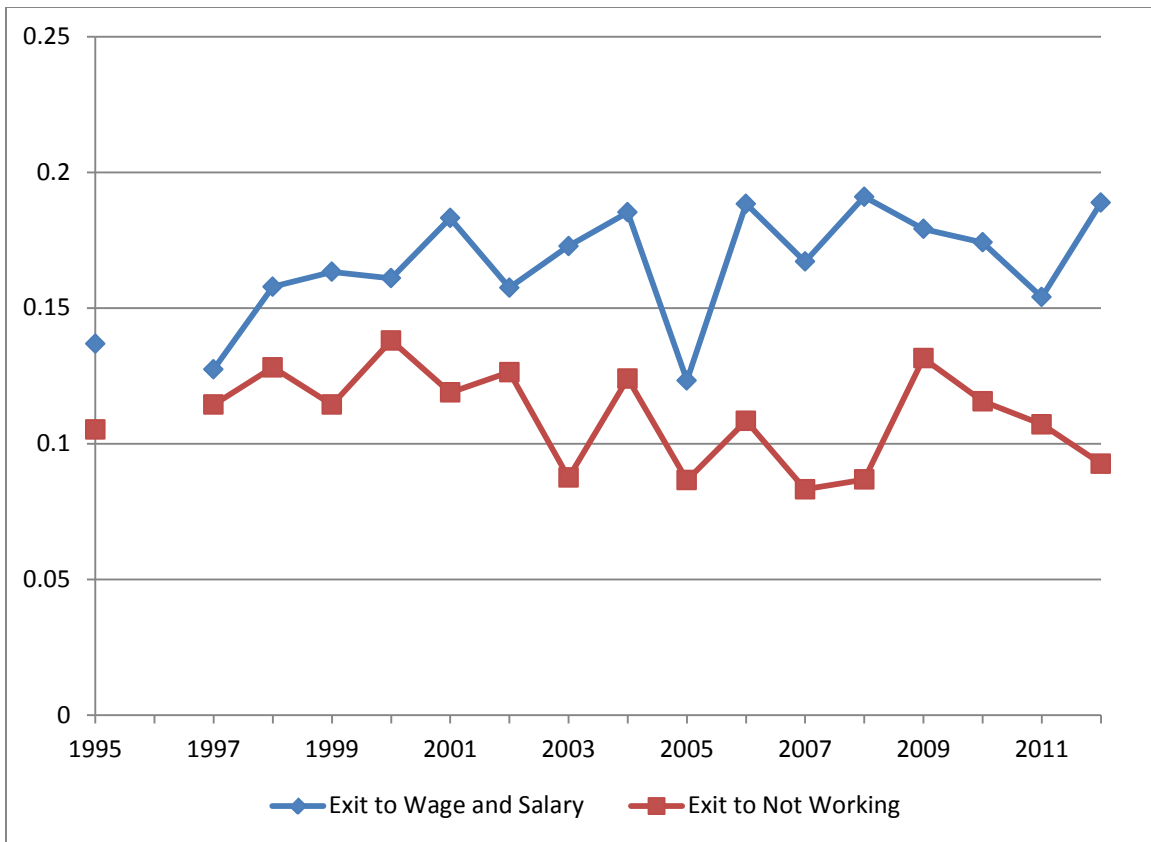
Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Figure 5. Self-Employment Continuation Rate



Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

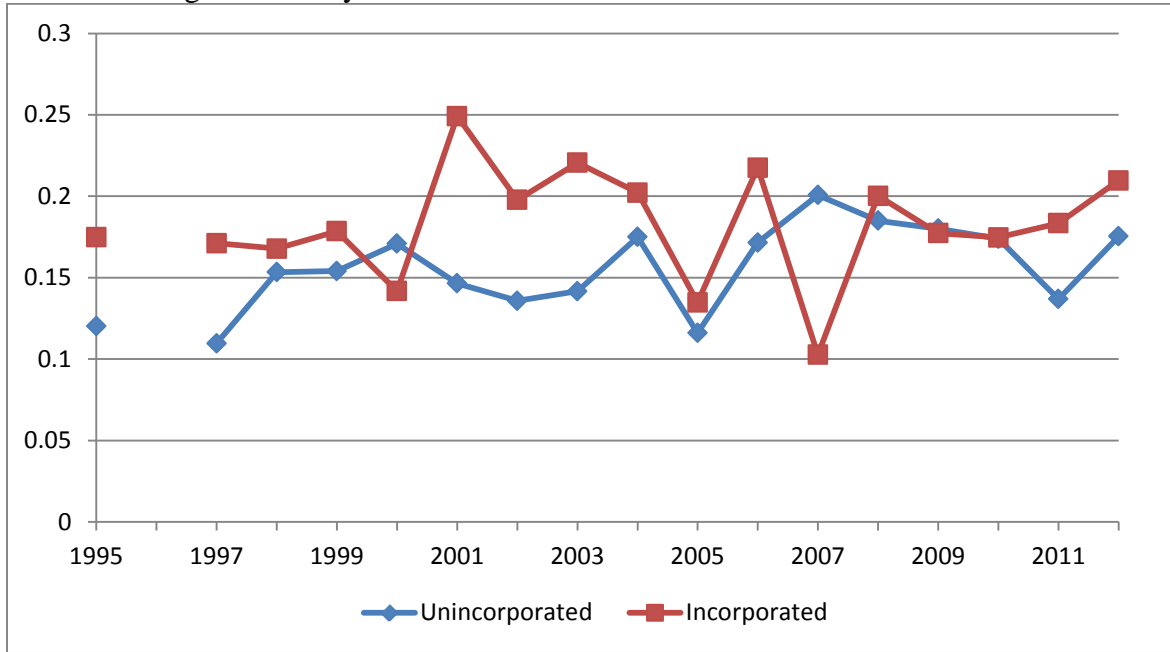
Figure 6. Self-Employment Exit Rates



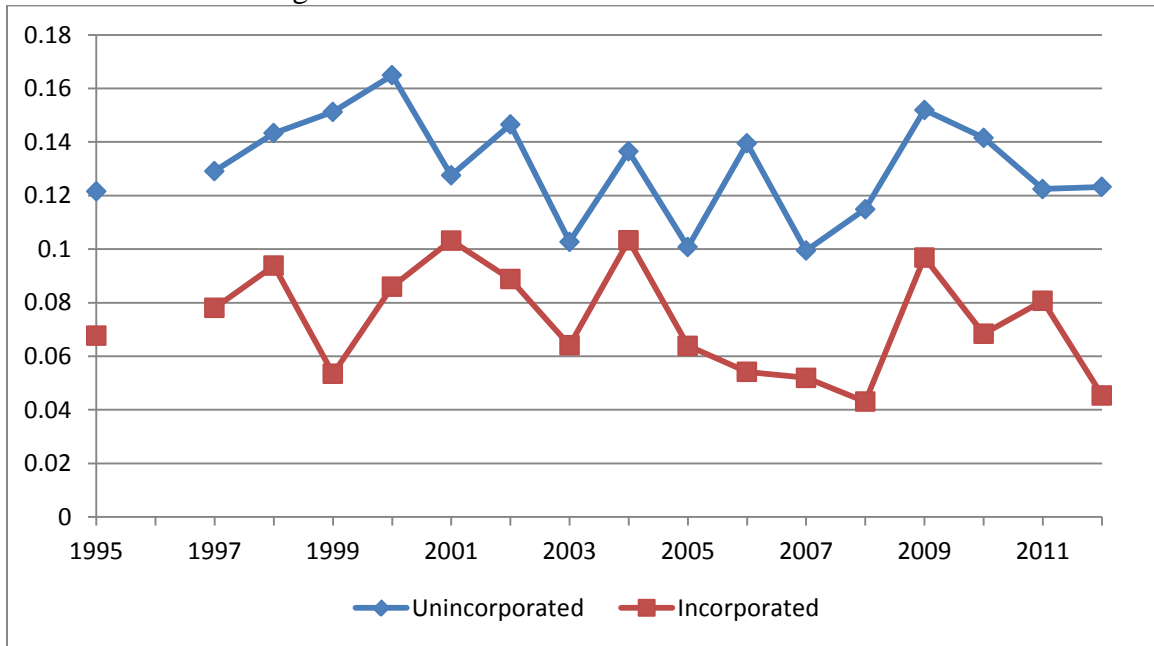
Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Figure 7. Self-Employment Exit Rates – by Incorporation Status

A. Exit to Wage and Salary



B. Exit to Not Working



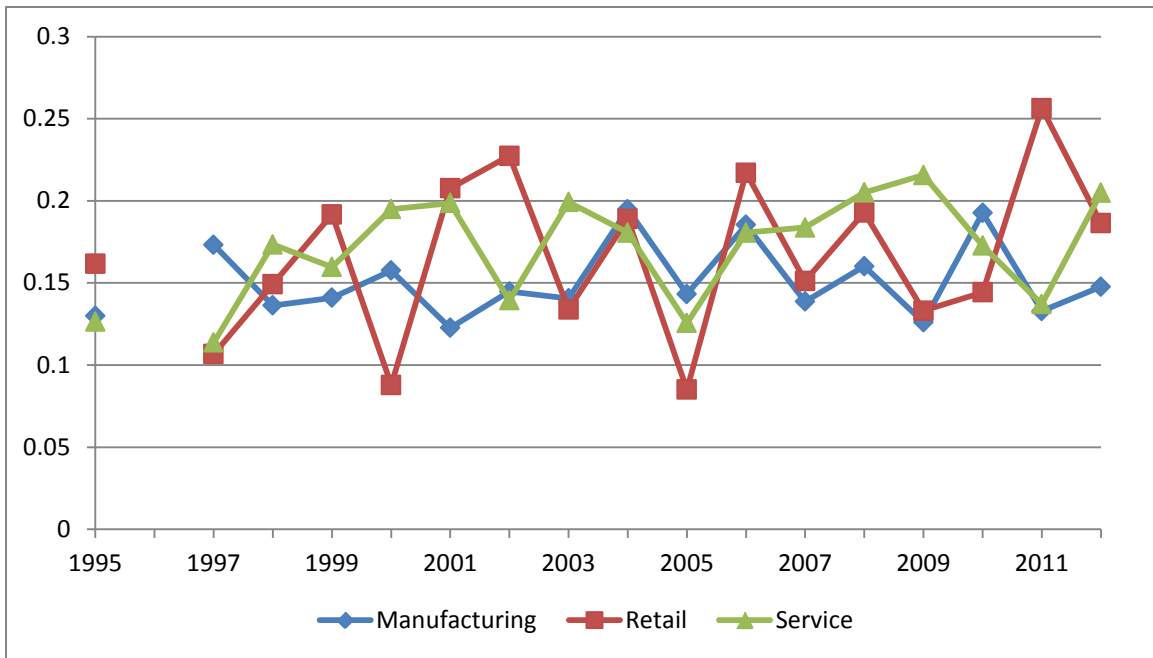
Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Figure 8. Self-Employment Exit Rates to Wage and Salary – by Private/Public Sector



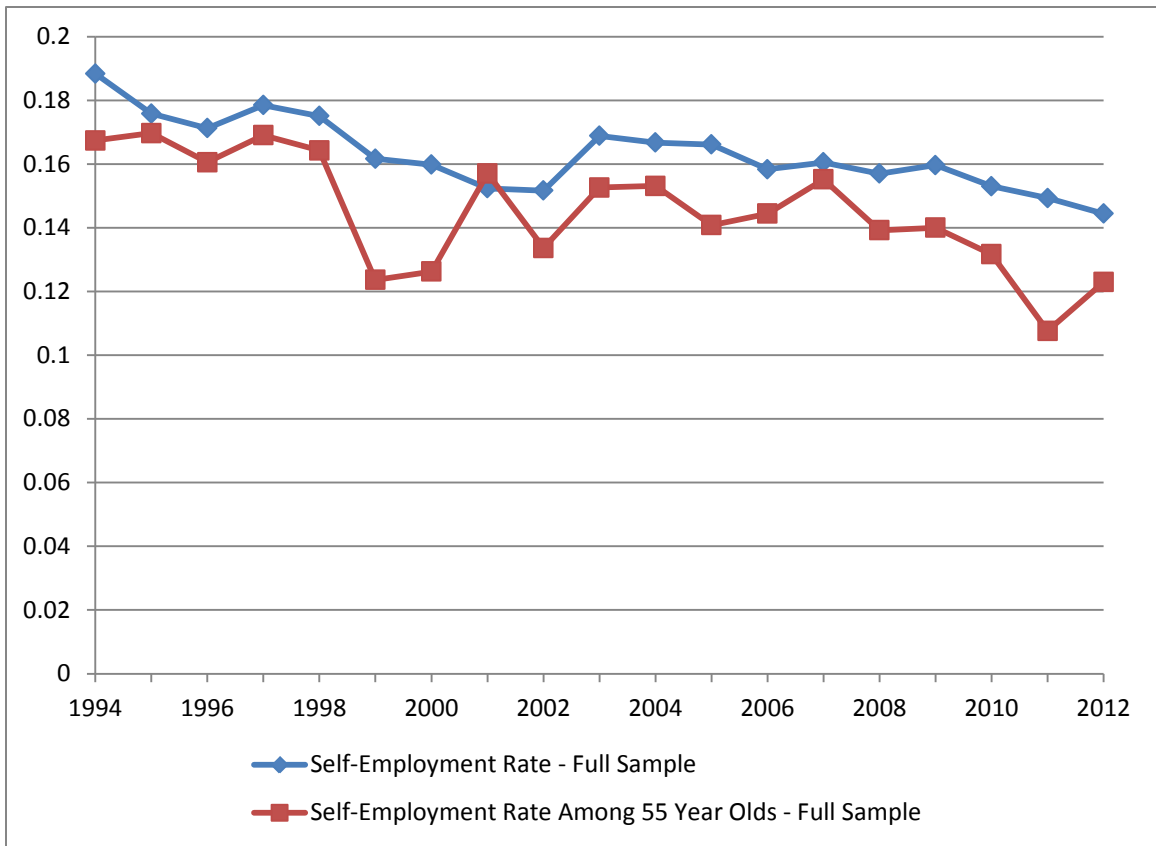
Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Figure 9. Self-Employment Exit Rate to Wage and Salary – by Industry



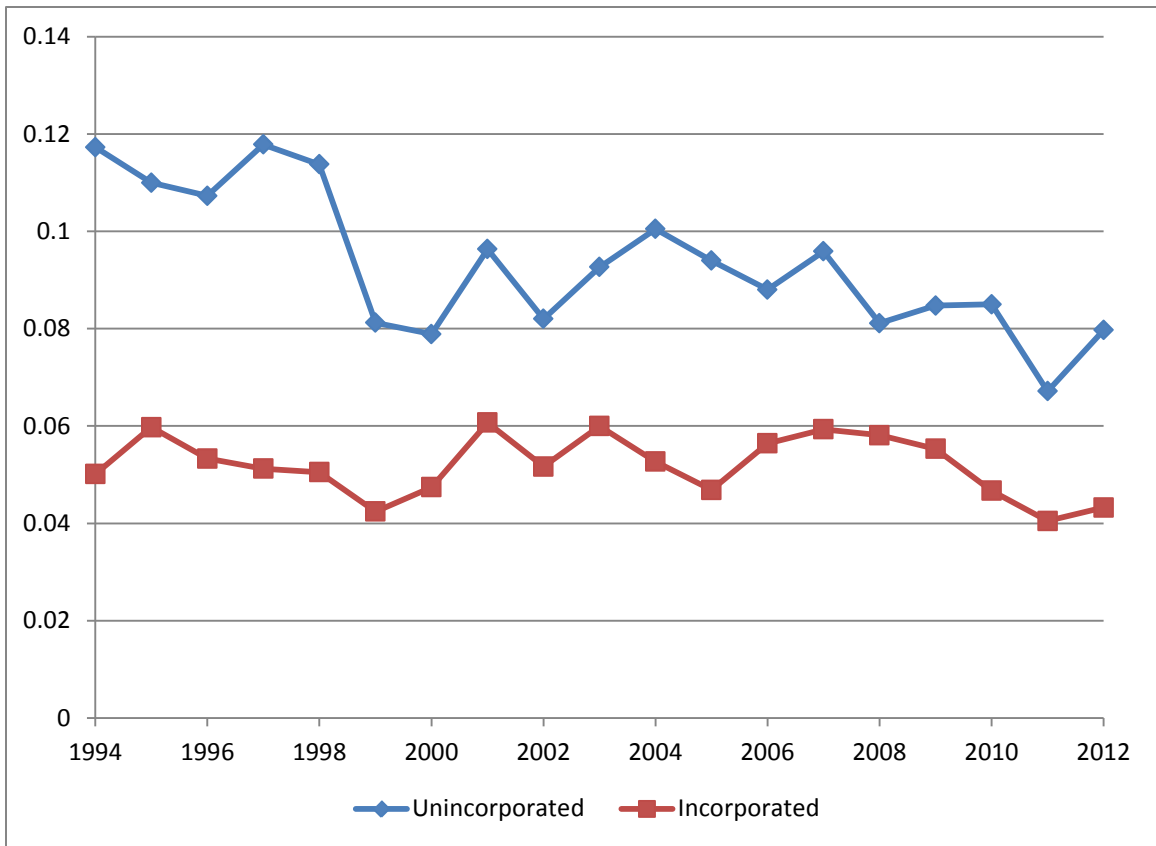
Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Figure 10. Comparison of Self-Employment Rates within 55-64 Cohort



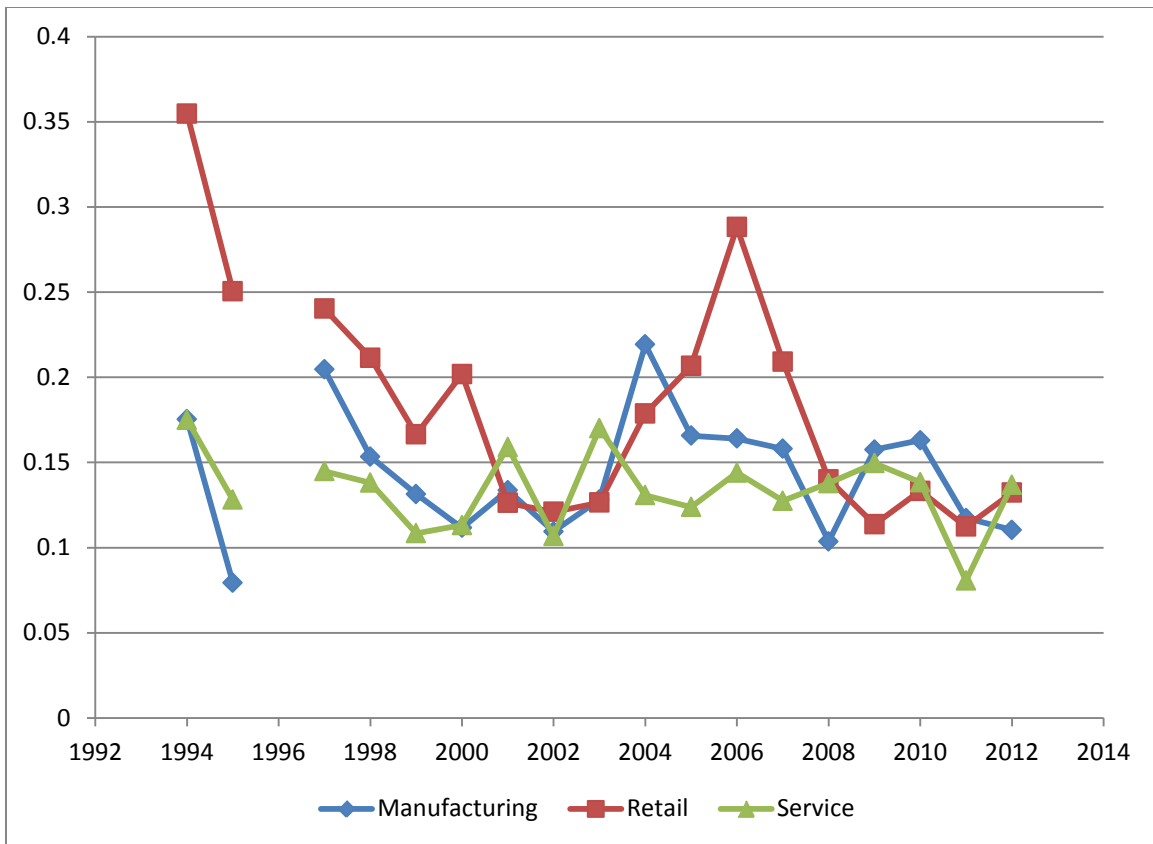
Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Figure 11. Self-Employment Rate Among 55 Year Olds – by Incorporation Status



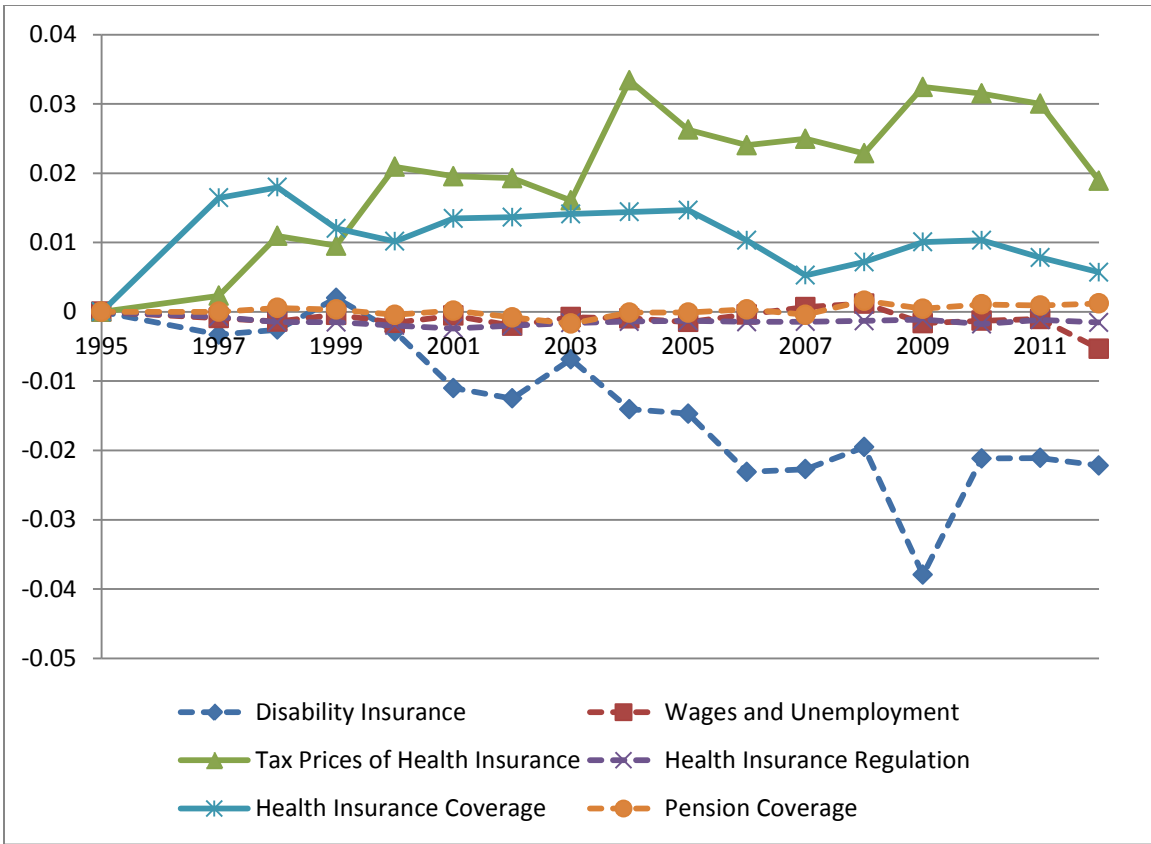
Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Figure 12. Self-Employment Rate Among 55 Year Olds – by Industry



Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

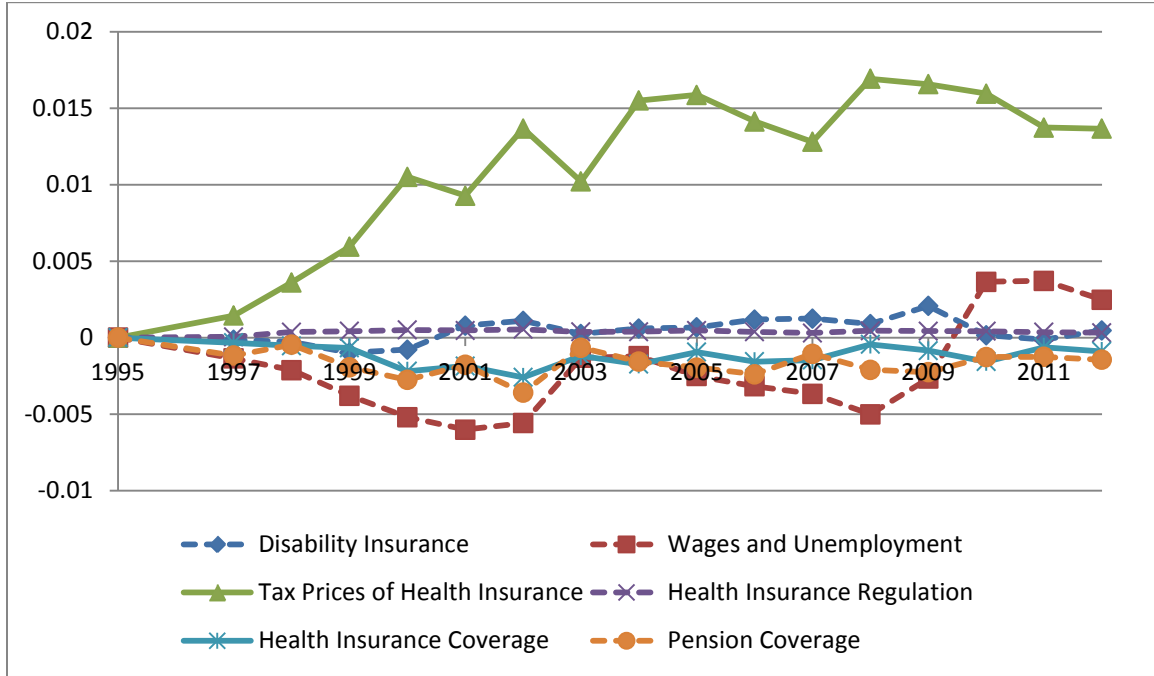
Figure 13. Counterfactual Simulations of Continuation Rates – Impact of Economic and Policy Variables



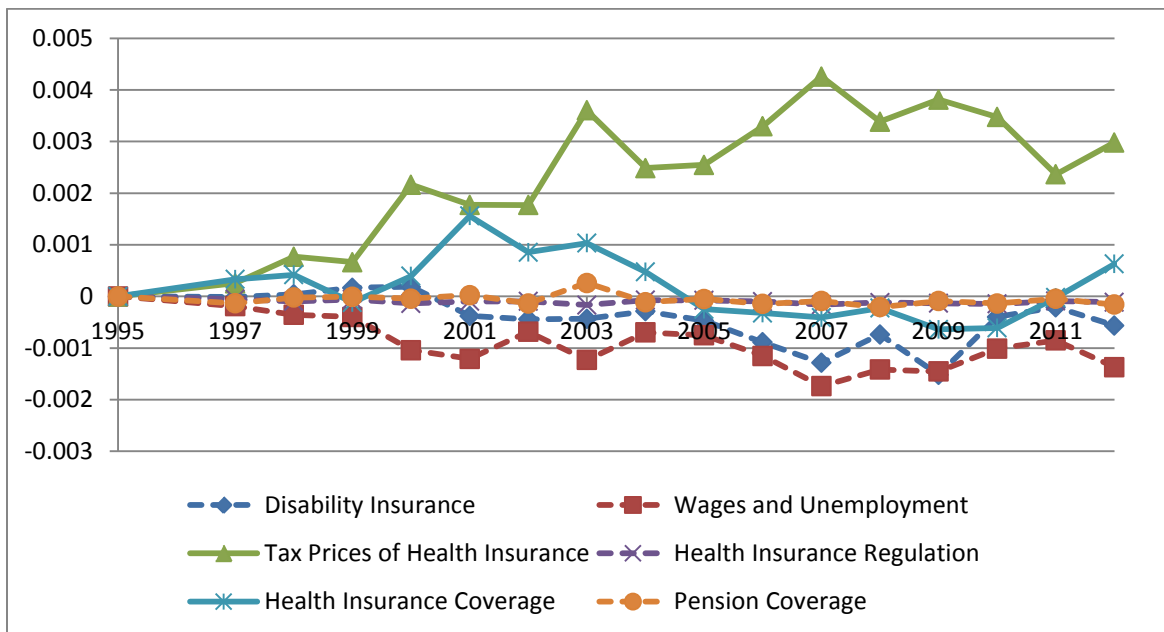
Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Figure 14. Counterfactual Simulations of Entry Rates – Impact of Economic and Policy Variables

A. From Wage and Salary



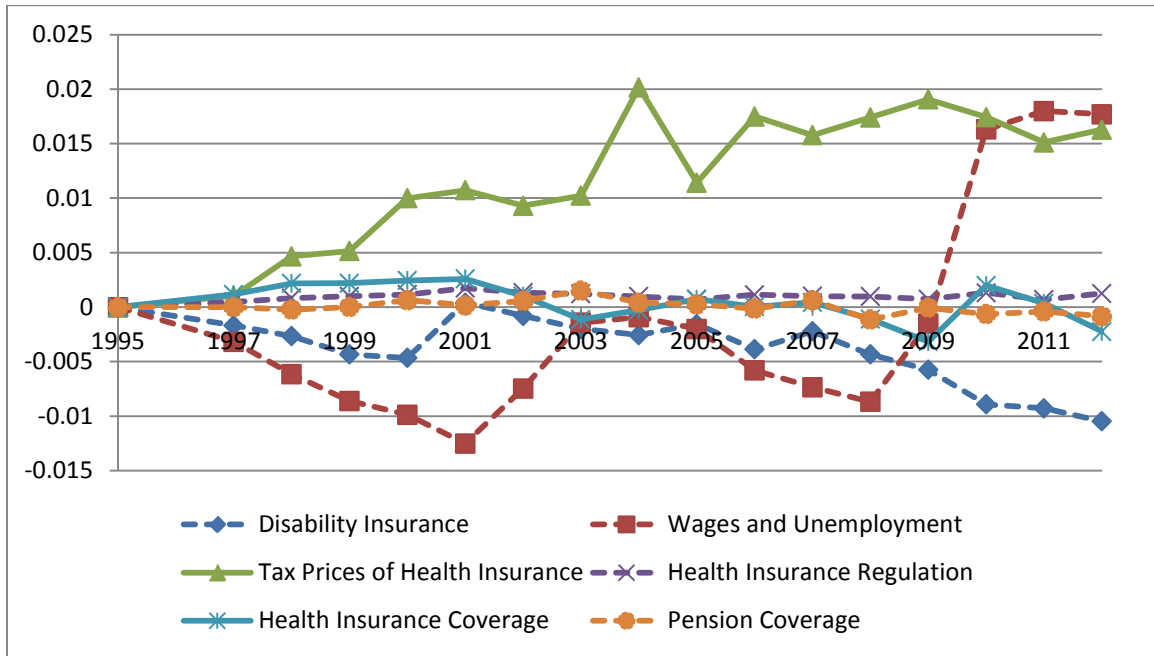
B. From Not Working



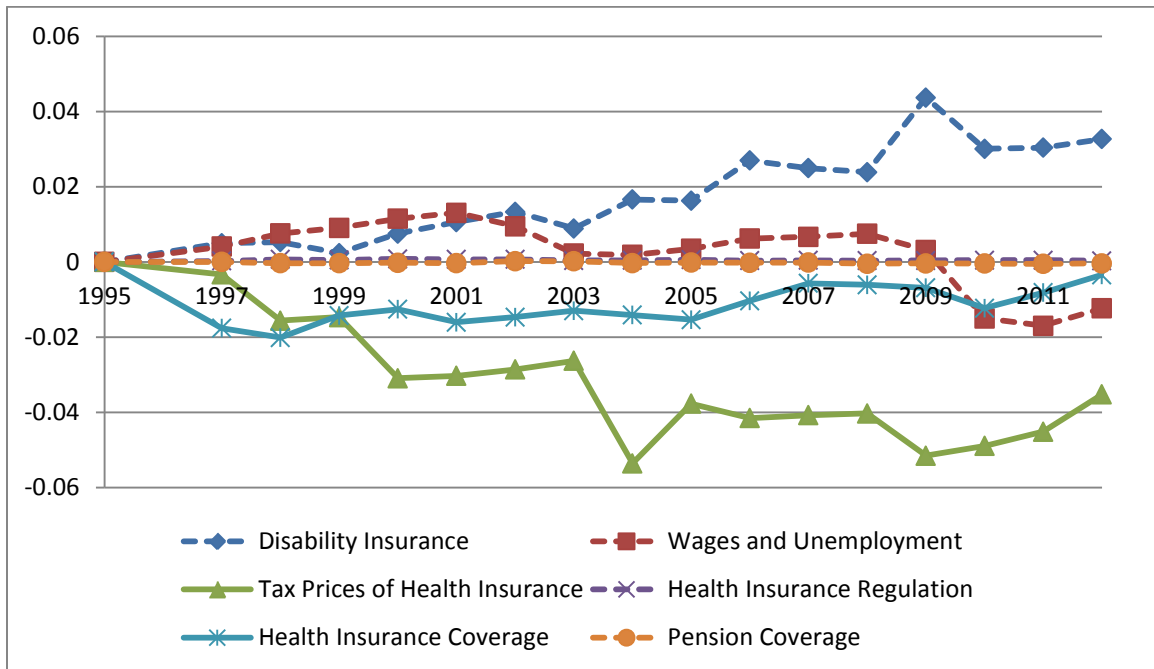
Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Figure 15. Counterfactual Simulations of Exit Rates – Impact of Economic and Policy Variables

A. Wage and Salary

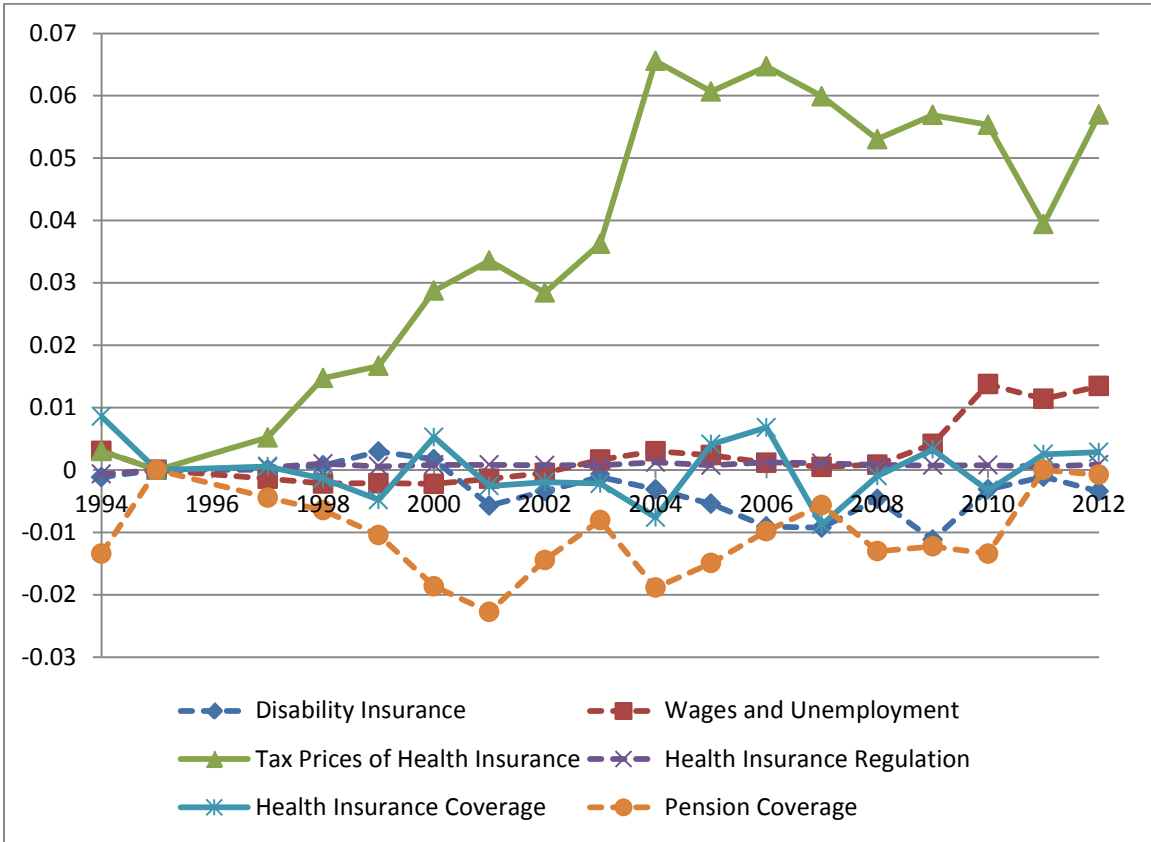


B. Not Working



Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Figure 16. Counterfactual Simulations of Self-Employment Rate at Age 55 – Impact of Economic and Policy Variables



Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Table 1. Tests of Significance of Self-Employment, Continuation, Entry, and Exit Rates

Rate	Means			Coefficient on Linear Time Trend
	1994	2012	Difference	
Self-employment	18.838 (0.556)	14.444 (0.360)	-4.394***	-0.155*** (0.019)
Self-employment Among 55 Year Olds	16.737 (1.397)	12.294 (0.869)	-4.443***	-0.216*** (0.048)
Incorporated	5.577 (0.315)	5.571 (0.240)	-0.007	0.0134 (0.012)
Unincorporated	13.260 (0.488)	8.873 (0.288)	-4.388***	-0.168*** (0.016)

	Means			Coefficient on Linear Time Trend
	1995	2012	Difference	
Self-employment continuation	68.174 (2.613)	66.154 (2.181)	-2.020	0.015 (0.116)
Self-employment entry from:				
Wage and Salary	1.512 (0.288)	2.254 (0.305)	0.742*	-0.002 (0.017)
Not Working	2.137 (0.485)	1.629 (0.293)	-0.508	0.002 (0.017)
Self-employment Exit to:				
Wage and Salary	13.678 (1.896)	18.886 (1.846)	5.208**	0.198** (0.091)
Not Working	10.524 (1.706)	9.262 (1.290)	-1.261	-0.110 (0.077)

Notes: *** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

Source: Author's calculations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Table 2. Multinomial Logit Results for Transition From/To Self-Employment

Subsample Coefficients for transition to:	Self-Employed		Wage and Salary		Not Working	
	Wage and Salary	Not Working	Self-Employed	Not Working	Self-Employed	Wage and Salary
Female	0.234** (0.073)	0.422*** (0.090)	-0.595*** (0.076)	-0.102* (0.040)	-0.719*** (0.112)	-0.196*** (0.058)
Age	-0.028* (0.014)	0.101*** (0.017)	-0.001 (0.015)	0.123*** (0.008)	-0.144*** (0.021)	-0.150*** (0.011)
High School Graduate	-0.152 (0.152)	-0.269 (0.148)	-0.014 (0.150)	0.012 (0.065)	0.309 (0.195)	0.116 (0.088)
Some College	-0.080 (0.151)	-0.575*** (0.156)	0.377* (0.155)	0.036 (0.069)	0.507* (0.198)	0.254** (0.094)
College Graduate	-0.045 (0.155)	-0.570*** (0.167)	0.563*** (0.162)	0.014 (0.077)	0.746*** (0.218)	0.214 (0.109)
Graduate School	-0.148 (0.161)	-0.473** (0.182)	0.649*** (0.171)	-0.081 (0.088)	0.755** (0.232)	-0.028 (0.129)
African-American	0.477** (0.166)	0.536** (0.182)	-0.324* (0.156)	0.013 (0.066)	-0.003 (0.202)	0.123 (0.091)
Other	-0.145 (0.165)	0.267 (0.200)	-0.093 (0.170)	-0.075 (0.096)	0.396 (0.237)	0.242 (0.129)
Number of Children < 18	0.070 (0.114)	-0.056 (0.157)	0.102 (0.113)	0.056 (0.066)	0.125 (0.174)	0.229** (0.085)
Married	-0.048 (0.096)	0.391** (0.121)	0.609*** (0.101)	0.248*** (0.049)	-0.138 (0.132)	-0.485*** (0.068)
Investment Income	-0.028*** (0.008)	-0.002 (0.011)	0.042*** (0.011)	0.024*** (0.005)	-0.009 (0.014)	-0.052*** (0.006)
Earned Income	0.117** (0.042)	-0.061** (0.021)	-0.241*** (0.039)	-0.269*** (0.020)	0.070** (0.025)	0.137*** (0.014)
DI Average Benefit	0.912 (1.318)	3.409 (1.789)	1.513 (1.442)	-0.391 (0.749)	-1.048 (2.213)	0.130 (1.027)
DI Receipt Rate	-7.870 (5.367)	8.750 (6.419)	-8.695 (5.410)	1.858 (2.913)	3.050 (6.730)	-12.127** (4.110)
Unemployment Rate	0.034 (0.035)	-0.058 (0.045)	0.074* (0.037)	0.040* (0.019)	0.005 (0.050)	0.001 (0.027)
Average Wages (in \$1000s)	0.001 (0.006)	0.004 (0.007)	-0.010 (0.005)	0.006 (0.004)	-0.013 (0.009)	0.000 (0.005)

Subsample	Self-Employed		Wage and Salary		Not Working	
	Wage and Salary	Not Working	Self-Employed	Not Working	Self-Employed	Wage and Salary
Coefficients for transition to:						
After-Tax Price of SE Health Insurance	-0.263 (0.875)	3.850*** (1.056)	-4.736*** (1.101)	3.191*** (0.626)	-2.264 (1.225)	-2.533*** (0.677)
After-Tax Price of WS Health Insurance	0.226 (0.821)	2.235* (1.023)	3.217*** (0.949)	0.797 (0.579)	-0.920 (1.101)	-1.778** (0.615)
Community Rating or Guaranteed Issue Individual HI Regulation	0.167 (0.120)	0.144 (0.154)	0.037 (0.129)	0.158* (0.074)	-0.129 (0.184)	-0.294** (0.109)
Community Rating and Guaranteed Issue Individual HI Regulation	-0.052 (0.123)	-0.016 (0.149)	0.258 (0.140)	0.044 (0.068)	0.009 (0.182)	0.029 (0.097)
Medicare	0.053 (0.429)	1.596*** (0.305)	-0.353 (0.376)	0.357* (0.162)	-1.677*** (0.257)	-1.110*** (0.114)
Medicaid	0.456* (0.231)	0.539* (0.249)	-0.043 (0.251)	-0.006 (0.123)	-0.564* (0.227)	-0.717*** (0.122)
Dependent Health Insurance	-0.188 (0.109)	0.088 (0.126)	-0.196 (0.127)	0.168* (0.076)	-0.612*** (0.169)	-0.551*** (0.087)
Private Health Insurance	-0.194 (0.113)	-0.400** (0.140)	0.786*** (0.139)	0.005 (0.108)	0.201 (0.185)	-0.192 (0.113)
Employer-Sponsored Health Insurance	0.063 (0.103)	-0.137 (0.125)	-0.873*** (0.113)	-0.140* (0.062)	-0.567*** (0.151)	-0.259** (0.081)
Other Health Insurance	-0.031 (0.161)	-0.041 (0.179)	-0.358* (0.177)	0.056 (0.085)	-0.569** (0.208)	-0.312** (0.115)
Employer Pension Plan	0.098 (0.090)	0.081 (0.126)	-0.977*** (0.085)	-0.139*** (0.041)	0.425** (0.156)	0.979*** (0.076)
Observations	8,878		44,138		32,190	

Notes: Each panel presents the estimated coefficients from separate multinomial logit models. Sample includes individuals aged 55-63 in first year of transition. Investment income and Labor and Transfer Income are expressed as the inverse hyperbolic sine of these variables. All specifications include time and census division fixed effects and a constant. Standard errors are in parentheses.

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Table 3. Multinomial Logit Results for Being Self-Employed Among 55 Year Olds

Base Category Coefficients for Employment Mode:	Not Working	
	Self-Employed	Wage and Salary
Female	-1.245*** (0.093)	-0.254*** (0.065)
High School Graduate	0.394* (0.163)	0.226* (0.103)
Some College	0.632*** (0.169)	0.291** (0.112)
College Graduate	0.684*** (0.186)	0.073 (0.125)
Graduate School	1.301*** (0.209)	0.489** (0.158)
African-American	-0.993*** (0.212)	-0.101 (0.111)
Other	-0.246 (0.209)	0.094 (0.140)
Number of Children < 18	0.108 (0.119)	0.116 (0.088)
Married	-0.147 (0.121)	-0.385*** (0.084)
Investment Income	-0.018 (0.012)	-0.048*** (0.008)
Earned Income	0.207*** (0.045)	0.270*** (0.031)
DI Average Benefit	-3.250 (1.765)	-1.828 (1.243)
DI Receipt Rate	-0.001 (6.544)	-8.563 (4.564)
Unemployment Rate	-0.036 (0.046)	-0.071* (0.033)
Average Wages	0.007 (0.007)	-0.001 (0.005)

Base Category	Not Working	
	Self-Employed	Wage and Salary
Coefficients for Employment Mode:		
After-Tax Price of SE Health Insurance	-7.378*** (1.161)	-4.228*** (0.897)
After-Tax Price of WS Health Insurance	1.466 (1.056)	-1.471 (0.832)
Community Rating or Guaranteed Issue Individual HI Regulation	-0.090 (0.164)	-0.197 (0.119)
Community Rating and Guaranteed Issue Individual HI Regulation	0.136 (0.167)	0.100 (0.119)
Medicare	-3.006*** (0.459)	-2.302*** (0.225)
Medicaid	-1.349*** (0.332)	-0.679*** (0.159)
Dependent Health Insurance	-0.456** (0.141)	-0.458*** (0.100)
Private Health Insurance	0.740*** (0.173)	-0.194 (0.153)
Employer-Sponsored Health Insurance	-0.415** (0.135)	0.652*** (0.090)
Other Health Insurance	-0.825*** (0.226)	-0.400** (0.129)
Employer Pension Plan	-0.138 (0.120)	1.386*** (0.077)
Observations	12,006	

Notes: Table presents estimated coefficients from a multinomial logit regression. Sample includes individuals age 55. Investment income and Labor and Transfer Income are expressed as the inverse hyperbolic sine of these variables. All specifications include time and state fixed effects and a constant. Standard errors are in parentheses.

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

Source: Author's calculations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Appendix

Mathematical Representation of Markov Chain Model

Let N_t^j denote the number of individuals age 55-64 in work status j (where work status SE denotes self-employment, work status WS denotes wage and salary work, and work status NW denotes not working) in year t . Let E_t^j denote the number of these individuals who were age 54 in year $t-1$ (i.e. entrants into the 55-64 age range) and who were in work status j . The observed number of individuals in each of the three work statuses in year t will be related to the number of individuals in each work status in year $t-1$ through

$$(1) \quad \begin{bmatrix} N_t^{SE} \\ N_t^{WS} \\ N_t^{NW} \end{bmatrix} = \begin{bmatrix} c_t^{SE,SE} & c_t^{WS,SE} & c_t^{NW,SE} \\ c_t^{SE,WS} & c_t^{WS,WS} & c_t^{NW,WS} \\ c_t^{SE,NW} & c_t^{WS,NW} & c_t^{NW,NW} \end{bmatrix} \begin{bmatrix} N_{t-1}^{SE} \\ N_{t-1}^{WS} \\ N_{t-1}^{NW} \end{bmatrix} + \begin{bmatrix} E_t^{SE} \\ E_t^{WS} \\ E_t^{NW} \end{bmatrix}$$

where c_t^{jk} denotes the probability that an individual age 55-64 in work status j in year $t-1$ would be in work status k in year t . The diagonal rates are the continuation rates, since they denote the fraction of individuals in one work status that stay in that status in the next year. The probabilities $c_t^{WS,SE}$ and $c_t^{NW,SE}$ are the entry rates, since they denote the fractions of individuals in wage and salary employment (or who are not working) who enter into self-employment in the next year. Finally, the rates $c_t^{SE,WS}$ and $c_t^{SE,NW}$ are the exit rates, since they denote the fraction of self-employed individuals who exit to wage and salary employment or not working. Because some individuals age 55-64 in year $t-1$ will not be in the 55-64 age range in year t , $\sum_k c_t^{jk} \leq 1$, where $1 - \sum_k c_t^{jk}$ is the fraction of 55-64 year olds in work status j in year $t-1$ that are not in that cohort in year t .

Since we are interested in the dynamics of the self-employment rate among workers, note that this equation can be rewritten as

$$(2) \quad \begin{bmatrix} r_t^{SE} \\ r_t^{WS} \\ R_t^{NW} \end{bmatrix} N_t = \begin{bmatrix} c_t^{SE,SE} & c_t^{WS,SE} & c_t^{NW,SE} \\ c_t^{SE,WS} & c_t^{WS,WS} & c_t^{NW,WS} \\ c_t^{SE,NW} & c_t^{WS,NW} & c_t^{NW,NW} \end{bmatrix} \begin{bmatrix} r_{t-1}^{SE} \\ r_{t-1}^{WS} \\ R_{t-1}^{NW} \end{bmatrix} N_{t-1} + \begin{bmatrix} \beta_t^{SE} \\ \beta_t^{WS} \\ B_t^{NW} \end{bmatrix} E_t$$

where $N_t = N_t^{SE} + N_t^{WS}$ (in other words, the size of the workforce age 55-64 in year t) and $E_t = E_t^{SE} + E_t^{WS}$. In this rendering, r_t^{SE} denotes the self-employment rate among workers age 55-64, r_t^{WS} denotes the wage and salary employment rate among workers, and R_t^{NW} denotes the ratio of the number of individuals who are not working to the number working. The terms β_t^{SE} , β_t^{WS} , and B_t^{NW} are defined similarly. Finally, dividing through by N_t yields

$$(3) \quad \begin{bmatrix} r_t^{SE} \\ r_t^{WS} \\ R_t^{NW} \end{bmatrix} = \mu_t \begin{bmatrix} c_t^{SE,SE} & c_t^{WS,SE} & c_t^{NW,SE} \\ c_t^{SE,WS} & c_t^{WS,WS} & c_t^{NW,WS} \\ c_t^{SE,NW} & c_t^{WS,NW} & c_t^{NW,NW} \end{bmatrix} \begin{bmatrix} r_{t-1}^{SE} \\ r_{t-1}^{WS} \\ R_{t-1}^{NW} \end{bmatrix} + \varepsilon \begin{bmatrix} \beta_t^{SE} \\ \beta_t^{WS} \\ B_t^{NW} \end{bmatrix}$$

where μ_t reflects the change in the size of the age 55-64 work force between $t-1$ and t , and ε denotes the fraction of workers in year t who are new entrants in the 55-64 year cohort.

Data Source

Data for this study come from the 1994-2012 waves of the Annual Social and Economic (ASEC) supplements to the Current Population Survey (CPS), commonly known as the March CPS. The CPS is a nationally representative survey of households that is administered on a monthly basis. CPS households are interviewed for four consecutive months, are out of the sample for the next eight months, then interviewed for a final four months. In addition to information on whether the individual is self-employed and the amount of self-employment income, the March CPS also includes information on age, education, race, family composition, disability status, health insurance and pension coverage, and state of residence. It is possible to match respondents across two adjacent March surveys, so that one can observe whether an individual continued in, entered, or exited self-employment between their first March interview and their second.

There are several advantages to using the CPS for this study. First, the CPS is the dataset that is used in the most commonly referenced tabulations of self-employment rates, including Fairlie (2004) and Hipple (2010). Second, the March CPS is collected annually, so that annual rates of entry and exit can be examined (in contrast to a data source like the Health and Retirement Study (HRS) in which respondents are only interviewed every other year). Third, the sample size is sufficiently large that it is possible to tabulate rates overall and for a number of subsamples (including by incorporation status, industry, and region of the country). However, individuals are observed for at most one two-year pair, and so it is not possible to track individual over longer periods of time. In addition, although many variables of interest are included in the survey, the CPS does not include information on respondents' wealth.

Appendix Table 2 presents the sample sizes for each year of the sample. In each year of the CPS, approximately one third of the sample (the Matched Sample t column) can be matched with an observation from the subsequent year, and one third (Matched Sample $t+1$ column) can be matched with an observation from the prior year, leaving about one third of the sample in each year unmatched (due to the respondent moving, being deceased, or not being interviewed for some other reason). The first and last years

of the sample are exceptions to this pattern, since observations from the first (last) year cannot be matched to an earlier (later) year. The years 1995-1996 are also exceptions, since (because of a redesign of the CPS) observations from 1995 cannot be matched to observations from 1996.

Appendix Table 3 presents sample statistics for all relevant variables across all years of the full sample.³⁶ Slightly less than 10 percent of the sample is self-employed³⁷, around 50 percent of the sample are wage and salary employees, and the balance are not working. A little more than half of the sample is female, with an average age of around 59. Thirty-three percent of the sample are high school graduates, 25 percent have attended some college, 16 percent are college graduates, and over 11 percent have attended graduate school. Finally, around 10 percent of the sample is African-American, and around 5 percent of the sample is some other nonwhite race.

Appendix Figure 1 presents four different tabulations of self-employment rates, by year: (a) rates from Hipple (2010) who reports average self-employments across all months of the CPS, (b) rates calculated using the full March CPS sample in each year, (c) rates calculated using individuals who are in their second year of the matched sample, and (d) reweighted³⁸ rates calculated using individuals who are in the second year of the matched sample. (The tabulations used to create these figures are presented in Appendix Table 4.)

All four trends show a notable decline in self-employment rates, from above 18 percent in 1994 to just above 14 percent in 2012. Looking across the years in this figure, it appears that the rates among the full sample match those in Hipple (2010) relatively closely, but not exactly, due to the fact that this study uses only March data, while Hipple (2010) uses all months, and self-employment rates may vary across the year.

Since the self-employment continuation, entry, and exit rates can only be calculated among the matched sample (because an individual must be observed in two adjacent years in order to observe these transitions), it is important to ensure that the matched sample is similar to the sample as a whole. Here, again, the rates match closely, but not exactly. However, the reweighting procedure results in a trend in self-employment in the matched CPS sample that is much closer to that in the full sample than when using the unadjusted weights. As a result, the adjusted weights are used in all tabulations that utilize the matched sample. Note that, because the sample begins in

³⁶ Tabulations for individuals in the second year of the matched sample are similar.

³⁷ Note that this is the fraction of the total population that is self-employed, while Figure 3 presents tabulations of the fraction of non-agricultural workers that are self-employed, and so the latter figure is higher than the former.

³⁸ Weights were adjusted using a process described in Nichols (2007) using code graciously provided by Stuart Craig at Yale University. In this procedure, a logit is estimated to generate probabilities of being in the matched sample, and weights are then adjusted to match the age, race, sex, marital status, and employment mode distribution of the full sample.

1994, the first continuation, entry, and exit rates that can be calculated come from 1995 (comparing 1995 to 1994).

Estimation Methods

For the multinomial logit models of transitions to and from the various labor force statuses, the sample is cut to include only individuals in a particular status j in year $t-1$.³⁹ The assumption is then made that the probability that individual i in status j is observed in status k in the next period is given by

$$(4) \quad \Pr(S_{it} = k | S_{i,t-1} = j) = \frac{\exp(Z_{k,it})}{1 + \sum_{m=1}^2 \exp(Z_{m,it})}$$

where

$$(5) \quad Z_{m,it} = \beta_m X_{it} + \delta_d + \gamma_t.$$

The vector X_{it} includes demographic variables (including sex, age, education, race, marital status, and presence of children), income variables (including investment income, which will proxy for the wealth of the individual, and labor and transfer income) macroeconomic and policy variables (including the state unemployment rate, the state average weekly wage, the after-tax prices of the health insurance while self-employed and while wage and salary workers⁴⁰, measures of state-level health insurance regulation,⁴¹ and measures of state disability insurance policy⁴²) and individual economic variables (including health insurance and pension variables)⁴³. Also included are census division⁴⁴ fixed effects, denoted δ_d , and year fixed effects, denoted γ_t . (Detailed information on the definitions and sources of each of these variables are presented in Appendix Table 11.) For each of these specifications, continuing in status k is considered

³⁹ To examine exits from self-employment, the sample will be cut to include only self-employed workers. To examine entries into self-employment, the sample will be cut to include wage and salary workers or individuals who are not working.

⁴⁰ For the derivation of these variables, see Appendix Table 11. As can be seen in this table, the after-tax price for wage and salary workers is proportional to the share of income that an individual would keep after taxes (i.e. one minus their combined marginal federal, state and payroll tax rates). As a result, it is not possible to enter tax rates directly into the estimation equation, as the two variables are almost perfectly collinear. Instead, the after-tax price for wage and salary workers will capture the combined effects of changes in the cost of health insurance while a wage and salary worker and changes in tax rates per se.

⁴¹ These include whether a state's individual insurance market had community rating regulations (which limit the extent to which insurance companies may charge different premiums based on health status) or guaranteed issue regulations (which prevent insurance companies from excluding anyone because of pre-existing conditions), or both.

⁴² For these variables, I use the state-level average Disability Insurance benefit among disabled workers, and the state-level Disability Insurance disabled worker receipt rate among adults age 18-64.

⁴³ Because these variables are partly a function of whether an individual is self-employed, a wage and salary worker, or not working, I use the value of these variables in the first year of the two year pair (that is, the year before a transition, if any, is made).

⁴⁴ For the classification of states into census divisions, see http://www.census.gov/econ/census07/www/geography/regions_and_divisions.html

the base status, and so the estimated coefficients reflect increases or decreases in the probability of transitioning to another status.

In the multinomial logit of employment status choice among 55 year olds, the sample is cut to include individuals who are 55, and the assumption is made that the probability that individual i who is age 55 in year t is observed in status k is given by

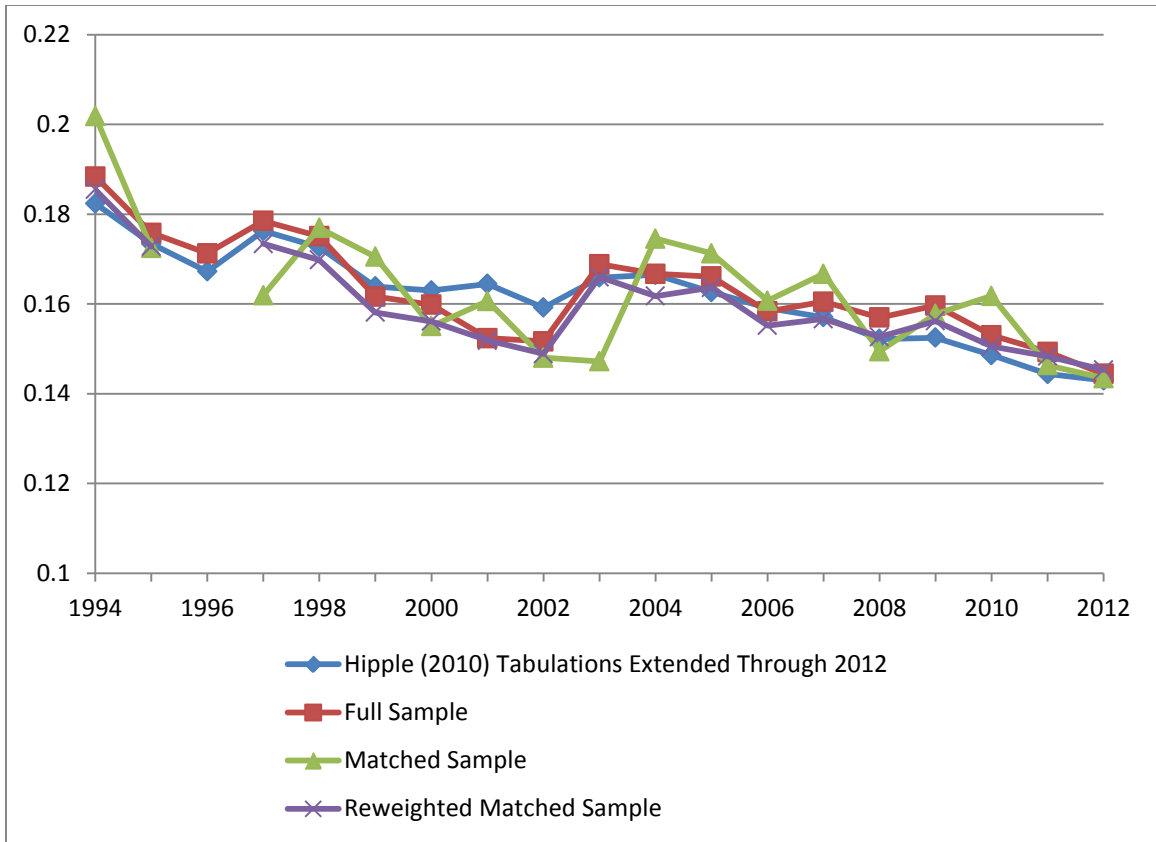
$$(6) \quad \Pr(S_{it}^{55} = k) = \frac{\exp(Z_{k,it}^{55})}{1 + \sum_{m=1}^2 \exp(Z_{m,it}^{55})}$$

where

$$(7) \quad Z_{m,it}^{55} = \beta_m^{55} X_{it} + \delta_d + \gamma_t,$$

and the independent variables are defined as above. In this specification, not working is defined as the base status. As a result, the estimated coefficients reflect increases or decreases in the probability of being self-employed or a wage and salary employee.

Appendix Figure 1. Comparison of Self-Employment Rates - 55-64 Year Olds



Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS), Hipple (2010) extended through 2012 via communication with Steve Hipple.

Appendix Table 1. Self-Employment Numbers and Rates by Age Group

	All Ages	Number (Thousands)					All Ages	Rate				
		25 to 34 years	35 to 44 years	45 to 54 years	55 to 64 years	65+ years		25 to 34 years	35 to 44 years	45 to 54 years	55 to 64 years	65+ years
1994	13,052	2,356	3,970	3,269	1,973	948	0.109	0.075	0.117	0.143	0.182	0.285
1995	12,913	2,312	3,931	3,357	1,913	900	0.106	0.073	0.114	0.141	0.173	0.272
1996	12,888	2,227	3,992	3,483	1,894	889	0.105	0.071	0.114	0.140	0.167	0.266
1997	13,198	2,130	4,002	3,645	2,094	962	0.105	0.069	0.114	0.139	0.176	0.280
1998	13,061	2,034	4,006	3,620	2,154	904	0.102	0.066	0.113	0.134	0.173	0.262
1999	12,906	1,998	3,895	3,611	2,113	916	0.099	0.066	0.108	0.129	0.164	0.255
2000	13,521	2,071	3,985	3,882	2,217	957	0.101	0.067	0.111	0.130	0.163	0.246
2001	13,434	1,959	3,862	3,877	2,345	958	0.100	0.064	0.109	0.127	0.164	0.240
2002	13,399	1,961	3,740	3,923	2,434	923	0.100	0.065	0.108	0.127	0.159	0.229
2003	14,154	2,080	3,939	4,057	2,692	992	0.104	0.069	0.115	0.129	0.166	0.230
2004	14,487	2,111	3,912	4,121	2,823	1,060	0.106	0.070	0.115	0.129	0.166	0.235
2005	14,625	2,135	3,774	4,191	2,924	1,165	0.105	0.070	0.110	0.128	0.163	0.244
2006	15,019	2,142	3,854	4,374	3,024	1,166	0.106	0.070	0.113	0.130	0.159	0.233
2007	15,148	2,081	3,808	4,543	3,104	1,185	0.105	0.067	0.112	0.133	0.157	0.222
2008	14,840	2,012	3,566	4,451	3,110	1,269	0.104	0.065	0.108	0.131	0.152	0.223
2009	14,310	1,869	3,314	4,287	3,144	1,332	0.104	0.063	0.106	0.129	0.152	0.229
2010	13,883	1,773	3,182	4,077	3,156	1,324	0.101	0.059	0.105	0.125	0.149	0.223
2011	13,559	1,761	2,910	3,925	3,142	1,437	0.099	0.058	0.097	0.121	0.144	0.228
2012	13,819	1,741	3,011	3,867	3,263	1,583	0.099	0.057	0.100	0.119	0.143	0.229

Notes: Rate is the fraction of non-agricultural employment in each year.

Source: Hipple (2010) extended through 2012 via communication with Steve Hipple.

Appendix Table 2. Sample Sizes

Year	In Matched Sample		Not in Matched Sample	Total
	t	t+1		
1994	4,801	0	9,722	14,523
1995	0	4,801	9,779	14,580
1996	4,703	0	8,001	12,704
1997	4,890	4,703	3,505	13,098
1998	4,902	4,890	3,560	13,352
1999	4,949	4,902	3,494	13,345
2000	5,006	4,949	3,734	13,689
2001	5,029	5,006	3,794	13,829
2002	6,403	5,029	8,907	20,339
2003	6,911	6,403	7,723	21,037
2004	5,947	6,911	9,026	21,884
2005	6,528	5,947	9,554	22,029
2006	7,013	6,528	8,914	22,455
2007	7,354	7,013	8,983	23,350
2008	7,421	7,354	9,362	24,137
2009	7,711	7,421	9,731	24,863
2010	7,153	7,711	10,584	25,448
2011	7,597	7,153	11,179	25,929
2012	0	7,597	18,912	26,509
Total	104,318	104,318	158,464	367,100

Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Appendix Table 3. Sample Statistics

A. Indicator Variables

	Fraction of Sample
Self Employed	0.093
Wage and Salary Employee	0.487
Not Working	0.420
Female	0.521
High School Graduate	0.334
Some College	0.244
College Graduate	0.157
Graduate School	0.113
African-American	0.101
Other	0.051
Community Rating or Guaranteed Issue Individual HI Regulation	0.069
Community Rating and Guaranteed Issue Individual HI Regulation	0.154
Medicare	0.135
Medicaid	0.072
Dependent Health Insurance	0.180
Private Health Insurance	0.076
Employer-Sponsored Health Insurance	0.490
Other Health Insurance	0.055
Employer Pension Plan	0.331
N	367,100

B. Continuous Variables

	Mean	Std. Dev.	Min	Max
Age	59.040	3.441	54.000	65.000
Number of Children < 18	0.121	0.326	0.000	1.000
Total Income	79,773	84,158	-29,755	1,539,406
Investment Income	5,799	18,892	-30,926	579,347
Earned Income	73,973	78,429	-31,239	1,530,000
DI Average Benefit	1.064	0.054	0.894	1.234
DI Receipt Rate	0.034	0.011	0.011	0.082
Unemployment Rate	6.066	2.122	2.300	13.800
Average Wages (in \$1000s)	44.833	8.747	0.585	81.529
After-Tax Price of SE Health Insurance	0.844	0.117	-0.520	1.051
After-Tax Price of WS Health Insurance	0.672	0.117	-0.554	0.906
N		367,100		

Source: Author's calculations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Appendix Table 4. Self-Employment Rates Among 55-64 Year Olds

	Full Sample	Matched Sample	Reweighted Matched Sample	55 Year Olds - Full Sample	Unincorporated - Full Sample	Incorporated - Full Sample
1994	0.188	0.202	0.185	0.167	0.133	0.056
1995	0.176	0.172	0.173	0.170	0.116	0.060
1996	0.171			0.161	0.121	0.051
1997	0.178	0.162	0.173	0.169	0.124	0.055
1998	0.175	0.177	0.170	0.164	0.114	0.061
1999	0.162	0.171	0.158	0.124	0.104	0.058
2000	0.160	0.155	0.156	0.126	0.103	0.057
2001	0.152	0.161	0.152	0.157	0.101	0.051
2002	0.152	0.148	0.149	0.134	0.095	0.057
2003	0.169	0.147	0.166	0.153	0.105	0.064
2004	0.167	0.175	0.162	0.153	0.101	0.065
2005	0.166	0.171	0.164	0.141	0.104	0.062
2006	0.158	0.161	0.155	0.144	0.101	0.057
2007	0.160	0.167	0.157	0.155	0.102	0.058
2008	0.157	0.149	0.153	0.139	0.096	0.061
2009	0.160	0.158	0.156	0.140	0.098	0.061
2010	0.153	0.162	0.151	0.132	0.095	0.058
2011	0.149	0.146	0.148	0.108	0.092	0.058
2012	0.144	0.143	0.145	0.123	0.089	0.056

Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Appendix Table 5. Continuation Rates Among 55-64 Year Olds

	All Obser- vations	Unincor- porated	Incor- porated	Manu- facturing	Retail	Service	North- east	Mid- west	South	West
1995	0.682	0.680	0.685	0.672	0.648	0.705	0.699	0.725	0.647	0.678
1996										
1997	0.690	0.676	0.726	0.693	0.701	0.684	0.705	0.721	0.702	0.642
1998	0.651	0.631	0.695	0.639	0.618	0.674	0.659	0.610	0.641	0.685
1999	0.677	0.652	0.719	0.716	0.645	0.675	0.640	0.670	0.714	0.669
2000	0.640	0.591	0.734	0.655	0.696	0.607	0.558	0.611	0.694	0.644
2001	0.641	0.672	0.585	0.640	0.620	0.649	0.659	0.544	0.669	0.657
2002	0.667	0.667	0.667	0.754	0.531	0.686	0.629	0.677	0.671	0.687
2003	0.684	0.717	0.634	0.709	0.734	0.658	0.690	0.679	0.665	0.710
2004	0.634	0.617	0.662	0.725	0.578	0.616	0.650	0.655	0.638	0.601
2005	0.734	0.725	0.748	0.720	0.653	0.759	0.718	0.788	0.681	0.776
2006	0.660	0.646	0.684	0.685	0.615	0.664	0.678	0.637	0.693	0.616
2007	0.692	0.637	0.798	0.715	0.678	0.686	0.696	0.667	0.694	0.706
2008	0.653	0.628	0.691	0.724	0.663	0.616	0.611	0.666	0.662	0.658
2009	0.635	0.608	0.682	0.666	0.658	0.616	0.631	0.650	0.599	0.675
2010	0.668	0.632	0.733	0.661	0.663	0.673	0.662	0.695	0.619	0.724
2011	0.703	0.701	0.706	0.708	0.664	0.711	0.725	0.650	0.674	0.748
2012	0.662	0.658	0.667	0.691	0.668	0.649	0.689	0.757	0.617	0.643

Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Appendix Table 6. Entry Rates from Wage and Salary Employment Among 55-64 Year Olds

	All Observations	Unincorporated	Incorporated	Private Sector	Public Sector	Manufacturing	Retail	Service	North-east	Mid-west	South	West
1995	0.015	0.007	0.008	0.019	0.003	0.008	0.039	0.012	0.015	0.018	0.011	0.018
1996												
1997	0.026	0.010	0.016	0.031	0.006	0.029	0.031	0.022	0.038	0.016	0.016	0.042
1998	0.023	0.012	0.011	0.026	0.011	0.024	0.020	0.023	0.027	0.016	0.028	0.018
1999	0.028	0.019	0.009	0.033	0.010	0.021	0.044	0.028	0.014	0.029	0.032	0.034
2000	0.031	0.019	0.012	0.037	0.012	0.024	0.028	0.035	0.021	0.021	0.043	0.031
2001	0.028	0.016	0.011	0.032	0.013	0.028	0.023	0.029	0.033	0.019	0.030	0.028
2002	0.040	0.021	0.019	0.046	0.016	0.052	0.048	0.031	0.033	0.040	0.044	0.039
2003	0.024	0.015	0.009	0.030	0.003	0.023	0.028	0.024	0.015	0.021	0.022	0.043
2004	0.027	0.016	0.010	0.032	0.009	0.030	0.035	0.023	0.020	0.027	0.031	0.025
2005	0.027	0.013	0.014	0.035	0.001	0.029	0.023	0.027	0.027	0.021	0.034	0.022
2006	0.024	0.014	0.010	0.032	0.001	0.032	0.029	0.020	0.022	0.019	0.024	0.032
2007	0.021	0.015	0.007	0.026	0.009	0.013	0.017	0.026	0.020	0.018	0.022	0.025
2008	0.029	0.012	0.016	0.036	0.008	0.020	0.044	0.029	0.040	0.021	0.029	0.027
2009	0.028	0.015	0.013	0.032	0.016	0.037	0.019	0.027	0.021	0.021	0.029	0.040
2010	0.028	0.013	0.015	0.034	0.010	0.034	0.018	0.028	0.023	0.022	0.028	0.038
2011	0.024	0.012	0.011	0.030	0.005	0.024	0.024	0.023	0.028	0.014	0.028	0.022
2012	0.023	0.014	0.009	0.029	0.003	0.012	0.028	0.025	0.020	0.016	0.024	0.029

Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Appendix Table 7. Entry Rates from Not Working Among 55-64 Year Olds

	All Observa- tions	Unincor- porated	Incor- porated	Manu- facturing	Retail	Service	North- east	Mid- west	South	West
1995	0.0214	0.0178	0.0036	0.0027	0.0039	0.0148	0.0083	0.0407	0.0202	0.0137
1996										
1997	0.0136	0.0130	0.0007	0.0032	0.0053	0.0051	0.0100	0.0101	0.0194	0.0102
1998	0.0131	0.0113	0.0018	0.0023	0.0022	0.0086	0.0147	0.0146	0.0080	0.0194
1999	0.0091	0.0078	0.0012	0.0020	0.0025	0.0045	0.0097	0.0129	0.0076	0.0075
2000	0.0175	0.0148	0.0027	0.0030	0.0024	0.0120	0.0172	0.0162	0.0186	0.0170
2001	0.0143	0.0121	0.0022	0.0047	0.0039	0.0057	0.0104	0.0142	0.0126	0.0210
2002	0.0144	0.0109	0.0035	0.0049	0.0038	0.0058	0.0130	0.0144	0.0149	0.0147
2003	0.0257	0.0215	0.0042	0.0050	0.0068	0.0139	0.0228	0.0128	0.0198	0.0487
2004	0.0122	0.0093	0.0029	0.0026	0.0014	0.0081	0.0043	0.0148	0.0153	0.0113
2005	0.0122	0.0098	0.0024	0.0022	0.0026	0.0074	0.0102	0.0125	0.0141	0.0101
2006	0.0162	0.0136	0.0026	0.0013	0.0038	0.0111	0.0182	0.0058	0.0208	0.0172
2007	0.0213	0.0174	0.0038	0.0064	0.0015	0.0134	0.0126	0.0148	0.0182	0.0372
2008	0.0164	0.0122	0.0041	0.0021	0.0028	0.0114	0.0206	0.0069	0.0161	0.0229
2009	0.0182	0.0129	0.0053	0.0037	0.0026	0.0119	0.0120	0.0113	0.0181	0.0298
2010	0.0171	0.0125	0.0046	0.0046	0.0029	0.0097	0.0070	0.0163	0.0182	0.0237
2011	0.0116	0.0099	0.0017	0.0008	0.0023	0.0085	0.0050	0.0092	0.0130	0.0166
2012	0.0163	0.0151	0.0012	0.0033	0.0032	0.0099	0.0179	0.0053	0.0111	0.0346

Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Appendix Table 8. Exit Rates to Wage and Salary Employment Among 55-64 Year Olds

	All Obser- vations	Unincor- porated	Incor- porated	Private Sector	Public Sector	Manu- factur- ing	Retail	Service	North- east	Mid- west	South	West
1995	0.137	0.120	0.175	0.129	0.008	0.130	0.162	0.126	0.179	0.093	0.152	0.118
1996												
1997	0.127	0.110	0.171	0.121	0.007	0.173	0.107	0.114	0.110	0.165	0.127	0.108
1998	0.158	0.153	0.168	0.152	0.006	0.136	0.149	0.173	0.151	0.136	0.162	0.171
1999	0.163	0.154	0.179	0.154	0.009	0.141	0.192	0.160	0.155	0.146	0.146	0.196
2000	0.161	0.171	0.142	0.149	0.012	0.157	0.088	0.195	0.223	0.140	0.105	0.208
2001	0.183	0.146	0.249	0.165	0.019	0.123	0.208	0.199	0.186	0.221	0.133	0.220
2002	0.157	0.136	0.198	0.149	0.009	0.145	0.227	0.139	0.116	0.150	0.171	0.180
2003	0.173	0.142	0.221	0.165	0.007	0.141	0.134	0.199	0.160	0.167	0.191	0.161
2004	0.185	0.175	0.202	0.177	0.008	0.195	0.189	0.181	0.187	0.209	0.171	0.193
2005	0.123	0.116	0.135	0.118	0.006	0.143	0.085	0.126	0.152	0.081	0.144	0.111
2006	0.188	0.172	0.218	0.170	0.018	0.185	0.217	0.181	0.178	0.224	0.159	0.209
2007	0.167	0.201	0.103	0.157	0.010	0.139	0.151	0.184	0.157	0.180	0.163	0.168
2008	0.191	0.185	0.200	0.186	0.005	0.160	0.193	0.205	0.208	0.175	0.161	0.229
2009	0.179	0.180	0.177	0.170	0.010	0.126	0.133	0.216	0.187	0.214	0.170	0.163
2010	0.174	0.174	0.175	0.165	0.009	0.193	0.144	0.173	0.146	0.176	0.220	0.131
2011	0.154	0.137	0.183	0.148	0.006	0.133	0.256	0.137	0.157	0.170	0.174	0.126
2012	0.189	0.175	0.210	0.180	0.009	0.148	0.186	0.205	0.179	0.107	0.222	0.203

Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Appendix Table 9. Exit Rates to Not Working Among 55-64 Year Olds

	All Obser- vations	Unincor- porated	Incor- porated	Manu- facturing	Retail	Service	North- east	Mid- west	South	West
1995	0.105	0.122	0.068	0.134	0.107	0.092	0.050	0.118	0.114	0.129
1996										
1997	0.114	0.129	0.078	0.091	0.115	0.126	0.145	0.085	0.101	0.136
1998	0.128	0.143	0.094	0.185	0.184	0.069	0.115	0.200	0.119	0.098
1999	0.114	0.151	0.053	0.124	0.122	0.106	0.114	0.184	0.094	0.098
2000	0.138	0.165	0.086	0.163	0.114	0.134	0.119	0.204	0.134	0.115
2001	0.119	0.128	0.103	0.178	0.120	0.094	0.123	0.119	0.130	0.101
2002	0.126	0.147	0.089	0.087	0.184	0.119	0.201	0.083	0.140	0.081
2003	0.087	0.103	0.064	0.106	0.091	0.078	0.090	0.108	0.073	0.088
2004	0.124	0.136	0.103	0.062	0.129	0.145	0.119	0.100	0.130	0.133
2005	0.087	0.101	0.064	0.098	0.178	0.060	0.064	0.086	0.109	0.069
2006	0.108	0.139	0.054	0.086	0.141	0.107	0.106	0.123	0.090	0.124
2007	0.083	0.099	0.052	0.108	0.117	0.063	0.081	0.097	0.079	0.079
2008	0.087	0.115	0.043	0.088	0.083	0.087	0.086	0.084	0.098	0.075
2009	0.131	0.152	0.097	0.144	0.148	0.121	0.149	0.110	0.167	0.089
2010	0.116	0.142	0.068	0.137	0.137	0.101	0.161	0.097	0.115	0.093
2011	0.107	0.122	0.081	0.121	0.078	0.109	0.054	0.120	0.129	0.105
2012	0.093	0.123	0.045	0.133	0.056	0.085	0.113	0.072	0.093	0.093

Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Appendix Table 10. Self-Employment Rates Among 55 Year Olds

	Full Sample	Unincorporated	Incorporated	Manufacturing	Retail	Service	North-east	Mid-west	South	West
1994	0.167	0.117	0.050	0.175	0.355	0.175	0.163	0.142	0.195	0.218
1995	0.170	0.110	0.060	0.079	0.251	0.128	0.154	0.172	0.106	0.212
1996	0.161	0.107	0.053							
1997	0.169	0.118	0.051	0.205	0.240	0.145	0.151	0.144	0.174	0.169
1998	0.164	0.114	0.050	0.153	0.211	0.138	0.105	0.081	0.196	0.211
1999	0.124	0.081	0.042	0.131	0.166	0.108	0.087	0.115	0.116	0.180
2000	0.126	0.079	0.047	0.112	0.202	0.113	0.150	0.125	0.133	0.100
2001	0.157	0.096	0.061	0.134	0.126	0.159	0.198	0.080	0.121	0.233
2002	0.134	0.082	0.052	0.109	0.121	0.107	0.087	0.091	0.107	0.203
2003	0.153	0.093	0.060	0.128	0.126	0.170	0.165	0.131	0.099	0.188
2004	0.153	0.100	0.053	0.219	0.179	0.131	0.160	0.105	0.196	0.181
2005	0.141	0.094	0.047	0.166	0.207	0.124	0.137	0.128	0.079	0.223
2006	0.144	0.088	0.056	0.164	0.288	0.144	0.082	0.210	0.154	0.179
2007	0.155	0.096	0.059	0.158	0.209	0.127	0.118	0.093	0.176	0.185
2008	0.139	0.081	0.058	0.104	0.140	0.138	0.120	0.100	0.133	0.135
2009	0.140	0.085	0.055	0.158	0.114	0.150	0.135	0.111	0.122	0.177
2010	0.132	0.085	0.047	0.163	0.133	0.138	0.140	0.127	0.127	0.167
2011	0.108	0.067	0.040	0.117	0.112	0.081	0.081	0.070	0.085	0.156
2012	0.123	0.080	0.043	0.110	0.132	0.137	0.169	0.105	0.113	0.148

Source: Author's tabulations using the 1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS).

Appendix Table 11. Definitions and Sources for Variables in Multinomial Logit Regressions

Variable	Definition	Source
Self Employed	Indicator variable that equals one if individual's class of worker is unincorporated or incorporated self-employment	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Wage and Salary Employee	Indicator variable that equals one if individual's labor force status is employed, and class of worker is private or government	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Not Working	Indicator variable that equals one if individual is unemployed, not in labor force, or industry is agriculture	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Female	Indicator variable that equals one if individual is female	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Age	Age in years	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Total Income	Total amount of family income	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Investment Income	Sum of family's interest, dividends, and rental income	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Labor and Transfer Income	Sum of family's wages and salaries, self-employment, farm income, unemployment compensation, Social Security benefits, retirement income, and alimony	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
High School Graduate	Indicator variable that equals one if individual's highest level of educational attainment is a high school diploma or equivalent	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)

Some College	Indicator variable that equals one if individual's highest level of educational attainment is an Associate's degree, or if the individual attended college but did not receive a Bachelor's degree	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
College Graduate	Indicator variable that equals one if individual's highest level of educational attainment is a Bachelor's degree	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Graduate School	Indicator variable that equals one if individual's highest level of educational attainment is a Master's, Professional, or Doctoral degree	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
African-American	Indicator variable that equals one if individual is African-American	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Other	Indicator variable that equals one if individual is a non-white race other than African-American	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Number of Children < 18	Number of children under the age of 18 who live with the respondent	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
DI Average Benefit	State level annual ratio of amount of Disability Insurance benefits disbursed to the number of Disability Insurance recipients	<i>OASDI Beneficiaries by State and County</i> (Various Years), Social Security Administration, Office of Policy and Office of Research, Evaluation and Statistics. Tables 1-3. http://www.ssa.gov/policy/docs/statcomps/oasdi_sc/index.html
DI Receipt Rate	State level annual ratio of the number of Disability Insurance recipients to the size of the population age 18-64	<i>OASDI Beneficiaries by State and County</i> (Various Years), Social Security Administration, Office of Policy and Office of Research, Evaluation and Statistics. Tables 1-3. http://www.ssa.gov/policy/docs/statcomps/oasdi_sc/index.html . Popu-

		<p>lation Data from http://www.census.gov/popest/data/state/asrh/1990s/tables/ST-99-09.txt, https://www.census.gov/popest/data/state/asrh/2009/files/SC-EST2009-AGESEX-RES.csv, http://www.census.gov/popest/data/state/asrh/2012/index.html</p>
Unemployment Rate	State level annual unemployment rate	U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics. (www.bls.gov/lau)
Average Wages (in \$1000s)	State level annual average wage	U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages. (www.bls.gov/cew)
After-Tax Price of SE Health Insurance	The after tax price of a dollar of health insurance premiums paid if self-employed, calculated as $1 - \theta_f \tau_f - \theta_s \tau_s + (\theta_s \tau_s \tau_f) * item$, where τ_f and τ_s are federal and state marginal tax rates, <i>item</i> is an indicator for the individual itemizing deductions, and θ_f and θ_s are the shares of self-employed health insurance premiums deductible at the federal and state levels.	Marginal tax rates calculated using NBER's TAXSIM model (users.nber.org/~taxsim) on CPS data. Federal deductibility of self-employed health insurance information from Heim and Lurie (2009). State deductibility of self-employed health insurance information from Selden (2009), extended up to 2012 and back to 1994 by author.
After-Tax Price of WS Health Insurance	The after tax price of a dollar of employer sponsored health insurance premiums, calculated as $(1 - \tau_p - \tau_f - \tau_s + (\tau_s \tau_f) * item) / (1 + \tau_p)$, where τ_p is the payroll tax rate, τ_f and τ_s are federal and state marginal tax rates, and <i>item</i> is an indicator for the individual itemizing deductions.	Marginal tax rates calculated using NBER's TAXSIM model (users.nber.org/~taxsim) on CPS data.
Community Rating or Guaranteed Issue Individual	Indicator variable for the respondent's state having community rating or guaranteed issue regulations in the individual	Information collected by Heim and Lurie (forthcoming-a)

HI Regulation	health insurance market	
Community Rating and Guaranteed Issue Individual HI Regulation	Indicator variable for the respondent's state having both community rating and guaranteed issue regulations in the individual health insurance market	Information collected by Heim and Lurie (forthcoming-a)
Medicare	Indicator variable for the individual reporting being covered by Medicare	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Medicaid	Indicator variable for the individual reporting being covered by Medicaid	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Dependent Health Insurance	Indicator variable for the individual reporting being covered as a dependent on another individual's health insurance policy	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Private Health Insurance	Indicator variable for the individual reporting being covered by private health insurance	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Employer-Sponsored Health Insurance	Indicator variable for the individual reporting being covered by employer-sponsored health insurance	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Other Health Insurance	Indicator variable for the individual reporting being covered by some other type of health insurance	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)
Employer Pension Plan	Indicator variable for the individual reporting being a participant in an employer's pension plan	1994-2012 Annual Social and Economic (ASEC) supplements of the Current Population Survey (CPS)

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