Divergent Fortunes: Income Diversification, Rising Older Entrepreneurship and Falling Younger Entrepreneurship

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I.   **Introduction**

Entrepreneurship is often understood as an economically important and personally rewarding experience for those willing to take the associated risks. Because older households are naturally more risk averse than younger households, considering they have less time to recover from potential income and savings losses, we should observe more entrepreneurship among younger than older households. The opposite has been the case for some time, though. Entrepreneurship has declined among households headed by somebody younger than 50 years (Simon & Barr, 2015), while it has grown among older households and become more prevalent than among younger households (Cahill, Giandrea & Quinn, 2013; Curl, Sharpe & Noone, 2014; Moulton, Diebold & Scott, forthcoming; Stangler, 2009; Zissimopoulos & Karoly, 2007).

It is possible that the risks associated with entrepreneurship have fallen for older households, but increased for younger ones. Moulton, Diebold and Scott (forthcoming) attribute some of this growth to the Medicare Modernization Act of 2003, which increased older households' access to prescription drug coverage. Weller et al. (2015) similarly find that diversifying income away from risky business income, for instance, with interest and dividends has contributed to growing older entrepreneurship after 1998. Younger households, on the other hand, may have taken on more debt than was the case for previous generations (SBA, 2014), leaving them with less wealth and thus fewer opportunities to generate capital income as an income diversification and risk mitigation strategy.

It is, however, also possible that entrepreneurship among younger households is not correlated with income diversification. The decline of entrepreneurship among younger households then may reflect other factors such as demographic shifts towards more single households, which tend to be less likely to be entrepreneurs than married couples and less desire for nonpecuniary rewards associated with entrepreneurship such as autonomy (Hamilton, 2000).

Our paper is the first, to our knowledge, to systematically document the widening entrepreneurship gap by age and to examine the role of income diversification as a potential correlate with

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declining younger entrepreneurship since the early 2000s. Our research could further our understanding of the importance of risk mitigation strategies for entrepreneurs.

The rest of our paper proceeds as follows. Section II offers a brief review of the relevant literature, followed by a presentation of our data and methodology in section III. Section IV shows our empirical results for entrepreneurship trends by age and for the role of income diversification in determining changes in entrepreneurship by age. We discuss several possible alternative explanations for the widening entrepreneurship gap in section V and section VI concludes.

II.   **Literature Review**

Entrepreneurship is one possible employment arrangement, although it is generally seen as riskier than wage and salary employment. Yet, entrepreneurship in the United States appears to have trended downward over the past two decades (Morelix et al., 2015). This national trend, though, masks a growing divide in entrepreneurial activity. Entrepreneurship has declined among households headed by somebody younger than 50 years (Simon & Barr, 2015), while it has grown among older households and become more prevalent than among younger households (Cahill, Giandrea & Quinn, 2013; Curl, Sharpe & Noone, 2014; Moulton, Diebold & Scott, forthcoming; Stangler, 2009; Zissimopoulos & Karoly, 2007).

Wage and salary employment can entail risks as people lose their jobs and face wage and benefit cuts, but entrepreneurship is generally riskier as it could result in substantial income and wealth losses if a business struggles or fails. All else equal, households will then become entrepreneurs if they have lower risk aversion (Douglas & Shepherd, 2000; Ekelund et al. 2005; Hartog, Ferrer-i-Carbonell & Jonker, 2002) or if the risks associated with entrepreneurship are mitigated, for instance, through easier access to health insurance (Blumberg, Corlette & Lucia, 2015; Moulton, Diebold & Scott, forthcoming). Risk aversion and economic risks associated with entrepreneurship are generally higher for older households than for younger ones as older households tend to be more risk averse (Palsson, 1996) and by extension would need more risk mitigation to work as entrepreneurs.

Income diversification can indeed incentivize entrepreneurship. A number of researchers find that access to health insurance – an in-kind form of income – increases job mobility (Gruber & Madrian,

2002) and self-employment (DeCicca, 2010; Fairlie, Kapur & Gates, 2011; Moulton, Diebold & Scott, forthcoming). Olds (2014) also finds that in-kind transfers in the form of food stamps contribute to increased self-employment. Income diversification through cash income, which is by definition at least as if not more valuable to recipients as in-kind transfers, should have similar effects on entrepreneurship. Further, Gruber and Orszag (2003) find that the Social Security earnings test may reduce women's employment, implying that the elimination of the earnings test – greater earnings potential – would increase overall employment. Similarly, Haider and Loughran (2008) find that the Social Security earnings test increases older men's earnings, although there is again no distinction by employment arrangements. The existing evidence suggests that income diversification is positively related to employment, although the role of income diversification through cash income as incentives for people to become or stay entrepreneurs remains understudied.

Importantly, income diversification from cash income as an incentive for entrepreneurs may be able to explain the divergence in entrepreneurship by age. Older households have gained new ways to diversify their income with capital income and retirement benefits, while such access has declined for younger households. First, older households' wealth has disproportionately grown over the past three decades (Fry et al., 2011; Weller et al. 2015). With greater wealth, older households can finance their business and liquidate more of their assets through realized capital gains and realized dividends and interest payments as a source of additional income unrelated to risky business income (Weller & Wenger, 2015).[2] Importantly, while wealth does not appear to be a systematic source of business liquidity (Hurst & Lusardi, 2004), it may be a source of personal income diversification for entrepreneurs. Second, older households also gained access to more income diversification through Social Security. Fry et al. (2011) suggest that older adults are advantaged by having inflation-indexed Social Security as the anchor of their annual income streams. Legislative changes in 2001 reduced earnings tests for those starting to receive

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[2] We used synthetic cohort analyses to use simplified Granger causality tests between capital income and wealth. Our results show that neither is leading the other, suggesting that capital income and wealth are only loosely correlated.

Social Security benefits at or after the full-benefit age, allowing older Social Security recipients to earn more money while collecting their full benefits (Burke, 2000). Third, cash income transfers for self-employment purposes exists under the Unemployment Insurance system, but its reach is very limited. The Self-Employment Assistance (SEA) program allows laid off workers to use their benefits to start a business. Many of the unemployed, though, do not qualify for unemployment insurance benefits and if they do, they may not work in a state that offers SEA since only ten states offered such programs in 2016 (DOL, 2016). That is, older workers have gained access to key cash income diversification tools, while this is not the case for younger workers.

Income diversification, however, may play only a limited role or no role in incentivizing entrepreneurship. First, workers may seek out more self-employment since wage and salary employment has become less remunerative; median wage growth in the US has been nearly stagnant since 1979 (Mishel, Gould & Bivens, 2015) and long-term unemployment has trended upward, suggesting that, once people lose a job, they have a harder time than in the past to get back into another job As a consequence, people may become more willing to pursue entrepreneurship than in the past. Second, financial deregulation has improved credit access, at least prior to the Great Recession. Financial deregulation culminated in the Gramm-Leach-Bliley Act of 1999, which has contributed to greater market investments overall without adverse effects to smaller businesses (Carow, Kane, & Narayanan, 2006; Rauch & Hendrickson, 2004). That is, lower interest rates and fewer credit constraints applied to all borrowers including entrepreneurs. Third, entrepreneurs can be motivated by nonpecuniary effects such as more scheduling flexibility (Cahill, Giandrea & Quinn, 2006), greater independence (Dawson & Henley, 2012; Cromie, 1987), more self-esteem (Carland, Carland & Carland, 1995) and less discrimination (Unson & Richardson, 2013). Hamilton (2000), for instance, interprets the fact that the self-employed often earn less than they could in wage and salary employment as evidence for the persistence of such nonpecuniary effects.

All of these alternative explanations could explain the growing entrepreneurship divide by age. Older workers, for instance, typically experience longer spells of unemployment than younger workers

(BLS, 2016). The increases of income uncertainty associated with wage and salary employment then may have been greater for older workers than younger workers. Also, younger workers may decide to stay in wage and salary employment longer than in the past, even though or possibly because the labor market has become riskier, to further their skills and thus improve their future earnings potential. This is less relevant to older workers, who have fewer years left in the labor market. Moreover, credit constraints may have dropped more for older households than for younger ones since incomes and collateral have improved more for older ones. And finally, many changes in nonpecuniary incentives by age may be a priori ambiguous, except for age discrimination, which by definition does not apply to younger workers. It is possible that older workers may increasingly enter entrepreneurship to avoid age discrimination.

We primarily want to understand the role of income diversification for entrepreneurship to see whether differential access can explain the growing entrepreneurship gap by age. We also consider alternative explanations to ensure the robustness of our conclusions.

III.   **Data and variables**

We use the Federal Reserve's triennial Survey of Consumer Finances (SCF) as our data source. The SCF is a nationally representative household survey on wealth, including business ownership (Bricker et al., 2012). It also includes information on sources and amounts of income and employment status. Moreover, the SCF contains several demographic characteristics for the head of household such as age, marital status, education, ethnicity and race. All variables are available from 1989 to 2013, leaving us with nine cross-sectional survey years.

The SCF is a cross-sectional data set repeated every three years that oversamples wealthy households to get an accurate picture of total U.S. wealth. Household weights are designed to capture the entire US population and all of its assets (Kennickell, 2001). The SCF in 2013 included 6,026 households, of which 1,458 cases were selected to represent relatively wealthy households (BOG, 2014). The SCF imputes missing data and generates five replicates of each observation, each with separate weights, to increase the number of usable observations fivefold while holding the sample size constant.

We separate households into older and younger households, such that those with a head of household 50 years old or older are older and everybody else is younger. This age cutoff preserves sufficiently large samples for all years in both age groups. We include retirees and non-retirees in both growth to track changes in income as many retirees still receive employment income.

Households' employment arrangements

We classify people as wage-and-salary employees, independent contractors or entrepreneurs. The SCF asks one question on employment status of the head of household – works for somebody else, self-employed, retired, or disabled or otherwise out of the labor force. Separately, the SCF asks questions related to owning a privately held business with fewer than 500 employees. We define entrepreneurs as those who own and manage such a business worth over $5000 (in 2013 dollars).[3] Independent contractors, in comparison, own and manage such a business, but that it was worth less than $5000 (in 2013 dollars).

We use the employment status question to identify the head of household's primary employment arrangement under multiple employment arrangements. We hence define full-time entrepreneurs, for instance, as those who own and manage their own business and also indicated they are self-employed. Part-time entrepreneurs, in comparison, own and manage their own business worth more than $5,000 (in 2013 dollars), but indicated an employment status other than self-employment. We can similarly distinguish full-time and part-time independent contractors. Wage and salary employees are all those, who indicate that they work for somebody else in the employment status question.

Our data show the share of entrepreneurs, rather than those moving into entrepreneurship. Studying entrepreneurs, whose businesses are larger than those of independent contractors, reflect greater commitments in terms of time (longer-term commitments) and size (higher financing needs). Independent contracting may fluctuate more with short-term trends than is the case for entrepreneurship. Thus, an analysis of entrepreneurship trends by age may better capture longer-term trends in the changing relative

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[3] Our definition is consistent with the literature. See, for instance, Bitler, Moskowitz & Vissing-Jorgensen (2005), Cagetti & DeNardi (2006), Gentry & Hubbard (2000), DeNardi, Doctor & Krane (2007) and Quadrini (2000), who use positive business net worth thresholds for their definitions of entrepreneurs. Our results are robust when we move the threshold for entrepreneurs below $5,000 to, for instance, $3,000 (in 2013 dollars).

risk of entrepreneurship compared to looking at the flows into and out of self-employment or trends in independent contracting. Focusing on the share of older entrepreneurs consequently highlights the determinants of sustained rather than transitory self-employment increases.

Changes over time

We study the importance of economic pressures and financial strength in determining changes in the relative risk of entrepreneurship compared to wage and salary employment. We specifically consider changes correlated with entrepreneurship growth by separating our sample into early years (1989 to 1998) and later years (2001 to 2013). This data break correlates with key increases in wage and salary employment uncertainty and in financial strength. The recession in early 2001, for instance, marks an upturn in long-term unemployment (Kosanovich & Sherman, 2015) and the return to stagnant wages for low-wage and middle-wage workers (Mishel, Gould & Bivens, 1995). Household wealth also reached a peak never before recorded in early 2000.[4] Moreover, credit access increased for all business with the Gramm-Leach-Bliley Act of 1999. Further, the Senior Citizens' Freedom to Work Act of 2000 made it easier for people to work and receive full Social Security benefits (Burke, 2000).[5] None of these factors systematically changed with the Great Recession of 2007 to 2009, suggesting that there is only one justifiable economically relevant break in our data that falls between the survey years of 1998 and 2001.

Indicators capturing declining risks of entrepreneurship due to income diversification

Lower financial risks of entrepreneurship would be reflected in more access to income diversification. To capture income diversification, we consider whether a household has substantial income from private capital (capital gains and dividend and interest income) or from Social Security and retirement income. In each case, we create an indicator variable for receipt of substantial income that takes on the value of '1' if the household received more than $5,000 (in 2013 dollars) from a particular income source in a given year, and '0' otherwise.

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[4] Authors' calculations based on Board of Governors. Federal Reserve System. 2015. Release Z.1 Financial Accounts of the United States. Washington, DC: BOG.

[5] Congress initially created DOL's SEA program in 1992 and expanded it in 2012 (CFED, 2013; DOL, 2016), but its scope is limited and likely too small to affect the numbers of entrepreneurs at the national level in a noticeable way.

Direct measures for alternative explanations for widening entrepreneurship gap

Contemporaneous economic pressure indicators alone cannot capture the relationship between economic pressures and the entrepreneurship share in cross-sectional data because these dynamics likely unfold over time. We first examine the effects of concurrent economic difficulty, specifically the share of part-time entrepreneurs and the share of households with substantial government transfer income (unemployment insurance and worker's comp) greater than $5,000 (in 2013 dollars) to see if they correlate with entrepreneurship trends. We also use proximate measures that capture economic pressure trends, including age, age at which a business was started and expected years to retirement. It is, for instance, possible that younger households delayed starting a business, while older households decided to remain entrepreneurs longer due to economic pressures, resulting in a widening gap of entrepreneurship by age over time. We further supplement our analysis with data on people's skills, specifically the share of households with at least a college degree and the number of years working full time, to see whether younger households are more likely in the later years than in the early years to stay in wage and salary employment to increase their skills. We would expect to see government transfer receipts to become more of an incentive or at least less of an obstacle to entrepreneurship for older entrepreneurs compared to younger ones if economic pressures had a differential effect on entrepreneurship by age. Similarly, we would expect the share of part-time entrepreneurs to have fallen among younger entrepreneurs, but grown among older ones if economic pressures have contributed to the widening entrepreneurship gap by age. The underlying logic here is that part-time entrepreneurship may offer a safety valve if people pursue entrepreneurship amid rising economic pressures. We would also expect that the age of younger and older entrepreneurs went up, suggesting that younger entrepreneurs waited longer to enter entrepreneurship, while older entrepreneurs continued to work longer. And, we would expect that younger wage and salary employees closed the skills gap – measured by college degrees and full-time job experience -- with entrepreneurs, who usually have more formal education and often more work experience, while we would not expect to see a narrowing of this gap among older households. That is, we especially consider the relative difference in skills between entrepreneurs and wage and salary employees in our data.

We also control for the possibility that credit access has differentially change by entrepreneurs' age. We specifically use past delinquency rates as an inverse proxy for borrower quality. Alternatively, we use loan denial rates as a measure of entrepreneurial liquidity constraints. We also consider whether households have become more indebted. It is again possible that credit access improved for older households, but worsened for younger ones, resulting in a widening entrepreneurship gap by age. We would then expect to see delinquency rates, loan denials and debt to asset ratios to increase for younger households, while they remained stable or even improved for older households.

Finally, we consider whether non-pecuniary motives have become increasingly important for older entrepreneurs. Our data set does not include variables that would allow us to directly assess non-pecuniary motives in owning and managing a business. We instead summarize data, so that we can compare what entrepreneurs would have earned as wage and salary employees with their actual business income. Entrepreneurial income below what entrepreneurs could have earned as wage and salary employees suggest that entrepreneurs receive nonpecuniary rewards such as greater autonomy from their work (Hamilton, 2000). We first estimate Mincer regressions, which are commonly used to calculate age-earnings profiles (Mincer, 1958; Lemieux, 2003; Heckman, Lochner & Todd, 2003), for the earnings of wage and salary employees. We now use mutually exclusive definitions of wage and salary employees and full-time entrepreneurs. We conduct our estimates separately for women and for men since earnings are paid to individuals.[6] And, we combine data for the early years (1989 to 1998) and for the later years (2001 to 2013), ensuring that we have sufficiently robust sample sizes for our estimates. Our regressors are years of schooling, potential experience, potential experience squared, and controls for industry, occupation and year. We subsequently use our parameter estimates to predict annualized earnings for full-time entrepreneurs and compare those predicted earnings with entrepreneurs' business income, which we define as the sum of the earnings they receive from their business plus business income reported on their tax forms. Our business income measure is akin to one of the variables defined by Hamilton (2000) and is

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[6] We base the rest of our analysis on households rather than individuals since many key variables for assets, debts and income diversification are only available at the household level.

less likely to be influenced by tax considerations than just using business income. We specifically calculate the ratio of entrepreneurs' median actual income to median predicted earnings.[7] A ratio of less than 100 percent suggests that entrepreneurs receive nonpecuniary benefits from their work.

Our comparative earnings analysis has several limitations. Our results can give a general sense of trends in the earnings differentials between entrepreneurs and wage and salary employees by age, but they lack the accuracy of other estimates for the earnings potential of the self-employed. First, the SCF has fewer observations than other data sets used to estimate earnings regressions, which requires us to combine years in our analysis (Lemieux, 2003; Heckman, Lochner & Todd, 2003). Age-earnings profiles in different years may vary, although such variations are likely to be small. We add the survey year as regressor to account for changes in age-earnings profiles caused, for instance, by a national recession. Second, the publicly available data from the SCF do not contain information on the race/ethnicity of a spouse, requiring us to eliminate a potentially important determinant of earnings. Our results may understate the earnings potential for white entrepreneurs, who tend to make up a disproportionate share of entrepreneurs. The relative differences between predicted earnings for entrepreneurs and actual earnings of wage and salary employees are thus lower than they otherwise would be. Third, the SCF does not directly ask which spouse in a married couple runs the business that the household owns and manages. We infer that a spouse is an entrepreneur if the household owns and manages their own small business worth at least $5,000 (in 2013 dollars), if a spouse works in that business and if that spouse indicates that they are self-employed.

Additional controls

We also include demographic controls for race, ethnicity, family status, educational attainment and risk tolerance in our analyses. Demographics are increasingly being examined for their correlation to entrepreneurship. For example, several studies find that non-whites and Hispanics have a higher rate of entrepreneurship than non-Hispanic whites (Biggs & Springstead 2008; Lofstrom, Parker & Bates 2012;

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[7] We use medians here since entrepreneurship income can be highly unevenly distributed, skewing averages.

Fairlie 2012). And, women make up slightly more than half of all self-employed, but women-owned businesses are typically smaller than businesses owned by men (U.S. Department of Commerce, 2010), which could result in women-owned businesses being more likely operating as independent contractors than as entrepreneurs. Zissimopoulos, Karoly, and Gu (2009) also find that older individuals with higher levels of education are more likely to pursue self-employment. Finally, recent research suggests that less risk averse people may be more likely to start a business than more risk averse ones (Caliendo, Fossen & Kritikos, 2009). We control for these factors to make sure that the widening entrepreneurship gap by age did not follow demographic changes, but rather reflect underlying economic trends.

Data limitations

We should note a few limitations of our research. First, we use cross-sectional data, which makes it difficult to infer causality rather than correlation. However, we bring several backward looking indicators to bear and undertake a number of supplemental analyses to at least rule out reverse causality from entrepreneurship to capital gains and interest and dividend income. Second, our data combine household observations such as sources of household income with observations for the head of household such as risk aversion and age. In married couples, who make up more than 80 percent of entrepreneurs, the head of household is almost universally the husband in the SCF. Our key income diversification variables reflect the uncertainty of household income and thus capture joint household decisions to a large degree. Our economic pressure proxies such as age may, for instance, capture joint retirement decisions as spouses appear to coordinate retirement decisions (Johnson, 2014).

Empirical strategy

Our empirical strategy proceeds as follows. First, we show employment arrangement trends by age and provide F-tests as statistical significance tests for weighted survey data, comparing levels over time and by age. Second, we show summary data for income diversification measures – substantial income from capital and Social Security, pensions and other annuities, broken down by age and time period.

Third, we estimate the relative importance of income diversification measures in determining the likelihood of being an entrepreneur compared to working as wage and salary employee, by age and time period, using instrumental variable multinomial logit regressions.

We instrument capital income by a household's change in its wealth distribution position from three years earlier to the relevant survey year. Because we have cross-sectional data, we need to estimate the wealth that a household would have had three years earlier. To do this, we first estimate a regression for the determinants of wealth, including age and years. We then predict the wealth that a household would have had three years earlier based on the estimated regression parameters. We assign this earlier-year estimated wealth to a centile in the actual wealth distribution from three years earlier. That is, each household's estimated previous year wealth is associated with a value between 1 and 100. We also assign the actual wealth in the current survey year to a centile in the current year's wealth distribution – again, matching each household's wealth to a value between 1 and 100. We subtract the earlier wealth position indicator from the present wealth position indicator. The resulting value of changes in wealth indicator positions over a three year interval can range from -99 to 99. Because we use changes in wealth positions over three years, we cannot use observations for 1989 and thus are only left with eight survey years.

We use the values of the changes of a household's position in the wealth distribution as instruments for capital income. This is likely a good instrument. It is exogenously determined. And, households likely react to the change of their wealth relative to the distribution of wealth by accessing their wealth – if their position improves – or by reducing their access – if their position worsens. Capital income should thus be positively correlated with changes in households' relative wealth position.

We then use Rubin's (1987) method to estimate parameters and standard errors across multiple imputations to estimate the probability of being an entrepreneur with instrumented capital income as one determinant. We report relative risk ratios, which show the percentage point change of being an entrepreneur associated with moving one step up for indicators and discrete variables such as age, rather than the difficult to interpret parameter estimates.

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With our regression analyses, we want to know whether younger and older entrepreneurship is sensitive to income diversification. We also want to know whether the size of relative risk ratios changes by age in a way that can explain the widening entrepreneurship gap.

We confirm our initial regression results with a number of robustness tests, using alternative model specifications and alternative income diversification measures.

To understand the importance of income diversification for entrepreneurship, we finally provide additional estimates and discussion of alternative explanations for the growing gap in entrepreneurship by age.

IV.   **Empirical analysis**

We first summarize entrepreneurship trends by age from 1989 to 2013 in Table 1.[8] Starting in 1998, entrepreneurship is consistently more widespread among households 50 years old and older than among younger households, which represents a reversal of trends during the earlier years. This change reflects both declining younger entrepreneurship and increasing older entrepreneurship. The share of younger households working as entrepreneurs fell from 9.8 percent during the early years to 9.0 percent in the later years. At the same time, entrepreneurship increased from 8.3 percent for older households during the early years to 9.9 percent during the later years (Table 1).

*** INSERT TABLE 1 ABOUT HERE ***

These changes may not seem large, but they occurred against the backdrop of an aging society, which magnifies the relative changes. Entrepreneurship has increased by 1.6 percentage points as share of all older households, compared to a drop of 0.8 percentage points for younger households from the early to the later years. At the same time, the share of older households has grown from 42.7 percent of the population during the early years to 48.4 percent in the later years. As a result, the number of older entrepreneurs has substantially increased. During the early years, there was an average of 3.5 million older entrepreneurs in any given year, compared to 5.6 million older entrepreneurs in the later years. Even

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[8] We tested alternative entrepreneurship definitions, which also show a widening gap in entrepreneurship.

in 2013, there were 5.4 million older entrepreneurs, well above the 3.8 million older entrepreneurs in 1998 – the largest annual number during the early years. In comparison, the number of younger entrepreneurs totaled 5.0 million in 2010 and 4.5 million in 2013, the second lowest and lowest numbers since 1989, respectively. While there were 2.5 million more younger entrepreneurs than older ones in 1989, there were 900,000 more older entrepreneurs than younger ones in 2013.[9]

Table 1 also shows that the widening age gap is unique to entrepreneurship as there are no changes in independent contracting by age. Not shown here, the growth in older entrepreneurship primarily results from full-time entrepreneurship, not part-time entrepreneurship.[10] The decline in younger entrepreneurship is about evenly split between full-time and part-time entrepreneurship, according to our calculations. Put differently, the widening entrepreneurship gap by age is largely a full-time entrepreneurship phenomenon.

Table 2 next shows our summary data on income diversification for entrepreneurs by age and time period. Older entrepreneurs are more likely to receive substantial income from two income sources unrelated with business income – capital income and Social Security, pensions and other annuities – than is the case for younger entrepreneurs (Table 2). Furthermore, capital income has declined for older entrepreneurs, while Social Security, pensions and other annuities have increased. Younger entrepreneurs saw a decline in the share of households with substantial capital income from 17.8 percent in the earlier years to 14.7 percent in the later years (Table 2). . Income diversification from either source declined for younger entrepreneurs from 19.8 percent in the early years to 17.4 percent in the later years (Table 2), while simultaneously the share of younger entrepreneurs also fell. At the same time, the respective share with substantial income from capital or Social Security, pensions and annuities held steady among older entrepreneurs with a little over 50 percent (Table 2), even as older entrepreneurship increased.

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[9] All numbers in this paragraph are authors' calculations based on BOG (various years).

[10] The relative increase in entrepreneurship from the early to the late years at 19.3 percent is slightly larger than the relative increase in wage and salary employment at 18.6 percent, but the relative increase in full-time entrepreneurship of 28.3 percent from an average of 5.3 percent in the early years to an average of 6.8 percent in the later years was much larger. Authors' calculations based on Fed (various years).

*** INSERT TABLE 2 ABOUT HERE ***

Multivariate results for income diversification in determining entrepreneurship

We next simultaneously test the relative importance of income diversification and a number of other control variables in determining entrepreneurship by age, using instrumental variable multinomial logistic regressions. We compare self-employment, and independent contractors to wage-and-salary employees and only include full-time workers (35 hours or more) in our analysis. We use the same income diversification variables as in Table 2. We also include demographic controls for race, ethnicity, family status, education, and risk tolerance to our model.[11]

We estimate the full model separately for households younger than 50 years and for those 50 years old and older. We also estimate each model for the early and the late years, but add another model for the years after the Great Recession – 2010 and 2013 – to ensure that our conclusions are not unduly influenced by the turmoil following that recession.

Table 3 shows the relative risk ratios of each factor rather than the underlying parameter estimates.[12] We are especially interested to see whether income diversification matters for entrepreneurship by age and whether those determinants have changed over time.

Income diversification is linked to the likelihood of being an entrepreneur.[13] We find that capital income is associated with more entrepreneurship in the early years among younger and older households

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[11] The SCF asks "which of the statements … comes closest to the amount of financial risk that you are willing to take when you save or make investments?", allowing respondents to choose from "Take substantial/above average/average financial risks expecting to earn substantial/above average/average returns" and "Not willing to take any financial risks". We combine answers indicating above average and substantial willingness to take risks.

[12] The appendix includes the parameter estimates as well as standard diagnostics in Table A1. We do not include parameter estimates or relative risk ratios for independent contractors since our earlier evidence has shown that the widening gap in self-employment by age is driven by entrepreneurship.

[13] Other estimates have the expected signs or are statistically significant. Single women are less likely to be entrepreneurs, for instance. Having been delinquent on a bill is associated with a higher likelihood of entrepreneurship, indicating that entrepreneurs likely face more financial constraints than wage and salary workers. To confirm this, we reestimated our results with an indicator for the likelihood of being denied a loan application as explanatory variable instead of whether a household has been delinquent on any bills. These results suggest that entrepreneurs are more likely than wage and salary employees to have been denied a loan application, confirming that entrepreneurs face greater liquidity constraints. Also, entrepreneurs are less likely than wage and salary employees to have health insurance. Finally, after controlling for other factors, people with at least a college degree are less likely than people without high school degrees to be entrepreneurs, compared to wage and salary employees.

and Social Security, pension and annuity income shows a positive correlation with older entrepreneurship after the Great Recession (Table 3). Having substantial capital income raises the chance of being an entrepreneur relative to wage and salary employment by 73.9 percent for younger households and by 89.6 percent for older households in the later years (Table 3). Put differently, having substantial capital income substantially raises the chance of being an entrepreneur instead of wage and salary employee.

*** INSERT TABLE 3 ABOUT HERE ***

The size of the effects of income diversification in determining the likelihood of entrepreneurship generally increases over time for younger and older households (Table 3). The chance of being a younger entrepreneur relative to wage and salary employees was 66.9 percent greater with substantial capital income between 1992 and 1998, compared to 73.9 percent between 2001 and 2013.[14] Among older households, the relative increased in probability of entrepreneurship compared to wage and salary employment associated with substantial capital income grew from 78.8 in the early years to 89.6 percent. The importance of capital income in determining entrepreneurship increased faster for older households – by 11.1 percentage points -- than for younger ones, who only saw a gain of 5.7 percentage points in their relative probability of being entrepreneurs over time (Table 3).

Income diversification is more predictive of older entrepreneurship than it is for younger entrepreneurs. Since older entrepreneurs have substantially more access to income diversification than younger ones do (Table 2), it is likely that income diversification partially explains the widening age gap in entrepreneurship..[15]

We undertake a robustness check for our key multivariate results. We estimate our full model from Table 3 with an alternative specification of the income diversification variables. We now generate indicators that take on the value of '1' if any given income source makes up more than 20 percent of a household's income and zero otherwise. Our previous results and conclusions are robust. Capital income

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[14] We lose observations from 1989 due to our instrumenting process.
[15] We should note that older entrepreneurs have become more likely than wage and salary employees to have substantial capital income. Only 15.7 percent of older wage and salary employees had substantial capital income in the early years, and 104 percent did in the later years. Authors' calculations based on Fed (various years).

is relatively more important for older households than for younger ones and the gap has grown over time

(Table 4). Social Security, pensions and annuity income are now statistically significant in the later years

(Table 4).[16]

*** INSERT TABLE 4 ABOUT HERE ***

Exploring alternative explanations for the growing entrepreneurship gap

We consider three alternative explanations for the widening gap in entrepreneurship by age:

rising economic pressures, fewer credit constraints and differential valuation of nonpecuniary benefits. In

relevant instances, we compare data for entrepreneurs with that for wage and salary employees. We will

thus consider additional data as well as our previous multivariate results in this discussion.

First, younger and older households may have reacted differently to growing economic pressures

in the labor market. Job uncertainty may have risen more for older workers than for younger ones and

younger workers may have increasingly chosen wage and salary employment as an opportunity to

advance their skills as insurance against job and earnings uncertainty in the future.

We now consider direct economic pressure indicators such as substantial government transfer

income receipt and the share of part-time entrepreneurs, proximate economic pressure indicators such as

entrepreneurs' age and supplemental measures of the skill development for wage and salary employees

such as the share of people with college degrees and length of time in full-time employment.

Table 5 offers additional summary data on direct and proximate economic pressure indicators as

well as on two skill development measures. The rising age of younger entrepreneurs and the falling share

of part-time entrepreneurship among younger entrepreneurs support the argument that younger

households responded to rising pressures by delaying entrepreneurship, while the stable share of younger

entrepreneurs with substantial government transfer income at around six percent does not support this

argument (Table 5). Our multivariate results in Tables 3 and 4 also indicate that the chance of being an

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[16] We also estimated our model with only one indicator for income diversification – whether a household has substantial income from any of the two key income sources. Our results – not shown here – show that income diversification becomes somewhat smaller in determining younger entrepreneurship, while it becomes larger in determining older entrepreneurship over time.

entrepreneur went up with age and faster so in the later years, which implies that while younger

households waited longer to start a business,[17] they eventually became more likely to work as

entrepreneurs than in the past. Further, our previous multivariate results showed that younger

entrepreneurship was increasingly negatively correlated with government transfer income receipt, which

again suggests that younger households became more likely to stay in wage and salary employment in the

later years than in the early years in part because of economic pressures. Finally, the skills differences

between younger entrepreneurs and wage and salary employees remained stable over time (Table 5),

suggesting that gaining more skills in the face of rising pressures played little role in holding back

younger entrepreneurship.[18] Our data suggest in part that younger households responded to greater

uncertainty of wage and salary employment by delaying entrepreneurship, although the exact reasons for

this delay are unclear.

<center>*** INSERT TABLE 5 ABOUT HERE ***</center>

The support for a correlation between labor market pressures and older entrepreneurship is

weaker than for younger households (Table 6). Part-time entrepreneurship fell among older households,

while the age of older entrepreneurs stayed constant, contradicting our expectations for a connection

between economic pressures and entrepreneurship. At the same time, the share of older entrepreneurs

with substantial government transfer income receipt increased (Table 5) and substantial government

income receipt became less of a negative factor in determining older entrepreneurship over time (Tables 3

and 4), suggesting that a small share of older households may have responded to labor market pressures

by working as entrepreneurs. The bottom line is that increasing labor market pressures and the associated

growth of risks in wage and salary employment may have held back younger households from

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[17] The average age, at which households younger than 50 years started their business went from 31.5 years in the early years to 32 years in the later years. Authors' calculations based on SCF.

[18] We also looked at occupational breakdowns among younger entrepreneurs within the highly aggregated occupational categories of the SCF and there does not appear to be a shift towards more skill intensive occupations among younger entrepreneurs over time. This also suggest that younger households stayed away from entrepreneurship due to reasons other than to gain additional skills.

entrepreneurship, while such labor market pressures do not appear to be correlated with older

entrepreneurship and thus cannot fully explain the widening gap in entrepreneurship by age.

Our data suggest that younger households delayed entrepreneurship due to economic pressures.

We consider whether the widening gap in entrepreneurship by age simply reflects later onset of

entrepreneurship and whether younger households will eventually catch up to previous cohorts.[19] We

specifically compare the entrepreneurship shares – full-time and part-time entrepreneurs as share of the

population – for households between the ages of 25 years and 34 years in 1989 with those in the same age

range in 1998. By choosing these age ranges for these cohorts, we ensure that we have sufficiently large

sample sizes for each year, that our cohorts adequately straddle the younger and older household

groupings we have used so far and that the two cohorts only minimally overlap.[20] We should see lower

entrepreneurship shares at earlier ages and either a parallel trend or gradual catching up from the younger

cohort to the older cohort if younger cohorts simply delayed entrepreneurship and planned on working as

entrepreneurs longer than was the case for older cohorts. Figure 1 instead shows a widening

entrepreneurship gap between the older and younger cohorts, suggesting that younger cohorts not only

delayed entrepreneurship due to economic pressures in their early years, but also continued to stay away

from entrepreneurship at older ages, possibly because of less access to income diversification.

*** INSERT FIGURE 1 ABOUT HERE ***

Next, we turn to differential changes in liquidity constraints by age as a possible explanation for

the widening entrepreneurship gap. We specifically summarize delinquency rates, loan denial rates and

the ratio of debt to assets for younger and older entrepreneurs in Table 6. The summary data show that

liquidity constraints – measured by delinquency rates and denial rates – loosened for younger and older

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[19] Relatedly, we consider additional information to see whether younger households may have increasingly defined entrepreneurship differently than older households did. That is, it may be possible that younger households are in fact operating as entrepreneurs, but do not consider themselves as such. The limited data in the appendix suggests that this was not the case.

[20] We also looked at younger age groups for 1989 and 1998 cohorts and for the same age groups in the intervening years – 1992 and 1995. Those comparisons show that entrepreneurship generally was less prevalent in later cohorts than in earlier ones.

entrepreneurs. In fact, the improvements were greater for younger households than for older ones.[21]

Furthermore, while younger entrepreneurs became more indebted over time, their debt increase was less

than that of younger wage and salary employees and also less pronounced than for older entrepreneurs.

All available evidence suggests that credit access in fact eased more for younger entrepreneurs than for

older ones and did not contribute to the widening entrepreneurship gap by age.

*** INSERT TABLE 6 ABOUT HERE ***

Finally, we consider whether changes in non-pecuniary benefits of entrepreneurship such as

independence and flexibility may have played a role in creating the entrepreneurship gap by age. We

specifically compare predicted earnings of entrepreneurs – what they would have earned in wage and

salary employment – with their actual income, specifically their earnings plus reported business income. I

Figure 2, we show the ratio of median entrepreneurship income to their predicted wage and salary income

for younger and older men.[22] The ratio is below 100 percent, suggesting that entrepreneurs receive

nonpecuniary benefits from their work. Importantly, the two lines for younger and older entrepreneurs are

closely related, indicating that there is no widening gap in nonpecuniary benefits by age (Figure 3).

*** INSERT FIGURE 2 ABOUT HERE ***

We find only very limited evidence that alternative scenarios can explain the widening

entrepreneurship gap by age, leaving us with the conclusion that relatively greater and more stable access

to income diversification for older households as compared to younger ones is a key explanation for the

widening entrepreneurship gap by age.

V.   **Conclusion**

The key result of our analysis is that income diversification has become increasingly important in

determining entrepreneurship, but that younger households became less likely over time to have income

from multiple sources. At the same time, older households maintained their income diversification and

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[21] Our multivariate results in Tables 3 and 4 suggest that the changes in the entrepreneurship response to delinquency rates are not statistically significant.
[22] Our results for women do not materially differ from those for men and we only present data for men to keep the figure manageable, particularly since men make up the majority of entrepreneurs.

their likelihood of working as entrepreneurs became more responsive to having substantial income from

non-business sources such as capital income and Social Security benefits.

The trends in capital income for younger and older households in part follow rising wealth

inequality by age. Older households have seen larger increases in wealth from the early to the later years

than was the case for younger households.[23]

Our results on the link between Social Security and annuity income and entrepreneurship also

indicate that older entrepreneurs may have increasingly benefited from these sources as a buffer for a new

business. Younger households have less access to Social Security and other annuity income to diversify

their income and when they do, it is typically for disability and survivorship benefits instead of retirement

benefits, which could limit the effectiveness of these benefits as income diversification. The relevant

parameter estimates for Social Security for older households have become larger in later periods

compared to earlier ones, but remained statistically insignificant for younger ones(Tables 3 and 4). Our

results are consistent with large earnings gains among older households prior to becoming entrepreneurs.

More earnings translate into more retirement benefits.

Our estimates are consistent with the proposition that income diversification is an increasingly

important driver of entrepreneurship as it reduces the risks associated with entrepreneurship relative to

wage and salary employment and that differential opportunities to diversify income by age can explain

part of the widening gap in entrepreneurship. Moreover, insofar as income diversification depends on past

wealth and past earnings gains for older households, rising wealth inequality and slow earnings growth in

recent years could limit the share of households – young and old – that can diversify their income. Slower

entrepreneurship growth in the future could be the result.

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[23] While there is a correlation between capital income and wealth, this does not create an endogeneity problem. Capital income follows wealth and does so unsystematically. We confirmed this with synthetic cohort models not shown here.

Appendix

A1. Tables

*** INSERT TABLE A1 ABOUT HERE ***

*** INSERT TABLE A2 ABOUT HERE ***

A2. References

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