University of Nevada, Reno

Exploring the Factors that Influence Entrepreneurial Activity through a Business Cycle in the United States

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By:

Aaina Sharma

Dr. Mark Pingle/Thesis Advisor

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<u>Abstract</u>

This study investigates to what extent factors during a business cycle influence the probability of one becoming an entrepreneur. Using United States data from the Panel Study of Income Dynamics (PSID) and the Office of Federal Housing Enterprise Oversight (OFHEO), I find a positive relationship between an individual's unemployment and the likelihood of self-employment. This relationship can be explained as necessity entrepreneurship, where self-employment is necessary due to the tight labor market conditions. Furthermore, while prior literature points to liquidity constraints as a significant hinderance to entrepreneurial activity, this study finds no such relationship. Using instrumental variables methodology, I show that liquidity constraints do not have a significant effect on the entrepreneurial decision in a business cycle for the average American.

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I.   <u>Introduction</u>

The fluctuation of entrepreneurial entry is evident throughout a business cycle. Various factors influence an individual's decision to become an entrepreneur including changes in tax policies, changes in employment, changes in capital resources, changes in lending practices, and changes in demand for goods and services provided by entrepreneurs. However, fundamental differences between a boom period and recessionary period can significantly impact the factors listed above and therefore entrepreneurial activity. Given the volatility of a complete business cycle, policymakers need information to understand and make appropriate policies to encourage entrepreneurial activity over the course of a business cycle.

The purpose of this paper is to evaluate the factors that influence entrepreneurial activity over the course of a complete business cycle. In contrast to previous literature, this paper analyzes entrepreneurial activity over the course of a complete business cycle, including a major recession, the Great Recession in the United States. Furthermore, the data set utilized in this research is unique because it is a combination of both individual level data through the Panel Study of Income Dynamics (PSID) and regional home price data. The span of data covered by this paper, 2003 to 2013, will allow for more variation in factors that influence entrepreneurial activity which is not a strength of previous literature. Additionally, given that data spans through one complete business cycle, including the Great Recession, there is more variation in the Housing Price Index (HPI) and its impact on household wealth than analyzed in previous literature. The scope of research will enhance the understanding of entrepreneurship in an economy and help fill a gap in entrepreneurial research.

The analysis is organized in the following manner. Section II will highlight the theoretical framework of the entrepreneurial decision and provide a summary of previous literature. Section III details the Panel Studies of Income Dynamics data utilized in the study. Section IV outlines the Ordinary Least Squares ("OLS") estimating model and provides results. Section V presents the Instrumental Variable ("IV") model, implemented to account for the possibility of endogeneity. Lastly, section VI provides concluding remarks regarding the overall discoveries of this paper and discusses possibilities for extending the research.

II.   **Theoretical Framework**

2.1 The Entrepreneurial Decision

The entrepreneurial choice model, also known as the occupational choice model, involves comparing the potential earnings from self-employment with the potential earnings from paid employment. In the economic models representing the entrepreneurial decision by Evans and Jovanovic (1989) and Fairlie (2013), the net income equation of the self-employed is of the following nature:

$$Y^{SE} = \theta f(k)\varepsilon + r[z - k] \quad (1)$$

Here, Y^{SE} is the earnings from the self-employment sector, θ is the entrepreneurial ability, $f(.)$ is the production function where capital is the only input, r is the rate of interest, z is the initial wealth of the entrepreneur, k is the amount of capital invested in the business, and ε is the random component to the production process. The intuition behind this expression of an entrepreneur's net income is that there is a first component that is the income earned by an entrepreneur given his ability to produce a product and a second component that is interest on the capital not invested in one's own business. (If $z < k$,

then the entrepreneur is borrowing funds for the business reduces income by the net interest payment $r[z - k]$.

On the other hand, the net income equation of the paid employee is:

$$Y^W = w + rz, \qquad (2)$$

where Y^W is the earnings the wage and salary sector, and w represents waged earned by an individual in the market. An individual will choose self-employment if the anticipated income from self-employment earnings and personal wealth after using it as startup capital is greater than the potential earnings gained from paid employment and investment of personal wealth.

If we set equations (1) and (2) equal to each other, we have the situation where becoming an entrepreneur and working for someone else are equally attractive. This occurs when

$$\theta f(k)\varepsilon - rk = w. \qquad (3)$$

Assuming that there are no borrowing constraints, the theoretical model reveals that initial wealth, z, is not a determining factor in the occupational choice. Although initial wealth reduces the need to borrow for an entrepreneur, it is not the pivotal factor that influences a person's decision one way or another. Rather, entrepreneurial ability, one's access to borrow funds and the wages earned in employment, influence an individual's decision in occupational choice. However, if borrowing constraints exist in the market, then z become an important factor in the occupational choice of an individual. While an entrepreneur's natural ability represented by θ is not a controllable factor, access to liquidity and wages earned are determined by market conditions. The volatility of

liquidity and wages throughout a business cycle gives rise to the uncertainty of occupational choice.

We can utilize this theoretical model to evaluate the dynamic decision-making of an individual to be an entrepreneur during boom and recessionary periods of the economy. During a recession, one of the primary impacts on the economy is the increase in the unemployment rate. Given the increase in the unemployment rate, there is a decrease in wages earned due to the surplus of labor supply. Paid employees may experience lower net income and thus, giving rise to the need of entrepreneurial activity in the economy. If w is expected to be zero (in case of unemployment, furloughs or limited hiring opportunities) then an individual would be "pushed" into self-employment as opportunities diminish in the wage. Through the investigation of the Great Recession, Fairlie (2013) and Fossen (2020) provide empirical evidencing suggesting that a significant portion of variation in entrepreneurial activity is induced by the experience of high unemployment.

Also, during a recession, consumers and firms reduce demand for products and services provided by new companies which decreases potential entrepreneurial earnings. On the other hand, the cost of production through lower cost of labor is significantly reduced, increasing potential entrepreneurial earnings. Recessions also reduce total initial wealth z, which makes it even more difficult for an individual to startup his business. In periods such as the Great Recession, individuals experience a substantial decline to personal wealth caused by the declining value of homes. The loss of total wealth during recessions makes the presence of liquidity constraints even more persistent than normal economic period, creating more difficulties for entrepreneurs to acquire the capital

required to start a business. At the same time, the rate to borrow funds are likely to be lower during the recession.

The scenarios described above are characteristics of a recessionary period that can impact the entrepreneurial decision. However, equal and opposite forces influence the entrepreneurial decision during a boom period. It is evident that over the course of a business cycle, there are many opposing factors that are influencing entrepreneurial activity in the economy, leaving the net effect quite ambiguous. Therefore, it is important to launch an empirical investigation.

2.2 Previous Literature

A vast library of research has evaluated the factors that influence entrepreneurial entry during specific periods of a business cycle. The first of many studies evaluate the relationship between liquidity constraints and probability of being an entrepreneur. Early studies conducted by Evans and Jovanovic (1989), Blanchflower and Oswald (1998), and Disney and Gathergood (2008) have noted a positive relationship between household wealth, a proxy of financial constraints, and the probability of being an entrepreneur. Specifically, Evans and Jovanovic (1989) argue that capital is essential for a startup business and liquidity constraints tend to exclude those with insufficient capital funds to be entrepreneurs. Further supporting this research, Blanchflower and Oswald (1998) conclude that the receipt of inheritance, another incremental increase to household wealth, tends to increase a typical person's probability of becoming an entrepreneur.

While historical research has primarily focused on incremental changes to household wealth to explain variation in the probability of entrepreneurial activity for the population as a whole, Hurst and Lusardi (2004) and Disney and Gathergood (2008) argue that

household wealth influences the likelihood of entrepreneurship for only a distinct class, not the average population. Utilizing the Instrumental Variables (IV) methodology, Hurst and Lusardi (2004) and Disney and Gathergood (2008) conclude that changes in housing price (the instrument) explain a statistically significant portion of variation in household wealth, which in turn positively effects self-employment for those in the top income distribution.

When evaluating entry to entrepreneurship over the course of a business cycle, recessionary periods present unique economic conditions that may suppress or boost entrepreneurship. On one side of the spectrum, Milton Friedman (1968) argued that entrepreneurship is hampered during times of crises because of the level of uncertainty, obstruction of smooth creative destruction, and the credit crunch. Financial crises foster financial instability which hinders opportunities of profit and capital resources available to start one's business. Additionally, financial crises disrupt the routines set by emerging firms. As established by Friedman, financial stability is a prerequisite for "the effective operations of those basic forces of enterprise, ingenuity, invention, hard work and thrift that are the true springs of economic growth" (Friedman, 1968).

The view held by Milton Friedman is supported by many recent studies. It is supported by Bartz and Winkler (2016) who demonstrate that during the 2009 global financial crisis, firms with more entrepreneurial attitudes experienced negative growth in Germany in comparison to less entrepreneurial and mature firms. Consistent with this line of thought, fewer individuals enter self-employment during a major recession because of the perceived uncertainty and relatively high-risk investment environment (Rampini, 2004).

However, on the other hand, research has also pointed to recessions has a boom period for a specific type of entrepreneurship—necessity entrepreneurs—representing a type of counter cyclical business creation. The basic distinction between an opportunity entrepreneur and a necessity entrepreneur is that opportunity entrepreneurs create a business when they see an available opportunity while necessity entrepreneurs are forced to create a business due to lack of labor market options (Fairlie and Fossen, 2017). During the Great Recession, Fairlie (2013) and Fossen (2020) demonstrate that high unemployment positively impacted one to start a busines because there is a lack of better opportunity. Similarly, the analysis of Fritsch, Kritikos and Pijnenburg (2014) showed a positive relationship between unemployment rates and start-up businesses and implied a counter-cyclical relationship between new business formation and recessions in Germany.

After an analysis of the literature, it is evident that throughout a business cycle there are several opposing effects on entrepreneurial activity. While there are many microeconomic factors that influence entrepreneurial activity, measuring the effect of household wealth on entrepreneurial activity is of most interest given the liquidity prior to the Great Recession and the liquidity constraint post the Great Recession in the United States. When analyzing the entrepreneurial activity throughout a business cycle, it is important to examine through different lens. In this case, I will be focusing on how variation in GDP and unemployment influence entrepreneurial activity in the United States from 2003 to 2013.

III. Data

The primary data set utilized in this study is the Panel Study of Income Dynamics (PSID) from 2003 to 2013, in biannual increments. Since 1968, the University of Michigan has conducted the PSID to uncover information about family history of employment, income, wealth, expenditures, health, marriage, education, and numerous other topics. Specifically, for the research question in hand, the survey develops two variables of importance. First, the survey questions if the head of the family is/was self-employed, is/was employed by someone else, or other. Based on this survey question, I construct a dummy variable for self-employment. Second, the PSID includes several survey questions about the participant's household wealth. For the purposes of this research, I construct the household wealth measure to include total saving and checking accounts, bonds, stocks, housing equity, other real estate and vehicles, minus debt of a household. Utilizing the Consumer Price Index (CPI) from the United States Bureau of Labor Statistics, I adjust household wealth (in 10,000s of dollars) to a base year of 2003. Table 1 highlights the summary statistics of key variables.

The average household wealth for a participant in the survey is $85,218 in 2003 dollars. Approximately half of the participants in the survey are married and on average, each household has 1 child. The sample is predominately comprised of white and black individuals, which in total make up about 97% of the sample. On average, survey participants have received an education with some level of college. About 12.69% of the head of households are self-employed. At the same time, about 6.35% of the head of households are unemployed.

The second data source used in this analysis is the Office of Federal Housing Enterprise Oversight (OFHEO), which captures an index of local housing prices for the analysis. The housing price index (HPI) is a broad measure of the movement of single-family housing prices in the United States. The index is developed by reviewing repeat mortgage transactions on single-family properties whose mortgage has been purchased or securitized by Fannie Mae or Freddie Mac since January 1975. In the data, the same quarter of the previous year is used as a base year and is used to derive the index of change. The HPI is available on a quarterly basis, therefore, an annualized HPI is created through the average of four-quarter period.

Table 1: Summary Statistics of Households from the PSID

	Mean
Self Employed (Not Self Employed=0; Self-Employed=1)	.1269 (.3329)
Household wealth ($10,000 in 2003 dollars)	8.5219 (39.4242)
Unemployment (Not unemployed=0; employed=1)	.0635 (.2438)
Married (not married=0; married=1)	.4948 (.5000)
White (not White=0; White=1)	.6266 (.4837)
Black (not Black=0; Black=1)	.3463 (.4758)
Native American (not Native American=0; Native American=1)	.0069 (.08298)
Asian (Not Asian=0; Asian=1)	.0116 (.1070)
Latino (Not Latino=0; Latino=1)	.0085 (.0920)
Educ (in years)	13.3892 (2.4011)
Age (in years)	41.0314 (13.0360)
Children (Number of children)	.9063 (1.1772)
N=Households	34,902

IV. **Estimating the Models**

4.1 OLS Model

The main objective of this study is to examine how household wealth and other

microeconomic factors affect the probability of starting one's own business over a

complete business cycle. I utilize a linear probability model to explore this question.

Controls in the model include age, education, family structure dummies, and dummies for

states. To construct a measure of household wealth consistent with prior literature (e.g.

Hurst & Lusardi, 2004), the measure of household wealth includes total saving and

checking accounts, bonds, stocks, housing equity, other real estate, and vehicle equity,

minus debt of a household.

The equation used to analyze the effects of household wealth and macroeconomic

factors on the probability of entrepreneurship is:

$$Y_{ikt}^{emp} = \alpha + \beta_1 W_{ikt} + \beta_2 U_{ikt} + \beta_3 G_{kt} + \beta_4 S_{kt} + \beta_5 X_{ikt} + \varepsilon_{ikt} \tag{4}$$

Where Y_{ikt}^{emp} equals 1 if the individual is self-employed and 0 otherwise for person i in

state k in time t, W_{ikt} is the level of individuals household wealth, U_{ik} equals 1 if the

head of the household is unemployed and 0 otherwise, G_{kt} is the real Gross Domestic

Product (GDP) for a given state k, in year 2003. S_{kt} is the set of dummy variables for

different states k, X_{ikt} includes individual characteristics (age, education, children, marital

status, and race), and ε_{ikt} is the error term.

4.2 OLS Results

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Table 2: OLS Regression for Probability of Entrepreneurship

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	(1)	(2)	(3)
Wealth	0.000844***	0.000627***	0.000629***
	(0.0000412)	(0.0000424)	(0.0000426)
Unemployment		0.00182**	0.00271***
		(0.000791)	(0.000887)
rGDP		0.00000260	0.0000129
		(0.00000411)	(0.0000417)
Age		-0.00360***	-0.00334***
		(0.000840)	(0.000841)
age2		0.0000764***	0.0000735***
		(0.00000952)	(0.00000954)
Children		0.00827***	0.00810***
		(0.00163)	(0.00163)
Married		0.00751*	0.00668*
		(0.00394)	(0.00395)
Educ		-0.00368***	-0.00383***
		(0.000756)	(0.000766)
Black		-0.0323***	-0.0315***
		(0.00400)	(0.00454)
Native American		0.00790	0.00219
		(0.0212)	(0.0217)
Asian		-0.0429***	-0.0419**
		(0.0166)	(0.0166)
State Dummies	No	No	Yes
_cons	0.119***	0.163***	0.135***
	(0.00182)	(0.0203)	(0.0269)
N	34902	34902	34902
r2	0.0119	0.0306	0.0358
F	419.7	100.2	21.20

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2 reports estimates of equation (4). In column (1) of Table 2, I estimate the effect of household wealth on the probability of self-employment without any macro factors, controls or state dummies. The results indicate that when an individual's household wealth increases by $10,000, the probability of being an entrepreneur increases by 0.0844 percentage points. Although this relationship is significant at the 99% confidence level, economically speaking, household wealth has a positive but small effect on the likelihood of being an entrepreneur in general.

In column (2) of Table 2, I estimate the complete model (4) but without state dummy variables. The coefficient estimate of household wealth decreases by 0.0217 percentage points. The results indicate that as an individual's household wealth increases by $10,000, the probability of being an entrepreneur increases by 0.0627 percentage points. The results in column (2) also show that if an individual is unemployed then the likelihood of entrepreneurship increases by .182 percentage points, and this is significant at the 99% level. This positive correlation between unemployment and probability of entrepreneurship could be attributed to the high level of unemployment in the United States during the Great Recession, which is captured by the data on hand. Column (2) also illustrates that the economic prosperity during this time period in the United States did not have a significant effect on entrepreneurial activity. Additionally, the estimates indicate that Blacks and Asians are less likely to start businesses in comparison to White people. As a person ages, he is more likely to start his own business but at a decreasing rate. Individuals with children are more likely to start a business and those who obtain more education are less likely to be self-employed.

In column (3) of Table 2, I include state dummies and the same controlled variables as represented in column (2). When we use a 95% confidence level, the effects of household wealth and unemployment rate on the likelihood of becoming an entrepreneur remain significant. That is, the inclusion of state dummies does not change the overall conclusion reached with the OLS model.

V.   **Instrumental Variable Methodology**

5.1 Possibility of Endogeneity

Previous literature strongly argues that the influence of household wealth on the probability of being an entrepreneur may be endogenous.   The possible endogeneity in equation (4) may arise because both household wealth and the likelihood of being self-employer may be dependent upon other individual unobservable characteristics such as personal motivation and acquisitive preference (Disney & Gathergood, 2009; Hurst & Lusardi, 2004).   To account for the possibility of this endogeneity, I utilize the Instrumental Variable (IV) methodology to seek a consistent estimate of β_1 in equation (4). The IV method will allow us to establish whether a causal relationship exists between household wealth and the probability of self-employment, despite speculation of endogeneity in the OLS model and potential biased results obtained in the previous section (Angrist & Pischke, 2008).

To measure a consistent estimate of household wealth, I instrument household wealth with state level Housing Price Index (HPI). The first stage of the IV method is as follows:

$$W_{ikt} = \gamma + \delta_1 HPI_{ikt} + \delta_2 U_{ikt} + \delta_3 S_{kt} + \delta_4 X_{ikt} + \varepsilon_{ikt} \qquad (5)$$

where, HPI_{ikt} is the given housing price index observed for a specific individual i in state k in time t. Using equation (5), I can obtain consistent estimates of household wealth and estimate the following second stage model:

$$Y_{ikt}^{emp} = \alpha + \mu_1 \widehat{W}_{ikt} + \mu_2 U_{ikt} + \mu_3 S_{kt} + \mu_4 X_{ikt} + \gamma_{ikt} \tag{6}$$

where, $\widehat{W}_{ikt}$ is a consistent estimate predicted from equation (5) above.

5.2 Results of IV Methodology

Table 3: IV Results—Probability of Self-Employment

	(1)	(2)	(3)
Wealth	0.000233	-0.000421	-0.000323
	(0.000650)	(0.00103)	(0.00146)
Unemployment		0.00140	0.00217*
		(0.000899)	(0.00121)
rGDP		0.00000748	-0.00000259
		(0.00000635)	(0.0000482)
Age2		0.0000873***	0.0000840***
		(0.0000144)	(0.0000187)
Age		-0.00395***	-0.00372***
		(0.000915)	(0.00103)
Children		0.00873***	0.00851***
		(0.00171)	(0.00176)
Married		0.0142*	0.0129
		(0.00773)	(0.0102)
Educ		-0.00158	-0.00199
		(0.00221)	(0.00292)
Black		-0.0383***	-0.0368***
		(0.00713)	(0.00932)
Native American		0.00437	-0.000225
		(0.0217)	(0.0222)
Asian		-0.0396**	-0.0402**
		(0.0170)	(0.0169)
State Dummies	No	No	Yes
_cons	0.125***	0.138***	0.119***
	(0.00653)	(0.0319)	(0.0366)
N	34902	34902	34902
r2	0.00565	0.0136	0.0219
Widstat	141.6	59.65	30.17

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The IV estimator is considered valid and consistent if and only if the given instrument fulfills the conditions of exclusion and relevance. The exclusion condition states that the instrument cannot be correlated with the error term, reintroducing endogeneity in the original model. In this specific case, the instrument (HPI) fulfills this condition as HPI is exogenous to unobserved characteristics in the error term such as personal motivation. HPI is independent from one's motivation as the data tracks economic trends in housing prices from quarter and quarter. Personal motivation to be self-employed is unlikely to be driven by regional housing price data.

The condition of relevancy states that z (the instrument) must be correlated with the endogenous explanatory variable in the first stage regression. If a weak correlation exists, the possibility of making misleading inferences is strong. Logically, the HPI instrument is strongly correlated to the volatility of household wealth as housing equity is considered the single most prominent asset held by American households. Also, given that in this analysis the data spans through one complete business cycle, including a major recession (Great Recession); there is more variation in the HPI instrument and its impact on household wealth than analyzed in previous literature. Further statistically validated in Table 3, the HPI instrument is strongly correlated with household wealth as the F-test statistic is greater than 30 in all three regressions.

Table 3 shows the results of the IV methodology. In comparison to the OLS regressions in Table 2, the IV regressions demonstrate that household wealth does not significantly impact the probability of being self-employed for an individual. Household wealth may not significantly alter an individual's decision to be an entrepreneur in the long run. In contrast to other variables that may impact the entrepreneurial decision,

household wealth is quite volatile throughout a business cycle. Furthermore, other financial tools may be available to an entrepreneur to supplement personal wealth such as small business loans and loans from family/friends. The results of this study only capture the Local Average Treatment Effect (LATE). The LATE effect captures household wealth that will only increase/decrease for individuals when housing prices increase/decrease, respectively. Due to the methodology of IV, I am not able to capture the Average Treatment Effect (ATE) because there will always be market participants that will have an increase/decrease in household wealth despite changes in the housing market.

One important result shown in Table 3 is the relationship between individual unemployment rate and the likelihood of being an entrepreneur. Similar to the conclusion reached by Fairlie (2013) and Fossen (2020), if the unemployment rate increases by 1 percentage point then the probability of entrepreneurship increases by 0.217 percentage points (see Table 3 Column 3). This result is statistically significant at the 90% confidence level. During a business cycle, the increase of individual unemployment can give rise to entrepreneurship because there is a lack of labor demand in the labor market. Given the surplus of labor and lack of employment, individuals are forced to create new jobs through entrepreneurship to create opportunities of employment and decrease the surplus of labor.

In terms of economic growth's impact on the probability of being entrepreneur, there is no change in the level of significance from the OLS model. Thus, the results in this study do not support the ideas of Milton Friedman (1968). This study supports modern perspective of how recessions can spur entrepreneurial activity. This study shows that

necessity entrepreneurs are more likely to spearhead entrepreneurial activity throughout a complete business cycle as recessions such as the Great Recession deplete the means of generating income and stress the labor market, forcing individuals to develop new employment opportunities.

VI.   <u>Concluding Remarks</u>

This study analyzes the factors that influenced entrepreneurial activity in the United States from 2003 to 2013, focusing primarily on household wealth, GDP and individual unemployment. Although previous literature emphasizes the role of wealth in occupational choices, I show that household wealth is not a significant factor which influences the average Americans' decision to be an entrepreneur as shown by the IV methodology. The effect of economic growth is even less significant than household wealth on the average Americans' entrepreneurial decision-making process. Rather, the results indicate that the rate of unemployment demonstrates a positive influence on the probability of self-employment. The findings of this research are in-line with the recent results presented by Fairlie (2013), Fritsch, Kritikos and Pijnenburg (2015), and Fossen (2020). With the recent research of Fossen (2020), I provide further support to show that during recessions, such as the Great Recession entrepreneurial activity is generated through necessity entrepreneurship. Necessity entrepreneurship develops due to the tightening of the labor market.

Given the results of this study, future research should expand the geography of study and explore if the same effects are present in Southeast Asian countries such as India and China since global recessions have unique effects in different regions. It would be interesting to analyze whether the phenomenon of the necessity entrepreneur is present

in different regions during recessionary periods as determined in the United States.

Another limitation of this study is that I am not able to distinguish whether the

entrepreneurial activity generated during this specific business cycle through

unemployment appears more during boom periods or in recessionary periods.

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