

WEALTH ACCUMULATION DIFFERENCES
BETWEEN WAGE-EARNING AND ENTREPRENEURIAL FAMILIES:
THE ROLE OF ACTIVE SAVING BEHAVIOR

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By

EMILIAN SIMAN

Dr. Deanna L. Sharpe, Dissertation Advisor

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The undersigned appointed, by the dean of the Graduate School, have examined the dissertation entitled

WEALTH ACCUMULATION DIFFERENCES BETWEEN
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SAVING BEHAVIOR

presented by Emilian Siman,
a candidate for the degree of doctor of philosophy, and hereby certify that, in their
opinion, it is worthy of acceptance.

Deanna L. Sharpe, Ph.D., Associate Professor

Peter Mueser, Ph.D., Professor

Robert O. Weagley, Ph.D., Associate Professor

Joan Hermsen, Ph.D., Associate Professor

Pamela Norum, Ph.D., Associate Professor

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ABSTRACT

This study examines the relationship between entrepreneurship and active saving behavior. This examination is important for several reasons. First, academics and professional writers have noted an increasing trend of concentration of wealth toward the higher tail of the wealth distribution over the 1990s (Wolff, 1995, 2003; Bradford, 2003; Quadrini 1999, 2000; Gentry & Hubbard 2004). These reports have stimulated the interest of economists in an old inquiry: Why do some people get richer while others do not? In addition, these same authors have suggested that income is not solely responsible for this concentration of wealth, noting that most of those at the higher tail of the wealth distribution are entrepreneurs.

Second, attention given by both academic publications and the popular press to the dramatic decrease in the personal saving rate during the same period increases interest in motives for savings.

Third, recently the professional and scientific community has revived the debate regarding the efficiency of entrepreneurial policy, suggesting that entrepreneurship has major implications on personal wealth accumulation (Nelson, 2006; Hurst & Lusardi, 2004). Specifically, the work of Hurst and Lusardi (2004) suggests that most of those attempting to enter into entrepreneurship are not financially constrained, except those from the top five percent of the wealth distribution. These findings along with Quadrini (1999, 2000) and Gentry and Hubbard's (2004) suggestions regarding entrepreneurship and wealth concentration legitimize new research inquiry regarding the relationship

between entrepreneurship and wealth. Does entrepreneurship contribute to personal wealth accumulation?

Shumpeter (1934) views entrepreneurial ability as the main determinant of entrepreneurial entry, providing conceptual validity when researching the effects of entrepreneurship on wealth accumulation. Still, the following questions remain of great interest: What economic mechanisms govern the relationship between entrepreneurship and wealth accumulation? What generates wealth accumulation differences between entrepreneurial and wage-earning families?

These general premises encourage further examination of the relationship between wealth and entrepreneurship. Three main explanations of wealth differences among families have been offered: the family's initial wealth endowment, the family's market return on their personal asset portfolio, and the family's saving behavior. The current research focuses on saving behavior as the source of wealth accumulation differences between entrepreneurial and wage earning families. Therefore, it is proposed that before entry, and during entrepreneurship, entrepreneurial families exhibit a more accelerated active saving behavior than wage-earning families.

Several theories and hypotheses support these claims. Families anticipating entrepreneurial entry foresee the potential financial constraints and costs of borrowing. Therefore, they are induced into more accelerated saving behavior because it is cheaper to internally finance their entrepreneurial projects since external borrowing often relies on collateral savings. Further, income uncertainty induces precautionary saving behavior (Carroll and Samwick, 1998). Entrepreneurial ventures are inherently associated with high-income risk, and consequently, it is expected that entrepreneurial families would

respond to the income uncertainty by saving more intensely prior to entry and during entrepreneurship than wage earning families. Finally, mental accounting processing suggests that people develop mentally separate accounts for their sources of money in accordance with liquidity (Thaller, 1988). It is speculated here that entrepreneurial families consider their money invested in entrepreneurship to be a less liquid mental account, and therefore they are less likely to consume from it. *Ceteris paribus*, entrepreneurial families would save more than wage earning families because of this mental accounting processing. Other supporting theories are discussed in the study.

Using this theoretical foundation, a Fisherian two period utility maximization model was developed. In this model, family earnings came only from wages in the first period, and there was no initial endowment. In the second period, family earnings came from wages and entrepreneurial activity. The optimal values of savings, entrepreneurial ability, and proportion of involvement in entrepreneurial activity versus wage earning, provide an ample opportunity for making theoretical predictions. Using the power function as the functional form of the utility function, the empirical modeling was further developed.

The data used for statistical analyses were the Panel Study of Income Dynamics, family file data collection, over the twenty-years time interval, 1984-2003. Preliminary analyses were performed to help identify significant differences in wealth and wealth components between entrepreneurial and wage-earning families over time.

A special sampling design was applied for the regression analyses. The design was a “rotating” sample of married couple families that retained the same head and wife with the head aged 21 to 65 years old any time during the research time horizon, 1984-

2003. Regressions tested the temporal effects of entry, incumbency, and exit from entrepreneurship on active savings. The regression results support the hypotheses that before entry, and during entrepreneurship, entrepreneurial families exhibit a more accelerated saving behavior than wage earning families. All else being equal, entrepreneurial families will accumulate more wealth than wage earning families. Additional tests were used to further validate these results.

This research effort is distinctive in several ways. First it focuses on active savings as the unique true measure of family's saving behavior. Prior work has employed wealth to income ratios (Quadrini, 1999, 2000; Gentry & Hubbard 2004; Bradford, 2003), or rates of savings, and thus they confound the effects of active and passive savings. Second, the study identifies the temporal effect of active saving and entrepreneurial families. Findings suggest that accelerated saving behavior is exhibited only at certain time periods during the life cycle of an entrepreneurship. Third, the study develops comprehensive theoretical and empirical modeling, which helps to conceptualize the economic phenomenon and allows behavioral predictions to be made. Fourth, the current work advances an innovative sampling procedure for longitudinal data analysis.

This study has some limitations. Attrition and structural changes in PSID data collection over times limits the supporting power of some results. Furthermore, the complexity of the dependent variable computation (active savings) introduces potential errors. Lastly, the measurement errors of wealth and wealth components contribute to relatively low R-squares.

Finally, this study contributes to the understanding of saving behavior and wealth accumulation of entrepreneurial and wage earning families. Research findings suggest that controlled funding and/or subsidies dedicated to entrepreneurship could lead to an increase in personal saving of the families attempting to enter into, or incumbent in, entrepreneurship. Closer monitoring of the performance of publicly funded projects might create appropriate constraints to balance increased access to funding and personal saving. A carefully designed taxation policy that provides benefits to those offering private funding to would-be entrepreneurs could also balance access to funding and rigorous performance control.

The study concludes with suggestions for future research.

1. INTRODUCTION

1.1 Overview

Intriguing statements like “the richest one percent of families hold one third of the total wealth in the economy” (Cagetti & DeNardi, 2005; Quadrini, 1999; Mishel, Bernstein, & Allegretto, 2005), or “the richest 10 percent of families own about 85 percent of all financial securities, and 90 percent of all business assets,” (Wolff, 1995, 2003) generate questions regarding the economic mechanisms whereby some families become successful in accumulating wealth while others do not.

As documented by several researchers (Quadrini, 1999, 2000; Gentry & Hubbard, 2000; Cagetti & De Nardi, 2006), neither labor earnings nor total income entirely explain wealth concentration. Rather, other important factors may contribute to wealth concentration. In particular, evidence from nationally representative financial data, such as the Survey of Consumer Finances or the Panel Study of Income Dynamics, indicates a bi-directional relationship exists between entrepreneurship and family wealth.

Quadrini (1999) suggests that the mere observation that entrepreneurial families are wealthier than non-entrepreneurial families is evidence that borrowing constraints exist. The consequence of these borrowing constraints is that only wealthier families are in the position to enter and sustain a business. But, this position illustrates only one potential direction of the relationship between entrepreneurship and wealth. The inverse direction of the relationship between entrepreneurship and wealth has been offered as another valid possibility. According to this alternative point of view, business families are wealthier because they save more (Quadrini, 1999, 2000; Gentry & Hubbard, 2000;

Bradford 2003). Thus, the higher saving rate for entrepreneurial families could be explained by the relatively high cost of external financing, or by the inherent exposure to entrepreneurial risk (the high odds of not being successful associated with the implementation of new ideas). This latter direction of causality between entrepreneurship and wealth has received relatively less attention in the literature.

The economic literature presents different ideas regarding the relationship between wealth and entrepreneurship. Knight (1921) regards wealth as a necessary condition for business entry. He suggests that assuming risk is an essential characteristic of entrepreneurship in addition to capital. Asymmetric information between entrepreneur and capital owners, moral hazard (intentionally failing to perform) and adverse selection (loaning money to low performers) lead to market constraints, which foster conditions for entrepreneurial entry and success mostly for wealthier families. Thus, in addition to risk taking, entrepreneurial entry and success is preconditioned by capital ownership.

On the other hand, Schumpeter (1934, 1950) proposed that entrepreneurs do not necessarily need wealth for business entry. Rather, it is enough for would-be entrepreneurs to identify successful arbitrage opportunities in the economy and use capital markets to provide the necessary financial means for business entry and functioning. Following this line of reasoning, in a recent Forbes article, Nelson (2006) suggested that money is no longer a constraint for entrepreneurial individuals and families.

Nelson's argument supports one side of a long lasting debate among researchers and policy makers regarding the role of government, and its efficiency, in financing small business. During the early 2000s, borrowing conditions and the price of borrowing were

relaxed to the most advantageous levels in history. Consequently, the idea that “would-be” entrepreneurs face financial constraints for business entry seemed to lose validity (Greenspan, 2004).

Aligning with this view regarding the means for entrepreneurial entry, Hurst and Lusardi (2004) called for a paradigm shift in understanding the relationship between family finance and entrepreneurship. Their research findings suggest that wealth should not be considered the major driver for entrepreneurship entry.

However, Cagetti and De Nardi (2006) suggest us to read carefully Hurst and Lusardi’s results because the lack of borrowing constraints on entrepreneurial entry is not the same as lack of borrowing constraints on entrepreneurial investment after entry. Their caution suggests the need to focus attention on a longitudinal approach and consider time as a factor when investigating the precursors and effects of entrepreneurship. The time points of particular interest in the study of entrepreneurship are date of entry, business duration, and business exit.

Joining the same line of thinking, but concentrating on a somewhat narrower point of view regarding the relationship between entrepreneurship and wealth, Fairlie (2005) suggests that entrepreneurship might be a way for upper social mobility. He asserts that there are benefits to be gained from investigating the characteristics of entrepreneurs coming from economically disadvantaged families. He found empirical evidence of earning differentials between business owners and wageworkers, and men vs. women, respectively for individuals coming from poor families.

Thus, while one school of thought proposes that wealth is a necessary condition for the entrepreneurial occupational choice, another recent school of thought suggests

investigating the reverse causal direction, that is, entrepreneurship leads to an acceleration in wealth accumulation. Quadrini (1999) asserts that it is legitimate and important to examine the positive implications of entrepreneurship on household wealth concentration. Quadrini (1999, 2000) and Gentry and Hubbard (2004) suggest some reasons for the particular wealth accumulation behavior of enterprising families. Here, their list is expanded to provide a more comprehensive view of the potential factors that could account for the wealth accumulating behavior exhibited by entrepreneurial families.

First, entrepreneurial families facing borrowing constraints should save more than other families in advance of business start-up or before implementation of a major project. It is common for an entrepreneurial family to sustain the development and implementation costs of an entrepreneurial idea far in advance of the initial business start. Consequently, the entrepreneurial family would be expected to put aside funds allocated to these “before startup costs.” Second, the entrepreneurial family should foresee the higher costs of external vs. internal financing of business operations, and thus exhibit an accelerated saving behavior as compared with other families (Buera 2006). Third, entrepreneurial families face idiosyncratic entrepreneurial uncertainty. Consequently, they would be expected to protect themselves by accumulating more wealth in anticipation of adverse business events. The accumulated level of wealth determines how well a family can smooth consumption when facing unfavorable events. Fourth, entrepreneurial families anticipate that access to external financing depends on the amount of internal financing (accumulated wealth) and consequently they become motivated to save more even when they intend to use external sources of capital to

finance their operations (Shane 2003). Fifth, entrepreneurial families might have clear and well-established financial goals to achieve, and thus, according to the path-goal leadership theory proposed by House (1971), they would have a relatively higher motivation to save money as compared with other occupational type families. It is suggested here that the financial discipline and organization imposed by business ownership provides an edge in terms of family financial management for entrepreneurial families as compared with most wage earning families. Taking into account of the fact that licensing a business and applying for a business loan requires a business plan and a budget, it is assumed that entrepreneurial families are exposed to more financial planning concepts and practices than wage earning families. Sixth, families that are entrepreneurial, or on the way to become so, might make a distinction among their various financial accounts and handle them in different ways. Following the concept of “mental accounting” proposed by Thaler (1998), an entrepreneurial family should be less likely to consume from money allocated to its business as compared to money allocated to liquid accounts. Thus, assuming that two families receive the same income, the mere fact that the enterprising family allocates money to its business accounts may generate a relatively lower propensity to consume as compared with a wage earning family. Seventh, Hurst, Lusardi, Kennickell and Toralba (2006) propose further saving motives for the entrepreneurial households; specifically pension coverage and bequest. The entrepreneurial families must accumulate more wealth to sustain their retirement consumption since pension coverage is much lower among business owning than among wage earning families. Also, entrepreneurial families may exhibit stronger bequest motives than wage earning households.

Although the literature proposes many reasons for differences in wealth accumulation between enterprising and wage earning households, it falls short of identifying the precise financial/economic mechanisms that drive the disparity in wealth building behavior. Many researchers classify all entrepreneurial saving motives under the generic term of “precautionary saving.” But this approach creates confusion. Hurst, Lusardi, Kennickell, and Toralba (2006) highlight the importance of the methodological approach used to disentangle the complexity of entrepreneurial saving behavior. They propose separating the precautionary effects associated with the potential loss of income from other effects such as financing costs, or bequests, etc. They found precautionary effects for entrepreneurs that were much lower than those reported in previous research. They took this finding to indicate that other motives were responsible for the rest of the reported effects.

Some researchers have questioned the rationality of entrepreneurialism (May, 2006). Critics have noted that entrepreneurs are prone to hold undiversified portfolios (Gentry & Hubbard, 2001; Heaton & Lucas, 2000), they take too much risk for the earnings they are able to extract (Moskowitz & Vissing-Jorgensen, 2002), and they accept in many instances lower median-lifetime earnings than similarly skilled wage earners (Hamilton, 2000). Average returns from private (non publicly traded) investments are lower than the average returns from public (publicly traded) investments (Moskowitz & Vissing-Jorgensen, 2002), thus calling into question the entrepreneurial family’s persistence in this occupational choice. But, these facts about entrepreneurial families still beg the question by what processes and/or mechanisms are entrepreneurial families

able to accumulate more wealth than wage-earning families? This research examines the role of entrepreneurship in family wealth accumulation.

1.2 Purpose of Study

The impetus for this study is the simple observation that entrepreneurial families hold relatively higher levels of wealth than wage earning families, yet this outcome is not merely the result of their income (Quadrini, 1999, 2000; Gentry & Hubbard, 2004; Juster, Lupton, Smith & Stafford, 2006; Hurst & Lusardi, 2004; Fairlie & Krashinsky, 2006).

To illustrate this fact, Tables 1 and 2 reports comparative descriptive statistics of total wealth, and wealth components, over a twenty year time horizon, for both entrepreneurial (business owning) and wage earning households. These data come from the Panel Study of Income Dynamics (PSID), a nationally representative longitudinal survey that has been conducted yearly until 1999 and bi-annually after that. The time frame in Table 1 is from 1984 to 2003. All dollar values are in 2003 dollars. The descriptive values have been weighted, after normalizing weights as recommended by the PSID procedure (see <http://psidonline.isr.umich.edu/Guide/tutorials/>).

Examining the summary data in Table 1, it is clear that there is a consistent significant difference ($t = -14.10$, $p < .001$, see Table 2) between the average (median) wealth of entrepreneurial and wage-earning families. Specifically, in 1984 the average (median) total wealth held by entrepreneurial families was \$513,805 (\$198,345), almost 5 times higher than the average (median) total wealth holdings of wage earning families \$111,595 (\$39,314). This difference in average (median) values is observed across the years from 1984 to 2003. There is a slight downturn around 1994. In 2003, average

(median) wealth of entrepreneurial families was \$717,122 (\$236,600), whereas it was \$181,491 (\$48,056) for wage earning families ($t = -14.00$, $p < .001$). A close comparison between mean and median values indicates a high concentration of wealth toward the upper end of the wealth distribution, which is clearly evident for entrepreneurial households. In the same time, the ratio of total income of entrepreneurial to wage earning family is only two. In 1984, entrepreneurial families report an average (median) income of \$85,361 (\$67,634), whereas, the wage-earning families report an average (median) income of \$42,673 (\$ 35,065). In the same fashion, in 2003, entrepreneurial families averaged (with a median) \$106,055 (\$ 70,000) in total income, whereas wage earning families averaged (with a median) \$53,504 (\$ 40,200) in total income.

These data illustrate the proposed research challenge. As highlighted briefly in the prior section, the determinants of these observed wealth-holding differences are not entirely clear. Several hypotheses have been proposed, but, in general, there are three main alternatives that can be used to explain the observable wealth differences between two families. First, there could be a difference in the initial endowment of the families, which could be further preserved, increased, or lost. Second, asset allocation of the two types of families could differ and thus create a difference in portfolio rate of return. Third, the two types of families might save at different rates.

Among these explanatory alternatives, this study focuses on the family saving behavior. In particular, it is proposed that the observed wealth differences between entrepreneurial and wage-earning families can be explained by the difference in saving behavior.

This research attempts to answer these specific research questions:

1. What is the role of entrepreneurship in wealth accumulation of American families?
2. What differences in “active” saving behavior exist between entrepreneurial and wage-earning families?
3. Given differences in “active” saving behavior, when are these differences in “active” saving behaviors exhibited? Prior to entrepreneurship entry, during entrepreneurship, after entrepreneurship exit?
4. What other socio-economic factors are linked to entrepreneurial choice and might influence the wealth-accumulating behavior of entrepreneurs?

Longitudinal family data selected from the Panel Study of Income Dynamics (PSID) are used to answer these questions. The time horizon for the study is twenty years, starting with 1984 and ending with 2003.

This research endeavor differs from prior work in several ways. First and foremost it focuses attention on the saving behavior of the family, specifically on the active saving component. Secondly, it traces this behavior across the life cycle of entrepreneurial activity - before entrepreneurship entry, during entrepreneurship, and after exit from entrepreneurship. Third, the research controls for other potential drivers of active saving behavior, such as income uncertainty, human capital, home ownership, and inheritance. It should be noted, however, that the longitudinal nature of the data (i.e. use of a 20 year time span) involves measurement errors, and consequently, imposes some testing limitations.

Some recent work by Hurst, Lusardi, Kennickell and Toralba (2005) supports controlling for the effects of various saving motivations. These authors along with others have

suggested that it is essential to separate business-owning families from other families when examining precautionary savings motives. They argue that aggregating both groups produces an overestimated precautionary effect that accounts for up to fifty percent of the variation in aggregate wealth (Skinner, 1988; Caballero, 1990, 1991; Carroll, 1992; Carroll & Samwick, 1997, 1998; Kazarosian, 1997; Gourinchas & Parker, 2002). When the groups were separated, however, the precautionary effect dropped down to more modest levels below ten percent (Hurst, Lusardi, Kennickell & Toralba, 2005). Hurst, Lusardi, Kennickell and Toralba (2005) further suggest that when accounting for precautionary savings using micro data sets, researchers have to properly control for differences in saving motives between entrepreneurs and non-entrepreneurs.

In summary, the purpose of this research is to determine the magnitude and type of saving behavior that is prevalent among entrepreneurial families throughout various stages of the entrepreneurship life cycle: before entering, during, and after exiting entrepreneurship.

1.3 Justification for the Study

There are a number of reasons why a comparative study of wealth accumulation behavior of entrepreneurial versus wage-earning families is of interest. First, a consistent observable wealth discrepancy exists between these two types of families. Table 1 presents a comparison of asset holdings of entrepreneurial (business-owning) and wage-earning families at five-year intervals over a twenty-year period, 1984 to 2003. All values in Table 1 are in 2003 dollars, and refer to all surveyed families by PSID. As one can observe from the table, throughout the twenty-year time span entrepreneurial families

consistently hold on average (median) value more wealth than wage earning families. Briefly, in 1984 entrepreneurial families held on average (median) wealth \$513,835 (\$198,345) whereas wage-earning families held on average (median) wealth \$111,592 (\$39,314); and in 2003, one could observe even bigger differences where entrepreneurial families held on average wealth \$717,122 (\$236,600) whereas the wage-earning families held \$181,491 (\$48,056) respectively. Understanding more about these observable differences helps us to identify economic mechanisms that lead some families toward higher levels of financial well-being and levels of living. Further, such an outcome contributes to developing better-informed public policies regarding small-business subsidies and taxation.

Second, there is a general public concern regarding the dramatic decrease in the personal saving rates in the United States, from around 10 percent in 1980s, to about zero in 2005, to below zero in subsequent years. These low levels of savings signal a potential decrease in future income levels and level of living of American families. Thus, families behaving contrary to this general trend are intriguing, and investigation of the driving forces behind their out-of-the-ordinary behavior may give insight into broader savings motives or lack thereof.

Most economists agree that the investment rate, whether at a national or personal level, is positively correlated to the rate of saving. Higher levels of savings, either at a national or personal level, foster economic opportunities in home ownership, education, retirement, and protection against financial shock.

Table 1. Longitudinal comparison of wealth/ wealth components between entrepreneurial and wage-earning families, all PSID sample [in \$2003, Average (Median)]

Asset Category \ Year	1984		1989		1994		1999		2003	
	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.
Occupational category										
N	563	5955	718	5976	893	7271	764	5838	822	6600
Business value (Median)	177,166 (17,709)	0 (0)	190,307 (14,839)	0 (0)	145,269 (6,208)	0 (0)	317,897 (5,522)	0 (0)	265,276 (3,500)	0 (0)
Checking/saving accounts (Median)	37,868 (8,855)	18,409 (2,656)	48,690 (11,871)	22,003 (2,968)	34,874 (9,312)	21,049 (2,483)	36,714 (6,627)	14,397 (2,209)	41,960 (8,000)	17,540 (2,000)
Real estate (Median)	94,755 (0)	12,737 (0)	159,208 (0)	12,614 (0)	129,772 (0)	9,325 (0)	90,551 (0)	11,423 (0)	133,484 (0)	15,028 (0)
Stock/MF/IT/IRA (Median)	29,669 (0)	10,030 (0)	31,225 (0)	17,597 (0)	86,439 (248)	26,103 (0)	85,958 (0)	32,185 (0)	53,666 (0)	45,406 (0)
Vehicles/motor home/trailer (Median)	18,486 (11,511)	8,140 (5,313)	20,433 (13,355)	9,581 (5,936)	20,403 (12,416)	11,435 (7,449)	21,720 (14,358)	11,551 (6,074)	21,816 (15,000)	11,457 (6,000)
Bonds/Cash insur./Collections (Median)	66,756 (0)	21,493 (0)	23,548 (0)	5,905 (0)	21,220 (0)	9,715 (0)	16,653 (0)	7,046 (0)	17,564 (0)	6,603 (0)
IRA (Median)							54,234 (442)	18,073 (0)	51,891 (2,000)	26,093 (0)
Credit card/Consumer debt (Median)	8,097 (531)	2,608 (0)	7,943 (1,336)	3,811 (0)	19,116 (1,862)	5,132 (0)	11,952 (884)	5,152 (0)	11,391 (1,000)	6,487 (0)
Wealth (No main home equity) (Median)	416,554 (125,205)	68,201 (12,397)	465,468 (115,742)	63,889 (14,097)	421,861 (105,533)	72,495 (16,016)	611,775 (145,786)	89,523 (13,855)	574,265 (134,001)	111,629 (16,000)
Wealth (Median)	513,835 (198,345)	111,592 (39,314)	589,561 (215,161)	115,072 (40,065)	518,470 (184,993)	119,546 (43,207)	716,225 (219,784)	138,805 (39,760)	717,122 (236,600)	181,491 (48,056)
Total family income (Median)	85,361 (67,634)	42,673 (35,065)	97,035 (69,371)	46,887 (37,097)	100,444 (69,525)	51,346 (39,729)	98,988 (65,714)	51,932 (39,509)	106,055 (70,000)	53,504 (40,200)

Source: Author's computation of PSID data. The results are weighted by normalized PSID weights.

Table 2. *t* test results of wealth (wealth components) by group comparison, entrepreneurial and wage-earning families, all PSID sample. Mean values by group are presented in Table 1.

Asset Category \ Year	1984		1989		1994		1999		2003	
	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t
Business value	-22.60***	<.0001	-18.90***	<.0001	-22.30***	<.0001	-12.06***	<.0001	-17.74***	<.0001
Checking/saving accounts	-8.01***	<.0001	-9.73***	<.0001	-5.30***	<.0001	-7.24***	<.0001	-7.05***	<.0001
Real estate	-16.62***	<.0001	-12.73***	<.0001	-14.75***	<.0001	-11.73***	<.0001	-8.25***	<.0001
Stock/MF/IT/(IRA)	-6.17***	<.0001	-2.11**	0.0345	-7.07***	<.0001	-3.06***	0.0022	-0.33	0.7379
Vehicles/motor home/trailer	-18.00***	<.0001	-16.81***	<.0001	-12.96***	<.0001	-9.63***	<.0001	-14.34***	<.0001
Bonds/Cash insur./Collections	-1.82*	0.0691	-8.83***	<.0001	-5.31***	<.0001	-3.93***	<.0001	-5.87***	<.0001
IRA							-9.65***	<.0001	-4.01***	<.0001
Credit card/Consumer debt	-6.13***	<.0001	-4.97***	<.0001	-7.51***	<.0001	-4.54***	<.0001	-6.12***	<.0001
Wealth (No main home equity)	-12.56***	<.0001	-18.84***	<.0001	-21.36***	<.0001	-14.76***	<.0001	-12.64***	<.0001
Wealth	-14.10***	<.0001	-20.64***	<.0001	-21.55***	<.0001	-15.6***	<.0001	-14.00***	<.0001
Total family income	-23.84***	<.0001	-19.40***	<.0001	-17.91***	<.0001	-16.53***	<.0001	-15.68***	<.0001

Source: Author's computation of PSID data. *** Statistically significant at $p < .01$, ** Statistically significant at $p < .05$, * Statistically significant at $p < .10$.

Beside these general benefits of saving, some research studies, more specifically (Fairlie, 2005), have suggested that entrepreneurship induces accelerated saving paths, which in turn provide a platform for upward social mobility, especially among those coming from economically disadvantaged families. Research efforts to understand saving behavior of various population groups such as entrepreneurial families and wage-earning families is justified because what is learned about the differences between these two groups may be transferable to other population groups as well.

Professional opinion regarding the saving phenomenon is divided. While some researchers are pessimistic about the downward trend of savings in the U.S. and its consequent economic effects (Isidore, 2005; Associated Press, 2006), others suggest a positive view, noting that the U.S. continues to offer a superior combination of good investment opportunities along with low domestic saving (Bosworth, 2006). No matter which side taken, there is a call for a national saving policy to stimulate home ownership, education, retirement saving, and small business investment among low- and median-income American families (Johnson, Mensah & Steuerle, 2006). Consequently, it is in the interest of private investors, government, and general public to understand what specific combinations of saving and investing strategies lead to higher levels of wealth accumulation. If entrepreneurship generates more efficient saving incentives, then more public policy effort should be allocated to fostering economic conditions that facilitate equal opportunities for this occupation. More public education should engage in understanding the costs and benefits of entrepreneurship, and there should be more public encouragement given to fostering favorable conditions for wide spread adoption of entrepreneurial activities. In conjunction with these public policy initiatives, financial

incentives that ease access to capital would also contribute to the development of a healthy economic environment for the entrepreneurial sector, which ultimately would be reflected in the general economic well being. Finally, an appropriate taxation and lending policy corroborated with other financial incentives could eventually attract families to pursue the entrepreneurial path. Fairlie and Krashinski (2006) have suggested that the results of research efforts tapping into the relationship between entrepreneurship and wealth accumulation are important because it offers decisional support for governmental funding of entrepreneurship.

Academics have special interest in developing a comprehensive saving theory in which the relationship between entrepreneurship and wealth accumulation has its special place.

The recent debate about the efficiency of public investment into the entrepreneurial sector, and the new look to the relationship between capital constraints and entrepreneurship entry (Nelson, 2006), invites for further research of such kind. On the one hand, Nelson (2006) suggests that there is no need to throw more money in the economy to promote small-business ownership. Along the same line, Hurst points to the need of having a better selection mechanism for those subsidized by the system, and, in particular, to help those with good ideas who are constrained by the system. His bottom line is that targeting the average business startups is not an efficient approach to take vis-à-vis entrepreneurship public policy. Hurst's research suggests that, "people who have money aren't any more likely to start businesses than those who don't have it" (Nelson 2006). This new stand against the popular belief that easier access to capital facilitates entrepreneurial entry calls for more research. The present research attempts to respond to

this paradigm change and provide answers regarding the relationship between entrepreneurship and wealth.

1. REVIEW OF THE LITERATURE

2.1 Descriptive Statistics Regarding Wealth Dynamics of American Families: 1984-2003

The brief look at the wealth and income descriptive statistics during 1984–2003 provides a starting point for understanding trends and relationships between wealth, income, and several demographics such as occupation (entrepreneurship vs. wage earning), and marital status (married couples vs. single), see Tables 1 to 6. These results provide a first hand picture, which reveals the significant gains on average personal wealth and income of the entrepreneurial and wage earning families during late ‘80s and ‘90s. In Table 1, one could identify an increase on the average (median) wealth from \$513,835 (\$198,345)¹ for entrepreneurial families in 1984, up to \$717,122 (\$236,600) in 2003; and from \$111,192 (\$39,314) for wage earning families in 1984, up to \$181,491 (\$48,056) in 2003 respectively. In a less dramatic way, one could see an increase of average (median) total income from \$85,361 (\$67,634) in 1984 for entrepreneurial families, up to \$106,055 (\$70,000) in 2003; and similarly an increase of the average (median) total income from \$42,673 (\$35,065) in 1984 for wage earning families, up to \$53,504 (\$40,200) in 2003 respectively. These figures underlines once again, if needed, the favorable evolution of the economy during late ‘80s, and ‘90s. These observations leads to the following logical questions: What is at the roots of this economic dynamics? Since income seems to be less intuitive in explaining it, by what other means did families gained so much in personal wealth during this period?

¹ Average value (Median value)

Many economists attempted to describe the mechanisms that governed this favorable evolution. Among these, Bostic, Stuart, and Painter (2006) indicate that during the '90s, the stock market produced volatile asset prices that climbed up by 450 percent. This peak was followed by a decline by a third in 2000-2001. Following the same trend, the price of houses in the housing market almost doubled over the 1990s, continuing at the same pace during 2000 - 2005 and doubling again in metropolitan areas. Home equity grew by 9.6 trillion during 2001-2004, becoming the major component of wealth for the average American family. In conjunction with this unprecedented housing equity growth, innovations in the mortgage market allowed homeowners to extract \$383 billion of home equity in 2001, \$552 billion in 2002 and \$300 billion in 2003 to finance various consumption needs (Greenspan & Kennedy, 2005).

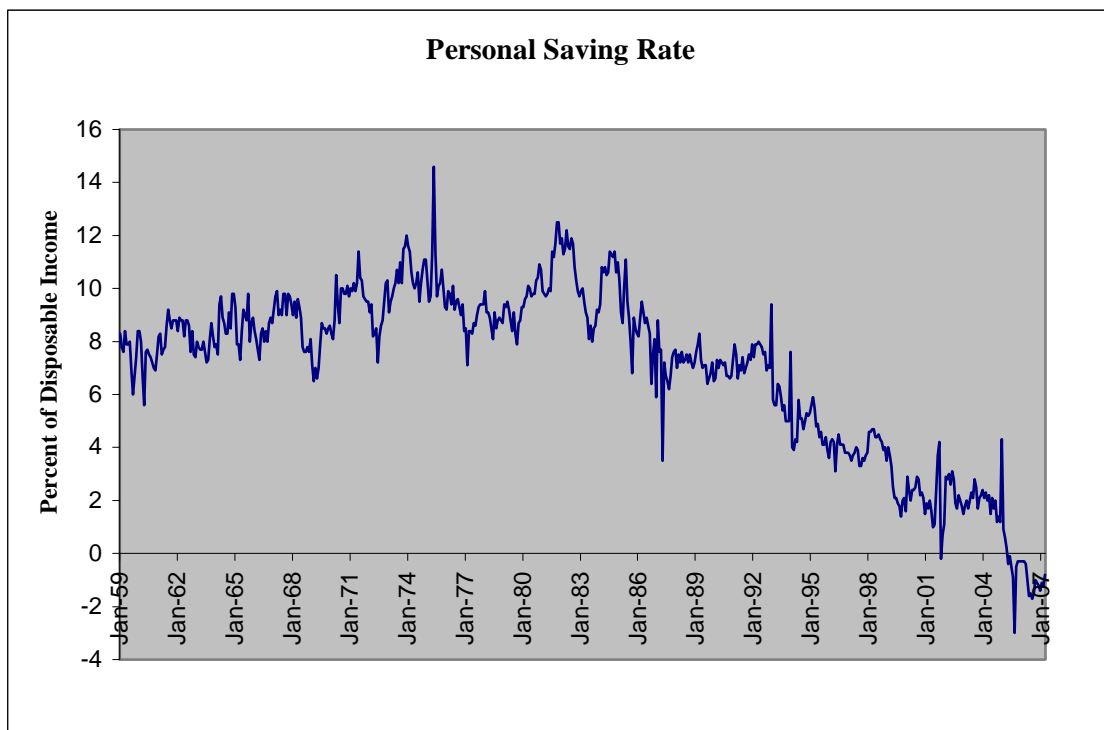
During the same period, in contrast to this unprecedented and favorable dynamic of the prices of several personal financial assets, the personal saving rate fell to subzero levels (see Figure 1). It is remarkable that the personal saving rate level was relatively constant, varying between 7 and 10 percent between 1959 and 1983, but it suffered a serious decline down to zero and even negative values between 1984 and January 2007.

At first glance these trends make it be easy to conclude that active saving has decreased at the expense of the unrealized capital gains that were obtained by asset prices increasing in this favorable economic cycle. But this conclusion would not explain the observed differences in wealth accumulation between entrepreneurial and wage-earning American families throughout 1984-2003. Questions about these puzzling facts remain yet unanswered. Why does the saving behavior of entrepreneurial families apparently run counter the general declining trend for the rates of personal saving for American

families? Is this difference produced by a different saving behavior? Or, is there self-selection of the wealthier family group into entrepreneurship?

A partial answer might be provided by the unprecedented capital gains experienced by stockholders and homeowners during the '90s (Hurst, Luoh, & Stafford, 1998; Poterba, 2000; Juster, Lupton, Smith, & Stafford, 2000, 2006), but more research is needed to understand the multiple economic mechanisms that favor wealth accumulation for entrepreneurial families.

Defining this context is of great importance when developing a scientific inquiry regarding the relationship between entrepreneurship and wealth accumulation. The next section explores current literature linking entrepreneurship and wealth.



Source: U.S. Department of Commerce

Fig. 1 Personal Saving Rate in the U.S., January 1959 – January 2007

Table 3. Longitudinal comparison of wealth/wealth components between entrepreneurial and wage-earning, married couples only. [\$2003, Average (Median)]

Asset Category \ Year	1984		1989		1994		1999		2003	
	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.
Occupational category										
N	498	3,090	567	2,969	657	3,411	576	2,841	594	3,076
Business value (Median)	217,928 (26,564)	0 (0)	229,344 (22,258)	0 (0)	170,349 (6,208)	0 (0)	365,637 (8,836)	0 (0)	243,508 (5,000)	0 (0)
Checking/saving accounts (Median)	44,800 (12,042)	22,484 (5,313)	54,902 (14,839)	29,807 (6,381)	37,503 (9,933)	26,910 (4,966)	40,734 (8,836)	18,301 (3,313)	49,926 (10,000)	23,856 (5,000)
Real estate (Median)	111,347 (0)	16,646 (0)	193,734 (0)	20,049 (0)	138,624 (0)	13,317 (0)	88,950 (0)	16,475 (0)	156,711 (0)	22,790 (0)
Stock/MF/IT/(IRA) (Median)	37,535 (0)	13,977 (0)	37,725 (0)	27,814 (0)	106,326 (1,242)	39,779 (0)	102,519 (0)	44,327 (0)	61,570 (0)	77,869 (0)
Vehicles/motor home/trailer (Median)	19,952 (14,168)	11,829 (8,855)	22,370 (14,839)	14,766 (10,981)	21,907 (14,899)	15,574 (12,416)	23,677 (16,567)	16,723 (11,044)	23,960 (17,000)	17,028 (12,000)
Bonds/Cash insur./Collections (Median)	86,433 (0)	40,491 (0)	28,294 (0)	8,874 (0)	21,904 (0)	13,578 (0)	19,670 (0)	9,957 (0)	20,338 (0)	9,357 (0)
IRA (Median)							60,213 (5,522)	28,254 (0)	63,398 (4,179)	40,825 (0)
Credit card/Consumer debt (Median)	9,518 (354)	3,133 (35)	8,264 (1,039)	4,992 (445)	22,194 (2,483)	6,514 (621)	13,221 (663)	6,105 (221)	10,761 (500)	7,021 (500)
Wealth (No main home equity) (Median)	508,477 (145,217)	102,293 (23,022)	558,105 (148,387)	96,318 (29,677)	474,414 (134,089)	102,642 (31,039)	690,179 (170,636)	127,931 (27,390)	608,740 (168,136)	185,678 (35,000)
Wealth (Median)	626,019 (253,243)	165,225 (77,036)	704,687 (277,484)	174,649 (87,548)	584,123 (230,931)	165,959 (81,943)	805,628 (257,335)	197,337 (77,863)	769,740 (287,500)	286,576 (108,000)
Total family income (Median)	95,158 (78,452)	57,857 (52,258)	109,513 (78,645)	66,311 (57,174)	109,634 (77,959)	70,027 (59,594)	114,606 (79,599)	71,687 (59,695)	122,077 (78,015)	76,273 (63,500)

Source: Author's computation of PSID data. The results are weighted by normalized PSID weights.

Table 4. *t* test results of wealth (wealth components) by group comparison, entrepreneurial and wage-earning families, all PSID sample, married couples only. [Mean values by group are presented in Table 3.]

Asset Category \ Year	1984		1989		1994		1999		2003	
	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t
Business value	-17.61***	<.0001	-14.20***	<.0001	-16.21***	<.0001	-8.75***	<.0001	-13.57***	<.0001
Checking/saving accounts	-7.02***	<.0001	-6.45***	<.0001	-3.07***	0.0022	-4.82***	<.0001	-4.85***	<.0001
Real estate	-13.27***	<.0001	-9.39***	<.0001	-10.63***	<.0001	-7.51***	<.0001	-5.61***	<.0001
Stock/MF/IT/(IRA)	-6.20***	<.0001	-0.95	0.3429	-4.63***	<.0001	-2.17**	0.0304	0.42	0.6729
Vehicles/motor home/trailer	-10.71***	<.0001	-8.52***	<.0001	-6.70***	<.0001	-4.41***	<.0001	-7.13***	<.0001
Bonds/Cash insur./Collections	-1.16	0.2470	-6.27***	<.0001	-2.68***	0.0074	-3.10***	0.0020	-3.85***	<.0001
IRA							-5.97***	<.0001	-2.46**	0.0138
Credit card/Consumer debt	-4.65***	<.0001	-2.5**	0.0111	-5.22***	<.0001	-3.02***	0.0026	-4.0***	<.0001
Wealth (No main home equity)	-9.32***	<.0001	-13.60***	<.0001	-14.90***	<.0001	-10.34***	<.0001	-7.42***	<.0001
Wealth	-10.33***	<.0001	-14.67***	<.0001	-15.50***	<.0001	-10.83***	<.0001	-8.07***	<.0001
Total family income	-15.63***	<.0001	-11.19***	<.0001	-10.57***	<.0001	-10.46***	<.0001	-8.77***	<.0001

Source: Author's computation of PSID data. *** Statistically significant at $p < .01$, ** Statistically significant at $p < .05$, * Statistically significant at $p < .10$.

Table 5. Longitudinal comparison of wealth (wealth components) between entrepreneurial and wage-earning, single parent or individual families. [\$2003, Average (Median)]

Asset Category \ Year	1984		1989		1994		1999		2003	
	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.
N	118	2,864	151	3,007	235	3,846	188	2,996	228	3,523
Business value (Median)	49,824 (7,084)	0 (0)	61,708 (5,194)	0 (0)	64,918 (2,483)	0 (0)	177,011 (1,104)	0 (0)	314,500 (500)	0 (0)
Checking/saving accounts (Median)	16,246 (5,313)	14,377 (886)	28,226 (4,452)	15,453 (1,187)	26,189 (6,208)	14,927 (745)	24,850 (3,313)	10,789 (1,104)	23,946 (3,000)	12,223 (1,000)
Real estate (Median)	43,004 (0)	8,868 (0)	45,469 (0)	6,373 (0)	101,943 (0)	5,143 (0)	95,276 (0)	7,655 (0)	80,957 (0)	8,492 (0)
Stock/MF/IT/(IRA) (Median)	5,135 (0)	6,124 (0)	9,810 (0)	9,021 (0)	35,340 (0)	11,758 (0)	37,088 (0)	20,962 (0)	35,794 (0)	17,227 (0)
Vehicles/motor home/trailer (Median)	13,913 (7,084)	4,489 (1,771)	14,051 (5,936)	5,228 (2,226)	15,640 (8,070)	7,102 (3,725)	15,944 (11,044)	6,770 (3,313)	16,967 (8,000)	6,764 (3,000)
Bonds/Cash insur/Collections (Median)	5,384 (0)	2,692 (0)	7,916 (0)	3,413 (0)	18,981 (0)	5,663 (0)	7,751 (0)	4,356 (0)	11,291 (0)	4,284 (0)
IRA (Median)							30,688 (0)	8,661 (0)	25,869 (0)	13,688 (0)
Credit card/Consumer debt (Median)	3,664 (531)	2,088 (0)	6,883 (1,484)	2,820 (0)	9,261 (1,862)	3,687 (0)	8,209 (1,381)	4,271 (0)	13,020 (2,000)	6,033 (0)
Wealth (No main home equity) (Median)	129,842 (55,253)	34,463 (5,313)	160,297 (46,594)	36,668 (6,114)	253,751 (55,374)	40,906 (6,705)	380,399 (54,670)	54,021 (6,627)	496,306 (59,700)	56,646 (6,200)
Wealth (Median)	163,927 (84,119)	58,515 (12,397)	210,304 (71,374)	65,063 (13,355)	308,273 (82,564)	70,897 (15,271)	452,390 (88,576)	84,700 (15,462)	598,362 (166,000)	93,000 (17,000)
Total family income (Median)	54,805 (43,919)	27,647 (22,101)	55,930 (47,484)	30,582 (23,849)	71,028 (43,454)	31,736 (24,537)	52,901 (42,094)	30,671 (26,507)	69,826 (51,155)	34,326 (27,024)

Source: Author's computation of PSID data. The results are weighted by normalized PSID weights.

Table 6. *t* test results of wealth (wealth components) by group comparison, entrepreneurial and wage-earning families, single parent families only. [Mean values by group are presented in Table 5.]

Asset Category \ Year	1984		1989		1994		1999		2003	
	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t
Business value	-29.17***	<.0001	-20.19***	<.0001	-20.77***	<.0001	-10.87***	<.0001	-11.59***	<.0001
Checking/saving accounts	-0.44	0.6576	-3.16***	0.0016	-2.67***	0.0076	-4.34***	<.0001	-3.26***	0.0011
Real estate	-5.45***	<.0001	-9.27***	<.0001	-8.66***	<.0001	-9.75***	<.0001	-9.31***	<.0001
Stock/MF/IT/(IRA)	0.15	0.8782	-0.19	0.8481	-5.11***	<.0001	-0.95	0.3442	-1.84*	0.0652
Vehicles/motor home/trailer	-11.11***	<.0001	-9.96***	<.0001	-8.92***	<.0001	-8.66***	<.0001	-10.10***	<.0001
Bonds/Cash insur./Collections	-1.75*	0.0808	-2.40**	0.0163	-4.68***	<.0001	-0.79***	<.0001	-3.32***	<.0001
IRA							-6.04***	<.0001	-1.35	0.1774
Credit card/Consumer debt	-2.10**	0.0357	-4.66***	<.0001	-6.23***	<.0001	-3.78***	0.0002	-4.47***	<.0001
Wealth (No main home equity)	-7.77***	<.0001	-11.73***	<.0001	-13.02***	<.0001	-10.11***	<.0001	-13.04***	<.0001
Wealth	-7.54***	<.0001	-9.86***	<.0001	-10.28***	<.0001	-10.42***	<.0001	-14.05***	<.0001
Total family income	-12.37***	<.0001	-11.03***	<.0001	-10.78***	<.0001	-6.54***	<.0001	-13.64***	<.0001

Source: Author's computation of PSID data. *** Statistically significant at $p < .01$, ** Statistically significant at $p < .05$, * Statistically significant at $p < .10$.

2.2 Review of Studies Linking Entrepreneurship and Household Wealth

While the concept of entrepreneurship is old (Chantillon 1755) and a considerable body of research attempts to answer an extensive list of questions regarding the economics of entrepreneurship, little has been done to better understand the relationship between entrepreneurship choice and family finance. (For a complete historical perspective on the evolution of entrepreneurship understanding, see Murphy, Liao, and Welch (2006)).

Current literature suggests that entrepreneurial families exhibit differential wealth accumulating behavior as compared with wage-earning families (Quadrini, 1999, 2000; Gentry & Hubbard, 2004; Hurst & Lusardi, 2004; Petrova, 2005), but we don't have yet a complete understanding why and how is this happening. What does create the wealth differences between entrepreneurial and wage earning families?

Schmidt and Sevak (1997) give a concise summary of potential sources for differences in wealth among families, entrepreneurial or wage earning:

1. Families may enter the study period with a greater endowment (possibly inherited),
2. Families may receive different rates of return on their personal or family portfolio of assets,
3. Families may differ in their saving behavior.

Although a rich and extended literature has evaluated the effects of inheritance, or rates of return on family portfolios, given the focus in this study on saving behavior, the survey of literature presented here is limited to studies that research the relationships that exist among entrepreneurship, savings behavior, and wealth accumulation.

A significant portion of the literature on entrepreneurship and household finance discusses the ideas of Frank Knight (1921) and Joseph Schumpeter (1934, 1950) regarding entrepreneurship. Knight (1921) suggested that entrepreneurs face financial uncertainty born from working with a new idea. Due to the potential for adverse selection (selecting those with low entrepreneurial abilities) and moral hazard problems (awarding loans to those who intentionally default), capital markets constrain entrepreneurs and thus limit entrepreneur's survival abilities. Therefore, Knight strongly supports the idea that access to financial resources/wealth facilitates entrepreneurial entry. In contrast, Schumpeter (1934, 1950) argued that entrepreneurship is the ability of an individual, or group of individuals, to identify arbitrage opportunities in the economy, which in his opinion is independent from the financial aspects of the business. Further, it is the role of capital markets to provide adequate resources to make the entrepreneurial venture viable and to assume a part of the entrepreneurial risk. This debate continues and each research effort adds more empirical support to one side or another.

Evans and Jovanovic (1989) subscribe to Knight's view of entrepreneurship and develop a behavioral model of entrepreneurial choice under liquidity constraints. The authors suggest that the average entrepreneur is limited to a capital stock equal to one and one-half times their wealth. Further, they argue that this liquidity constraint will prevent some people from entering entrepreneurship, but also it will affect those being entrepreneurs by forcing them to use fewer resources than needed. Those most affected by the liquidity constraint appear to be high-ability/low-asset individuals. These individuals are willing to transition to an entrepreneurial occupation, but the financial resources available to them limit their entry.

Evans and Lighton (1989) provide empirical support for the hypotheses advanced by Evans and Jovanovic (1989). They find that men with greater assets are more likely to opt for self-employment occupations, all else being equal. These findings are consistent with the liquidity constraint hypothesis.

Holtz-Eakin, Joulfaian, and Rosen (1994a) subscribe to the view that capital markets play an important role in individual choice between wages versus entrepreneurial earnings. Using a unique dataset built from Schedule C tax returns filed with the Internal Revenue Service, the authors provide empirical support for the explanatory power of an individual's inheritance on choosing the entrepreneurial alternative. They suggest that there is a positive relationship between the size of the inheritance and the odds of becoming an entrepreneur, as well as between the size of the inheritance and the quantity of capital employed by the entrepreneurship.

Using the same dataset, Holtz-Eakin, Joulfaian, and Rosen (1994b) examined why some entrepreneurs survive whereas other do not. They looked at entrepreneurial growth conditional on surviving. Their results suggest that personal inheritance slightly increases the probability of becoming an entrepreneur. In addition, it has a significant influence on the financial performance of the incumbent entrepreneurs. Therefore, they add further evidence to support Knight's vision of entrepreneurial determinants.

Continuing the same stream of research, Dunn and Holtz-Eakin (2000) examine the relationship between family financial status and human capital and the transition to self-employment. They find that owned financial assets play a modest role in the transition to self-employment. In contrast, they find that parents' capital exerts a major influence. The strong effects are not due to parents' financial means, but rather are due to

their own-self employment experience and success. It is proposed that entrepreneurship is correlated across generations because the parents transmit to their offspring valuable entrepreneurial experience, reputation, social and managerial human capital.

Although he agrees that one's wealth endowment is a main determinant of choosing the entrepreneurial path, Quadrini (1999, 2000) examines the opposite causal direction. He suggests that business families own more wealth because they save more. In particular, entrepreneurial families with a lower level of wealth get higher marginal returns from saving. In other words, Quadrini (1999, 2000) suggests that entrepreneurship choice has wealth accumulation effects such that entrepreneurial households accumulate more wealth than wage-earning families. To test this new approach, he suggests looking into the dynamics of socio-economic mobility of entrepreneurial families. He advanced that enterprising families experience greater upward-mobility than wage-earning families.

In this causal relation twist, entrepreneurship causes a certain kind of wealth accumulation behavior. This idea is further supported by the empirical work of Gentry and Hubbard (2004). They argue that wealth-income and saving-income ratios are higher for entrants and continuing entrepreneurs, even after controlling for age and other demographic variables. Moreover the authors suggest that the portfolios of enterprising households are less diversified than portfolios of wage-earning households, with a concentration of assets held within their own business. The lack of diversification is observed to persist even for continuing entrepreneurs although they are expected to be less liquidity constrained than new entrants.

Building on Quadrini and Gentry and Hubbard's work, Bradford (2003) finds that black and white families hold greater amounts of wealth than wage earning families. His findings suggest also that black entrepreneurial families hold a smaller proportion of black family wealth than white entrepreneurial families hold of white family wealth. Black and white entrepreneurial families have more upward and less downward social mobility than their corresponding racial group of wage earning families respectively. Black entrepreneurial families have less downward mobility than white entrepreneurial families. Finally, his findings indicate that the entrepreneurial families save at higher rate than wage earning families, and that there is no difference between the saving rates of black and white entrepreneurial families.

Hurst and Lusardi (2004) challenged the belief that liquidity constraints are important causal determinants of entry into self-employment. They showed empirically that the positive relationship between entry rates and wealth is unchanging as wealth increases from the 1st to the 95th percentile of the wealth distribution, but it increases radically after this point. To test their work, these authors used an ingenious instrument for wealth - unanticipated changes in house prices - in order to avoid the endogeneity problems developed by the use of wealth. This work challenged Knight's view and supported further inquiry into the potential opposite causal direction of the relationship between wealth and entrepreneurship.

Petrova (2005) suggests that the liquidity constraint might not hold for all enterprising households. Using Panel Study of Entrepreneurial Dynamics, she noted that around 80 percent of nascent entrepreneurs also hold regular jobs. Therefore, she questions the occupational choice of this group of households. She finds a new way of

testing the validity of liquidity constraint hypothesis. According to her proposition, if the credit constraint is crucial in choosing the entrepreneurial avenue, then wealthier entrepreneurs should allocate most of their time to entrepreneurial activity because they are not financially constrained. Her research findings suggest that the entrepreneurial households that choose the dual status of working for someone else and for one's self are not financially constrained. This situation seems to be true not only because of the dual status, but also because the majority of part-time entrepreneurs operate in less capital-intensive sectors.

Cagetti and De Nardi (2005) gravitate also toward the liquidity constraint hypothesis studying the impact of more restrictive borrowing constraints and voluntary bequests on entrepreneurial activity. According to their findings, imposing more restrictive borrowing conditions leads to less wealth concentration as well as to less intense entrepreneurial activity. Almost identical findings result from an economy with accidental bequests only. This situation generates fewer entrepreneurs, less aggregate capital, and less wealth concentration.

Magri (2005) aligns also to Knight's wealth precondition for entrepreneurship entry. Using an Italian dataset, Magri finds that household initial net wealth is a determinant in opting for entrepreneurial venue. Its explanatory power diminishes as the household's net wealth increases. Even when instrumented, net wealth explains occupational choice, most of the effect captured by the first two quartiles of net wealth. Also, the liquidity effect is relevant for those households that have been turned down for credit. Conditional on becoming an entrepreneurial household, the initial net wealth does not affect the size of the business.

More recently, a research focus shift pleads for the Shumpeterian view of entrepreneurship. Hurst and Lusardi (2004) provide support for this alternative view. They propose that propensity to become an entrepreneur is not a linear function of wealth. They find a positive relationship between wealth and entry to entrepreneurship only for the top 5 percent of the wealth distribution. For all other wealth categories, this relationship is essentially flat. Looking further into categories of industries, the authors find that wealth matters only for the entry in the industries that require high initial capital. Also, the results indicate that, when intergenerational transfers instrument wealth, business entry is predicted by past and future inheritances. This situation might capture not only liquidity.

Fairlie (2005) builds on the Schumpeterian vision of entrepreneurship and advances further questions regarding socio-economic mobility of young adults from disadvantaged families. He acknowledges the arguments about entrepreneurship as a route out of poverty. Therefore, he uses data from the National Longitudinal Survey of Youth to examine the earnings of young business owners who came from economically disadvantaged families. He finds some evidence that self-employed business owners earn more than wage-earning families. This work provides evidence against the prior findings regarding earnings differentials between self-employment and paid employment (Hamilton 2000).

Fairlie and Krashinsky (2006) challenge the findings of Hurst and Lusardi (2004) suggesting that analyzing rates of entry to self-employment depends further on the employment status before entry. They demonstrate that the wealth constraint has more

impact on those that come from the un-employed group before entry to entrepreneurship than on those that come from the employed group.

This division of arguments regarding the relationship between entrepreneurship and wealth invites further investigation of the link between entrepreneurship and wealth accumulation. The alternative approaches to the relationship between wealth and entrepreneurship presented here offer a more complete understanding on the functionality of this relationship. It is evident that more recent work on this relationship focuses on entrepreneurship as a cause for personal wealth building (Quadrini, 1999, 2000; Bradford, 2003; Gentry & Hubbard, 2004). This body of literature provides supporting evidence for the hypothesis that entrepreneurial families exhibit differential saving behavior as compared with wage earning families. The next section identifies gaps resulting from this body of literature.

2.3 Literature Gaps in the Study of Wealth and Saving Behavior Differences

This section presents a list of identified gaps in the current literature. The gaps provide further reasons for focusing on differences in wealth and saving behavior between entrepreneurial and wage-earning families, and suggest methodological approaches that improve the study of the relationship between entrepreneurship and wealth.

Although saving behavior differences between entrepreneurial and wage-earning families have been suggested in prior studies (Quadrini, 1999, 2000; Bradford, 2003; Gentry & Hubbard, 2004; Juster, Lupton, Smith & Stafford, 2000, 2006), these works have focused on wealth accumulation differences, wealth to income ratio differences, and social mobility. In general, the hypotheses advanced in these studies were supported by

descriptive statistics and less by causal analyses. The use of total wealth as dependent variable introduces confounding effects of active and passive savings. Therefore, it is suggested here that using “*active saving*” as dependent variable in the study of saving behavior and wealth accumulation of entrepreneurial and wage-earning families provides a superior methodological setting. “*Active saving*” is the unique component of saving that captures the behavior of the family, and is under the complete control of the family.

Further, most national data collections on consumer expenditures (e.g. the Consumer Expenditure Survey (CES)) or consumer finances (e.g. the Survey of Consumer Finances (SCF)) are cross-sectional and cannot track saving behavior of the same individuals over time. It is suggested that investigating saving behavior requires a longitudinal data set.

When those surveys contain a longitudinal module, e.g. SCF during ‘80s (1983-1989), or they are longitudinal by design (PSID) most of the reported results are based on outdated data collections (mostly period ’83 -’94). Consequently, prior research based on these surveys has some limitations. It is proposed that PSID provides the needed longitudinal testing conditions that increase the power of generalization, but conditioned by reporting on more recent data collections.

The need for research on more current data is born from the fact that there has been substantial change in personal and family portfolio structure in the late 1980s, the 1990s, and the beginning of 2000s. For example, investments in stocks and mutual funds have gained tremendous popularity. As briefly described in a previous section, home equity gained popularity during the same period and became the major asset in the portfolio of most American families. These facts suggest that more current data might provide a new

perspective when testing saving behavior hypotheses, at least from a portfolio structural perspective.

Furthermore, in the late 1980s and during the 1990s, there was a proliferation of diverse saving-investing vehicles, each having different rate of return and uncertainty. Thus, saving-investing behavior became far more complex than ever before. Life cycle wealth accumulation is increasing due to holding of equity-based assets, but the value of the equity-based assets is often dependent on tacit knowledge. It is of interest to examine how these changes may have affected the saving-investing behavior of American families, and if the research claims based on earlier data collections still hold.

Hurst, Luoh, and Safford (1998) asserted that during 1980s and 1990s human capital investment became a priority for most individuals in the American society because earnings of the highly educated group rose to higher levels as compared to the earnings of those with less education. Moreover, women's participation in the labor market changed significantly in this period of time, affecting family income and consumption-saving patterns. It is important to capture these structural changes in the study of wealth accumulation differences between entrepreneurial and wage-earning families, by comparing results from more recent data collections to results from much earlier data collections.

3. THEORETICAL FRAMEWORK

3.1 Theoretical Model and Hypotheses

Three theories support the hypotheses regarding wealth accumulation differences between entrepreneurial and wage earning families: the cost of external financing, the uncertainty of income within entrepreneurial families, and mental accounting processing.

In order to show how these theories sustain the research objectives, a two-period consumption model (Fisher, 1930) is developed, which incorporates the transition from wage earning, in period 1, to entrepreneurship in period 2. In this two-period world, family's lifetime utility function is $U(C_1, C_2)$.

$$\text{Assume that } \frac{\partial U}{\partial C_1}, \frac{\partial U}{\partial C_2} > 0, \quad (1)$$

$$\text{and } \frac{\partial^2 U}{\partial C_1^2}, \frac{\partial^2 U}{\partial C_2^2} < 0, \text{ such that } U \text{ is a concave function of both arguments.} \quad (2)$$

The family begins period 1 with zero resources, and earns y_1 income. Total resources are divided between consumption during period 1, C_1 and savings at the end of period 1, S_1 .

$$y_1 = C_1 + S_1, \quad (3)$$

$$S_1 = y_1 - C_1. \quad (4)$$

At the end of period 2, the resources equal the sum of the savings at the end of period 1 and the interest they produced over one period. If the rate of interest is r , then

$$W_2 = S_1 + S_1 r = S_1(1 + r) = (y_1 - C_1)(1 + r). \quad (5)$$

Assuming that the world will end after period 2, the family will consume all resources in period 2. Therefore,

$$C_2 = W_2 + y_2, \quad \text{or} \quad (6)$$

$$C_2 = S_1(1+r) + y_2, \quad \text{or} \quad (7)$$

$$C_2 = (y_1 - C_1)(1+r) + y_2. \quad (8)$$

As previously stated, the income in period 1 comes from wages, $y_1 = w_1$, while the income in period 2 comes from entrepreneurial rent and wages, $y_2 = \theta K^\alpha \delta^\gamma + (1-\delta)w_2$.

The coefficient δ indicates the proportions of entrepreneurial and wage income from the total income in period 2. Thus, $0 \leq \delta \leq 1$. When $\delta = 0$ we have a wage earning only family in period 2, whereas $\delta = 1$ reflects the situation when the income in period 2 comes only from entrepreneurial earnings. Regarding the entrepreneurial earnings,

$$\theta K^\alpha \delta^\gamma, \quad (9)$$

θ represents the entrepreneurial abilities of the family,

K is the capital invested in the entrepreneurial project,

α is the scale production coefficient, in this case decreasing returns to scale (Lucas, 1978; Evans & Jovanovic, 1989; Holtz-Eakin, Joulfaian & Rosen, 1994a, 1994b; Gentry & Hubbard, 2004).

γ is the involvement coefficient. As the return to scale increases, it increases the participation to entrepreneurship δ^γ , thus $\alpha + \gamma \leq 1$ (Petrova, 2005).

Further, considering the von Neumann-Morgenstern (1980) utility function as additive and time-separable, the objective function is the summation of the utility from

consumption in period 1, C_1 , and the utility of consumption from consumption in period 2, C_2 , then the problem can be stated as:

$$U = \max_{S_1, K, \delta} [U(C_1) + \beta U(C_2)] = \max_{S_1, K, \delta} \{U(w_1 - S_1) + \beta U[(S_1 - K)(1+r) + \theta K^\alpha \delta^\gamma + (1-\delta)w_2]\} \quad (10)$$

where

$$C_1 = (w_1 - S_1)$$

$$C_2 = (S_1 - K)(1+r) + \theta K^\alpha \delta^\gamma + (1-\delta)w_2,$$

and

β is the subjective time preference discounting factor applied by the individual or family to future consumption. $\beta = \frac{1}{1+\rho}$, where ρ is the subjective discount rate.

If the objective function is maximized with respect to S_1 , K and δ , then the first order conditions (FOCs) are:

$$\frac{\partial U}{\partial S_1} = -U_1 + \beta(1+r)U_2 = 0 \quad (11)$$

$$\frac{\partial U}{\partial K} = \beta U_2 [-(1+r) + \alpha \theta K^{\alpha-1} \delta^\gamma] = 0 \quad (12)$$

$$\frac{\partial U}{\partial \delta} = \beta U_2 (\beta \theta K^\alpha \delta^{\gamma-1} - w_2) = 0 \quad (13)$$

Renaming $(1+r) = R$ for parsimonious reasons, interest based factor, and rearranging relation (11), it can be concluded that

$$\frac{U_1}{U_2} = \beta R. \quad (14)$$

Reorganizing equations (12) and (13) the following system of equations are obtained:

$$\begin{cases} \alpha \theta K^{\alpha-1} \delta^\gamma = R \\ \beta \theta K^\alpha \delta^{\gamma-1} = w_2 \end{cases} \quad (15)$$

Dividing the two equations of the system (15), one to the other, the result is

$$\frac{\alpha}{\gamma} \frac{\delta}{K} = \frac{R}{w_2}. \quad (16)$$

Replacing (16) in the system of equations (15), gives

$$\begin{cases} \alpha \theta K^{\alpha-1} K^\gamma \left(\frac{R}{w_2}\right)^\gamma \left(\frac{\gamma}{\alpha}\right)^\alpha = R \\ \gamma \theta \delta^\alpha \left(\frac{\alpha}{\gamma}\right)^\alpha \left(\frac{w_2}{R}\right)^\alpha \delta^{\gamma-1} = w_2 \end{cases} \quad (17)$$

Finally, the maximizing values of K and δ are

$$K^* = \theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R}\right)^{\frac{1-\gamma}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_2}\right)^{\frac{\gamma}{1-\alpha-\gamma}}, \quad (18)$$

$$\delta^* = \theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R}\right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_2}\right)^{\frac{1-\alpha}{1-\alpha-\gamma}}. \quad (19)$$

The values of δ point to three potential cases, described briefly in Table 7.

Table 7. Alternative occupational choices for modeling

Case\Time period	Period 1 occupation	Period 2 occupation
Case 1 ($\delta = 0$)	Wage earning only	Wage earning only
Case 2 ($0 < \delta < 1$)	Wage earning only	Wage earning + entrepreneurial rent
Case 3 ($\delta = 1$)	Wage earning only	Entrepreneurial rent

Therefore, the solutions to the optimization problem are:

Case 1: $(K^*, \delta^*) = \{0, 0\}$ for $\theta = 0$; (20)

$$\text{Case 2: } (K^*, \delta^*) = \{X, Y\} \text{ for } 0 < \theta < \left(\frac{R}{\alpha}\right)^\alpha \left(\frac{w_2}{\gamma}\right)^{1-\alpha} \quad (21)$$

where

$$X = \theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R}\right)^{\frac{1-\gamma}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_2}\right)^{\frac{\gamma}{1-\alpha-\gamma}}, \quad (22)$$

$$Y = \theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R}\right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_2}\right)^{\frac{1-\alpha}{1-\alpha-\gamma}}. \quad (23)$$

$$\text{Case 3: } (K^*, \delta^*) = \left\{ \left(\frac{\theta\alpha}{R}\right)^{\frac{1}{1-\alpha}}, 1 \right\} \text{ for } \theta \geq \left(\frac{R}{\alpha}\right)^\alpha \left(\frac{w_2}{\gamma}\right)^{1-\alpha}. \quad (24)$$

If the savings from period 1 are less than the capital necessary for investment, $S_1 < K$, then the family has to borrow additional capital, and $r(S_1 - K)$ is the amount of money that the family repays at the end of the period. Due to asymmetric information between lender and borrower, the lender will give the borrower only a certain capital amount, which varies between zero and an amount proportional to the collateral assets that the lender can secure from the borrower at the transaction time.

Therefore, in the model, the family can borrow only up to an amount proportional to its savings from period 1, $(\lambda - 1)S_1$. This condition indicates that $\lambda - 1$ is the factor of proportionality, and $\lambda \geq 1$. The largest amount of capital that can be invested in the entrepreneurial activity by a family is $S_1 + (\lambda - 1)S_1 = \lambda S_1$ (Evans & Jovanovic, 1989; Petrova, 2005). Thus the capital constraint faced by the family in period 2 is

$$0 \leq K \leq \lambda S_1. \quad (25)$$

Case 1: there are no financial constraints.

Case 2: the family is unconstrained if $K \leq \lambda S_1$, which translates further into

$$\theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{1-\gamma}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_2} \right)^{\frac{\gamma}{1-\alpha-\gamma}} \leq \lambda S_1, \quad (26)$$

or its entrepreneurial abilities have to be

$$\theta \leq (\lambda S_1)^{1-\alpha-\gamma} \left(\frac{R}{\alpha} \right)^{1-\gamma} \left(\frac{w_2}{\gamma} \right)^\gamma. \quad (27)$$

Otherwise, the family is financially constrained. Taking in consideration the limitations imposed by (21) and (27), the condition for the unconstrained entrepreneurial abilities have to restated

$$0 < \theta < \min \left[(\lambda S_1)^{1-\alpha-\gamma} \left(\frac{R}{\alpha} \right)^{1-\gamma} \left(\frac{w_2}{\gamma} \right)^\gamma, \left(\frac{R}{\alpha} \right)^\alpha \left(\frac{w_2}{\gamma} \right)^{1-\alpha} \right]. \quad (28)$$

If $\lambda = \infty$ then, (28) converts into condition (21). In contrast, if the family is constrained $K > \lambda S_1$ and the resulting condition on entrepreneurial abilities θ becomes

$$(\lambda S_1)^{1-\alpha-\gamma} \left(\frac{R}{\alpha} \right)^{1-\gamma} \left(\frac{w_2}{\gamma} \right)^\gamma < \theta < \left(\frac{R}{\alpha} \right)^\alpha \left(\frac{w_2}{\gamma} \right)^{1-\alpha}, \quad (29)$$

or

$$\left(\frac{\lambda S_1}{\frac{w_2}{R} \frac{\alpha}{\gamma}} \right)^{1-\alpha-\gamma} < \theta < 1. \quad (30)$$

Case 3: The family that is only entrepreneurial in period 2, and financially unconstrained, $K \leq \lambda S_1$, the entrepreneurial ability should respect the following condition

$$\theta \leq (\lambda S_1)^{1-\alpha} \frac{R}{\alpha}. \quad (31)$$

Combining (24) and (31) leads to the following condition on θ for the unconstrained entrepreneurial family

$$\theta \geq \min \left[(\lambda S_1)^{1-\alpha} \frac{R}{\alpha}, \left(\frac{R}{\alpha} \right)^\alpha \left(\frac{w_2}{\gamma} \right)^{1-\alpha} \right]. \quad (32)$$

From the study of these three cases it can be concluded that the distinction between being financially constrained and unconstrained depends on entrepreneurial ability, θ , and the level of savings from period 1, S_1 . This distinction is given by

$$\theta \leq \text{or } > (\lambda S_1)^{1-\alpha-\gamma} \left(\frac{R}{\alpha} \right)^{1-\gamma} \left(\frac{w_2}{\gamma} \right)^\gamma \text{ for families earning wages and entrepreneurial rent in}$$

period 2, or $\theta \leq \text{or } > (\lambda S_1)^{1-\alpha} \frac{R}{\alpha}$ for families earning entrepreneurial income only in

period 2. Therefore, there is an incentive for entrepreneurial families to save more money in period 1, S_1 , to remain financially unconstrained. When the family becomes financially constrained, the cost of money becomes an issue. The constrained family has to pay back $(\lambda - 1)S_1 r_B$, where r_B is the rate of borrowing money from the bank. The rate of borrowing money depends on the credibility of the entrepreneur, the amount of collateral money committed to the loan, the degree of enforceability of the lending

contract, etc. (Magri 2003). The cost of the loan is given by the difference between the rate of borrowing and the rate of interest $(\lambda - 1)S_1(r_B - r)$.

This cost creates an incentive for the entrepreneurial families to save money for their future projects, as well to search for finance sources of finance such as family, friends, or angel investors.

This mathematical exercise suggests that there are incentives for entrepreneurial families to save more than for wage earning families, and it is legitimate to hypothesize the following:

H1. *Before entrepreneurial entry, families transitioning from wage earning to entrepreneurial occupation are likely to actively save more than wage earning families. Thus, all else equal, they will accumulate more wealth.*

The objective problem (10), can be generalized further by adding the inherent uncertainty associated to the entrepreneurial income from period 2. Therefore, the model will evolve into

$$U = \max_{S_t, K_t, \delta_t} [U(C_t) + \beta E_t U(C_{t+1})] = \max_{S_t, K_t, \delta_t} \left\{ U(w_t - S_t) + \beta E_t U \left[(S_t - K_{t+1})(1+r) + \theta K_{t+1}^\alpha \delta_{t+1}^\gamma + (1 - \delta_{t+1})w_{t+1} \right] \right\} \quad (33)$$

where

$$C_t = (w_t - S_t)$$

$$C_{t+1} = (S_t - K_{t+1})(1+r) + \theta K_{t+1}^\alpha \delta_{t+1}^\gamma + (1 - \delta_{t+1})w_{t+1}$$

where E_t symbolizes the expected value at time t of the $U(C_{t+1})$.

A resulting solution from FOCs is the well-known Euler equation

$$U_t = \beta RE_t [U_{t+1}]. \quad (34)$$

This relation advances that marginal utility of consumption at time t , U_t , equals marginal utility of consumption at time $t+1$, U_{t+1} , times discount factor, $R=(1+r)$, and time preference rate, $\beta = \frac{1}{1+\rho}$.

The Euler equation (34) doesn't provide direct quantitative solutions regarding consumption levels in periods t and $t+1$. Thus, further assumptions about the functional form of the utility function must be made. To capture the uncertainty of income in the second period, the Euler equation could be written as follows

$$U_t = \beta RE_t[U_{t+1}] + \frac{\sigma^2}{2} \Psi \quad . \quad (35)$$

where

σ^2 is the variation of the second period income, $\sigma^2 > 0$;

Ψ represents a function of the third derivative of utility, which results from the asymmetry in utility function. If utility function has a decreasing absolute risk aversion (DARA), $\left(-\frac{U''}{U'}\right)$, then $\Psi < 0$ (Ahsan, 1977).

This model form suggests that marginal utility of consumption at time t equals the discounted marginal utility (time-preference and rate of interest) at time $t+1$ plus the income uncertainty term, $\frac{\sigma^2}{2} \Psi$ (Kuntz-Duriseti, 2004). Because the term capturing the uncertainty is negative for DARA utility function, one can predict the change in consumption in the first period. Consumption in the first period, C_t , has to decrease in order to increase the marginal utility of consumption in the first period (U_t'). The

increase in U_t' due to decrease in consumption in the first period, C_t , compensates for the decrease of $\beta RE_t[U_{t+1}]$ by $\frac{\sigma^2}{2} \Psi$.

The quadratic form of the utility function represents a particular case because the third derivative of the utility function is zero. The quadratic utility function still prompts risk aversion, but it does not ask for precautionary response under income uncertainty. Due to its symmetry, this utility function produces the *certainty equivalent* (CE) optimal level of consumption for the two time periods, equation (34), and thus it is considered as a benchmark that helps evaluate the effects of future income uncertainty (Kuntz-Duriseti, 2004).

Another approach to explaining the wealth accumulation and saving effects is mental accounting and the fungibility of wealth components (Shefrin & Thaler, 1988; Thaler, 1999). Fungibility refers to the fact that wealth components are treated equivalently whenever an individual or family operates on them. Empirical findings show that this is not a true generalization. In contrast, individuals and families assign wealth components to separate mental accounts and treat the money in each of them differently.

Shefrin and Thaler (1988) show that individuals and families develop a hierarchy of money locations based on how tempting is to spend the money from each location for household purposes. The authors propose that the most tempting class of accounts is the “current assets,” which is represented by cash, money market accounts, or checking accounts. Money from these accounts is easily accessible, liquid, and frequently spent each period. Less tempting to spend is money in the “current wealth” category, which consists of saving accounts, stock investments, mutual funds, etc. These accounts are designated for saving. Next category in the hierarchy is home equity. And finally the least

tempting category includes “ future income,” like funds designated to human capital development, pension funds, 401 K and 403 B, IRA accounts, etc. The most important prediction of mental accounting theory is that if money is transferred from tempting accounts into less tempting to spend accounts they are more likely to be saved (Thaler, 1999).

Considering that entrepreneurial families are less diversified in their investments than wage earning families (Gentry & Hubbard, 2000) since they invest most of their money in their own enterprise, and following the logic of income uncertainty and mental accounting, it is proposed here

H2: *Entry and incumbent entrepreneurial families are likely to actively save more than wage earning families. Thus all else equal, they will accumulate more wealth.*

“Mental accounting” processing and entrepreneurial families’ concentration of their investments toward their own business (Gentry & Hubbard, 2000) also support hypothesis H2. It is suggested that enterprising families have their money committed to less tempting accounts such as investments in their own business, and thus, they are likely to consume less as compared with wage earning families.

Three aspects are particularly important for the mental accounting process (Kivetz, 1999). First, the way in which the outcomes are experienced, and consequently, classified is very important. For example, money obtained through a long process of investing, hard work, and risk taking, in the case of entrepreneurship, are experienced and classified mentally differently from wage money, received also through hard working, but with greater certainty. The second important aspect of mental accounting processes

entails labeling the mental accounts based on the related activity, like regular vs. transitory income, or non-discretionary versus discretionary expenses (luxuries). This step helps individuals and families to match their accounts with particular groups of expenses. Thus, income coming from entrepreneurial activities might be further mentally labeled and committed to entrepreneurial projects. Finally, the third important aspect of a mental accounting process is related to the frequency with which mental accounts are assessed (i.e. daily, weekly, etc.) and whether they are defined broadly or narrowly. This definition might suggest that individuals and families involved in entrepreneurial activity might update their related accounts quarterly, semiannually, or annually, whereas wage earning individuals and families might update their accounts biweekly, or monthly. Ishikada and Ueda (1984) findings support this claim, showing that marginal propensity of consumption is higher for regular income than for bi-annual bonuses, which are the norm in Japan. Thus far, it is speculated that this delayed updating in mental and physical accounts for entrepreneurial families might create saving differences between entrepreneurial and wage earning families.

Developing further Shefrin and Thaler's (1988) life cycle model, Levin (1998) suggests that consumption of any good, C , is a function dependent on income, y , and asset structure, A_1, \dots, A_k ,

$$C = C(y, A_1, A_2, A_3, \dots, A_k) \quad (36)$$

with

$$\frac{\partial C}{\partial y} \neq \frac{\partial C}{\partial A_1} \neq \frac{\partial C}{\partial A_2} \neq \dots \neq \frac{\partial C}{\partial A_k} \neq \frac{\partial C}{\partial W} \quad (37)$$

where W is total wealth, which equals $\sum_1^k A_i$. Consumption from liquid accounts is more tempting than consumption from illiquid accounts.

Furthermore, each asset is used to cover certain kind of expenditures and thus the marginal propensity to consume different goods from the same asset class is different:

$$\frac{\partial C_1}{\partial A_k} \neq \frac{\partial C_2}{\partial A_k} \neq \dots \neq \frac{\partial C_G}{\partial A_k}. \quad (38)$$

Taking a similar approach with Davies, Esau and Goshray (2007) this study extends Levin's (1998) framework by suggesting that the marginal propensity of consumption from different sources of income is different. Also, there are different marginal propensities to consume from different asset accounts. In the case of the two period model, consumption in each period is illustrated as a function of the present, y_t , future income y_{t+1} , and the structure of family's assets A_1, \dots, A_k . Therefore, consumption can be expressed as

$$C_t = C(y_t, y_{t+1}, A_1, A_2, A_3, \dots, A_k) \quad (39)$$

Coming back to the original assumptions, when the family transitions from a wage earning occupation in period one to entrepreneurship in the second period, it starts with no assets. After period two the world ends, so everything accumulated is consumed in period two. It is also assumed that money saved is placed in a checking account (liquid account), A_1 , and own business, A_2 . When family is constrained it means that there is no A_1 left to consume because it is all invested in the family's business (entrepreneurial project), A_2 .

If money is invested in less liquid accounts in period 1 for the purpose of the startup business, consumption in period 1, C_1 , would be less than in the case where this account does not exist, and money would be placed in a liquid account (checking or savings account). Therefore, more savings are expected from period one, if a family foresees entry to entrepreneurship, and thus, separates mentally the liquid money from the money allocated to entrepreneurial activity.

3.2 Empirical Model

This section presents the choice of empirical modeling that allows the proposed hypotheses to be tested. The two-period maximizing consumption-saving model with income uncertainty in period 2, and mental accounting effects, does not allow direct estimation of the effects advanced in the hypotheses, unless further assumptions are made regarding the form of the utility function.

Kimball (1990a, 1990b, 1993) argues that Decreasing Absolute Risk Aversion (DARA) is the most realistic (plausible) condition for the average utility function. Basically, this condition suggests that risk aversion decreases as wealth level rises. The most commonly used functional form for the utility functions of DARA class is the Constant Relative Risk Aversion (CRRA). It is proposed that this specification form can be used for the utility function, since others have used it before (Browning & Lusardi, 1996)

$$U_C(C, Z) = \frac{1}{1 - \phi(Z)} \left\{ \frac{C}{\phi(Z)} \right\}^{1 - \phi(Z)} . \quad (40)$$

where

C is consumption,

Z is a vector of modifiers for utility, which will refer as a vector of “demographics.”

The common candidates for Z are household composition, health status, and labor supply, but it can be anything that affects family’s utility function.

$\phi(Z)$ is the coefficient of relative risk aversion, which is independent of the level of lifetime wealth, but dependent on certain demographics,

$\varphi(Z)$ is an adult equivalence scale, which requires that marginal utility of consumption will increase with family size.

If this specification is applied to the two-period model, the result is:

$$\begin{aligned}
 U &= \max_{S_t, K_{t+1}, \delta} [U(C_t) + \beta U(C_{t+1})] \\
 &\equiv \max_{S_t, K_{t+1}, \delta} \left\{ \frac{1}{1 - \phi(Z_t)} \left[\frac{w_t - S_t}{\varphi(Z_t)} \right]^{1 - \phi(Z_t)} + \beta \frac{1}{1 - \phi(Z_{t+1})} \left[\frac{(S_t - K_{t+1})(1+r) + \theta K_{t+1}^\alpha \delta_{t+1}^\gamma + (1 - \delta_{t+1})w_{t+1}}{\varphi(Z_{t+1})} \right]^{1 - \phi(Z_{t+1})} \right\} \quad (41)
 \end{aligned}$$

where

$$C_t = (w_t - S_t),$$

$$C_{t+1} = (S_t - K_{t+1})(1+r) + \theta K_{t+1}^\alpha \delta_{t+1}^\gamma + (1 - \delta_{t+1})w_{t+1}.$$

The resulting FOCs from this model are given by equations (11), (12), and (13).

While (12) and (13) are used to determine the optimal levels K^* and δ^* that maximizes consumption across the two periods, equation (11) is left unsolved. The research focus is active savings and thus solving equation (11) determines the optimal saving level that maximizes total utility over the two periods considered. Thus, using the power form of the utility function in equation (11) we obtain

$$\frac{\partial U}{\partial S_t} = - \frac{(w_t - S_t)^{-\phi(Z_t)}}{[\varphi(Z_t)]^{1 - \phi(Z_t)}} + \beta R \frac{[(S_t - K_{t+1})R + \theta K_{t+1}^\alpha \delta_{t+1}^\gamma + (1 - \delta_{t+1})w_{t+1}]^{-\phi(Z_{t+1})}}{[\varphi(Z_{t+1})]^{1 - \phi(Z_{t+1})}} = 0 \quad (42)$$

Further, in order to simplify the equation, consider the coefficient of risk aversion, $\phi(\cdot)$ independent of the vector of demographics Z . Browning and Lusardi (1996) used a similar simplification.

$$\beta R \frac{[(S_t - K_{t+1})R + \theta K_{t+1}^\alpha \delta_{t+1}^\gamma + (1 - \delta_{t+1})w_{t+1}]^{-\phi}}{[w_t - S_t]^{-\phi}} - \frac{[\varphi(Z_{t+1})]^{1-\phi}}{[\varphi(Z_t)]^{1-\phi}} = 0 \quad (43)$$

Working further on equation (43) and denoting the optimal values by * results the following

$$[(S_t^* - K_{t+1}^*)R + \theta K_{t+1}^{*\alpha} \delta_{t+1}^{*\gamma} + (1 - \delta_{t+1}^*)w_{t+1}] + (\beta R)^{\frac{1}{\phi}} \frac{[\varphi(Z_t)]^{\frac{1-\phi}{\phi}}}{[\varphi(Z_{t+1})]^{\frac{1-\phi}{\phi}}} (S_t^* - w_t) = 0 \quad (44)$$

Furthermore,

$$S_t^* \left[R + (\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})} \right)^{\frac{1-\phi}{\phi}} \right] = K_{t+1}^* R - \theta K_{t+1}^{*\alpha} \delta_{t+1}^{*\gamma} - (1 - \delta_{t+1}^*)w_{t+1} + (\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})} \right)^{\frac{1-\phi}{\phi}} w_t \quad (45)$$

We replace $\frac{1}{R + (\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})} \right)^{\frac{1-\phi}{\phi}}} = \tilde{Z}$ in (45) and it results

$$S_t^* = R\tilde{Z}K_{t+1}^* - \tilde{Z}\theta K_{t+1}^{*\alpha} \delta_{t+1}^{*\gamma} + \tilde{Z}(\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})} \right)^{\frac{1-\phi}{\phi}} w_t - (1 - \delta_{t+1}^*)\tilde{Z}w_{t+1} \quad (46)$$

Case 1: $(K^*, \delta^*) = \{0, 0\}$ for $\theta = 0$;

$$S_t^* = \tilde{Z}(\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})} \right)^{\frac{1-\phi}{\phi}} w_t - \tilde{Z}w_{t+1} \quad (47)$$

Relation (47) indicates that the optimal amount of saving in period 1 when the family earns income only from wages in both periods, S_t^* , depends on: the changes in the

demographics vector Z , from period t , to period $t+1$; the interest rate, $R=(1+r)$; the subjective rate of discounting; β , and wages in both periods, w_t and w_{t+1} .

$$\text{Case 2: } (K^*, \delta^*) = \left\{ \theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{1-\gamma}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}} \right)^{\frac{\gamma}{1-\alpha-\gamma}}, \theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}} \right)^{\frac{1-\alpha}{1-\alpha-\gamma}} \right\} \text{ for}$$

$$0 < \theta < \left(\frac{R}{\alpha} \right)^\alpha \left(\frac{w_{t+1}}{\gamma} \right)^{1-\alpha}$$

Therefore, for the unconstrained families if we replace the optimal values (K^*, δ^*) in equation (46), we obtain

$$S_t^* = R\tilde{Z}\theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{1-\gamma}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}} \right)^{\frac{\gamma}{1-\alpha-\gamma}} - \tilde{Z}\theta\theta^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{\alpha(1-\gamma)}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}} \right)^{\frac{\alpha\gamma}{1-\alpha-\gamma}} \theta^{\frac{\gamma}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{\gamma\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}} \right)^{\frac{\gamma(1-\alpha)}{1-\alpha-\gamma}}$$

$$+ \tilde{Z}(\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})} \right)^{\frac{1-\phi}{\phi}} w_t - \left[1 - \theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}} \right)^{\frac{1-\alpha}{1-\alpha-\gamma}} \right] \tilde{Z}w_{t+1} \quad (48)$$

Further

$$S_t^* = R\tilde{Z}\theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{1-\gamma}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}} \right)^{\frac{\gamma}{1-\alpha-\gamma}} - \tilde{Z}\theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}} \right)^{\frac{\gamma}{1-\alpha-\gamma}}$$

$$+ \tilde{Z}(\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})} \right)^{\frac{1-\phi}{\phi}} w_t - \left[1 - \theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}} \right)^{\frac{1-\alpha}{1-\alpha-\gamma}} \right] \tilde{Z}w_{t+1} \quad (49)$$

Next

$$S_t^* = \tilde{Z}\theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}} \right)^{\frac{\gamma}{1-\alpha-\gamma}} (\alpha - 1) + \tilde{Z}(\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})} \right)^{\frac{1-\phi}{\phi}} w_t$$

$$- \tilde{Z}w_{t+1} + \tilde{Z}\theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R} \right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}} \right)^{\frac{\gamma}{1-\alpha-\gamma}} \gamma \quad (50)$$

Finally,

$$S_t^* = \tilde{Z}\theta^{\frac{1}{1-\alpha-\gamma}} \left(\frac{\alpha}{R}\right)^{\frac{\alpha}{1-\alpha-\gamma}} \left(\frac{\gamma}{w_{t+1}}\right)^{\frac{\gamma}{1-\alpha-\gamma}} (\alpha + \gamma - 1) + \tilde{Z}(\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})}\right)^{\frac{1-\phi}{\phi}} w_t - \tilde{Z}w_{t+1} \quad (51)$$

Equation (51) indicates that the unconstrained families who are involved both in wage earning and entrepreneurship in period 2 should save an optimal value S_t^* , which depends on: entrepreneurial ability θ , the change in the vector of demographics Z , rate of interest $R=(1+r)$, the subjective rate of discounting $\beta = \frac{1}{1+\rho}$, and wages in period 1 and 2, w_t and w_{t+1} . The predicted direction of influence is given by the coefficients provided in equation (51). For example, due to the fact that $\alpha + \gamma \leq 1$ for diminishing returns to scale, the entrepreneurial ability θ is expected to be negatively correlated to the optimal saving amount S_t^* . This relation is consistent with Evans and Jovanovic (1989) findings, but contrary with Petrova's (2005) suggestions.

A negative correlation is expected between the optimal savings and the size of the wage in period 2, w_{t+1} .

Further, positive correlations are expected between the optimal saving amount S_t^* and the wage in the first period w_t , and the optimal saving amount S_t^* and the change in the demographics vector Z .

For the constrained families the determination of the optimal amount of saving is technically more difficult. The following equation results for this case

$$S_t^* - R\tilde{Z}\lambda S_t^* + \tilde{Z}\theta(\lambda S_t^*)^\alpha \delta_{t+1}^{\gamma} - \tilde{Z}(\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})}\right)^{\frac{1-\phi}{\phi}} w_t + (1 - \delta_{t+1}^*)\tilde{Z}w_{t+1} = 0 \quad (52)$$

After rearranging (52) it results

$$\tilde{Z}\theta\delta_{t+1}^*\lambda^\alpha S_t^{*\alpha} + (1 - R\tilde{Z}\lambda)S_t^* - \tilde{Z}(\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})} \right)^{\frac{1-\phi}{\phi}} w_t + (1 - \delta_{t+1}^*)\tilde{Z}w_{t+1} = 0 \quad (53)$$

Technically, solving this polynomial equation is a complex process, which requires a few transformations. It is not the intent here go through this process. We can predict from (53) that if there are real solutions for this equation, the optimal saving amount S_t^* depends on: entrepreneurial ability θ , the change in the vector of demographics Z , rate of interest $R=(1+r)$, the subjective rate of discounting $\beta = \frac{1}{1+\rho}$, the return to scale coefficients $\alpha + \gamma$, the proportion of money borrowed λ , the proportion of entrepreneurial activity relative to total activity in period 2, δ_{t+1}^* , and wages in periods 1 and 2, w_t and w_{t+1} . Since we don't have a direct relationship among these variables to show it is not possible to make predictions about the direction of the effects.

Finally, a similar approach could be applied for

$$\text{Case 3: } (K^*, \delta^*) = \left\{ \left(\frac{\theta\alpha}{R} \right)^{\frac{1}{1-\alpha}}, 1 \right\} \text{ for } \theta \geq \left(\frac{R}{\alpha} \right)^\alpha \left(\frac{w_2}{\gamma} \right)^{1-\alpha}.$$

If we replace these optimal results K^* and δ^* in equation (46), we can determine the optimal amount of saving for the families dedicated fully to entrepreneurship in period 2.

Therefore,

$$S_t^* = R\tilde{Z} \left(\frac{\theta\alpha}{R} \right)^{\frac{1}{1-\alpha}} - \tilde{Z}\theta \left(\frac{\theta\alpha}{R} \right)^{\frac{\alpha}{1-\alpha}} + \tilde{Z}(\beta R)^{\frac{1}{\phi}} \left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})} \right)^{\frac{1-\phi}{\phi}} w_t \quad (54)$$

Working further on (54) it results

$$S_t^* = R\tilde{Z}\left(\frac{\theta\alpha}{R}\right)^{\frac{1}{1-\alpha}}\left(\frac{\alpha-1}{\alpha}\right) + \tilde{Z}(\beta R)^{\frac{1}{\phi}}\left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})}\right)^{\frac{1-\phi}{\phi}} w_t \quad (55)$$

Since $\alpha \leq 1$, it is expected that a negative correlation between the optimal savings S_t^* and the entrepreneurial abilities θ exist; a prediction consistent with Evans and Jovanovic's (1989) suggestions. A positive correlation is expected between the optimal saving amount S_t^* and the change in the demographics' vector Z . Also, positive effects are expected from the rate of interest $R=(1+r)$, the subjective temporal discount rate $\beta = \frac{1}{1+\rho}$, and the wage level in period 1, w_t .

For the constrained families who choose only entrepreneurial income in period 2, equation (55) becomes

$$S_t^* = R\tilde{Z}\lambda S_t^* - \tilde{Z}\theta\lambda^\alpha S_t^{*\alpha} + \tilde{Z}(\beta R)^{\frac{1}{\phi}}\left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})}\right)^{\frac{1-\phi}{\phi}} w_t \quad (56)$$

Rearranging the terms in (56) we obtain

$$(R\tilde{Z}\lambda - 1)S_t^* - \tilde{Z}\theta\lambda^\alpha S_t^{*\alpha} + \tilde{Z}(\beta R)^{\frac{1}{\phi}}\left(\frac{\varphi(Z_t)}{\varphi(Z_{t+1})}\right)^{\frac{1-\phi}{\phi}} w_t = 0 \quad (57)$$

A similar discussion could be applied to equation (57) as in Case 2 for the constrained families. In summary, it is difficult to determine a relationship for the optimal amount of savings S_t^* and, consequently, no predictions can be made about the direction of the effects. But we can state that S_t^* depends on: the entrepreneurial ability θ , any change in the demographic variables Z , the rate of interest r , the rate of subjective temporal discount ρ , and the wage level in period 1, w_t .

In all three cases, we should add the random error e_{t+1} to the optimal saving functions S_t^* , where $E(e_{t+1}) = 0$ and σ_{t+1}^2 is the variance of e_{t+1} .

As described in the theoretical part, the error captures the variance of future consumption (period 2), or the precautionary motive. Higher uncertainty leads agents to lower current consumption in order to increase precautionary savings.

Two features of the precautionary savings are important to consider (Browning & Lusardi, 1996): the precautionary savings depends on the uncertainty associated with future exogenous variables (e.g. income, demographics), and the precautionary savings depends on cash-on-hand (assets plus current earnings). Because of the second feature, income variance is not by itself an adequate proxy for the variance term. The impact of income risk on current consumption decisions depends on the level of current assets, and income relative to expected future income. Thus, we have to include in our empirical model total wealth lagged one period, to capture fully the income risk effects.

Therefore, in summary of the three cases presented earlier and based on equations (51) and (53), it is proposed a linear empirical model of active savings as a function of the following list of variables

$$\text{Active Savings} = F(\text{family demographics, entrepreneurial choice, permanent income, consumption shock variability, random error}); \quad (58)$$

Equation (58) represents a reduced functional form, which, for parsimonious reasons, identifies groups of independent variables, or independent variables alone, by theoretical importance emphasized thus far. For example, family demographics may include family composition like marital status, number of children, age of the youngest child, age of the head of the household, education of the head of the household, race, and

homeownership. Entrepreneurial choice substitutes for entrepreneurial ability because entrepreneurial ability is difficult to observe. Permanent income substitutes for the wages. As mentioned earlier, consumption shock variability is captured by income shocks (income variability represented by transitory income), accompanied by the level current family assets (embodied by the lagged wealth and inheritances received). Browning and Lusardi (1996, p.1806) provide an in depth discussion regarding this approach to consumption shock variability.

Based on the discussed issues, we propose the following full specification of the empirical model

$$\begin{aligned}
 ACTSAV = & \alpha_0 + \alpha_1 WLTH_{lagged} + \alpha_2 PINCOME_{family} + \alpha_3 TNCOME_{family} + \alpha_4 AGE1_{head} + \\
 & \alpha_5 AGE2_{head} + \alpha_6 AGE3_{head} + \alpha_7 NOCHILDREN + \alpha_8 AGEOFYOUNGESTCH + \\
 & \alpha_9 EDUCATION_{head} + \alpha_{10} BUSINCUMBENT + \alpha_{11} BUSSWITCHER + \alpha_{12} WAGETOBUS + \\
 & \alpha_{13} WAGESWITCHER + \alpha_{14} BUSTOWAGE + \alpha_{15} HOwnerINCUMB + \alpha_{16} HOwnerSWITCHER + \\
 & \alpha_{17} Re ntTOHOwn + \alpha_{18} Re ntSWITCHER + \alpha_{19} HOwnTO Re nt + \alpha_{20} RACEBlack_{head} + \\
 & \alpha_{21} RACEOther_{head} + \alpha_{22} FirstINHERITANCE_{lagged10y} + \alpha_{23} FirstINHERITANCE_{lagged5y} + \varepsilon
 \end{aligned} \tag{59}$$

where

$ACTSAV$ – is the active savings of the family;

$WLTH_{lagged}$ - the net worth (wealth) lagged to a prior available period;

$PINCOME_{family}$ - represents the permanent income of the family;

$TNCOME_{family}$ – represents the transitory income;

$AGE1_{head}$, $AGE2_{head}$, $AGE3_{head}$ - represent categorical age variables for the head of the household, 21-30 years old, 31-40 years old, and 51-65 years old respectively. Age dummy category 41-50 years old remains the ;

$NOCHILDREN$ - represents family's number of children between 1 and 17 years old;

$AGEOFYOUNGESTCH$ – is the age of the youngest child in the family;

EDUCATION_{head} - represents the dummy variable that distinguished between college and non-college educated families;

BUSINCUMBENT, *BUSSWITCHER*, *WAGETOBUS*, *WAGESWITCHER*, *BUSTOWAGE* - are categorical variables accounting the longitudinal change of occupational status of the family. The dummy variable *WAGEINCUMBENT* is the reference group;

HOwnerINCUMB, *HOwnerSWITCHER*, *RentTOHOwn*, *RentSWITCHER*, *HOwnTORent*, - are categorical variables accounting for longitudinal change of family status between home ownership and renting. *RentINCUMB* remains the reference category. We want to control for home ownership because for a fairly large group of families a significant part of their active savings over five years period results from payments toward the mortgage premium;

RACEBlack_{head} and *RACEOther_{head}* – are dummy variables identifying the race of the head of the household. *RACEWhite_{head}* is the reference race category.

FirstINHERITANCE_{lagged5y}, *FirstINHERITANCE_{lagged10y}* - are the first inheritances received by the family five and ten years ago respectively. We want to control for these variables.

One could observe that this specification include controls for major motivations of saving, which might otherwise override the saving motivation studied here, occupational choice of entrepreneurship vs. wage earning. Thus, longitudinal type of variables was created for “home ownership vs. renting”, and “receiving an inheritance” in the past ten and five years.

To support the descriptively the claim that entrepreneurial families accumulate more wealth than wage earning families, we propose to regress total family wealth

against the same independent variables specification used in equation (71). Similar specifications have been used in the literature (Caroll & Samwick, 1998; Quadrini, 1999).

$$\begin{aligned}
TOTWLTH = & \alpha_0 + \alpha_1 WLTH_{lagged} + \alpha_2 PINCOME_{family} + \alpha_3 TNCOME_{family} + \alpha_4 AGE1_{head} + \\
& \alpha_5 AGE2_{head} + \alpha_6 AGE3_{head} + \alpha_7 NOCHILDREN + \alpha_8 AGEOFYOUNGESTCH + \\
& \alpha_9 EDUCATION_{head} + \alpha_{10} BUSINCUMBENT + \alpha_{11} BUSSWITCHER + \alpha_{12} WAGETOBUS + \\
& \alpha_{13} WAGESWITCHER + \alpha_{14} BUSTOWAGE + \alpha_{15} HOwnerINCUMB + \alpha_{16} HOwnerSWITCHER + \\
& \alpha_{17} RentTOHOwn + \alpha_{18} RentSWITCHER + \alpha_{19} HOwnTORent + \alpha_{20} RACEBlack_{head} + \\
& \alpha_{21} RACEOther_{head} + \alpha_{22} FirstINHERITANCE_{lagged10y} + \alpha_{23} FirstINHERITANCE_{lagged5y} + \varepsilon
\end{aligned} \tag{60}$$

where

TOTWLTH – represents total family wealth.

Browning and Lusardi (1996, pp.1829) provide a comprehensive list of empirical specifications for consumption studies based on the Euler equation. This seminal work helps on validating externally the empirical specification proposed by the current study. Detailed definitions of the variables used in the empirical model are provided in the next section.

4. RESEARCH FRAMEWORK AND METHODS

4.1 Data Set and Sampling Procedure

This study attempts to provide answers about the relationship between entrepreneurship and wealth from a longitudinal perspective. To this end, this study uses data from the Panel Study of Income Dynamics (PSID), a longitudinal data collection conducted by the Survey Research Center, Institute for Social Research, University of Michigan. PSID is a uniquely designed national survey. It has collected data on the dynamics of economic and demographic aspects of the sample, as well as on some sociological and psychological measures from a representative sample of American families since 1968. The original sample consisted of 4,800 families. Tracking family members over time coupled with changing family dynamics due to launch of adult children, birth, death, divorce, the sample had grown to 6023 families in 2003 and 6224 families in 2005. Table 8 presents the changing sample size of PSID over time. Prior to 1997 the survey was conducted every year. Due to funding limitations, the survey became biennial after 1997.

Table 8. Changes of PSID sample size throughout years

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Cases	6,918	7,032	7,018	7,061	7,114	7,114	9,371	9,363	9,829	9,977
Year	1994	1995	1996	1997	1999	2001	2003			
Cases	10,764	10,401	8,511	6,747	6,997	7,406	7,822			

Furthermore, in response to funding limitations, PSID reduced its core sample (the one started in 1968) from 8,500 families in 1996, to 6,168 families in 1997.

Concomitantly with the core reduction, a refreshed immigrant sample of 441 families was introduced in 1997. The Latino families sub-sample was dropped in 1995

With the funding from the National Institute on Aging, PSID collected wealth and wealth components data in 1984, 1989, 1994, 1999, 2001, and 2003. The wealth modules measure net equity in housing and non-housing assets organized by eight components: (1) equity in other real estate, (2) equity in vehicles, (3) equity in farm or business equity, (4) equity in stocks, mutual funds, investment trusts and stocks held in IRAs, (5) checking, savings accounts, CD's treasury bills, saving bonds, and liquid assets in IRAs, (6) equity in bonds, trusts, life insurance and other assets, (7) equity in IRA accounts, and (8) debts. In addition, these modules contain questions regarding purchase and sell actions regarding asset categories mentioned earlier, which allows computations of active and passive (capital gains) savings. Therefore, these supplement modules make PSID a very suitable data source for the longitudinal study proposed by the present study. This study uses 20 years of PSID survey data - 1984 to 2003. In particular, the sample used in this study starts from a merged file containing 20 years of family data. Three additional selection rules were imposed. The families that remained in the sample used in this study had to (1) be married-couple families, (2) have a household head between 21 and 65 years old, and (3) have the same head and wife for duration of time in sample (i.e. no marital status changes).

The theoretical reasoning behind selecting only married-couple families is that wealth holdings of husband and wife households is, on average, twice as large as the wealth of single individual household, due to ability to combine the assets of each person in the married couple. Further, there are synergistic effects of marriage on household

savings beyond the simple summation of the two partners' individual net-worth (Juster, Lupton, Smith, & Stafford, 2000). Therefore it is a must to study married-couples separately from single parent families because different financial mechanisms act upon married-couples versus single in their wealth accumulating processes.

Age of household head is bounded between 21 and 65 because these are the typical years for labor market engagement. At age 21, individuals are considered adults, able to enter into contractual obligations. Thus, it is an age when one could become a business owner, or self-employed in their own right. It is also the age that marks the beginning of adulthood and financial independence. At the other end of the age spectrum, 65 years old selected because it typically indicates the beginning of retirement. Retirement can lead to using accumulated wealth for consumption. This possibility could complicate identification of active savings behavior, so older than normal retirement age were omitted from this study. It was expected that the ages 21 to 65 would capture the years when marriage and business ownership were most likely to occur.

Finally, marriage dissolution or remarriage changes the wealth accumulating dynamics, either at times earlier to the event, or at the time after the event, through assets and liabilities brought in, or taken out, of the family unit. Therefore, in an attempt to control the "economic experiment," the focus here is on stable married-couple families, who experience no changes in the head or wife during 1984-2003.

The technical steps engaged in the creation of the sample used in this study are:

- 1) Download from PSID Website the merged file containing (or merge together) the 20 year family data sets from 1984 to 2003;

- 2) Make a first filtration to keep only married-couple families with the head of the family between 21 and 65 years old at any time within the 1984-2003 time interval;
- 3) Check the data from 1984-2003 and identify any of the family records that report a change in marital status. Depending on the situation, assign missing values to the back end, or a front end, of such a record. Assign missing values to the back end of the record when a single parent family changes into a married couple at a certain point during the time horizon (1984-2003). In the same spirit, assign missing values to the front end of a married couple record that split-off and converted into two single parent families at a certain point in the time horizon.
- 4) In a similar manner refine the sample further, based on the age of the head of the family, and assign missing values to the back end, or front end, of a record when the head appears to have an age out of the specified limits, 21 and 65 years old. During 1984-2003 time interval, whenever in a certain year it is observed family records with the head younger than 21, it should be assigned missing values toward the back end of the sample. The same procedure should be applied whenever in a year it is observed a family record with the head older than 65. It should be assigned missing values toward the front end of the time interval, 1984-2003, for such cases.
- 5) Finally, the last refinement applied to the sample should be made by the family composition change. If a change in head or wife is noted in a record, a missing value is assigned from the year such a change occurs up to the front end of the time horizon. But, at the same time a new record is created, as if a new family

had entered the study. In this situation, missing values are added to the back end of the time horizon up to the year when the new family is created.

After all these steps have been completed, the final sample is ready for analyses.

The final sample is a rotating sample, which each year drops out families that no longer meet the sample selection criteria, and admits new families that do. The sample size changes during the research timeframe (1984-2003). Some of these changes occur because of the families rotating in or out of the sample, and other changes are determined by overall changes of the PSID data collection. A graphical representation of the sampling formation is provided in Figure 2.

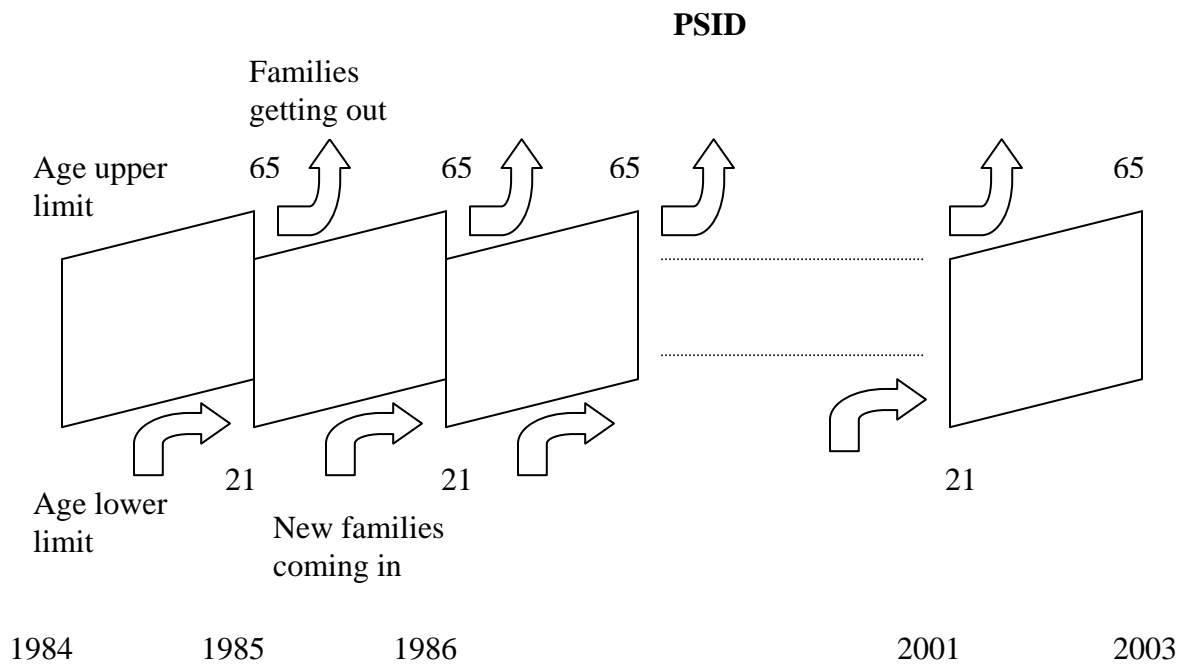


Fig. 2 The graphical representation of the rotating sample

4.2 Measures of the Dependent and Independent Variables

As suggested by Luoh and Stafford (1998), the approach taken in computing active savings and wealth is somewhat arbitrary and remains in the researcher's hands. Most often the choice of what to include and what to exclude from the measure is guided by the research study interest. In this study, the measurement of active savings is guided by suggestions given for use of the PSID by the original data collectors (PSID, year) as well as other researchers. Luoh and Stafford (1998) and Juster, Lupton, Smith and Stafford (2006) define *wealth* as a summing index measure of eight equally weighted components:

1. main home equity (w_1);
2. real estate other than home equity (w_2);
3. farm or private business (w_3);
4. automobiles, motor homes, or boats (w_4);
5. checking and saving accounts, money market funds, certificates of deposit, gov. bonds, treasury bills including those in investment retirement accounts (w_5);
6. equities in publicly traded corporations, mutual funds, investment trusts, and investment retirement accounts (w_6);
7. other savings which include corporate bonds, rights in a trust or estate, the cash value of life insurance, and valuable collections (w_7);
8. total non-collateralized debt, which is negative (w_8);

Consequently, total net wealth in each year of wealth data collection is simply computed as

$$w_t = \sum_{k=1}^8 w_{kt}, \text{ where } t = 1984, 1989, 1994, 1999, 2001, 2003, k = 1, \dots, 8. \quad (61)$$

where

w – meaning wealth or wealth component ;

t – indicating the time (wave) of interest, from 1984 up to 2003;

k – indicating the component of wealth added, from 1 to 8.

The wealth with no home equity, excludes the main home equity component from the computation of wealth. It is an alternative measure of wealth that sets apart the accumulated home equity. In a similar manner, the online directions for using PSID data (<http://psidonline.isr.umich.edu/>), as well as several researchers (Luoh & Ming, 1998; Juster, Lupton, Smith & Stafford, 2006), define *active savings* as a summing index measure of several components. The approach taken in computing an active savings measure depends much on the desired accuracy. Certain compromise has to be done because of the complications encountered when attempting to separate the active saving part of certain wealth components (e.g. bonds, cash in insurance, collections, etc. as well as the contributions toward remaining mortgage premium). For example, Hurst, Luoh, and Stafford (1998) suggested using the following measure for active savings:

$$\begin{aligned} \text{Active savings} = & \text{net inflow into stock market} + \text{net change in transaction account balances} + \text{net} \\ & \text{inflows into business} + \text{net inflow into annuities} + \text{home improvements} + \text{net inflows into non-} \\ & \text{main home real estate} - \text{increases in non-collateralized debt.} \end{aligned} \quad (62)$$

PSID (<http://psidonline.isr.umich.edu/>) also provides in 1989 and 1994 an alternative measure of active savings.

For example in 1989, PSID used the following measure for families reporting no sale of the main residence:

Active Savings =

SUM (1984 House Value, unless moved between 1984 and 1989, Value of Private Annuities in 1989, Value of Real Estate Purchased Since 1984, Cost of Additions/Repairs to Real Estate Since 1984, Amount Invested in Business/Farm Since 1984, Amount of Stock Purchased Since 1984, Assets Removed by Movers Out Since 1984, Debts Added by Movers In Since 1984, Total Wealth in 1989, Equity in Real Estate in 1984, Equity in Farm/Business in 1984, Value of Stocks Held in 1984) –

SUM (1989 House Value, Equity in Real Estate in 1989, Equity in Farm/Business in 1989, Value of Stocks Held in 1989, Value of Pensions/Annuities Cashed In Since 1984, Value of Real Estate Sold Since 1984, Value of Farm/Business Sold Since 1984, Value of Stock Sold Since 1984, Debts Removed by Movers Out Since 1984, Assets Added by Movers In Since 1984, Value of Inheritance Received Since 1984, Value of All Other Inheritances Received Since 1984, 1984 Total Wealth in 1984). (63)

However, PSID suggests that researchers should reconsider this definition based on their research interest and abilities to innovate measures. Based on these preexisting measures and the recommendations provided by Luoh and Staffrod, 1998

(<http://psidonline.isr.umich.edu/Data/Documentation/active-savings/intro.html>) the following measure of active savings is used in this study:

Active savings = *net inflow into stock market* + *net change in transaction account balances* + *net inflows into business* + *net inflow into annuities* + *home improvements* + *net inflows into non-main home real estate* + *net inflow into mortgage premium* + *net inflow into transportation means* + *net inflow into bonds and insurance cash accounts* + *net into assets brought in - increases in non-collateralized debt* – *net into debts brought in.* (64)

It is suggested here that this measure of active savings is close to the PSID definition, but more accurate than PSID approach in separating the active part of certain category of savings, in particular the contributions toward mortgage premium.

The extant literature provides various approaches when defining entrepreneurship (Chantillon, 1755; Knight, 1921; Shumpeter, 1934, 1950). We define *entrepreneurial family* as a family that reports owning one or more businesses or have financial interest in one or more businesses. The wage earning families are identified as all other families.

This classification of entrepreneurial and wage earning families is based on the following PSID question:

“Did you (Head) or any one else in the family own a business at any time during the previous year or have a financial interest in any business enterprise?”

Gentry and Hubbard (2004) have used a similar definition of the entrepreneurial household, but they restricted further their definition to the households that own one or more business with a total market value of at least \$5,000. Also, Quadrini (1999) and Bradford (2003) used the same PSID variable “*Whether Business*” that we use to classify entrepreneurial and wage earning families. In addition Quadrini calibrated his results of the occupational classification using another question that helps identify entrepreneurial and wage earning families. This second criteria is based on the head’s self-employment choice. The author obtained similar results working with both definitions of entrepreneurial and wage earning families (Quadrini, 2000).

The *number of children* in the family is computed as MAX¹ of the number of children reported each year in the past five years.

¹ MAX stands for maximum

The *age of the youngest child* in the family is computed as MAX of the ages of the youngest child reported yearly in the past five years.

As described earlier, the present study takes longitudinal approach on the occupational choice of the family, entrepreneurship versus wage earning. Therefore, several occupational choice dummy variables have been constructed. Depending on entrepreneurial and wage earning coding in each year, the following demographic variables were created for every five-year interval. The five-year time intervals is imposed by the PSID data collection of wealth and wealth components, and they reconciles with the Permanent Income Hypothesis (PIH) that suggests that people have limited time horizons. People tend to use about three to four years into the future whenever they discount (Friedman, 1963).

For example, for the 1984-1989 time interval, the following measures were constructed for family occupation:

IF a business owning family in 1984 and in 1989 and no switch in occupational category in this period, THEN *business incumbent* = 1; ELSE *business incumbent* = 0;

IF a wage earning family in 1984 and in 1989 and no switch in occupational category in this period THEN *wage earning incumbent* = 1; ELSE *wage earning incumbent* = 0;

IF a wage earning family in 1984 and a wage earning family 1989 and switched the occupational category in this period THEN *wage switcher* = 1; ELSE *wage switcher* = 0;

IF a business owning family in 1984 and a business owning family 1989 and switched the occupational category in this period THEN *business switcher* = 1; ELSE *business switcher* = 0;

IF a wage-earning family in 1984 and a business owning family in 1989 and switched the occupational category in this period THEN $wagetobus = 1$; $wagetobus = 0$.

IF a business owning family in 1984 and a wage earning family in 1989 and switched the occupational category in this period THEN $bustowage = 1$; $bustowage = 0$.

The same coding scheme has been applied to the other time intervals, 1989-1994, 1994-1999, and 1999-2003. A graphical representation of the coding procedure indented to capture the longitudinal dynamics of family occupational choice is provided in Figure 3.

Occupation Time	Bus. Owner	Wage Earn.	Bus. Owner	Wage Earn.	Bus. Owner	Wage Earn.
Beginning/ Year 1	◆	●	▲	◆	◆	◆
Year 2	◆	●	▲	◆	◆	◆
Year 3	◆	●	▲	◆	◆	◆
Year 4	◆	●	▲	◆	◆	◆
End/Year 5	◆	●	▲	◆	◆	◆
Coding	Bus. Own. ◆	Wg. Earn. ●	Bus. Own. ▲	Wg. Earn. ◆	Wage to Bus. ◆	Bus to Wg. ◆

Figure 3. Coding scheme for the longitudinal change of family occupation

The same coding constructing procedure is applied to reflect the dynamics of change in homeownership versus renting classification of the sample by five years time

intervals, 1984-1989, 1989-1994, 1994-1999, and 1999-2003. The coding procedure scheme is based on the PSID variable “*Own/rent or what?*”

Do you (or anyone else in your family living there) own the (home/apartment), pay rent, or what?

Depending on the starting and ending classification, the following categories were created: *homeowner incumbent*, *renter incumbent*, *homeowner switcher*, *renter switcher*, “*hmowntorent*”, and “*renttohmown*.”

Dummy variables were created for education and race. For each five-year interval, education was recoded and collapsed in two categories as follows:

IF education is less or equal to high school THEN *high school* = 1; ELSE *high school* = 0;

IF education is some college and college THEN *some and coll* = 1;

ELSE *some and coll* = 0;

Race variable has been collapsed in three categories only, and recoded as follows:

IF race equal 1 THEN *white* = 1; ELSE *white* = 0;

IF race equal 2 THEN *black* = 1; ELSE *black* = 0;

IF race greater than 2 THEN *other (non white or black, including Hispanic)* = 1; ELSE *other (non white or black, including Hispanic)* = 0;

The specific variable names by year of the variables recoded here are provided in Appendix, Table 23.

The lagged wealth (no main home equity included), the current and lagged first inheritance, the number of children, and the age of the youngest child are continuous variables, and they are used as provided by PSID. The specific PSID variable names of these variables are provided in Tables 20, 21, and 23.

The *permanent income* for every five-year period is computed here as the average value of the total family incomes collected by PSID each year in the past five years.

The *transitory income* for every five years period is defined as the variability of income over the considered time horizon (five-year intervals) and computed as the variance of the total family incomes collected by PSID each year in the past five years. Similar approaches to the measure of permanent and transitory income were mentioned by Guariglia (2001) and Robst, Deitz, and McGoldrick (1999).

A comprehensive summary of the specific PSID variable names by year, used for computing the earlier mentioned index measures, stated dummies, or in testing various statistical models advanced in this study, are presented in the Appendix, Tables 20 –28.

4.3 Analyses

To test the hypotheses, three levels of analyses were performed. The *first level of statistical analyses* (preliminary) involves descriptive cross tabulation comparisons of wealth (and wealth components) by occupation choice, entrepreneurial versus wage earning, for all families in PSID data (see Tables 1 and 2). The preliminary analyses are further focused on cross tabulations comparisons of wealth (and wealth components) by occupational choice (entrepreneurship versus wage earning), and by marital status (married couples versus single parent/individual), see Tables 3 to 6. Since the focus of the causal analyses is on married couples only, the results from Tables 3 and 4 are particularly important for this level of analyses. Finally, preliminary cross tabulation comparisons of wealth (and wealth components), by occupational choice, and by education level (some and college versus high school or less education) were performed, see Tables 9 to 12. This level of analyses helps to identify statistically significant differences in wealth (and wealth components) controlled for various demographic

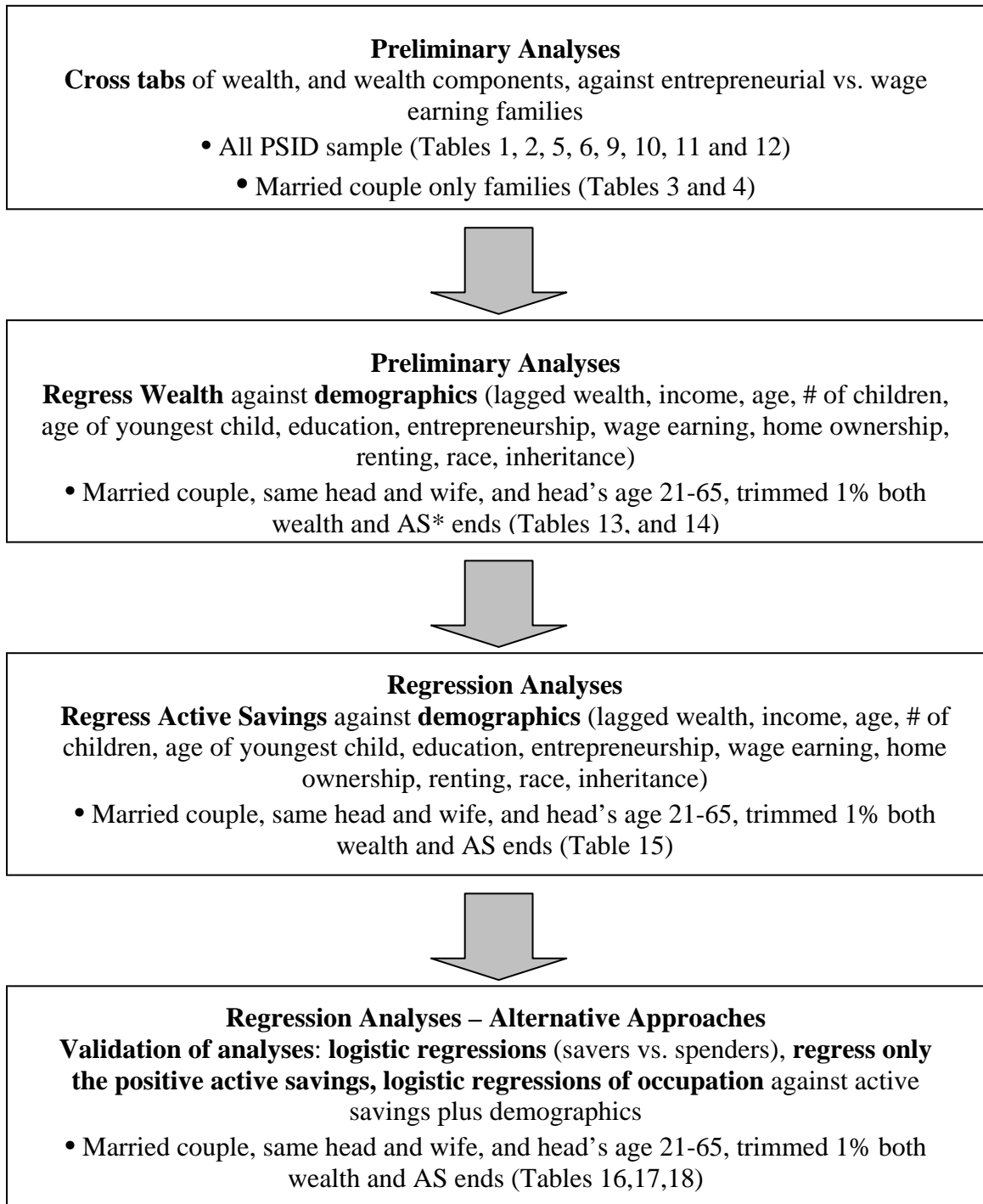
groupings: occupational choice, marital status, and education. It is important to note that all the results are weighted. The weights provided by PSID were normalized according to the procedural indications provided online by PSID Website (<http://psidonline.isr.umich.edu/Guide/tutorials/>). All the dollar values were updated to \$2003 based on the CPI index values provided in Appendix, Table 26.

In addition, regressions of wealth against occupational choice, and other demographics (see equation (60)), were included at this level of analysis. These regressions pre-test the independent variables used in the causal analyses (equation (59)) presented next.

The *second level of analyses* includes causal testing of *active savings* as response variable to choices of family occupation, as well as choices or variation among the same demographic controls used in the preliminary part against wealth. The mathematical illustration of this empirical testing is provided by equation (59). These regressions analyses attempt to capture the temporal effects of changes of family's occupation (entrepreneurial versus wage earning) on *active savings*. These regressions are applied to the rotating sample described in the earlier section. The results are weighted by the normalized PSID weights according to the suggested procedure. Further, the regression results are validated (triangulated) by the results of logistic regressions, which consider the dependent variable, active savings, as dichotomous: saver vs. spender family. The same independent variables' specification as in equation (59) is used for these tests. Finally, further validation of the results is done by comparing the original linear regression estimates with the regression estimates obtained only from the positive side of the distribution of active savings. The results are also weighted by the same procedure as described earlier in this section.

The *third* level of *analysis* is also a causal analysis, but it tests in a logit regression if the odds of getting into entrepreneurship increase by the level of active savings.

A concise illustration of the hierarchical approach to these empirical tests is provided in Figure 4.



*AS stands for active savings

Fig. 4 Summary of statistical analyses

5. FINDINGS

5.2. Descriptive Analysis

Table 1 provides a cross-tabulation comparison between entrepreneurial and wage earning families in terms of wealth and wealth structure. One could observe major differences in wealth levels between entrepreneurial and wage earning families. As previously mentioned, this table includes all the surveyed families by PSID, the values are in 2003 dollars, and the results are weighted by the normalized weights resulting from applying the PSID procedures (<http://psidonline.isr.umich.edu/Guide/tutorials/>). During 1984-2003, the difference in average accumulated wealth between entrepreneurial and wage earning families is around four to five fold the wealth of wage earning families. These statistically significant differences become larger as we progress from 1984 towards 2003: \$513,835 (\$198,345) for entrepreneurial families in 1984 versus \$111,592 (\$39,314) for wage earning families in the same year ($t = -14.10, p < .001$), and \$717,122 (\$236,600) for entrepreneurial families in 2003 versus \$181,491 (\$48,056) for wage earning families in the same year respectively ($t = -14, p < .001$).² The results indicate an increasing trend in personal accumulated wealth as we progress from 1984 towards 2003. This simple comparison shows that on average entrepreneurial families accumulate more wealth than wage earning families. Also, this comparison allows us to identify structural difference in assets allocation between entrepreneurial and wage earning families and how they evolved longitudinally (temporally) as we progress from 1984 toward 2003.

² The figures outside the parentheses represent the average value while the figures inside the parentheses reports the median value, average (median).

Here we list a few highlights resulting from this examination:

- Entrepreneurial families allocate a large part of their assets toward their own business, around 2/5 of total wealth: on average, \$177,166 out of \$513,835 total wealth in 1984, and \$265,276 out of \$717,122 total wealth in 2003 respectively. Quadrini (1999), Bradford (2003), and Gentry and Hubbard (2004) have noted this tendency, and they suggested that it is a risk factor for entrepreneurial families.
- Compared to wage earning families, the entrepreneurial families owned larger amounts in cash accounts as well as in consumer credit accounts. In 1984, enterprising families had \$37,868 (\$8,855) in checking/saving accounts, which is significantly more than \$18,409 (\$2,656) for wage earning families respectively ($t = -8.01, p < .001$, Table 2). This two-fold ratio on average values of cash accounts between entrepreneurial and wage earning families preserved almost constant throughout the twenty-year time span, 1984-2003. In 2003, entrepreneurial families had \$41,960 (\$8,000) in checking/saving accounts versus \$17,540 (\$2,000) for wage earning families ($t = -7.05, p < .001$, Table 2).³ Furthermore, the same “around two fold” ratio applies to average consumer debt accounts: in 1984, \$8,097 (\$531) versus \$2,608 (\$0) respectively ($t = -6.13, p < .001$, Table 2) and in 2003, \$11,391 (\$1,000) compared to \$6,487 (\$0) respectively ($t = -6.12, p < .001$, Table 2). One could speculate that the difference in average values of checking accounts between entrepreneurial and wage earning families is born from the entrepreneurial family’s need to cushion for daily unexpected financial shocks.

³ Average value (median value).

- In contrast to wage earning families, the entrepreneurial families have a larger portion of their asset portfolio invested in real estate other than main residence. On average, in 1984, entrepreneurial families had \$94,755 invested in real estate versus \$12,737 for wage earning families, which went up in 2003 to \$133,484 for entrepreneurial families versus \$15,028 for wage earning families respectively. One could make the case that enterprising families hedge their entrepreneurial risk with real estate investment, or the ‘other real estate’ could be business property.
- As compared with wage earning families, the entrepreneurial families have relatively larger asset allocation in stocks/mutual funds. In 1984, entrepreneurial families had on average \$29,669 invested in stocks/mutual funds versus \$10,030 for wage earning families ($t = -6.17, p < .001$, Table 2), whereas in 1999, entrepreneurial families topped this type of investment to an average of \$85,958 relative to \$32,185 for wage earning families, and further down in 2003 to \$53,666 for entrepreneurial families and \$45,406 for wage earning families respectively.
- As compared with wage earning families, the entrepreneurial families own twice as much asset investments in bonds, cash value life insurance, collections, etc. This trend preserved fairly consistent across the time span of this research. Interestingly enough, the investments in bonds, cash value life insurance, collections suffered a decreasing trend, which contrasts the increasing trend of portfolio allocations to investments in stocks/ mutual funds. As one progresses from 1984 to 2003 he or she can observe that on average families allocate smaller

amounts of money to investments in bonds, cash value life insurance, collections, etc. In 1984, entrepreneurial families had \$66,756 average investments in bonds, cash value insurance, collections, etc. compared with \$25,493 average allocations to the same asset category for wage earning families, whereas in 2003 the average amounts went down to \$17,564 for entrepreneurial families and \$6,603 for wage earning families respectively.

- Against some arguments advanced in the literature (Hurst, Lusardi, Kennickel and Toralba, 2005) that business owning families have less retirement coverage than wage earning families and consequently they save more to hedge against retirement, the results presented here indicate a different picture. Starting with 1999, PSID collected separate data for investments in Individual Retirement Accounts (IRAs). The group statistics indicate that on average business owning families have two fold more money in IRAs than wage earning families. In 1999, enterprising families had on average \$54,234 (\$442) invested in IRAs versus. \$18,083 (\$0) for wage earning families, whereas in 2003, entrepreneurial families had on average \$51,891 (\$2,000) in IRAs versus. \$26,093 (\$0) for wage earning families.
- Finally, home equity remained an equally important asset for both entrepreneurial and wage earning families.

In conclusion, the descriptive statistics of wealth and wealth components by occupational category (entrepreneurial and wage earning families) indicate that entrepreneurial families have on average greater levels of accumulated wealth. They allocate their asset portfolio mostly toward their own business, real estate other than the main home, and

contrary to other research findings, they allocate an important part of their wealth to stocks/mutual funds and IRAs. One should note that some of these conclusions are valid mostly for the wealthier part of the distributions, since median values are zero for a large part of the asset categories.

To better understand these effects, we continued the comparative cross tabulations by introducing new variables such as marital status and education. Tables 3,4, 5 and 6 compares wealth (and wealth structure) between entrepreneurial and wage earning families by for marital status. When controlling for marital status and comparing entrepreneurial and wage earning families the following concluding observations should to be considered:

- As expected, married couple families are wealthier than single individual families. Across the 20 years of this study, this observation is consistent. Ability to combine the net worth of two individuals undoubtedly contributes to this result.
- All the earlier conclusions regarding differences in wealth and wealth components' allocation between entrepreneurial and wage earning families remain valid when separating married couples from single parent families. It should be noted that, for married-couple families, the descriptive statistics are higher in magnitude than those for aggregate comparison.

Similar observations could be stated looking at differences in wealth accumulation, and wealth structure, between entrepreneurial and wage earning families when controlling for educational level of the head of the family. For this analysis, education was collapsed into two categories: 1) high school education or less, and 2) some college

and college degree. Tables 9, 10, 11 and 12 provide descriptive statistics for entrepreneurial and wage earning families, when controlling for educational status.

For the “some college and college” group, it is important to observe the big gap in wealth and asset allocations by category between entrepreneurial and wage earning families, particularly regarding the investments in stocks and mutual funds, and bond/cash value insurance/ collections respectively. For the same group, one could observe a shift in the investment allocations from bonds/cash value insurance/collections toward stocks/mutual funds when progressing from 1984 towards 2003. In 1984, entrepreneurial families owned on average \$38,977 (\$355) investments in stocks/mutual funds versus \$116,278 (\$0) in bonds/cash value insurance/collections, whereas in 1999 entrepreneurial families had on average \$114,242 (\$0) in stocks/mutual funds and \$21,320 (\$0) in bonds/cash value insurance/collections, with a further dropping in 2003 to \$71,923 (\$1,000) in stocks/mutual funds and \$19,958 (\$0). A similar picture, but at lower magnitude could be observed for wage earning families.

These observations emphasize once more the changes in the wealth structure and asset allocation that took place across the twenty-year time span, especially during ‘90s when stocks and mutual funds were very popular and profitable investment instruments. These descriptive statistics provide basic support for the research inquiry proposed in this work. More investigative efforts are needed to understand the differences between entrepreneurial and wage earning families. The changes in wealth structure allocations due financial product changes, as well as the changes in the importance of human capital investment throughout the research horizon reaffirms the complexity of the current investigative effort.

In summary, this cross tabulation comparative view indicates that there are significant differences in the wealth accumulation of the two groups of families and they preserve or accentuate when controlling for marital status an education of the head of the family.

Next, regression analyses of wealth against several demographic controls was performed. These regression analyses had two major goals: 1) to determine in a longitudinal setting the degree of association between occupational choice (entrepreneurial versus wage earning) and wealth accumulation and 2) to assess the effect of various controls (age, number of children, the age of the youngest child, education, race, home ownership, and inheritance) on the earlier mentioned relationship

Table 14 summarizes the resulting estimates of four independent regressions that test the degree of association between total family wealth, occupational choice and other demographics as specified earlier by equation (60) from the theoretical and empirical modeling section. These regressions test independently throughout a retrospective five-year time span for most variables, except first inheritance, which expands the retrospective look to up to ten years. The dependent variable in these regressions is total wealth in 1989, 1994, 1999, and 2003, respectively. The independent variables tested are: five years lagged wealth (no main home equity included); family's permanent income computed as the average of the incomes reported in the past five years; family's transitory income computed as the variance of the incomes received in the past five years; age of the head of the household used as a categorical variable with groups from 21 to 30, 31 to 40, 41 to 50, and 51 to 65 years old; number of children; the age of the youngest child;

Table 9. Longitudinal comparison of wealth (wealth components) between entrepreneurial and wage-earning families having the head with some college ed. or college degree. [in \$2003, Average (Median)]

Asset Category \ Year	1984		1989		1994		1999		2003	
	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.
Occupational category										
N	292	1,632	408	2,026	541	2,550	544	2,310	487	2,464
Business value	243,492	0	246,911	0	168,426	0	250,800	0	277,461	0
(Median)	(26,564)	(0)	(19,290)	(0)	(6,208)	(0)	(4,417)	(0)	(2,000)	(0)
Checking/saving accounts	45,745	22,162	53,548	28,673	38,692	28,963	47,597	17,830	53,574	24,168
(Median)	(10,626)	(6,730)	(14,839)	(5,936)	(12,416)	(6,208)	(8,836)	(3,313)	(10,000)	(5,000)
Real estate	125,703	19,328	208,185	18,762	180,554	12,810	111,216	15,279	184,931	21,778
(Median)	(3,985)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Stock/MF/IT/(IRA)	38,977	17,961	37,979	39,392	127,732	46,442	114,242	60,171	71,923	81,795
(Median)	(355)	(0)	(1,484)	(0)	(3,725)	(0)	(0)	(0)	(1,000)	(0)
Vehicles/motor home/trailer	18,972	10,502	20,888	11,857	21,809	13,753	22,288	13,985	21,529	13,817
(Median)	(14,168)	(7,084)	(14,839)	(8,161)	(12,416)	(9,933)	(14,358)	(8,836)	(15,000)	(9,000)
Bonds/Cash insur/Collections	116,278	59,422	31,812	9,952	25,915	14,024	21,320	10,870	19,958	9,385
(Median)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
IRA							74,044	30,935	68,156	39,273
(Median)							(13,253)	(0)	(6,500)	(0)
Credit card/Consumer debt	11,978	4,549	9,513	6,443	25,478	7,512	14,969	7,522	13,692	8,857
(Median)	(1,771)	(708)	(1,484)	(1,336)	(2,483)	(1,614)	(884)	(1,104)	(2,000)	(1,000)
Wealth (No main home equity)	577,189	124,825	591,223	97,513	534,650	108,479	626,557	141,584	683,741	181,343
(Median)	(152,300)	(22,225)	(138,000)	(24,484)	(132,351)	(32,777)	(172,293)	(26,838)	(196,000)	(30,000)
Wealth	695,639	182,322	741,513	165,561	648,699	167,797	748,312	204,549	853,904	270,531
(Median)	(263,869)	(63,399)	(253,593)	(58,603)	(227,951)	(76,977)	(260,648)	(66,267)	(335,001)	(83,000)
Total family income	104,720	57,980	116,513	65,740	123,628	69,617	116,161	70,068	126,364	69,157
(Median)	(80,891)	(51,357)	(82,355)	(54,161)	(85,667)	(58,395)	(78,899)	(56,189)	(82,010)	(54,300)

Source: Author's computation of PSID data. The results are weighted by normalized PSID weights.

Table 10. *t* test results of wealth (wealth components) by group comparison, entrepreneurial and wage-earning families having the head with some college or college degree. [Mean values by group are presented in Table 7.]

Asset Category \ Year	1984		1989		1994		1999		2003	
	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t
Business value	-12.56***	<.0001	-11.55***	<.0001	-14.94***	<.0001	-10.57***	<.0001	-11.73***	<.0001
Checking/saving accounts	-5.62***	<.0001	-5.26***	<.0001	-2.30**	0.0214	-5.35***	<.0001	-4.72***	<.0001
Real estate	-10.43***	<.0001	-7.92***	<.0001	-10.07***	<.0001	-8.01***	<.0001	-5.99***	<.0001
Stock/MF/IT/(IRA)	-4.09***	<.0001	-0.35	0.7300	-4.37***	<.0001	-1.64	0.1009	0.22	0.8289
Vehicles/motor home/trailer	-9.15***	<.0001	-8.96***	<.0001	-7.46***	<.0001	-4.65***	<.0001	-7.70***	<.0001
Bonds/Cash insur./Collections	-0.93	0.3517	-5.31***	<.0001	-3.27**	0.0011	-2.52**	0.0117	-3.42***	0.0006
IRA							-6.51***	<.0001	-7.73***	<.0001
Credit card/Consumer debt	-3.51***	0.0005	-1.84*	0.0663	-4.75***	<.0001	-2.64***	0.0084	-3.67***	0.0003
Wealth (No main home equity)	-6.78***	<.0001	-11.11***	<.0001	-13.49***	<.0001	-10.07***	<.0001	-8.55***	<.0001
Wealth	-7.53***	<.0001	-12.13***	<.0001	-13.98***	<.0001	-10.65***	<.0001	-2.91***	0.0036
Total family income	-13.55***	<.0001	-9.95***	<.0001	-11.85***	<.0001	-9.41***	<.0001	-9.76***	<.0001

Source: Author's computation of PSID data. *** Statistically significant at $p < .01$, ** Statistically significant at $p < .05$, * Statistically significant at $p < .10$

Table 11. Longitudinal comparison of wealth (wealth components) between entrepreneurial and wage-earning families having the head with high school ed. or less [in \$2003, Average (Median)]

Asset Category \ Year	1984		1989		1994		1999		2003	
	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.	Bus. owner	Wage earn.
Occupational category										
N	269	4,283	306	3,859	338	4,446	264	3,208	285	3,504
Business value (Median)	97,911 (8,855)	0 (0)	102,122 (14,839)	0 (0)	101,398 (2,483)	0 (0)	460,189 (8,283)	0 (0)	269,667 (5,000)	0 (0)
Checking/saving accounts (Median)	28,523 (6,198)	16,570 (1,240)	34,011 (7,419)	18,094 (1,484)	27,776 (6,208)	15,416 (745)	18,091 (4,418)	12,101 (968)	20,358 (5,000)	11,366 (1,000)
Real estate (Median)	57,919 (0)	9,528 (0)	81,688 (0)	8,750 (0)	37,210 (0)	6,628 (0)	56,438 (0)	8,269 (0)	41,836 (0)	7,634 (0)
Stock/MF/IT/(IRA) (Median)	18,597 (0)	6,160 (0)	17,760 (0)	7,186 (0)	25,370 (0)	11,257 (0)	36,923 (0)	11,208 (0)	22,103 (0)	13,368 (0)
Vehicles/motor home/trailer (Median)	17,932 (9,740)	6,995 (3,542)	17,998 (11,871)	8,156 (4,452)	18,046 (12,416)	9,750 (6,208)	20,905 (15,462)	9,510 (4,860)	23,521 (15,000)	9,242 (4,100)
Bonds/Cash insur/Collections (Median)	7,293 (0)	2,798 (0)	8,354 (0)	3,310 (0)	13,058 (0)	6,510 (0)	7,714 (0)	4,241 (0)	14,799 (0)	4,220 (0)
IRA (Median)							19,921 (0)	8,171 (0)	20,386 (0)	14,719 (0)
Credit card/Consumer debt (Median)	3,420 (0)	1,639 (0)	5,478 (445)	2,196 (0)	7,547 (1,738)	3,331 (0)	6,389 (663)	3,162 (0)	6,694 (0)	3,792 (0)
Wealth (No main home equity) (Median)	224,757 (99,172)	40,412 (8,855)	256,455 (85,323)	43,301 (9,200)	215,311 (75,984)	46,232 (9,933)	613,792 (73,998)	50,337 (8,836)	405,975 (68,700)	56,746 (8,800)
Wealth (Median)	296,653 (165,937)	76,745 (30,991)	337,845 (153,136)	83,887 (29,678)	280,750 (148,988)	84,536 (29,798)	688,867 (144,682)	89,929 (31,256)	504,775 (136,501)	102,369 (30,600)
Total family income (Median)	62,050 (52,342)	35,169 (28,555)	65,054 (56,239)	35,330 (29,238)	58,101 (50,007)	38,058 (30,130)	70,425 (53,565)	37,521 (30,041)	68,253 (49,200)	37,765 (30,160)

Source: Author's computation of PSID data. The results are weighted by normalized PSID weights.

Table 12. *t* test results of wealth (wealth components) by group comparison, entrepreneurial and wage-earning families having the head with high school or less education. [Mean values by group are presented in Table 9.]

Asset Category \ Year	1984		1989		1994		1999		2003	
	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t	t Value	Pr > t
Business value	-26.72***	<.0001	-20.64***	<.0001	-12.80***	<.0001	-8.46***	<.0001	-12.75***	<.0001
Checking/saving accounts	-3.84***	0.0001	-5.32***	<.0001	-3.96***	<.0001	-2.31**	0.0208	-3.88***	<.0001
Real estate	-9.81***	<.0001	-9.97***	<.0001	-9.79***	<.0001	-7.51***	<.0001	-7.55***	<.0001
Stock/MF/IT/(IRA)	-2.94***	0.0033	-4.15***	<.0001	-3.63***	0.0003	-4.78***	<.0001	-0.89	0.3716
Vehicles/motor home/trailer	-14.40***	<.0001	-12.38***	<.0001	-9.32***	<.0001	-10.89***	<.0001	-12.50***	<.0001
Bonds/Cash insur./Collections	-4.35***	<.0001	-4.51***	<.0001	-2.64***	0.0083	-1.34	0.1794	-4.84***	<.0001
IRA							-13.63***	<.0001	-0.63	0.5279
Credit card/Consumer debt	-3.54***	0.0004	-5.76***	<.0001	-5.56***	<.0001	-4.11***	<.0001	-3.71***	0.0002
Wealth (No main home equity)	-18.33***	<.0001	-17.71***	<.0001	-14.67***	<.0001	-9.72***	<.0001	-12.66***	<.0001
Wealth	-19.07***	<.0001	-18.37***	<.0001	-12.14***	<.0001	-10.14***	<.0001	-13.53***	<.0001
Total family income	-14.98***	<.0001	-17.15***	<.0001	-6.90***	<.0001	-3.86***	<.0001	-13.21***	<.0001

Source: Author's computation of PSID data. *** Statistically significant at $p < .01$, ** Statistically significant at $p < .05$, * Statistically significant at $p < .10$

Table 13. Descriptive statistics of the variables used in the regression testing [\$2003].

	1989		1994		1999		2003	
	Mean	Percent	Mean	Percent	Mean	Percent	Mean	Percent
Dependent variables								
WEALTH	\$197,561		\$182,618		\$161,771		\$205,925	
ACTIVE SAVINGS	\$37,419		\$20,021		\$22,670		\$22,159	
SAVERS	78.92%		61.68%		71.48%		68.13%	
Independent variables								
Lagged Wealth - 5 yrs. (no main home equity)	\$73,680		\$85,471		\$112,646		\$127,242	
Permanent Income (avg. of inc. - past 5 yrs.)	\$67,973		\$69,819		\$70,989		\$79,938	
Transitory Income (var. of inc. - past 5 yrs.)	3.361E+08		4.194E+08		1.054E+09		9.585E+08	
Age of head - between 21 and 30 yrs. Old	6.28%		5.10%		15.60%		12.12%	
Age of head - between 31 and 40 yrs. Old	31.66%		31.00%		26.82%		25.09%	
Age of head - between 51 and 65 yrs. Old	34.79%		24.48%		27.92%		33.21%	
Number of Children	1.534		1.383		1.313		1.277	
Age of the Youngest child	7.314		6.466		5.751		5.460	
Head - some and full College Ed.	44.33		48.84%		51.87%		55.63%	
B. own - incumbent (back and now - no change)	7.56%		7.94%		6.88%		10.07%	
B. own - switcher (back and now - switched)	2.11%		3.67%		2.29%		1.31%	
Wage to Bus. own - (wage back - busns. now)	9.55%		7.06%		7.23%		6.37%	
Wg. earn. - switcher (back and now - switched)	9.80%		17.17%		5.24%		2.89%	
Bus. own to Wg. - (B. back - Wg. now)	5.06%		6.84%		4.53%		5.76%	
Hm. own - incumbent (back and now - no change)	73.34%		61.18%		56.36%		61.88%	
Hm. own - switcher (H. back and now - switched)	1.60%		11.58%		4.69%		0.91%	
Renter to Hm. owner - (rent back - Hm. own now)	7.95%		10.06%		8.97%		8.82%	
Renter - switcher (rent back and now - switched)	0.39%		1.11%		0.41%		0.31%	
Hm. owner to rent - (Hm. owner back - rent now)	2.24%		5.46%		2.50%		2.86%	
Head's Race - Black	7.97%		7.60%		7.38%		6.61%	
Head's Race - Other (non white or black incl. Hisp)	0.75%		0.46%		1.56%		1.66%	
First inheritance - 10 and 5 yrs. in the past	\$6,295		\$3,745		\$3,605		\$4,543	
First inheritance - 5 yrs. in the past	\$4,755		\$5,271		\$3,994		\$2,764	

Source: Author's computation of PSID data. The results are weighted by normalized PSID weights.

Table 14. Regression results: the dependent variable is total wealth

Independent variables	1989			1994			1999			2003		
	Parameter estimate	Pr > t	VIF	Parameter estimate	Pr > t	VIF	Parameter estimate	Pr > t	VIF	Parameter estimate	Pr > t	VIF
Intercept	-118941***	<.0001	0.000	-55172***	<.0001	0.000	-53179**	0.016	0.000	-95539***	<.0001	0.000
Lagged Wealth - 5 yrs. (no main home equity)	1.013***	<.0001	1.504	1.019***	<.0001	1.488	1.039***	<.0001	1.287	1.024***	<.0001	1.237
Permanent Income (avg. of inc. - past 5 yrs.)	2.435***	<.0001	1.510	2.114***	<.0001	1.643	2.079***	<.0001	1.549	2.246***	<.0001	1.660
Transitory Income (var. of inc. - past 5 yrs.)	1.030E-5*	0.0623	1.129	-1.593E-7	0.963	1.315	-2.280E-6***	<.0001	1.108	4.334E-6***	0.003	1.309
Age of head - between 21 and 30 yrs. Old	12791	0.651	1.426	-32996**	0.039	1.228	-35071.000	0.160	1.232	-26081	0.382	1.189
Age of head - between 31 and 40 yrs. Old	15365	0.347	1.742	-29747***	0.000	1.577	-15737.000	0.229	1.508	-25176*	0.100	1.473
Age of head - between 51 and 65 yrs. Old	43096**	0.012	2.005	22538***	0.008	1.698	40825***	0.001	1.755	80787***	<.0001	1.752
Number of Children	2851.439	0.648	1.787	-2445.760***	<.0001	1.459	-2058.623**	0.017	1.540	-3760.005***	0.000	1.458
Age of the Youngest child	-1728.183*	0.100	1.415	1078.399	0.718	1.636	-9741.706**	0.051	1.819	3065.867	0.589	1.774
Head - some and full College Ed.	-19524	0.135	1.264	-1727.307	0.792	1.251	-239.206	0.981	1.249	23405*	0.053	1.268
B. own - incumbent (back and now - no change)	190994***	<.0001	1.242	56242***	<.0001	1.243	95523***	<.0001	1.111	121099***	<.0001	1.140
B. own - switcher (back and now - switched)	-65738	0.113	1.035	39820**	0.018	1.080	48784*	0.064	1.078	159315***	0.001	1.046
Wage to B. own - (wage back - B. now)	34914*	0.086	1.069	36118***	0.002	1.074	65110***	<.0001	1.065	55314**	0.011	1.053
Wage earn. - switcher (back and now - switched)	27908	0.164	1.066	13635	0.174	1.069	-13268	0.501	1.043	108895***	0.001	1.026
B. own to Wage - (B. back - Wg. now)	-6590.359	0.806	1.044	-8761.534	0.473	1.084	53388***	0.008	1.057	63126***	0.004	1.042
H. own - incumbent (back and now - no change)	64256***	0.000	1.846	52074***	<.0001	2.670	66308***	0.000	2.754	77891***	<.0001	2.330
H. own - switcher (H. back and now - switched)	28456	0.572	1.100	1056.682	0.952	1.406	64509*	0.059	1.297	77103	0.207	1.109
Renter to H. owner - (rent back - H. own now)	23196	0.803	1.032	-17234	0.641	1.069	-276393***	0.000	1.096	248339**	0.029	1.037
Renter - switcher (rent back and now - switched)	14719	0.568	1.4847	16517	0.208	1.946	6031.046	0.787	2.103	16347	0.526	1.807
H. owner to rent - (H. owner back - rent now)	22899	0.580	1.148	-9404.876	0.619	1.314	-42078	0.191	1.348	-10024	0.780	1.327
Head's Race - Black	-20366**	0.035	1.051	-35926***	0.003	1.057	-46812**	0.012	1.053	-40211*	0.083	1.045
Head's Race - Other than W or B include Hisp.	-41692	0.531	1.012	29169	0.594	1.021	-49893	0.317	1.011	-35587	0.434	1.020
First inheritance - 10 and 5 yrs. in the past	-0.397	0.035	1.136	0.512***	<.0001	1.147	-0.156	0.492	1.084	0.903***	<.0001	1.121
First inheritance - 5 yrs. in the past	1.366***	<.0001	1.065	0.639***	<.0001	1.007	0.73382***	<.0001	1.086	0.867***	0.001	1.079
R-squared	0.3908			0.6169			0.5621			0.4809		
Number of cases	2150			2180			1674			1908		

Source: Author's computation of PSID data. *** Statistically significant at $p < .01$. ** Statistically significant at $p < .05$. * Statistically significant at $p < .10$. The results are weighted by normalized PSID weights.

education of the head as a dummy with a value of 1 for some college and college degree and 0 for high school or less education; longitudinally coded dummies controlling for the occupational choice – entrepreneurship versus wage earning (see the explanation provided in the measurements section), longitudinally coded dummies controlling for home ownership vs. renting status, race with a dummy for each category: whites, blacks, other non white and non black but including Hispanics; first inheritance received between ten and five years back, as a continuous variable; first inheritance received in the past five years, as a continuous variable. Descriptive statistics about the variables used in the regression testing are provided in Table 13.

As highlighted in Table 14, the statistically significant results are fairly consistent throughout the four years. A good part of the variation in accumulated wealth is explained by of the independent variables tested here: in 1989, R^2 of 0.3908 up to a maximum R^2 of 0.6169 in 1994 and then down to a R^2 of 0.4809 in 2003.

Family's lagged wealth (five years back), permanent and transitory income are consistently significant explanatory factors for the variation in total wealth ($p \leq .001$), excepting transitory income in 1994.

The regressions from 1994 and 2003 indicate that the age group 31 to 40 years old has statistically significant negative effects on total wealth ($p = .000$ in 1994 and $p = .100$ in 2003 respectively) when compared to the reference group, age between 41 and 50 years old. Also, the 51 to 65 year old age category appears to be significantly richer ($p = .012$ for 1989, $p = .008$ in 1994, $p = .001$ in 1999 and $p < .001$ in 2003) than the base age group, 41 to 50 years old.

The number of children is statistically significant ($p < .001$, $p = .017$, and $p = .000$) in 1994, 1999 and 2003 respectively, and indicates that more children in the family lowers the total wealth. The age of the youngest child is not so consistent. It is statistically significant only in 1989 ($p = .10$) and in 1999 ($p = .051$) indicating that the higher the age of the youngest child, the lower the family's accumulated wealth. It is possible that the older the youngest child, the higher are the human capital expenses associated with the child.

When looking at the occupational choice effects, the following observations can be made:

Incumbent business owners, which are the families that had a business five years in the past and preserved this occupational choice across the studied five-years, are wealthier than the base category, the wage earning incumbent families. The statistical significance ($p < .001$) preserves across the four regressions and the size and sign of the parameter estimate indicate that this group is wealthier than the wage earning incumbent group. This particular result supports the effects hypothesized in H2.

The business owning families that switched status during the five years time frame appear ($p = .016$, $p = .064$, and $p = .001$ in 1994, 1999, and 2003 respectively) to be wealthier than the wage earning incumbent families. The sign and size of the parameter estimate show that this group is less likely to be wealthier than the business owning incumbents: 39,820 versus 56,242 in 1994, and 48,784 versus 95,523 in 1999 respectively. In 2003 the situation is reversed.

The "wage to business ownership" group is consistently statistically significant ($p < .086$ in 1984, $p = .002$ in 1989, $p < .001$ in 1999, $p = .011$ in 2003) throughout the four

regressions, and the size of the parameter estimate points out that families that transit from wage earning to business ownership are wealthier than wage earning families. These observations regarding entrepreneurial families descriptively support hypothesis H1.

Similar thoughts and observations are valid for home owning incumbent families. This family group shows consistent statistically significant parameter estimates different from zero ($p < .001$). The positive correlation and the size of the parameter estimates indicate that home owning, incumbent families, are wealthier than renting incumbent families.

The parameter estimate for first inheritance in the past five years is also consistently statistically significant across the four regressions ($p < .001$) showing that the families that received in the past year a first inheritance are wealthier than those who did not receive such an inheritance. For example in 1989, every first inheritance dollar is associated to \$1.366 in total wealth. In 1994, every first inheritance dollar explains 64 cents in total wealth, and so forth. Further, the first inheritance received between ten and five years in the past are statistically significant factors only in 1994 and 2003 ($p < .001$). These regressions provide a good platform for the second *level of statistical testing*, the causal analysis. Which of the factors observed descriptively being associated to the variation of wealth become explanatory factors for the *active saving* behavior of the American families? Several regression tests have been performed to support further hypotheses H1, and H2.

5.3 Multivariate Analysis

As proposed in the theoretical and empirical modeling section, the causal testing involves four regressions for years 1989, 1994, 1999, and 2003 respectively (see equation (59)).

The regressions test active saving against the same list of variables tested earlier against wealth: lagged wealth, family's permanent income, family's transitory income, age categories, number of children, age of the youngest child, education, the six dummy categories for employment choice, the six dummy categories for home ownership versus renting, race, inheritance. As used earlier when regressed wealth, the time frame for these regressions is five years in the past. Detailed definitions of the measures of the variables used in this model are provided in the methods section. The sample was trimmed by the first percentile and last percentile of reported wealth and active saving distributions in order to avoid the outlier values. Those outliers could influence drastically the results. Several authors employed similar methods of clearing their sample (Hurst, Luoh & Stafford, 1998; Carroll & Samwick, 1997; Gentry & Hubbard, 2004; Guariglia, 2001) Table 14 provides a summary picture of the results of the four regressions tested across the research time horizon, 1984 - 2003. The following findings could be concluded from these tests:

- The lagged wealth without home equity (five year lag) correlation to current active savings is statistically significant ($p = .001$ in 1984, $p = .004$ in 1989, and $p = 0.005$ in 1999). One dollar in lagged wealth is reflected in around 2-3 cents in active savings. In 2003 regression, the statistical significance is lost.
- Family's permanent income (the average family's income over the past five years) is statistically significantly correlated to active savings ($p < .001$). One

dollar from family's income is reflected in average in 44 cents in active savings over five years in 1989, 57 cents in active savings in 1994, 32 cents in active savings in 1999, and 31 cents in 2003.

- Family's transitory income (earnings' variation over the past five years) is statistically significantly correlated to active savings in 1989 ($p = 0.012$) and in 2003 ($p = 0.001$). The size of this effect on active savings is very small.
- The age category group of 50 to 65 years old for the head is consistently significant across the four regressions ($p = .003$ in 1989, $p = .057$ in 1994, marginally significant $p = .100$ in 1999, and $p = .028$ in 2003). The sign of the parameter estimate indicates that this group actively saves less on average (between -6,816 in 1994 and -6,022 in 1999) than the base group, which is 41 to 50 years old. The coefficient in 1989 is not the same with other three estimates indicating a reversed effect. One could speculate that this age group in general completed their mortgage payments, they are out of saving for kids' college education, but are highly motivated to save for their retirement nest egg. It might be possible to save actively less than the base group, which is in the life cycle stage with multiple saving motives. They could get more savings due to capital gains.
- Number of children correlation coefficient indicates that more children in the family leads to less active savings (-611.47 per additional child at $p = .009$ in 1994, -435.3 per additional child at $p = .097$ in 1999, and -408.1 at $p = .041$ in 2003). In 1989 the results are not statistically significant although the sign and size of the coefficient seems to be in the direction expected.

- Business ownership incumbent families save actively more than the wage earning families. The parameter estimates are statistically significant ($p < .001$ in 1989 and 1994, and $p = .029$ in 1999 respectively), the sign and size suggest more active savings by around \$25,849 to \$24,741 in 1989 and 1994, and by around \$10,877 in 1999. These results support hypothesis H2.
- The “wage to business” ownership category saves actively more than the base group, the wage earning incumbent families. The parameter estimates are consistently statistically significant ($p < 0.001$ in 1989, $p = .042$ in 1994, $p = .007$ in 1999, and $p = .021$ in 2003 respectively). They save around \$17,141 per year more in 1989 down to around \$10,000 per year more in 2003. These results support hypotheses H1.
- Business owning families, who switch between business ownership and wage earning and back, are also saving more than wage earning incumbent families. Evidence of statistical significance is shown only in 1994, $p = .009$ and parameter estimate of \$18,584.
- In a similar manner, one could identify consistent, statistically significant correlations throughout 1984-2003, between home ownership incumbency, in 1994 and 2003 ($p = .002$ and $p = .052$ respectively), home ownership switching choice, in 1989, 1994 and 2003 ($p = .004$, $p < .001$, and $p < .001$ respectively), and renter switcher choice in 1989, 1994, 1999, and 2003 ($p = .006$, $p < .001$, $p = .017$, and $p < .001$ respectively). The size of these effects is summarized in Table 14.

Table 15. Regressions results: dependent variable is active savings

Independent variables	1989			1994			1999			2003		
	Parameter estimate	Pr > t	VIF	Parameter estimate	Pr > t	VIF	Parameter estimate	Pr > t	VIF	Parameter estimate	Pr > t	VIF
Intercept	-754.733	0.880	0.000	-21979***	0.000	0.000	-4409.581	0.508	0.000	-4141.086***	0.370	0.000
Lagged Wealth - 5 yrs. (no main home equity)	0.037***	0.001	1.504	-0.028***	0.004	1.488	-0.016***	0.005	1.287	4.557E-4	0.886	1.237
Permanent Income (avg. of inc. - past 5 yrs.)	0.443***	<.0001	1.510	0.570***	<.0001	1.643	0.318***	<.0001	1.549	0.307***	<.0001	1.660
Transitory Income (var. of inc. - past 5 yrs.)	-2.600E-6**	0.012	1.129	-1.920E-6	0.185	1.315	-7.952E-6	0.629	1.108	-9.422E-7***	0.001	1.309
Age of head - between 21 and 30 yrs. Old	-875.933	0.868	1.426	-443.210	0.947	1.228	-14916**	0.049	1.232	-5724.620	0.321	1.189
Age of head - between 31 and 40 yrs. Old	4605.193	0.132	1.742	3747.251	0.253	1.577	7404.074*	0.062	1.508	-3030.386	0.309	1.473
Age of head - between 51 and 65 yrs. Old	9428.994***	0.003	2.005	-6815.676**	0.057	1.698	-6021.712*	0.100	1.755	-6148.900**	0.028	1.752
Number of Children	-233.549	0.842	1.787	-611.470***	0.009	1.459	-435.307*	0.097	1.540	-408.092**	0.041	1.458
Age of the Youngest child	-658.985***	0.001	1.415	-374.711	0.765	1.636	-251.428	0.868	1.819	-671.231	0.541	1.774
Head - some and full College Ed.	4315.047*	0.077	1.264	600.835	0.827	1.251	3531.968	0.253	1.249	-189.828	0.935	1.268
B. own - incumbent (back and now - no change)	25849***	<.0001	1.242	24741***	<.0001	1.243	10877**	0.029	1.111	4056.528	0.242	1.140
B. own - switcher (back and now - switched)	-2933.069	0.705	1.035	18584***	0.009	1.080	7856.681	0.324	1.078	-5018.670	0.584	1.046
Wage to B. own - (wage back - B. now)	17141***	<.0001	1.069	9971.278**	0.042	1.074	13083**	0.007	1.065	9793.273**	0.021	1.053
W.g. earn. - switcher (back and now - switched)	-4033.378	0.283	1.066	-1246.308	0.767	1.069	-4963.142	0.407	1.043	-10512*	0.101	1.026
B. own to Wage - (B. back - W.g. now)	-6637.874	0.187	1.044	9762.689*	0.056	1.084	-12342**	0.042	1.057	5984.980	0.154	1.042
H. own - incumbent (back and now - no change)	2275.134	0.493	1.846	13412***	0.003	2.670	7116.544	0.192	2.754	7445.688*	0.052	2.330
H. own - switcher (H. back and now - switched)	26835***	0.004	1.100	34135***	<.0001	1.406	15777	0.128	1.297	50568***	<.0001	1.109
Renter to H. owner - (rent back - H. own now)	10603	0.542	1.032	2811.769	0.856	1.069	15550	0.477	1.096	9243.448	0.673	1.037
Renter - switcher (rent back and now - switched)	13336***	0.006	1.485	25060***	<.0001	1.946	16189**	0.017	2.103	24685***	<.0001	1.807
H. owner to rent - (H. owner back - rent now)	-7677.679	0.321	1.148	19632**	0.013	1.314	-1799.307	0.854	1.348	4813.386	0.488	1.327
Head's Race - Black	-11613***	0.005	1.051	-7712.999	0.127	1.057	-16060***	0.004	1.053	-6904.375	0.123	1.045
Head's Race - Other (non W. or B. include Hisp.)	-15808	0.206	1.012	-3515.734	0.876	1.021	7719.622	0.610	1.011	-899.627	0.918	1.020
First inheritance - 10 and 5 yrs. in the past	-0.105***	0.003	1.136	0.150***	0.006	1.147	-0.254***	0.000	1.084	0.004	0.916	1.121
First inheritance - 5 yrs. in the past	0.042	0.219	1.065	0.083***	0.002	1.007	0.007	0.883	1.086	0.220***	<.0001	1.079
R-squared	0.162			0.1505			0.0927			0.1248		
Number of cases	2150			2185			1674			1908		

Source: Author's computation of PSID data. *** Statistically significant at $p < .01$, ** Statistically significant at $p < .05$, * Statistically significant at $p < .10$. The results are weighted by normalized PSID weights.

Table 16. Logit regressions results: the dependent variable is categorical, saver versus spender

Year	1989			1994			1999			2003		
	Parameter estimate	Pr > Chi Sq	Point Est.	Parameter estimate	Pr > Chi Sq	Point Est.	Parameter estimate	Pr > Chi Sq	Point Est.	Parameter estimate	Pr > Chi Sq	Point Est.
Intercept	0.366	0.119		-0.642***	0.0007		0.244	0.321		0.247	0.211	
Lagged Wealth - 5 yrs. (no main home equity)	-6.61E-7	0.203	1.000	-2.27E-6 ***	<0001	1.000	-8.37E-7 ***	0.001	1.000	-1.34E-7	0.322	1.000
Permanent Income (avg. of inc. - past 5 yrs.)	1.2E-5***	<0001	1.000	1.2E-5***	<0001	1.000	5.57E-6 ***	0.002	1.000	6.364E-6 ***	<0001	1.000
Transitory Income (var. of inc. - past 5 yrs.)	-148E-12***	0.002	1.000	-973E-13 *	0.075	1.000	3.5E-11	0.171	1.000	-238E-13 *	0.054	1.000
Age of head - between 21 and 30 yrs. Old	0.144	0.571	1.155	0.109	0.634	1.115	-0.789***	0.004	0.454	-0.427*	0.084	0.652
Age of head - between 31 and 40 yrs. Old	0.325**	0.028	1.384	0.148	0.194	1.160	0.187	0.232	1.205	-0.330**	0.012	0.719
Age of head - between 51 and 65 yrs. Old	0.269*	0.080	1.309	-0.154	0.205	0.857	-0.177	0.212	0.837	-0.301**	0.016	0.740
Number of Children	0.023	0.593	1.030	-0.019**	0.018	0.982	-0.018*	0.072	0.982	-0.019**	0.026	0.981
Age of the Youngest child	-0.015	0.123	0.985	0.022	0.618	1.022	0.053	0.370	1.055	-0.074	0.118	0.928
Head - some and full College Ed.	-0.040	0.739	0.961	0.144	0.124	1.155	-0.052	0.659	0.949	0.161	0.120	1.175
B. own - incumbent (back and now - no change)	0.588***	0.019	1.800	0.7623***	<0001	2.143	0.262	0.187	1.300	-0.016	0.916	0.984
B. own - switcher (back and now - switched)	0.120	0.752	1.127	-0.136	0.551	0.873	-0.468*	0.103	0.626	-0.598*	0.114	0.550
Wage to B. own - (wage back - B. own now)	0.194**	0.033	1.214	0.444**	0.017	1.558	0.627***	0.003	1.872	0.047*	0.081	1.048
Wg. earn. - switcher (back and now - switched)	-0.409**	0.014	0.664	0.013	0.927	1.013	-0.057	0.804	0.945	-0.329	0.230	0.719
B. own to Wage - (B. back - Wg. now)	-0.139	0.567	0.870	0.064	0.707	1.066	-0.567***	0.008	0.567	0.234	0.229	1.263
H. own - incumbent (back and now - no change)	0.226	0.128	1.254	0.891***	<0001	2.438	0.421**	0.031	1.523	0.428***	0.007	1.534
H. own - switcher (H. back and now - switched)	2.281**	0.017	9.788	1.046***	<0001	2.846	0.884**	0.035	2.419	14.155	0.962	>999,999
Renter to H. owner - (rent back - H. own now)	-1.030	0.136	0.357	0.480	0.324	1.616	1.483	0.139	4.404	1.830	0.135	6.231
Renter - switcher (rent back and now - switched)	1.129***	<0001	3.094	1.482***	<0001	4.403	0.945***	0.000	2.572	0.975***	<0001	2.652
H. owner to rent - (H. owner back - rent now)	-0.933***	0.003	0.394	0.625**	0.013	1.869	-0.094	0.786	0.910	-0.124	0.665	0.883
Head's Race - Black	-0.565***	0.002	0.569	0.024	0.887	1.024	-1.007***	<0001	0.365	-0.316*	0.091	0.729
Head's Race - Other (non W. or B include Hisp.)	-1.351***	0.008	0.259	0.116	0.867	1.123	0.168	0.775	1.182	0.016	0.966	1.016
First inheritance - 10 and 5 yrs. in the past	-2.44E-6*	0.100	1.000	4.429E-6***	0.023	1.000	-9.75E-6 ***	0.001	1.000	-2.68E-6	0.124	1.000
First inheritance - 5 yrs. in the past	9.301E-7	0.623	1.000	4.408E-6*	0.084	1.000	8.031E-7	0.674	1.000	8.914E-6**	0.037	1.000
Pr > Chi Sq		0.1958			0.2673			0.685			0.2132	
Number of cases		2150			2183			1674			1908	

Source: Author's computation of PSID data. *** Statistically significant at $p < .05$. ** Statistically significant at $p < .10$. The results are weighted by normalized PSID weights.

Table 17. Regressions results: the dependent variable is active savings. Only active savings > 0

Year	1989			1994			1999			2003		
	Parameter estimate	Pr > t	VIF	Parameter estimate	Pr > t	VIF	Parameter estimate	Pr > t	VIF	Parameter estimate	Pr > t	VIF
Intercept	9341.782*	0.082	0.000	90.670	0.989	0.000	9036.302	0.143	0.000	310.417	0.951	0.000
Lagged Wealth - 5 yrs. (no main home equity)	0.050***	<.0001	1.472	0.042***	<.0001	1.580	0.017***	0.001	1.226	0.004	0.202	1.229
Permanent Income (avg. of inc. - past 5 yrs.)	0.409***	<.0001	1.510	0.506***	<.0001	1.671	0.383***	<.0001	1.556	0.31865***	<.0001	1.6045
Transitory Income (var. of inc. - past 5 yrs.)	-8.790E-7	0.494	1.182	8.828E-8	0.9527	1.362	-3.352E-7***	0.006	1.133	-8.85E-07***	0.005	1.356
Age of head - between 21 and 30 yrs. Old	-761.830	0.891	1.442	-4673.912	0.500	1.218	-7243.940	0.314	1.210	-3849.836	0.533	1.179
Age of head - between 31 and 40 yrs. Old	3097.209	0.331	1.767	3012.545	0.364	1.579	1913.744	0.580	1.575	2224.890	0.465	1.444
Age of head - between 51 and 65 yrs. Old	6706.690**	0.046	2.022	-4516.550	0.222	1.639	-3789.671	0.252	1.725	-1816.904	0.522	1.771
Number of Children	-1319.156	0.285	1.809	-423.913*	0.082	1.489	-254.327	0.283	1.588	-155.087	0.456	1.535
Age of the Youngest child	-476.998**	0.023	1.426	-2229.374*	0.082	1.619	-1699.491	0.206	1.797	-453.180	0.693	1.836
Head - some and full College Ed.	7559.623***	0.003	1.225	-198.088	0.944	1.249	4762.377*	0.081	1.267	-462.058	0.845	1.235
B. own - incumbent (back and now - no change)	24060***	<.0001	1.250	12787***	0.008	1.289	8636.350**	0.041	1.092	5441.753*	0.116	1.133
B. own - switcher (back and now - switched)	-4758.503	0.554	1.034	36145***	<.0001	1.066	20873***	0.007	1.091	7221.571	0.488	1.033
Wage to B. own - (wage back - B. own now)	18708***	<.0001	1.084	9082.418**	0.058	1.085	5384.291*	0.104	1.075	11936.000***	0.005	1.074
Wage earn. - switcher (back and now - switched)	2384.012	0.563	1.064	-2313.128	0.595	1.071	2525.571	0.632	1.039	-15712.000**	0.022	1.032
B. own to Wage - (B. back - Wage now)	-3398.739	0.517	1.047	9019.781*	0.095	1.097	4128.228	0.476	1.046	2739.602	0.507	1.056
H. own - incumbent (back and now - no change)	5975.294*	0.095	1.938	14501***	0.007	3.613	9046.838*	0.082	3.219	17027.000***	<.0001	2.720
H. own - switcher (H. back and now - switched)	19370**	0.032	1.135	37008***	<.0001	1.659	28261***	0.002	1.415	40029.000***	0.0001	1.199
Renter to H. owner - (rent back - H. own now)	47504**	0.038	1.024	8057.481	0.637	1.103	-29682*	0.119	1.142	2504.037	0.901	1.056
Renter - switcher (rent back and now - switched)	9810.591**	0.047	1.604	18542***	0.003	2.663	12988**	0.036	2.527	27540.000***	<.0001	2.180
H. own to rent - (H. owner back - rent now)	5594.632	0.567	1.121	22506***	0.011	1.460	-2669.349	0.782	1.380	10887.000	0.167	1.361
Head's Race - Black	-9469.792**	0.037	1.042	-9786.159*	0.068	1.063	-8368.082	0.152	1.036	-5371.548	0.269	1.042
Head's Race - Other (non W. and B. include Hisp.)	-14577	0.356	1.013	-14111.087	0.957	1.023	2114.378	0.870	1.013	-813.522	0.928	1.035
First inheritance - 10 and 5 yrs. in the past	-0.009	0.853	1.165	0.045	0.403	1.212	-0.014	0.876	1.047	0.071	0.134	1.141
First inheritance - 5 yrs. in the past	0.059*	0.100	1.120	0.059**	0.012	1.010	0.117**	0.037	1.075	0.142***	0.0021	1.118
R-squared		0.2105			0.2324			0.2067			0.1954	
Number of cases		1659			1502			1155			1289	

Source: Author's computation of PSID data. *** Statistically significant at $p < .01$. ** Statistically significant at $p < .05$. * Statistically significant at $p < .10$. The results are weighted by normalized PSID weights.

- Race, families headed by an African American, also shows statistically significant correlations. On average, they save actively less, by $-13,336$ ($p = .006$) in 1989 up to $-6,904$ ($p = .12$, marginally significant) in 2003.
- First inheritance received in the past five years has a consistent, statistically significant, positive effect across the four regressions. Families that received such an inheritance saved around 8 to 22 cents from each dollar received. In contrast, the first inheritance received between ten and five years ago, shows inconsistent effects. Similarly, the first inheritance received between ten and five years in the past has statistically significant effects in 1989, 1994, and 1999 ($p = .003$, $p = .006$, and $p = .0001$) and it indicates a dissaving of 10 cents to a quarter for every dollar received.

At this stage two more tests were performed to validate further that the advanced hypotheses are statistically supported. Table 16 summarizes the results of four logit regressions testing saving versus not saving against the same list of explanatory variables used in earlier regressions. The logit regression basically attempts to identify if the occupational choice, reformulated as a categorical dichotomous variable, is telling us the same story. The “saver” family was defined as one reporting active savings greater than 0, and the “spender” family the one reporting active savings lower than zero over the studied period. The relevant results are related to “business owner incumbent” and “wage to business ownership” categories. Table 16 shows that the business owner incumbent families have 80 percent greater odds to save than wage earning families in 1989, and 143 percent greater odds to save than wage earning families in 1994, we keep all else constant.

Furthermore, “wage to business ownership” families have 21 percent greater odds to be savers than wage earning families in 1989, 56, 87, and 5 percent greater odds to save than wage earning families in 1994, 1999, and 2003 respectively, if we keep all else constant. According to Table 16, “business owner switcher” families are 37 percent and 45 percent in 1999 and 2003 lower odds to be a saver family than wage earning families. These results support hypotheses H1 to H2.

Finally, we selected from the samples only the families that reported positive active savings for the researched period, and we further regressed active savings against the same a list of variables reported earlier. The results of these regressions are summarized in Table 17. The same conclusions as the ones earlier derived about the entrepreneurial choice groups would be valid here. The R^2 values are a bit improved compared with the earlier testing of the active savings. H1 and H2 are supported by the results of this analysis. The final testing step attempts to determine if active saving behavior explains the transition to becoming a business owning family (“up to business” group). Consequently, working on the same sample of families reporting positive active savings, we looked at the families getting from “wage to business ownership” versus the rest. Table 18 summarizes the results of the four logit regressions having “wage to business” categorical variable as response variable and lagged wealth (no main home equity included), family’s permanent income, family’s transitory income, active savings, education, race and inheritance as explanatory variables. Supportive results suggesting that active saving behavior increases the odds of transition from “wage to business” choice are presented in Table 18 for 1989, 1994, and 2003 respectively.

Table 18. Logit regressions results: the dependent variable is "wage to business ownership"

Independent variables	1989			1994			1999			2003		
	Parameter estimate	Pr > Chi Sq	Point Est.	Parameter estimate	Pr > Chi Sq	Point Est.	Parameter estimate	Pr > Chi Sq	Point Est.	Parameter estimate	Pr > Chi Sq	Point Est.
Intercept	-2.7955***	<.0001		-2.979***	<.0001		-2.791***	<.0001		-3.469***	<.0001	
Lagged Wealth - 5 yrs. (no main home equity)	-1.56E-6**	0.019	1.000	-1.76E-6**	0.035	1.000	-7.7E-7	0.195	1.000	6.328E-8	0.745	1.000
Permanent Income (avg. of inc. - past 5 yrs.)	-4.34E-6	0.169	1.000	7.761E-7	0.792	1.000	6.736E-6***	0.010	1.000	4.204E-6*	0.068	1.000
Transitory Income (var. of inc. - past 5 yrs.)	3.900E-5***	<.0001	1.000	2.51E-10***	<.0001	1.000	-558E-14	0.573	1.000	-291E-14	0.907	1.000
Active Savings	5.686E-6***	0.0002	1.000	2.312E-6*	0.100	1.000	1.773E-6	0.387	1.000	6.339E-6***	0.005	1.000
Age of head - between 21 and 30 yrs. Old	0.2158	0.530	1.241	0.478	0.230	1.613	0.309	0.531	1.361	0.461	0.384	1.585
Age of head - between 31 and 40 yrs. Old	0.0410	0.849	1.042	0.553***	0.004	1.738	0.022	0.927	1.022	0.202	0.463	1.224
Age of head - between 51 and 65 yrs. Old	0.0270	0.902	1.027	-0.082	0.734	0.921	0.183	0.399	1.201	0.069	0.770	1.071
Head - some and full College Education	0.3634**	0.040	1.438	0.346*	0.062	1.413	0.177	0.390	1.193	0.109	0.632	1.115
Head's Race - Black	-0.2481	0.494	0.780	-0.870*	0.081	0.419	-0.037	0.935	0.964	-1.386	0.133	0.250
Head's Race - Other (non W. or B. include Hisp.)	-13.1574	0.984	<0.001	-12.237	0.985	<0.001	-13.250	0.982	<0.001	1.905***	<.0001	6.718
First inheritance - 10 and 5 yrs. in the past	-8.05E-6*	0.100	1.000	1.276E-6	0.724	1.000	-5.13E-7	0.938	1.000	-1.000E-5	0.183	1.000
First inheritance - 5 yrs. in the past	3.626E-6	0.158	1.000	-1.000E-5	0.125	1.000	-5.53E-6	0.347	1.000	2.502E-6	0.429	1.000
Pr > Chi Sq	0.2914			0.8627			0.1044			0.9487		
Number of cases	1652			1500			1155			1289		

Source: Author's computation of PSID data. *** Statistically significant at $p < .01$, ** Statistically significant at $p < .05$, * Statistically significant at $p < .10$. The results are weighted by normalized PSID weights.

6. CONCLUSIONS

We have to conclude that entrepreneurial families hold on average around five to six times the wealth of wage earning families. The entrepreneurial families allocate their asset portfolio mostly toward their own business, and real estate other than the main home. This asset allocation focus might expose entrepreneurial families to more financial risk. Contrary to anecdotal beliefs, the entrepreneurial families allocate an important part of their wealth to stocks/mutual funds and IRAs. We have to note that some of these conclusions are more evident and clear for the wealthier part of the distributions. Also, these differences are accentuated further when we focus the attention on the married-couple, or “some college and college” educated families.

The family asset allocation changed across the twenty years time span, especially during the nineties when stocks and mutual funds became very popular investment instruments. There is a visible shift from bonds/cash value insurance/collection allocations, observable in 1984, in favor of stock, mutual funds, and IRA investments, as we move forward towards 2003. The changes in wealth structure allocations due to the evolution of financial products, as well as the changes in the importance of human capital investment during the research horizon, have significant effects on the wealth accumulation of the targeted categories of American families under study: entrepreneurial and wage earning families. It is obvious that financial markets innovated significantly throughout the time line of the present research, and consequently this work attempts to capture those changes.

Therefore, the present work attempts determine entrepreneurial effects on wealth, but also to separate them from various other effects such as life-cycle effects, wealth effects, financial innovation effects, and economic business cycles. These issues underline once more the complexity of the current research endeavor.

The observed trends in the cross tabulation of wealth and wealth components against marital status and education were ultimately supported by regression testing. The proposed hypotheses are supported empirically in the context of multivariate analyses. A summary of the regression results is presented in Table 19.

Therefore we conclude that

before entrepreneurial entry, families transiting from wage earning to entrepreneurial occupation are likely to actively save more than wage earning families. Thus all else equal, they will accumulate more wealth.

And,

incumbent entrepreneurial families are likely to actively save more than wage earning families. Thus all else equal, they will accumulate more wealth.

These results allow us to claim that entrepreneurship has an effect on wealth accumulation through an accelerated saving behavior exhibited before entry and during entrepreneurship.

As suggested earlier, the main drivers of this behavior are likely to be the cost of external funding and the increased income risk associated to entrepreneurship activity. As long as the entrepreneurial families are, or perceive that they are, financially constrained, they will engage in intense active saving to compensate. If everything else is assumed constant, the entry to entrepreneurship and entrepreneurial families will accumulate more

wealth. Separating the active saving from other wealth effects is an important focus of the current work. The results presented in this work contribute marginally to answering the contrary effects of the declining family savings and the increasing levels of family wealth. Partially, the observable increase in the personal wealth of entrepreneurial families is explained by the active saving behavior exhibited at various times across the entrepreneurship cycle. Also partially, the increase in personal wealth of entrepreneurial families is lead by the significant capital gains in corporate equities or housing during the researched timeframe (Juster, Lupton, Smith, and Stafford 2006). Thus, it appears that entrepreneurship contributes to family wealth accumulation through an induced active saving behavior at various times during the business cycle of the entrepreneurship.

Table 19. Summary of regressions' results

Analysis	Table 15 Regression AS*>0 & AS<0		Table 16 Logit regression AS>0 & AS<0	Table 17 Regression AS >0	
	Sign	Size	Odds factor	Sign	Size
Lagged Wealth - 5 yrs. (no main home equity)	+/-	0.016 – 0.037	1.000	+	0.017- 0.050
Permanent Income (avg. of inc. - past 5 yrs.)	+	0.307 – 0.570	1.000	+	0.319 – 0.506
Transitory Income (var. of inc. - past 5 yrs.)	-	9.422E07 – 2.600E-06	1.000	-	3.352E-7 8.850E- 7
Age of head - between 21 and 30 yrs. Old	-	1,4916	0.454		-
Age of head - between 31 and 40 yrs. Old	+	7,405	0.719		-
Age of head - between 51 and 65 yrs. Old	+/-	6,021 – 9,430	0.714 – 1.309	+	6,707
Number of Children	-	408 - 612	0.982	-	424
Age of the Youngest child	-	659	-	-	477 - 2229
Head – some College and full College Ed.	+	4,315	-	+	4,762 – 7,759
B. own - incumbent (back and now - no change)	+	10,877 – 25,849	1.800 – 2.143	+	5,442 – 24,060
B. own - switcher (back and now - switched)	+	18,584	0.550 – 0.626	+	20,873 – 36,145
Wage to B. own - (wage back - busns. now)	+	9,771 – 17,141	1.048 – 1.872	+	5,384 – 18,708
Wage. earn. - switcher (back and now - switched)	-	10,512	0.664	-	15,712
B. own to Wage - (B. back - Wg. now)	+/-	9,763 -12,342	0.567	+	9,020
H. own - incumbent (back and now - no change)	+	7,446 – 13,412	1.534 – 2.438	+	5,075 – 17,027
H. own - switcher (H. back and now - switched)	+/-	26,835 – 50,568	2.419 – 9.788	+	28,261 – 40,029
Renter to H. owner - (rent back - H. own now)		-	-	+/-	29,682 - 47,504
Renter - switcher (rent back and now - switched)	+	16,149 - 25,060	2.572 – 4.403	+	12,988 – 27,540
H. owner to rent - (hm. owner back - rent now)	+	19,632	0.394 – 1.869	+	22,506
Head's Race - Black	-	11,613 – 16,060	0.365 – 0.565	-	9,470
Head's Race - Other (non white or black incl. Hisp)		-	0.259		-
First inheritance - 10 and 5 yrs. in the past	+/-	0.105 – 0.254	1.000		-
First inheritance - 5 yrs. in the past	+	0.083 – 0.220	1.00		0.059 – 0.142

* AS means active savings

7. CONTRIBUTIONS

The present research contributes to the current body of knowledge on active savings and entrepreneurship in several ways. Generally, this work contributes to the overall understanding of family's saving behavior. Through its focus on the relationship between entrepreneurship and wealth, it provides the following specific additions:

- When making predictions regarding the saving behavior of entrepreneurial family, the current work distinguishes between savings and active savings. This is an important distinction that allows testing causal relationships between entrepreneurship and active saving behavior, entrepreneurship and wealth accumulation respectively.
- It places a temporal context upon the saving behavior of the entrepreneurial families. It is suggested that the saving behavior of the entrepreneurial families depends on the entrepreneurial business cycle. Specifically, it is advanced that the saving behavior of entrepreneurial families is more accelerated than the saving behavior of the wage earning families before entrepreneurial entry and during entrepreneurship.
- It provides a comprehensive two period consumption model, which allows predictions regarding influencing factors of the saving behavior before entering, and during, entrepreneurship. Among those factors, the presence of financial constraints, the entrepreneurial ability, the wage in both periods, income uncertainty and other demographics, play an important role.

Methodologically, compared to other similar studies, the present work introduces several advances regarding the technical aspects such as:

- The twenty-year time frame.
- The “rotating” sample, which allows the continuous entrance and exit of several family groups into the sample as we progress temporally across the research timeframe.
- The treatment of the families reporting a change in the head or wife throughout the research timeline. Whenever such an event occurred, a duplicate record (family) was created. For the original record, the entire information following the change in family composition moment was erased. For the newly created record, the entire information prior the change in the family composition was erased.
- The validation (triangulation) of multivariate analyses: an active savings regression on the entire sample, the logit on saver versus consumer, and a regression on the positive side of active savings only.

8. LIMITATIONS

Several limitations are worthy to be noted here:

- The twenty-year timeline introduces certain limitations. This timeline exposes the sample to a lot of attrition. In addition the “rotating” technique introduces constantly into the sample a group that will have no prior data, which is useless for certain testing performed. Furthermore, as illustrated in Table 8, a lot of structural changes have been done to PSID over the research period, 1984 –2003. Those changes go from a simple variation in sample size, to complex changes in the composition of the sample through the addition or subtraction of immigrant groups, or other groups of interest.
- The computation of active savings introduces some limitations. As indicated earlier in the “Methods” section, PSID computed active savings in 1989 and 1994 in a certain way (see the definition provided by PSID at <http://simba.isr.umich.edu/>), whereas Luoh and Stafford (1995), and later, Juster, Lupton, Smith, and Stafford (2006) have other suggestions about this computation. This flexibility introduces potential errors.
- Limitations are produced by the PSID data collected annually up to 1999 and bi-annually after that. Up to 2001, PSID did not include the defined contribution pensions in the measure of wealth (Juster, Lupton, Smith & Stafford, 2006). Even earlier work (Hurst, Luoh, & Stafford 1998) acknowledges that one of the main limitations of PSID and most other data on household asset holding is the absence

of private pension information. PSID attempted lately, after 2001, to correct the problem by collecting detailed information on private pensions.

- Measurement error in wealth and wealth components is important to be noted here. It has been documented by several authors (Avery & Kennickell, 1991; Browning & Lussardi, 1996; Juster, Smith, & Stafford, 1999) that measurement errors in wealth and wealth components are at the root of producing single digit R^2 in all models of wealth and wealth change. Improvements have been obtained by using bracketed questioning, CATI and CAPI data collection techniques that flags large differences across time. Because “active savings” is computed as an index measure of several components, it basically adds the measurement error of all these components.
- The sample selection technique is a source of potential errors. One potential source of criticism refers to the treatment procedure applied to family records where the same head and wife status preserved for couple of years and then a change in wife or head appears. Conform with the treatment procedure explained in sampling section earlier, the front end of such a record is assigned to missing values and a duplicate record is created (like a new family is created) with the back end assigned to missing values, and the front end containing the valid variable records of the new family. The source of criticism is the possibility that the families that divorce and remarry more often are among the wealthy. Literature on divorce and remarriage is divided relative to this potential question. Some authors (Coleman & Ganong, 1990) suggest that the rate of divorce and remarriage is higher among the rich, at least during 80s. Others, have suggested

that the rates of divorce and remarriage is higher among the middle socio-economic class. Gender differences are stressed out. This aspect remains to be further investigated by the author. However, we performed the same analyses presented in this work without creating new records when marital events are present for a record, and the results were neither improved nor gotten worse.

These limitations were not mentioned here to diminish the value of the present research work, but to invite to further methodological innovation that can overcome them. The robustness of the provided findings, as well the validation of the multivariate analyses used in this work legitimizes its current presentation as valuable contribution to the existing body of knowledge.

9. IMPLICATIONS

The present research proposes that entrepreneurial families actively save more money than wage earning families before entry and during entrepreneurship. Several theories are supporting this unique behavior of the entrepreneurial families. Among those a few of them are more relevant in explaining the active saving behavior exhibited by entrepreneurial families. As presented in the theoretical modeling section, the borrowing constraints and the lending-borrowing born transaction costs faced by entrepreneurial families act as driving forces on saving behavior of entrepreneurial families. Further, the uncertainty of future income inherently associated with entrepreneurial activity leads to an accelerated saving behavior of entrepreneurial families. Finally, the “mental accounting” processing applied to money allocation toward own business by entrepreneurial families, which is associated to a less liquid mental account, plays a decisional role in embracing an accelerated saving behavior. Empirical support has been offered for these claims along the present work and consequently several implications can be inferred from the present propositions.

The immediate implication is that we have a better understanding over family’s saving behavior. More precisely, it is suggested that the choice of entrepreneurial occupation has an impact on the family saving behavior, and consequently on its wealth accumulation process. Furthermore, it is added here that the spike in the saving activity is exhibited before entry into and during entrepreneurship. The increase in the saving activity is associated to income uncertainty resulting from entrepreneurial projects, but also due to the borrowing constraints and costs faced by entrepreneurial families at

various points of their pass-through entrepreneurial life cycle. These theoretical implications lead to practical and policy implications. It is proposed that some level of financial constraint has positive saving behavior of the entrepreneurial families. Speculating further, it is suggested that controlled access to public funding (subsidizing entrepreneurship through small business loans) would put some limitations on those families desiring entry to entrepreneurship, or those already being entrepreneurial but starting new projects, and therefore, driving them to save in anticipation of the financial constrains. On the same token, monitoring closer the loans creates an extra cost for the lending agencies and the borrowing entrepreneurs, which makes the external financing more expensive than internal financing. The final goal of the public policy is to achieve a balance between constrains, which increases personal savings, and access to public funding, which increases entrepreneurial entries and projects.

Nelson's (2006) discussion of Hurst and Lusardi's (2004) findings, which suggest that only the top five percent of the entrepreneurial households are truly financially constrained, become more relevant in the context of the present research findings. Full access to financial funding without constraints might not be efficient, at least from the personal wealth accumulation perspective. It might produce more entrepreneurial entries, but the benefit of the increased number of entries into entrepreneurship could be counterbalanced by the afterwards number of entrepreneurial exits and lower level personal savings.

Thus, it is suggested here that the entrepreneurship policy should be shaped toward offering controlled access to public financial funding. Several alternative are possible.

As Hanna (2008) suggests, a straight forward governmental policy of offering cheap credit for everybody taking on new entrepreneurial ventures might not produce the most efficient way of using taxpayers money. But, as most of the American states practice, the majority of the financial assistance programs targeting entrepreneurs are in the form of loan guarantees, loan participation, or direct loans (Kayne, 1999). These forms of financial assistance insure a direct level of performance monitoring, partnership with the state, as well as high level of qualifying standards.

Another policy alternative is to provide taxation provisions that encourage investors to intensively participate in financing new ventures. Investors' participation to new ventures assumes higher controls on money access and performance of the entrepreneurial firms. This policy alternative is recognized (Kanniainen & Keuschnigg 2004) as providing more benefits than the simple governmental subsidies, loans, and participation. Investors bring to the table other added value besides only funding.

10. FUTURE RESEARCH

Several areas of research regarding the relationship between entrepreneurship and wealth require further attention.

The current public concern regarding the low rates of health insurance coverage among entrepreneurial, compared with wage earning, families calls for further investigation of this topic. Perry and Ronsen (2001) suggested that the public concern with reference to entrepreneurial lack of health insurance coverage might be misplaced. Using Medical Expenditure Panel Survey of 1996, they found that individuals who self select into entrepreneurship are equally healthy with the wage-earning individuals, *ceteris paribus*, and that the relative lack of health insurance coverage doesn't have any effect on the health of the entrepreneurial individuals. The insurance coverage of the entrepreneurial families could have important effects on their saving behavior.

Another area that needs further examination is on the effects of tax incentives offered to home-based entrepreneurships. According to Publication 587 (IRS, 2007) several tax benefits can be obtained if using your home entirely, or partially, for operating your business. Among the provided tax benefits are the deductions of a percent of: rent or mortgage payment, depreciation, property taxes, insurance, utilities, maintenance expenditures, home improvements, etc. If you own a home based business, you might also be entitled to deductions related to expenses related to operating the personal vehicle for business purposes. Yet there is no research measuring the effects of this taxation policy on entrepreneurial families wealth accumulation. These tax incentives could have significant effects on wealth accumulation and spending of the home based

entrepreneurial operations. The issue is more and more relevant as the Internet provides more than ever before opportunities to set-up home based operations.

The fact that PSID started in 2001 to collect more detailed information about private pensions coverage, provides new opportunities for research on the implications regarding retirement preparation, entrepreneurship, and total wealth.

Among the sources of wealth differences between entrepreneurial and wage earning families we mentioned the initial endowment and portfolio allocation. These two areas need more work in understanding how do entrepreneurial families use their initial endowment, and how do they adjust their portfolio allocation when constrained or when they are under financial stress.

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APPENDIX

Table 20. PSID active saving component variables by year

VARIABLE	1984	1989	1994	1999	2001	2003
Value of all checking/sav accounts/cd etc. (transaction accounts)	V10918, V17601[89]	V17329	ER3742	ER15020	ER19216	ER22596
Value of all debts	V10933, V17607[89]	V17335	ER3753	ER15031	ER19227	ER22622
Money put into annuity	NA	VIANN_89, V17340	VIANN_94, ER3758	ER15036	ER19232	ER22627
Money cashed from annuity	NA	VOANN_89, V17343	VOANN_94, ER3763	ER15041	ER19237	ER22632
Sell main home	NA	NA	VSHOM_94, ER3769	ER15047	ER19243	ER22638
Buy non-main home real estate	NA	VBREL_89, V17346	VBREL_94, ER3774	ER15052	ER19248	ER22643
Sell non-main home real estate	NA	VSREL_89, V17349	VSREL_94, ER3779	ER15057	ER19253	ER22648
Home improvement	NA	VHIMP_89, V17352	VHIMP_94, ER3784	ER15062	ER19258	ER22653
Buy business	NA	VBBUS_89, V17355	VBBUS_94, ER3788	ER15066	ER19262	ER22657
Sell business	NA	VSBUS_89, V17358	VSBUS_94, ER3793	ER15071	ER19267	ER22662
Assets moved out	NA	VOASS_89, V17371	VOASS_94, ER3817	ER15095	ER19291	ER22686
Assets brought in	NA	VIASS_89, V17377	VIASS_94, ER3827	ER15106	ER19302	ER22697
Debt moved out	NA	VODEB_89, V17373	VODEB_94, ER3822	ER15100	ER19296	ER22691
Debt brought in	NA	VIDEB_89, V17379	VIDEB_94, ER3833	ER15111	ER19307	ER22702
Net into stock	NA	VSTOC_89, V17365-V17368	VSTOC_94, ER3805-ER3811	ER15075, ER15076, ER15077, ER15078, ER15083-ER15089	ER19271, ER19272, ER19273, ER19274, ER19279-ER19285	ER22666, ER22667, ER22668, ER22669, ER22674-ER22680
First gift/inheritance	V10940	VINHA_89, V17384	VINHA_94, ER3838	ER15117	ER19313	ER22708
Second gift/inheritance	V10945	VINHB_89, V17387	VINHB_94, ER3843	ER15122	ER19318	ER22713
Third gift/inheritance	NA	NA	VINHC_94, ER3848	ER15127	ER19323	ER22718
Active savings	NA	V17610	NA	NA	NA	NA
Family weight	V11079	V17612	FCWT94	FCWT99	FCWT01	FCWT03
Core/immigrant family weight					ER20394	ER24179

Table 21. PSID wealth, and wealth component, variables by year

VARIABLE	1984 (\$1984)	1989 (\$1989)	1994 (\$1994)	1999 (\$1999)	2001 (\$2001)	2003 (\$2003)
Value of farm/business owned	S103, V17595[89], V10908	S203, V17323	S303, ER3731	ER403, ER15002	S503, ER19198	S603, ER22563
Value of checking/savings	S105, V17601[89], V10918	S205, V17329	S305, ER3742	ER405, ER15020	S505, ER19216	S605, ER22596
Value of credit card/other debt	S107, V17607[89], V10933	S207, V17335	S307, ER3753	ER407, ER15031	S507, ER19227	S607, ER22622
Value of other real estate	S109, V17590[89], V10899	S209, V17318	S309, ER3721	ER409, ER14993	S509, ER19189	S609, ER22554
Value of stock	S111, V17598[89], V10913	S211, V17326	S311, ER3736	ER411, ER15007	S511, ER19203	S611, ER22568
Value of transp. Vehicles	S113, V17592[89], V10903	S213, V17320	S313, ER3726	ER413, ER14997	S513, ER19193	S613, ER22558
Value of other savings/assets	S115, V17604[89], V10923	S215, V17332	S315, ER3748	ER415, ER15026	S515, ER19222	S615, ER22617
Value of IRA				ER419, ER15014	S519, ER19210	S619, ER22590
Total wealth (no main home equity included)	S116	S216	S316	ER416	S516	S616
Total wealth (main hom equity included)	S117, V17609[89],	S217, V17389	S317	ER417	S517	S617
Family weigh	V11079	V17612	FCWT94	FCWT99	FCWT01	FCWT03
Core/immigrant family weight					ER20394	ER24179

Table 22. PSID entrepreneurship variables by year

VARIABLE	1984	1989	1994	1999	2001	2003
Whether farm/business?	S102, V17594	S202, V17322	S302, ER3730	ER402, ER14349	S502	S602
Whether head farmer?	V10870	V17297	ER3092	ER14345	ER18484	ER21852
Whether business?	V10872	V17299	ER3096	ER14349	ER18489	ER21857
HD professional practice/trade?	V10259	V16416	ER3152, PROF94	ER14428	ER18579	ER21948
R put time in business	V10874	V17302	N/A	ER14355, ER14357, ER14368, ER14370, ER14381, ER14383, ER14394, ER14396, ER14407, ER14409	ER18495, ER18497, ER18509, ER18511, ER18523, ER18525, ER18537, ER18539, ER18551, ER18553	ER21863, ER21865, ER21877, ER21879, ER21891, ER21893, ER21905, ER21907, ER21919, ER21921
Type of business have interest in	V10873	V17300	N/A	ER14350, ER14363, ER14376, ER14389, ER14402	ER18490, ER18504, ER18518, ER18532, ER18546	ER21858, ER21872, ER21886, ER21900, ER21914
Who in the family own business	[85]V11890	V17301	ER3098, ER3099, ER3100, ER3101, ER3102, ER3103, ER3104, ER3105, ER3106, ER3107	ER14351, ER14352, ER14364, ER14365, ER14377, ER14378, ER14390, ER14391, ER14403, ER14404	ER18491, ER18492, ER18505, ER18506, ER18519, ER18520, ER18533, ER18534, ER18547, ER18548	ER21859, ER21860, ER21873, ER21874, ER21887, ER21888, ER21901, ER21902, ER21915, ER21916
Employment status HD	V10453	V16655	ER2068	ER13205	ER17216	ER21123
Work for money HD?	V10454	V16657	ER2073	ER13209	ER17220	ER21127
Work self/others?	V10456	V16658, V16728	ER2074, ER2076, ER2145	ER13210, ER13292	ER17221, ER17303	ER21147, ER21203, ER21235, ER21267
Main occupation HD	V10460	V16663	HDOCC94	HDOCC99, ER13215	HDOCC01, ER17226	ER21145
# of businesses HD			HDBNUM94	HDBNUM99	HDBNUM01	ER24114
Employment status WF	V10671	V16974	ER2562	ER13717	ER17786	ER21373
Work for money WF?	V10672	V16976	ER2567	ER13721	ER17790	ER21377
Work for self/others?	V10674	V16977, V17047	ER2568, ER2639	ER13722, ER13804	ER17791, ER17873	ER21397, ER21453, ER21485, ER21517
Main occupation WF	V10678	V16982	WF0CC94	WF0CC99, ER13727	WF0CC01, ER17796	ER21395
# of businesses WF			WFBNUM94	WFBNUM99	WFBNUM01	ER24115
# of businesses HD+WF			BUSNUM94	BUSNUM99	BUSNUM01	ER24113
Family weight	V11079	V17612	FCWT94	FCWT99	FCWT01	FCWT03
Core/immigrant family weight					ER20394	ER24179

Table 23. PSID demographic variables by year

VARIABLE	1984	1989	1994	1999	2001	2003
Family composition change	V10010	V16310, V17611	[93]V21608	NA	ER17007	ER21007
Current family composition	V10015	V16315	NA	ER15104	ER19300	ER22695
# in FU	V10222, V10418	V16389, V16630	ER2006	ER13009	ER17012	ER21016
H+W # of dependents	V10279, V10895	V16439, V17309	ER3707	ER14977	ER19173	ER22538
# of children in FU	V10422	V16634	ER2010	ER13013	ER17016	ER21020
Age of HD	V10419	V16631	ER2007	ER13010	ER17013	ER21017
Age fo WF	V10421	V16633	ER2009	ER13012	ER17015	ER21019
Sex of HD	V10420	V16632	ER2008	ER13011	ER17014	ER21018
Marrital status HD	V10426, V11065	V16637, V17565	ER2014	ER13021	ER17024	ER21023
Wife in FU	V10670	V16358, V17402	ER3475, ER3863	ER13716, ER14228, ER15805	ER17785, ER19866	ER21372
Type of FU H+W?	V10865	V17292	[93]V23153	ER14228	ER18356	ER21622
Education HD	V10996, V11042	V17545	ER3964, ER3962, ER3959, ER3951	ER15953, ER15952, ER15951, ER15948, ER15940,	ER20013, ER20014, ER20012, ER20009, ER20006, ER20001	ER24148, ER23451, ER23450, ER23449, ER23446, ER23438
Education WF	V10955, V11043	V17546	ER3898, ER3896, ER3894, ER3889	ER15859, ER15856, ER15848, ER15847, ER15861	ER19921, ER19922, ER19920, ER19917, ER19909	ER24149, R23359, ER23358, ER23357, ER23354, ER23346
Whether new HD in FU	V10966	V17451	ER3917	ER15890	ER19951	ER23388
Race HD	V11055	V17483	ER3944	ER15928	ER19989	ER23426
Race WF	V10988	V17418	ER3883	ER15836	ER19897	ER23334
HD parents poor?	V10988	V17466	ER3923	ER15926	ER19987	ER23424
Family weight	V11079	V17612	FCWT94	FCWT99	FCWT01	FCWT03
Core/immigrant family weight					ER20394	ER24179

Table 24. PSID income variables by year

VARIABLE	1984 (\$1983)	1989 (\$1988)	1994 (\$1993)	1999 (\$1998)	2001 (\$2000)	2003 (\$2002)
Total family money income	V11022	V17533	FAMINC94	FAMINC99, ER16462	FAMINC01	ER24099
Mean Total Family Income (five years span)	Mean(V7412, V8065, V8689, V9375, V11022)	Mean(V12371, V13623, V14670, V16144, V17533)	Mean(V18875, V20175, V21481, V23322, FAMINC94)	Mean(FAMINC95, FAMINC96, FAMINC97, FAMINC99)	FAMINC01	ER24099
H+W taxable income for year ...	V10277	V16435	TXHW94	TXHW99, ER16452	TXHW01	ER24100
H+W total transfer income	V10305	V16485	TRHW94	TRHW99, ER16454	TRHW01	ER24101
Business income			BUSINC94	BUSINC99, ER16450	BUSINC01	ER24107
H+W Federal Taxes		V17528				
H Labor income	V11023	V17534	V23323 [93], HDEARN94	ER16463, HDEARN99	HDEARN01	ER24116
W Labor income	V10263	V16420	V22324[93], WFEAR N94	ER16465, WFEARN99	WFEARN01	ER24135
County unemployment rate	V11063	V17563	V23335[93]			
H Mean Labor Income (five years)	Mean(V7413, V8066, V8690, V9376, V11023)	Mean(V12372, V13624, V14671, V16145, V17534)	Mean (V18878, V20178, V21484, V23323, HDEARN94)	Mean(HDEARN95, HDEARN96, HDEARN97, HDEARN99)	HDEARN01	ER24116
W Mean Labor Income (five years)	Mean(V6988, V7580, V8273, V8881, V10263)	Mean(V11404, V12803, V13905, V14920, V16420)	Mean(V17836, V19136, V20436, V23324, WFEARN94)	Mean(WFEARN95, WFEARN96, WFEARN97, WFEARN99)	WFEARN01	ER24135
H+W Mean Labor Income (five years)	NA	NA	Mean(V23323+V21484, HDEARN94+WFEARN94)	Mean(HDEARN95 +WFEARN95, HDEARN96+WFEAR N96, HDEARN97+WFEAR N97, HDEARN99+WFEAR N99)	HDEARN01 +WFEARN01	ER24116 +ER24135
Family weight	V11079	V17612	FCWT94	FCWT99	FCWT01	FCWT03
Core/immigrant family weight					ER20394	ER24179

Table 25. PSID housing variables by year

VARIABLE	1984	1989	1994	1999	2001	2003
Own or rent?	V10437	V16641	ER2032	ER13040	ER17043	ER21042
House value	V10018	V16324	ER2032	ER13041	ER17044	ER21043
Remaining principal mortgage 1	V10020	V16326	ER2037	ER13047	ER17052	ER21051
Remaining principal mortgage 2	NA	NA	ER2038	ER13056	ER17063	ER21062
Moved any time since sprg.?	V10447	V16649	ER2062	ER13077	ER17088	ER21117
Whether sold home since ?			ER3768	ER15046	ER19242	ER22637

Table 26. CPI index annual averages

Year	CPI	Year	CPI	Year	CPI
2006	201.6	1996	156.9	1986	109.6
2005	195.3	1995	152.4	1985	107.6
2004	188.9	1994	148.2	1984	103.9
2003	184	1993	144.5	1983	99.6
2002	179.9	1992	140.3		
2001	177.1	1991	136.2		
2000	172.2	1990	130.7		
1999	166.6	1989	124		
1998	163	1988	118.3		
1997	160.5	1987	113.6		

Table 27. V17610 active saving 1984-1989, as defined by PSID. Change in wealth from the 1984 to the 1989

V17340 Value of Private Annuities in 1989	- V17343 Value of Pensions/Annuities Cashed in Since 1984	Net into Pensions/Annuities
V17346 Value of Real Estate Purchase Since 1984	- V17349 Value of Real Estate Sold Since 1984	Net into Real Estate (other than Main Home)
V17352 Cost of Additions/Repairs to Real Estate Since 1984		Net into home improvement
V17355 Amount invested in Business/Farm Since 1984	- V17358 Value of Farm/Business Sold Since 1984	Net into Farm/Business
V17365 Amount of Stock Purchased Since 1984	- V17373 Value of Stock Sold Since 1984	Net into Stock
V17371 Assets Removed By Movers Out Since 1984	- V17377 Assets Added by Movers in Since 1984	Net Assets Brought In
V17379 Debts Added By Movers in Since 1984	- V17343 Debt Removed by Movers In Since 1984	Net Debt Took Out
	- V17609 1984 Total Wealth in 1984	
V10018 1984 House Value (unless mooved between 1984 and 1989)	V10018 1984 House Value (Main home)	0
V17590 Equity in Real Estate in 1984	V17590 1984 Net Value of Other Real Estate	0
	V17320 1984 Net Value of Vehicles	Net Value of Vehicles
V17595 Equity in Farm/Business in 1984	V17595 1984 Net Value of Farm or Business	0
V17598 Value of Stock Held in 1984	V17598 1984 Net Value of Stocks	0
	V17329 1984 Value of Cash Accounts	Net Value of Cash accounts
	V17332 1984 Net Value of Other Assets	Net Value of Other Assets
	- V16326 1984 Remaining Mortgage Principal (Main Home)	Net Payment Toward Mortgage
	- V17335 1984 Other Debts	Net Payment Toward Other Debts
V17389 Total Wealth in 1989		
V16324 1989 House Value (Main home)	- V16324 1989 House Value	0
V17318 1989 Net Value of Other Real Estate	- V17318 Equity in Real Estate in 1989	0
V17320 1989 Net Value of Vehicles		
V17323 1989 Net Value of Farm or Business	- V17323 Equity in Farm Business in 1989	0
V17326 1989 Net Value of Stocks	- V17326 Value of Stocks Held in 1989	0
V17329 1989 Value of Cash Accounts		
V17332 1989 Net Value of Other Assets		
- V16326 1989 Remaining Mortgage Principal (Main Home)		
- V17335 1989 Other Debts		

Table 28. PSID Other housing variables by year

Year	Own or rent?	House value?	Remaining principal mortgage 1?	Remaining principal mortgage 2?	Moved anytime since spring?	Whether sold the house since?	Refinanced mortgage 1?	Refinanced mortgage 2?
1984	V10437	V10018	V10020		V10447			
1985	V11618	V11125	V11127		V11628			
1986	V13023	V12524	V12526		V13037			
1987	V14126	V13724	V13726		V14140			
1988	V15140	V14824	V14826		V15148			
1989	V16641	V16324	V16326		V16649			
1990	V18072	V17724	V17726		V18087			
1991	V19372	V19024	V19026		V19387			
1992	V20672	V20324	V20326		V20687			
1993	V22427	V21610	V21612		V22441			
1994	ER2032	ER2033	ER2037	ER2038	ER2062	ER3768		
1995	ER5031	ER5032	ER5036	ER5037	ER5061			
1996	ER7031	ER7032	ER7042	ER7043	ER7155		ER7040	ER7041
1997	ER10035	ER10036	ER10044	ER10045	ER10072		ER10042	ER10043
1999	ER13040	ER13041	ER13047	ER13056	ER13077	ER15046	ER13046	ER13055
2001	ER17043	ER17044	ER17052	ER17063	ER17088	ER19242	ER17051	ER17062
2003	ER21042	ER21043	ER21051	ER21062	ER21117	ER22637	ER21050	ER21061
2005	ER25028	ER25029	ER25042	ER25053	ER25098	ER26618	ER25041	ER25052

VITA

Emilian Siman has been working on this dissertation with the Department of Personal Financial Planning from University of Missouri - Columbia (UMC), USA. Here are a couple of milestones of his life journey up to the current time.

In July 1987, Emilian Siman earned his Bachelor of Science in Mechanical Engineering, with an emphasis on Technology of Machine Building, from University “Lucian Blaga” from Sibiu, Romania. After a couple of years of professing engineering in auto parts manufacturing industry, he joined the faculty of the University “Lucian Blaga” from Sibiu (ULBS), Romania. He taught engineering specific classes.

After December 1989, tremendous social-economic and political changes affected the life of Romanians. In 1993 an exchange program between UMC, USA and ULBS, Romania has been started. This program offered Emilian the chance to get admitted into the Master of Business Administration (MBA) program offered by the Business School from UMC. He earned his MBA degree in December 2000 with an emphasis in Marketing.

In 2003, Emilian got admitted into the doctoral program in Consumer and Family Economics with the Personal Financial Planning Department from UMC. The present work is in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with the graduation attempt for May 2008.

The most important lesson learned by Emilian during this turbulent journey is that passion for research and science is everything. Throughout his time with the UMC, Emilian became deeply passionate about research on consumer related issues such as saving behavior, credit management, and technology effects on consumers' life.