

# The Influence Of Birth Order On Financial Risk Tolerance

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## ABSTRACT

*This study examines birth order as a predictor of financial risk tolerance. Three hundred sixty-eight individuals, drawn predominantly from a large university in the Southwestern United States, completed a psychometrically sound financial risk tolerance measure (Grable and Lytton, 1999). The results confirmed previous literature in regard to gender and education as predictors of risk tolerance. However, for the first time, firstborn individuals were shown to be significantly less risk tolerant than later-born individuals. Furthermore, it was shown that later-born males were more likely than the first-born to have a majority of their portfolios allocated in stock; additionally the later-born males were more likely than the later-born females to hold a greater proportion of their assets in stocks.*

**Keywords:** Risk Tolerance; Birth Order; First-born; Later-born

## INTRODUCTION

Prior research of financial risk tolerance have examined numerous variables, including gender, age, marital status, education, financial knowledge, income, wealth, number of dependents, and employment status (Barsky et al., 1997; Bernasek & Shwiff, 2001; Chang, DeVaney & Chiremba, 2004; Chaulk, Johnson & Bulcroft, 2003; Donkers & Van Soest, 1999; Gilliam, Goetz & Hampton, 2008; Grable & Joo, 1999 & 2000; Grable, Lytton & O'Neill, 2004; Halek & Eisenhauer, 2001; Hallahan, Faff & McKenzie, 2004; Hawley & Fujii, 1993; Masters, 1989; Morse, 1998; Siegel & Hoban, 1991; Sung & Hanna, 1996a & 1996b; Yao, Hanna & Lindamood, 2004; Yook & Everett, 2003) and their association with risk tolerance of individuals. However, only a few papers have examined the effects of birth order on financial risk tolerance (Eckel & Grossman, 2008; Grable & Joo, 1999 & 2000; Van de Venter & Michayluk, 2007).

Firstborn children have been considered to possess a greater capacity for achievement academically, politically and professionally, but it wasn't until 1874 that the first empirical analysis of birth order was conducted by Sir Francis Galton in which he noticed an unusually high number of firstborn English scientists. Since that time a plethora of research has been conducted seeking to determine the impact of birth order on numerous psychological characteristics and individual achievements. The purpose of this paper is to examine the effect of birth order on financial risk tolerance while controlling for various demographic and economic variables. There are only a few studies that have examined birth order using instruments specifically designed to assess financial risk tolerance (Grable & Joo, 1999 & 2000; Van de Venter & Michayluk, 2007). Many of these studies have used the Choice Dilemmas Questionnaire (CDQ) (Stoner, 1961) to estimate risk tolerance in decision making (Cecil, 1972; Weller, 1976), while others have used a series of gambles as the measure for risk tolerance (Halek & Eisenhauer, 2001; Eckel & Grossman, 2008).

The results of recent studies have been inconclusive in predicting a relationship between birth order and financial risk tolerance; for the first time, however, this study expands on previous literature by examining whether differences in financial risk tolerance between firstborn and later-born individuals do indeed exist. Other variables from the risk tolerance literature are considered to determine if there is an interaction effect on birth order.

## LITERATURE REVIEW

In 1999 Roszkowski, commenting on birth order research and the sparsity of literature as it applies to the area of financial risk tolerance, suggested that first-born children were more risk averse than their later-born siblings. This is due in part to parental pressures experienced by firstborn children which require them to be responsible and dependable, inherently suggesting that they should not be “taking unnecessary chances” (p. 167). Grable and Joo (1999) developed a five-question measure specifically designed to assess financial risk tolerance. Birth order, along with several other demographic, socioeconomic, and psychological variables, was examined but was not found to be significant among the 242 college students used in the pilot study. In 2000, Grable and Joo repeated the study with 460 faculty and staff members from two universities. This second study examined several environmental and bio-psychosocial factors, including birth order, but could not find it to be significant.

One recent study by Van de Venter and Michayluk (2007) used a psychometrically designed measure of financial risk tolerance to determine if birth order was a predictor of risk tolerance. The data used in this research was gathered by an Australian magazine, *Smart Investor*, and FinaMetrica over a five-year period beginning in 2002. Among the questions in the 2002 and 2003 administration of the survey, participants were asked questions regarding their birth order. In addition to completing the *Smart Investor* survey, participants were also given an opportunity to complete a risk tolerance assessment developed by FinaMetrica. The data consisted of 1,108 participants, and the results did not find a relationship between birth order and risk tolerance.

More recently, a paper by Eckel and Grossman (2008) used a series of five simple gambles to assess risk preferences. The first gamble has a certain payoff, while the other four have increasing payoffs as well as increasing risk. These payoffs are designed in a linear manner, with increasing variance and significant rewards or penalties depending upon the participant’s outcome. Birth order was among several control variables but did not prove to be significant in the ordered probit regression. The results showed that men were more willing to accept the risky gambles than women.

The literature on birth order has waxed and waned in popularity since Sir Francis Galton’s publication in 1874. Among the more recent noted researchers of birth order is Frank Sulloway. In his 1996 book, *Born to Rebel*, Sulloway examined numerous current and historical people and their differences. He observed that first-borns have a tendency to be much more conservative, while later-born children are more risk seeking. Sulloway concluded that “firstborns lead fashionable reforms, populist revolutions and orthodox science” while their later-born siblings “tend to be radical revolutionaries, fostering protest long before it is stylish to do so” (p. 351). This stems for the firstborn’s desire to portray the characteristic of the parents by continuing the status quo of the family. Conversely, the later-born child’s need to take greater risk comes from the need to find their own unique position within the family. These attitudes are carried through into political and religious views, with the firstborn maintaining the more conservative parental perspective while the later-born child takes a more liberal stance. Only children have tendencies of both the first-born and later-born children. They are similar to first-borns in that they more closely identify with their parents and authority, while they also exhibit more liberal political and religious characteristics similar to later-born children.

After carefully considering the findings of previous studies and observing the differences between first-born and later-born individuals as suggested by Galton (1874) and Sulloway (1996), this research was restricted to comparing the financial risk tolerance of first-borns with the later-born respondents. It is hypothesize that first-born individuals are likely to be more financially risk averse when compared with their later-born counterparts and that first-born individuals are less likely to own risky assets, such as stocks, when compared with the later-born individuals.

*H1: First-born individuals are likely to be more financially risk averse than the later-born individuals after controlling for other socio-economic and demographic factors*

*H2: The First-born individuals are less likely than the later-born individuals to own risky assets such as stocks after controlling for other socio-economic and demographic factors.*

The study controls for a number of socio-economic and demographic variables which have been found to be significantly associated with risk tolerance in prior literature.

## **METHODOLOGY**

### **Data**

The data for this study were collected in the fall of 2006 using a web-based survey tool. The participants were a convenience sample of faculty and staff primarily from a large southwestern public university. The vast majority of the respondents in the initial survey were married. To avoid endogeneities that may have resulted due to interactions between birth order and marital status, the non-married respondents and respondents without any siblings were dropped and the 368 married respondents who were either first-born or later-born were retained for our study.

### **Dependent Variables**

In this research, the first dependent variable of interest is risk tolerance. Risk tolerance in our study has been measured using the scale developed by Grable and Lytton (2001). These scores are determined by the respondents' self-reported answers to the question(s) representing their perception of their financial risk tolerance.

Risk tolerance based on the Grable Lytton Risk Tolerance Scale (GL-RTS) (see Appendix 1) is measured next. The responses to questions 1 and 10 are reverse coded, so that higher scores reflect greater risk tolerance. The scale consists of three separate components of risk tolerance. Questions 4, 5, 8, 11, and 12 address investment risk; 1, 3, 6, 7, and 13 address financial risk; questions 2, 9, and 10 address speculative risk. The total risk tolerance in this scale is obtained by adding up the individual scores from the 13 questions. Stock ownership is used as a dependent variable to study whether birth order is a predictor of preference for risky asset ownership. The variable used for this analysis is "stocks" a binary variable coded as "1" if the participants invested more than 50% of their assets in stocks, and as "0" if otherwise.

### **Independent Variables**

The primary independent variable of interest is birth order. The variable used for this study is binary and coded as "1" if the individual is firstborn and "0" if the individual is later-born. Other control variables include age, which is split into quintiles. The lowest quintile of respondents, aged below 36 years, is used as the reference group. The reference group is compared against age groups 36 to 41, 42 to 47, 48 to 55, and respondents with age greater than 55. Gender is included as a control variable because of its significant association with risk tolerance, risky asset ownership, and wealth in previous literature (Zagorsky, 2005).

In this study, only married couples have been examined. Male primary income earners are included in the model, controlling for the women primary income earners as the reference group. Joint ownership of assets is also included in this model, after controlling for asset ownership by only the husband or the wife as the reference group. These variables are included to control for the effects of income and wealth (Gutter & Fontes, 2006; Zagorsky, 2005). In the past, the correlation between higher education and economic capital has been found to be a predictor of risky asset ownership, savings, and retirement planning (Springstead & Wilson, 2000; Yuh & DeVaney, 1996). Educational attainment is included as a binary variable coded as "1" if the respondent has an educational attainment of college degree or higher and as "0" if otherwise.

## **ANALYSIS**

This research examines the role of birth order in determining individual risk tolerance and risky asset ownership of households. For the purpose of this analysis, the descriptive statistics are run to compare distribution of the different socio-economic and demographic variables with respect to birth order (firstborn vs. later-born). In addition, *t* tests are also performed to detect any significant difference that may exist with respect to birth order among the different demographic and asset allocation characteristics.

Next, after controlling the various demographic and socioeconomic variables, a regression model is used for estimating whether being first-born is negatively associated with risk tolerance. In order to test whether firstborn respondents are less likely to invest the majority of their wealth in stocks as compared with later-born respondents, a logit estimation model was used. This model tests the hypothesis that firstborns are less likely to allocate a majority of their assets in stocks after controlling for other socioeconomic and demographic variables and risk tolerance.

## RESULTS

### Descriptive Statistics

Table 1 shows the results from the descriptive statistics and the *t* tests. The results indicate that a significantly larger proportion of males in this study were later-born (61%). This study found that a higher proportion of later-born (60%) respondents had a college degree, compared with the firstborns (40%). Also, in comparison to the first-born respondents (54%), a greater proportion of later-born respondents had postgraduate education (56%). The descriptive statistics also indicate that a higher percentage of later-born respondents (60%) invested a majority of their resources in risky financial assets such as stocks, as compared with 40% of the firstborns. Furthermore, Table 1 shows that while a higher percentage of the firstborns were in the first quartile (58%) of the risk tolerance scale, indicating that they were more risk averse, a much greater percent of later-born respondents were in quartile 3 (64%) and quartile 4 (58%) of the risk tolerance scale, suggesting that a higher percentage of later-born were more risk tolerant.

Table 1. Descriptive Statistics

Variables	Coding	Firstborn	Later-Born
<b>Gender</b>			
Male	1=yes; 0=no	39%	61%***
Female	1=yes; 0=no	48%	52%
<b>Age</b>			
Less than 35 years	1=yes; 0=no	46%	54%
36–41 years	1=yes; 0=no	40%	60%*
42–47 years	1=yes; 0=no	43%	57%
48–55 years	1=yes; 0=no	42%	58%
Greater than 55 years	1=yes; 0=no	44%	56%
<b>Educational Attainment</b>			
Less than High School	1=yes; 0=no	55%	45%
Associate Degree	1=yes; 0=no	41%	59%
College Degree	1=yes; 0=no	40%	60%**
Postgraduate	1=yes; 0=no	44%	56%*
<b>Asset Allocation</b>			
Invest >50% in Stocks	1=yes; 0=no	40%	60%***
Invest >50% in REIT	1=yes; 0=no	44%	56%
Invest >50% in Cash	1=yes; 0=no	53%	47%
<b>GL-RTS Risk</b>			
Q1 (Most Risk Averse)	1=yes; 0=no	58%*	42%
Q2	1=yes; 0=no	52%	48%
Q3	1=yes; 0=no	36%	64%***
Q4 (Most Risk Taking)	1=yes; 0=no	42%	58%*

\*\*\* p,.01, \*\* p,.05, \* p,.10

Next, a second set of descriptive statistics were run to study whether the characteristics of firstborn and later-born respondents varied by gender (see Table 2). It was found that among male respondents, a higher percentage of those ages 36 or older were later-born. It was also found that a higher percentage of later-born males

had educational attainment of college or higher and invested a greater percentage of their assets in stocks (60%). Moreover, a higher percentage of males in risk-tolerance quartiles 2, 3, and 4 were later-born. Among women, the finding showed a higher proportion of firstborns had educational attainment of high school or less. Further, a significantly higher percentage of women who invested majority of their financial assets in stocks were later-born (60%), whereas 60% of the firstborns held 50% more of their assets in cash.

**Table 2. Descriptive Statistics 2**

Variables	Coding	Male		Female	
		Firstborn	Later-Born	Firstborn	Later-Born
<b>Age</b>					
Less than 35 years	1=yes; 0=no	46%	54%	49%	51%
36–41 years	1=yes; 0=no	40%	60%*	42%	58%
42–47 years	1=yes; 0=no	36%	64%*	50%	50%
48–55 years	1=yes; 0=no	36%	64%*	46%	54%
Greater than 55 years	1=yes; 0=no	40%	60%*	50%	50%
<b>Educational Attainment</b>					
Less than High School	1=yes; 0=no	48%	52%	65%***	35%
Associate Degree	1=yes; 0=no	37%	63%	45%	55%
College Degree	1=yes; 0=no	36%	64%**	45%	55%
Postgraduate	1=yes; 0=no	40%	60%**	50%	50%
<b>Asset Allocation</b>					
Invest >50% in Stocks	1=yes; 0=no	40%	60%***	40%	60%***
Invest >50% in Real Estate	1=yes; 0=no	44%	56%	48%	52%
Invest >50% in Cash	1=yes; 0=no	53%	47%	60%*	40%
<b>GL-RTS Risk</b>					
Q1 (Most Risk Averse)	1=yes; 0=no	56%	44%	49%	51%
Q2	1=yes; 0=no	32%	68%***	48%	52%
Q3	1=yes; 0=no	32%	68%***	39%	61%*
Q4 (Most Risk Taking)	1=yes; 0=no	34%	66%***	40%	60%

\*\*\* p,.01, \*\* p,.05, \* p,.10

**Table 3. Regression Birth Order as a Predictor of Risk Tolerance**

	Coefficient	Standard Error (Robust)
Firstborn (Ref: LB)	-0.115*	0.470
Age (Ref: Less than 35 years)		
36–41 years	0.241	0.353
42–47 years	-0.402	0.379
48–55 years	-0.038	0.373
Greater than 55 years	-0.11	0.335
Male (Ref: Female)	0.281*	0.609
Income	-0.289	0.610
Assets	0.005	0.003
Family Size	0.029	0.068
College or Up	.712**	0.264
Intercept	7.441***	0.386

\*\*\* p,.01, \*\* p,.05, \* p,.10

Table 4. Logit Analysis for the Likelihood of Stockownership

Variables	Coefficient	Standard Error	Odds Ratio
First-born (Ref: LB)	-0.252*	0.343	0.814
Age 36–41	-0.399	0.363	0.741
Age 42–47	0.381	0.388	1.463
Age 47–55	0.929**	0.389	2.533
Age greater than 55	-0.065	0.344	0.936
Female	-0.481**	0.711	0.675
H. Income	0.484	0.660	1.622
HH Assets	0.009***	0.003	1.009
Family size	-0.094	0.072	0.910
College & Up	0.4024	0.286	0.669
Risk Tolerance	0.116***	0.027	1.123
Intercept	-3.373***	0.841	

\*\*\* p,.01, \*\* p,.05, \* p,.10

### Birth order as a predictor of risk tolerance

The OLS regression analysis of birth order as a predictor of risk tolerance (Table 3) shows that the first-born, as compared with the reference group of later-born respondents, are likely to have a lower risk tolerance. Among the control variables we find that men compared with women and respondents with educational attainment of college or higher, were positively associated with having a higher risk tolerance.

### Birth order as a predictor of stock-ownership

Table 4 shows the logit estimation of the likelihood of allocating greater than 50% of assets to stocks. The results show that the first-born respondents are less likely to allocate a greater proportion of their assets to stocks as compared with the later-born respondents. Among other control variables, household asset ownership and risk tolerance are positive predictors of stock-ownership, whereas those in the 47–55 age group are more likely to own stocks than the control group of respondents who are 35 or younger. Women overall are also less likely than men to own stocks.

## CONCLUSIONS

The findings of this research confirm those previously found in the literature on financial risk tolerance: namely, that men are more risk tolerant than women and that education is positively associated with higher levels of risk tolerance. This study is somewhat limited by the fact that the data were a convenience sample of faculty and staff primarily from a large southwestern public university thereby containing a larger degree of highly educated individuals than the general population. Even though a convenience was used, it is the first study to examine the difference between firstborns and later-borns risk tolerance.

This research is also among the first to support the hypothesis made by Roszkowski (1999), which suggests that firstborns are more conservative, and therefore less tolerant of risk, than later-borns. Furthermore, it was found that first-born were less likely than the later-born to have a majority of their portfolios allocated in stock. Also, it is significant that only two other studies have used psychometrically sound measures of financial risk tolerance and neither of them has been published. The fact that these findings were contrary only illustrates the need for further research in this area.

## AUTHOR INFORMATION

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