

# **The Influence of Birth Order on Financial Risk Tolerance**

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## **Abstract**

Birth order has been examined as a predictor of financial risk tolerance in very few papers, and this study is the first to explore the difference between risk tolerance scores of firstborn and later-born married individuals. Three hundred sixty-eight married individuals, predominantly from a large Southwestern university, 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. It was also 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.

## **Introduction**

Researchers 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). 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).

For centuries it had been thought that firstborn children possessed a greater capacity for achievement, but wasn't until 1874 that the first empirical analysis of birth order was conducted by Sir Francis Galton when 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. 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).

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). Their results have consistently shown that birth order is not a

significant predictor of financial risk tolerance. The purpose of this research is to explore the difference in financial risk tolerance between firstborn and later-born individuals. It will also consider other variables from the risk tolerance literature to determine if there is an interaction effect on birth order.

## **Background**

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 firstborn children were more risk averse than their later-born siblings. This is in part due to parental influence placed on firstborn children to be responsible and dependable, which would suggest “to the Child this means not 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 biopsychosocial factors, including birth order, but once again did not find it to be significant.

An unpublished paper by Van de Venter and Michayluk (2007) was the first to use 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 were consistent with those of Grable and Joo.

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. Galton's research upheld the prevalent view that intelligence decreased with the number of consecutive births, and that the firstborn was superior. 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 firstborns have a tendency to be much more conservative, while later-born children are more risk seeking. This stems from 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 firstborn and later-born children. They are similar to

firstborns in that they more closely identify with their parents and authority, while at the same time they are similar to later-born children in their more liberal political and religious views.

## **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 sample consists of 368 individual survey respondents.

### *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; and 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. Another variable of interest is the interaction variable of those firstborn respondents who are male. 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 (Yuh & DeVaney, 1996; 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, presence of human capital as evidenced through educational attainment 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 financial decision making of households. For the purpose of this analysis, the descriptive statistics are run to compare distribution of the different socio-demographic and asset allocation-related 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 for family size along with other demographic and socioeconomic variables, a regression model is used for estimating whether being firstborn is negatively associated with risk tolerance. In addition, we estimate whether birth order interacted with gender is a predictor of risk tolerance.

In order to test whether firstborn respondents are less likely to invest majority of their wealth in stocks as compared with later-born respondents, we use a logit estimation model. This model tests our 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. The model also controls for those firstborn respondents who have a college degree or higher.

## **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. Table 1 also 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, indicating that a higher percentage of later-born were more risk tolerant.

Next, we ran a second set of descriptive statistics to study whether the characteristics of firstborn and later-born respondents varied by gender (see Table 2). We found that among male respondents, a higher percentage of those ages 36 or older were later-born. We 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, we found that a higher proportion of firstborn women had educational attainment of high school or lower. 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.

#### *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 firstborns, as compared with the reference group of later-borns, 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. We also find that firstborn respondents who were male had a higher risk tolerance than the firstborn females.

### *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 later-born respondents are more likely to allocate a greater proportion of their assets to stocks as compared with the firstborn respondents. The results also show that the later-born women are less likely to allocate a lower proportion of their assets to stocks as compared to the control group. 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 research is 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 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.

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.

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**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%*

**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%



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

	Coefficient	Standard Error (Robust)
Firstborn (Ref: LB)	-0.915*	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)	1.192*	0.609
FB*Male	.989**	0.343
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

**Table 4. Logit Analysis for the Likelihood of Stockownership**

Variables	Coefficient	Standard Error	Odds Ratio
Later-Born	.752**	0.343	2.122
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	-0.394	0.711	0.675
LB*Female	-.803*	0.382	0.448
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	