

# Determinants Of Risk Tolerance In The Baby Boomer Cohort

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## ABSTRACT

*Using data from 26,759 respondents, this study examined the differences in financial risk tolerance among leading baby boomers and trailing baby boomers. The study also investigated differences between these two sub-cohorts in perceived risk tolerance and measured risk tolerance as determined by the FinaMetrica Risk Profiling System. The results of this study found that leading boomers were less risk tolerant than trailing boomers. Variables with a positive association with risk tolerance for both groups include higher educational attainment, income, net worth, and gender with men having higher risk tolerance than women. There was dissimilarity between married for leading boomer and trailing boomer. Being married was negatively associated with risk tolerance for leading boomers and positive for trailing boomers. It was also found that leading boomers, those with less educational attainment, lower income earners and those with a greater number of financial dependents tend to underestimate their risk tolerance.*

**Keywords:** Financial Risk Tolerance, Perceived Risk Tolerance, Baby Boomers

## INTRODUCTION

Researchers from every discipline are watching with great interest the Baby Boomer cohort. This generation born between 1946 and 1964 has been the subject of a vast number of academic studies and research by economists, policy makers and financial services professionals. While retirement preparation and financial planning are certainly issues of important consideration for this cohort as they approach their retirement, recent studies in behavioral economics demonstrates that financial risk tolerance in financial market participation, wealth accumulation, and economic behavior of individuals should also be evaluated. (Riley & Chow, 1992; Barsky et al., 1997). Therefore, understanding the financial risk tolerance exhibited by this cohort can be useful for private wealth managers and financial planning practitioners in designing the investment portfolios for this generation. The same knowledge can also assist economists and policy makers in developing policies and solutions to better prepare the baby boomers for their retirement.

Recent research on this generation demonstrates that those born during the first five years (1946-1950) of this nineteen year time span experienced significantly different economic and socio-political events than those born in the last five years of this generation (1960-1964). As a result, the authors propose in their study that there is likely to be considerable heterogeneity in the economic behavior of these two cohorts (Wellner, 2000). Wellner (2000) defines the 1946-1950 sub-cohort as “leading boomers” and the 1960-1964 sub-cohort as the “trailing boomers.” In addition to this, Hallahan et al. (2003) finds that individuals tend to underestimate their risk tolerance as they grow older, inferring that the older baby boomers may underestimate their risk tolerance.

The purpose of this study is to examine whether the leading boomers differ significantly from the trailing boomers in their financial risk tolerance. This study also investigates whether the leading and the trailing boomers differ in their tendency to underestimate their risk tolerances. The empirical analysis for this study is conducted using a proprietary dataset provided by the FinaMetrica Corporation. Risk tolerance is measured through the use of a profiling system developed by this company. Control variables examined are gender, age, region of residence, education, income, net assets, marital status and financial dependents. The remaining sections of this study comprise

of a detailed review of literature for the baby boomers and risk tolerance; this is followed by statements of hypotheses, methodology, results, discussion, and conclusion sections.

## **LITERATURE REVIEW**

### **Risk Tolerance**

Risk tolerance is a behavioral finance term that can be inversely related to the economic concept of risk aversion. There have been substantial contributions in the Economic literature to the study of risk tolerance and its relation to individual financial behavior. The study of Riley and Chow (1992) on individual asset allocation as a measure of relative risk aversion finds a steady increase in equity holdings as age increased, indicating a greater tolerance for risk. However, this study shows that risk tolerance decreased among individuals older than 65, as retirement income became an issue. They also find that as income and wealth increased, allocation of risky assets also increased. The level of education seemed to be positively associated with a willingness to accept risk. Furthermore, the greatest aversion to risk was demonstrated by the divorced and separated households (Riley & Chow, 1992).

Sung and Hanna (1996) use data from the 1992 Survey of Consumer Finances to show that higher levels of non-investment income, non-liquid financial assets, education and time horizons of thirty years or more, were positive predictors of higher risk tolerance. This study also finds that the married and male headed households were more likely to be risk tolerant than female headed households, and that self-employed individuals were more willing to take financial risks even though they had greater income volatility. Wang and Hanna (1997) find that age was positively associated with having a greater risky asset to net worth ratio.

Hanna, Gutter and Fan (1998) use a modified version of the risk tolerance scale developed by Barsky, et al (1997) to show that financial knowledge, education, and income were important predictors in determining an investor's risk tolerance. This study also found that risk tolerance of individuals reduced with an increase in the number of their financial dependents. Grable and Joo (1999) find in their study that married individuals, and men when compared with women have greater risk tolerance.

Hallahan, Faff and McKenzie (2004) use an Australian dataset of 20,415 respondents to show that individuals typically underestimate their risk tolerance score. The researchers found that people in general were more risk tolerant than what they perceived themselves to be. Meaning, income and wealth were positively associated with financial risk tolerance. Age and marital status were found to be negatively correlated with risk tolerance.

### **Baby Boomers**

Baby Boomers have been frequently studied and researched by sociologists, economists, demographers and marketers in the recent past. Wellner (2000) defines baby boomers as individuals born between 1946 and 1964. The author argues that the experiences of those born between 1954 and 1964 were substantially different than the group born between 1946 and 1953. This paper describes those born between 1946 and 1950 as leading boomers, individuals born between 1951 and 1959 as core boomers, and individuals born between 1960 and 1964 as trailing boomers. Schewe, Geoffrey and Noble (2000) estimate the leading-edge boomers born between 1946 and 1954 to be 32,531,000; whereas, there are approximately 46,794,000 trailing-edge boomers born between 1955 and 1964. The authors discuss in their paper that leading-edge boomers experienced better economic times than did their trailing-edge counter parts. Even though they grew up during socially turbulent times, economic conditions continued to grow as it had during the late forties and fifties. This period of prosperity and growth left an impression on this segment of the cohort that the good times were here to stay. This is demonstrated in leading-edge boomers' reluctance to save for retirement. In contrast, the trailing-edge boomer mindset is much different. Research suggests that the trailing-edge boomers are spenders just like the leading-edge boomers, but not because they expect good times to last forever. Instead they assume that they can always get a loan, take out a second mortgage or get another credit card (Schewe et al., 2000). These attitudes present serious challenges and are demonstrated by the sharp rise in bankruptcies and financially irresponsible behavior observed in this sub-cohort across the country.

## **HYPOTHESES**

These studies reveal that risk tolerance is an important predictor in the asset ownership and wealth creation of individuals. Individuals also tend to underestimate their risk tolerance. Previous research provides evidence that the leading and trailing baby boomers differ in their consumption habits and economic behavior. Our study examines whether the leading and trailing boomers also have different levels of risk tolerance and whether the various determinants of individual financial risk tolerance in the general population also hold true for the baby boomers. This paper further investigates whether one cohort of baby boomers is more likely to underestimate risk tolerance than the other after controlling for various socioeconomic, demographic and behavioral characteristics. Hence, based on existing literature and findings of similar studies in the past, the following hypotheses have been developed:

**Hypothesis1:** The older cohort of baby boomers (leading boomers) has a lower risk tolerance than the younger cohort of baby boomers, when controlling for other socioeconomic and demographic factors.

**Hypothesis2:** Individuals who are less informed, and who have a higher perceived risk aversion, are more likely to underestimate their risk tolerance.

## **METHODOLOGY**

### **Data**

This paper uses data from the FinaMetrica Risk Profiling System, a proprietary dataset collected between February 2000 and September 2004. The FinaMetrica dataset also contains risk tolerance scores measured using a questionnaire that has been scientifically and psychometrically validated for assessing financial risk tolerance (Roszkowski, Davey & Grable, 2005). The FinaMetrica risk tolerance questionnaire comprises of 25 questions designed to measure a respondent's risk tolerance using a single standardized (0-100) Risk Tolerance Score (RTS). A higher RTS indicates that the respondent can tolerate a higher level of financial risk; conversely, a lower RTS indicates risk aversion. This dataset also includes information on the socio-demographic composition of the respondents including gender, age, residence, education, income, net assets, marital status and number of financial dependents.

Our study includes a sample of respondents who are U.S. residents born between 1946 through 1964. There are a total of 26,759 respondents in this study, including 8268 leading boomers (born between 1946 through 1950), 12,908 core boomers (born between 1951 through 1959), and 5583 trailing boomers (were born between 1960 through 1964). The boomer classifications are based on the definitions of leading, core and trailing boomers, as suggested in the Wellner (2000) study. In the Wellner (2000) study, leading boomers comprised of 28% percent of the boomer population and 23% of boomers were trailing boomers. The distribution in our study compares well with the distribution of boomers in the Wellner (2000) study. In this research 31% of the population are leading boomers and 21% are trailing boomers.

### **Variables**

The dependent variable used for empirically testing the first hypothesis is financial risk tolerance as measured by the Risk Tolerance Score (RTS). The RTS is a continuous variable and is estimated from the respondents' responses to 25 questions designed to measure their financial risk tolerance within a range of 0 to 100. A higher RTS represents greater risk tolerance. The dependent variable in the second analysis used for computing the likelihood of underestimating risk tolerance is a binary variable. This variable is coded as '1' if the respondent's measured RTS is higher than the respondent's perceived risk tolerance score; the variable is coded as '0' if otherwise.

### **Independent Variables**

The primary independent variables of interest are leading boomers and trailing boomers. The leading boomer variable is coded as '1' if born between 1946 and 1950 and as '0' if otherwise. Similarly, the trailing boomer

variable is coded as '1' if the respondents are born between 1960 and 1964 and as '0' if otherwise. These two variables are included in the model with core boomers as the reference group.

The demographic control variables include age, marital status, gender and the number of financial dependents. Age is included in the model because findings from earlier studies indicate an association between individual risk tolerance and age (Riley and Chow, 1992; Wang and Hanna, 1997; Roszkowski, Davey and Grable, 2005). Marital status is included because previous literature shows that risk tolerance varies with an individual's marital status (Hallahan et al., 2003). Grable and Joo (1999) study finds that men demonstrate a higher risk tolerance, and to control for this difference gender is included in our model. Income, educational attainment and net assets are also included as control socioeconomic variables because past studies have found that income, education and wealth are positive predictors of risk tolerance (Hallahan et al., 2003; Riley and Chow, 1992; Grable and Joo, 1999). The second part of this study looks at the predictors of underestimating risk tolerance. Therefore, in the second analysis along with other control variables, the perceived risk tolerance scores are also included. The perceived risk tolerance scores are first distributed into quartiles and the quartiles 1, 2 and 3 are included in the model, using quartile 4 as the reference group.

### **Analysis**

First, a comparative statistical analysis and the descriptive statistics for the leading and trailing boomer sub-cohorts are observed. A reliability statistic of the risk tolerance scale (RTS) is also calculated by measuring the Cronbach's alpha of the scale. Three separate OLS regression models are next computed to empirically test the first hypothesis-- whether a significant difference in the risk tolerance of leading and trailing boomer sub-cohorts exists. A number of socio-economic and demographic characteristics are controlled for in the model. The first regression estimates whether trailing boomers or leading boomers have greater risk tolerance when compared to the reference group of core boomers, after controlling for other socioeconomic and demographic characteristics in the overall boomer sample. The second regression model estimates the determinants of risk tolerance for the leading boomers sub-cohort, and the third model estimates the determinants of risk tolerance for only the trailing boomers.

The second part of our study estimates the determinants of underestimating risk tolerance among the leading and trailing boomers. We use a multivariate regression model to estimate whether the less informed individuals, and individuals with lower perceived risk tolerance, are more likely than others to underestimate their risk tolerance scores.

## **RESULTS**

### **Descriptive Statistics**

Descriptive statistics and means tests of the sample are presented in table 1. The results suggest that the average risk tolerance score for the trailing boomers (57.4) is higher than that of the leading boomers (52.2). The perceived scores of risk tolerance are also higher for the trailing boomers. The difference between the measured and perceived scores suggests that individuals in general underestimate their risk tolerance level. When measuring the magnitude of this distance, a t-test revealed that leading boomers underestimate their risk tolerance level more than trailing boomers in absolute points (5.1 versus 4.8). The descriptive statistics also indicate that while the leading boomers have a higher net worth, the trailing boomers have higher educational attainment, and higher income. The trailing boomers also have a larger number of financial dependents. The result of Cronbach's alpha (0.89) in table 2 shows a high reliability for the RTS measure of risk tolerance.

Table 1: Descriptive Statistics and Means Tests

Category	Mean/%	
	Leading Boomer (N=8268)	Trailing Boomer (N=5583)
Birth Year Range	1946-1950	1960-1964
Risk Tolerance	52.22	57.40***
Age in years	61.04***	47.1
Married	89.20%	89.59%
Male	54.11%	52.93%
Financial Dependents	1.24	2.32***
Perceived Risk Tolerance	47.18	52.24***
Difference of RTS and Perceived score	5.09*	4.82
Education		
< High school	0.39%	0.34%
High school	14.98%***	10.58%
Trade or diploma	11.87%***	8.38%
University degree or higher	72.76%	80.7%***
Before-tax Personal Income		
< \$50,000	24.78%***	19.63%
\$50,000-\$99,999	32.09%***	26.11%
\$100,000-\$199,999	24.95%	29.56%***
\$200,000 and over	18.18%	24.70%***
Net Asset		
< \$200,000	9.01%	17.79%***
\$200,000-\$499,999	21.91%***	24.64%
\$500,000-\$999,999	26.43%***	25.43%
\$1,000,000-\$1,999,999	22.83%***	17.89%
\$2,000,000 plus	19.82%***	14.85%

\*p&lt;.05, \*\*p&lt;.01, \*\*\*P&lt;.001

Table 2: Reliability Measure (Cronbach's Alpha)

Reliability	Estimates
Number of items in the scale:	25
Scale reliability coefficient:	0.888

### Determinants of Risk Tolerance

Table 3 shows the ordinary least square (OLS) estimates of the factors contributing to the financial risk tolerance of individuals. The results suggest that when compared with the core baby boomers, trailing boomers have a higher risk tolerance, and, conversely, the leading boomers have a significantly lower risk tolerance. The results also indicate that age is negatively associated with risk tolerance. Compared to the boomers who have not completed high school, respondents who have a high school diploma, or have attended college and higher, demonstrated higher risk tolerance. The estimates also show that risk tolerance is positively associated with income and net worth. Results suggest that men and respondents who are married are more likely to have higher risk tolerance than women.

As was evident with the overall sample, the estimates from the leading boomers' regression model shows that risk tolerance reduces with age for the leading boomers. Interestingly, the leading boomers who are married have a lower risk tolerance; however, leading boomer men when compared with leading boomer women also have a higher risk tolerance. Completion of college or higher, income and high net worth, are positive predictors of risk tolerance in this model. The results suggest that when compared with individuals earning less than \$50,000 annually, the higher income earners have a significantly higher risk tolerance. Similarly, when compared with individuals with a net worth of \$200,000 or less, individuals having net worth of \$2,000,000 or more have a significantly higher risk tolerance.

The results from the trailing boomer cohort suggest that age is negatively associated with risk tolerance. Similar to the estimates of the two previous models, men have a higher risk tolerance than women in the trailing boomer cohort as well. Unlike the leading boomers, being married is positively associated with a higher risk tolerance score among the trailing boomers. The results also suggest that risk tolerance for this cohort is positively associated with educational attainment of high school, attendance of college or higher, higher income, and higher net worth. When examining the effect of wealth, the results show that trailing boomers with net worth of \$1,000,000 or more, scored significantly higher on the risk tolerance scale.

Table 3: OLS Estimates of Factors affecting Risk Tolerance Scores

Variables	Overall		Leading Boomer		Trailing Boomer	
	Coef.	Std. Error	Coef.	Std. Error	Coef.	Std. Error
Leading Boomers	-0.583***	0.183				
Trailing Boomers	0.681***	0.211				
Age	-0.234***	0.006	-0.299***	0.113	-0.336**	0.137
Married	0.573***	0.169	-0.859*	0.437	0.408***	0.145
Male	5.587***	0.136	4.401***	0.346	5.952***	0.416
Number of Financial dependents	0.069	0.048	0.082	0.134	0.315	0.125
Education (Ref: < High school)						
High school	1.234**	0.596	0.862	1.522	4.681***	0.137
Trade school	0.783	0.607	2.217	1.531	2.899	2.151
College or higher	1.564***	0.580	2.638***	0.481	1.588***	0.066
Income (Ref: <\$50,000)						
\$50,000-\$99,999	1.683***	0.177	1.767***	0.436	2.819***	0.583
\$100,000-\$199,999	3.229***	0.197	3.518***	0.501	3.912***	0.606
\$200,000-\$499,999	4.313***	0.249	4.838***	0.617	5.349***	0.720
>\$500,000	4.299***	0.386	4.667***	0.948	4.414***	1.043
Net worth (Ref: <\$200,000)						
\$200,000-\$499,999	0.337	0.209	0.474	0.628	0.245	0.602
\$500,000-\$999,999	0.583***	0.219	0.566	0.621	0.196	0.623
\$1,000,000-\$1,999,999	0.877***	0.240	0.907	0.651	0.881***	0.198
\$2,000,000 and up	1.104***	0.272	1.880***	0.309	1.402***	0.291
_cons	60.852***	0.658	63.513***	7.105	68.886***	6.767

\*p<.05, \*\*p<.01, \*\*\*P<.001

### Predictors of underestimating Risk Tolerance

The results from table: 4 show the predictors of underestimating risk tolerance among baby boomers. The results indicate that the perceived risk tolerance scores of leading boomers are significantly more likely to be lower than their measured risk tolerance scores. Interestingly, this tendency to underestimate risk tolerance increases with age, and is negatively associated with educational attainment of college or higher, and income. Those respondents who have a greater number of financial dependents also underestimated their risk tolerance. Individuals who were in the first, second and third quartiles of the perceived risk tolerance were more likely to underestimate their risk tolerance than individuals who were in the fourth quartile. Conversely, married respondents and men were less likely to underestimate their financial risk tolerance.

### DISCUSSION

The purpose of this study was to determine the factors affecting risk tolerance in the two baby boomer sub-cohorts and to identify the predictors of underestimating risk tolerance. For both groups, gender, higher income and higher net worth affected their risk tolerance score. Age has long been treated as a salient factor for determining risk tolerance. Past research provides ample evidence that age affects risk tolerance (Rile and Chow, 1992; Bajtelsmit and VanDerhei, 1997; Roszkowski, Davey and Grable, 2005). This study finds that not only were the older leading boomers less risk tolerant than trailing boomers, age was also negatively associated with risk tolerance in the regression estimates of the two sub-cohorts. The financial services industry needs to recognize this relationship and continue offering and designing financial products to address these differences.

Table 4: Predictors of underestimating risk tolerance

Variables	Estimates	
	Coef.	Std. Err.
Leading Boomers	0.616**	0.289
Trailing Boomers	-0.382	0.303
Age	0.184***	0.035
Married	-0.728***	0.198
Male	-1.681***	0.158
Number of Financial dependents	0.086*	0.051
Education (Ref: < College)		
College or higher	-0.587***	0.170
Income (Ref: <\$50,000)		
\$50,000-\$99,999	-0.659***	0.205
\$100,000-\$199,999	-1.363***	0.225
\$200,000-\$499,999	-1.788***	0.272
>\$500,000	-1.694***	0.399
Net worth (Ref: <\$200,000)		
\$200,000-\$499,999	-0.262	0.249
\$500,000-\$999,999	-0.132	0.250
\$1,000,000-\$1,999,999	0.087	0.268
\$2,000,000 and up	0.128	0.300
Perceived risk (Ref: Q4)		
Q1	13.467***	0.224
Q2	6.214***	0.234
Q3	2.491***	0.220
Constant	6.722***	1.916

\*p<.05, \*\*p<.01, \*\*\*P<.001

Consistent with the findings of previous research by Hallahan, Faff and McKenzie (2004), men are found to be more risk tolerant than women across all three models. Financial planners and private wealth managers need to take this difference into account when providing services for their clients. Hallahan, Faff and McKenzie (2004) study finds that education was a positive predictor of financial risks tolerance. Previous research by Riley and Chow (1992); Sung and Hanna (1996); and Grable and Joo (1999) also support this finding. The result of this research finds that completion of college or higher is positively associated with higher risk tolerance among leading boomers; additionally, when compared with the reference group of individuals with less than high school, individuals who completed high school or completed college or higher have an increased risk tolerance in the trailing boomer sample and the overall sample.

As found in past research, this study also finds that income and networth are positive predictors of risk tolerance across both boomer cohorts and in the overall sample (Riley and Chow, 1992; Grable and Joo, 1999). Our study finds that when compared to those earning less than \$50,000, higher income earners have a higher risk tolerance among leading boomers, trailing boomers, and the overall sample. Furthermore, when compared to the networth of less than \$200,000, those with net worth of \$2,000,000 among leading boomers and those with networth of \$1,000,000 or higher among trailing boomers are positively associated with higher risk tolerance. Our study also finds that individuals with networth of \$500,000 or higher are positively associated with higher risk tolerance in the overall sample. Hallahan, Faff and McKenzie (2003) found that being married was negatively associated with risk tolerance. Our study finds that while being married is negatively associated with risk tolerance among the leading boomers, married trailing boomers and married respondents in the overall sample have a higher risk tolerance.

The Hallahan, Faff and McKenzie (2003) study is among the first to find that individuals tend to underestimate their risk tolerance. Our study extends this literature to study the predictors of underestimation of risk tolerance among the baby boomers. The results of our study indicate that the leading boomers are more likely to underestimate risk tolerance. Additionally, age and having greater number of financial dependents is also positively associated with underestimation of risk tolerance. Conversely, higher educational attainment, income, being married

and men are less likely to underestimate risk tolerance. This study also finds that those who fall in the lower quartiles of perceived risk tolerance are more likely to underestimate their risk tolerance scores.

## CONCLUSION

The results of this study agree with the findings of Hallahan, Faff and McKenzie (2003) study to some extent; however, we also find that the lower income and the less educated are more likely to underestimate their risk tolerance scores. This is perhaps because the lower income groups, the less educated and women have less investment experience than their reference groups and hence are probably more prone to underestimating their risk tolerance.

The measurement of individual financial risk tolerance is critical to the success of meeting individual goals through portfolio allocation. The differences in the financial risk tolerances of the leading and trailing boomers, in addition to the findings of different economic, social and political experiences of these two cohorts found in previous literature, illustrate this point. Furthermore, the fact that leading boomers, the less informed individuals and lower income earners tend to underestimate their risk tolerance also emphasizes the need for risk tolerance scores to be measured before the construction of the individual investment portfolios. The findings of our study provide important information for financial services practitioners and policy makers regarding the differences in risk tolerance scores of the two baby boomer cohorts.

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