Scientific Research Publishing

Modern Economy, 2018, 9, 2150-2163
http://www.scirp.org/journal/me
ISSN Online: 2152-7261
ISSN Print: 2152-7245

Risk Tolerance, Time Preference and Financial Decision-Making: Differences between Self-Employed People and Employees

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How to cite this paper: Shtudiner, Z. (2018) Risk Tolerance, Time Preference and Financial Decision-Making: Differences between Self-Employed People and Employees. *Modern Economy*, **9**, 2150-2163.
https://doi.org/10.4236/me.2018.912133

Received: November 9, 2018
Accepted: December 15, 2018
Published: December 18, 2018

Abstract

This study analyzes the differences between salaried employees and self-employed people, in terms of risk tolerance, time preference, and choice of financial investment channels. Both groups completed research questionnaires designed to elicit responses relevant to these questions. Analysis of the results shows that self-employed people have less risk aversion and a stronger future preference. These preferences are consistent with independent work, where the fruits of success can sometimes be harvested only after a long period of time; the risks are greater, and the level of uncertainty is higher. The subjects were also asked to choose investment channels for different amounts of money. Both self-employed people and employees chose less risky investment channels as the amounts increased. However, the self-employed people chose riskier investment channels than the employees. This decision-making tendency is clearly reflected in their choice of occupation, risk tolerance and time preference. This study can increase the self-employed people's awareness of the characteristics that influence their financial decision-making. In addition, there is now a trend for investment advisors to focus on the psychological and demographic characteristics of clients when advising them regarding the composition of their investment portfolios. This study shows that the client's occupation can be an important factor that ought to influence composition of the portfolio, potentially improving client satisfaction.

Keywords

Time Preference, Risk Tolerance, Decision-Making, Self-Employed

1. Introduction

Many researchers have tried to understand how the psychological characteristics

of investors influence their decision-making when choosing an investment path. Self-employed people, especially entrepreneurs, choose riskier routes than salaried employees who are usually paid a fixed wage. In this study, we examine whether the risk tolerance, time preference and willingness to take risks when making investment decisions of self-employed people differ from those of employees.

This paper contributes to the existing literature in several ways. First, most researches focus on entrepreneurs and not on self-employed. Although the two groups overlap, they are not identical. Second, a surprising lack of attention has been paid to the time preference and investment decisions of self-employed people compared to employees. Third, this paper presents cognitive biases that can explain the differences between self-employed and employees.

In the literature review, we will first survey the personality characteristics of self-employed people (Section 2.1), and then their risk tolerance (Section 2.2), time preference (Section 2.3), and cognitive biases (Section 2.4), as compared to employees.

2. Literature Review

2.1. Personality Traits of Self-Employed People

Psychologists have long studied how personality traits influence decision-making, but this issue has only recently begun to interest economists as well. The former argue that personality in general is a critical determinant of an individual's occupational choice, and some personality traits can contribute to explaining occupational directions [1]. For example, Zhao and Seibert [2] show that the personality structure of self-employed people and entrepreneurs differs from those of managers who are not entrepreneurs (hereinafter, "non-entrepreneurs").

The literature on how personality influences occupation features two approaches; the first focuses on general personality traits, especially those included in the Big Five personality traits: extroversion, agreeableness, openness, conscientiousness (or "responsibility"), and emotional stability. The second approach concentrates on specific personality traits [3]. The Big Five model classifies a range of personality traits according to a concise structure, and some researchers believe that this model has greater reliability and validity, making it better able to identify the connections between personality and entrepreneurial activity than studies of more specific characteristics [3]. Others argue that an approach based on general traits cannot identify connections to entrepreneurial activity [4]. According to these researchers, specific characteristics such as risk tolerance, need for achievement and focus on control are more helpful in predicting entrepreneurial activity than the Big Five.

Moreover, Caliendo, Fossen and Kritikos [3] found that risk tolerance has a positive effect on the decision to be independent, and a negative impact on remaining an employee. Regarding the decision to be self-employed, they found

that three characteristics included in the Big Five model—openness, extraversion and emotional stability—increase the probability that a person will work independently. In addition, specific personality characteristics were also found to strongly influence the decision to be self-employed, including risk tolerance, focus on control and trust. Indeed, the decision to be self-employed is influenced by traits not included in the Big Five. Further, researchers found that agreeableness is the only one of the Big Five factors that influences the decision to cease being self-employed. Higher levels of agreeableness increase the probability a person will stop working independently, while low levels contribute to entrepreneurial survival. Among specific personality traits, researchers found that risk tolerance has a strong effect on leaving self-employment. Once an individual has worked independently for several years, an external focus of control increases the chances that he or she will leave the field. In other words, if the individual attributes his or her failures to external factors, the probability of that person surviving as a self-employed person is low.

2.2. Risk Tolerance

Grable [5] defines tolerance for financial risk as the maximum level of uncertainty a person is willing to bear when making financial decisions. In economics, the prevailing assumption is that entrepreneurs are more tolerant of risk than the rest of the population [6] [7] [8] [9]. According to Knight [7], economic theory examines the choice of individuals to be entrepreneurs or salaried employees through the lens of risk tolerance. Kihlstrom and Laffont [8] analyzed the maximum level of risk aversion required for an individual to become an entrepreneur. Based on the finding that entrepreneurs do not invest more conservatively than other individuals, other than their large investment in the private capital of their business, entrepreneurs may be more tolerant of risk than the rest of the general population [9].

While economists provide indirect evidence of risk tolerance among entrepreneurs, psychologists offer more direct analyses [10]-[16]. Among the questions psychologists frequently ask is whether entrepreneurs have a higher risk tolerance than non-entrepreneurs. Entrepreneurs are generally considered more tolerant of risk than non-entrepreneurs, because they must deal with a variety of options that are less structured and less clear [10], and they are necessarily held accountable for their decisions [11] [12].

However, other researchers argue that there is a second theoretical position, which suggests that entrepreneurs are no different from non-entrepreneurs in their risk attitude, because both are highly motivated to achieve [13] [14]. As is well known, people with a need for achievement set challenging goals of moderate difficulty, take personal responsibility for their decisions [15], and are characterized by taking a larger number of moderate risks [16].

Studies examining the tendency of entrepreneurs and non-entrepreneurs to take risks have yielded contradictory findings, posing an obstacle to the development of a theory [17]. This contradiction is evident in several studies, for ex-

ample, that of Brockhaus [18] who noted that there is no difference in risk tolerance between entrepreneurs and non-entrepreneurs. On the other hand, studies by Sexton and Bowman [14] [19] did show that entrepreneurs and non-entrepreneurs differed in their risk tolerance.

In order to clarify the results of the inconsistent studies, Stewart and Roth [17] conducted a meta-analysis of 12 studies published between 1980-1999, and showed that the risk bias among entrepreneurs is greater than that of non-entrepreneurs. Miner and Raju [20] analyzed 14 studies that were not included in Stewart and Roth's analysis [17] and reached the opposite conclusion, finding that entrepreneurs are actually more risk-averse than non-entrepreneurs.

Xu and Ruef [6] suggest that most of the factors that propel individuals to be self-employed are not financial, and suggest two classes of non-pecuniary motivations: autonomy and identity realization. The researchers found that entrepreneurs generally consider these factors more important than the financial benefits of entrepreneurial activity. In order for entrepreneurs to receive these non-pecuniary benefits, they must be risk-averse and minimize the threat of needing to close the business. The researchers argued that the high rate of financial losses in new ventures, along with the finding that entrepreneurs are less tolerant of risk, contributes to the assumption that many of the factors that motivate individuals to found a business are not financial. If they were, entrepreneurs would not begin new enterprises, because of the high rate of losses, and many entrepreneurs who are running their own enterprises would abandon the field.

The demographic and socioeconomic traits that might influence the financial risk tolerance of entrepreneurs have also been analyzed. Grable [5] pointed out that there is a link between individuals' risk tolerance, their personality traits and socioeconomic background. Relevant factors that might affect an individual's risk tolerance and risktaking are gender, age, marital status, occupation and income. It was found that married adult men who are professionally employed, with relatively high incomes, relatively good educations, financial knowledge and heightened economic expectations are more likely to be risk tolerant.

2.3. Time Preference

Individual time preference is another variable that affects entrepreneurs' decision-making. Time preference describes a person's preference for current consumption over future consumption. Since consumption in the present is more beneficial than equal consumption in the future, people require compensation for deferring consumption to the future, based on their individual time preference. Using the requested compensation, we can calculate a person's subjective discount rate (SDR) and use it as a measure of time preference. The higher the compensation required, the higher the SDR, and the stronger the individual's preference for the present [21] [22].

Risk tolerance may be a key characteristic affecting time preference [23] [24] [25]. Stevenson [26] argues that people who are more risk averse can tolerate less uncertainty about their future income. This may lead to a higher SDR and a de-

mand for higher compensation for delaying consumption or payment. Anderhub *et al.* [27] studied delayed lottery payments, and found a positive correlation between the degree of risk tolerance and SDR. In other words, individuals who tend toward taking more risks will request proportionally greater compensation. A later study also found a positive correlation between risk aversion and SDR [28].

2.4. Cognitive Characteristics

Many researchers have tried to understand how the psychological characteristics of investors influence their decision-making when selecting an investment path [29] [30]. These characteristics apply to self-employed people and employees and investors from both groups can be classified according to these criteria. We will address the four biases that influence investors' decision-making, and attempt to understand how these characteristics affect both self-employed people and employees.

The self-reference bias refers to individuals' tendency to attribute their success to their own skills and abilities, while failures are attributed to "bad luck". They thereby overvalue their own qualifications [31] [32]. Studies have found that excessive self-confidence has a negative effect on decision-making [33] [34].

As shown in Section 1.1, self-employed people are characterized by strong internal control and high extroversion, and need a certain degree of self-confidence in order to be able to start a business. Therefore, we conclude that their self-confidence will tend to be higher than the rest of the population, and they may take greater risks.

The conservatism bias is evident in the tendency of investors to respond slowly, and delay updating their portfolios in response to evidence and recent developments [32]. They do not react to new stories published about a particular company; as a result, the company's stock prices remain unaffected. It has been found that conservatism has a significant effect on investors' decision-making, and a more conservative investor will take fewer risks. As presented in Section 1.1, an openness to experience influences a person's decision to be an self-employed person. On this basis, we can conclude that more conservative individuals find it difficult to be self-employed because that would require them to adapt to the market uncertainties that characterize independent businesses.

The herd effect is the human tendency to follow the majority, on the assumption that decisions made by the majority are always correct [32]. People who act this way will base their investment decisions on the purchases and sales of the majority. Herding creates speculation bubbles, and renders the stock market ineffective [35]. Self-employed people have a lower tendency to follow the herd. If they did, their business would not stand out in the market, and remain independently viable.

The availability bias occurs when individuals act on the basis of current, easily-accessible information. They have a strong tendency to focus their attention on a particular fact rather than on the general situation, because it is closer to the

present or better remembered [36]. We assume that a self-employed person will not be affected by this bias in the long-term, because focusing a particular fact rather than the broader situation hampers market survival. Independent employment requires adaptation to the situation and a broad view of many variables.

3. Hypotheses

On the basis of the current literature on the subject, we have developed the following hypotheses.

1) Self-employed people will have higher risk tolerance (weaker risk aversion) than employees.

2) Self-employed people will have stronger future preference (weaker present preference) than employees.

3) Self-employed people will choose higher-risk investment channels than employees.

4. Methodology

4.1. Subjects

The research population includes 92 subjects, of whom 50 are salaried employees and 42 are self-employed. The age range is 30 - 64 (AVR = 43.0; SD = 9.4), of whom 60% are men and 40% are women. In addition, 52% of the subjects' parents are self-employed people. Subjects whose parents were self-employed were asked to rate their parents' success on 5-point scale, and the average success was 3.71. Most of the subjects are married (57%), 26% are single, and 17% reported their marital status as "Other". While 34% of the subjects have secondary education, 66% have academic degrees, of whom 29% have degrees in a field related to the economics. In addition, 16% mentioned that they had been trained as investment consultants, and 38% were working in professions related to economics. On 5-point scales, their average income is 3.49 and the average socioeconomic status in childhood was 3.22. The questionnaire also asked subjects about their investment habits; 27% responded that they had, in the past, invested in through investment advisors, 35% testified that they invest online, using their bank's website, while only 8% indicated that they use independent financial software (e.g., Forex) for investment purposes.

4.2. Questionnaires

Researchers distributed the questionnaires to the subjects in person. The variable for risk tolerance was measured in several ways. First, Part A of the questionnaire included 17 statements [37], to which subjects responded on a 4-point scale (1 = "does not describe me at all"; 4 = "describes me very well"). Second, subjects were asked to rate their own risk tolerance risk on a seven-point scale (1 = "do not like risk at all"; 7 = "very risk loving"). Third, Part B of the questionnaire asked subjects to state the amounts they would be willing to pay for lottery

tickets [38]. Willingness to pay less than the expected yield from the lottery attests to risk aversion; the lower amount a person is willing to pay, the higher the risk aversion. Fourth, Part C of the questionnaire presented 10 pairs of lotteries, with the first choice being the safer lottery of the two [39]. Subjects were asked to select their preferred lottery in each pair. Choosing the second option, the less safe lottery testifies to weaker risk aversion.

Another variable, time preference, was examined using questions that asked subjects to indicate the minimum amounts they would want to receive in order to be indifferent to delaying a present payment and receiving a higher amount in the future [38]. Higher amounts indicate subjects with a stronger preference for the present. The answers were converted to an annual SDR.

Subjects' choices of investment channels for varying amounts of money were elicited using questions phrased in this manner:

Assuming you have NIS 50,000 available, how would you invest your money? If you chose to divide amount, please take care that the total equals 100%.

_____Long-term savings plan.

_____Government bonds.

_____Corporate bonds.

_____Shares.

_____Foreign currency.

Each investment channel was weighted by risk level (long-term savings plan, 0%; government bonds, 30%; corporate bonds, 70%; shares, 90%; and foreign currency, 100%), and then the index of the subject's risk index for investment decisions was calculated. The questionnaire included similar questions for NIS 200,000 and NIS 500,000.

The last part of the questionnaire included demographic questions concerning gender, age, marital status, education, occupation, income level, socioeconomic status in childhood, parents' occupation, and investment habits.

5. Results

The first question examined whether there is a difference in risk tolerance between the employees as a group and the self-employed people as a group. This analysis was done in several ways. First, the subjects' responses to Part A of the questionnaire were compared. A significant difference was found between the self-employed people and employees ($t = 3.389$, $p = 0.001$); the average of the self-employed people ($M = 2.674$, $SD = 0.588$) was higher than that of the employees ($M = 2.293$, $SD = 0.489$). Second, the hypothesis that there is a difference in risk tolerance was examined by comparing self-employed people and employees' readiness to pay for 5 lottery tickets. A t-test was conducted for the independence of the samples. A significant difference was found between the group of self-employed people and the group of employees ($t = 1.918$, $p = 0.058$); the average in the independent group ($M = 460.476$, $SD = 268.437$) was higher than that of the employees ($M = 317.7$, $SD = 414.834$). These two results show

that risk aversion among self-employed people as a group is lower than that of employees as a group. Despite the difference in risk associated with the responses, self-reported risk tolerance did not differ between the two groups (t-test for independent samples, t = 1.523).

The second question examined whether there is a difference in the time preference of employees, as a group, and self-employed people,as a group. The subjects were asked about three time periods, and the SDR of the self-employed people was lower than that of the employees, showing that the latter have a weaker present preference and stronger future preference. Figure 1 shows the differences in the SDR of the two groups of subjects, and Table 1 presents the results of T-tests.

To control other factors that can affect the time preference, we ran multivariate regression analysis of subjective discount rate (one year). The independent variables were risk tolerance, self-employed (self-employed = 1, employee = 0), age, female (female = 1, male = 0), married (married = 1, otherwise = 0), income (1 - 5 scale, 1 low - 5 high), Economics education (1 = Economics education, 0 = otherwise). The results are presented in Table 2. We found that the SDR of the self-employed people was lower than that of the employees, consistent with the results in Table 1. The level of income has a negative effect on the annual subjective discount rate. In other words, high-income respondents can afford to ask for a lower compensation for delayed consumption or payment.

Finally, we examined the difference, in any, in the level of risk taken by employees and self-employed people when selecting investment channels. Subjects were asked chose investment channels for investing three different total amounts. The investments could be divided between channels, which were weighted according to their riskiness (see above). Each subject's risk index for investment decisions was calculated on the basis their responses. The higher the index, the more risk the person is willing to accept. Figure 2 displays the comparison between self-employed and employees in terms of index rate of

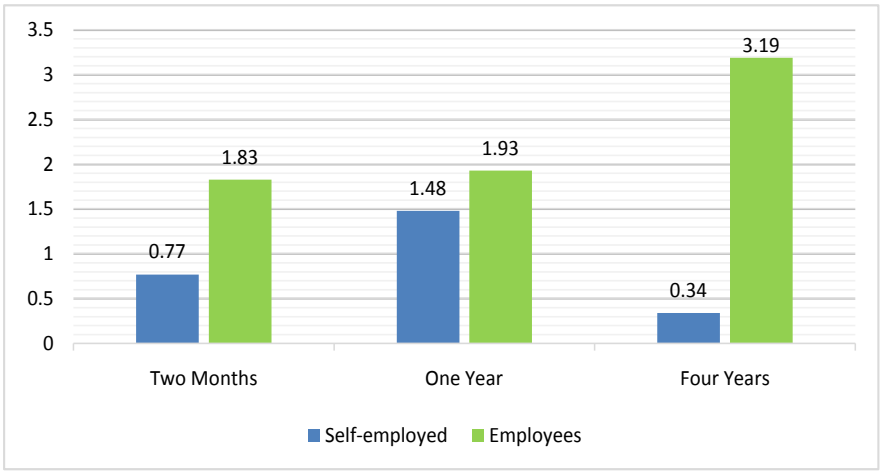

Figure 1. Subjective discount rates, comparison between self-employed and employees.

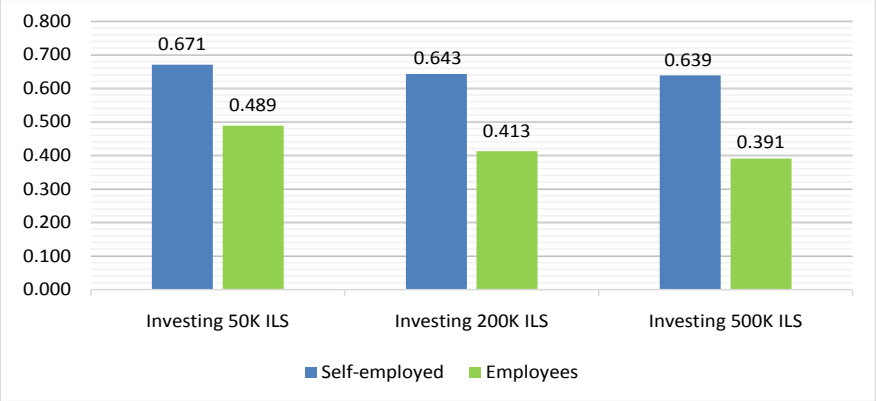

Figure 2. Index rate of investments, comparison between self-employed and employees.

Table 1. Average subjective discount rates (comparing employees to self-employed) Standard deviations are in parentheses.

	Employees	Self-employed	T-test
	(s.d.)	(s.d.)	
Two Months	1.83	0.77	t = −2.510
	(0.904)	(0.513)	p = 0.015
One Year	1.93	1.48	t = −0.928
	(1.431)	(1.232)	p > 0.1
Four Years	3.19	0.34	t = −6.528
	(3.069)	(0.307)	p = 0.000

Table 2. Regression analysis, the dependent variable is subjective discount rate (one year).

	Coefficient	Standard deviation	significance
Constant	5.649	1.593	0.001
Risk aversion	−0.008	0.094	0.934
Self employed	**−0.836**	**0.503**	**0.090**
Age	−0.056	0.026	0.036
Female	−0.418	0.505	0.410
Married	0.638	0.492	0.199
Income	−0.429	0.205	0.039
Economics Edu.	−0.512	0.529	0.336
$R^2 = 0.143$			
n = 92			

investments. The results of the statistical analysis (see Table 3) shows that for all three sums of money, the self-employed people chose riskier investment channels, and these differences are statistically significant. The results also show that

Table 3. Average risk index (comparing employees to self-employed). Standard deviations are in parentheses.

	Employees	Self-employed	T-test
	(s.d.)	(s.d.)	
Investing 50 K ILS	0.489	0.671	t = 3.143
	(0.289)	(0.259)	p = 0.002
Investing 200 K ILS	0.413	0.643	t = −4.804
	(0.227)	(0.230)	p = 0.000
Investing 500 K ILS	0.391	0.639	t = −4.899
	(0.247)	(0.235)	p = 0.000

the level of risk drops slightly for the larger amount, among both self-employed people and employees.

To control other factors that can affect the selection of investment channels, we ran multivariate regression analysis of risk index, for investing three different total amounts (50 k, 200 k, 500 k ILS). Besides the independent variables in Table 2, we included another variable, present preference (SDR, one year). The results are presented in Table 4. We found that self-employed people chose riskier investment channels (higher risk index) for all three sums of money, consistent with the results in Table 3. The level of risk aversion has a negative effect on the risk index of investment channels (50 k and 200 k amounts).

6. Conclusions

In this study, we examined whether there are differences in risk tolerance, time preference, and choice of investment channels between self-employed people and salaried employees. The research hypotheses were confirmed: self-employed people have lower risk aversion (higher risk tolerance); weaker present preference (stronger future preference), and select higher-risk investment channels than employees.

There are several ways to explain the last result. First, self-employed people may have less risk aversion, as the current findings suggest. Second, the risky investment channels such as foreign currency and stocks are more liquid than the other investment options given on the questionnaire. It is acknowledged that the work of self-employed people is characterized by a lack of routine, uncertainty and frequent changes in the business situation, which is affected by many factors. Therefore, they distributed their investment between more options, and choose those with higher liquidity despite the higher risk. The employees chose safer, low-yield investment channels, such as long-term savings plans and bonds, which are consistent with the idea that they are less risk tolerant. The safer channels they selected are also less liquid. However, the liquidity of their capital is less important to employees because their work situation is less uncertain, and their income is fixed. Therefore, we conclude that employees prefer to distribute their investment in safe plans with low liquidity.

Table 4. Regression analysis, the dependent variable is average risk index Investing 50 k, 200 k, 500 k ILS.

	Investing 50 K ILS	Investing 200 K ILS	Investing 500 K ILS
Constant	0.395*	0.363*	0.425**
	(0.208)	(0.178)	(0.190)
Risk aversion	−0.031***	−0.017*	−0.011
	(0.011)	(0.010)	(0.010)
Self employed	**0.167*** **	**0.210*** **	**0.229*** **
	(0.062)	**(0.053)**	**(0.057)**
Age	0.004	0.000	−0.003
	(0.003)	(0.003)	(0.003)
Female	−0.001	0.011	0.013
	(0.062)	(0.053)	(0.056)
Married	0.031	0.026	0.013
	(0.061)	(0.052)	(0.055)
Income	0.030	0.043*	0.038
	(0.026)	(0.022)	(0.023)
Economics Edu.	0.024	0.015	0.041
	(0.065)	(0.055)	(0.059)
Present preference	−0.008	0.002	0.005
	(0.013)	(0.011)	(0.012)
R^2	0.161	0.213	0.273
n	92	92	92

Note: *p < 0.10, **p < 0.05, ***p < 0.01. Standard deviations appear in the parentheses.

The findings also show a moderate decline in the riskiness of average investment distribution as the amount increases. In both groups, the larger amounts were invested more securely. Subjects with more disposable income for investment distributed their capital in a more balanced manner, and choose less risky investment channels. Moreover, previous studies have shown that individuals with higher income also have more obligations, increased responsibility, and more people who depend on them. Therefore, they are less tolerant of risk and choose safer channels.

The current results show that self-employed people have a weaker present preference than employees. Previous studies have shown that an individual's time preference is directly related to his or her risk tolerance. Hence, individuals with a higher risk tolerance require a lower premium for delayed payment. On the whole, self-employed people were found to be more risk tolerant than employees. In light of this, we conclude that self-employed people have a higher future preference than employees, and therefore sought a lower premium for delayed payment. As noted above, employees have less uncertainty, a relatively

steady income and a known employment horizon. Our findings are consistent with those of Stevenson [26] who argues that someone who has less risk tolerance is less likely to accept uncertainty concerning future income. This may lead to a higher SDR and requesting higher compensation compensation for delayed consumption or payment.

This study may aid investment portfolio managers in building portfolios for their clients. We believe that portfolio managers should focus on their clients' demographic characteristics, especially their occupations. This will enable them to build more suitable portfolios, based on clients' risk tolerance and time preference. This study might also be useful to self-employed people who are characterized by high risk tolerance, and ought to be aware of this tendency when choosing investment paths so they can moderate their choices, as necessary. Conversely, employees, who are characterized by economic stability, have varied investment options and can take more risks.

There are additional factors that are not considered in this study, including demographic traits such as: residential locale, number of children in the family, birth order, ethnicity, and parental occupation, etc., and personality factors such as: creativity, dedication, and criticalness, etc. All of these factors might affect people's employment situation, risk tolerance and time preference. We suggest that further research be conducted to expand into these additional personality and demographic factors that may influence an individual's decision to be a self-employed person.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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