Frontiers in Business, Economics and Management
ISSN: 2766-824X | Vol. 14, No. 1, 2024

Analysis of Undergraduate Decision-making for Further Education Based on Behavioral Economics Theory

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Abstract: With the economic development and improvement of education in China, the scale of China's postgraduate education has become larger and larger. The choice of further education or direct employment is increasingly a major concern for most undergraduates. Therefore, this paper analyzes the different effects of irrational factors in the decision-making process of college students for further education at various stages under the framework of behavioral economics such as Prospect Theory, Psychological Account Theory, Procrastination Theory, and Herd Effect. Based on the analysis results, this paper puts forward corresponding suggestions from the school, society and the students themselves, all parties working together to guide college students to find their own career planning.

Keywords: Behavioral economics; decision-making for further education; prospect theory; psychological account; procrastination theory.

1. Introduction

With the rapid development of the economy and society, young people in China have been given more favorable opportunities for development and a wider and wider stage for achieving excellence in life in the new era, which is mainly reflected in more equal educational opportunities and more diversified career choices. (Information Office of the State Council of the People's Republic of China: White Paper on Chinese Youth in the New Era, April 2022 Edition) The undergraduate community is a thriving force for youth. According to the National Bureau of Statistics, the number of graduates in all colleges of our country reached 9.673 million in 2022. Standing at a new crossroads in life, how to reach future goals and choose academic and career paths are the questions worth exploring. With the development of behavioral economics and experimental economics, more and more scholars have begun to challenge the assumption of "rational man" in traditional economics. Professor Simon, the winner of the Nobel Prize in Economics, once proposed that: the ability of human thinking is not infinite. It is limited rationality that human beings possess, precisely because of it, people do not always pursue the maximization of utility in their behavior. (Herbert A. Simon, “Bounded Rationality,” Utility and Probability 1 (1990): 15-18) The same is true for undergraduates. Combining the background of the times with the actual characteristics of the current youth, this paper introduces and explores the factors that affect the decision-making of the undergraduates to pursue further education from the perspective of behavioral economics.

2. Literature Review

Subjective factors are a non-negligible part among the reasons influencing the choice of further education. In terms of the current undergraduates’ choice of whether to pursue further education, Huang Yushi (2021) finds, according to the results of a survey and research, that the reasons why college students choose to taking postgraduate examination for further education rather than being employed are related to the realization of self-worth, blind following the trend, economic environment, employment opportunities, discrimination in academic qualifications, and policy benefits, etc. And in the findings of Zhu Dongyuan et al. (2021), it is revealed that blindly following the trend is also one of the reasons why undergraduates choose to pursue postgraduate studies. In a quantitative study by Zhong Yuwen (2021), it is shown that behavioral attitudes, subjective norms, and perceived behavioral control have a significant positive effect on selection behavior of the postgraduate entrance examination, in which behavioral attitudes have the greatest influence with the perceived utility as the greatest driving force.

Gradually, scholars have noticed the strong connectivity that exists between the choice of further education and behavioral economics. Based on behavioral economics, Zhang Baoying (2010) analyzes the behavior of taking postgraduate entrance examination from the college graduates, and concludes that limited rationality is an important constraint for the choices to take postgraduate entrance examination, while irrational psychological factors are the key shackles of examination decisions. In a comparative analysis of time preference and procrastination between the postgraduates and undergraduates, Yang Yi (2016) finds that undergraduates are more short-sighted and procrastinated than postgraduate students, but tend to be more idealistic. Li Jialin (2019) proposes that fresh undergraduates and previous graduates mentally divide their salaries into different psychological accounts.

3. Theoretical Framework

Under the premise of uncertainty and limited rationality, this study takes prospect theory as the core theory, takes procrastination theory, psychological account theory and herd effect as secondary theories, and uses the value function as the main analysis tool to specifically analyze the behavior of undergraduates of the decision-making on further education. Prospect theory holds that in the process of making decisions, individuals go through an Editing Phase and an Evaluation Phase. At the editing phase, people mainly focus on gains and losses, and the core of judging benefits and losses is the determination of reference points. And psychological

accounts and herd effects will influence choice of reference points at this stage for the decision makers. In the valuation phase, prospect theory adopts the concept of "total value" to measure the decision-making behavior of individuals. The procrastination effect, on the other hand, manifests inconsistency in time preferences at this stage, thus affecting decision making. The following is the theoretical framework of this study.

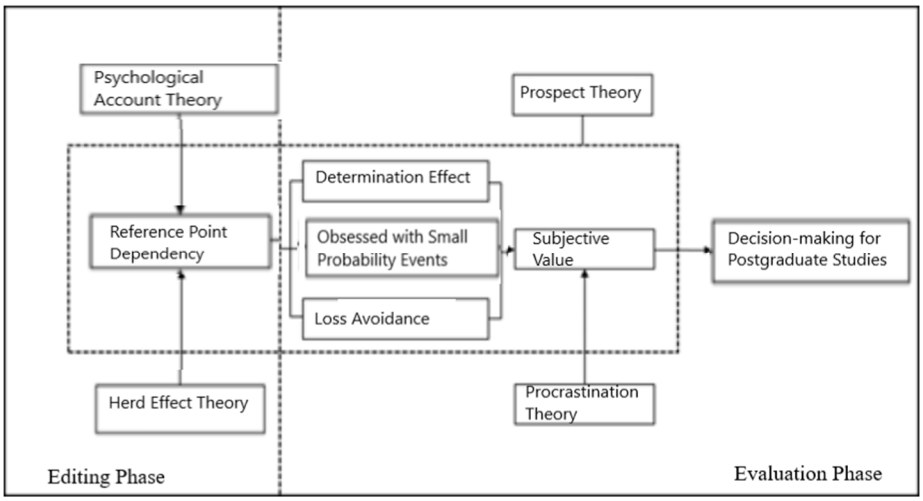

Figure 1. Theoretical Framework

4. Analysis of Behavioral Economics on Decision-making for Further Education

4.1. The Impact of Prospect Theory on Decision-Making Behavior for Further Education

4.1.1. Overview and Application of Prospect Theory

Prospect theory combines the value function and the decision weight function as a new utility function, to describe people's decision-making mechanisms under uncertain conditions. The value function v(x), an estimate of the deviation from the reference point, reflects the subjective value of the expected outcome. According to the value function in Figure 2 below, the value function is concave for gains and convex for losses, and the value function is steeper when expressing losses. In reality, decision makers use weight functions instead of probabilities, as demonstrated by assigning relatively more weight to small probabilities and relatively less weight to large probabilities. The properties of the value function and the weight function also reflects the existence of four distinctive features of decision-making under prospect theory, namely, reference point dependence, determination effect, obsession with small probability events, and loss avoidance, and college students' decision-making for further education is also affected by the four effects above.

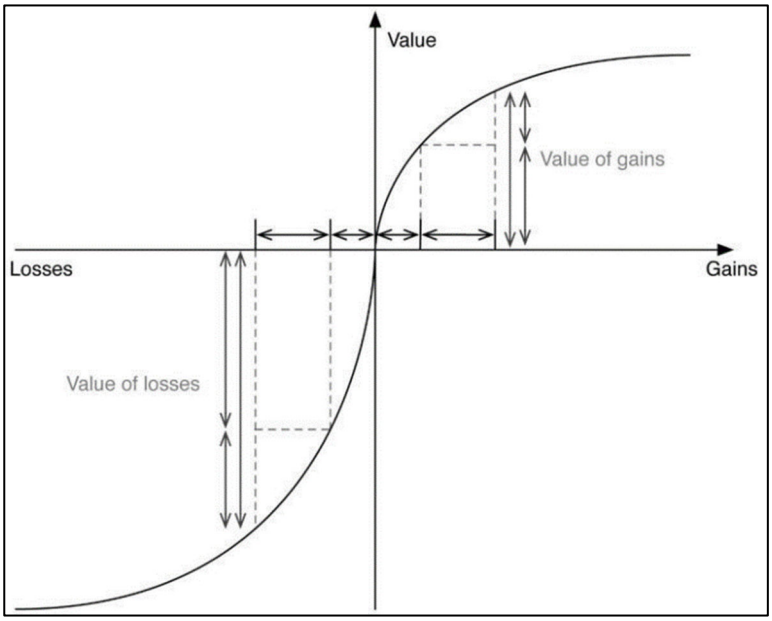

Figure 2. Value Function

(In Figure 2, the coordinate origin represents the reference point of decision makers, the positive and negative in horizontal axis represent the gain or loss of final outcome of the decision makers relative to the reference point, and the vertical axis represents the outlook of the individual decision maker.)

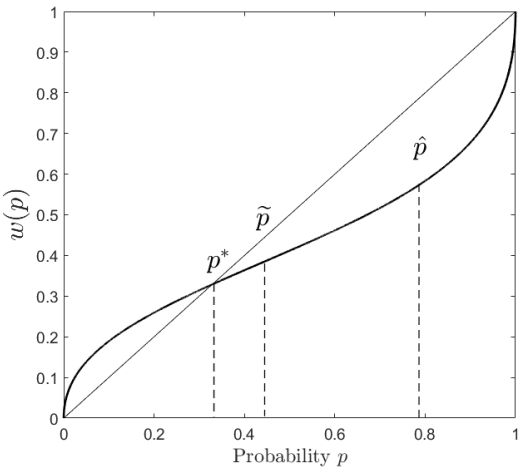

Figure 3. Weighting Function

4.1.2. The Effect of Reference Point Dependence on Decision Making Behavior for Further Education

The decision maker's evaluation of gains and losses depends on the choice of reference point, i.e., the decision maker cares more about relative utility than absolute utility. The gains and losses brought by postgraduate entrance examination to college students are judged on the basis of reference points. When the reference points are different or change, the losses and gains resulting from their assessment of the value of exams also change accordingly. Different college students with different personal backgrounds choose different reference points. Whether or not to take the postgraduate entrance examination is affected by factors such as the level of the college, academic performance, and family income. And it may be that it is not the absolute value of the utility that comes from taking postgraduate education that influences college students' choices, but rather the difference value brought by the absolute utility from attending postgraduate entrance examination compared with a reference point selected according to one's background.

4.1.3. The Determining Effect on the Behaviors of Decision-making for Further Education

The value function of prospect theory reflects the fact that people are more inclined to take risks when faced with equivalent losses, and more inclined to accept certainty of profit when faced with equivalent prospects of gains. Against the background of the popularization of higher education and the increasing saturation of the domestic job market, most college students have gradually become dissatisfied with their bachelor's degree and hope to gain higher competitiveness in the labor market by pursuing further education. Thus, for students who intend to take postgraduate entrance examination, the certainty of gains of obtaining a master's degree in the labor market is more attractive than the uncertainty of gains from a bachelor's degree plus work experience.

4.1.4. The Effect of Obsession with Small Probability Events on Decision-making Behavior for Further Education

Since the weight function depends on the subjective psychology of the decision maker, in reality, the likelihood of the individual's estimate of each state is not the true probability, but rather the decision weighting that is integrated into the individual's subjective feelings, and there is an "overestimation of the phenomenon" of small probabilities. That is, in the process of making decisions based on limited information, there will be the cognitive bias of believing in the law of small numbers, resulting in the "survivor's bias", which leads to an increase in the prediction of success in the examination, and thus an increase in preference for the examination.

4.1.5. The Effect of Loss Avoidance on Decision-Making Behavior in Further Education

For the decision makers, the decrease in utility from a loss is greater than the increase in utility from a gain when the absolute amounts are the same. As a result, when faced with the same risk, a portion of those who intend to take the exam will psychologically amplify the reduction of the effect produced by the failure of the exam, thus affecting their decision. However, with the growing employment pressure of undergraduates, more and more undergraduates choose to take the postgraduate entrance examination. And the risky behavior of taking the examination, has turned out to be safer for most candidates instead. It can be seen that many students who intend to take exams will believe that if they don't take the exam, they may miss an opportunity to fight to change their destiny, and choose to take the exam out of disgust for loss.

4.2. The Effect of Psychological Account Theory on Decision-making Behavior for Further Education

The psychological account proposed by Richard Seiler is a virtual existence of value account formed by people according to their different conditions. Decision makers will make many irrational consumption behaviors under the influence of the psychological accounts. In the decision-making of taking exam, psychological accounts also play an important role in shaping graduates' behaviors, focusing on the following two psychological effects: people put funds into different psychological accounts according to different sources and expenditures, which are not replaceable for each other, i.e., the non-substitution effect; people measure the consequences of their consumption decisions by adding past investments and current payments together as the total cost of the decision, i.e., the misconception of sunken cost.

4.2.1. The Influence of Non-substitutability Effects on Decision-making Behavior for Further Education

In traditional economics, it is assumed that income from different sources has exactly the same utility for people. While in behavioral economics, people have different psychological accounts, with money varying from account to account. Suppose college students facing graduation have two types of decisions. The first decision is being employed, in which they can get a job with a starting salary of 10,000yuan, but the work is relatively hard, and requires frequent overtime work without official staffing. The second decision is to continue with further education. Upon successful completion of their studies, they will be able to obtain a job with a starting salary of 8,000yuan, but the job does not require overtime work and is officially staffed. When faced with the above two decisions, although the monthly salary in decision 1 is greater in amount than in decision 2, the monthly salary in decision 1 requires more effort to obtain. Most students will put the money from decision 2 into an "easier-earned" psychological account, and put the money from decision 1 into a psychological account that "takes a lot of time and effort to obtain". At this point, there is no longer a substitutability for the same amount of funding for both decisions. An easier

income is more attractive than hard-won money. As a result, college students are more likely to choose to continue their studies in the hope of obtaining an "easier" salary in the future, which shows that money is irreplaceable under different psychological accounts and that the estimation of the value of money is assessed on based on a case-to-case basis. In addition, the improvement of social status after upgrading academic qualifications is also one of the implicit elements to form psychological accounts for most decision makers of further education. It is easier to get a decent job with more room for development if they choose further study.

4.2.2. The Influence of Sunken Cost Misconceptions on Decision-Making Behavior of Further Education

In the scenario assumed by traditional economics, the time spent and the money invested by college students during the postgraduate exam constitute their sunken costs. In reality, however, college students are often disturbed by sunken costs and incorporate them into their consideration of future costs and gains, especially when faced with the decision to take the second exam after failure in first time. On the one hand, they think that if they give up postgraduate entrance examination now, the time and money spent before will be useless and they are not reluctant about it. On the other hand, they believe that the time and money spent in the past has been internalized to a certain extent as their learning outcomes, and believe that a failure is only occasional, thus making irrational decisions—to take the next exam blindly. After excluding sunken costs, if the opportunity cost of second exam is greater than the opportunity cost of direct employment, then choosing direct employment is obviously the more rational decision.

4.3. The Influence of the Herd Effect on Decision-making Behavior for Further Education

When graduates make decisions on further education, they are like a sheep in a flock; Many of their views or behaviors are spontaneous, apparently, but in fact are the consequence of being "assimilated" by the group consensus. The reasons include the following aspects of the herd effect in decision-making of further education:

Firstly, there is information asymmetry in the market for further education. The herd effect is inseparable from information asymmetry. It is the information asymmetry prevalent in the further-education market that forces college students and their families to defer to those who have an absolute information advantage, and it is very difficult to identify competitors who have an information advantage. Thus, yielding to the first competitor to take action can effectively reduce the risk of participating in the market.

Secondly, many students will be affected by the information that surrounds them when making decisions. For example, some students may think, "Some seniors have succeeded in applying for the top 50 universities in QS, so should I also give it a try? Although sometimes the group psychology may lead to positive results. For example, a student with absolute strength is hesitating whether to take postgraduate exam. If he is surrounded by many students who share the same ideas at that time, it will strengthen his decision. However, if he chooses to follow the crowd blindly and deviate from his actual needs, he is very likely to make irrational decisions.

Thirdly, the desire of comparison will affect students' decision-making. Different decision-makers from different families, with different learning abilities, are faced with very different opportunities. This means that their decisions may not be comparable, but due to vanity. Decision makers will inevitably hold a psychology of comparison which will lead to imitation and comparison with each other.

In the decision-making process of the further education of college students, the group who choose to take further education can be regarded as a whole and divided into the confused group and the determined group. These two groups together constitute the micro-subjects of the system of further education, and there is a dynamic process of change within this micro-subject. The determined group will take the lead in making the decision on further education and behave to implement this decision. The confused group, on the other hand, examines its previous decision-making behavior according to the judgment of the determined group: if they have the same decision-making direction as the determined group, it strengthens their resolve to act; if they find themselves in a situation where their decision-making is at odds, the confused group will begin to doubt their original judgment and eventually choose to follow the crowd blindly. Generally speaking, in the further education group, the confused group infects each other in the process of imitation and following the group, thus generating the typical herd effect. Therefore, under the influence of the herd effect, the greater the number of people taking exam around an individual, the greater the probability that they will choose to take further education.

4.4. The Effects of Choice and Procrastination Theory on Decision-making Behavior for Further Education

4.4.1. Overview and Application of Choice and Procrastination Theory

More and more economic literature argues that people have the problem of self-controls, i.e., they are time-inconsistent in terms of preferences, which is often discussed as the implication of procrastination. Ted O,Donoghue and Matthew Rabin proposed the behavioral economics theory of choice and procrastination (CHOICE AND PROCRASTINATION) in 2000. It notes two aspects. On the one hand, if action brings immediate gains, then time-inconsistent preferences make people act in advance. If action results in immediate losses, then this preference causes people to delay action. On the other hand, in general, mature people will act earlier than naive ones.

The time preferences of undergraduate groups are inconsistent. Through a survey and research of the data, it is concluded that undergraduate college students prefer timely feedback and enjoying the present (Yang Yi 2019). This preference can lead to procrastination when faced with tasks that cause immediate losses. But procrastination will cause greater losses, especially in learning tasks, where procrastination can severely affect learning outcomes. The more severe the procrastination is, the less useful the learning is. The procrastination makes some undergraduates prefer direct employment, because decisions-making like postgraduate entrance examination requires long-term accumulated study and preparation, and the feedback is not timely enough compared to interviewing for a job.

4.4.2. The Important Goal Effect on Decision-Making Behavior for Further Education

The importance of goals intensifies delays. Rabin developed a model of procrastination based on self-control problems, where people choose from a selection menu and are partially aware of the self-control problem. Rabin found that providing additional options for a person can cause him to procrastinate. People procrastinate more when pursuing important goals than unimportant ones, or incremental importance will aggravate procrastination. The more important the goals are and the more effort he plans to put into them, the more likely he is to procrastinate the implementation of them. For the undergraduates, the goal of taking postgraduate entrance examination for further education determines the next step, which is extremely important, and with plans to work hard for it, so delays are highly likely to occur.

4.4.3. The Impact of Naive Decision Maker Theory on Decision-making Behavior of Higher Education

Rabin also concludes that naive and childish people are more likely to procrastinate than mature and sophisticated people. The undergraduates are naive behavioral decision-makers due to their inexperience in decision-making with more idealistic nature of cognition. In Choice and Procrastination Theory, naive and childish people are more likely to procrastinate than mature and sophisticated people. The undergraduates, new to society and inexperienced in rational decision-making, prefer to make decisions with timely feedback. However, there is less preference for tasks that require long-term preparation, such as postgraduate entrance examination for further education.

4.4.4. The Effect of Incentive Mechanism on Decision-Making Behavior for Further Education

Traditional economic modeling insists that only total profits are the most important. While Rabin argues that the specific structure of incentive mechanism is also crucial for people with preferences for immediate happiness. Compared to high school students and employed staff, the undergraduates lack the mechanism with a well-developed and effective self-motivation. People with preferences for immediate happiness may not behave correctly in the process of maximizing their long-term utility. The lack of immediate happiness feedback for most undergraduate students in preparation for postgraduate entrance examination, makes it easy for them to abandon the decision to pursue further education and prefer employment.

5. Conclusions and Recommendations

5.1. Conclusion of the Research

Many undergraduates take the future employment prospects as their main reference point when faced with the decision to pursue further education, so as to make the decision about whether to pursue further education by weighing the expected gains and losses from their future employment prospects. Secondly, graduates psychologically divide the salaries generated by different job nature and social status into different mental accounts. In addition, the herd effect is very likely to cause the blindness of college students' decision-making in further education. And when they fail the exam, some college students become very vulnerable to the sunken costs and blindly choose to fight for the second time. At the same time, the undergraduates have inconsistent time preferences, which may lead to procrastination. As naive and childlike decision-makers, it's rather possible for them to make irrational decisions. Meanwhile, they may be affected by the importance of the decision-making, the insufficient incentives, etc., possibly cause their procrastination behavior and thus interfere their decision on further education. These factors are intertwined and work together in decision-making of college students, which makes the process more complex and diversified.

5.2. Recommendations for Countermeasures

As for the individual, it is important for students to rationally assess their own conditions, and they should reasonably judge their risk tolerance based on their family situation and their abilities, and avoid survivor bias due to information asymmetry. Besides, it is necessary to strengthen their ability to sort through information and exclude the influence of other interference factor while receiving key messages. It is essential to gain experience in decision-making, to make rational decisions, and to try to avoid the disadvantages of naive decision makers and the impact of sunken costs. Meanwhile, the decisions for further education can affect their future path, so it is not advisable to imitate the decisions of others for the sake of comparison.

As for the school, the first step is to improve and refine incentive mechanism. The specific structure of incentive is crucial for those with a preference for immediate satisfaction. Schools should be more caring about students' intentions and choices to help the undergraduates better integrate their graduation with further education and employment. Provide care and set up incentive feedback for students preparing for postgraduate education at home and abroad. Secondly, it is important to provide channels for students who choose to pursue employment to pass on their experience. Broaden information channels to reduce the costs of information and asymmetries for undergraduates who are about to make decisions for further education.

As for the society, first of all, young people should be given more opportunities for trial and error and room for growth. In the real world, there is no completely rational decision-making. Society should provide more opportunities and encouragement to young people, recognizing the shortcomings of the undergraduates and giving them the space to gain experience. In many cases, the herd effect in the decision-making process is caused by the lack of open information in the market, so all sectors of society should work together to create an open and transparent market in order to effectively reduce the phenomenon of blind follow-up. In addition, the job market should avoid the "diploma-only theory" and try to develop a more comprehensive and perfect recruitment mechanism and performance appraisal mechanism to promote the effective allocation of human resources, and in this way to enforce the effective allocation of educational resources.

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