

Costs and Benefits: Economic Perspective of High Quality Youth *

Xi WAN

College of Business Administration, Chongqing University of Science & Technology, China;
Email: x.wan@qub.ac.uk; pulice@126.com

Abstract

Based on the literature review, the cost and benefit analysis had been conducted on the high quality youth from an economic perspective. Opportunity costs include the monetary benefits, non-monetary benefits (the psychological benefits) and the loss-of-time value. Army service benefits include immediate service benefits and the expected return. Immediate monetary benefits include salaries, benefits, family preference, retirement benefits and so on. For non-monetary benefits, the military service not only obtains material benefits, but also receives psychological and spiritual benefits, which constitutes an individual's utility function together. Theoretically this research could provide useful insights into the military recruit system from a new perspective. Firstly, this study can potentially open up a new field from the economic point of view for China economics study. Secondly, the framework of this analysis could provide an useful research paradigm to similar problems. On the other hand, this research could bring about practical contributions by providing references for the policy makers to use any military recruit system and other military manpower policy levers to attract, recruit, train, retain, maintain and enhance the military human performance. Finally, the limitations of this empirical research are discussed and future research are also suggested in different kinds of context.

Key Words: Military recruit system, All Volunteer Force (AVF), Conscription, High quality youth, Costs and benefits

* This paper is supported by National Social Science Foundation of China (09CZZ027) to Xi Wan, visiting scholar at Queen's University from Sept.2011-Sept.2012

1. INTRODUCTION

As attributed to ‘Homer’s Iliad’, Men grow tired of sleep, love, singing, and dancing sooner than war. Since the humans entered the era of civilization, war has become a way of violence interaction style of humankind, and it is the product of a certain stage of the human society. As war continuously happened almost around the world, military service system came into being and different recruiting systems formed. Recruiting systems refer to institutional arrangements which are used to absorb certain quantity, quality and structure of the military manpower to meet the needs of the nation’s defense. Basically there are two models: compulsory military service (conscription) and all volunteer force (or mercenary). Some countries have combined these two models which was known as ‘hybrid military service system’. The human resources management is a dynamic process, which includes recruitment, training, detainment, use, promotion and development, dismissal and retirement stages. As an organization, army’s human resources management process includes recruitment, training, detainment, use, promotion, development and retirement stages too. More specifically, military recruit systems refer to the systems and methods which absorb the military manpower in the recruitment stage. Is there a best model among different recruit models? The short answer might be ‘no’, since the best recruit model should be the most suitable one. Some other researchers have argued that the models which are able to successfully attract high-quality youth are the good ones. The decision makers need to choose the most appropriate model based on the results of benefits and costs analysis.

2. LITERATURE REVIEW

The research on military recruit system has been carried out from many perspectives, such as historical perspective, philosophical perspective, political perspective and military human resource management view. Historical research relates to the origin and evolution historical facts of military recruitment system, therefore people could learn from the success and failure in military recruitment system history; philosophical research mainly relates to the military recruitment system’s reasonableness or/and unreasonableness from the relationships between national and individual rights perspective; political research mainly relates to the constitutionality of the military recruitment system from the constitution; from the military human resource management’s view, research mainly relates to the process of recruit, military training, rotation the salary structure of the military, military manpower development programs and labor relations between the military and soldier.

The research on military recruitment system from an economic perspective was originated by Adam Smith. He described the origin and evolution historical facts of military recruitment system from the cost-benefit analysis perspective, and he also found that the mode of production and technological progress had changed people’s cost-benefit structure, thereby affecting the choices and evolution of military recruit system.

Since the late 20th century, most western countries have abandoned the conscription and started to use the AVF(all volunteer force) in the implementation process of army professionalization, along with the world's military service system reform and development,. The change in the way of military manpower mobilization helps promote the contemporary western economists' attention. Their research were more broadly conducted and deeply digged; they studied different kinds of issues in military recruit process. The United States 'research on this particular area is a good example. It is just like what Walter Y. Oi said:"John Warner, James Miller, and Beth Asch advance the proposition that economics and the economic way of thinking played an important role in the decision to end conscription. They are major contributors for the growing field of defense economics".

2.1 Military manpower demand and supply

Economists have been using standard career choices theory to study the decisions of individuals who want to join the army. Research shows that the decision-making model for enlisting is affected by some factors, such as military salary levels, salary levels in the civil sector, the unemployment rate, variety of welfare programs provided by the military, personal preferences for military life, the threat of war, military advertising, recruitment agency's efforts and other factors; therefore the military manpower supply is a function for those variables. To estimate the function, different economists use different definitions, models, data and methods, so that the conclusions are various.

Overall, the military manpower supply flexibility is in much higher degree for the salary rate of military and civilian sector. The variety of the welfare programs provided by the military, military advertising, recruitment agency's efforts, and reaction of the unemployment rate is not the same(Charles Brown,1985;Colin Ash, Bernard Udis and Robert F. McNown, 1983;Charles Dale and Curtis Gilrag, 1985;Larry Deboer and B. Wade Brorsen,2001). The empirical research on military manpower supply can help the military design the reasonable salary, determine the reasonable advertising investment, the forecasting of military manpower supply, and other activities. Generally it is believed that the demand for military manpower depends on a country's external security environment and national defense strategy;it is often seen as an exogenous variable. However, as the military can make choice between differentmilitary weapons equipment and manpower; therefore when the price of military manpower rises, military would use the capital to replace labor, resulting in reducing the demand for military manpower. Cdr. Rolf Clark (1976)and Michael Ridgef (1991) conducted empirical studies in the United States and UK respectively, they found that the military made choice between military weapons equipment and manpower, but this alternative was found less flexible. This also illustrates that the impact of military salary level is a factor that should be taken into consideration for military manpower.

2.2 The cost-effective of military recruit system

Walter Y. Oi was one of the early economists who applied economic methods for estimating the cost of conscription. Based on Walter Y. Oi's research, Anthony C. Fisher (1969) used probability and statistics to deduce and estimate the U.S. military manpower supply function in the presence of conscription. On this basis, he estimated that the spending of military personnel would increase in the presence of conscription abolition. During this period, other scholars such as Benjamin P. Klutz also used the method to estimate the financial cost of the implementation of all voluntary force; his research was further amended for Anthony C. Fisher. In addition to the research of military recruit system direct costs, economists also has paid more attention on the service impact on the human capital accumulation, and the impact of military skills transferability in the civil department on veterans' income. This can also be seen as an important part of cost-benefit analysis on military recruit system. Most studies in this area have shown that there is no income gap for those who can transfer military skills (such as electronic, electrical and mechanical equipment maintenance) to the civilian sector compared to others who did not serve. However, those special military skills (such as fighting skills) had a negative impact on the veterans' income, so these positions should be given higher compensations.

During the 1960s, after the U.S. was bogged down in the Vietnam War, the anti-war sentiment has become much higher, so that people began to criticize directly at the U.S. conscription. Many well-known economists were involved in the discussion of the cost of conscription. Including Milton Friedman ,Allen W. Wallis, William Mecliling Water Y. Oi and Robert Barro, many economists used economic theory and method to analyse deeply on different aspects of military recruit system. With their efforts, the United States decided to implement all voluntary force in 1973 when are the golden days of the research of military recruit system from the economic perspective.

American scholar Lee and McKenzie in 1992 proposed a theoretical framework, which was based on the opportunity cost of personal service. On a basis of different military recruit systems, they found that the all voluntary force was superior to draft force not only for cost, but also for military manpower quality. Jian guo Gao and Rong Yao(2008)compared to the composition of military recruit cost between the all voluntary force and raft force, and they found that all voluntary force would be the best way to attract military manpower.

In 1988, the U.S. General Accounting Office, estimated the military budget cost of the impact of all voluntary force transfer based on their own assumptions. They concluded that: from conscription to all voluntary force, the military budget cost which might be saved was 7.8 billion dollars (1988 price).

2.3 Conscription taxes

The draft places a conscription tax on those who are forced to serve, the difference between the rate of military pay and the opportunity cost of foregone civilian wages. The U.S. defense economist Walter Y. Oi thought that conscription was equivalent to putting conscription taxes on military manpower, which might lead to the loss of social welfare. For recruit costs, there

were budget cost, individual opportunity costs, and salary costs, which were used to overcome their aversion to the military occupation. Conscription was equivalent to putting conscription taxes on military manpower. The nature, scale, efficiency and fairness of conscription taxes became a major concern for economists. W. Lee Hansen and Burton A. Weisbrod have analyzed the details of the distribution of conscription taxes effects and configuration efficiency in their coauthored “conscription Economics”, and Ryan C. Amacher et al (1982) coauthored “conscription Economics”. The United States suffered a tremendous cost in the Iraq war, but the government did not set up a special war tax to help solve this problem. The tax measures were mainly focused on expanding the scope of social security taxes, improving the fuel, cigarettes, alcohol, transportation and other items or services tax, and the removing some preferential policies.

2.4 Service decision-making behavior

In 1982, American scholar James R. Hosek and Christine E. Peterson finished a study on service decision-making behavior of U.S. junior high school students and high school graduates. Based on its research framework, people must make their own choices on continuing to go to school, work or enlistment, through a large number of social surveys, extensive empirical research were carried on ,the goal of research was to find the different factors affecting the decision-making behavior of two different groups.

Decision-making of graduates were based on his tradeoff on costs and benefits, as a rational economic man, his pursuit of the given cost of benefits or utility maximization, if the benefits of joining the army more than cost, then he may choose to join the army. American scholar Nelson. G (1986) provided standard theory of career choice to describe the decision-making behavior. He thought the situation when the salary difference between military and civilian sector ($W^M - W^C$) over the net non-monetary income of civilian sector ($\tau^C - \tau^M$), people will be recruited. In 1999, Kilburn and Klerman used the data on post-Cold War to extend the decision-making model. They found that some variable factors which could effect return rate of education such as AFQT test scores, high school graduation age and mother's education level, reduced the ratio of these two categories of young people into the army, as a result of that the possibility of college was increased. Their research showed that there was a highly alternative between the university and military service, for other young people, work and military service also has a high alternative.

3. THEORETICAL BACKGROUND

3.1 The relation of total costs and high-quality military personnel

In the mercenary system, the recruitment of high-quality is very useful to improve the combat effectiveness of troops, on the surface, recruit high quality youth in accordance with the market price law seems to pay the high cost, but it is not always the case. Although the benefits of compulsory military are that it can save manpower costs, it is easy to stimulate the military to

use manpower wasteful and lower cost. The military is more popular to use low quality youth. Thus, the labor price advantage may be offset by the number. According to the economics point, the military is a special labor and its production is public goods, namely, defense security products. The output level of the national security is established by the investment of a certain amount of military manpower and weaponry. We assume that output level of the national security is established by the investment of a certain amount of military manpower and weaponry. The total cost of the army investment is C, and inputs can be divided into three parts: the number of weapons and equipment is W, low-quality youth H_L , and high-quality youth H_H , the average unit cost price of the three were C_W , C_L , C_H , then:

$$C = C_W W + \sum_{i=L,H}^2 C_i H_i = C_W W + (C_L H_L + C_H H_H) \tag{1}$$

From the equation, the total cost of military spending is determined by the level of weapons and equipment, different types of quality military personnel and their respective proportion of the labor price levels. This equation shows that both labor costs of high-quality military personnel and relative size of different quality staff can exert effect on the cost of military manpower.

Assuming that there is a very small proportion of high-quality military manpower in the initial structure of the military manpower, as small as zero, the cost of military manpower mainly depends on the labor costs and size of low-quality military personnel. Then, the question is that if the army should be reformed to improve the quality of soldiers, use a higher cost to recruit high quality soldiers in service, then will it be bound to cause the huge growth of military cost?

The dynamics time of military high-quality troops recruitment is defined as T_1 and T_2 , then the changes of total costs caused by a higher proportion of high-quality military personnel can be expressed as:

$$\Delta C = C_{T_2} - C_{T_1} = \Delta(C_W W) + \sum_{i=L,H}^2 \Delta(C_i H_i) = \Delta(C_1 W) + \Delta(C_L H_L) + \Delta(C_H H_H) \tag{2}$$

If

$$\begin{aligned} \Delta(C_H H_H) &= C_H^{T_2} H_H^{T_2} - C_H^{T_1} H_H^{T_1} = -\Delta(C_1 W) - \Delta(C_L H_L) \\ &= -(C_W^{T_2} W^{T_2} - C_W^{T_1} W^{T_1}) - (C_L^{T_2} H_L^{T_2} - C_L^{T_1} H_L^{T_1}) \\ &= (C_W^{T_1} W^{T_1} + C_L^{T_1} H_L^{T_1}) - (C_W^{T_2} W^{T_2} + C_L^{T_2} H_L^{T_2}) \end{aligned} \tag{3}$$

Then

$$\Delta C = \Delta(C_1 W) + \Delta(C_L H_L) + \Delta(C_H H_H) = 0 \tag{4}$$

Formula (3) is dependent on the substitution effect of the quality of high-quality military personnel and weaponry, the higher the elasticity of substitution, the higher proportion of high-quality military personnel will lead to reduce the proportion of low quality military

personnel, and the cost of weapons and equipment will be reduced too. Thus, the higher proportion of high-quality military personnel may not bring the tremendous growth in military labor costs. The military will plan carefully the use of human, weapons and the costs of equipment research and development, use and maintenance are also reduced effectively by high-quality military personnel. In some special nodes, the results will be formula (4), namely the total cost of the military changes is zero. Although this point in practice more difficult to achieve, but at least the total costs is not the same proportion of the use of high-quality military personnel. For example, a study of the U.S. defense economist Daula.T and D. Smith, showed that the use of high-quality military personnel would make the equipment cost reductions.

3.2 Human capital theory

As defense work does not generate economic benefits directly, its products are national security. Therefore, the value is difficult to quantify but is embodied in national defense and military benefits. People are regarded as a production means from the modern human capital theory perspective, mainly focus on the role of people's quality in the modern economic growth. Many scholars thus conclude that human capital is unrelated to defense and military fields, which are rarely involved in research.

In recent years, research on human capital of military has become hot point, In China, Zhang Ping, Hu Xiaohua (2002) "Military human capital and the quality construction of armed forces in the new century", Fu Huimin (2002), "research on human capital of national defense science and technology", Hu Liang (2008) "research on military human capital investment", other related papers will be more. But there are just a small number of papers in human military capital. A large number of empirical studies on the relationship of human capital and economic growth have been carried on, but the problem is how to apply the theory to estimate the investment benefits of military human capital? There is no doubt that military's fighting capacity depend on military human capital level, but it is quite difficult to assess accurately the relationship between the two, since the military field has a completely different indicators from economic. Therefore, the ration of military's fighting capacity may be the only standard to measure military human capital. However, the military's fighting capacity is affected by many factors, it is a complex process, some indicators are not clear and accurate like economic. Especially in the peace times, he military's fighting capacity is different in different industries and military departments. Taking the military industry as example, the performance of military capacity in the field of military research and the performance of military research capacity in the field of armed forces , the level of training and operational levels. Therefore, the research on military human capital must combine the general human capital theory and the reality of armed forces to analyze in detail.

Social benefits of investment in human capital refers to the investment in education, in addition to the benefit of individuals or families, which includes the benefits of other society members which the individuals can not fully occupied. For example, a number of significant inventions for education improved, the proceeds will go far beyond the scope of the inventor himself.

Engels pointed out: “The educated community members bring more benefits to society than ignorant uneducated people. ... On the other hand, only educated workers have the kind of calm and careful which need by the peaceful society transformation”

At present, the Measure of social return rate on human capital includes the incremental contribution method of Schultz, the contribution rate of Denison and simplified coefficients method. Schultz calculated that the return rate of primary education is 35%, secondary education is 10%, higher education is 11%, the average return rate is 17.3%. In order to improve the quality of education, the United States has invested \$ 291.2 billion from 1929 to 1957, so the gains were: $2912 \times 17.3\% = 504$ million. American economist Denison, published book in 1962 “American Economic Growth and the choice we face”, to use their own methods, according to U.S. data above, average annual growth rate during this period is 2.93%,

Marx has an excellent argumentation to it in “Das Kapital”, It has offered valuable material and method for the fact that we ponder over this question. When the financial crisis took off last autumn, Karl Marx's “Das Kapital”, originally published in 1867, whooshed up bestseller lists, He said: “a small amount of ordinary complex labor equal to the large amounts of simple labor”. Complex labor needs higher education; it can create higher value at the same time. Based on this principle, the main method is to use simplified labor coefficient to simplify the complex labor, on this basis, we can calculate the military human capital.

Obviously, the first step of this approach is to determine the simplified labor coefficient, which is the key to the method and it is very difficult. Here, the length of education determines the ratio between the complex labor and simple labor. As generally believed, under normal circumstances, the length of education years is positive correlation to complexity of the work. In theory, the military with longer education years has the ability to master complex military technology, the combat effectiveness is higher, on the contrary, the military with shorter education years, the combat effectiveness is relatively low. Zhang Ping, Hu Xiaohua (2002) estimated the contribution rate for combat effectiveness is 19.71%.

4. COST AND BENEFIT ANALYSIS

4.1 The cost of individual

The socio-economic system consists of two departments, namely, the military and local civilian sector. Individuals standing in front of the two demand side: one side is the military, the other is the local civil sector, where to go, they will make a choice between the two (third option, that is not working, but this choice does not constitutes the opportunity cost of military career, it will not be considered). If the individual through the trade-offs and made the choice of army service, then they also give up work opportunity at the local civilian sector, the local civilian sector earnings constitute the opportunity cost of their military service. The so-called opportunity cost of army service, is the result of individual choice to work in the military and give up work in the local civilian sector, so, obviously, they last currency and non-monetary benefits in the local

civilian sector. As a rational economic man, the opportunity cost of his/her choice is important key parameters. If the opportunity cost of personal service over the proceeds of its service, they will choose work in the civilian sector. Opportunity cost includes the following aspects: the monetary benefits: the income in the local civilian sector, non-monetary benefits: the psychological benefits, the loss of time value.

4.1.1 The cost of monetary benefits

Assumption in T fiscal year, income level of high-quality individuals work at the local civilian sector is W^C , the recruitment opportunity cost of N high-quality individuals in is:

$$TOC = N \times \overline{W^C} \tag{5}$$

Where, TOC is N high quality individuals' total opportunity cost of income, $\overline{W^C}$ is N high quality individuals' average opportunity cost of income.

This formula is only theoretical so that reality is difficult to calculate. We can use the theory of human capital to estimate the level of income depends on the level of human capital stock, under normal circumstances, the more years of education, the higher the human capital ownership, the higher the income levels. Education and human capital investment rate of return is an effective way to measure individuals' income levels work at local civilian sector. We can use the Mencerian Rate of Return to conduct investigations. The expression of Mencerian Rate of Return is:

$$\ln W^C = a + b * S + c * (EX) + d * (EX)^2 + \varepsilon \tag{6}$$

Where, w^C is personal income of laborers, measured by annual personal income lever. s is education years of laborers, EX is service length of laborers, Squared service length reflect a nonlinear relationship between income and service length, because to a certain extent the impact of person's work experience on their income will tend to weaken, stagnation and even retrogression. ε is a random error term, represents the other factors in addition to education and work experience, coefficient b represents individual education rate of return, that is, the individual received income from school formal education.

Thus, if the data is sufficient, we can use egression analysis of measurement based on model (5), each estimated variable obtained from data fitting regression coefficient, so you can get personal education rate of return in a range, the coefficient b , Furthermore, get w^C from b .

If the individual after graduation at the university immediately to enter the military, his opportunity cost of the initial service can be expressed as:

$$W^C = \exp(\bar{a} + \bar{b} * S) \tag{7}$$

If the individual after N years to enter the military, his opportunity cost of the initial service can be expressed as:

$$W^C = \exp(\bar{a} + \bar{b} * S + \bar{c} * N + \bar{d} * N^2) \tag{8}$$

4.1.2 The cost of Non-monetary benefits

In the labor supply model, individuals' decision is between work and leisure. If he chooses to work, then leisure constitute the opportunity cost of their work, and leisure is more a psychological income or utility, not properties with direct price. Similarly, individuals who choose to join the army service, he is bound to give up work at the local civilian sector, then he will lose some benefits which can not measure directly with currency or price, that we call "psychological benefits". That constitutes the opportunity cost of personal join the army. If a person like safety, comfortable and easy when he work at the local civilian sector, now pay him a certain amount of money, so he would rather give up the work to join the army, the utility of money is equivalent to the psychological benefits. But maybe his real income is less than what he expected, the loss of psychological benefits will be occur, we can use behavioral economics theory to explain this phenomenon.

Daniel Kahneman and Amos Tversky(1979) published their famous paper "A Prospect Theory :An Analysis of Decision under Risk", which was one of the founding papers of behavioral economics. Prospect theory is a theory that describes decisions between alternatives that involve risk, where the probabilities of outcomes are known. The model is descriptive: it tries to model real-life choices, rather than optimal decisions. It describes how people choose between probabilistic alternatives and evaluate potential losses and gains. In the original formulation the term prospect referred to a lottery. The theory describes the decision processes in two stages, editing and evaluation. In the first, outcomes of the decision are ordered following some heuristic. In particular, people decide which outcomes they see as basically identical, set a reference point and then consider lesser outcomes as losses and greater ones as gains. In the following evaluation phase, people behave as if they would compute a value (utility), based on the potential outcomes and their respective probabilities, and then choose the alternative having a higher utility.

The theory describes the decision processes in two stages: editing and evaluation. In the first instance, outcomes of the decision are ordered following some heuristic. In particular, people decide which outcomes they see as basically identical, set a reference point and then consider lesser outcomes as losses and greater ones as gains. In the following evaluation phase, people behave as if they would compute a value (utility), based on the potential outcomes and their respective probabilities, and then choose the alternative having a higher utility.

The value function (sketched in the Figure 1) that passes through the reference point is s-shaped and asymmetrical. Losses hurt more than gains feel good (loss aversion). This differs greatly from expected utility theory, in which a rational agent is indifferent to the reference point. In expected utility theory, the individual only cares about absolute wealth, not relative wealth in any given situation. The function is a probability weighting function and expresses that people tend to overreact to small probability events, but under react to medium and large probabilities.

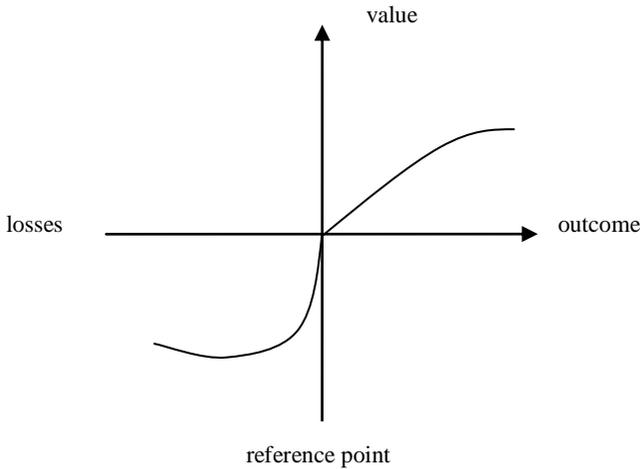


Fig.1 The value function

Source: Kahneman, Daniel, and Amos Tversky (1979) "Prospect Theory: An Analysis of Decision under Risk", *Econometrica*, XLVII (1979), 263-291.

If psychological factor is decision-making factors of high-quality recruits, then, different utility functions are:

Assumed prospect utility function of fully rationality is:

$$G(x) = (1 - p)V(x) + pV(x) \tag{9}$$

Then prospect utility function of bounded rationality is:

$$F(x) = \Pi(1 - p)V(x) + \Pi pV(x) \tag{10}$$

Function above, $V(x)$ is the value function of enlistment, p is the probability of successful employment after retirement based on fully rationality, Πp is the probability of successful employment after retirement based on bounded rationality, decision-weighting function Πp is monotone increasing function, discontinuous from 0 to 1.

$$C = F(x) - G(x) \tag{11}$$

Function above, C is difference of prospect utility between fully and bounded rationality, namely opportunity cost of psychological.

4.1.3 The loss of human capital incremental value

From the perspective of generation and use, military human capital can be divided into the cost of individual value C and the value added value B . These are the stock and incremental value of human capital, the cost of individual value C means the labor costs of pre-paying intellectual ability, the necessary means of subsistence reproduction value, it is full cost of military human

capital individual which in order to obtain their own knowledge and skills, including professional training fee and the opportunity costs, the necessary means of subsistence reproduction value costs. The incremental value of individual B means the value generated in the process of work experience. The basic model of military human capital individual value is:

$$V = C + B \tag{12}$$

As the stock value of military human capital is the same before they join the army or enter local civil sector, the opportunity cost are discussed, then there is some incremental loss of human capital, people's time value is always expressed the stock of human capital continuous improvement over time, and thus brought about the ability to work and income capabilities.

If you choose to join the army, then the service will excluded the accumulation of experience and capabilities at local civil sector during the time, affecting the civilian human capital accumulation, resulting in the time value loss of people's, once exit active duty to the local civilian sector, their earning capacity will be affected and weakened.

Especially those skills of military positions can not be converted to civilian positions so that earning capacity will be greatly diminished after they retired. From the special nature of human capital perspective, the time value of high quality youth is also affected by the special nature of military human capital. In the two extreme cases, if the special nature of military human capital is very high, its conversion to civilian human capital would be zero, and the time value would be lost completely. If the special nature of military human capital is very low, that is, its military-specific nature is zero, the loss of time value would be zero. The military experience can give him benefits at the local job. However, reality is always between the two situations, in which service is bound to bring the time value loss of high quality youth more or less, further affecting their future earnings. Based on anticipated income method, we construct the following formula:

$$B_F = \beta \times \sum_{t=1}^n \frac{R_t}{(1+i)^t} \tag{13}$$

Where, B_F , the anticipated income of military human capital in the military sector, R_t , the anticipated income in the military during time t , t , income years, i , discount rate, β , profit contribution rate of military human capital in the military sector.

$$B'_F = \beta' \times \sum_{t=1}^n \frac{R'_t}{(1+i)^t} \tag{14}$$

Where, B'_F , the anticipated income of military human capital in the civilian sector, R'_t , the anticipated income in the civilian sector during time t , t , income years, i , discount rate, β' profit contribution rate of military human capital in the civilian sector.

If we calculated the difference of the anticipated income in the civilian and military sector respectively, we can get the possible incremental loss.

$$C = B'_F - B_F \quad (15)$$

C is the loss of human capital incremental value.

The evaluation process is as follows: (1)determine the income years, without considering the leaving probability to calculate the remaining working life, retired age is 60-year-old,(2)determine the business net profit, based on historical data, according to second exponential smoothing method to predict the future corporate profit,(3) determine the discount rate according to expert advice,(4)calculated profit contribution rate of military human capital in different departments,(5) according to the formula above to calculate the value.

4.2 The benefits of individual

Army service benefits can be summarized from different points of view. From the time dimension perspective, immediate service benefits and expected return would be gained from revenue nature, monetary benefits and non-monetary benefits. Immediate service benefits refer to the gains during the service until people retired or quit active. According to the nature of income, immediate service benefits can be divided into the immediate monetary benefits and non-monetary benefits. Immediate monetary benefits include, salaries, benefits, family preference, retirement benefits and so on. Non-monetary benefits, military service not only to obtain material benefits, but also receive psychological and spiritual benefits, the two together constitute the individual's utility function. Expected return come from human capital accumulation in military service, including deep-level training on skills and knowledge in military service, a lot of healthy human capital, strictly formal military training, medical and health care, strong ideals and beliefs, discipline and so on, these factors are very good for working in the civil sector, such military human capital can be effectively translated into civilian human capital and to obtain long-term gains.

Just like Khammonds(2001)said “West Point, another ‘Harvard Business School’, the military school has trained more than 60% of the world's top 500's CEO. In China, many entrepreneurs have a army service background, such as Liu Chuanzh-chairman of the board in Lenovo Group, Wang Shi- CEO of Vanke, Ren Zhengfei- CEO of Huawei and so on.

5. CONCLUSION

The theoretical contributions of this paper include, First, there is no doubt that the analysis and research provide some useful insights into the military recruit system from a new perspective, which will enhance and amend our knowledge and understanding of military recruit system. Second, from economic point of view, the study opened up a new field for China economics study, western economists have done a lot of work, but the Chinese study of this issue is still rare. This preliminary research can play a pioneering role in causing people to this and other related issues. Finally, the analysis framework may provide a useful research paradigm to similar problems.

The practical contributions of this paper include providing a reference for policy makers, the use of military recruit system and other military manpower policy levers to attract, recruit, train, retain, maintain and enhance the military human performance.

The limitations of this paper are that this empirical research is not sufficient and it needs to be validated in different contexts. This empirical research should be conducted by fuzzy comprehensive evaluation, in this case, data collection is very important. Although force constitute rationality, alternative cost analysis of force types could provide the direction for future research.

Theoretically this research could provide useful insights into the military recruit system from a new perspective. Firstly, this study can potentially open up a new field from the economic point of view for China economics study. Secondly, the framework of this analysis could provide a useful research paradigm to similar problems. On the other hand, this research could bring about practical contributions by providing references for the policy makers to use any military recruit system and other military manpower policy levers to attract, recruit, train, retain, maintain and enhance the military human performance. Finally, the limitations of this empirical research are discussed and future research are also suggested in different kinds of context.

REFERENCES

- [1] Altman, S., and R. Barro, 1971, Officer supply— The impact of pay, the draft, and the Vietnam War, *American Economic Review* 61(4): 649 - 664.
- [2] Altman, S., and A. Fechter, 1967, The supply of military personnel in the absence of a draft, *American Economic Review* 57(2): 19 - 31.
- [3] Asch, B., J. Hosek, and J. Warner, 2007, The economics of military manpower in the post Cold War era, In K. Hartley and T. Sandler, eds., *Handbook of Defense Economics*, vol. 2, Amsterdam: Elsevier: 1076 - 1118.
- [4] Asch, B., Schonlau, M., Du, C, 2004, Policy Options for Military Recruiting in the College Market: Results from a National Survey, MG-105-OSD. RAND, Santa Monica, CA.
- [5] Asch, B., Romley, J., Totten, M., 2005, The Quality of Personnel in the Enlisted Ranks, MG-324-OSD.RAND, Santa Monica, CA.
- [6] Buddin, R., Kapur, K., 2002, Tuition Assistance Usage and First-Term Military Retention, MR-1295-OSD.RAND, Santa Monica, CA.
- [7] Browning, E., 1987, On the marginal welfare cost of taxation, *American Economic Review* 77(1): 11 - 23.
- [8] Bohn, Don, Edward Schmitz and Richard VanMeter., 1996, The Geographic Location of Recruiting Resources, CNRC Report.
- [9] Brown, Charles, 1985, Military Enlistments: What Can We Learn from Geographic Variation?, *American Economic Review* 75: 228-34.

- [10] Cindy Williams, 2005, Transforming the Rewards for Military Service, MIT Security Studies Program.
- [11] Colin Ash, Bernard Udis and Robert F. McNown, 1983, Enlistments in the All Volunteer Force: A Military Personnel Supply Model and its Forecasts, *American Economic Review* 73(1): 101 - 131.
- [12] Daula, Thomas and D. A. Smith, 1985, Estimating Enlistment Models for the U.S. Army, in Ronald Ehrenberg (ed.), *Research in Labor Economics* 7: 261-309.
- [13] Dean Russell, 1955, The Conscript Idea, Published in *The Freeman*; Ideas on Liberty.
- [14] Elliott, M., Kapur, K., Gresenz, C., 2004, Modeling the Departure of Military Pilots from the Service, MR-1327-OSD. RAND, Santa Monica, CA.
- [15] Frank, D., 2004, As Luck would Have It: The Effect of the Vietnam Draft Lottery on the Future Corporate Leaders of America, Kellogg School of Management, Northwestern University, Evanston.
- [16] Fricker, R., 2002, The Effects of Perstempo on Officer Retention in the US Military, MR-1556-OSD. RAND, Santa Monica, CA.
- [17] Fisher, A., 1969, The cost of the draft and the cost of ending the draft, *American Economic Review* 59(3): 239 - 254.
- [18] Golding, H., Gregory, D., 2002, Sailors' Willingness to Complete Sea Tours: Does Money Matter? CRMD0006886.A2/Final, Center for Naval Analyses, Alexandria, VA.
- [19] Granger C, W. J. and P. Newbold, 1973, Some Comments on the Evaluation of Forecasts, *Applied Economics* (5): 35-47.
- [20] Grissmer, David W., 1979, The Supply of Enlisted Volunteers in the Post-Draft Environment: An Analysis Based on Monthly Data, 1970-75 in Richard V. L. Cooper. Defense Manpower Policy, Santa Monica. The Rand Corporation. 100-15.
- [21] Hansen, M., Wenger, J., Monroe, A., Griffis, H., 2003, Is Enlisted Retention too High? CRM D0008594.A2/Final, Center for Naval Analyses, Alexandria, VA.
- [22] Hansen, M., Wills, J.K., Reese, D., 2004, Level-Loading of Enlisted Accessions, CRM D0010352.A2/Final, Center for Naval Analyses, Alexandria, VA.
- [23] Kahneman, Daniel and Amos Tversky, 1979, Prospect Theory: An Analysis of Decision under Risk, *Econometrica* XLVII:263-291.
- [24] McNown, Robert F., Bernard Udis and Colin Ash, 1980. Economic Analysis of the All-Volunteer Force, *Armed Forces and Society*, (7): 113-32.
- [25] Rosen, S., 1992, The military as an internal labor market: Some allocation, productivity, and incentive problems, *Social Science Quarterly* 73(2): 227 - 237.
- [26] Ross, T., 1994, Raising an army: A positive theory of military recruitment. *Journal of Law & Economics* 37(1): 101 - 131.