

An Analysis on Supply and Demand of Athletes' Accidental Injury Commercial Insurance in China

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Abstract

Through establishing supply and demand curve and its equilibrium, we shall analyze the supply and demand characteristics of athletes' accident commercial insurance in China. Subsequently, we shall discuss the influence of market, policy, law and other means of regulation on supply and demand equilibrium, so as to provide with theoretical support to Athletes' accident commercial insurance in China.

Keywords: Athlete, Accidental injury, Commercial insurance

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The insurance service of 2008 Olympic Games has tested China's sports insurance industry, which is also a significant opportunity for drawing on international experience and developing sports insurance, including athletes' accident insurance. However, compared to developed countries, China still has a long way to go on sports insurance (Feng, 2009). At present, China's athletes' accident commercial insurance represents as: oversupply of low-rate products and short supply of high-rate products, so nonequilibrium of supply and demand presents. Through establishing supply and demand curve and its equilibrium, we shall analyze the supply and demand characteristics of athletes' accident commercial insurance in China. Subsequently, we shall discuss the influence of market, policy, law and other means of regulation on supply and demand equilibrium, so as to provide with theoretical support to athletes' accident commercial insurance in China.

1. Current status of supply and demand of athletes' accident commercial insurance in China.

Athletes' accident commercial insurance is one type of personal accident insurance for individual athlete, which mainly provides with insurance service to athletes for personal training and match. Currently, among athletes' accidental injuries in China, "although minor injury accounts for biggest percentage, disability and serious injury have almost reached 30%, which means serious injuries have produced adverse effects on approximate one-third athletes for their personal health and being engaged in sports. Moreover, over 70% of Chinese athletes have been injured to different extent." (Wang et al, 2007) However, relevant research shows, among 3800 investigated athletes, "insured athletes account for only 32.2%, while the number of non-insured ones is high to 55.3% which is far more than that of insured. In addition, 12.5% of athletes are in unclear status. So the insurance level of Chinese athletes is extremely low." (Wang et al, 2007) The reasons should be that, firstly, the design of insurance policy is lack of pertinence, which can't meet the requirements of athletes for elusion of vocational risks; secondly, insurance depth and density are below average level, which results in difficulty of price dependence; thirdly, insurance fund is dependent on government for long term, but market, policy and law have inadequate regulations.

2. Analysis on supply and demand of athletes' accident commercial insurance in China

2.1 Analysis on price-supply and -demand

Herein we shall analyze price-supply curve and price-demand curve. See Figure 1, Q is the quantity of unit homogeneous product of athletes' accident commercial insurance; P is the price of unit homogeneous insurance product; Es is the corresponding insurance product; Ed is the demand elasticity of price. In Figure 1 (a), Q stays at A when P is low. According to law of great numbers, when P slightly increases, amplitude of Q is less than that of P by increasing 1 unit of Q, i.e. $E_s < 1$ as P is low, due to high increase of marginal cost. When P is high to E, Q is high also. According to law of great numbers, when P slightly decreases, Q marginal cost to Q production cost by decreasing 1 unit of Q can be neglected, and $E_s > 1$.

In Figure 1 (b), when P is high, Q is low to F. When P decreases, Q will increase correspondingly. According to law of great numbers, here consumers are risk haters, and other risk subjects still choose saving, social insurance and self-protection to take risks. When amplitude of Q is less than change of P, $E_d = (\Delta Q/Q) / (\Delta P/P) < 1$. P is low, while Q stays high at A. When P gradually decreases, anticipated consumers at corresponding positions are

enlarged into broader risk subjects. According to law of great numbers, when amplitude of Q is more than change of P , $Ed = (\Delta Q/Q) / (\Delta P/P) > 1$. In Figure 2, E is the equilibrium of P and Q , which is an ideal state of market supply and demand. Pe is equilibrium price, and Qe is equilibrium quantity.

2.2 Supply analysis

Supply of athletes' accident commercial insurance means the quantity of insurance products that insurer is willing to and can sell at possible price for athletes' unit homogeneous products within certain period. It consists of two factors. One hand, insurer is willing to sell insurance products. On the other hand, insurer is able to supply insurance. Its influential factors are mainly composed of insurance premium rate, cost and market monopoly degree. Due to late start of athletes' accident commercial insurance in China and immature managerial technique, insurance suppliers highly measure premium rate of unit homogeneous product of athletes' accident commercial insurance than real level, considering risk apportionment and corporate sustainable running. Shown as Figure 3, real supply curve stays at S^1 , and meets supply curve d at E^1 . Premium rate price of unit homogeneous product, Pe^1 is high, while quantity of market deal Qe^1 is low. If S^1 moves left to S , unit homogeneous insurance premium rate will decrease, quantity of market deal will increase, and market supply and demand will go to ideal E .

If unit homogeneous product cost of China's athletes' accident commercial insurance decreases through cost adjustment, supply curve will vertically go up to S^2 from S^1 on condition of same quantity Q . Thus, price falls to Pe^2 , and deal quantity increases to ideal E^2 where Qe^2 and demand curve d meet. The other influential factors are comparatively low opening-up degree of China's insurance market, so few suppliers, small insurance variety, too much restriction to insurance capital and market channel, and high barrier to entry and exit. See Figure 4.

2.3 Demand Analysis

Demand of athletes' accident commercial insurance refers to the quantity of insurance products that athletes are willing to and can buy at possible price for unit homogeneous insurance products during sports training and match within certain period. It consists of two factors as well. One hand, athletes have purchase desire. On the other hand, athletes are able to buy them. Its influential factors are athletes' income, price of substitutes and complementary products of commercial insurance, and athletes' preference and anticipation to risks. As far as income is concerned, Chinese athletes' income mainly comes from basic salary and subsidy. There is a big gap compared to few Olympic champions or excellent athletes who achieved world or national award (Liu & Sun, 2009). As for price of substitutes and complementary products, there are two pieces of source, i.e. excellent athletes' mutual insurance by Sports Insurance Department of China Sports Foundation, athletes' injury insurance, etc. In fact, the former is just a kind of pension which comes from athletes' individual paid premium, collection of relevant activities and social donation and help. With regards to preference and anticipation, athletes' welfare after retirement during planned economy time has been abolished, so athletes are not optimistic to the future after retirement (Zhang & Cao, 2005). In Figure 5, with the restriction of income level, substitutes and future anticipation, the real demand of athletes' accident commercial insurance Qe^1 is less than potential demand Qe , and market price Pe^1 is lower than ideal price Pe .

3. Analysis on supply and demand equilibrium of athletes' accident commercial insurance in China

3.1 Supply and demand equilibrium condition

It is assumed that an insured of athletes' accident commercial insurance has wealth W , its utility is $u(W)$, and random loss is X . Maximum premium he is willing to pay in order to avoid loss X is $G = nP_{\max}$ (n is quantity of unit homogeneous insurance products; P is price of unit homogeneous insurance products). An insurer of athletes' accident commercial insurance has wealth w_1 , and its utility function is $u_1(w_1)$. If he accepts insurance, he will confront random loss and make reparations. Minimum premium he charges is $H = nP_{\min}$.

If $E[x] = \mu$, based on Expected Utility Theory, $G \geq \mu$, $H \geq \mu$ (1)

For insured, $u(W - G) = E[u(W - X)] = \int_0^\infty u(W - x) f(x) dx$ (2)

$f(x)$ is density function of risk X , for insurer, $u_1(w_1) = E[(w_1 + H - X)] = \int_0^\infty u_1(w_1 + H - X) f(x) dx$ (3)

Therefore, only if real charged premium is between G and H , insured and insurer will both be satisfied. Here insurance policy is feasible, i.e. satisfying general equilibrium conditions: $H < P < G$. So $(H/n) < P < (G/n)$, $Qe = n$.

3.2 Supply and demand equilibrium

Combining Figure 2 and conditions of athletes' accident commercial insurance policy, we obtain general

equilibrium supply and demand curve and its point of equilibrium; see point E in Figure 6.

3.3 High premium rate-high risks supply and demand equilibrium

Owing to few risk subjects of athletes' accident commercial insurance products of high premium rate-high risks, here on selling n units of athletes' accident commercial insurance products, insurer achieves utility $u_1(w_1) = E[(w_1 + H - X)] = \int_0^\infty u_1(w_1 + H - X)f(x)dx$. Because of big X , with the decrease of n , X is approximately equal to H on condition of few buyers. So insurer's utility approximately goes to zero. Insurer's supply Qs^1 will stay at low level. However, at the same price, demand Qd^1 is large, consequently, demand exceeds supply. See Figure 7 (a).

3.4 Low premium rate-low risks supply and demand equilibrium

Due to large quantity of risk subjects of athletes' accident commercial insurance products of low premium rate-low risks supply and demand equilibrium, it is easy to use law of great numbers to determine rate. Once accidents happen, they will bring small loss to insurer, simultaneously, insurer will take fewer risks of adverse selection. Here regarding to insurer, on selling n units of athletes' accident commercial insurance products, insurer achieves utility $u_1(w_1) = E[(w_1 + H - X)] = \int_0^\infty u_1(w_1 + H - X)f(x)dx$. Product X of low premium rate-low risks is small. With the increase of n , $H=nP$ increases and insurer's utility increases as well. Therefore, at the same market price, supply is high to Qs^2 , while demand is low to Qd^2 . See Figure 7 (b).

4. Supply and demand adjustment of Athletes' Accident Commercial Insurance in China

4.1 Market adjustment

Market adjustment consists of production cost adjustment and information cost adjustment. Through improving market regulation system, we should remove various barriers to resource flowing in sports insurance market, and reduce material cost of athletes' accident commercial insurance products. A variety of marketing channels need to be developed so as to reduce operating cost of insurance companies. Talents specializing sports insurance should be introduced in order to strengthen theoretical research on market rules and characteristics of sports insurance, especially athletes' accident commercial insurance. Accumulation of sports vocational insurance data has to be consummated for the purpose of solving current problems, i.e. few categories of insurance, high premium rate and lack of individual terms. According to different sports items, guaranteed emphasis of individual athletes' accident commercial insurance products should be established. Different premium rate and compensation range also need to be determined. We should determine disclaimer range scientifically, so that athletes' accident commercial insurance will more accord with athletes' injury characteristics, which are different from ordinary medical treatment and personal accident commercial insurance products. Meanwhile, labor cost should be reduced, so that the supply and demand of homogeneous insurance policy at the same price will increase.

4.2 Policy adjustment

In Nov. 2006, China State Sports Administration, Ministry of Finance and Ministry of Labor and Social Security together issued "On further strengthen social security of athletes", in which athletes' basic pension insurance, basic medical insurance, unemployment insurance and injury insurance are definitely stipulated, and Chinese athletes' social security is specified from system perspective (Zhou, 2008). The Chinese government should implement special supportive policies to sports insurance, especially athletes' accident commercial insurance. They can reduce sales tax; for instance, reduce sales tax of athletes' accident commercial insurance from ordinary rate 8% to 3%. Insurance of the athletes at provincial, municipal and national level should be tax free. Meanwhile, income tax of athletes' accident commercial insurance companies needs to be derated. Derated tax can be added to capital so that the utilization and turnover rate of insurance funds will be promoted. "Thus, insurance premium rate will be reduced and insurance fee will decrease, so that the shortage of insurance capital can be relieved" (Zhang et al, 2008).

4.3 Law adjustment

Along with the marketized reform of sports, China's relevant departments and industry associations should establish related rules, and regulate the minimum insurance and guarantee terms in the contracts between club and athletes. The responsibility range of match undertakers should be stipulated in the form of legislation. Moreover, examination procedure of sponsored insurance needs to be specified in order to ensure insurance types, insurance range, security level and diversity of insurance capital source. As for system level, we should discover the development system beneficial to athletes' accident commercial insurance. For those projects with marketization difficulty, compulsory insurance can be properly popularized to establish long-effect sustainable policy and capital support in the form of legislation.

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Figure 1. Supply and Demand Curve of Athletes' Accident Commercial Insurance in China

(a: Price-Supply Curve; b: Price-Demand Curve)

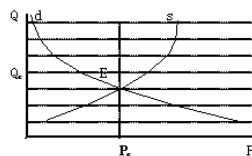


Figure 2. Equilibrium of Supply and Demand

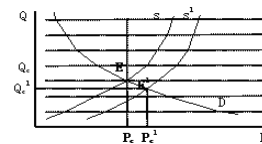


Figure 3. Supply Change 1

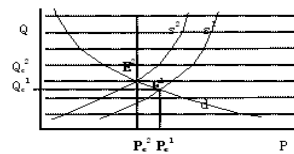


Figure 4. Supply Change 2

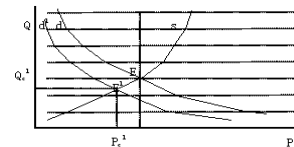


Figure 5. Demand Change

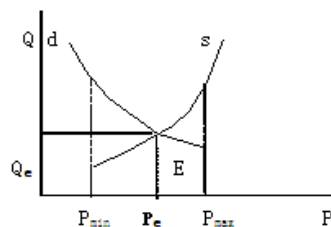


Figure 6. Supply and Demand Equilibrium of Athletes' Accident Commercial Insurance in China

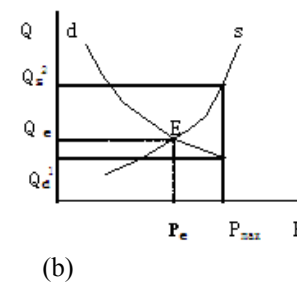
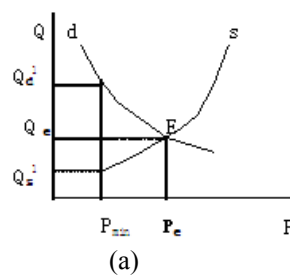


Figure 7. Supply and Demand Equilibrium of Athletes' Accident Commercial Insurance in China
(a: High premium rate-high risks supply and demand equilibrium; b: Low premium rate-low risks supply and demand equilibrium)