

Rent Seeking Contest and Indirect Risk Preference

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ABSTRACT

Rent seeking contest shapes the risk preference of the contestants. It instills in the weaker contestant who has little to lose and much to gain a preference for risk taking, and the weaker the contestant, the stronger the instilled preference for risk taking. On the other hand, it causes the stronger contestant who has much to lose and little to gain to have a preference for risk aversion and, the stronger the contestant, the more intense the instilled preference for risk aversion. Increases in the economies of scale in rent seeking amplify the effects of rent seeking contests on the risk preference of the contestants. The paper also derives the Arrow-Pratt measure of absolute risk aversion for the contestants.

Keywords: Risk Preference, Rent Seeking, Economies of Scale, Indirect Utility Function, Arrow-Pratt Measure of Absolute Risk Aversion

JEL CODES: D80, D72, D74, H56

1. INTRODUCTION.

Many economic decisions involve risk and uncertainty. There has been extensive research on how decisions are made under uncertainty. An important line of the research on economics of uncertainty is to investigate how external conditions affect the indirect utility function and the risk preference of an individual. Domar and Musgrave (1944), Stiglitz (1969) and Feldstein (1969), for instance, analyze the effects of taxation on risk taking while Masson (1972) and Roy and Wagenvoort (1996) study how capital market structure affects the risk preference.¹

A very important economic activity is rent seeking. Rent seeking yields returns to the undertaker while generating no new wealth for society. Rent seeking contests are very common and important in human societies. Wars, for instance, are rent seeking contests of a grand scale. At a lower level, the competition for social status is a rent seeking contest that most individuals constantly engage in.

¹ See also Woodland (1980) and Kihlstrom and Mirman (1981).

There are quite a number of works on how risk preference affects rent seeking behaviors.² However, so far there is no research on how rent seeking contests affect the risk preference of the contestants. This paper fills in the gap by studying how the participation in a rent seeking contest affects the risk preference of the contestants.

The relative power position of a contestant in a rent seeking contest affects his attitude toward risk. A very weak contestant is in a precarious position and has little to lose and much to gain. The relative power position therefore induces in such a very weak contestant a risk-seeking attitude towards economic decisions or any decision that might affect his power position. On the other hand, a very strong contestant has little to gain and much to lose. The relative power position induces in such a very strong contestant a risk-averse attitude in economic undertakings, or in any undertaking that has power implications.

The rent seeking technology affects how the rent seeking contest shapes the risk preference of the contestants. An important technological parameter is the economies of scale in rent seeking, which measure the advantage that a contestant with a larger rent seeking capability has over a contestant with a smaller rent seeking capability. It is also named the mass factor. A larger mass factor accentuates the disparity in power and amplifies the effects of the rent seeking contests on the risk preference of the contestants. When there is a large mass factor, the stronger contestant becomes extremely risk averse while the weaker contestant becomes extremely risk loving..

Section two presents the model and derives the main results. Section three applies the insights generated to understand how risk preference as shaped by rent seeking contest affects decisions on war, economic development and institutional innovations.

2. THE MODEL.

The society consists of only two persons, contestants 1 and 2. There is a fixed supply of an only consumer good in the society to be divided between the two contestants. The contestants derive constant marginal utility from the consumption good. The contestants have endowments but the endowments could not be directly consumed. They however could invest their endowments. The investment projects have different risk and returns profiles. The returns from investments could not be directly

² Van Long and Vousden (1987), Konrad and Schlesinger (1997), Yamazaki (2009), Treich (2010) and Cornes and Hartley (2012).

consumed either. However, the contestants could use the returns from investments as inputs into the rent seeking contest for competing for the fixed exogenously supplied consumer good. Since the contestants have no other uses for the returns from investments, they put all their respective returns from investment into the rent seeking contest.

Given the respective inputs into rent seeking by the two contestants, the share of the consumption good that he could secure through power struggle is determined by the contest success function. For analytical convenience, we use the difference form of Tullock-Hirshleifer contest technology function.³ The difference form of Tullock-Hirshleifer contest technology function is:

$$P = \frac{e^{mF_1}}{e^{mF_1} + e^{mF_2}} \quad (1)$$

P is the share of contested resources captured and controlled by contestant 1.⁴ F_1 is the rent seeking capability of contestant 1 and F_2 is the rent seeking capability of contestant 2. m is the rent seeking decisiveness parameter or mass factor. A larger mass factor means that there are greater economies of scale in rent seeking and a contestant with a larger rent seeking capability could more effectively seize and control a larger share of the contested resources. If the mass factor is small, then a given change in the difference in rent seeking capability between the contestants causes a tiny variation in the respective share of the contested resources captured by the contestants. If the mass factor is large, then a given change in the difference in rent seeking capability between the contestants causes a huge variation in the respective share of the contested prize captured by the contestants.

The marginal effect of rent seeking capability of contestant 1 on the relative share of the contested resources captured by contestant 1 is

$$\frac{\partial P}{\partial F_1} = mP(1-P) \quad (2)$$

Note that the right hand side of Equation 2 has two components. The first component is the mass factor, m . The second component is $P(1-P)$. This is a measure of the

³ Hirshleifer (1989). See also Hirshleifer (1988, 1991, 1995).

⁴ The alternative interpretation of P is that it is the probability of victory for contestant 1.

asymmetry in power between the two contestants. When the two contestants are exactly evenly matched, this component reaches its maximum, which is one quarter. On the other hand, as the two contestants become more unequal in power, this component decreases in size. When one contestant is completely powerless relative to the other contestant, this component becomes zero.

Proposition 1:

The rent seeking contest instills in the weaker contestant a risk-seeking preference and it instills in the stronger contestant a risk-averse preference.

Proof:

The second derivative is:

$$\frac{\partial^2 P}{\partial (F_1)^2} = m^2 P(1-P)(1-2P) \quad (3)$$

The marginal effect of F_1 on P is increasing when $P < \frac{1}{2}$ (or $F_1 < F_2$), at its greatest when $P = \frac{1}{2}$ (or $F_1 = F_2$), and decreasing when $P > \frac{1}{2}$ (or $F_1 > F_2$). That is to say, the power function is convex when $F_1 < F_2$ (that is, the second derivative is negative), is concave when $F_1 > F_2$ (that is, the second derivative is positive), and is linear at $F_1 = F_2$.

Q. E. D.

In other words, the relative power position of a contestant instills a risk-seeking preference in him when he is weaker than his opponent, for the power function has increasing marginal returns in this situation. The relative power position of a contestant instills a risk-averse attitude in him when he is stronger than his opponent, for the power function has diminishing marginal returns in this case. For expositional convenience, the risk attitude derived from the power position of the contestant relative to his rival is named the power induced risk attitude (PIRA).

There are two measures of risk attitude. One is the Arrow-Pratt measure of absolute

risk-aversion (ARA) or the coefficient of absolute risk aversion. The other is the Arrow-Pratt measure of relative risk-aversion (RRA) or coefficient of relative risk aversion. The Arrow-Pratt measure of absolute risk-aversion for the power-induced risk attitude (ARA-PIRA) is:

$$ARA - PIRA = -\frac{\frac{\partial^2 P}{\partial (F_1)^2}}{\frac{\partial P}{\partial F_1}} = -\frac{m^2 P(1-P)(1-2P)}{mP(1-P)} = -m(1-2P) \quad (4)$$

Proposition 2:

The power-induced risk attitude has an increasing absolute risk aversion with respect to power.

Proof:

$$\frac{\partial (ARA - PIRA)}{\partial P} = 2m \quad (5)$$

Q. E. D.

That is to say, the more powerful a stronger contestant is relative to his rival, the more risk-averse he becomes. Conversely, the less powerful a weaker contestant is relative to his rival, the more risk-seeking he becomes.

The weaker the highly disadvantaged contestant, the more risk-seeking he is. For instance, a highly disadvantaged contestant who has practically nothing to lose will be much more risk seeking than a slightly disadvantaged contestant who still has quite a lot to lose. On the other hand, the stronger the highly advantaged contestant, the more risk-averse that stronger contestant is. A highly advantaged contestant who has almost nothing to gain and everything to lose is more risk averse than a slightly advantaged contestant who still has much to gain and not as much to lose.

Proposition 3:

The absolute magnitude of power-induced risk attitude increases with the mass factor.

Proof:

$$\frac{\partial |ARA - PIRA|}{\partial m} \geq 0 \quad (6)$$

That is, if $ARA - PIRA < 0$, then $\frac{\partial (ARA - PIRA)}{\partial m} < 0$, if $ARA - PIRA = 0$, then $\frac{\partial (ARA - PIRA)}{\partial m} = 0$, and if $ARA - PIRA > 0$, then $\frac{\partial (ARA - PIRA)}{\partial m} > 0$.

Q. E. D.

A larger mass factor causes the stronger contestant with a risk-averse power-induced risk attitude to be more risk averse, and the weaker contestant with a risk-seeking power-induced risk attitude to be more risk loving. This is because when the mass factor gets larger, there are two effects. One is that the power function becomes more convex when $F_1 < F_2$, and more concave when $F_1 > F_2$ and consequently, the weaker contestant becomes more risk-seeking and the stronger contestant becomes more risk-averse. The second effect is that a larger mass factor accentuates the disparity in power between the two contestants, given their difference in rent seeking capability. As a result, the weaker contestant becomes weaker and more risk-seeking and the stronger contestant becomes stronger and more risk-averse.

3. APPLICATIONS AND CONCLUSIONS.

A stronger contestant is more risk averse and a weaker contestant is more risk seeking. This insight might explain the observation of Olson (1982)'s observation that countries in the lead are less innovative especially on institutional aspects, for instance, Great Britain after World War II. The insight also helps to explain the gambling for resurrection phenomena observed by Goemans (2000) that domestically endangered leaders tend to undertake risky ventures internationally in order to booster their position at home.

The insight generated by the model also argues that the distribution of income and wealth in a society affects the risk preference of the members of the society. Income and wealth affects one's status in the social hierarchy and this is in a way a rent seeking contest. Therefore, a society with very unequal distribution of income and wealth will have members that are polarized in their risk preference, with richer

citizens being very risk averse and the poor very risk loving. Such a society is more likely to be polarized politically as well.

The power-induced risk attitude helps to understand why an imperial order that is very powerful and secure is very conservative and lacks innovation and creativity. The all-encompassing empire, given its preponderant relative capability, is at the point of the power function where there are strong diminishing returns to capability and the power function is highly concave. Such an empire is therefore very risk-averse for any innovation would most probably undermine the power position of the empire and is quite unlikely to improve it. The larger the mass factor, the more powerful and risk-averse an all-encompassing empire is. Consequently, a major civilization composed of only a gigantic, uncontestable and universal or almost universal empire will exhibit a very different risk preference when compared to another major civilization composed of many equal and independent sovereign states. The civilization with a universal empire will be plagued by risk aversion and the state system civilization will largely be characterized by risk neutrality. This might explain the stagnation of Japan, China, India, Persia and Middle East during the early modern era as they were all ruled by continental size empires. It might also explain the dynamic rise of Europe during the early modern era as Europe was a competitive state system.⁵

To conclude, the relative power position of participants in a rent seeking contest affect their risk preference. Rent seeking contests are ubiquitous in human societies. Therefore there should be more research to investigate their effects on the risk preferences of individuals and their decisions in economy and society.

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REFERENCES

- [1] Bernholz, P., Streit, M. E. and Vaubel, R. (Eds.). (1998). Political Competition, Innovation and Growth: A Historical Analysis. Berlin: Springer-Verlag.
- [2] Bernholz, P. and Vaubel, R. (Eds.). (2004). Political Competition, Innovation and Growth in the History of Asian Civilizations. Cheltenham, UK: Edward Elgar.
- [3] Cornes, R. and Hartley, R. (2012). Risk aversion in symmetric and asymmetric

⁵ Refer to Bernholz et al. (1998) and Bernholz et al. (2004).

- contests, *Economic Theory*, 51, 247-275.
- [4] Domar, E. D. and Musgrave, R. A. (1944). Proportional income taxation and risk-taking, *The Quarterly Journal of Economics*, 58, 3, 388-422.
- [5] Goemans, H. E. (2000). *War and Punishment: The Causes of War Termination and the First World War*, Princeton University Press.
- [6] Hirshleifer, J. (1988). The analytics of continuing conflict, *Synthese*, 76, 201-233.
- [7] ----- (1989). Conflict and rent-seeking success functions: ratio vs. difference models of relative success, *Public Choice*, 63: 101-112.
- [8] ----- (1991). The technology of conflicts as an economic activity, *Journal of Economic Perspectives*, 81, 2, 130-134.
- [9] ----- (1995). Anarchy and its Breakdown, *Journal of Political Economy*, 103, 1, 26-52.
- [10] Kihlstrom, R. E. and Mirman, L. J. (1981). Constant, increasing and decreasing risk aversion with many commodities, *The Review of Economic Studies*, 48, 2, 271-280.
- [11] Konrad, K. A. and Schlesinger, H. (1997). Risk aversion in rent-seeking and rent-augmenting games, *Economic Journal*, 107, 1671-1683.
- [12] Masson, R. T. (1972). The creation of risk aversion by imperfect capital markets, *The American Economic Review*, 62, 1/2, 77-86.
- [13] Olson, M. (1982). *The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities*, Yale University Press.
- [14] Roy, S. and Wagenvoort, R. (1996). Risk preference and indirect utility in portfolio-choice problems, *Journal of Economics*, 63, 1, 139-150.
- [15] Stiglitz, J. E. (1969). The effects of income, wealth, and capital gains taxation on risk-taking, *The Quarterly Journal of Economics*, 83, 2, 263-283.
- [16] Treich, N. (2010). Risk-aversion and prudence in rent-seeking games, *Public Choice*, 145, 339-349.
- [17] Van Long, N. and Vousden, N. (1987). Risk-averse rent seeking with shared rents, *Economic Journal*, 971-985.
- [18] Woodland, A. D. (1980). Direct and indirect trade utility functions, *The Review of Economic Studies*, 47, 5, 907-926.
- [19] Yamazaki, T. (2009). The uniqueness of pure-strategy Nash equilibrium in rent-seeking games with risk-averse players, *Public Choice*, 139 (3-4), 335-342.