

Rational Entrepreneurship in Local China: Exit Plus Voice for Preferential Tax Treatments

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Rational Entrepreneurship in Local China: Exit Plus Voice for Preferential Tax Treatments*

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Keywords: Exit, Voice, Preferential tax treatments, Tax competition, China

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1. Introduction

Aiming to recentralize fiscal capacity and address the abuse of preferential tax policy by local government in 1980s, the Chinese tax-reform 1994 seems to have achieved such ends. The decline of revenue-to-GDP ratio and central government's share of total revenue has been reversed under the new Tax-Sharing-System (TSS). The tax structure has been simplified by a uniform VAT tax and the central tax authority has been re-strengthened by establishing its own tax administrative agency, the national-tax-bureau-system, under the State Taxation Administration (SAT) paralleling the local-tax-bureau-system controlled by local governments. Yet, assessing such outcomes is not straightforward from a comprehensive perspective over Chinese public finance (Zhang, 1999; Lee, 2000; Wong, 2000). Firstly, the recentralization of fiscal capacity was far from success. If intergovernmental transfers are excluded, the net share of central government's revenues accounted for much less than those ostensibly increasing figures in the statistical report. Secondly, considering substantive extrabudgetary and off-budget revenues, which particularly exist in Chinese local budget system, local governments remain extensive discretionary power over such fiscal resources. Thirdly, local governments are willing to and able to implement various countermeasures to circumvent the central policies in favor of their own interests. Therefore, the status quo of *de facto* fiscal decentralization was not changed so much and local government still use a variety of preferential tax policies but in a special way to attract investments, as showed by recent field research in local China (Krug, *et al.*, 2005).

Consequently, the *de facto* fiscal decentralization induces inter-jurisdictional tax competition, thereby opening a window of opportunity for firms, especially those with substantial influences, to negotiate with local governments for preferential tax treatments albeit more difficult facing unified and standardized central tax policy. With regard to the bulk of incentives for investment strategy, preferential tax treatments obviously stand out of others and induce firm's Tieboutian migration (1956) for less tax burden. However, asset specificity (Williamson, 1985) like site specificity,

physical and human asset specificity and dedicated assets might generate lock-in effect and make exit less attractive to firm. Thus, in addition to such “voting by feet”, an alternative is to voice, as Hirschman (1970) puts in his influential book *Exit, Voice and Loyalty*. Unlike its common counterpart in western countries as complaint or lobbying, voice is delivered via a *guanxi* network in China, especially via the entrepreneur’s personal relations with government officials who are in charge of policy-making or -implementation. Embedded in a complex, uncertain and unpredictable business environment in China, such political affiliation is crucial to business success. It emphasizes the reciprocity and long-term relationship so as to need exchanged interests and substantive inputs in means of money, time and effort to cultivate, maintain and expand (Yang, 1994; 2002; Boisot and Child, 1996; Luo, 1997). Therefore, since both exit and voice accrue cost and risk as well, a rational entrepreneur makes choice on the ground of cost-benefit-calculation and the response of government. However, to what extent will the exit option surpasses voice option and *vice versa*? Under what conditions will they be residual or alternative of each other? Would they be jointly adopted as a mixed strategy? What institutions would facilitate exit *vis-à-vis* voice?

In order to answer preceding questions and operate and extend Exit-Voice theory, we construct a game model of interaction between firm and local government, in terms of exit and voice for preferential tax treatments, and reveals dynamics of these two options under rational entrepreneurship of economizing transaction cost. The remainder will proceed as follows. Next section conceptualizes exit and voice compared to Hirschman’s original account. Section 3 and 4 present the basic and extended model of exit-voice game between firm and local government and the equilibria outcomes, followed by the section of empirical cases. The final section draws the conclusion.

2. Exit and voice theory

2.1 Tiebout model and voice

Tiebout's seminal article (1956) suggests that individuals, by moving their residences, select preferred combination of public goods provided by local community and tolerance of tax payment as buying private goods in a competitive market. The original model regards individual's tax payment as price for public package and local government as a producer. After marginal-cost-and-benefit-calculation, individual migrates into target region, thereby forcing local government to economize cost (tax levy) and provide desired public goods. Finally, both demand for and supply of public goods reach a Pareto optimum in different localities. Individual preference is, in particular, fully revealed through such mimic market exchange mechanism so as to address Samuelsonian (1954) distortion of public policy due to the lack of private information. Similarly, firms could move their locations to maximize profit and minimize tax cost as well (Richter, 1994; Richter and Wellisch, 1996). They could also shift their income into tax haven by internal transfer pricing system among different subsidiaries (Osmundsen, *et al.*, 1998; Mintz and Smart, 2004). Such "voting by feet" based on the mobility induces various inter-jurisdictional tax competitions for inflow investments or factors (Wilson, 1999). Local governments leapfrog to reduce local tax rate and alleviate tax burden (Musgrave, 1997) or even engage in a "destructive interregional competition" (Cumberlans, 1981) for mobile firms, termed as "bidding for firms" (Black and Hoyt, 1989) or "race to the bottom" (Grandy, 1989).

Yet, this is only part of the story. Exit for preferential tax treatments in real world may undertake considerable costs and risks, not so easily as switch from an apple to an orange in the supermarket. Asset specificity (Williamson, 1985) weakens investment redeployability and locks firms in a certain location. So do entrepreneurs and employees who have lived in a location for years. They own site-specific assets, embrace specific local culture and language, enjoy environmental amenities, possess residence-specific human capital and involve in personal network that significantly deliquesces any exit intention (Blankart, 2002). Hence, exit is vulnerable to be blocked or inhibited thanks to prohibitive exit cost. Tiebout model has not only received extensive theoretical critiques (Bewley, 1981) but also experienced empirical

challenges (for review see Dowding, *et al.*, 1994). From this point of view, Hirschman's exit-voice framework (1970) is particularly applicable to extend Tiebout model¹ and makes "voting by hand" an attractive alternative to "voting by feet".

Taking an example of buying product in a competitive market, Hirschman (1970) claims that if the quality is deteriorating or price is rising consumers could punish the producer by shifting to its rivals and let market to select the fittest survival. Alternatively, consumers could voice to the firm for performance recuperation. According to Hirschman's definition (1970, p.30), voice is "any attempt at all to change, rather than to escape from, an objectionable state of affairs, whether through individual or collective petition to the management directly in charge, through appeal to a higher authority with the intention of forcing a change in management, or through various types of actions and protests, including those that are meant to mobilize public opinion."

Orbell and Uno's (1972) study on the exit-voice propensity of urban people dealing with a neighborhood problem has shown that people, as a rational decision maker, choose whether exit or voice by weighing marginal benefit and cost. The high moving cost to the suburbs, such as housing, commute and taxes, would lead people to voice their discontent and struggle for improvement of neighborhood conditions. Furthermore, if the public goods and service within the community carry such characteristics as: i) economies of scale; ii) difficulty of specifying expected quality of service; iii) nature of monopoly; iv) "connoisseur goods" with exit barriers (education, health care, etc.); v) consumers incompetent to exercise exit (children or the ill, etc.), the exit is likely to be inefficient for inhabitants (Young, 1974). So far voice option functions as a substitute when the exit option is less attractive.

However, exit and voice may be complementary to each other. Sharp (1984) finds that

¹ See Dowding, et al. (2000) for a detailed review.

better educated and higher income people who have indeed greater mobility appear more inclination to opt voice in local affairs and their voice receive more attention from local officials in that their potential exit could influence local economic well-being (Peterson, 1981). Thus, those who possess exit option but regard it as the last resort would be more likely prefer voice and directly articulate their concerns since local government would more seriously take care of their voice due to the threat of exit.

The dynamics of these two options might result in contradict outcomes: the presence of the exit tends to “*atrophy the development of the art of voice* (Hirschman, 1970, p.43)” on the one hand; and on the other hand, “in some situations, exit will therefore be a reaction of *last resort* after voice has failed (p.37, italic in original).”

2.2 Exit-voice in local China

Despite China’s authoritarian political regime, a *de facto* fiscal decentralization has been resulted by successive fiscal reforms with significant devolution of policymaking authority and corresponding responsibility from the central state apparatus to local government since 1970s (Wong, 1991; 1992; 1997). Particularly, a market-preserving federalism of Chinese style, which restricts central government’s excessive intervention and aligns appropriate incentives for local government with local economic prosperity, has been shaped (Montinola, *et al.*, 1995; Weingast, 1995; Qian and Weingast, 1996; 1997; Qian and Roland, 1998).

Under such institutional arrangement, exit available to individuals and firms imposes powerful constraint on central and local government size and forces public policy to gear with consumer-citizens’ preference which has been empirically tested by Zhu and Krug (2005). Firms are able to migrate or establish new subsidiary to seek most preferential treatments and best investment environment. For instance, firms may enjoy a corporate income tax exemption in the first two years after making profit and 50 per cent reduction in the third through fifth year. Moreover, since 1980s, various

Special Zones at national, provincial or even sub-provincial level have been set up, which proffer further favored policies such as tax rate discount, tax holiday, investment amortization, tax deduct, and the like². In addition to firm's mobility inducing foregoing preferential tax policies, voice is also feasible to influence government policy-making. In 2005, China initiated a new round tax reform to unify corporate income tax on domestic and foreign enterprise by abolishing some preferential tax treatments to the latter. In order to block such scheme, fifty-four multinationals jointly petitioned central government for preserving their taxation privileges with five to ten years' extension³.

Despite the absence of democracy institution, voice might take a variety of types in China as Hirschman (1970, p.30) points out "voice is nothing but a basic portion and function of any political system". Here, the *guanxi* network is a crucial means for voice. It "involves the exchange of gifts, favors and banquets; the cultivation of personal relationships and networks of mutual dependence; and the manufacturing of obligation and indebtedness (Yang, 1994, p.6)." *Guanxi* network has existed for centuries and become a source of sustained competitive advantage for doing business in China (Tsang, 1998). Particularly, to establish the political affiliation with government officials who are in charge of policy-making or -implementation is crucial to business success in a complex, uncertain and unpredictable business environment (Yang, 1994; 2002; Boisot and Child, 1996; Luo, 1997). Reciprocity and long-term relationship are two fundamental characteristics of a sustained *guanxi* network that needs necessary exchanged interests and substantive inputs of time, money and effort to cultivate, maintain and expand. Considering *guanxi* network as business capital or asset, its value depends on: i) durability of a long-term relation; ii) wielded discretionary power; iii) connectivity to expand the network and iv) degree of tightness (Wank, 1996). As a result, *guanxi* practices of the firm with local

² See Appendix 1 for various special zones at national level.

³ A joint memorial, *On New Corporate Income Tax Law: Standpoints of Multinationals Investing in China*, was submitted to the State Council, Ministry of Finance, State Administration of Taxation, and Ministry of Commerce by 54 multinationals (name list in Appendix 2).

government could be donation to public projects, increasing local employment and support to various local policies in a formal way; and in an informal way, such as personal gifts, banquets, favors, even bribe and the like.

3. Exit-voice game: the basic model

3.1 Structure of the game

We model a two-player, three-stage game with complete and perfect information. In one region, a firm makes profits-before-tax R and a local government levies tax rate r while a lower tax rate r_L ($r_L < r$) is offered in its neighbor region⁴. C_C is the tax collection cost of local government and obviously smaller than tax revenue ($0 < C_C < r_L R < rR$). Basically, the firm can either exit to the neighbor region for less tax burden, or voice to local government for equivalent preferential tax treatment but both actions bear cost, C_E for exit and C_V for voice ($C_E > 0$, $C_V > 0$). The local government holds two actions: reduce the tax rate to r_L or maintain present tax rate r . The order of moves is as follows:

In stage 1, the firm has three feasible actions: exit, voice or acquiesce. Exit (E) means firm migrates to neighbor region and ends the game with payoff $(1-r_L)R-C_E$ to the firm and 0 to local government. Choosing acquiescence (A), the firm stays in the region and acquiesce the present tax rate. Consequently, it gains $(1-r)R$ and leaves payoff $rR-C_C$ to local government. The voice (V) of the firm brings the game into stage 2;

In stage 2, if local government decides to reduce tax rate r to r_L , the game is terminated with payoff $(1-r_L)R-C_V$ to firm and $r_L R + \alpha C_V - C_C$ to local government. Here, C_V denotes the voice cost that firm invests in the *guanxi* network with local officials for their “voice”, and α ($0 < \alpha < 1$) is the rent-dissipation coefficient for such rent-seeking activity is non-efficient to the society. The game continues if the local

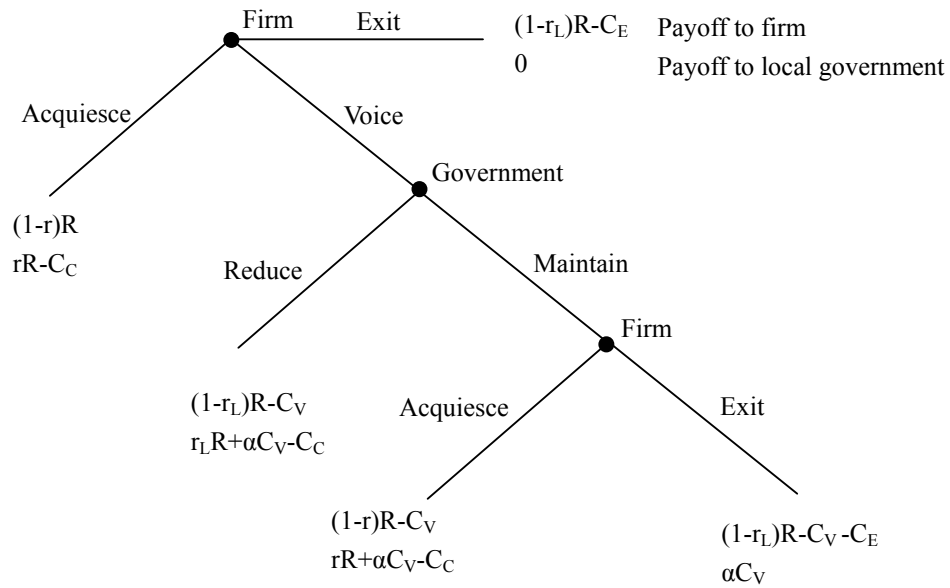
⁴ Considering that various preferential tax treatments virtually result in a lower effective tax rate to firms, local government's strategy is simplified to offer lower tax rate in the model.

government takes the action M of maintaining present tax rate r ;

In stage 3, either acquiescence (A) or exit (E) of the firm ends the game. Accordingly, the payoff of the former action is $(1-r)R-C_V$ to firm and $rR+\alpha C_V-C_C$ to local government while the latter action $(1-r_L)R-C_V-C_E$ and αC_V .

Figure 1 gives the extensive-form representation of the game

Figure 1 Extensive form of the basic model



3.2 Subgame perfect equilibria and propositions

Following backwards induction to solve this game for subgame perfect equilibria, we begin at the third stage where the firm chooses the optimal choice and, then, figure out local government's optimal strategies in the second stage and, finally, determine the firm's optimal decision in the first stage.

Figure 1 indicates immediately that the subgame perfect equilibrium strategy of the firm in the third stage is to maximize the payoff between action Acquiescence, $(1-r)R-C_V$ and Exit, $(1-r_L)R-C_V-C_E$:

$$Max_{A,E} \{(1-r)R - C_V, (1-r_L)R - C_V - C_E\}$$

if $C_E < (r-r_L)R \Rightarrow (1-r)R - C_V < (1-r_L)R - C_V - C_E$, then the firm will choose Exit. Similarly, if $C_E \geq (r-r_L)R \Rightarrow (1-r)R - C_V \geq (1-r_L)R - C_V - C_E$, then firm will prefer Acquiescence.

Therefore, the subgame perfect equilibrium in the final stage is:

Table 2 Firm's strategy in stage 3

Firm	E_3	when $C_E < (r-r_L)R$
	A_3	when $C_E \geq (r-r_L)R$

Note: The subscript 3 denotes the third stage.

Determining the subgame perfect equilibrium strategy of the government in the second stage requires the distinction of the cases $C_E < (r-r_L)R$ and $C_E \geq (r-r_L)R$ in order to anticipate the payoff maximizing response of the firm in the final stage. Suppose that $C_E < (r-r_L)R$, i.e. the firm chooses Exit in the third stage, the government's payoff is:

$$Max_{R,M} \{r_L R + \alpha C_V - C_C, \alpha C_V\}$$

Obviously, government will choose Reduce, because $r_L R + \alpha C_V - C_C > \alpha C_V$. If $C_E \geq (r-r_L)R$, i.e. the firm chooses Acquiesce in the third stage, the government's payoff becomes:

$$Max_{R,M} \{r_L R + \alpha C_V - C_C, rR + \alpha C_V\}$$

The government will maintain present tax rate because $r_L R + \alpha C_V - C_C < rR + \alpha C_V - C_C$.

The subgame perfect equilibrium in the second stage is:

Table 3 Government's strategy in stage 2

Government	R_2	when $C_E < (r-r_L)R$
	M_2	when $C_E \geq (r-r_L)R$

Note: The subscript 2 denotes the second stage.

In the first stage, if $C_E < (r-r_L)R$, the firm predicts government's strategy in the second stage will be Reduce and thus firm's payoff of Voice will be $(1-r_L)R - C_V$. Consequently, firm maximizes payoff of Acquiescence, Voice and Exit:

$$Max_{A,V,E} \{(1-r)R, (1-r_L)R - C_V, (1-r_L)R - C_E\}$$

If $C_V < C_E < (r-r_L)R \Rightarrow (1-r_L)R - C_V > (1-r)R > (1-r_L)R - C_E$, firm chooses Voice; if

$C_E < (r-r_L)R < C_V \Rightarrow (1-r_L)R - C_E > (1-r)R > (1-r_L)R - C_V$, firm prefers Exit; and if $C_E < C_V < (r-r_L)R \Rightarrow (1-r_L)R - C_E > (1-r_L)R - C_V > (1-r)R$, firm's optimal strategy is Exit.

If $C_E \geq (r-r_L)R$, government will maintain the present tax rate in the second stage and make firm to acquiesces in the final stage. Therefore, firm's payoff of Voice in the first stage is $(1-r)R - C_V$ and maximizing payoff is:

$$\text{Max}_{A,V,E} \{(1-r)R, (1-r)R - C_V, (1-r_L)R - C_E\}$$

Thus, $C_E \geq (r-r_L)R \Rightarrow (1-r)R > (1-r)R - C_V$ and $(1-r)R > (1-r_L)R - C_E$, firm chooses Acquiesce.

The subgame perfect equilibrium in the first stage is therefore:

Table 4 Firm's strategy in stage 1

Firm	V_1	when $C_E < (r-r_L)R$ and $C_V < C_E$
	E_1	when $C_E < (r-r_L)R$ and $C_E < C_V$
	A_1	when $C_E \geq (r-r_L)R$

Note: The subscript 1 denotes the first stage.

According to different combination of exit and voice cost, we have such propositions:

Proposition 1: If $C_E < (r-r_L)R$ and $C_V < C_E$, firm will voice and local government will response to reduce present tax rate.

Proposition 2: If $C_E < (r-r_L)R$ and $C_E < C_V$, firm will exit to neighbor region for more preferential tax treatment.

Proposition 3: If $C_E \geq (r-r_L)R$, firm will acquiesce the present tax rate.

3.3 Implications of the basic model

The proceeding simple model illustrates how relative exit and voice cost determine a rational entrepreneur's behavior in the game played with local government for preferential tax treatments. A basic implication is that the exit-availability rather than unavailability stimulates and strengthens voice practice in that either high exit or

voice cost impedes firm to opt for voice.

Figure 2 Comparative statics of the basic model

		Exit cost		
		Low	High	
Voice cost	Low	1: {Voice}/{Reduce}	3: {Acquiesce}	$C_V = C_E$
	High	2: {Exit}	3: {Acquiesce}	

$C_E = (r - r_L)R$

With regard to possible combinations of high-low possibilities of exit and voice cost for two players' decisions, Figure 2 depicts corresponding equilibrium outcome of the game. The watershed between high and low cost for exit and voice is the potential benefit gained from preferential tax treatments, $(r - r_L)R$. The left column shows that exit cost under the threshold allows firm easily to migrate between regions for preferential tax treatments. In Proposition 2, exit cost is even lower than voice cost so as to indulge firm in frequent migrations between regions and leaves no room for voice to be considered. The exit strategy profits the most for firm. The equilibrium outcome, therefore, is firm directly exits to neighbor region in the first stage. Yet, when voice cost becomes so favorable (lower than exit cost) that firm would benefit larger from voice than exit in Proposition 1. The exit turns to be last resort after voice. Then, underpinned by the threat of exit, firm's voice might receive local government's compromise of offering preferential tax treatments. In Proposition 3, the high exit cost blocks firm's exit option and should encourage firm to utilize voice according to Hirschman's theory (1970). However, no matter whether firm resort to voice and as long as local government perceive that firm are unable to exit, they would remain present tax burden in accordance with Ramsey's rule (1927) taxing most the immobile factors. Then, firm would rather stay and renounce any attempt of voice in the first stage. In short, with the intention of enhancing effective mobility, firms may, in the real world, implement various measures such as changing organization form into

holding company or group management system, diversifying investments in different regions etc. In particular, firms will resort partial-exit by only registering headquarter or establishing new nominal affiliated enterprise in neighbor regions in which favorable tax policy is offered so as to lower the exit cost.

4. Exit-voice game: the extended model

4.1 Structure of the game

In the real world, firm may hold private information of exit cost that causes information asymmetry problem in the game against local government. By introducing an artificial player, Nature, we extend the basic model with imperfect information in which Nature firstly decides firm type of exit cost with probability p_L ($\in (0,1)$) for low exit cost C_{EL} and $1-p_L$ for high one C_{EH} . Figure 3 gives the extensive-form representation of the game. The dashed line denotes the same information set for local government who doesn't know firm's type of exit cost but only its probability distribution. Considering 12 possible cases of combination of C_V , C_{EL} , C_{EH} , and $(r-r_L)R$, we suppose $C_V < C_{EL} < (r-r_L)R < C_{EH}$, i.e. voice is always profitable to firm, and keep the analysis within an operable bound. Furthermore, this assumption is in accordance with the real world and offers the most interesting economic implications. Other things are the same as those in Figure 1.

4.2 Nash equilibria and propositions

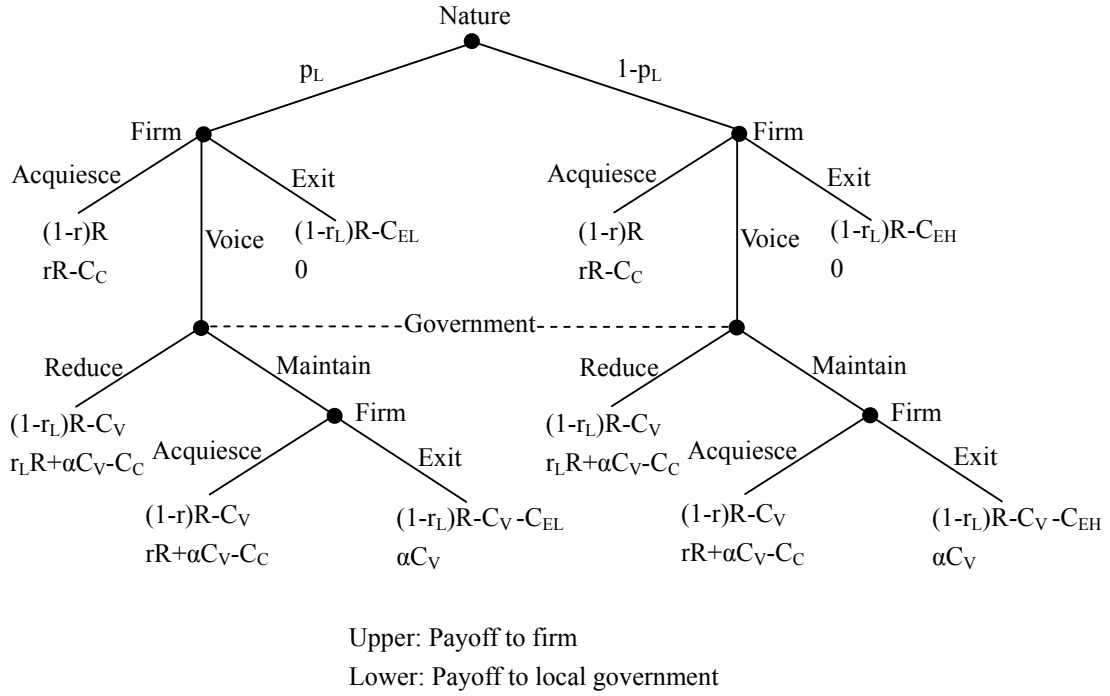
Combining backwards induction technique and strategic form (Appendix 3), we have such Nash equilibria and propositions⁵:

Proposition 4: If $C_V < C_{EL} < (r-r_L)R < C_{EH}$ and $p_L < (r-r_L)R/(rR-C_C)$, low-exit-cost-type firm will exit and high-exit-cost-type firm will acquiesce the present tax rate.

⁵ We concentrate on the pure-strategy Nash equilibria in this paper but we give the results of mixed-strategy Nash equilibria in Appendix 3.

Proposition 5: If $C_V < C_{EL} < (r-r_L)R < C_{EH}$ and $p_L \geq (r-r_L)R/(rR-C_C)$, low-exit-cost-type firm will exit and high-exit-cost-type firm will acquiesce the present tax rate or both types of firm will voice while local government will response to reduce tax rate.

Figure 3 Extensive form of the extended model



4.3 Implications of the extended model

Holding a little private information of the exit cost, the firm has advantage in the game. One straightforward outcome is that no matter what the probability of low exit type is, the low-exit-type firm chooses exit and high-exit-type firm chooses acquiescence. Either action will end the game in the first stage as shown in the equilibrium outcome in Proposition 4 and 5 (Figure 4). However, another interesting implication is when the probability p_L is higher than $(r-r_L)R/(rR-C_C)$, the high-exit-cost-type firm might bluff local government into believing that it has low exit cost and is able to move, thereby forcing local government to give preferential tax treatments. Due to such information asymmetry, the less mobile firm might mimic behaviors of those high and pretend to be low exit cost type. The firm will adopt the organization forms with high mobility such as holding company or group

management system, diversify investments in different regions and practice voice to local government.

Figure 4 Equilibrium outcome of the extended model

		Probability of low-exit-cost	
		Low	High
Voice cost	Low	4: {Exit, Acquiesce}	5: {Exit, Acquiesce} 5: {Voice, Voice}/{Reduce}
	High		

$p_L = (r - r_L)R / (rR - C_C)$

5. Empirical case

We present three empirical cases of different types of firm to illustrate the implications of our model, showing how exit and voice cost influence firm's behavior and leads to dynamic interaction between the firm and local government. These three cases are Procter & Gamble (foreign enterprise), Shenzhen Changhong (foreign investment enterprise) and Wenzhou Sanlian (domestic private enterprise) ⁶.

5.1 Case 1: Procter & Gamble

In 1980s, Procter & Gamble launched a joint venture, Procter & Gamble-Hutchison Ltd. (P&G-H), with Hutchison Whampoa (China) Ltd (HWCL), a Hong Kong-based company who has extensive relations with Chinese government (with P&G holding 69.25 per cent and HWCL 30.75 per cent). Under the help of HWCL, P&G set up Guangzhou P&G with Guangzhou Soap Factory (GSF) and the Import and Export Trade Corporation for Construction of Guangzhou Economic and Technological Development Zone (GETDZ) in August 1988. The registered capital was \$10 million (GSF 25 per cent, GETDZ 5 per cent and P&G-H 70 per cent). After then, P&G rapidly expanded operations in China: Guangzhou P&G Paper Products Ltd started in 1990; Beijing and Shanghai Branches in 1991; Guangzhou P&G Detergent Products Ltd in 1992; Beijing Panda P&G, Chengdu P&G and Tianjin P&G in 1993; Guangzhou Lonkey P&G in 1994; Guangzhou P&G Oral Care Products Ltd in 1995,

⁶ The case study bases on interviews, document data (e.g. www.pg.com, www.sz-changhong.com, www.sz-changhong.com), and other publications (e.g. Dyer, D., Dalzell, F. and Olegario, R. (2004). *Rising Tide: Lessons from 165 Years of Brand Building at Procter & Gamble*. Harvard Business School Press.).

etc. Until now, P&G has thirteen joint ventures and wholly owned companies -- located in Guangzhou, Beijing, Shanghai, Chengdu, Tianjin and Suzhou.

In addition to market factors why P&G rushed to expand operations in other regions, to enhance mobility and spread risks are significant two motivations behind such expanding strategy. In 1993, the establishment of P&G (China), a holding company, further served proceeding two purposes in that such organization form allows capital, information, raw material, products and so on to be easily reallocated and exchanged among affiliated enterprise, thereby dramatically cutting down the local dependence and exit cost of certain subsidiary in a locality. P&G not only implement tax planning by shifting income between subsidiaries in different regions via transfer pricing but also use financial techniques such as thin capitalization (debit and credit between affiliated enterprises) to lessen corporate income tax burden. In 2002, Guangzhou P&G took a substantive loan of 2 billion RMB and lent them to its affiliated enterprises free of interests. Therefore, Guangzhou P&G manipulated income tax base by both deducting itself interest cost from profit before tax and escaping taxable interest income from its affiliated enterprises and evaded 81.5 million RMB of due tax payment (CBT, 2004).

Furthermore, P&G dedicates arduous efforts to cultivate strong relationships with government officials at the national and especially provincial and local levels. During period of 1996-2003, P&G's donation to China's rural education, Project Hope, has added up to 16 million RMB with 100 primary schools in 27 provinces. P&G also donated 10.7 million RMB to Tsinghua University, 7 million RMB to Ministry of Education, 1.5 million to China Wildlife Conservation Foundation for Panda, 1 million RMB to 1999 World Gymnastics Championships (Tianjin), 3 million RMB to the Beijing 2008 Olympic Games, etc. Thus, the CEO of Greater China P&G has been awarded to meet high-ranking government officials, including former Premier Zhu Rongji and Li Peng, former Vice Premier Qian Qichen, Wu Xueqian and Tian Jiyun and mayors of Beijing, Shanghai and Guangzhou, etc. In 1998, Mr. Dimitri

Panayotopoulos, former CEO of Greater China P&G, was honored with Glory Citizen by Guangzhou government. Depending on such solid networks with governments at all levels, P&G might voice for unusual concessions from them such as special generous treatment or other requirement. For instance, State Administration of Taxation (Guangdong) granted P&G special tax deduction of 86.8 million RMB for disposal of asset loss in 2002⁷. In the same year, Guangzhou government also yielded up its shares in the joint venture, Guangzhou P&G, since P&G phased in its wholly owned strategy in China and then menaced to move to Tianjin if such requirement was unable to be fulfilled. As a result, P&G controlled 99 per cent shares of Guangzhou P&G and left only 1 per cent to Guangzhou government as a symbol.

5.2 Case 2: Shenzhen Changhong

Founded in 1997, Shenzhen Changhong (SZCH) specializes in manufacturing precision moulds and becomes a leading company in the mould industry. SZCH has total asset of 130 million RMB and 288 employees, whose accumulated sales revenue and net profits is more than 90 million RMB and 20 million RMB since 2001. Its key customers include Panasonic, Konica-Minolta, Canon, Epson, Brother, Sony, Samsung, Sharp, and Ricoh and the like. In 2002, Hongkong Changhong (HKCH) was established to deal with import and export trade. Two years later, a joint venture, Shanghai Changmei (SHCM), was founded with registered capital of 18 million RMB (HKCH 70 per cent and SZCH 30 per cent).

SZCH has three shareholders: Mr. Li (80 per cent), Hua (10 per cent) and Xu (10 per cent), who are townies and have known each other for ten years. They all have extensive *guanxi* network with local officials. In particular, Mr. Hua invests substantive time and money to cultivate an intimate *guanxi* network with several local officials of Shenzhen LG district, such as Mr. Zhang, director of Bank of China, Mr. Peng, director of Economic and Trade Bureau, Mr. Xiong, director of Science and

⁷ On July 2 2004, State Administration of Taxation (Guangdong) issued a circular (Yu Guoshui Han [2004] 333) to authorize Guangzhou Municipal Office on offering P&G special tax deduction of 86.8 million RMB for disposal of asset loss in 2002.

Technology Bureau, and Mr. Wang, governor of PS Township. Therefore, SZCH benefits a lot from this network. In 2003, Mr. Xiong accredited SZCH as the Shenzhen New & High-Tech Company that lent various preferential policy packages to SZCH, including three-year-tax-exempt and six-year-half-tax-duty (corporate income tax, CIT), tax-exempt of import equipment, low-price-land and low-interest-loan. Furthermore, due to the New & High-Tech qualification, Mr. Peng granted 50 million RMB quota of interest-exempt loan and then Mr. Zhang loaned 45 million RMB to SZCH. Meanwhile, these three entrepreneurs purchased 25,000 sq. m. lands from Mr. Wang in PS Township with a low price of 160 RMB per sq. m., which saved 8.5 million RMB according to the normal market price. In 2004, they moved from AL Township to the new factory built in PS Township. Although the relocation lasted for three months, the total exit cost was not so much because the AL and PS Township are located in the same LG district. Meanwhile, aiming to spread risk and increase mobility, they also invested a joint venture (SHCM) with HKCH in Shanghai, in which they enjoy two-year-tax-exempt and three-year-half-tax-duty (CIT). However, they regard SHCM as a backup to easily reallocate asset in case that SZCH goes to bankrupt or to strengthen their bargaining power for more preferential policy treatment from PS township government.

5.3 Case 3: Wenzhou Sanlian

In his hometown AJ Township, P County, Mr. Wang set up Wenzhou Sanlian (WZSL) to produce gear units in 1985. After twenty years development, WZSL becomes a group company with total asset of 200 million RMB and 500 employees, diversifying in several sectors of variable speed machinery, real estate, fancy paper, and water supply.

As a local people and former chairman of Private Entrepreneur Association, Mr. Wang embraces an extensive and embedded *guanxi* network in P County that greatly facilitates his business. For instance, WZSL was accredited as Wenzhou New & Hi-Tech Company in 2000 and therefore enjoyed a three-year-tax-exempt (CIT) and

purchased 34,000 sq. m. land in the industry park with only 225 RMB per sq. m (market price 600 RMB per sq. m). However, a political struggle between the governor, Mr. Dai, and party secretary, Mr. Cao, of P County nearly destroyed his *guanxi* network and business in 2002 since his political friends from both sides betrayed him. The aftermath spread to the co-project with P county government on water supply (county government 51 per cent, Mr. Wang 49 per cent), which not only cost him 50 million RMB, but also brought two million RMB loss every year because the county government refuse to implement their agreement to purchase the water at the price of 1.55 RMB per ton and force Mr. Wang to accept the price of 0.6 RMB with the menace of tax inspection on WZSL and withdraw the preferential tax treatment. Thus, Mr. Wang considered moving out.

In 2003, the governor of Y County, Shangdong Province, thousands kilometers far from Wenzhou, came to attract investment by offering preferential policy package of five-year-tax-exempt and five-year-half-tax-duty (CIT), free of land (only 7 RMB per sq. m.) and sufficient bank loan. With regard to such attractive offer, Mr. Wang purchased 134,000 sq. m. land and got a loan of 20 million RMB from Construction Bank Y County branch to build a new factory there. Yet, Mr. Wang underestimated the exit cost in that the total shift will stop production for at least half year that will accrue a significant loss of 20 million RMB. Political risk in Y County, Shangdong Province, is another unstable factor. The government officials there are even more corrupt and less creditable and accountable than those in P County, Wenzhou. Consequently, Mr. Wang decided to temporarily move ten per cent of production capacity to his new factory in 2004 and leave the final decision to next year. When government officials of P County were aware of Mr. Wang's exit, they conceded by appropriating provincial earmarked grants of 20 million RMB to the loss-making water-supply co-project and negotiating with Industrial & Commercial Bank P County branch for offsetting total 69 million RMB long-term loan on the water-supply company by only returning 40 million RMB. Furthermore, WZSL was accredited as Wenzhou New & Hi-tech Company and thus granted a three-year tax holiday again in

2004.

6. Conclusion

The complex interplay between exit and voice hampers further empirical application of Hirschman's theory because of a lack of clarity in that too many situations may happen to determine different possible results: the exit may surpass voice and *vice versa*, or voice may join exit as a mixed strategy, or both options would be abandoned. Moreover, vague notion of voice weakens its operation. No rigorous methodology or decent research is conducted to address such problems (Dowding, *et al.*, 2000).

From the point view of transaction cost economics, we clarify the critical factors of relative cost of exit and voice and information structure that ultimately decide the outcomes, especially, in the case of exit-voice game between firm and government for preferential tax treatments in local China. Given the Chinese characteristic, firms voice via cultivating, maintaining and expanding *guanxi* network with government officials at all levels. A rational economizing of relevant transaction cost of exit-voice helps firm to create the right strategy against government. The possible outcomes, thus, depend on combinations of exit-voice cost. Particularly, in contrast to Hirschman's doubt that easy exit would undermine utilization of voice, the analysis suggests potential exit not only allures firm to opt for voice but also reinforces firm's voice. Acknowledging the essence of mobility, firm may carry out various measures in order to promote effective mobility or merely camouflage as a higher mobile firm to government who is unaware of exact exit cost. The information asymmetry facilitates firm to impose pressure on government by threat of migration to other regions.

The policy implication is that discriminated tax incentive is needed to deal with private information of mobility. For those relative immobile industries with heavy investment, government should fix and restrict tax policy while offer preferential tax menu to those others. Meanwhile, an information revealing mechanism should be

established to identify firm's type of exit cost. The annual financial audit report of accountant is a reliable source in that the investment level shows the degree of lock-in, which is sunk cost in a locality and the profit level presents its opportunity cost weighed in the exit-voice calculation. The level of voice investment in networks could also be checked as a parameter.

Appendix 1

Various national-level special zones

Special Zones	Number	Main preferential Taxation Policies (FIEs and FEs) ^a
Special Economic Zones (SEZ)	5	Corporate income tax rate at 15%.
Economic and Technological Development Zones (ETDZ)	54	Production-oriented enterprises are subject to corporate income tax rate at 15%.
Hi-Tech Industry Development Zones (HTIDZ)	53	High or new technology enterprises are subject to corporate income tax rate at 15%.
Free Trade Zone (FTZ)	15	Export-oriented enterprises are subject to corporate income tax rate at 15%.
Border Economic Cooperation Zone (BECZ)	14	Two-year-exemption of corporate income tax and three-year-reduction of 50% since profitable year.
Export Processing Zone (EPZ)	38	VAT refund on export goods.
Tourist and Holiday Resort (THR)	11	Corporate income tax rate at 24%.
Taiwanese Investment Zone (TIZ)	4	Corporate income tax rate at 15%.
Central and Western Regions of China	20	Similar to policies in SEZs and ETDZs.

^a Foreign investment enterprises (FIEs); Foreign enterprises (FEs).

Source: China Association of Development Zones (CADZ), www.cadz.org.cn

Appendix 2

Name list of 54 multinationals for joint-petition

ABB	EXXON MOBILE	NOKIA
ALCATEL	GE	OMRON
ALSTOM	GENERAL MILLS	ORACLE
AMAT	GM	OTIS
AMWAY	HONEYWELL	PANASONIC
BASF	HP	PEPSI
BAYER	IBM	PHILIPS
BP	IKEA	PRAXAIR
DEGUSSA	ITOCHU	SAMSUNG
DELL	KCC	SCHNEIDER
DELPHI	KODAK	SHELL
DHL	KRAFT	SIEMENS
DUPONT	LEXMARK	SOJITZ
E28	METRO	SONY
EFFEM	MICROSOFT	TNT
EMRSN	MOTOROLA	TOSHIBA
EPSON	NCR	UNILEVER
ERICSSON	NESTLE	YUM

Source: China Business Times, January 13, 2005, www.cbt.com.cn

Appendix 3

Nash equilibria of the extended model

Following backwards induction to solve this game for Nash equilibria, we start at the third stage in which firm maximized its payoff by choosing possible actions. A strategic form is presented to solve for equilibria in stage 1 and 2 due to asymmetric information problem.

A strategy of the firm in the third stage of the game has to specify two actions, i.e. the responses to government's Maintain action when firm is low or high exit cost type. Analogous to section 3.2, the Nash equilibrium strategy in the final stage of the game is:

Table 1 Firm's strategy in stage 3

Firm	(A_3, A_3)	when $(1-r)R-C_V > (1-r_L)R-C_V-C_{EL}$ and $(1-r)R-C_V > (1-r_L)R-C_V-C_{EH}$ $\Rightarrow (r-r_L)R < C_{EL} < C_{EH}$
	(E_3, A_3)	when $(1-r)R-C_V < (1-r_L)R-C_V-C_{EL}$ and $(1-r)R-C_V > (1-r_L)R-C_V-C_{EH}$ $\Rightarrow C_{EL} < (r-r_L)R < C_{EH}$
	(E_3, E_3)	when $(1-r)R-C_V < (1-r_L)R-C_V-C_{EL}$ and $(1-r)R-C_V < (1-r_L)R-C_V-C_{EH}$ $\Rightarrow C_{EL} < C_{EH} < (r-r_L)R$

Note: The subscript 3 denotes the third stage.

Considering 12 possible cases of combination of C_V , C_{EL} , C_{EH} , and $(r-r_L)R$ and to keep the analysis within an operable bound, we suppose $C_V < C_{EL} < (r-r_L)R < C_{EH}$, i.e. voice is always profitable to firm. Furthermore, this assumption is in accordance with the real world and offers the most interesting economic implications.

If $C_V < C_{EL} < (r-r_L)R < C_{EH}$, firm will choose (E_3, A_3) in the final stage. This strategy is incorporated in the strategic form of the first two stages in Table 2. The Nash-equilibrium response of the government is to choose Reduce when the firm chooses either (V_1, A_1) or (V_1, E_1) because $R_2 > M_2$; when the firm selects (A_1, V_1) or

Table 2 Strategic form of firm and government in stage 1 and 2

Firm	Government	
	R_2	M_2
(A_1, A_1)	$((1-r)R, rR-C_C)$	$((1-r)R, rR-C_C)$
(A_1, V_1)	$(p_L(1-r)R + (1-p_L)[(1-r_L)R-C_V], p_L(rR-C_C) + (1-p_L)(r_LR + \alpha C_V - C_C))$	$(p_L(1-r)R + (1-p_L)[(1-r)R-C_V], p_L(rR-C_C) + (1-p_L)(rR + \alpha C_V - C_C))$
(A_1, E_1)	$(p_L(1-r)R + (1-p_L)[(1-r_L)R-C_{EH}], p_L(rR-C_C))$	$(p_L(1-r)R + (1-p_L)[(1-r_L)R-C_{EH}], p_L(rR-C_C))$
(V_1, A_1)	$(p_L[(1-r_L)R-C_V] + (1-p_L)(1-r)R, p_L(r_LR + \alpha C_V - C_C) + (1-p_L)(rR-C_C))$	$(p_L[(1-r_L)R-C_V-C_{EL}] + (1-p_L)(1-r)R, p_L\alpha C_V + (1-p_L)(rR-C_C))$
(V_1, V_1)	$((1-r_L)R-C_V, r_LR + \alpha C_V - C_C)$	$(p_L[(1-r_L)R-C_V-C_{EL}] + (1-p_L)[(1-r)R-C_V], p_L\alpha C_V + (1-p_L)(rR + \alpha C_V - C_C))$
(V_1, E_1)	$(p_L[(1-r_L)R-C_V] + (1-p_L)[(1-r_L)R-C_{EH}], p_L(r_LR + \alpha C_V - C_C))$	$(p_L[(1-r_L)R-C_V-C_{EL}] + (1-p_L)[(1-r_L)R-C_{EH}], p_L\alpha C_V)$
(E_1, A_1)	$(p_L[(1-r_L)R-C_{EL}] + (1-p_L)(1-r)R, (1-p_L)(rR-C_C))$	$(p_L[(1-r_L)R-C_{EL}] + (1-p_L)(1-r)R, (1-p_L)(rR-C_C))$
(E_1, V_1)	$(p_L[(1-r_L)R-C_{EL}] + (1-p_L)[(1-r_L)R-C_V], (1-p_L)(r_LR + \alpha C_V - C_C))$	$(p_L[(1-r_L)R-C_{EL}] + (1-p_L)[(1-r)R-C_V], (1-p_L)(rR + \alpha C_V - C_C))$
(E_1, E_1)	$(p_L[(1-r_L)R-C_{EL}] + (1-p_L)[(1-r_L)R-C_{EH}], 0)$	$(p_L[(1-r_L)R-C_{EL}] + (1-p_L)[(1-r_L)R-C_{EH}], 0)$

Note: The subscript 1 and 2 denotes the first and second stage, respectively.

(E_1, V_1) , the government will prefer Maintain, because $M_2 > R_2$; while the government will be indifferent facing firm's actions of (A_1, A_1) , (A_1, E_1) or (E_1, E_1) , because $M_2 = R_2$. If the firm chooses (V_1, V_1) , the payoff-maximizing strategy of the government depends on p_L versus $(r-r_L)R/(rR-C_C)$. When $p_L \geq (r-r_L)R/(rR-C_C)$, the government prefer Reduce to Maintain and vice versa.

Using iterated elimination of strictly dominated strategies for firm, it follows from Table 2 that $(A_1, A_1) < (V_1, V_1)$, $(A_1, V_1) < (E_1, V_1)$, $(A_1, E_1) < (V_1, E_1)$, $(V_1, A_1) < (V_1, V_1)$, $(V_1, E_1) < (V_1, A_1)$, $(E_1, A_1) < (E_1, V_1)$, $(E_1, E_1) < (E_1, V_1)$ and $(E_1, V_1) < (V_1, V_1)$ in the left column, i.e. government chooses Reduce. Similarly, in the right column of government's Maintain strategy, firm's payoff is as such: $(A_1, A_1) < (E_1, A_1)$, $(A_1, V_1) < (A_1, A_1)$, $(A_1, E_1) < (E_1, A_1)$, $(V_1, A_1) < (E_1, A_1)$, $(V_1, V_1) < (V_1, A_1)$, $(V_1, E_1) < (V_1, A_1)$, $(E_1, V_1) < (E_1, A_1)$ and $(E_1, E_1) < (E_1, V_1)$. Thus, simplify Table 2 into Table 3, we have Nash equilibria dependent on the value of p_L .

Table 3 Simplified strategic form of firm and government in stage 1 and 2

Firm	Government	
	R_2	M_2
(V_1, V_1)	$(\underline{(1-r_L)R-C_V}, r_LR+\alpha C_V-C_C)$	$(p_L[(1-r_L)R-C_V-C_{EL}]+(1-p_L)[(1-r)R-C_V],$ $p_L\alpha C_V+(1-p_L)(rR+\alpha C_V-C_C))$
(E_1, A_1)	$(p_L[(1-r_L)R-C_{EL}]+(1-p_L)(1-r)R,$ $(1-p_L)(rR-C_C))$	$(p_L[(1-r_L)R-C_{EL}]+(1-p_L)(1-r)R,$ $(1-p_L)(rR-C_C))$

Case 1: $p_L < (r-r_L)R/(rR-C_C)$

When $p_L < (r-r_L)R/(rR-C_C)$, government will prefer M_2 when firm chooses (V_1, V_1) (Table 4). We use a graphical representation to solve for the Nash equilibrium.

Table 4 The Nash equilibrium in stage 1 and 2 ($p_L < (r-r_L)R/(rR-C_C)$)

Firm	Government	
	R ₂	M ₂
(V ₁ , V ₁)	$((1-r_L)R-C_V, r_LR+\alpha C_V-C_C)$	$(p_L[(1-r_L)R-C_V-C_{EL}]+(1-p_L)[(1-r)R-C_V],$
(E ₁ , A ₁)	$(p_L[(1-r_L)R-C_{EL}]+(1-p_L)(1-r)R,$ $(1-p_L)(rR-C_C))$	$(p_L\alpha C_V+(1-p_L)(rR+\alpha C_V-C_C))$ $(p_L[(1-r_L)R-C_{EL}]+(1-p_L)(1-r)R,$ $(1-p_L)(rR-C_C))$

Suppose $(p, 1-p)$ be the mixed strategy in which firm chooses (V_1, V_1) with probability p ($\in [0,1]$) and (E_1, A_1) with $1-p$ and suppose $(q, 1-q)$ be government's mixed strategy choosing R_2 with probability q ($\in [0,1]$) and M_2 with $1-q$. If government plays $(q, 1-q)$, firm's expected payoffs are $P_{F(V, V)}=q[(1-r_L)R-C_V]+(1-q)\{p_L[(1-r_L)R-C_V-C_{EL}]+(1-p_L)[(1-r)R-C_V]\}$ from choosing (V_1, V_1) and $P_{F(E, A)}=q\{p_L[(1-r_L)R-C_{EL}]+(1-p_L)(1-r)R\}+(1-q)\{p_L[(1-r_L)R-C_{EL}]+(1-p_L)(1-r)R\}$ from choosing (E_1, A_1) . Then, the best-response correspondence of firm is (Figure 1):

$$p^*(q)= \begin{cases} 1 & \text{for } P_{F(V, V)} > P_{F(E, A)} \Rightarrow q > q' \text{ (} q'=C_V/[(1-p_L)(r-r_L)R+p_L C_{EL}]\text{)}; \\ 0 & \text{for } P_{F(V, V)} < P_{F(E, A)} \Rightarrow q < q'; \\ \in [0,1] & \text{for } P_{F(V, V)} = P_{F(E, A)} \Rightarrow q=q' \end{cases}$$

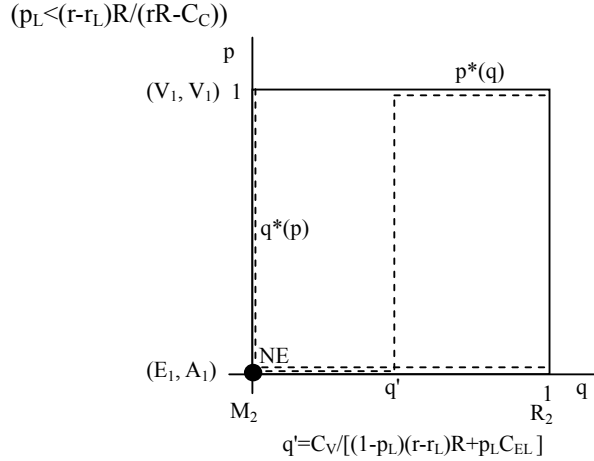
Similarly, if firm plays $(p, 1-p)$, government's expected payoffs are $P_{G(R)}=p(r_LR+\alpha C_V-C_C)+(1-p)(1-p_L)(rR-C_C)$ from choosing R_2 and $P_{G(M)}=p[p_L\alpha C_V+(1-p_L)(rR+\alpha C_V-C_C)]+(1-p)(1-p_L)(rR-C_C)$ from choosing M_2 . The best-response correspondence of government is:

$$q^*(p)= \begin{cases} 0 & \text{for } P_{G(R)} < P_{G(M)} \Rightarrow p > 0; \\ \in [0,1] & \text{for } P_{G(R)} = P_{G(M)} \Rightarrow p=0 \end{cases}$$

Thus, in Figure 1, the intersection of $p^*(q)$ and $q^*(p)$ is the horizontal segment: $(p=0, q < q')$. We have a pure-strategy Nash equilibrium: Firm (E_1, A_1) when $p=0$ and $q=0$

and a continuum of mixed-strategy Nash equilibria: Firm (E_1, A_1) and Government $(q, 1-q)$ when $q < q'$.

Figure 1 Graphical representation of firm and government's best-response correspondence



Case 2: $p_L > (r-r_L)R/(rR-C_C)$

When $p_L > (r-r_L)R/(rR-C_C)$, government will prefer R_2 when firm chooses (V_1, V_1) (Table 5).

Table 5 The Nash equilibrium in stage 1 and 2 ($p_L > (r-r_L)R/(rR-C_C)$)

Firm	Government	
	R_2	M_2
(V_1, V_1)	$((1-r_L)R - C_V, r_L R + \alpha C_V - C_C)$	$(p_L[(1-r_L)R - C_V - C_{EL}] + (1-p_L)[(1-r)R - C_V],$ $p_L \alpha C_V + (1-p_L)(rR + \alpha C_V - C_C))$
(E_1, A_1)	$(p_L[(1-r_L)R - C_{EL}] + (1-p_L)(1-r)R,$ $(1-p_L)(rR - C_C))$	$(p_L[(1-r_L)R - C_{EL}] + (1-p_L)(1-r)R,$ $(1-p_L)(rR - C_C))$

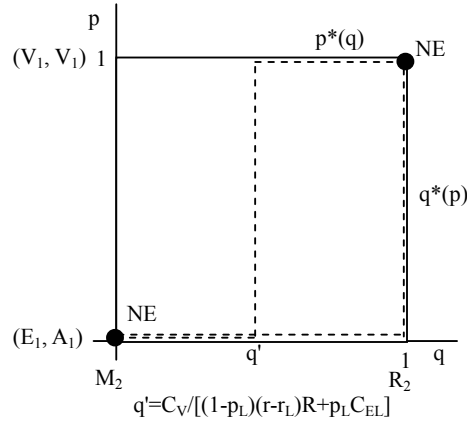
Analogous to Figure 1, the best-response correspondence of firm $p^*(q)$ in Figure 2 is:

i) if $q > q'$, $p^*(q)=1$; ii) if $q < q'$, $p^*(q)=0$; iii) if $q=q'$, $p^*(q) \in [0, 1]$. However, for the government:

$$q^*(p) = \begin{cases} 1 & \text{for } P_{G(R)} > P_{G(M)} \Rightarrow p > 0; \\ \in [0, 1] & \text{for } P_{G(R)} = P_{G(M)} \Rightarrow p = 0 \end{cases}$$

Thus, in Figure 2, there are two intersections of $p^*(q)$ and $q^*(p)$: $(p=1, q=1)$ and $(p=0, q=q')$. Therefore, we have two pure-strategy Nash equilibria: i) Firm (E_1, A_1) ; ii) Firm (V_1, V_1) and Government R_2 and a continuum of mixed-strategy Nash equilibria: Firm (E_1, A_1) and Government $(q, 1-q)$ when $q < q'$.

Figure 2 Graphical representation of firm and government's best-response correspondence ($p_L > (r-r_L)R/(rR-C_C)$)



Case 3: $p_L = (r-r_L)R/(rR-C_C)$

When $p_L = (r-r_L)R/(rR-C_C)$, government will be indifferent when firm chooses (V_1, V_1) (Table 6).

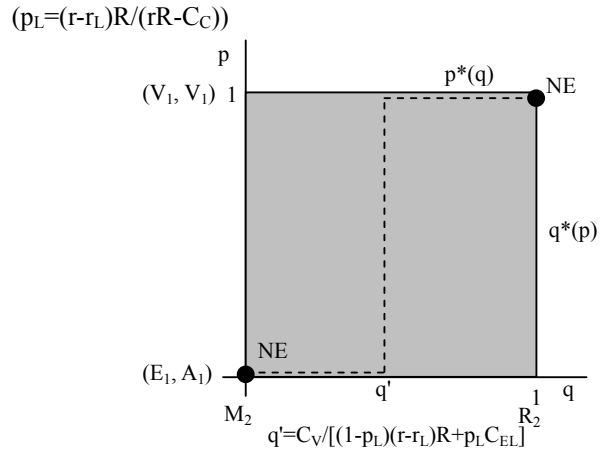
Table 6 The Nash equilibrium in stage 1 and 2 ($p_L = (r-r_L)R/(rR-C_C)$)

Firm	Government	
	R_2	M_2
(V_1, V_1)	$((1-r_L)R - C_V, r_L R + \alpha C_V - C_C)$	$(p_L[(1-r_L)R - C_V - C_{EL}] + (1-p_L)[(1-r)R - C_V],$ $p_L \alpha C_V + (1-p_L)(rR + \alpha C_V - C_C))$
(E_1, A_1)	$(p_L[(1-r_L)R - C_{EL}] + (1-p_L)(1-r)R,$ $(1-p_L)(rR - C_C))$	$(p_L[(1-r_L)R - C_{EL}] + (1-p_L)(1-r)R,$ $(1-p_L)(rR - C_C))$

Since government's expected payoffs of R_2 equals to that of M_2 ($P_{G(R)} = P_{G(M)}$) if firm plays $(p, 1-p)$, the government is indifferent to choose either R_2 or M_2 for any value of p (the whole dark square in Figure 3). Thus, the intersection of $p^*(q)$ and $q^*(p)$ is the value of firm's best-response correspondence $p^*(q)$. We have two pure-strategy Nash

equilibria: i) Firm (E_1, A_1) ; ii) Firm (V_1, V_1) and Government R_2 and a continuum of mixed-strategy Nash equilibria: i) if $q > q'$, $p^*(q)=1$ and if $q < q'$, $p^*(q)=0$, as indicated by two horizontal segments of $p^*(q)$ in Figure 3; ii) if $q=q'$, $p^*(q')$ is the entire interval $[0, 1]$, as indicated by the vertical segment of $p^*(q)$.

Figure 3 Graphical representation of firm and government's best-response correspondence



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