

MANAGER & POLITICIAN INTERACTION

by

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Abstract

In this study, we examine how politician influence affects firms in international competition. More specifically, we use a base model in which firms classified according to two basic rights of corporate governance, namely control right and cash flow right, may be allocated to politicians or managers. We use this model to analyze market outcomes for monopoly and international duopoly. By using these market outcomes, we try to understand mechanism beyond transfer of rights and effects of different firm governance structures on market outcomes.

YÖNETİCİ VE POLİTİKACI ETKİLEŞİMİ

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Özet

Bu çalışmada politik etkinin uluslararası rekabet üzerindeki etkileri incelenmektedir. Firmaları sınıflandırmak için literatürde sıkça kullanılmış olan kontrol hakkı ve nakit akış hakkı kullanılmıştır. Bu iki hak üzerinden kurmuş olduğumuz model ile tekel ve uluslararası duopol piyasalarını politik baskının olduğu ve olmadığı durumlarda incelenmektedir. Bu piyasaları inceleyerek hangi durumlarda politikacıların farklı firma yönetim türleri seçtiğini anlamaya çalışmıştır.

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1 Introduction

An important phenomenon in international trade today is the presence of firms with varying degrees of government control. Politician influence on firms is a very common experience. There are several national champions in world markets, especially in those with high fixed costs. Due to market structures, firms under political pressure have substantial market power. A well-known example is Gazprom, which produces %20 of global gas production. Politicians are not profit maximizers. They have other concerns such as diplomacy, rent seeking or international political rivalry.

Gazprom is a tremendous tool at the hands of Russian politicians to deal with anti-Russian movements in the neighboring countries. Belarus, having good relations with Russia, take advantage of low price in importing gas. On the other hand, Ukraine, having good relations with the USA, experiences high prices in importing gas. One other example of Turkey is the Turk Telekom privatisation case. Before privatisation, politician pressure led to high numbers of employment. However after privatisation, Turk Telekom fired nearly half of the employees.

Although there is a wide literature on imperfect competition between firms in international markets, the role of politician influence on international competition, and the interaction between competition and firms' ownership structure has not been examined.

While politicians may have various objectives to influence firms, here we restrict ourselves to one particular objective: Following Shleifer and Vishny(1994), we assume that politicians get utility from excess labor, though we set up a model in a slightly different manner as we discuss below.

We define two rights to model governance structure of a firm. The first one is control right. Shleifer and Vishny(1994) defines control right as right to choose excess labor. In this paper we define control right as right to choose output level. The key difference between this thesis and Shleifer and Vishny(1994) is that they assume marginal product of excess labor equals to zero. In this paper, we do not need such a strong assumption. Following Shleifer and Vishny(1994), we assume control right can belong to the politician or the manager. The second right is cash flow right. Cash flow right is a right to determine cash transfer from Treasury to the firm. In this paper, we assume that cash flow right can belong to only the politician.

The purpose of the thesis is to examine the interaction between ownership structure and competition in international markets. In particular, we study the impact of the distribution of control rights between politicians and managers on competition between firms in duopoly framework.

We start the analysis with the case of a monopoly with potential politician influence meaning under “politician control”. Then we start to analyze the case of a monopoly without politician influence meaning under “manager control”. We assume that firms with politician influence have some sort of productive inefficiency due to multiplicity of political objectives. To capture this fact, we assume manager control results in an increase in productive efficiency. After we fully set up the model for the monopoly case, we study market outcomes under politician and manager control.

We then analyze the effects of liberalization. In particular in the rest of the thesis, we examine an international market where there are two firms from different countries (Home and Foreign). We label Home firm as the first firm and we denote Home firm’s parameters and variables with subscript 1. In addition, Foreign firm is labeled as the second firm and we denote Foreign firm’s parameters and variables with subscript 2.

We try to answer the following questions:

- How does the distribution of control right affect market outcomes?
- Under which conditions would the politician be willing to transfer control rights?
- How does liberalization affect the governance structure of the firm?
- How does governance structure of the rival firm affect competitive behaviour and distribution of control right in Home firm?
- How does market structure affect governance structure of the firms?
- Under what conditions does a transormation(transfer of the control right to manager) occur in the context of international competition? In particular, we try to determine the necessary productive efficiency gain that is required to provide incentives to politicians to transfer control rights.
- Which governance structures may be observed in an international market as a Nash equilibrium?

This paper builds upon mainly two papers. Shleifer and Vishny(1994) presented a model that explained many stylized fact about the relationship between politicians and managers. They introduced two “rights” to analyze the relationship. The first one is “control right” i.e right to choose employment level. The latter one is “cash flow right” i.e right to choose level of transfer from Treasury to firm. They try to classify firms according to the governance structure of the firms. Although they explain many stylized facts, their analysis is limited due to zero productivity of excess labor assumption i.e excess labor hired by politician produces nothing.

Boycko et al(1996) develops a model based on Shleifer and Vishny(1994) and claims that subsidizing private firms may have more political cost than hiring more excess labor for state firms. In other words, they try to find which of these two rights(control right and cash flow right) is more valuable for the politician. They treat having control right and cash flow right as substitutes for politician. They figure out that control right is a better tool at the hands of the politicians.

Chong and Gradstein(2007) tests the influence of firms on government policies. They look on the other way of the relationship between politicians and managers. They set up a different model in which managers try to influence politicians by bribing them. The empirical results show that politicians make decision in the favor of the firms with high politician influence and large firms which may offer huge bribes. They show that large, government-owned firms have a better influence on government policies and legislation than the others.

This paper is the first paper which introduces international competition to this relationship. As international trade becomes more valuable for economists, we believe that changes in the structure of international trade will affect the interaction between politicians and managers.

The thesis is organized as following. In section 2, we theoretically answer the questions above. In section 3, we analyze theoretical results we find in section 2. Finally section 4 concludes.

2 The Model

2.1. Basics of the Model

In this paper, we provide a model to answer the following questions:

- How does competition affect governance structure of the firms?
- How do different governance types affect the market outcome?

To answer the questions above we should specify two agents for this model:

- Politician
- Manager

To point out the difference between different types of governance structures we specify two types of rights which can be owned by the politician and the manager very similar to Shleifer et al(1994):

- Control right: Control right is the right to choose production level of the firm. In this paper we assume that the it can be owned by both of the politician and the manager,
- Cash flow right: Cash flow right is the right to choose the transfer level from treasury to the firm. In this paper, we treat this right as a politician owned right. In other words, only politician can choose the level of subsidy.

In our study, if the control right is owned by politician we refer this type of firm as “politician controlled firm” and if the control right is owned by manager we refer this type of firm as “manager controlled firm”.

In this paper, we try to analyze the outcome of competition between firms with different governance types. We analyze 5 possible scenarios:

- Politician controlled firm under monopolistic market,
- Manager controlled firm under monopolistic market,
- Competition between two politician controlled firms,
- Competition between a politician controlled firm and a manager controlled firm,
- Competition between two manager controlled firms,

To represent the preferences of the politician and the manager, we use similar preferences with Boycko et al(1996).

The preference of politician is represented by the following utility function (U^p):

$$U^p = \gamma q - T$$

Here q is the level of production, which is directly a function of employment level. Therefore we assume that marginal utility of employment(γ) is positive.

T is the level of transfer from the treasury to private shareholders of the firm. We do not allow T become negative because otherwise it is a violation of private property rights. If we allow T can become negative then politician will never give up control right. For simplicity, we assume that marginal political cost of transfer is fixed and is equal to one.

The preference of the manager is represented by the following utility function (U^m):

$$U^m = \alpha\pi(q) + T$$

Here α represents share of the firm owned by private investors. “ π ” is the level of profit and T represents the level of transfer.

In a politician controlled firm, the politician aims to maximize his utility subject to a participation constraint:

$$\begin{aligned} \max_{q,T} \quad & \gamma q - T \\ \text{st:} \quad & \alpha\pi(q) + T \geq 0 \end{aligned}$$

Here the participation constraint represents that private share of profit after transfer is non-negative.

In manager controlled firm, the politician determines the level of transfer and the manager determines the level of production. One major difference between politician controlled firm and manager controlled firm is concerning the level of productivity. It is a fact that under politician control inefficiency is observed in production level. To capture this fact we assume that a manager controlled firm has productivity level of a where $a > 1$

Politician’s problem:

$$\begin{aligned} \max_T \quad & \gamma q - T \\ \text{st:} \quad & \alpha\pi(q) + T \geq 0 \end{aligned}$$

Manager’s problem:

$$\max_q \quad \alpha\pi(q) + T$$

2.2. Politician Controlled Firm Under Monopolistic Framework

To analyze a firm controlled by politician under monopolistic market, we need the following assumptions:

- Demand Schedule: $p = A - q$
- Production function under politician control: $q = l$
- Wage Schedule: $w = 1$
- $q \geq 0$; $p \geq 0$

Under the assumptions above we can rewrite the politician's problem as the following:

$$\begin{aligned} & \max_{q,T} \quad \gamma q - T \\ \text{st:} \quad & \alpha[(A - q)q - q] + T \geq 0 \end{aligned}$$

Optimal values as follows:

$$\text{Production level: } q = \frac{1}{2}[(A - 1) + \frac{\gamma}{\alpha}]$$

$$\text{Price level: } p = \frac{1}{2}[(A + 1) - \frac{\gamma}{\alpha}]$$

$$\text{Level of transfer: } T = \alpha \frac{1}{4} \left[\left(\frac{\gamma}{\alpha} \right)^2 - (A - 1)^2 \right]$$

$$\text{Utility of politician: } U^p = \alpha \frac{1}{4} \left[(A - 1) + \left(\frac{\gamma}{\alpha} \right) \right]^2$$

The comparative statics for the politician controlled firm is as follows:

- $\frac{\partial q}{\partial A} = \frac{1}{2} > 0$
- $\frac{\partial p}{\partial A} = \frac{1}{2} > 0$
- $\frac{\partial T}{\partial A} = -\alpha \frac{1}{2}(A - 1) < 0$
- $\frac{\partial UP}{\partial A} = \alpha \frac{1}{2}[(A - 1) + \left(\frac{\gamma}{\alpha}\right)] > 0$

An increase in demand leads to an increase in the optimal level of output. In addition to that it increases the level of profit which causes a decrease in the level of transfer. As a result, a higher demand schedule increases the utility of politician.

- $\frac{\partial q}{\partial \gamma} = \frac{1}{2}\left(\frac{1}{\alpha}\right) > 0$
- $\frac{\partial p}{\partial \gamma} = -\frac{1}{2}\left(\frac{1}{\alpha^2}\right) < 0$
- $\frac{\partial T}{\partial \gamma} = \frac{1}{2}\left(\frac{\gamma}{\alpha}\right) > 0$
- $\frac{\partial UP}{\partial \gamma} = \frac{1}{2}[(A - 1) + \left(\frac{\gamma}{\alpha}\right)] > 0$

An increase in political return of excess labor leads to an increase in the optimal level of output. On the other hand, due to decrease in relative cost of transfer(α/γ) the optimal level of transfer increases. The net effect of these two effects is positive. In other words, an increase in marginal benefit of production(γ) leads to an increase in utility of politician.

- $\frac{\partial q}{\partial \alpha} = -\frac{1}{2}\left(\frac{\gamma}{\alpha^2}\right) < 0$
- $\frac{\partial p}{\partial \alpha} = \frac{1}{2}\left(\frac{\gamma}{\alpha^2}\right) > 0$
- $\frac{\partial T}{\partial \alpha} = -\frac{1}{4}\left[\left(\frac{\gamma}{\alpha}\right)^2 + (A - 1)^2\right] < 0$
- $\frac{\partial UP}{\partial \alpha} = -\frac{1}{4}\left[\left(\frac{\gamma}{\alpha}\right)^2 - (A - 1)^2\right] < 0$

An increase in private share(α) leads to an increase in relative cost of transfer (α/γ). Due to this effect, it leads to a decrease in optimal output level and an decrease in the optimal level of transfer. The net effect of these two effects is negative. In other words, an increase in private share (α) leads to a decrease in utility of politician.

2.3. Manager Controlled Firm Under Monopolistic Framework

Manager governance brings more productivity to firm. To capture this fact we assume that the production function is different than the that when firm is controlled by the politician. Manager controlled firm has a better productivity level which is denoted as "a" whereas in politician controlled firm marginal product of labor equals to 1. To analyze a firm controlled by manager under monopolistic market, we need the following assumptions:

- Demand Schedule: $p = A - q$
- Production function under politician control: $q = al$
- Wage Schedule: $w = 1$
- $q \geq 0$ $p \geq 0$

Under the assumptions above we can rewrite the manager's problem as the following:

$$\max_q \quad \alpha[(A - q)q - \frac{1}{a}q] + T$$

We can also rewrite the politician's problem as the following:

$$\begin{aligned} \max_T \quad & \gamma q - T \\ \text{st:} \quad & \alpha[(A - q)q - \frac{1}{a}q] + T \geq 0 \end{aligned}$$

Optimal Values:

$$\text{Production level: } q = \frac{1}{2} \left(A - \frac{1}{a} \right)$$

$$\text{Price level: } p = \frac{1}{2} \left(A + \frac{1}{a} \right)$$

$$\text{Transfer level: } T = 0$$

T negatif olamayacağı için sıfır.

$$\text{Utility of Politician: } U^p = \gamma \frac{1}{2} \left(A - \frac{1}{a} \right)$$

The analysis of the politician controlled firm is as the following:

- $\frac{\partial q}{\partial A} = \frac{1}{2} > 0$
- $\frac{\partial p}{\partial A} = \frac{1}{2} > 0$
- $\frac{\partial U^p}{\partial A} = \frac{1}{2} \gamma A > 0$

An increase in demand increases optimal level of production. Since the transfer equals to zero for manager controlled firm, total utility of politician increases due to an increase in demand.

- $\frac{\partial U^p}{\partial \gamma} = \frac{1}{2} \left(A - \frac{1}{a} \right) \geq 0$

Since the politician does not control the level of production in the case of the manager controlled firm, the level production and transfer do not change due to an increase in political marginal benefit of excess labor. As a result, an increase in political marginal benefit of excess labor only increases the total utility of the politician.

- $\frac{\partial q}{\partial a} = \frac{1}{2}\left(\frac{1}{a^2}\right) > 0$
- $\frac{\partial p}{\partial a} = -\frac{1}{2}\left(\frac{1}{a^2}\right) < 0$
- $\frac{\partial U^p}{\partial a} = \gamma\frac{1}{2}\left(\frac{1}{a^2}\right) > 0$

A higher productivity level leads to an increase in optimal level of production. Since the transfer equals zero for manager controlled firm, politician has a higher utility if the productivity level is higher.

2.4. Politician Controlled Firm against Politician Controlled Firm

After market liberalization we have two rival firms in the same market. We name the first firm as Home firm and the second firm as Foreign firm.

General assumption about the market structure is that:

Demand Schedule: $p = A - q_1 - q_2$

where q_1 is production level of Home firm and q_2 is production level of Foreign firm.

Problem of Home Politician :

$$\begin{aligned} & \max_{q_1, T_1} \quad \gamma_1 q_1 - T_1 \\ \text{st:} \quad & \alpha_1 (A - 1 - q_1 - q_2) q_1 + T_1 \geq 0 \end{aligned}$$

Problem of Foreign Politician:

$$\begin{aligned} & \max_{q_2, T_2} \quad \gamma_2 q_2 - T_2 \\ \text{st:} \quad & \alpha_2(A - 1 - q_1 - q_2)q_2 + T_2 \geq 0 \end{aligned}$$

Equilibrium Values:

$$\text{Home firm's production: } q_1 = \frac{1}{3}[(A - 1) + 2\frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}]$$

$$\text{Foreign firm's production: } q_2 = \frac{1}{3}[(A - 1) + 2\frac{\gamma_2}{\alpha_2} - \frac{\gamma_1}{\alpha_1}]$$

$$\text{Total production: } Q = \frac{1}{3}[2(A - 1) + \frac{\gamma_2}{\alpha_2} + \frac{\gamma_1}{\alpha_1}]$$

$$\text{Market Price: } p = \frac{1}{3}[A + 2 - \frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}]$$

$$\text{Home firm's market share: } S_1 = [(A - 1) + 2\frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}] / [2(A - 1) + \frac{\gamma_2}{\alpha_2} + \frac{\gamma_1}{\alpha_1}]$$

$$\text{Foreign firm's market share: } S_2 = [(A - 1) + 2\frac{\gamma_2}{\alpha_2} - \frac{\gamma_1}{\alpha_1}] / [2(A - 1) + \frac{\gamma_2}{\alpha_2} + \frac{\gamma_1}{\alpha_1}]$$

$$\text{Home firm's profit: } \pi_1 = \frac{1}{9}[(A - 1) + 2\frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}][(A - 1) - \frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}]$$

$$\text{Foreign firm's profit: } \pi_2 = \frac{1}{9}[(A - 1) + 2\frac{\gamma_2}{\alpha_2} - \frac{\gamma_1}{\alpha_1}][(A - 1) - \frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}]$$

$$\text{Home firm's transfer: } T_1 = -\alpha_1 \frac{1}{9}[(A - 1) + 2\frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}][(A - 1) - \frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}]$$

$$\text{Foreign firm's transfer: } T_2 = -\alpha_2 \frac{1}{9}[(A - 1) + 2\frac{\gamma_2}{\alpha_2} - \frac{\gamma_1}{\alpha_1}][(A - 1) - \frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}]$$

$$\text{Home politician's utility: } U_1^p = \alpha_1 \frac{1}{9}[(A - 1) + 2\frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}]^2$$

$$\text{Foreign politician's utility: } U_2^p = \alpha_2 \frac{1}{9}[(A - 1) + 2\frac{\gamma_2}{\alpha_2} - \frac{\gamma_1}{\alpha_1}]^2$$

2.5. Politician Controlled Firm against Manager Controlled Firm

In this scenario, Foreign firm, the manager controlled firm, has a better productivity level (a_2) than the Home firm which is under politician control.

Problem of Home Politician:

$$\begin{aligned} \max_{q_1, T_1} \quad & \gamma_1 q_1 - T_1 \\ \text{st:} \quad & \alpha_1[(A - q_1 - q_2)q_1 - q_1] + T_1 \geq 0 \end{aligned}$$

Problem of Foreign Manager :

$$\max_{q_2} \quad \alpha_2[(A - q_1 - q_2)q_2 - (1/a_2)q_2] + T_2$$

Problem of Foreign Politician:

$$\begin{aligned} \max_{T_2} \quad & \gamma_2 q_2 - T_2 \\ \text{st:} \quad & \alpha_2[(A - q_1 - q_2)q_2 - (1/a_2)q_2] + T_2 \geq 0 \end{aligned}$$

Equilibrium Values:

$$\text{Home firm's production: } q_1 = \frac{1}{3}[(A - 1) + 2\frac{\gamma_1}{\alpha_1} - (1 - \frac{1}{a_2})]$$

$$\text{Foreign firm's production: } q_2 = \frac{1}{3}[(A - 1) + 2(1 - \frac{1}{a_2}) - \frac{\gamma_1}{\alpha_1}]$$

$$\text{Total production: } Q = \frac{1}{3}[(2A - 1) + \frac{\gamma_1}{\alpha_1} - \frac{1}{a_2}]$$

$$\text{Market price: } p = \frac{1}{3}[A + 1 - \frac{\gamma_1}{\alpha_1} + \frac{1}{a_2}]$$

$$\text{Home firm's market share: } S_1 = [(A - 2) + 2\frac{\gamma_1}{\alpha_1} + \frac{1}{a_2}]/[(2A - 1) + \frac{\gamma_1}{\alpha_1} - \frac{1}{a_2}]$$

$$\text{Foreign firm's market share: } S_2 = [(A + 1) - 2\frac{1}{a_2} - \frac{\gamma_1}{\alpha_1}]/[(2A - 1) + \frac{\gamma_1}{\alpha_1} - \frac{1}{a_2}]$$

$$\text{Home firm's profit: } \pi_1 = \frac{1}{9}[(A - 2) - \frac{\gamma_1}{\alpha_1} + \frac{1}{a_2}][(A - 2) + 2\frac{\gamma_1}{\alpha_1} + \frac{1}{a_2}]$$

$$\text{Foreign firm's profit: } \pi_2 = \frac{1}{9}[(A + 1) - 2\frac{1}{a_2} - \frac{\gamma_1}{\alpha_1}][(A + 1) - \frac{\gamma_1}{\alpha_1} - 2\frac{1}{a_2}]$$

$$\text{Home politician's transfer: } T_1 = -\alpha_1\frac{1}{9}[(A - 2) - \frac{\gamma_1}{\alpha_1} + \frac{1}{a_2}][(A - 2) + 2\frac{\gamma_1}{\alpha_1} + \frac{1}{a_2}]$$

$$\text{Foreign politician's transfer: } T_2 = 0$$

$$\text{Home politician's utility: } U_1^p = \alpha_1\frac{1}{9}[(A - 1) + 2\frac{\gamma_1}{\alpha_1} + \frac{1}{a_2}]^2$$

$$\text{Foreign politician's utility: } U_2^p = \gamma_2\frac{1}{3}[(A + 1) - 2\frac{1}{a_2} - \frac{\gamma_1}{\alpha_1}]$$

2.6. Manager Controlled Firm against Manager Controlled Firm

In this scenario, Home firm has productivity level of a_1 and Foreign firm has productivity level of a_2 .

Problem of Home Manager :

$$\max_{q_1} \quad \alpha_1[(A - q_1 - q_2)q_1 - (1/a_1)q_1] + T_1$$

Problem of Home Politician :

$$\begin{aligned} \max_{T_1} \quad & \gamma_1 q_1 - T_1 \\ \text{st:} \quad & \alpha_1[(A - q_1 - q_2)q_1 - (1/a_1)q_1] + T_1 \geq 0 \end{aligned}$$

Problem of Foreign Manager:

$$\max_{q_2} \quad \alpha_2[(A - q_1 - q_2)q_2 - (1/a_2)q_2] + T_2$$

Problem of Foreign Politician:

$$\begin{aligned} \max_{T_2} \quad & \gamma_2 q_2 - T_2 \\ \text{st:} \quad & \alpha_2[(A - q_1 - q_2)q_2 - (1/a_2)q_2] + T_2 \geq 0 \end{aligned}$$

Equilibrium Values:

$$\text{Home firm's production: } q_1 = \frac{1}{3}[A - 2\frac{1}{a_1} + \frac{1}{a_2}]$$

$$\text{Foreign firm's production: } q_2 = \frac{1}{3}[A - 2\frac{1}{a_2} + \frac{1}{a_1}]$$

$$\text{Total production: } Q = \frac{1}{3}[2A - \frac{1}{a_1} - \frac{1}{a_2}]$$

$$\text{Market price: } p = \frac{1}{3}[A + \frac{1}{a_1} + \frac{1}{a_2}]$$

$$\text{Home firm's market share: } S_1 = [A - 2\frac{1}{a_1} + \frac{1}{a_2}]/[2A - \frac{1}{a_1} - \frac{1}{a_2}]$$

$$\text{Foreign firm's market share: } S_2 = [A - 2\frac{1}{a_2} + \frac{1}{a_1}]/[2A - \frac{1}{a_1} - \frac{1}{a_2}]$$

$$\text{Home firm's profit: } \pi_1 = \frac{1}{9}[A - 2\frac{1}{a_1} + \frac{1}{a_2}][(A - 1) + \frac{1}{a_1} + \frac{1}{a_2}]$$

$$\text{Foreign firm's profit: } \pi_2 = \frac{1}{9}[A - 2\frac{1}{a_2} + \frac{1}{a_1}][(A - 1) + \frac{1}{a_1} + \frac{1}{a_2}]$$

$$\text{Home politician's transfer: } T_1 = 0$$

$$\text{Foreign politician's transfer: } T_2 = 0$$

$$\text{Home politician's utility: } U_1^p = \gamma_1 \frac{1}{3}[A - 2\frac{1}{a_1} + \frac{1}{a_2}]$$

$$\text{Foreign politician's utility: } U_2^p = \gamma_2 \frac{1}{3}[A - 2\frac{1}{a_2} + \frac{1}{a_1}]$$

3. General Results

3.1. Monopoly

In this section, we analyze the monopoly outcomes under politician control and manager control.

We first start with politician control. Let us remember market outcome under politician control:

$$\text{Production level: } q = \frac{1}{2}[A - 1 + \frac{\gamma}{\alpha}]$$

$$\text{Market price: } p = \frac{1}{2}[A + 1 - \frac{\gamma}{\alpha}]$$

$$\text{Profit: } \pi = \frac{1}{4}[(A - 1)^2 - (\frac{\gamma}{\alpha})^2]$$

$$\text{Level of transfer: } T = \alpha \frac{1}{4}[(A - 1)^2 - (\frac{\gamma}{\alpha})^2]$$

$$\text{Utility of politician: } U^p = \alpha \frac{1}{4}[(A - 1) + \frac{\gamma}{\alpha}]^2$$

If we compare this production level with ordinary monopoly production ($\frac{1}{2}(A - 1)$), we have an additional part ($\frac{1}{2}(\frac{\gamma}{\alpha})$). This part represents effect of politician influence in the firm. Notice that the additional part is positively correlated with politician interest (γ), meaning a higher politician interest to the firm leads to higher level of output. On the other hand, the additional part is negatively correlated with private share (α). A higher private share increases the required level of cash flow to the firm and that leads decreases the utility of the politician and the politician decrease output level.

If we compare the price level by ordinary monopoly level of price ($\frac{1}{2}(A + 1)$), we also have an additional part here ($-\frac{1}{2}\frac{\gamma}{\alpha}$). Due to politician influence we have higher level of output and lower level of price compared to ordinary monopoly market outcome.

Now, we start analyzing a monopoly firm under manager control. Let us remember market outcomes of this scenario:

$$\text{Production level: } q = \frac{1}{2}((A - 1) + (1 - \frac{1}{a}))$$

$$\text{Market price: } p = \frac{1}{2}((A + 1) - (1 - \frac{1}{a}))$$

$$\text{Profit: } \pi = \frac{1}{4}(A - \frac{1}{a})^2$$

$$\text{Level of transfer: } T = 0$$

$$\text{Utility of politician: } U^p = \gamma \frac{1}{2}(A - \frac{1}{a})$$

If we compare the production level with ordinary monopoly production ($\frac{1}{2}(A - 1)$), we have an additional part ($\frac{1}{2}(1 - \frac{1}{a})$). This part represents effect of productive efficiency due to manager control. Notice that a higher level of productivity (a) leads to more output and lower price.

Lastly, we analyze the necessary condition for transformation (transfer of control rights to manager). We assume that politician makes the decision about transformation. Because of this, politician must get a better utility from a manager controlled firm than a politician controlled one as a necessary condition for transformation:

$$\gamma \frac{1}{2}(A - \frac{1}{a}) \geq \alpha \frac{1}{4}((A - 1) + \frac{\gamma}{\alpha})^2$$

By using this inequality, we obtain a threshold level of productivity for transformation (a^*).

$$a^* = \frac{\frac{\gamma}{\alpha}}{2A\frac{\gamma}{\alpha} - ((A-1) + \frac{\gamma}{\alpha})^2}$$

We conclude that if manager control brings productivity above this level politician will choose transformation and for productivity levels below the threshold, we observe a politician controlled firm.

Now, let us analyze the threshold level. The relations between this threshold and parameters of the model are as the following:

- Politician interest (γ): Positively affects the threshold,
- Private share (α): Negatively affects the threshold,
- Market size(A): Positively affects the threshold.

To sum up, the necessary productive gain of transformation(transfer of the control rights to manager) must be high for transformation in the markets with

- high politician interest(γ_1),
- low degree of privitisation(α_1),
- high market size(A).

3.2. After Liberalization against a Politician Controlled Firm

In this section, we analyze potential market outcomes after market liberalization when Foreign firm is under politician control. We start with the market outcome when Home firm is also under politician control. to make the analysis, let us remember the market outcome if both firms are under politician control.

$$\text{Home firm's production: } q_1 = \frac{1}{3}[(A - 1) + 2\left(\frac{\gamma_1}{\alpha_1}\right) - \left(\frac{\gamma_2}{\alpha_2}\right)]$$

$$\text{Price level: } p = \frac{1}{3}[A + 2 - \left(\frac{\gamma_1}{\alpha_1}\right) - \left(\frac{\gamma_2}{\alpha_2}\right)]$$

$$\text{Home firm's profit: } \pi_1 = \frac{1}{9}[(A - 1) + 2\left(\frac{\gamma_1}{\alpha_1}\right) - \left(\frac{\gamma_2}{\alpha_2}\right)][(A - 1) - \left(\frac{\gamma_1}{\alpha_1}\right) - \left(\frac{\gamma_2}{\alpha_2}\right)]$$

Home firm's transfer level:

$$T_1 = -\alpha_1 \frac{1}{9}[(A - 1) + 2\left(\frac{\gamma_1}{\alpha_1}\right) - \left(\frac{\gamma_2}{\alpha_2}\right)][(A - 1) - \left(\frac{\gamma_1}{\alpha_1}\right) - \left(\frac{\gamma_2}{\alpha_2}\right)]$$

$$\text{Home politician's utility: } U_1^P = \alpha_1 \frac{1}{9}[(A - 1) + 2\left(\frac{\gamma_1}{\alpha_1}\right) - \left(\frac{\gamma_2}{\alpha_2}\right)]^2$$

If we compare this output level with ordinary duopoly output $\left(\frac{1}{3}(A - 1)\right)$, we have an additional term here $\left(2\left(\frac{\gamma_1}{\alpha_1}\right) - \left(\frac{\gamma_2}{\alpha_2}\right)\right)$. The first part of this term $\left(2\left(\frac{\gamma_1}{\alpha_1}\right)\right)$ represents the effect of Home politician influence. The second part $\left(-\left(\frac{\gamma_2}{\alpha_2}\right)\right)$ represents the effect of Foreign politician influence. Notice that the additional term can be positive or negative. If Foreign politician is aggressive $\left(\frac{\gamma_2}{\alpha_2} \text{ is high}\right)$ enough then market demand for Home firm falls after market liberalization.

If we compare the price level with ordinary duopoly price level $\left(\frac{1}{3}(A + 2)\right)$, we have an additional term $\left(-\frac{1}{3}\left(\frac{\gamma_1}{\alpha_1}\right) - \frac{1}{3}\left(\frac{\gamma_2}{\alpha_2}\right)\right)$. Since this term is negative, we can conclude that after market liberalization, we have lower level of price than the ordinary duopoly price.

Now, we analyze the scenario in which Home firm is a manager controlled firm. Let us remember the market outcome where Home firm is a manager controlled firm and Foreign firm is a politician controlled firm.

To compare this outcome with the outcome under manager control let us remember the market outcome where there is a manager controlled firm in the Home country and a politician controlled firm in the Foreign country.

$$\text{Home firm's production: } q_1 = \frac{1}{3} \left[(A - 1) + 2 \left(1 - \frac{1}{a_1} \right) - \left(\frac{\gamma_2}{\alpha_2} \right) \right]$$

$$\text{Price level: } p = \frac{1}{3} \left[(A + 2) - \left(1 - \frac{1}{a_1} \right) - \left(\frac{\gamma_2}{\alpha_2} \right) \right]$$

$$\text{Home firm's profit: } \pi_1 = \frac{1}{9} \left[(A + 1) - 2 \left(\frac{1}{a_1} \right) - \left(\frac{\gamma_2}{\alpha_2} \right) \right] \left[(A + 1) + \left(\frac{1}{a_1} \right) - \left(\frac{\gamma_2}{\alpha_2} \right) \right]$$

$$\text{Home firm's transfer level: } T_1 = 0$$

$$\text{Home politician's utility level: } U_1^p = \gamma_1 \frac{1}{3} \left[(A + 1) - 2 \left(\frac{1}{a_1} \right) - \left(\frac{\gamma_2}{\alpha_2} \right) \right]$$

If we compare the output level with ordinary duopoly output level $\left(\frac{1}{3} (A - 1) \right)$, we have an additional term $\left(\frac{2}{3} \left(1 - \frac{1}{a_1} \right) - \frac{1}{3} \left(\frac{\gamma_2}{\alpha_2} \right) \right)$. The first part of this term $\left(\frac{2}{3} \left(1 - \frac{1}{a_1} \right) \right)$ represents the effect of Home firm productive superiority and the second part $\left(-\frac{1}{3} \left(\frac{\gamma_2}{\alpha_2} \right) \right)$ represents the effect of Foreign politician influence on Home firm market demand.

Similar with the previous scenario after market liberalisation, price level under this scenario is lower than price level of ordinary duopoly case. $\left(\frac{1}{3} (A + 2) \right)$

Now, let us derive the necessary condition for transformation. As we did in the previous part, necessary condition for transformation simply tells us Home politician should have a better level of utility from a manager controlled firm then he had from a politician controlled firm:

$$\gamma_1 \frac{1}{3} \left[(A + 1) - 2 \left(\frac{1}{a_1} \right) - \left(\frac{\gamma_2}{\alpha_2} \right) \right] \geq \alpha_1 \frac{1}{9} \left[(A - 1) + 2 \left(\frac{\gamma_1}{\alpha_1} \right) - \left(\frac{\gamma_2}{\alpha_2} \right) \right]^2$$

By using this inequality, we have a productivity threshold of Home firm for transformation (a^p) when Foreign firm is under politician control

$$a^p = \frac{6 \left(\frac{\gamma_1}{\alpha_1} \right)}{3 \left(\frac{\gamma_1}{\alpha_1} \right) \left[(A + 1) - \left(\frac{\gamma_2}{\alpha_2} \right) \right] - \left[(A - 1) + 2 \left(\frac{\gamma_1}{\alpha_1} \right) - \left(\frac{\gamma_2}{\alpha_2} \right) \right]^2}$$

The analysis of this threshold is below:

- Politician interest in Home firm (γ_1): positively affect the threshold.
- Private share of Home firm (α_1): negatively affect the threshold.
- Politician interest in Foreign firm (γ_2): negatively affect the threshold.
- Private share of Foreign firm (α_2): positively affect the threshold.
- Market size(A): effect of market size depends on other parameters. To see that let us take the derivative of the threshold with respect to market size parameter:

$$\frac{\left(6\left(\frac{\gamma_1}{\alpha_1}\right)\right)\left(2(A-1)+\left(\frac{\gamma_1}{\alpha_1}\right)-2\left(\frac{\gamma_2}{\alpha_2}\right)\right)}{\left\{3\left(\frac{\gamma_1}{\alpha_1}\right)\left[(A+1)-\left(\frac{\gamma_2}{\alpha_2}\right)\right]-\left[(A-1)+2\left(\frac{\gamma_1}{\alpha_1}\right)-\left(\frac{\gamma_2}{\alpha_2}\right)\right]^2\right\}^2}$$

If the Foreign firm is aggressive (γ_2/α_2 is high) enough then the derivative becomes negative. In other words, more aggressive politician controlled rival combined with high market size decreases the threshold productivity level for transformation of Home firm. The reason for this result is that if the rival firm is aggressive then it means that it steals more of Home firm's market share. As a result, politician may accept transformation with a small productivity gain.

If the Foreign firm is not very aggressive (γ_2/α_2 is low) then the derivative becomes positive. In other words, less aggressive politician controlled rival combined with high market size increases the threshold productivity level for transformation of Home firm. The reason for this result is that if the rival firm is less aggressive then it means that Home firm steals more of Foreign firm's market share. As a result, politician may accept transformation only for high productivity gain.

In conclusion, against a politician controlled Foreign firm, high productivity level is needed for transformation of Home firm in the markets with

- high politician interest at Home firm(γ_1),
- low private share at Home firm(α_1),
- low politician interest at Foreign firm(γ_2),
- high private share at Foreign firm(α_2).

3.3. After Liberalization Against a Manager Controlled Firm

In this section, we analyze potential market outcomes after market liberalisation when Foreign firm is a manager controlled firm. We start with the scenario where Home firm is under politician control. To make the analysis, let us remember market outcome when Home firm is a politician controlled firm and Foreign firm is a manager controlled firm.

$$\text{Home firm's production level: } q_1 = \frac{1}{3} \left[(A - 1) + 2 \left(\frac{\gamma_1}{\alpha_1} \right) - \left(1 - \frac{1}{a_2} \right) \right]$$

$$\text{Price level: } p = \frac{1}{3} \left[(A + 2) - \left(\frac{\gamma_1}{\alpha_1} \right) - \left(1 - \frac{1}{a_2} \right) \right]$$

$$\text{Home firm's profit: } \pi_1 = \frac{1}{9} \left[(A - 2) - \left(\frac{\gamma_1}{\alpha_1} \right) + \left(\frac{1}{a_2} \right) \right] \left[(A - 2) + 2 \left(\frac{\gamma_1}{\alpha_1} \right) + \left(\frac{1}{a_2} \right) \right]$$

$$\text{Home firm's transfer level: } T_1 = \alpha_1 \frac{1}{9} \left[\left(\frac{\gamma_1}{\alpha_1} \right) - \left(\frac{1}{a_2} \right) - (A - 2) \right] \left[(A - 2) + 2 \left(\frac{\gamma_1}{\alpha_1} \right) + \left(\frac{1}{a_2} \right) \right]$$

$$\text{Home politician's utility level: } U_1^p = \alpha_1 \frac{1}{9} \left[(A - 2) + 2 \left(\frac{\gamma_1}{\alpha_1} \right) + \left(\frac{1}{a_2} \right) \right]^2$$

If we remember regular duopoly production level $\left(\frac{1}{3} (A - 1) \right)$, here we have an additional part $\left(\frac{2}{3} \left(\frac{\gamma_1}{\alpha_1} \right) - \frac{1}{3} \left(1 - \left(\frac{1}{a_2} \right) \right) \right)$. The first part $\left(\frac{2}{3} \left(\frac{\gamma_1}{\alpha_1} \right) \right)$ represents the effect of politician influence of Home firm. Second part $\left(-\frac{1}{3} \left(1 - \left(\frac{1}{a_2} \right) \right) \right)$ represents the effect of Foreign firm productive superiority on Home firm's market demand.

If we compare this price level with ordinary duopoly price $\left(\frac{1}{3}(A+2)\right)$, we have an additional term $\left(-\left(\frac{\gamma_1}{a_1}\right) - \left(1 - \frac{1}{a_2}\right)\right)$. Since this additional part is negative we conclude that after liberalisation the price level is less than ordinary duopoly price.

Now, we analyze the scenario in which Home and Foreign firms are manager controlled firms. Let us remember the market outcome when both firms are manager controlled firms:

$$\text{Home firm's production level: } q_1 = \frac{1}{3} \left[A - 2 \left(\frac{1}{a_1} \right) + \left(\frac{1}{a_2} \right) \right]$$

$$\text{Price level: } p = \frac{1}{3} \left[A + \left(\frac{1}{a_1} \right) + \left(\frac{1}{a_2} \right) \right]$$

$$\text{Home firm's profit level: } \pi_1 = \frac{1}{9} \left[A - 2 \left(\frac{1}{a_1} \right) + \left(\frac{1}{a_2} \right) \right]$$

$$\text{Home firm's transfer level: } T_1 = 0$$

$$\text{Home politician's utility level: } U_1^p = \gamma_1 \frac{1}{3} \left[A - 2 \left(\frac{1}{a_1} \right) + \left(\frac{1}{a_2} \right) \right]$$

If we compare production level with duopoly production level, we have an additional part $\left(2 \left(1 - \left(\frac{1}{a_1}\right)\right) - \left(1 - \left(\frac{1}{a_2}\right)\right)\right)$. Here the first part $\left(2 \left(1 - \left(\frac{1}{a_1}\right)\right)\right)$ represents effect of Home firm productive efficiency on Home firm output decision and the second part $\left(-\left(1 - \left(\frac{1}{a_2}\right)\right)\right)$ represents effect of Foreign firm productive efficiency on Home firm output decision.

The price level is lower than regular duopoly price level $\left(\frac{1}{3}(A+2)\right)$ due to superior productive efficiency of both firms.

Now let us derive the necessary condition for transformation in Home firm. For transformation, politician must have a better utility in manager controlled firm than he has in politician controlled firm:

$$\gamma_1 \frac{1}{3} \left[A - 2 \left(\frac{1}{a_1} \right) + \left(\frac{1}{a_2} \right) \right] \geq \alpha_1 \frac{1}{9} \left[(A - 2) + 2 \left(\frac{\gamma_1}{\alpha_1} \right) + \left(\frac{1}{a_2} \right) \right]^2$$

By using this inequality, we have a productivity threshold(a^m):

$$a^m = \frac{6 \left(\frac{\gamma_1}{\alpha_1} \right)}{3 \left(\frac{\gamma_1}{\alpha_1} \right) \left[\left(A + \left(\frac{1}{a_2} \right) \right) - \left[(A - 2) + 2 \left(\frac{\gamma_1}{\alpha_1} \right) + \left(\frac{1}{a_2} \right) \right]^2}$$

If we analyze the relationship between the threshold and other parameters:

- Home politician interest(γ_1): positively affects the threshold,
- Home private share (α_1): negatively affects the threshold,
- Foreign productivity (a_2): negatively affects the threshold,
- Market size (A): effect of market size depends on other parameters. To see that let us take the derivative of the threshold with respect to market size parameter:

$$\frac{\left(6 \left(\frac{\gamma_1}{\alpha_1} \right) \right) \left(2(A-1) + \left(\frac{\gamma_1}{\alpha_1} \right) - 2 \left(1 - \frac{1}{a_2} \right) \right)}{\left\{ 3 \left(\frac{\gamma_1}{\alpha_1} \right) \left[\left(A + 1 - \left(1 - \frac{1}{a_2} \right) \right) - \left[(A-1) + 2 \left(\frac{\gamma_1}{\alpha_1} \right) - \left(1 - \frac{1}{a_2} \right) \right]^2 \right\}^2}$$

If Foreign firm is productive (a_2 is high) enough an increase in market size(A)decreases the threshold level.

If Foreign firm is not productive (a_2 is not high)enough an increase in market size(A)increases the threshold level.

3.4. Governance Game

In this section we try to analyze potential Nash equilibria of a governance game. Let us define governance game first.

A governance game(G) consists of the following components:

- Players: Home politician, Foreign politician
- Actions: Control right to politician, Control right to manager
- Payoff matrix:

		Foreign	
		Politician Control	Manager Control
Home	Politician Control	$\alpha_1 \frac{1}{9} [(A - 1) + 2 \frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}]^2$	$\alpha_1 \frac{1}{9} [(A - 2) + 2 \frac{\gamma_1}{\alpha_1} + \frac{1}{a_2}]^2$
	Manager Control	$\alpha_2 \frac{1}{9} [(A - 1) + 2 \frac{\gamma_2}{\alpha_2} - \frac{\gamma_1}{\alpha_1}]^2$	$\gamma_2 \frac{1}{3} [(A + 1) - 2 \frac{1}{a_2} - \frac{\gamma_1}{\alpha_1}]$
		$\gamma_1 \frac{1}{3} [(A + 1) - 2 \frac{1}{a_1} - \frac{\gamma_2}{\alpha_2}]$	$\gamma_1 \frac{1}{3} [A - 2 \frac{1}{a_1} + \frac{1}{a_2}]$
		$\alpha_2 \frac{1}{9} [(A - 2) + 2 \frac{\gamma_2}{\alpha_2} + \frac{1}{a_1}]^2$	$\gamma_2 \frac{1}{3} [A - 2 \frac{1}{a_2} + \frac{1}{a_1}]$

Governance game we describe above has a complicated payoff matrix. Because of this we impose symmetry assumption and try to make analysis easier.

Under Symmetry Assumption

		Foreign	
		Politician Control	Manager Control
Home	Politician Control	$\alpha \frac{1}{9} [(A-1) + \frac{\gamma}{\alpha}]^2$	$\alpha \frac{1}{9} [(A-2) + 2\frac{\gamma}{\alpha} + \frac{1}{a}]^2$
	Manager Control	$\alpha \frac{1}{9} [(A-1) + \frac{\gamma}{\alpha}]^2$	$\gamma \frac{1}{3} [(A+1) - 2\frac{1}{a} - \frac{\gamma}{\alpha}]$
		$\gamma \frac{1}{3} [(A+1) - 2\frac{1}{a} - \frac{\gamma}{\alpha}]$	$\gamma \frac{1}{3} [A - \frac{1}{a}]$
		$\alpha \frac{1}{9} [(A-2) + 2\frac{\gamma}{\alpha} + \frac{1}{a}]^2$	$\gamma \frac{1}{3} [A - \frac{1}{a}]$

Even the symmetric case payoff matrix is complicated. As a result, we try to analyze the conditions for each possible outcome.

(Politician Control, Politician Control) is a Nash equilibrium if

$$\alpha_1 \frac{1}{9} [(A-1) + 2\frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}]^2 \geq \gamma_1 \frac{1}{3} [(A+1) - 2\frac{1}{a_1} - \frac{\gamma_2}{\alpha_2}]$$

and

$$\alpha_2 \frac{1}{9} [(A-1) + 2\frac{\gamma_2}{\alpha_2} - \frac{\gamma_1}{\alpha_1}]^2 \geq \gamma_2 \frac{1}{3} [(A+1) - 2\frac{1}{a_2} - \frac{\gamma_1}{\alpha_1}].$$

The equations are more likely to hold if productivity gains from transformation are small enough depending on the rest of the parameters.

(Politician Control, Manager Control) is a Nash equilibrium if

$$\alpha_1 \frac{1}{9} [(A-2) + 2\frac{\gamma_1}{\alpha_1} + \frac{1}{a_2}]^2 \geq \gamma_1 \frac{1}{3} [A - 2\frac{1}{a_1} + \frac{1}{a_2}]$$

and

$$\gamma_2 \frac{1}{3} [(A+1) - 2\frac{1}{a_2} - \frac{\gamma_1}{\alpha_1}] \geq \alpha_2 \frac{1}{9} [(A-1) + 2\frac{\gamma_2}{\alpha_2} - \frac{\gamma_1}{\alpha_1}]^2$$

The equations are more likely to hold if productivity gain of transformation is large for Foreign firm and small for Home firm depending on the rest of the parameters.

(Manager Control, Politician Control) is a Nash equilibrium if

$$\gamma_1 \frac{1}{3} [(A + 1) - 2 \frac{1}{a_1} - \frac{\gamma_2}{\alpha_2}] \geq \alpha_1 \frac{1}{9} [(A - 1) + 2 \frac{\gamma_1}{\alpha_1} - \frac{\gamma_2}{\alpha_2}]^2$$

and

$$\alpha_2 \frac{1}{9} [(A - 2) + 2 \frac{\gamma_2}{\alpha_2} + \frac{1}{a_1}]^2 \geq \gamma_2 \frac{1}{3} [A - 2 \frac{1}{a_2} + \frac{1}{a_1}]$$

The equations are more likely to hold if productivity gain of transformation is large for Home firm and small for Foreign firm then depending on the rest of the parameters.

(Manager Control, Manager Control) is a Nash equilibrium if

$$\gamma_1 \frac{1}{3} [A - 2 \frac{1}{a_1} + \frac{1}{a_2}] \geq \alpha_1 \frac{1}{9} [(A - 2) + 2 \frac{\gamma_1}{\alpha_1} + \frac{1}{a_2}]^2$$

and

$$\gamma_2 \frac{1}{3} [A - 2 \frac{1}{a_2} + \frac{1}{a_1}] \geq \alpha_2 \frac{1}{9} [(A - 2) + 2 \frac{\gamma_2}{\alpha_2} + \frac{1}{a_1}]^2$$

The equations tell us that if productivity gain of transformation is high enough for Home firm and Foreign firm then depending on the rest of the parameters.

As a result, depending on the rest of the parameters a country with high benefits of transformation is more likely to choose manager control as a best response in the governance game.

4. Conclusion

In this thesis, we focus on effects of market structure on firm's governance structure. And we ask the following questions: "How does the distribution of control right affect market outcomes? Under which conditions would the politician be willing to transfer control rights? How does liberalization affect the governance structure of the firm? How does governance structure of rival firm affect competitive behaviour and distribution of control right in Home firm? How does market structure affect governance structure of the firms? Under what conditions does a transformation (transfer of the control right to manager) occur in the context of international competition. Which governance structures may be observed in an international market as a Nash equilibrium?" Therefore the objective of this study is mainly studying firm's governance structures under monopolistic and duopolistic frameworks.

In chapter 3, we show how firm's governance structure changes under monopolistic and duopolistic frameworks. In this chapter, we show that transformation (transfer of control right to manager) occurs in the country with low politician interest and high degree of privatisation. In addition, we show that after market liberalisation, entrant with high politician interest, low degree of privatisation and high productive superiority increases chance for transformation for the incumbent firm. Lastly, we analyze possible governance structures under duopolistic framework and we show that all possible governance structure pairs can be a Nash equilibrium.

References

- [1] Alberto Chong and Mark Gradstein. On the determinants and effects of political influence. *IDB Working Paper*, 518, 2007
- [2] Andrei Shleifer and Robert W. Vishny. Politician and firms. *Quarterly Journal of Economics*, 109: 995-1025, 1993
- [3] Maxim Boycko, Andrei Shleifer and Robert W. Vishny. A theory of privatisation. *The Economic Journal*, 106: 309-319,1996