การเปลี่ยนผ่านจากการแข่งขันภายในสู่แรงจูงใจในการใช้กลยุทธ์ และผลกระทบของวัฒนธรรมต่อการเปลี่ยน ผ่าน ในฐานะของกระบวนการขั้นต้นเพื่อไปสู่ความสามารถในการแข่งขันระหว่างประเทศของบริษัทไทย: การศึกษาโดยการทดลองในห้องทดลอง

นายพีรพัฒ โชคสุวัฒนสกุล

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาบริหารธุรกิจคุษฎีบัณฑิต สาขาวิชาบริหารธุรกิจ คณะพาณิชย์ศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2554

ลิบสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

บทคัดย่อและแฟ้มข้อมูลฉบับเต็มของวิทยานิพนธ์ตั้งแต่ปีการศึกษา 2554 ที่ให้บริการในคลังปัญญาจุฬาฯ (CUIR) เป็นแฟ้มข้อมูลของนิสิตเจ้าของวิทยานิพนธ์ที่ส่งผ่านทางบัณฑิตวิทยาลัย

The abstract and full text of theses from the academic year 2011 in Chulalongkorn University Intellectual Repository (CUIR)

are the thesis authors' files submitted through the Graduate School.

TRANSITION FROM DOMESTIC COMPETITION TO STRATEGIC CHOICE AND ITS CULTURAL EFFECTS AS AN EX-ANTE PROCESS TOWARD INTERNATIONAL COMPETITIVENESS OF THAI FIRMS: A LABORATORY EXPERIMENTS STUDY

Mr. Peerapat Chokesuwattanaskul

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Business Administration Program in Business Administration Faculty of Commerce and Accountancy Chulalongkorn University Academic Year 2011 Copyright of Chulalongkorn University

Thesis Title	TRANSITION FROM DOMESTIC COMPETITION TO
	STRATEGIC CHOICE AND ITS CULTURAL EFFECTS AS
	AN EX-ANTE PROCESS TOWARD INTERNATIONAL
	COMPETITIVENESS OF THAI FIRMS: A LABORATORY
	EXPERIMENTS STUDY
By	Mr. Peerapat Chokesuwattanaskul
Field of Study	Business Administration
Thesis Advisor	Associate Professor Somchanok Passakonjaras, Ph.D.

Accepted by the Faculty of Accountancy and Commerce, Chulalongkorn University in Partial Fulfillment of the Requirements for the Doctoral Degree

.....Dean of the Faculty of Commerce and Accountancy (Associate Professor Pasu Decharin, Ph.D.)

# THESIS COMMITTEE

พิรพัฒ โชคสุวัฒนสกุล : การเปลี่ยนผ่านจากการแข่งขันภายในสู่แรงจูงใจในการใช้กลยุทธ์ และ ผลกระทบของวัฒนธรรมต่อการเปลี่ยนผ่าน ในฐานะของกระบวนการขั้นด้นเพื่อไปสู่ความสามารถ ในการแข่งขันระหว่างประเทศของบริษัทไทย: การศึกษาโดยการทดลองในห้องทดลอง. (TRANSITION FROM DOMESTIC COMPETITION TO STRATEGIC CHOICE AND ITS CULTURAL EFFECTS AS AN EX-ANTE PROCESS TOWARD INTERNATIONAL COMPETITIVENESS OF THAI FIRMS: A LABORATORY EXPERIMENTS STUDY) อ. ที่ปรึกษาวิทยานิพนธ์หลัก: รศ. คร. สมชนก ภาสกรจรัส, 244 หน้า.

เป็นที่ขอมรับกันว่าบริษัทที่มีการวางปรับใช้กลขุทธ์โดยอิงระบบตลาดมีโอกาสในการประสบ กวามสำเร็จในการแข่งขันมากกว่าบริษัทที่ไม่มีการปรับใช้ ในระดับนานาชาติ การใช้กลขุทธ์โดยไม่อิงระบบ ตลาดไม่สามารถปรับใช้ได้อย่างง่าย โดยเฉพาะในกรณีที่กลขุทธ์ดังกล่าวถูกสร้างขึ้นในเศรษฐกิจของ ประเทศกำลังพัฒนา ด้วยเหตุนี้ การสร้างแรงจูงใจให้บริษัทต่างๆในประเทศเหล่านี้ปรับใช้กลขุทธ์โดยอิง ระบบตลาดแทนที่การใช้กลขุทธ์โดยไม่อิงระบบตลาด จึงจำเป็นต่อความสำเร็จของบริษัทจากประเทศเหล่านี้ ในระดับระหว่างประเทศ การศึกษานี้ใช้การทดลองในห้องทดลองเพื่อทดสอบกระบวนการสร้างแรงจูงใจ ดังกล่าวผ่านการเพิ่มขึ้นของระดับการแข่งขัน การศึกษานี้มุ่งที่จะตอบกำกล่าวอ้างสองประการกือ ประการ แรก ความเข้มงวดของนโยบายการแข่งขันที่เพิ่มขึ้นส่งผลให้มีการแข่งขันในระดับที่สูงขึ้น ประการที่สอง การแข่งขันในระดับที่สูงขึ้น ส่งผลให้บริษัทมีการปรับใช้กลขุทธ์โดยอิงระบบตลาดมากขึ้น ผลการทดลองได้ ยืนยันกระบวนการดังกล่าว และความเห็นที่ว่าบริษัทจะได้รับการจูงใจให้มีการสร้าง และปรับใช้กลขุทธ์มาก จึ้น โดยเริ่มต้นจากนโยบายการแข่งขันในประเทศ ทั้งนี้กระบวนการดังกล่าวยังได้รับผลกระทบจาก วัฒนธรรม โดยเฉพาะอย่างยิ่ง ความเป็นปีจเจกนิยม ในระดับที่แตกต่างกัน โดยในการทดลองได้ยืนยันผล ของวัฒนธรรมดังกล่าวอีกด้วย

สาขาวิชาบริหารธุรกิจ	ลายมือชื่อนิสิต
ปีการศึกษา2554	ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก

# # # 539 31675 26 : MAJOR BUSINESS ADMINISTRATION KEYWORDS: TRANSITION PROCESS / COMPETITION LAW / COMPETITIVENESS / LABORATORY EXPERIMENTS / INDIVIDUALISM

PEERAPAT CHOKESUWATTANASKUL: TRANSITION FROM DOMESTIC COMPETITION TO STRATEGIC CHOICE AND ITS CULTURAL EFFECTS AS AN EX-ANTE PROCESS TOWARD INTERNATIONAL COMPETITIVENESS OF THAI FIRMS: A LABORATORY EXPERIMENTS STUDY. ADVISOR: ASSOC. PROF. SOMCHANOK PASSAKONJARAS, Ph.D., 244 pp.

It is almost a truism that firms those strategize market-based strategies are potentially more successful than firms those do not. In the global space, non market-based strategies cannot be created or exploited easily, especially by firms from developing economies. Hence, the incentive for firms to strategize their market-based strategies instead of implementing non market-based strategies is necessary for their international success. This study adopted laboratory experiment to explore the process of strategizing incentive creation through increasing level of competition. This study answers two important claims. Firstly, more intensive policy leads to more competitive market. Secondly, more competitive market leads to more competition level of market-based strategy implementation. The experimental result supports these two claims. By confirming this ex-ante process of competitiveness creation, it serves as the confirmatory study of the argument that firms will be incentivized to create and exploit their competitive advantage by a competition in domestic market. Furthermore, the mechanism is also affected significantly by collectivism-individualism cultural dimension. This cultural effect is also confirmed by the experimental result.

Field of studyBusiness Administration	Student's signature
Academic Year2011	Advisor's signature

# **ACKNOWLEDGEMENTS**

I would like to express my gratitude to my dissertation advisor, Associate Professor Dr. Somchanok Passakonjaras for her advice, supports, and encouragements throughout the period that I develop my dissertation. Moreover, I would like to show my appreciation to my dissertation committees: Associate Professor Dr. Palin Phoocharoon, Professor Dr. Sakda Thanitcul, Associate Professor Dr. Supol Durongwatana, Associate Professor Dr. Pavida Pananond, and Associate Professor Dr. Pradit Wanarat for accepting to be my dissertation committee and for their helpful comments and suggestions to improve the quality of this paper. In addition, I appreciate the understanding, supports and encouragements from my classmates. I am also grateful for my friends from Faculty of Law, Chulalongkorn University, who came to be participants in my pilot test. Moreover, the computer program would not be complete without great helps from Mr. Varavongsa Ramangkura and Mr. Kobkrit Viriyayudhakorn. I would like to pay my gratitude toward all subjects who came from the executive MBA class 24 as well.

Last but not least, I am thankful for everything from my family members. They are simply my everything.

# CONTENTS

Abstract in Thai	iv
Abstract in English	v
Contents	ix
List of tables	xi
List of figures	. xiii
Chapter	
I. Introduction	1
1. Problem Definition and Background of Study	1
2. Theoretical background	4
3. Research Questions and Objectives of this Dissertation	10
4. Overview and Organization of the Dissertation	11
II. Literature Review	12
1. The rules of game in a location: Institutions	13
2. Definitions and Categorizations of Institutions	14
3. Consequences of Institutional Change on Firm	16
4. Strategy as a Consequence	21
5. Location of Institutions as a scope of analysis	24
6. Transition process: Institutions and Strategic Choice	28
6.1 Market-based institution: Competition Law	35
III. Research Design and Methodology	53
1. Design Overview	
2. Unit of Analysis	
3. Experimental Design	63
3.1 Variables Defined	68
3.2 Instrumentation and Materials	74
3.3 Experimental Procedure	75
3.4 Empirical Methodology	79
IV. Results	81
1. Research Participants	81
1.1 Subjects and Cultural Blocks	81
1.2 Demographic and Unaracteristics	81 01
1.5 Characteristics of Subjects by Cultural Diocks	01
2. Analysis of Pre-Experimental Questionnaire	84

3. Experiment	84
3.1 Within Collectivism block	84
3.2 Within individualism block	102
3.3 Between blocks	119
V. Conclusion and Discussion	133
1. Discussion of Empirical Results	133
2. Significance and Contribution of the study	139
3. Limitations of the Study and Future Research	141
4. Concluding Comments	146
References	148
Appendices	161
Appendix A: Leniency Program	162
Appendix B: Thailand Competition Act	177
Appendix C: Questionnaire of Individualism-Collectivism	183
Appendix D: Questionnaire for demographic and firm's representativeness	185
Appendix E: Instruction of Experiments	188
Appendix F: Screenshots of computer program	200
Biography	244

# LIST OF TABLES

	Page
Table 1: Consequences of Difference in Level of Individualism (adjusted from Hofstede	
(1984))	47
Table 2: Number of Firms in Thailand (Ministry of Commerce, 2010)	62
Table 3: Sample size for within-group experiment (Campbell, Julious, & Altman,	
1996)	63
Table 4: Table of treatments	68
Table 5: Individualism index questions	70
Table 6: Analysis of Firm Representativeness	82
Table 7 Analysis of Subject's Characteristics by Cultural Blocks	83
Table 8: Analysis of Collusion Decision between Laissez Faire and Antitrust	
Treatments in Collectivism Block	89
Table 9: Analysis of Collusion Decision between Antitrust and Leniency	
Program Treatments in Collectivism Block	91
Table 10: Analysis of Collusion Decision between Laissez Faire and Leniency	
Program Treatments in Collectivism Block	93
Table 11: Analysis of Cost Reduction of Laissez Faire and Antitrust	
Treatments in Collectivism Block	97
Table 12: Analysis of Cost Reduction of Antitrust and Leniency Program	
Treatments in Collectivism Block	.100
Table 13: Analysis of Cost Reduction of Laissez Faire and Leniency Program	
Treatments in Collectivism Block	.101
Table 14: Analysis of Collusion Decision of Laissez Faire and Antitrust	
Treatements in Individualism Block	.105
Table 15: Analysis of Collusion Decision of Antitrust and Leniency Program	
Treatements in Individualism Block	.107
Table 16: Analysis of Collusion Decision of Laissez Faire and Leniency Program	
Treatements in Individualism Block	.109
Table 17: Analysis of Cost Reduction of Laissez Faire and Antitrust	
Treatments in Individualism Block	.114
Table 18: Analysis of Cost Reduction of Antitrust and Leniency Program	
Treatments in Individualism Block	.116

Table 19: Analysis of Cost Reduction of Laissez Faire and Leniency Program
Treatments in Individualism Block11
Table 20: Analysis of Collusion Decision in Laissez Faire Treatment between Blocks12
Table 21: Analysis of Collusion Decision in Antitrust Treatment between Blocks
Table 22: Analysis of Collusion Decision in Leniency Program Treatment
between Blocks
Table 23: Analysis of Cost Reduction of Laissez Faire Treatment between Blocks
Table 24: Analysis of Cost Reduction of Antitrust Treatment between Blocks
Table 25: Analysis of Cost Reduction of Leniency Program Treatment
between Blocks
Table 28: EU system of leniency program: the level of punishment reduction
(Harrington, 2006)
Table 29: US system of leniency program: the level of punishment
reduction (Harrington, 2006)17
Table 30: Japan system of leniency program: the level of punishment
reduction (Harrington, 2006)17
Table 31: Countries and systems (source: countries' authority websites)174

# LIST OF FIGURES

Page
Figure 1: Research Methodology Framework (Cresswell, 2003)55
Figure 2: Research Framework
Figure 3: Flowcharts of an experimental process
Figure 4: Steps in each stage of game
Figure 5: Scatter Plot of Collusion Decision in Collectivism Block
Figure 6: Scatter Plot of Collusion Decision between Laissez Faire and Antitrust
Treatments in Collectivism Block
Figure 7: Scatter Plot of Collusion Decision between Antitrust and
Leniency Program Treatments in Collectivism Block
Figure 8: Scatter Plot of Collusion Decision between Laissez Faire and
Leniency Program Treatments in Collectivism Block
Figure 9: Scatter Plot of Cost Reduction of Laissez Faire and
Antitrust Treatments in Collectivism Block
Figure 10: Graph of Means of Cost Reduction of Laissez Faire and
Antitrust Treatments in Collectivism Block
Figure 11: Scatter Plot of Cost Reduction of Antitrust and
Leniency Program Treatments in Collectivism Block
Figure 12: Graph of Means of Cost Reduction of Antitrust and
Leniency Program Treatments in Collectivism Block
Figure 13: Scatter Plot of Collusion Decision in Individualism Block103
Figure 14: Scatter Plot of Collusion Decision of Laissez Faire and
Antitrust Treatments in Individualism Block
Figure 15: Scatter Plot of Collusion Decision of Antitrust and
Leniency Program Treatments in Individualism Block
Figure 16: Scatter Plot of Collusion Decision of Laissez Faire and
Leniency Program Treatments in Individualism Block
Figure 17: Scatter Plot of Cost Reduction in Individualism Block111
Figure 18: Graph of Means of Cost Reduction in Individualism Block112
Figure 19: Scatter Plot of Cost Reduction of Laissez Faire and
Antitrust in Individualism Block

Figure 20: Graph of Means of Cost Reduction of Laissez Faire and	
Antitrust Treatments in Individualism Block1	13
Figure 21: Scatter Plot of Cost Reduction of Antitrust and	
Leniency Program in Individualism Block1	15
Figure 22: Graph of Means of Cost Reduction of Antitrust and	
Leniency Program Treatments in Individualism Block1	15
Figure 23: Scatter Plot of Cost Reduction of Laissez Faire and	
Leniency Program in Individualism Block1	17
Figure 24: Graph of Means of Cost Reduction of Laissez Faire and	
Leniency Program Treatments in Individualism Block1	17
Figure 25: Scatter Plot of Collusion Decision of Laissez Faire Between Blocks	20
Figure 31: Scatter Plot of Collusion Decision of Antitrust Between Blocks	22
Figure 27: Scatter Plot of Collusion Decision of Leniency Program Between Blocks1	24
Figure 28: Scatter Plot of Cost Reduction of Laissez Faire Treatment between Blocks1	27
Figure 29: Graph of Means of Cost Reduction of Laissez Faire Treatment	
between Blocks1	27
Figure 30: Scatter Plot of Cost Reduction of Antitrust Treatment between Blocks1	29
Figure 31: Graph of Means of Cost Reduction of of Antitrust Treatment	
between Blocks1	29
Figure 32: Scatter Plot of Cost Reduction of Leniency Program Treatment	
between Blocks1	31
Figure 33: Graph of Means of Cost Reduction of of Leniency Program Treatment	
between Blocks	31
Figure 39: Relationship among effect of evidence, sanction and applicants1	71
Figure 40: Matrix of different policies 1 (source: Harrington 2006)1	75
Figure 41: Matrix of different policies 2 (source: Harrington 2006)1	76

# CHAPTER I INTRODUCTION

## 1. Problem Definition and Background of Study

Even though there are some examples of successful firms from unlikely originsfirms from developing economies or newly-founded firms-those have been called by specific technical terms such as emerging MNEs and Born-globals (Moen & Servais, 2002; Matthews, 2006; Pananond, 2009), these cases are argued as 'exceptional' cases where general firms from unlikely origins failed to succeed internationally (Johanson & Vahlne, 1977; Narula & Nguyen, 2011). There are evidences of successful MNEs from Thailand entering the 'big league', such as Charoen Pokphand Group (CP), PTT Plc., and Siam Cement Group (SCG) (Pananond, 2009). Narula and Nguyen (2011) discussed further that the evidences of successful emerging countries multinational enterprises (EMNEs) are just outliers or anecdotes. This is because they are the minor proportion of all firms from similar origins trying to establish in the international arena while majority of them fail. Consequently, the evidence extracted from the studies of these firms cannot be generalized. However, this fact does not invalidate the virtue of EMNEs or born-globals' studies because they are the current global business phenomena and a sophisticated understanding shall certainly be developed. The study nevertheless focuses on the explanation of the rest of firms from developing economies those fail to compete successfully in the current global business arena.

Moreover, Narula and Nguyan (2011) also pointed out that some countries have been developed and matured beyond the level of developing or emerging economies already. For example, EMNEs activity is still particularly intensive in the Asian Newly Industrialised Countries NICs and the BRICS (Brazil, Russia, India, China, and South Africa). Countries in these groups have been developing rapidly until their level of development converges to the developed world. Therefore, it is questionable whether the firms from these home-countries could still be considered as EMNEs or not. Otherwise, they are considered as traditional cases of MNEs. Nevertheless, regardless of origin, firms are still confronting with the so-called *liability of foreignness* when entering foreign countries and the failure to overcome the liability of foreignness becomes a root cause of firms' failure abroad (Hymer, 1972; Zaheer, 1995; Sakakibara & Yamawaki, 2008).

Besides the firms those decided to enter an internationalization process, the question remains whether indigenous firms could ignore the liability of foreignness or not. This is because they will never or not intend to get into foreign markets. In the reality, indigenous firms are also affected by foreign firms' penetration into their countries in various modes especially foreign direct investment (Fladmoe-Lindquist & Jacque, 1995). The level of capital and labor movements across countries becomes historically high in the last couple of decades and the world economy gradually transitions toward "semi-globalization" status (Ghemawat, 2003). For that reason, despite indigenous firms run business solely in home country, they still have to compete against incoming foreign firms. As a result, it is not solely about liability of foreignness but the threats from competitors are unavoidable in the global economy nowadays. To a certain extreme, D'Aveni (1997) coined and defined the term 'hypercompetition' as the condition of rapid escalation of competition and it is evident worldwide. It stands as an evidence of growing level of competition which might not be equivalently distributed worldwide but increased on average. The question remains how could the firms be prepared for the "*hypercompetitive*" world? D'Aveni (1997) stated as follows:

"In the past, firms would often try to increase profitability by legally restraining the level of competition in an industry. They avoided price wars, segmented the market to avoid head-to-head competition, and tried to keep the number of competitors low by putting up entry barriers around their industries. Yet, many firms have learned they cannot successfully follow such strategies in today's markets. (D'Aveni R., 1997, pp. 183-184)"

Regardless of the fundamental driving forces of hypercompetitive world—consumers, technology, free market, and cooperative alliance; the level of pressure from competition has been put on firms is trajectory (D'Aveni R., 1997). However, the condition of hypercompetition claimed in the context of D'Aveni arguments does not hold in all markets equivalently. The clause "*in the past*" in the quote above might be changed to "*currently*" in some contexts. This is mainly because many firms can still successfully follow such strategies in today's market. These strategies are generally called 'non market-based strategies' in opposed to market-based strategies in this study.

In some environments, firms are not bounded or given an incentive to avoid implementing such strategies by the social structure designed specifically to create the market condition, so-called market-support institutions. In the next section, the term institutions will be extensively discussed; it is broadly defined as the rules of game in a particular society at this point (Scott, 1995). Peng, Wang, and Jiang (2008) argued that the implicit assumption of developed, mostly western, economies cannot be held in developing economies. In particular, institutions are different in developing countries.

Since the competition is high worldwide and indigenous firms in developing economies cannot avoid this competition force, the point is how firms from developing economies could survive and perform in this condition. Peng (2003) called for more attention on the role of institutions on firms in developing countries. This is partially because these institutions are subject to change in relatively higher degree comparing to developed economies. In other word, the instability and absence of institutions in developing economies is potentially considered as either opportunity or threat. Regardless of the condition whether firms have to confront the liability of foreignness overseas or competition forces domestically, they are influenced by home-country institutions to a certain extent and it is market-based institutions those influence a competition pressure especially in the home country. Narula and Nguyan (2011) claimed that firms from developing economies require a possession of "non-location-bounded" advantages to beat the liability of foreignness. The fundamental reason behind an absence of non-location-bounded advantages is a failure to transfer advantages from domestic to international market. Consequently, domestic success does not guarantee an international one. Despite a rich set of examples might be defined, for example government support in various ways including debating infant industry argument, a distinctive example of location-bounded advantages is particularly the *market restriction*.

Regarding market restriction, Narula and Nguyan (2011) linked back to the function of the ownership advantages including both location-bounded and non-location-bounded advantages. They claimed that the relation of ownership advantages is actually a range of the relation from the domain of location advantages. That is to say, ownership advantages are fundamentally built from the location advantages. This is coherent with the argument in the Uppsala model which claimed the incremental process of internationalization of firms starting from domestic strengths (Johanson & Vahlne, 1977). These domestic strengths are virtually skills, technologies and knowledge created to beat competitors in domestic market those eventually become non-location-bounded advantages exploited across boundaries. Therefore, elimination of market restriction becomes a possible creator of domestic strengths such that deliver the non-location-bounded ownership advantages. This is simply because firm's choices are bounded by the institutions. Since market restriction is prohibited, market-based competition is obviously the choice, amongst others if not the only, left.

In other words, elimination of market restriction is a creation of market-based competition in home country of firms. Ultimately, a creation of competition serves as a location advantage of home country. At the end of the day, firm gains ownership advantages through such a change in location and these advantages are not location-bounded. Empirically, for example, the Japanese electronics industry is so competitive globally because

the rivalry is probably the most intense in the world domestically (Sakakibara & Porter, 2001). The following question is what mechanism is driving behind this intensive domestic rivalry. The linkage between elimination of market restriction and firm's development of ownership advantages is claimed but still unproven. Therefore, the previous discussion brings the study back to the upstream of the process. Hence, the arguments refer back to the fundamental problem of home-country institutions those influence the behavior of firm. Could they really influence the behavior of firm? If yes, the end product as a market-based strategy of firm could really be delivered? Could unlikely origins be changed toward likely origins of firms? These questions are empirically tested in this study.

## 2. Theoretical background

The richness of the real phenomenon of institutions allows the use of various theoretical approaches in the study. It can be looked at from every single perspective in the field of sociology, psychology, anthropology, political sciences, economics, law, and, lately, business. In this study, I use a subset of the potentially applicable theoretical perspectives. This subset is the focus of the literature review of the dissertation in the subsequent chapter.

Mainly, institutions are largely defined and conceptualized in sociology and anthropology while the adoption of concept has been widely-accepted in other fields such as economics and business. The newly introduced institution-based view in strategic management serves as a main theoretical framework of this study. Researchers in relevant fields have addressed various questions such as the consequence of competition on firms' strategy is majorly studied in industrial organization and business related fields. Moreover, business and psychology have taken socio-cultural dimensions into account to study the effect of cultural difference on specific behavior.

Although increasing number of research has turned the attention toward institutions, major findings in the research are generally embedded, i.e., they reflect the aspect of each field but provide no linkage between constructs. For example, the consequence of competition law on competition is studied in law and economics but scholars in fields rarely extend the research beyond competition especially in the firm's perspective. Conversely, scholars in business related fields such as strategic management take competition as given without a sufficient study throughout the prior cause of competition which, later one, becomes the newly-born institution-based view in strategic management field (Peng M. W., 2002). The scope of research has been limited to a one-shot relationship without a sufficient further consideration. Therefore, the linkage between pieces of knowledge is absent but necessary.

In Sociology, institutions have been on the top of research agenda and have been part of the mainstream research for a long time. However, sociologists exploited the idea of institutions in a limited scope. For example, they put more emphasis on the individual level rather than other levels beyond that (Meyer, 1990). Parsons (1937) formulated the functionalistic theory and claimed that all activities take place within an institutional framework. He described institutions as "normative patterns which define what are felt to be, in a given society, proper, legitimate, or expected modes of action or of social relationship" (Parsons, 1940, p. 190). Traditionally, scholars believe that the influences of institutions are built over time since the childhood and persisted until the death and the institutions themselves also persist overtime. In other words, institutions are given and subject to no change.

Later on, the belief of *static* institutions has been disclaimed, the term institutionalization process was coined by Selznick (1949) and Berger and Luckmann (1967). Even though different types of institutions change in the different velocity, they do essentially change. This process has been claimed to dynamically characterize the *organizations*, i.e., entities under the umbrella of institutions. Meyer and Rowan (1977) claimed that the formal organizational structures are actually consequences of rationalized institutional rules. Likewise, the rationale of the complexity in formal organizational structures is an expansion of rules. For this reason, institutions affect organizations in the economy by the process of incorporation, gaining legitimacy, and enhanced survival prospects perceived by organizations. As a result, institutions largely influence firms by their attempts to conform the enforced institutions.

Moreover, institutions are multidimensional. Friedland and Alfred (1987) proposed that there are differentiated institutional spheres in a society and no necessary harmony among various institutional complexes. An analysis of institutions cannot be completed by solely taking one dimension into account and ignoring other dimensions else. Consequently, Scott (1995) proposed that institutions may be broadly categorized into *formal and informal institutions*.

Meanwhile, in other fields such as political science and law, institutions have gradually coexisted throughout their history. For example, Bogason (1987) proposed that game theory, theory of collective action, and sociology have consistently contributed to the understandings of institutionalism in political science and legal fields. Relatively new and trajectory, economics and business have gradually incorporated institutions into their subject matters. Hodgson (1989) discussed extensively about economics and institutions. The word institutionalism has been used as the standard designation of a certain way of thinking in

economics which is opposed to neoclassical approach. The main idea of institutionalism is that it does not sharply delimit its field of study from other sciences but functions as more of an open, learning research system. It moreover allows a complex, scientifically based description of humankind including firms. Institutionalism proposed that there is also an interaction between institutions and individuals in the sense that both of them influence and constitute each other (Sjöstrand, 1993).

Nevertheless, the main contribution of institutional theory lies on the claim concluded by DiMaggio (1988) as follows:

"The distinguishing contribution of institutional theory rests on the identification of **causal mechanisms** leading to organizational change and stability on the basis of preconscious understandings that organizational actors share, independently or their interests" (p.3)

The argument of this study, to a certain extent, partially responds to this contribution. However, before extending and scoping further into a particular context related to international business where the precise answer could be delivered, the incorporation of institutionalism idea in strategic management is discussed in prior.

Oliver (1991) partially responded to the call for the awareness to the strategic behaviors that organizations have different ways of response to the institutional processes. Firm's response spans from being completely passive to actively manipulate the institutions. In principle, these organizational choices are limited by a variety of external pressures and firms respond accordingly to survive (Pfeffer & Salancik, 1978).

Moreover, institutional theory does not only explain the choice of behavior of firms, it also explains "*non-choice*" behavior of firms. This is particularly important. For example, the culture is imprinted in the society where the firms are originated and they are predicted to conform to the culture when culture is externally validated and accepted by firms as to be invisible to the actors those the culture influences (DiMaggio, 1988). Consequently, firms are implicitly influenced by the culture in their unconscious of, blind to, or otherwise take for granted the institutional processes to which they adhere. Therefore, this is a process of isomorphism rather than resistance.

Additionally, besides unconscious forces by the culture, firms are assumed to be interest-driven (DiMaggio & Powell, 1983). The interest driven process of firms in institutional theory is explained by their reproduction or imitation of strategic choice in response to external pressures, expectations, or norms of the environment. This is different from the traditional view that firms adjust their behaviors through the exercise of power,

control, or negotiation to reduce an environmental uncertainty. Therefore, institutional theory offers numerous insights into an understanding in firm's behavior.

The main message previously discussed is probably "institutions matter". Peng (2003) raised the succeeding research agenda as 'how institutions matter?' In the problem definition, institutions frame the choice that firm may choose. In the market, firms require institutions such that support them to create the competitive advantages vis-à-vis their competitors. At the same time, institutions should also limit an exploitation of non location-bounded advantages. This is simply because (semi)globalization puts a pressure on these advantages and it tends to be higher overtime (Ghemawat, 2003). *Probably*, the most important point might be an answer to the question whether firms will choose to implement market-based strategy instead of non-market-based strategy as a consequence of institutions or not? This is so-called a '*strategic choice*' in this study.

Despite a significance of institutions on firm, the concept of institutions is a big idea and probably too broad to conduct an empirical research at once. According to the previous discussions, there are two important pieces of research findings guiding toward the research question of this study: (1) competition and strategic choice, (2) the role of culture on both competition and firm strategic choice. They provide crucial pieces of jigsaw yet a complete picture which this study aims to investigate.

In competition and strategic choice, the literatures in strategic management and related fields confirming this link are considerably well-established. Firms are influenced by the environment and they adjust their strategy both voluntarily and coercively (Astley & Van de Ven, 1983). Hrebiniak and Joyce (1985) claimed that competition amongst other environmental factors certainly forces firms to adjust their strategic choice. In this context, strategy is more or less defined as *action*. Chen (1996) emphasizes that the heart of strategy is an interaction, which is a relation between actions and responses that lead to competitive advantage. The essence of the process is a competitive interaction between firms where actions and responses of firms are reciprocal. Finally, this competitive interaction creates competitive advantage of firms and performance (Grimm & Smith, 1997).

However, the discussion was solely on the strategic choice between different marketbased strategies. Peng, Wang, and Jiang (2008) argued that the strategic choice cannot solely be limited to amongst market-based strategies themselves. This is because in developing economies, the market-based strategies are not the only choices available. Referring back to the problem definition and background of study section, market restriction was claimed as one of the main instance of the competitive advantage that cannot be transferred across locations. Therefore, the strategic choice amongst market-based strategies is not an issue of interest in this study, but the strategic choice between non-market-based strategies and market-based strategies. Subsequent point is what specific strategies and choices are emphasized in this study. Certainly, besides the following analysis and description, it will be extensively elaborated in the subsequent chapter later as well.

Regardless of the competition for markets in product and geographic dimension, firms are believed amongst traditional scholars to implement strategy to compete back and forth. Tangentially, the key concepts of strategic management field have been influenced by the ideas of Porter, especially the five forces model (Porter, 1980). It explicitly stated that firms generally take competition (rivalry or competitive intensity) into their consideration when implementing strategy.

Also, industry-based view puts an emphasis on the industrial organization related issue. In particular, the inverse case of competition is exactly conspiracy amongst firms. Given that firms have a choice; firms probably prefer a reduced level of competition because that reduces the pressure on their profitability (Karnani & Wernerfelt, 1985). Adam Smith in The Wealth of Nation (1776) stated as follows:

# "People of the same trade seldom meet together, even for merriment and diversion, but their conversation often ends in a conspiracy against the public."

Here, the term *collusion* is coined. Evenett, Levenstein, and Suslow (2001) concluded that the clear evidence of collusion in both domestic and international markets implies that collusion is almost a natural consequence of an increasing level of competition which is triggered by the globalization process. Therefore, it could be seen that competition pressure could potentially lead to either competition or collusion.

Despite the practical absence of pure case of either choice, proportion of both activities is not identical. In other words, competition may lead to either market-based strategy or non-market-based strategy such as collusion (Peng, Wang, & Jiang, 2008). Traditionally, these binary choices are believed to be mainly determined by industry characteristics. Bain (1951) related the concentration of industry, i.e. competition pressure, to the profit rate. Certainly, the negative relationship has been showed and this leads to an incentive to reduce competition by firms through a collusion measure. Furthermore, related size of firms also influences incentive to form collusion. Peng (2006) termed this behavior as a '*capacity to punish*' which bigger firms could possess an ability to deter and combat defection hence sustains collusion. Conversely, similarity between firms could intensify competition because, ceteris paribus, no firm has a capacity to punish and play this role.

Similarity of products between firms and the stability of demand, supply, and technology also support collusion.

On the other hand, the choice does not solely rely on firms or industry characteristics, but also the rules that govern their behavior. Institutions are generally defined as *rules of game* which could be formed either formally or informally (Scott, 1995; North D. C., 1990). Studies have been conducted consistently that institutions, competition law in particular, could restraint the market restriction and promote competition (Shapiro & Kovacic, 1999).

Since the level of competition significantly influences strategic choice of firms, the change of institutions should be able to affect strategic choice as well. This is a vision beyond traditional interest which was mainly put into the task environment of firms. For example, Porter's diamond model was critiqued as it does not look beyond the rivalry of firms. Institution-based view therefore extended the scope and considered the source of rivalry which more or less is institution (Ramaswamy, Thomas, & Litschert, 1994). Surprisingly, this aspect of international business research is still very limited until nowadays (Peng, Wang, & Jiang, 2008). However, the competition law is not the only institution influencing firms, there is also an embedded structure of the society which more or less influences all activities which is called "informal institutions".

Laurent (1983) showed that differences amongst organizations are caused by differences in the assumptions about individuals' behavior, their values and beliefs about human nature. Differences in values and beliefs are, in turn, shaped by the socio-cultural national environment. Likewise, decisions to form a cartel or implement a strategy are more or less influenced. Based on Hofstede's (1980) and others' research, strategic management and international business research has proposed and tested the effects of various cultural dimensions on firms behaviors especially strategic ones. The cultural dimensions used for comparative studies include power distance. uncertainty avoidance. individualism/collectivism, and masculinity/femininity as well as many others such as Triandis (1984). Consequently, this study also focuses on the influence of culture on level of competition and strategic choice of firms.

On the other hand, even though the linkages between competition law and competition, and competition and strategic choice have been studied expansively and culture has been adopted extensively in IB field, it is astounding that none of empirical research, especially experimental research, has been conducted regarding these well-recognized linkages and concepts. This study therefore focuses on the choice of firms between competition and collusion. When the collusion is formed by an explicit agreement between conspirators, "cartel" is the term used to represent such an agreement (Brenner, 2005). The

evidences have showed that competition law influences the competition level in industrial organization (IO) field while competition pressure has been studied in strategic management and business related fields for a long time. This study tries to link both theoretical knowledge and empirically test the casual mechanism starting from institutional change which affects the cartel formation to strategic choice of firms. This process is defined "*Transition process*".

## 3. Research Questions and Objectives of this Dissertation

This dissertation attempts to test the causal mechanisms leading to organizational change which is the purpose of institutional change on firms. In the context of this research, cartel is the specific case where the so-called "most egregious" anti-competition behavior is conducted and the evidence in real phenomenon exhibits an absence of its detection in developing economies including Thailand (Nikomborirak, 2006). According to the previous section, by institutions, this study means not only formal institutions but also informal institutions. Their causal mechanism in the transition process becomes the research question and the objectives of this study will be elaborated subsequently. Broadly, the research question is as follows:

#### Does transition process exist and how does it work?

Since the transition process can be separated into two sub-sections—competition and strategic choice, the research questions could be more explicitly stated as follows:

# **RQ** 1: What is the consequence of formal and informal institutional change on the collusion vis-à-vis competition amongst firms?

#### RQ 2: What is the consequence of level of competition on the strategic choice of firms?

While referring to previous research in this chapter and the next chapter, this study has a unique purpose and approach that the test of transition process is the test of causal mechanisms of institutions. Since this study is a connection between different pieces of knowledge from different fields, the objective of the dissertation is to develop and test a testable model of the causal mechanisms which connects between institutional change and strategic choice of firms. The monotonicity of the empirical result of both research question stands for the existence of transition process because institutional change affects both competition and, then, strategic choice which is precisely the definition of transition process in this study.

Besides, the objective of the dissertation is to apply concepts from institutional theory, institution-based view of strategic management, industrial organization, and social psychology to support the specific testable model which could really exhibit the causal mechanisms of institutions and the causal mechanisms could really be empirically tested. Another objective of this dissertation is to introduce the new approach to test the trajectory institution-based view propositions in an empirical manner. For this particular purpose, the dissertation introduces the innovative research methodology for it.

This dissertation tries to overcome the limitations of prior research. In the empirical evidence, it tries to scope down to the testable case and, at the same time, still captures the main principle of the concepts. Since there is a tradeoff between generalizability and testability of empirical evidence, the study tries to optimally balance between both properties. Finally, the study aims to empirically prove the causal mechanism between institutions and strategic choice which could eventually ascertain a virtue of institution-based view which this type of research is not evident before.

## 4. Overview and Organization of the Dissertation

The central idea in this dissertation is that the transition process from institutions and strategic choice of firms exists. In particular, institutions span both formal and informal institutions. The dissertation is organized in five chapters and appendices. Chapter II presents the literature review. A model of causal mechanism that linked from institutions to strategic choice is developed. Essentially, the specific context and scope of the study is narrowed down and a set of hypotheses is derived. Chapter III describes the research design and methodology and includes the descriptions of the sample, variables, data collection efforts, research instruments, and analytical of the study. Chapter IV describes the results of the study. It includes the results ordering in accordance with the sequence of hypotheses. Finally, the dissertation concludes with Chapter V with conclusion and discussion of the findings of the study. Limitations and some ideas for future research are also presented.

# CHAPTER II LITERATURE REVIEW

"I believe that current events are forcing IB scholars to pay more heed to Douglas North's concepts of institutions...there can be little doubt that institution-related assets have become more important...I would hope that fraternity of IB scholars will place these issues at the top of their research agenda over the next decade or so. If we do not do so, I believe that we will be failing both our students and the international community that we seek to serve... (Dunning, 2004)"

In the previous chapter, this study has discussed institutions and related topics including the literatures in various fields those developed the concept of institutions. However, the query posed in the last chapter was a causal mechanism between institutions and firms. The discussed studies revealed that research has been conducted independently and the empirical test of the linkages between pieces of research is still absent. Such a linkage is necessary to explain the question 'how institutions affect firms?' which has been posed by Peng (2003). This chapter extends further to connect the missing link and draw a set of testable hypotheses. It is worthwhile to put a caveat that the stage of analysis should be *sequentially* discussed as follows: the relationship between location and firms first, then the specific location-influenced behavior shall be discussed subsequently. Some terminologies or definitions were briefly mentioned in the introductory chapter already. Rigorously, this chapter extensively discusses and defines them in details under the context of this study's research questions.

At the beginning of the 21st century, John H. Dunning claimed that location is one of the most 'challenging' topics in the field of *international business*, IB henceforth (Dunning, 2001). Dunning encouraged IB scholars to investigate more on the topic of location and extract the specifications of location-specific characteristics that explain the characteristics of international business more precisely. Moreover, Dunning convinced that 'location' is the unique subject of analysis of the IB field because an absence of location issue makes all of the analyses in IB field become invariant from the business field in general. It is therefore a duty of IB scholars to study the location-specific characteristics, institutions in particular, and their effects on firms.

Before discussing institutions in detail, North (2003) provides an interesting illustration of institutions in the professional sports competition as follows:

"...The way the game is played is a function of the formal rules that define what the players can and cannot do and of informal norms of behavior that are supposed to prevent you from trying to kill the quarterback on the opposing football team or from similar unsportsman-like behavior. And then there are the referees and umpires, who are supposed to see that people live up to both the formal rules and the informal norms. Now I do not know about here in Europe but I do know that in the United States very frequently it pays to play dirty, to try to injure the quarterback on the opposing team if he is a good quarterback; or otherwise do to the players on the other side, intimidate them and things like that. It makes a very different game, depending on whether you play the game according to the rules and people live up to the standards, formal or informal; or you try to evade them and to get away with it. Societies are like that. They are structured and made up of a complex of formal rules, informal norms and their enforcement characteristics.... (North, 2003)"

In brief, in a particular society, there are the rules for players to follow and these rules could be either formal or informal. Consequently, the naturally subsequent question is "*what are the consequences of the rules*?" Furthermore, in the case where expected consequence is specified, the question crawls backward to the root of it, that is, "*how could we change the rules in order to gain the specific consequence*?" This study extensively discusses these two broad questions in the context of international business. At the very beginning, these rules are broadly called "*institutions*". The definitions and details of institutions shall be elaborated in the succeeding section.

## 1. The rules of game in a location: Institutions

Institution-based view is a relatively new approach in the field of strategic management and IB (Peng M. W., 2003). In retrospect, the rising of studies in institutions was triggered by an absence of the explanatory power provided by traditional approaches in the IB and other business fields, especially strategic management. In strategic management, traditionally, both industry- and resources-based views are considered as mainstreams of strategic management field (Peng, 2006). Nevertheless, a richness of the real phenomena of differences between firms possessing the same or similar resources and capabilities in a given industry triggered the studies of an alternative explanation besides industry- and resources-based views (Mayrhofer, 2004; Chacar, Newburry, & Vissa, 2010). If firms could run their business in or get into different locations without any adaption required, then each location specific rules could be virtually ignored. Nevertheless, empirical evidences exhibit the

counterexamples. For example, a difference of the performances amongst subsidiaries of the same MNCs in different host countries could be the consequences of variation in transfer of practices from headquarters to subsidiaries and amongst subsidiaries themselves. It has been proposed that difference in the location-specific characteristics significantly influences the transfer of practices and, subsequently, difference in performances (Kostova, 1999). This particular difference across firms in the same industry and set of resources indicates an existence of the alternative explanatory factor and it seems to be embedded in a particular location. In specific location, there is a fundamental characteristic that governs the rule of game and practices which is called "*institutions*."

## 2. Definitions and Categorizations of Institutions

In the last chapter, this study discussed the studies in institutions and the evolution of the concept. In the prior discussion, the study presented the broad definition of institutions already. Since institutions become a crucial factor in this study, the precise definitions of institutions shall be articulated further. Doulas North formally defined institutions as "the humanly devised constraints that structure human interaction (North, 1990)." Alternatively, Richard Scott defined institutions as "regulatory, normative, and cognitive structures and activities that provide stability and meaning to social behavior (Scott, 1995)." This categorization put forward by Scott can be re-categorized into two groups by the degree of formality: Formal (Regulatory) and Informal (Normative and Cognitive) institutions. By formal institutions, the provisions and substances of institutions are explicitly written or stated. Conversely, *informal* institutions are normally implicit and rarely written in words. Therefore, Triandis (1995) claimed that the most important characteristic of culture as the "unstated assumption". In the long run, informal institutions might be well-established and obvious enough to be legislated and explicitly written as formal institutions. Conversely, lasting formal institutions could be enforced for a long while and it eventually becomes the belief of people in the society which acts as if informal institutions do. Therefore, in essence, both types are not mutually exclusive.

Scott (1995) categorizes institutions into two main categories: formal and informal institutions. The *formal* institutions are consisted of laws, regulations, and rules. In general, it is a coercive power of governments or governing entity of a specific society. On the other hand, *informal* institutions consist of norms, cultures, and ethics. Norms define how things should be done. That is to say, norms refer to how the values and beliefs of other relevant players influence the behavior of individuals and firms. For example, despite the recent interest in the concept of '*trust*' throughout the business world, the existence of antitrust laws

in the west is indicative of the differences in norms of business behavior. Asians may view some trust-based relationships among individuals or firms as normal and beneficial, whereas Americans may view these same relationships as collusion (such as Japan *Keiretsu* and Korea *Chaebol*). Meanwhile, cultures and ethics refer to the internalized, taken-for-granted values and beliefs that guide individual and firm behavior. For example, "whistle blowers" reported Enron's wrongdoing because of their beliefs in what was right and wrong (Watkins, 2003).

North (1993) further explained that institutions are the aggregation of formal institutions, informal institution and enforcement entity. This aggregated body of institutions serves as a "Rule of Game" which firms participate, or play, in the game. The way in which firms are playing the game is generally assumed that firms are trying, more or less, to maximize their profits subject to specific constraints. Moreover, firms are also engaging in the skills and knowledge acquiring process. These ways of playing the game stand for the purpose of acquiring and accumulating the *surviving ability* of firms.

In reality, the proper response to the rule of game does not simply increase the surviving ability but even determines the survival. D'Aveni and MacMillan (1990) empirically conducted the exploratory study of 57 bankrupt firms and 57 matched survivors to indicate the pattern of environment decision makings in both types of firms. Interestingly, survivors pay relatively more attention to the external environment both in normal and crisis periods. Conversely, failing firms deny or ignore the external environment during both periods. Therefore, the result implies a significance of an adjustment of surviving firms to external environments (D'Aveni & MacMillan, 1990).

There are two examples of how difference in institutions both formal and informal respectively might affect the firms in a given circumstance. *Formally*, the intellectual property law might be strictly imposed in one country while its level of strictness is relatively much weaker in another. Even though the same firm runs its business in both countries and in the same industry, the enforcement of intellectual property law differently affects the incentive for innovation between these two countries (Shapiro, 2005). By intellectual property effect, the argument is that temporary monopoly power possess might considerably provide disincentives for the intellectual property rights' holder to develop any innovation further. However, this fallacy is proven wrong. In the reality, the competitors of intellectual property rights' holder have to survive by inventing newer products with more innovation in order to differentiate their products and gain the market share. Usually, competitors are eager to gain the market share in the shortest period somehow and this process of back-and-forth competition creates an incentive for both parties to innovate. This scenario is considered a win-win situation and it is an example of a productive strategic choice of firms.

Besides, *informally*, Bartlett and Ghoshal (1988) also examined and claimed that the difference between the norms of subsidiary and parent of MNCs affects the innovation activities as well. It implies that even amongst the seemingly identical firms, parent and subsidiaries, difference in the institutions amongst locations of different units conduct their activities differently. Similarly, the underlying process is derived in the same vein as the previous paragraph but the antecedent is not the formal IP law protection in this case. Conversely, norms play its important role here. For example, referring to the same counterreaction between two companies discussed in the previous paragraph, it was left out an underlying assumption about the characteristics of both companies as well. Given the same IP law provision, e.g. same length of breadth, companies under a given institution might react to it at different degrees and that significantly affects the level of innovation created from competition.

One aspect to be noticed is that norms seem to affect behaviors in *moderating channel*. Referring back to the article by Bartlett and Ghoshal (1988), under the same set of organizational regulations and rules, norms moderately affect the practices under the restriction of these rules. Therefore, subsidiaries and parent behave differently under the same set of organizational regulations and rules. These two examples provide a glimpse on an effect of different types of institutions on firms' behaviors. Next, the consequences of different institutions shall be elaborated.

# 3. Consequences of Institutional Change on Firm

The argument of institution-based view is mainly that there are the rules of the game that firms need to conform to gain and remain legitimacy (Peng, 2003). This legitimacy is derived from the acceptance of the firm by stakeholders in its environment (Kostova & Zaheer, 1999). When firms need legitimacy in the environment to survive, they have to accept their responsibility of conforming to both formal and informal institutions. Moreover, they need to consider strategies they can adopt to change their destiny before pressures come by adapting themselves with the changes in institutions (Child, 1997). In this section, discussions and analyses on the consequence of institutions on firms will be elaborated.

It is crucial to understand that taking institutions into account requires a certain consideration on individuals or entities at the same time. This is fundamental for the schools of thought in Economics where institutions are studied. As discussed in the introductory chapter, traditional institutionalism is generally critical of neoclassical economics and supportive of government intervention (Brue & Grant, 2007). Conversely, New Institutionalism Economics (NIE) tends to be market-oriented and also emphasizes the

importance of institutions. Certainly, the works of Richard Posner in Law and Economics field, Ronald Coase and Oliver E. Williamson in transaction-cost economics, and James Buchanan and Gordon Tullock in public-choice theory are considered as the main strands of NIE. However, the most prominent strand of NIE probably is the works of Douglass North. North (1990) emphasizes a crucial principle behind NIE as follows:

"The choice theoretic approach is essential because a logically consistent, potentially testable set of hypotheses must be built on a theory of human behavior. The strength of microeconomic theory is that it is constructed on the basis of assumptions about individual behavior...Institutions are a creation of human beings. They evolve and are altered by human beings; hence our theory must begin with individual. At the same time, the constraints that institutions impose on individual choices are pervasive..." (North D., 1990)

Different opportunity sets created by institutions could lead to different eventual consequences on firms. On the contrary, specific eventual consequences might require a certain pattern of path-dependent explanation. This is simply because the "rule of game" governs how the activities within a society should be conducted. As a result, different conducts and activities lead to different consequences. As discussed earlier, given the specific consequence of institutions, the question lies on the characteristics of institutions that are corresponding to the consequence.

In the classical economics argument, Adam Smith claimed that the wealth of nation is a function of its productivity (North D., 1990). Furthermore, later on, mainstream schools of thought in Economics such as Keynesian, Neo-Keynesian, and Neo-classical economics generally agree with this argument (Brue & Grant, 2007). In short, productivity is a measure of the efficiency of production. It is crucial for firms because it means that the firms could manage to respond to obligations along the value chains and remain competitive in the market place. The productivity is the long-run phenomena in the classical economists' argument and it determines growth of the economies (Boumol, 1986). Porter (1980) also supports the idea of the competitiveness of nation derived from the productivity which could be created from the micro-foundation of the economy which is firm in particular. Moreover, in the long run, the competitiveness could be delivered solely by innovation which is a consequence of productivity as well (Schwab, 2010). The difference in productivity finally affects development of countries (Boumol, 1986).

Consequently, in a big picture, there is a difference amongst nations in the development aspect which is the consequence of, but not limited to, a difference in

institutions. North (1991) provided an example of this difference and it is precisely the distinction between "*productivity-raising institutions*" and "*non-productivity-raising institutions*". North argued that institutions exist because they minimize the interaction costs amongst human. Moreover, since they vary across locations, they provide the incentive structures differently. In general, wealthy economies are acquiring such a status quo because institutions give an incentive to the activities that encourage skills acquisition, capital expansion, new technology, and economic growth. These activities are generally called *productivity-raising activities*. Conversely, poorly defined property rights, lack of quality human resources in private sector, customs those limit work or disparage material gain, and over-emphasis on distribution instead of creation are considered *non-productivity-raising activities*. These activities are fundamentally based on transactions or interactions between individuals.

North (1991) further claimed that these transactions have a particular characteristic and the argument could be shown in two cases without losing of generality. By historical economics approach, in the productivity-raising case, the "New World" colonized by England and the Netherlands stands as an evidence. The fundamental structure of economics and business relations in the societies are broadly defined as *transactions*. Therefore, the difference in transaction characteristics in both economies is considered. In North America, the crucial characteristics of transactions are *complex and impersonal*. These transactions characteristics directly increased an ability to capture the modern technology which could be acquired both internally and externally. Internally, the capture of modern technology or innovation could be acquired by the competition force in the domestic market where firms are given an incentive to develop an innovation to compete with competitors. Externally, an absorptive capacity of domestic firms helps them capturing advanced technology or innovation from abroad especially the colonizer states.

Conversely, in the non-productivity-raising case, the *New World* colonized by Spain was mainly consisted of countries in South America. Obviously, the main difference lies in the transactions characteristic. They were generally *personalistic*. Certainly, this is inefficient because it increases transaction cost significantly and does not lead to the absorption of the gain from trade such as modern technology. This is claimed as a reason of an erratic economic growth in Latin America.

Since the difference between two regions is asserted as a result of the difference in transactions, the study elaborates the difference between complex and impersonal transactions, and personalistic transactions in the context of NIE framework. Part of a larger field of the NIE, the study of transaction costs focuses on an exchange between actors in an

economy. Neoclassical economic theory assumes that the institutional framework—the legal, political, and informational aspects of an economy—is given. In a *neoclassical* world contracts are costlessly and immediately enforced, property rights are secure, and any initial distribution of resources can be voluntarily bargained over and exchanged in order to maximize efficiency. Thus built into the model is the idea that any government intervention must be deleterious, since it involves a move away from a perfect market. However, once the idea of an undistorted initial period is questioned, much of the distinction between profit and rent-seeking breaks down. If the initial distribution of resources is distorted, then rent-seeking may involve fights over the distribution of rents and may not necessarily involve inefficient dissipation.

In contrast, transaction cost economics emphasizes that the creation, monitoring, and enforcement of long-term agreements are inherently impossible and therefore long-term or iterated exchange is risky. Transaction cost analysis thus examines the search for institutions that reduce the costs of exchange, since institutions evolve to minimize transaction costs. Closely related themes are property rights, informational asymmetries, and principal-agent models. In this world, a high performance economy is one in which institutions minimize transaction costs, property rights are secure, information is common or at least relatively public, and judicial and political rights are immutable. These conditions are not met in most developing countries. Coercion and uncertainty are both central to politics and economics and also intensify an actor's fears regarding potential expropriation, opportunism, and shirking. The search for institutions and methods by which actors can credibly engage in cooperative behavior is thus a central aim of the new institutional economics.

Kang (2003) discussed the idea of *personalistic* transactions (so-called cronyism here) and its relatively high transaction cost as follows:

"The perspective of the new institutional economics is particularly useful in understanding cronyism, a blanket term that refers to a number of related concepts: family and personal relations, bribery and corruption, patron-client relations, and collusion. In some cases cronyism involves political factions, groups, or informal networks, while in others it involves clans, families, or social groups. Cronyism is often seen as deleterious to economic growth because it implies decisions based on nonmarket principles, increases transaction costs, impedes efficiency, involves rent-seeking, distorts economic incentives, and makes exchange between actors more difficult. In most instances, reliance on personal relations is detrimental to economic efficiency (Kang, 2003)."

Subsequently, since the institutions, those will reduce the transaction cost in the economy and give an incentive to the players to behave in a productive manner, are in more or less the specific pattern, the question being posed by Doulas North was as follows:

"How does an economy develop the constraints that make individuals constrain their behavior so that they make systems effective forces for third party enforcement?"

By making a system of effective forces for the third-party enforcement, personalistic transactions are eliminated and substituted by the complex and impersonalistic transactions. Therefore, set of opportunities created by institutions is required in order to provide appropriate incentives for the players in the market to produce productive outcomes. The prior analysis implies that what the developing countries lack of is the *ability to capture the gain from trade* within and between economies. This ability requires productive behaviors of firms within country which is arguably influenced by the "*institutions transition*<sup>1</sup>" (North, 1993). By acquiring this ability, market could be expanded. This is because the change in institution leads toward the lower costs of transacting and permits capturing more of the gains from trade. Eventually, it hence permits the expansion of markets. Since the direction should be guided toward the perpetuating process of any path dependence in development, a crucial point is a *source* of this path. This is because path dependence in development implies a uniqueness of market expansion consequences. Therefore, the specific pattern of change might not identically happen but the principle aspect could still be identified which is exactly the productivity enhanced by the productivity-raising institutions.

Since the productivity could be enhanced by productivity-raising institutions through a reduction in transaction costs, the specific *picture* of these institutions is connected to the definitions and categorizations of institutions discussed earlier. The process and agents of such changes are formal and informal institution, and entrepreneurs. *Entrepreneurs* are defined as the decision makers of organizations including firms. They are responsible for being agents of the institutional change process who perceive opportunity sets created. Certainly, by this definition, entrepreneurs are not limited to the owners of small-medium size enterprises but the ownership and decision-making body of all types of firms. For the rest of this research, the words 'firms' and 'entrepreneurs' are exploited interchangeably. Eventually, institutions affect economy through the variation in transaction cost and transformation cost. This point is worthwhile considering in relative to the works of Oliver Williamson in

<sup>&</sup>lt;sup>1</sup> North (1990) defined institutions transition as "...fundamental and comprehensive changes introduced to the formal and informal rules of the game that affect organizations as players..."

transaction cost theory. In principle, Williamson considered these costs as exogenous instead of endogenous like institutional school of thought. Therefore, as it is taken as *endogenous* in the system, it is considered as an *adjustable* substance in the analysis. This is different from the approach when institutions are treated as exogenous which is not adjustable but taken as given.

Overall, institutions assign the expected payoff of each action in the market. As discussed earlier, firms are playing the game under the rules of game which are institutions. They both maximize profit subject to constrains and engage in the skills and knowledge acquiring in order to increase the survival possibility. This leads to a selection of the highest payoff choice. This is precisely the point where institutions play the most important role as the setter of the highest payoff choice(s). Institutions provide an incentive structure that makes the payoff of one choice different from another. For example, if the incentive structure makes piracy the most rate of return choice and maximize the survival possibility of firms in the market, firms tend to choose this path over others despite piracy is obviously non-productive. Conversely, if the incentive structure is designed to maximize the rate of return of productivity activities, firms will be provided an incentive to increase the level of productivity activities to increase their probability of survival.

### 4. Strategy as a Consequence

Certainly, firms, at least successful ones, are not doing their business by randomly doing activities or responding to the stimuli in an absence of direction. Given that institutions are introduced or changed to influence firms by providing a set of incentives, firms respond to the change by planning and implementing the set of activities. Therefore, there are systematic starting point and guideline of productive activities which firms create, follow and amend dynamically. It is broadly called *strategy*. In particular, strategy may be defined as "the creation of a unique and valuable position, involving a different set of activities...making trade-offs in competing...creating fit among a company's activities" (Porter, 1996). Besides, Chandler (1962) proposed that strategy is "...the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals...". Similarly, Peng (2006) proposed that strategy is consisted of two elements: formulating of plans and implementing of actions. Mainly, strategy is a unify theme that gives coherence to its various actions.

Generally, there are three mainstream approaches in the strategic field. *First*, industry-based view possesses the arguments regarding firm's strategic choices which based

mainly on the five forces model of Porter. *Second*, resource-based view puts more emphasis on the internal strengths and weaknesses of the firm. The view claims a significance of resources and capabilities in determining success or failure of firm. *Third*, institution-based view has been coined as the explanation of the broader influences on firm's strategic choice. These perspectives work jointly to explain the rationale behind firm's choice of strategy. As previously stated, this study puts an emphasis on the last perspective, *institution-based view*.

However, firms are not one-dimensional unit. Generally, scholars divided firm's strategic choices into two levels: corporate-level and business-level. In corporate-level strategy, firm is considered as a unified unit regardless of different businesses it may run. The corporate-level strategy concentrates on the choice of firm to create value through the configuration and coordination of its multimarket activities (Collis & Montgomery, 1997). In corporate-level, across different businesses, firm has to choose whether it will be adding or removing a particular set of businesses (diversification and acquisition) or not. Moreover, there is a significant interaction between strategy and structure of firms (Chandler, 1962). In additions, corporate governance and corporate social responsibility (CSR) are also investigated extensively by scholars (Hart, 1995; Monks & Minow, 2001).

In business level, it is generally defined as the way to build competitive advantage in a discrete and identifiable market (Peng M. W., 2006). In a specific market, firms make a crucial decision on forming strategic alliance and competing against competitors. To a certain extent, choice of entry modes might be a problem of consideration, but it becomes essential once firms make a decision to enter the foreign market. In the scope of this study, as discussed earlier, the foreign market entry is not the main subject of interest because indigenous firms are subject to change as well. More importantly, number of firms does not run their businesses in diverse markets, especially entrepreneurial firms. Solely SMEs, they account for more than 95 percents of the number of firms, create approximately 50 percent of the total value added, and generate 60 to 90 percent of employment worldwide (Knight, 2001).

While SMEs, and probably indigenous firms, have to take less or none of diversification and acquisition strategy into account, they barely avoid the competition from the competitors in the same market and might confront the choice to form a strategic alliance as well. It is therefore obvious that business-level strategy matters in almost all firms regardless of their size and location while corporate-level strategy importance is diminished or absent in some contexts. The context of business-level strategy is essentially coherent with the change in institutions that influence the choice of strategic alliance and competitions. Certainly after the scope of institutions is narrowed to the hypothesized level, the coherent

strategic choice will be discussed further. The categorization of level and type of strategy in this section serves as the prior discussion regarding the definition and level of strategy that this study put an emphasis on. In conclusion, this study puts emphasis on the business-level strategy dealing with the interaction between firms in the given market which could be either geographic- or product-scoped market. This leads to the analysis of the relationship between institutions and strategic choice in the subsequent sections.

Before discussing further on the issue of institutions and strategic choice, it is noticeable that these well-accepted definitions of strategy do neither claim nor imply that the end of strategy has to be in any particular pattern. In the modern business studies including IB, the term "strategy" is generally assumed to be a *market-based strategy*. In other words, the context of research is usually based on a relatively stable market-based institutional framework. This is because majority of the works primarily arise out of research in the United States, and few other developed economies, which is sensible to assume accordingly (Peng, Wang, & Jiang, 2008). This fact implicitly states an underlying assumption of a prior stage of strategy, that is, the market-based institutions have been developed and considerably stable. By this underlying prior stage, an absence of it might change the explanation of traditional beliefs and knowledge about firms' strategy and success. The "*rule of game*" is different across locations which, occasionally, the assumption is violated.

Evidences suggest significant differences of institutions across nations even within developed economies (Schwab, 2010; Lewin & Kim, 2004). In particular, the institutional difference between developing and developed economies is relatively more obvious (Peng, Wang, & Jiang, 2008). The difference of the rule of game between these two groups of countries significantly shapes the strategy and, consequently, performance of firms. According to Peng, Wang & Jiang (2008) argument, they claim an evident support for the significance of institutions in developing economies especially the market-based ones. Since an absence of market-based institutions affects the underlying assumption of strategic choice of firms, it raises the question whether introducing market-based institutions will influence strategic choice or not and by how. Even though the previously exhibited research discussed and proposed many ideas regarding the developing (emerging) economies and institutional framework, they mainly claimed an importance of institutions without narrowing down the scope of analysis into the essence of institutions and how does it work. Therefore, the question is what the specific characteristics of institutions should be. The next section elaborates more on the specific type of institutions that affects strategy.

## 5. Location of Institutions as a scope of analysis

Lewin and Volberda (1999) explained that the coevolution of firms is an adjustment of firms to their environment and that raised the key research question, "*How do firms coevolve with their environment?*" In general, firms may respond to the environmental changes differently, e.g. reactive response and proactive response (Lewin & Volberda, 1999). Similarly, Peng (2008) asked the question, "*How to play the game, when the rules of the game are not completely known and changing?*" However, Peng (2008) put more emphasis on the perspective of firms running business in different locations e.g. MNEs from developed economies and their "global strategy" (standardization of products and services) applicability but the same postulate could also be analogized to the institutional change within a specific location as well. Ultimately, the understanding on domestic firms from particular institutions, especially developing economies which are different from traditional "implicit" assumption of stable market-based institutional framework, is still known very little (Khanna & Palepu, 1997). This means the difference amongst locations of institutions plays an important role on the relationship between institutions and firms.

In general, there are two dimensions of relationship between institutions and firms: Frame of reference and Magnitude of the relationship. In brief, the former based on the country where the institutions and firms are located and the latter based on how large an influence of a specific institution on firms is. Based on the country of origin as a frame of reference, since institutions vary across countries, firms have to interact with different institutions in particular locations and the consequence is a variation in the strategic choice (Kostova, 1999; Peng, Wang, & Jiang, 2008). As a matter of fact, almost all firms have to deal, at least, with home-country institutions. In an exceptional case, some firms may directly deal with host-country institutions without much to concern about home-country (Moen & Servais, 2002). If there are any international activities or presences, another type of institutions so-called host-country institutions has to be taken into account. Traditionally, Hymer (1972) proposed that firms doing business abroad have to confront with some disadvantages. These disadvantages have been called and recognized as "Liability of Foreignness" (Hymer, 1972; Zaheer, 1995). The main argument of an idea is that unfamiliarity of foreign firms to the domestic environment especially institutions gives an advantage to indigenous firms over foreign firms. Therefore, foreign firms have to come up with other compensated advantages to compete and gain the piece of market pie against indigenous firms.
Consequently, scholars conventionally studied hugely on the effects of host-country institutions and the effects on firms' (Zaheer, 1995; Hill, Hwang, & Kim, 1990). Unarguably, host-country institutions evidently influence foreign firms. Kogut and Singh (1988) confirmed the relationship between cultures and choice of entry mode by inventing a "Cultural Distance" measurement which has being adopted widely in academic papers. Kostova (1999) extended the idea toward more eclectic framework and proposed the "Institution Distance" to explain differences between host-country institutions and home-country institutions. Still, this measurement was invented for the benefit of studying host-country institutions effect. Recently, numbers of works in the IB field have taken host-country institutions into account as a normal practice (Chacar, Newburry, & Vissa, 2010). Even though the results of empirical evidences might not be perfectly confirmed, some rejections lie on the contextual and technical fallacies. All in all, host-country institutions are widely accepted as a crucial explanation on IB phenomena (Kotabe & Mudambi, 2003).

On the other way around, *home-country institutions* and their effect on firms have been relatively less studied in spite of its significance (Shenkar & von Glinow, 1994). This piece of fact could be disregarded if the truth reveals that home-country institutions do not significantly affect firms, especially their strategic choice. However, home-country institutions were claimed to be a crucial driver behind firms' behavior and strategic choice (Khanna & Palepu, 1997). Li and Wyer Jr. (1994) proposed an interesting argument that, in a given location and set of institutions, firms those come from different home countries have to face the common host-country institutions. Therefore, one main difference is more or less an influence from the home-country institutions. Moreover, Bourgeois and Eisenhardt (1988) studied extensively about the strategic decision in the high-velocity environment of domestic (home-country) market in microcomputer industry. They confirmed a significance of the institutions, politics, in governing the performance of firms (Eisenhardt & Bourgeois III, 1988). Holding other things constant, the difference between home-country institutions should possess an authority to elucidate the differences of performance and success of firms to a certain extent.

Empirically, there are number of works in the IB field that justify the essence of home-country institutions as well. To name but a few, aiming to answer an underlying issue of home-country institutions' effects on strategic choice, Mayrhofer (2004) conducted a research on 26 empirical studies that attempt to measure home country effects and confirmed an importance of home-country institutions on the entry-mode decision. Porter (1990) claimed that home-country institutions play an important role on the competitive advantage creation through strategic choice. This idea has been empirically confirmed in Japanese

context and even asserted as the most important factor of Japan rapid development (Sakakibara & Porter, 2001). Furthermore, an information technology and business process outsourcing (IT/BPO) industry in India exhibits an example of the role of home-country institutions, higher education investment of government in particular, on the success of firms in related sectors (Peng, Wang, & Jiang, 2008). These evidences certainly state that home-country institutions matter. Consequently, the fact that few studies put an emphasis on this type of institutions is worthwhile to be concerned. Furthermore, regardless of the scarcity in research of home-country institutions, the essence of home-country institutions selection mainly relies on the potential explanation to the issue of a relationship between institutions and firms' strategic choice. In order to explain this particular relationship, specific type of home country should further be analyzed to verify the selection of home-country or host-country institutions as a topic of analysis.

Another dimension of relationship between institutions and firms lies on the magnitude of the relationship between institutions and firms' strategic choice. Put it simply, yet both home-country and host-country institutions are expected to influence firms, the influence of these institutions on firms are expected to be different across locations regardless of being home- or host-country institutions. However, considering the logic provided by Li and Wyer Jr. (1994), the difference of home-country institutions should play an important role determining firms' success or failure in a given host country because given the same arena of competition, host-country market, the obvious difference lies on the home-country institutions amongst firms. The point is what principally determines these differences. Scholars suggested the level of development, so-called advancement of development, as an essential determinant of an importance of institutions (Guillen & Garcia-Canal, 2009). Emerging economies are low-income, rapid-growth countries using economic liberalization as their primary engine of growth. There are two main groups of Emerging economies: developing countries and transition economies (Hoskinsson, Eden, Lau, & Wright, 2000). The findings that institutions effect seems to be more crucial in developing countries than in developed countries imply that the level of development negatively moderates the relationship between institutions and firms' strategic choice (Peng, Wang, & Jiang, 2008). It basically means that institutions matter in developing countries than developed countries (Meyer, 2001).

More importantly, an essence of institutions in developing countries is valid *only if* the case of developing country is considered as a home country. Put it simply, host-country institutions' issues generally rely on the differences between particular type of firms and their country of origin, and, host-country institutions. Consequently, the issues do not rely solely on host-country institutions regardless of the country of origin of firms. That is to say, in host-

country institutions, the unit of analysis is *not the institutions themselves but the difference between institutions*. For example, host-country culture's effects on MNEs' subsidiaries are measured in the form of Cultural Distance (CD) which considering the difference between culture between home and host countries (Shenkar, 2001). Moreover, EMNEs seem to be more successful in an investment in developing countries because they practice under the similar 'business terrain' in which MNEs from developed economies are not familiar with (Guillen & Garcia-Canal, 2009). Therefore, the advancement of development in host-country institutions context does not decrease the effect of institution as in the case of home-country institutions. Essentially, in this research, the effect of institutions on firms is the subject of interest; therefore, the case in which this effect will be optimized to extract the essence of it shall be selected. As a result, the selection of developing country to magnify the influence of institutions has verified the validity of home-country institutions selection as well.

Albeit institutions might be not as important in developed countries as in developing countries, it does not imply that institutions do not matter in developed countries. Conversely, Porter (1990) claimed that institutions, especially infrastructure-related institutions, influence firms' competitive advantages hugely. For example, Japanese firms' international competitive advantages have been proved to be a consequence of rivalry which is a direct consequence of domestic competition-related institutions (Sakakibara & Porter, 2001). Nonetheless, there is still a debate over the issue of singularity of the institutional effect on different locations. One group of scholars believed that traditional theoretical explanations which are applicable in developed countries cannot be exploited in developing or emerging countries (Kiggundu, Jorgensen, & Hafsi, 1983). Another group of scholars argued that distinction of developing economies characteristics is just a different stage of analysis. For example, EMNEs are just outliers and considerably the same as an early stage of general MNEs (Narula & Nguyen, 2011). Therefore, this study tries to investigate a relationship between institutions and firms' strategic behavior by taking this debate into account as well.

Even though developed countries are also influenced by institutions, an interesting and curious relationship between institutions and firms in developing countries has been intense enough such that it even creates an alternative theoretical approach in strategic management, so-called institution-based view (Peng M. W., 2003; Peng, Wang, & Jiang, 2008). Moreover, institutions seem to fit better to the emerging or developing countries as it could not be merely treated as a background but as a determinant of firms' strategy and competitive advantage (Ingram & Silverman, 2002). A co-existence of an importance of institutions and a status of being developing economies reemphasizes the choice of location of institutions. Furthermore, Shenkar and Von Glinow (1994) even claimed that institution may be the most applicable paradigm for explaining organizational behavior in developing countries.

By combining two dimensions of the relationship, home-country institutions of developing countries become the topic of interest in this research. This selection neither implies that other cases are of any less significance nor rejects the virtue of alternative scenarios. However, the reasons previously discussed provided a sufficiently strong foundation for the selection of the scope of analysis as it reflects an outstanding aspect of relevant institutional issues derived from the chain of reason being discoursed from the beginning. In the next section, this study continues the analysis on institutions effects on firms.

### 6. Transition process: Institutions and Strategic Choice

Institutions facilitate strategy by influencing firms to react or even play an active role in the institutional environment. This is because an institutional change provided proper incentives and changes in corporate culture that enable firms to make improvements. Numbers of researches point out an importance of the speed and nature of institutional change and its impact upon firm's strategies. For example, Tolbert and Zucker (1996) argued that the process of institutionalization should be of interest in the future academic progress. In this study, the term "*Transition process*" is used as the process which institutions influence the strategic choice of firms.

Logically, if institutional change leads to productivity-raising behavior, an absence of productivity-raising behavior implies an absence of institutional change. This logical equivalence is so-called '*contrapositive*'. In this statement, institutional change is a sufficient condition of productivity-raising behavior and productivity-raising behavior is a necessary condition of productivity-raising behavior. In analogy, clapping hands makes noise and without noise implies an absence of clapping. Consequently, clapping hands is sufficient to make noise but noise could be created by other means such as knocking the table. Conversely, noise is necessary to imply clapping because the clapping without noise is impossible. Therefore, it is impossible to claim that without institutional change, there will be no productivity-raising behavior. This study hence does not try to claim that productivity-raising behavior cannot be created without institutional change but institutional change could be a cause of productivity-raising behavior. Certainly, direct proof could be conducted to test the argument and the methodology shall be discussed later in the subsequent chapter. This study goes on to the discussion of more scoped issue.

As previously discussed a crucial role of home-country institutions, this study elaborates further on. The aim is virtually to specify a particular type of these institutions. In specification, objective of study is required to be revised. Productivity-raising activities are considered as a consequence of institutional change. Therefore, relevant institutions should be the ones those affect productivity-raising activities. Fundamentally, there are two main channels that institutions will affect productivity-raising activities through organizations including firms. First, firms are assumed to be bounded-rational. Therefore, they choose their choice of strategy, or strategic choice, differently in accordance with the choices and their (bounded) information. Institutions play an important role in this process. As the main function of institution is "uncertainty reduction", it reduces the elements of choice in the uncertainty region while increases the elements of choice in the certain region. This is because institutions help clarify acceptable and unacceptable choices which automatically remove these choices out of the uncertain region. Second, institutions also form a "compensatory structure" which organizations are obliged to follow and take into account (Scott, 1995). Firms are obliged to pay from conducting a certain pattern of behaviors and awarded from the others. This compensatory structure is generally formed by both formal and informal institutions. These two types of institutions also interact with each other in an influencing process as well.

Fundamentally, Adam Smith argued that the wealth of nations is a function of the size of their markets. Amongst several factors influencing market expansion, in a very fundamental basis, it crucially requires a process of the transformation from personal relationship toward impersonal relationship (North, 2003). In principle, institutions involve in this transformation process by paying for the incorporation of the relationships in an economy and this is by creating third-party enforcement, e.g. government. Therefore, institutions those help expand the market should fundamentally contribute to this transformation process and also improve the productivity incentive through two main channels discussed in the previous paragraph. An absence of third-party enforcement means a bargaining and self-controlled system amongst both parties which naturally forms personal relationship amongst parties. At the beginning of this chapter, there is a discussion regarding the difference between two types of transactions and its consequence on economic development. Overall, personalistic, vis-à-vis impersonalistic, transactions lead to a higher transaction costs.

Certainly, in an absence of regulations, firms in the market could govern themselves by the personal relationship. Since the nature of firms is profit maximization, they keep their relationship in such a way that supports this objective. The direct consequence is thus the formation of firms to agree upon some particular agreements that allow them to earn a higher profit. This type of behavior is generally called *Collusion*. The market expansion requires a higher amount of transactions; this collusive behavior nevertheless conversely delivers the opposite result. That is to say, the fundamental theory of competition is that price level will be driven toward to equilibrium level which is equal to marginal cost of firms. However, this contradicts to the objective of firms to maximize their profit.

Essentially, parties could personally agree upon some fixing restrains which restrict the mechanism of market and yield a higher level of profit. Certainly, this choice of firms reduces their incentive to increase the productivity level because the less-costly alternative could be done by agreeing upon the market restrain. North (1991) coined the research agenda such that the consequence of change in types of exchanges in the market should be considered. Crucially, differences in type of market exchanges or transactions made a huge difference between two "New Worlds". The core question therefore is whether change in these transactions could eventually create productivity or not? Next, a specific type of collusion is discussed before moving on to elaborate the institutional change and consequence in the specific context. Adam Smith specifically mentioned collusion as a natural tentative behavior of players in the market as follows:

"People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices (Smith, 1776)."

*Cartel* is a formal agreement, so-called explicit collusion, among firms. Cartel members may agree upon such matters as prices, total industry output, market shares, allocation of customers, allocation of territories, bid-rigging, establishment of common sales agencies, and the division of profits or combination of these (Hemani & Shapiro, 1993). The aim of such collusions is to reduce competition, therefore, members will gain more profit (Sullivan & Sheffrin, 2003). Cartels could be defined in a unanimous definition, which is an agreement not to compete (United Kingdom Office of Fair Trade, 2009). From consensus, there are some co-elements of hard core cartel: it is (1) an agreement; (2) between competitors; (3) to restrict agreement (ICN working group on cartel, 2005).

Generally, there are two main types of cartels: soft-core and hardcore cartels. *Soft-core cartels* result from a concerted act that has an anti-competitive effect along with an increase in efficiency. For example, joint production, joint R&D, joint marketing, and joint purchase result in soft-care cartels. In principle, soft-core cartels are not always accused as offences or wrongdoings. They are principally reviewed by weighing the anti-competitive

effect and the efficiency increase. If the latter one dominates, they are not accused. Conversely, *hardcore cartels* results from most types of improper concerted acts and directly restricts competition and results in price increase or, indirectly, production decrease. Therefore, illegal concerted acts can be determined without engaging in a specific market analysis (Koh & Hyun, 2011). Since the context of this study lies on the importance of institutional change on strategic choice of firm in opposed to non-market behaviors, the ambiguity and case-by-case basis of soft-core cartels seem not to serve the initial purpose. Therefore, the study continues its analysis in the context of hardcore cartel. Without losing of generality, in this study context, the terms 'cartel' and 'hardcore cartel' are exploited interchangeably.

According to OECD council, they also established a definition of hardcore cartel to provide to member countries for adoption and coherent understand (OECD, 2003) as follow:

"A "hardcore cartel" is an anticompetitive agreement, anticompetitive concerted practice, or anticompetitive arrangement by competitors to fix prices, make rigged bids (collusive tenders), establish output restrictions or quotas, or share or divide markets by allocating customers, suppliers, territories, or lines of commerce ..."<sup>2</sup>

Bundeskartellamt, The Bundeskartellamt and its tasks.

"Cartels mean express or tacit conventions, promises or agreements among firms to fix price and limit volume of production and sales, and selection of trading partners. They are classified in terms of the object of restriction into price cartels, volume cartels, market allocation cartels, and bid riggings."

"Cartel definition: Arrangement(s) between competing firms designed to limit or eliminate competition between them, with the objective of increasing prices and profits of the participating companies and without producing any objective countervailing benefits."

"What is a Conspiracy? When business competitors agree: on the prices that they will charge their customers; not to compete for certain customers; not to compete in a particular product or geographic market; or to prevent or impede other businesses from competing in a market."

Canadian Competition Bureau website

<sup>&</sup>lt;sup>2</sup> Considering the less legalistic definitions of hard core cartel, there is a similarity amongst definitions of different authorities as follows:

<sup>&</sup>quot;Cartels are secret agreements between firms to fix prices or share markets between them."

Irish Competition Authority, Cartel Watch, Guidelines on Cartels: Detection and Remedies.

<sup>&</sup>quot;What is a cartel? If several competing enterprises co-ordinate their market conduct for the purpose of eliminating competition this is called a cartel."

Japan Fair Trade Commission, What Practices are Subject to Control by the Antimonopoly Act?

European Commission, DG Competition, Glossary of Terms used in EU Competition Policy

Consequently, there are some specific types of cartels that could be called as "Hardcore".

- Price fixing;
- Output restrictions;
- Market allocation and
- Bid rigging

Price fixing is generally an agreement between competitors to buy or sell a product, service, or commodity only at a fixed price. Similarly, output restriction is conducted such that the price is maintained at a given level by controlling the supply of the product, service, or commodity. Market allocation is an agreement between competitors to divide the market into distinctive parts and each party runs the business in its own part. In particular, competing firms allocate specific customers or types of customers, products, or territories. Likewise, bid rigging is an agreement between bidders to promise an establishment of the contract to one party despite the appearance of other bidders in a bid.

Even though cartel seems to be a topic of industry-based consideration, an absence of context in not only industry-based view but also resource-based view makes institution-based view relevant to the study of cartel. In industry-based view, the study of cartel is considered in its status quo. However, the contexts of related regulations and the adjustment of firms' behaviors are the main concern of institutions. Previously, the task environment has been the main concern of business scholars. The *task environment* is usually the environment that most organizations like to focus on. The task environment helps them to specifically identify environment could be broadly defined as the external environment of an organization which affects its ability to reach business goals.

<sup>&</sup>quot;Cartels are agreements between undertakings, such as agreements and decisions, or concerted practices which restrain competition . . ."

Netherlands Competition Authority website

<sup>&</sup>quot;A cartel is generally considered to include conduct by two or more competitive businesses such as: price fixing; market sharing including bid-rigging or customer sharing; and/or production or sales quotas." Australian Competition and Consumer Commission website

Task environment is made up of five parts grounded on the Porter's five forces model (Porter, 1980). The first part is the competitors. Competitors compete mostly for market share. For example Nike, Adidas and Puma all compete for customers that are looking for athletic shoes, soccer cleats etc. Organizations also compete against one another but not only for market share, but also for privileges such as the rights to purchase real estates, or for a loan if the bank has limited funds they can lend. The second part is potential entrants. In a particular market, if the above average return is available in the industry, new entrants are motivated to enter into the industry to share such a return. However, in some conditions, entry barrier was created. For example, scale advantage of incumbents, and proprietary assets possessed by the incumbents. The third part is suppliers, the ones who provide resources to other organizations. For instance, McDonalds buys soda from Coca Cola, and ketchup from Heinz. Most companies do not buy all their supplies from just one supplier, because if that supplier goes bankrupt then so does the company that relied completely on them. The fourth part is customers. Organizations have individual customers as well as wholesalers, retailers that are also customers to companies. Lastly, the fifth part is substitutes. Substitutes are products of different industries that satisfy customer needs currently met by the focal industry. For instance, Pepsi is not a substitute for Coke, but tea and juice are. The intensity of substitutes is stimulated by the quality of substitutes and low level of switching costs.

Differences in emphasis on the institutional versus task environment suggest different loci of external power (those who shape and enforce institutional rules and beliefs versus those who control scarce resources) and different linkage processes between the organization and environment (exchange and resource flows versus incorporation and isomorphism) (Scott, 1987). These differences, in turn, lead to alternative conclusions about appropriate responses to the environment. Institutional theorists have emphasized the survival value of conformity with the institutional environment and the advisability of adhering to external rules and norms (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). Resource dependence theorists stress the organizational necessity of adapting to environmental uncertainty, coping with problematic interdependencies, and actively managing or controlling resource flows (Pfeffer & Salancik, 1978).

This study goes beyond the task environment. Institutions effects are separated largely into two levels; competition-in-general and cartel-specific institutions in particular. Of course, informal institution could not really be separated into the same levels as formal one. However, as previously discussed, both types of institutions interact with each other and informal institutions play a role in the effect of formal institutions on the firms behavior, cartel in specific (Please see **Appendix A** for the in-depth analysis of cartel).

Before moving on to the next section, it is essential to point out the *expectation* which is viable due to the introduction of the *transition process* from institutions to strategic choice of firms. Even though the topic was primarily discussed in the problem definitions in Chapter I, the extensive discussion is worthwhile considered further.

It seems obvious that this study has made an implicit assumption that strategy implementation is "good". In prior, it is almost a truism that strategy is relatively more important for the long-run benefit of firms than the short-run (Connelly, Tihanyi, Certo, & Hitt, 2010). By considering firm's interest, if firms could strengthen the network of suppliers, improve the quality of the labor pool, and increase the level of knowledge regarding techniques, pitfalls and opportunities; they are able to get the better support in their production (Porter, 1991; Krugman, 1996). These benefits are claimed to be created through the competition within the industry, not anti-competitive behaviors. This is because these benefits shall be created through firms that try to compete with each other by having these improving conditions instead of using the non-market behaviors to beat each other. These benefits could be considered as positive externalities to all the firms in given industry or market. It means that this would not solely help particular firms but all firms in a given industry or market will benefit. Consequently, ceteris paribus, they become more competitive in relative to firms from other industries or markets, even internationally. Moreover, this process also creates stronger competitive incentives together with greater pressures to upgrade productivity, because local rivals neutralize advantages due to input costs and other local business conditions. It is also proved that international competition is not a sufficient substitute for the domestic one (Porter, 1990; The World Bank, 1998; Narula & Nguyen, 2011).

The study continues its main argument in the relationship between institutions and strategic choice. This is in accordance with the call for the study of "how" institutions matter after the importance of it is well-recognized (Peng, Wang, & Jiang, 2008). Next, this study discusses the underlying mechanism which institutional change and firm's behavior are manipulated. In particular, the institutions that affect cartel behavior of firms are investigated further including the cartel characteristics. To put some caveats, ultimately, this specific case is considered in order to particularly scope down into a specific and essential case of the relationship between market-based institution and productive behavior of firms discussed earlier. To some certain extent, it serves as a "proxy" for related types of market-based institutions and productive behaviors will be discussed further in the subsequent chapters.

#### 6.1 Market-based institution: Competition Law

In this section, the literally most obvious institutions that affect strategic choice of firms, formal institutions, are discussed. Though state-owned enterprises (SOEs) are directly affected by government institutions but they are not under a jurisdiction of the competition law, non-SOEs are generally under a jurisdiction of competition law with rare exceptions. Evidently, the current study of institutional effects on developing economies firms has mainly focused on SOEs and there is a call for the research agenda that put more emphasis on non-SOEs and institutional changes (Hoskinsson, Eden, Lau, & Wright, 2000). Naturally, firms within the same market may form a group to make a secret agreement and this agreement eventually affects consumers in the market. If this agreement negatively affects consumers, it shall be prohibited. This type of behavior seems to negatively affect only consumers but benefit firms (Bain, 1951). However, it does not always truly benefit firms as it seems (Porter, 1990). It is simply because firms have less incentive to improve their competitive advantages because they could gain a profit without using them (Geroski & Jacquemin, 1988). Eventually, firms would not be able to reach their optimal potentials. In other words, this behavior pulls back their improvement and freezes their competence at a sub-optimal level.

By definition, competition policy is a policy that promotes or maintains market competition by regulating anti-competitive conduct (Taylor, 2006). Anti-competitive conduct is a practice that prevents or reduces competition in a market. However, there are still broad arguments over the consequences and righteousness of some types of anti-competitive conduct. For example, vertical agreements or price discrimination are argued to be productive if consumers are not harmed directly while some scholars decline to accept these practices (Bork, 1978). Conversely, there are some particular conducts which could be defined as a pure anti-competitive conduct and clearly against the public interest. Certainly, cartel is one of the most vivid illustrations; price fixing amongst competitors is non-productive and obviously deteriorates the public interest both in efficiency and welfare (Motta & Polo, 2003). There are both general and specific types of competition policy that deal with each anti-competitive conduct. For instance, the U.S. Antitrust act could be implemented in variety of conducts that restraint competition. The same goes for Thailand Competition Act (See **Appendix B**). In the other way around, some policies are designed specifically to deal with particular type of anti-competitive conduct.

In the previous section, the general introduction of cartel is discussed. This section extends further on its unique characteristics and clarifies how its specific policy is created. There are some distinctive characteristics of cartel. Cartels could be considered as one form of organized crime<sup>3</sup>. Cartel-like Organized crimes usually share three exclusive basic characteristics (Spagnolo, 2000). *First, cooperation among several agents,* many parties have to come together and conspire to form illegal body. This would, therefore, create some problems such as free riding, hold-up<sup>4</sup>, and moral hazard. Therefore, cartels are "intrinsically unstable" because members have incentive to deviate from cooperation (Stigler, 1964). *Second, cartel members typically keep their relationship ongoing*. Therefore, it's almost impossible to consider static phenomenon, hence, we have to study "flows" of benefits both in present and future<sup>5</sup>. Consequently, cartel must, *inter alia*, be able to control its members' fulfillment within the collusive agreement and enforce credible threats to any defections possible, since an explicit contract between cartelists is impossible to be signed and enforced<sup>6</sup>. *Third, each wrongdoer holds information of others*. The most important piece of information is an agreement to form cartel among cartelists.

Due to these crucial and unique characteristics of cartel, specific policy was designed to eliminate cartel behavior. **Leniency program** has been widely adopted as a tool to deal with cartel problems worldwide (OECD, 2003). Leniency program is an application of *prisoner's dilemma* game theoretic model<sup>7</sup>. A reduction of sanction (leniency) is used to incentivize wrongdoers to confess and provide necessary information on cartel formation to prove guilty of their partners. A reduction of punishment is exploited to increase the payoff of player (cartelist) on defecting from cooperation in a static game. Moreover, it reduces the net benefit of sustaining cooperation among cartelists; therefore, reduces the discount rate of

<sup>&</sup>lt;sup>3</sup> The *Organized Crime Control Act* (U.S., 1970) defines organized crime as "The unlawful activities of ... a highly organized, disciplined association..."

<sup>&</sup>lt;sup>4</sup> **Hold-up problem** is the problem where there is a situation that parties can work together with most efficient through cooperation, but the refrain from doing so because it may increase other parties' bargaining power and reduce profits. This problem frequently leads to merger, integration or non-compete clause.**Invalid source specified.** 

**Non-compete clause**, viz. Covenant not to compete (CNC), is an agreement not to pursue a similar profession or trade in competition against another party. Its enforcement possibility still relies on reasonableness and consideration like other types of contract.

<sup>&</sup>lt;sup>5</sup> Only in dynamic relationship where credible threat for defection is possible, and it is in coherent with the reality of business practices.

<sup>&</sup>lt;sup>6</sup> Civil and Commercial Code of Kingdom of Thailand, Section 150 "An act is void if its object is expressly prohibited by law or is impossible, or is contrary to public order or good morals."

<sup>&</sup>lt;sup>7</sup> *Prisoner's dilemma* is a fundamental problem in game theory that demonstrates why two people might not cooperate even if it is in both their best interests to do so. In the cartel case, it is cartelists' best interests if they agree to cooperate. However, this scenario is not sustainable because both players are going to defect as in the equilibrium circumstance.

future cooperation in a dynamic game (Osborne, 2004). The ultimate purpose of leniency program in cartel case is to deter, prevent an action *ex ante*, a cartel formation neither detect nor desist (Kaplow & Shavell, 1994; Spagnolo, 2000).

There are two main types of leniency program: full amnesty and hierarchical leniency. In the full amnesty type, only the first comer will get the benefit from leniency program and will receive completely no punishment. In hierarchical leniency type, not only the first comer will get the benefit from leniency program, but also latecomers who will receive a partial reduction of punishment sequentially (Spagnolo, 2006; Motta & Polo, 2003). The former has its advantage on the highest possible level of incentive to come forward. Meanwhile, the latter has an advantage on the potential amount of information yearned from cartelists (Harrington, 2005). Note that, there are also other possible categorizations of leniency program e.g. administrative and adversarial system (Please see **Appendix A** for more detail).

To explain the mechanism of leniency program, this study exploits the simple identity called "*deterrence identity*" as a tool of analysis (Spagnolo, 2006). Giancarlo Spagnolo proposed the equation to analyze the consequence of the policy on cartelists' behavior. Given that:

 $E(\Pi^c)$  is an expected payoff from participating  $E(A^c)$  is an expected antitrust consequences  $E(\Pi^d)$  is an expected gain from participating and then defecting  $E(A^d)$  is an expected antitrust cost when defecting

If there is a case where leniency program does not exist but antitrust existed, the inequality will be called "*Participation constraint*". For Participation constraint, cartel would be deterred if net profit of forming cartel is negative as the following equation (1).

$$E(\Pi^c) - E(A^c) \le 0 \tag{1}$$

In equation (1), if antitrust does not even exist (*laissez faire*<sup>8</sup>), there will be no expected antitrust consequences ( $E(A^c)$ ) and participation constraint should be impossible to

<sup>&</sup>lt;sup>8</sup> Laissez Faire is an environment in which transactions between private parties are free from state intervention, including regulations, taxes, tariffs and enforced monopolies. The phrase *laissez-faire* is French and literally means "let do", but it broadly implies "let it be", or "leave it alone." In the context of this study, it is exploited as a status when the competition policy does not exist.

satisfy. Therefore, introducing antitrust is expected to reduce the level of cartel in relative to *laissez faire*. However, the real purpose of participation constraint is to serve as a complimentary equation to the next equation, so-called, incentive compatibility or self-enforcing restraint. It is an identity of cartelist's decision of forming cartel when leniency program is introduced.

For incentive compatibility or self-enforcing constraint, cartel would be deterred if net profit of forming cartel is lower than net profit of defection after forming cartel. Equation (2) shows the constraint as follow:

$$E(\Pi^c) - E(A^c) \le E(\Pi^d) - E(A^d)$$
<sup>(2)</sup>

In the case of cartel, the right-hand-side term is introduced into the inequality because defection provides both benefit and cost to cartelists. If the policy and its authority could maximize the gain from defection and minimize or even eliminate the antitrust cost of defection, the right-hand-side term will be maximized. Comparing to equation (1), if the right-hand-side term of equation (2) is positive, cartel would be easier to deter. Therefore, introducing leniency program is expected to reduce the level of cartel formation in relative to antitrust.

So far, two empirical studies have been studied by econometrics. Fines, duration and leniency application were analyzed on their relationship by hypothesizing that magnitude of fines is positively related to information available to prosecution. By using survival analysis, the policy does not significantly affect the duration of the cartel formation (Brenner, An empirical study of the European corporate leniency program, 2005). Another article investigated on the effects of the 1996 EC leniency program is article by Sjoerd Arlman. Arlman (2005) found that the 1996 Leniency Notice led to a reduction in the time it took for the EU Commission to process cartel investigations, but did not enhance deterrence nor did the penalty discounts often reward genuine "whistle blowing" and the provision of value-added information (Arlman, 2005).

Asker (2010) considered the result of cartel defection due to leniency program on market conduct. This study analyzed the case of Parcel tanker shipping business worldwide. The study didn't indicate any significant change in market conduct due to following main implications. First, the length of contracts between cartelists is still lasting after cartel dissolution. Second, large fixed assets (ships) makes process of adjustment becomes significantly slow and difficult in the market (Asker, 2010). Moreover, Harrington (2004) also suggested similar concern that post-cartel competition practices can be inertia to some extent

because cartelists try to avoid signaling such a cartel behavior by changing their market conduct immediately. In conclusion, introduction of leniency program is another step of improvement in the regulations dealing with cartel formation. Meanwhile, an existence of antitrust is better than an absence of it as well. Therefore, there are two levels of tests required and the first hypothesis is drawn and separated into two sub-hypotheses as follows:

*Hypothesis 1a*: Leniency program reduces the level of cartel formation relative to the level of cartel formation when there is no leniency program.

*Hypothesis 1b*: Antitrust reduces the level of cartel formation relative to the level of cartel formation when there is a Laissez Faire.

It has to be unambiguous that the elimination of cartel formation does not automatically guarantee the higher level of market-based strategy implementation. Virtually, the linkage between the higher level of competition in the market created from the elimination of cartel, and the higher level of incentive in the market-based strategy implementation still needs a confirmation. In developing economies, an absence of strong legal regimes leads to insufficient knowledge about the governance structures for transactions in this region. As it is known that organizations will dominate markets as a governance structure is the presence of high uncertainty, the strategic alliances are one of the natural consequences of the status quo (Kogut, 1988). By introducing competition policy, it reduces an uncertainty of firm's anticompetitive behaviors (Dacin, Goodstein, & Scott, 2002). The uncertainty could be identified in the sense of anti-competitive behaviors' consequences. The more effective the policy is, the more certain the negative consequence of anti-competitive behavior, cartel in particular, is. At the same time, reduction in cartel formation also increases a certainty on implementing strategy because anti-competitive behaviors, especially obvious ones like cartel, become destructive and strategy implementation is a *possible* alternative of these anti-competitive behavior. These two changes incentivize firms to adjust their behavior. By the change of institution, so-called institution transition, firms interact accordingly and dynamically. North (1990) defined "institution transition" as "...fundamental and comprehensive changes introduced to the formal and informal rules of the game that affect organizations as players..."

Recently, Zhu, Wittmann, and Peng (2011) have confirmed the significance of *unfair competition* on the struggling innovation in the SMEs from China. The conversational interview has been conducted amongst CEOs, firm owners and managing directors of 41

SMEs from Beijing, Shanghai, Shenzhen, and Suzhou. The most crucial barrier is revealed as an unfair competition after 67% of interviewees considered it as the main barrier to the innovation of SMEs in China. The mechanism of this barrier and lack of incentive is derived from the cost, the risk, and the opportunity. Certainly, unfair competition increases the cost of innovation through the lack of priority for government procurement, difficulty of starting a business, poor enforcement of the competition law, and protectionism. Simultaneously, all of these barriers also reduce the opportunity of innovation. In particular, risk of innovation is enhanced through the poor enforcement of the competition law. These elements exhibit the institutional barriers that make the market-based strategy of SMEs in China stagnated (Zhu, Wittmann, & Peng, 2011). Moreover, Peng, Yamakawa, and Lee (2011) also conducted a research on bankruptcy law from the worldwide database. They confirmed the effect of formal institutions on firms in general.

The question remains how firms respond to the policy implementation. Transaction cost theory is exploited to incorporate the consequence of policy on firms' decision and how to react in accordance with the participation and self-enforcing constraints. Theoretically, there are different types of transaction within and between entities, including firms, and firms are formed in accordance to the difference between costs of these transactions in relative to other kinds of entities (Coase, 1937; Williamson, 1985). The analysis of transaction cost has its implicit assumption that firms are, to some certain extent, rational. They (try to) choose the relatively highest net benefit choice of action. However, as information is obviously incomplete, they do not know the certain values of either benefits or costs of all choices available. At its best, firms evaluate these values in the form of "expected values". Given set of possible values, each has its own level of probability (Mas-colell, Whinston, & Green, 1997). The consequence of effective policy on cartel shall increase the *perceived* probability level of being detected in other illegal anti-competition behaviors (North D., 1990). Consequently, it would increase the expected cost level (higher probability of being detected or punished), and reduce the expected net benefit, of all other illegal anti-competition behaviors. Given strategy implementation choice's net benefit remains the same; its relative net benefit to anti-competition behaviors will be higher. Therefore, it is more relevant that firms will choose to implement strategy more than prior. Next, the study analyzes a particular strategy that could be considered as a consequence of institutional change.

Since the discussion comes to the point where competition laws influence cartel and firms' strategic choice, the upcoming discussion lies on the specific strategy in which an elimination of cartel in developing economies will influence. In business-level strategy, Porter's generic strategies: cost leadership, differentiation, and focus; long serve as the most

influential business strategy paradigm. Porter (1985) stated that each generic strategy stands for "...a fundamentally different approach to creating and sustaining a competitive advantage...". Porter also disregarded the possibility of exploiting more than one generic strategy simultaneously as "...usually a firm must make a choice between them or it will become stuck in the middle..." (Porter, 1985, p. 17). Moreover, Porter stressed that "achieving cost leadership and differentiation are usually inconsistent, because differentiation is usually costly" (Porter, 1985, p. 18).

However, empirical evidences suggest that this claim might be too rigid and the reality does not require successful firms to distinctively choose one or another. Hill (1988) proposed that it is very likely that differentiation itself helps firms reduce the cost and indirectly stimulates the cost differentiation strategy. His research strongly encouraged an inconsistence of stuck-in-the-middle proposition of Porter by proposing vast contingencies where more than one generic strategy might work. Conversely, empirical evidences are still ambiguous. Kim and Lim (1988) empirically analyzed 54 firms in the electronic industry of Korea and confirmed an effectiveness of pursuing a clear-cut generic strategy. A study by White (1986) of 69 business units produced different findings. White found that 19 of the 69 units had a competitive advantage based on a combination of both low cost and differentiation. Moreover, his results suggest that business units that successfully combined both low cost and differentiation had the highest return on investment. Therefore, a consensus is still not yet delivered (Peng, 2006).

This study does not jump into the endless debate in the choice of generic strategies because the choice of interest in this study is a switching from non-market-based strategy to market-based strategy. That is to say, once the market-supported institutions (institutions that support market system which are antitrust and leniency program in this research context) are introduced, the choice of strategy should be expected to switch from non-market-based to market-based strategy. This statement is still yet to be confirmed and is conjectured as a hypothesis.

Nevertheless, the question remains whether which choice of strategy stands as a direct consequence of introducing market-supported institutions. Referring back to the cartel definition, the hard-core cartels is defined as an anticompetitive agreement, anticompetitive concerted practice, or anticompetitive arrangement by competitors to fix prices, make rigged bids, establish output restrictions or quotas, or share or divide markets by allocating customers, suppliers, territories, or lines of commerce. Amongst numbers of potential consequences of cartels e.g. scarcity of supply in the market, change in price level seems to be an obvious one. Price fixing influences price level directly and obviously. Bid rigging results

in providing a contract to one party even though for the sake of appearance several other parties also present a bid, and eventually form a price fixing or market allocation. Output restrictions and market allocation both manipulate the supply level in a particular market and certainly influence the marginal value which customers are willing to purchase, and that influences price. Since they share the same direct or indirect consequence on price level, the question remains how price level influences strategic choice and vice versa.

Price is the marginal value of purchasing marginal unit of goods while cost is the value that has been used up to produce a unit of goods or services (Mankiw, 2008). Virtually, they are the different ends of the same transaction of goods or services. Combining with the profit maximizing objective of firms, these two terms interact with each other in the decision process. Certainly, cost level influences pricing strategy and vice versa.

In marketing field, cost level plays a critical role in formulating a pricing strategy of firms as it is one of the most crucial elements in the marketing tactics of firms (Kotler & Armstrong, 2008). In principle, despite the concern regarding cost level similarly, successful firms determine cost level from the price the customers can be convinced to pay and then choose quantities to produce and markets to serve while unsuccessful firms inverse the process. Therefore, firms generally decide what to produce and to whom to sell it by comparing the prices they can charge with the costs they must incur (Nagle & Hogan, 2006). This decision pattern does not need to consider an existence of competitive market at all because firms possess a similar logic of consideration (Drucker, 1995).

However, an absence of competitive market, existence of cartel in this context, changes the possible price level which is generally higher than an absence of cartel. In the price level context; market allocation, output restriction, and price fixing cartels generally deliver the same consequence on a price level in the market. They increase the price level in the market. If the convincing price level becomes significantly higher, firms determine their cost level respectively and perceive no necessity in cost adjustment. When there is no push from the price level, companies are given less incentive to decrease their cost level in order to compete amongst each other (Stahl & Grigsby, 1997).

Porter (1980) states overall cost leadership as one of generic strategies. Cost leadership is the lowest cost of operation. Therefore the cost-leadership strategy means an achievement of overall cost leadership through a set of functional policies aimed at this basic objective. This can be done by aggressive construction of efficient-scale facilities, vigorous pursuit of cost reductions from experience, tight cost and overhead control, avoidance of marginal customer accounts, and cost minimization in areas. Overall, low cost is determined by the cost level relative to competitors. Therefore, if there is a push from the price level in

the market; firms are given an incentive to adjust their cost level. It implies that an incentive of cost-leadership strategy exploitation could be triggered by an elimination of cartel because the push factor of cost reduction will be introduced. The question remains what environmental conditions necessary for cost leadership.

Given the definition of cost leadership strategy discussed earlier, there are some environmental conditions that form the foundation of cost leadership. Murray (1988) claimed that the customers demanding the product(s) need to be price sensitive. Traditionally, scholars consider a broad picture of cost leadership and reject the viability of small firms to successfully implementing a cost leadership strategy (Porter, 1980; Baack & Boggs, 2008). This is because considerable amount of resources are needed (Wright, 1987).

On the other hand, in contemporary view, small firms can also be cost leaders if they achieve an advantage conducive to low costs. For example, radical innovation in production process may enable a startup or small company to offer a cheaper product or service where incumbents' cost and price are too high such as low-cost airlines. Therefore, generally, price sensitivity in the market becomes a crucial factor determining relevance of cost leadership strategy. In addition, an absence of price sensitivity supports the differentiation strategy in contrary (Baack & Boggs, 2008). In essence, the consequence of cost leadership strategy lies beyond the scope of this research where the argument bases mainly on the consequence of institutions on strategic choice.

Since the price sensitivity is the major determinant of using cost leadership strategy, an introducing of competition law which influences price level also triggers the level of cost leadership strategy implementation. Price sensitivity arguably are most needed in developing countries because of the relative importance of pricing policy which plays the same central role in fiscal policy that income tax and social security plays in most developed countries (Deaton, 1989). The fact that developing countries customers are relatively lower income group of customers explains why the elasticity of demand to price of them is higher than developed economies. Because one unit change in price is counted as a higher proportion to the income, the change matters to their decision in a higher degree. As Murray (1988) argued, price sensitivity is a necessary condition of an implementation of cost leadership strategy. Developing economies, where the average incomes of people are relatively low, possess a relatively high level of price sensitivity. This is because the marginally increased price in relative to their income level is higher and trivial change in price level makes a difference (Easterly, 2007). Here, the concurrence of cost leadership strategy and cartel elimination policy occurs because both of them are magnified by the status quos of being developing economies.

As the push-effect of the price level plays a crucial role on the cost adjustment, it implies that a degree of intensity in the former should intensify a level of the latter. In accordance with the first hypothesis, since leniency program is expected to give the highest level of influence on the price level by a reduction in cartel formation; such a scenario should also deliver the highest level of cost adjustment necessity. This is because the higher level of competition makes the pressure of price level becomes higher. Certainly, the level of cost adjustment reflects the level of cost-leadership strategy implementation. Even though cost adjustment sometimes requires no cost-leadership strategy, an absence of cost adjustment implies an absence of cost-leadership strategy. Therefore, the second hypothesis is drawn and divided into two sub-hypotheses as follows:

*Hypothesis 2a*: In leniency program scenario, firms choose to implement cost-leadership strategy most frequently comparing to other scenarios.

*Hypothesis 2b:* In antitrust scenario, firms choose to implement cost-leadership strategy more frequently than laissez faire scenario.

### 6.2 Informal Institutions: Culture

The analysis of institutions will be an unfinished work without taking informal institutions into account. Oliver (1997) discusses the ideas of firm's sustainable competitive advantages in emerging economies context. He argued that the direction that firms restructure themselves in response to institutional change could be a focus in strategy research and how the process of restructuring is virtually determined. He further argues that the interactions between theoretical approaches related to institutional theory should be investigated.

Even though numerous works in industrial organizations economics suggest that leniency program evidently destabilizes the cartel agreement, it is not entirely understood why self-reporting is more likely to occur in some cartels than in others and why firms in similar roof of regulation implement or possess different set of competitive advantages. Intuitively, if the regulation's structures are not significantly different from each other, there should be other factors influencing the behavior of firms. Since the formal regulations are generally similar to each other and similarity of industry and resources of firms persists, there should be an alternative explanation on the difference amongst firms especially on their different reactions toward particular institutions such as competition law. Scholars suggested that *culture* plays an important role in organizational behavior and business activities (Kogut & Singh, 1988; Nardon & Steers, 2009; Weber, Shenkar, & Raveh, 1996).

In retrospect, Taylor (1871) defined the culture: "the complex whole which includes knowledge, belief, art, morals, custom and any other capabilities and habit acquired by man as a member of society". Kluckhohn (1981) defined the well-known definition of culture among anthropologists as the patterned way of thinking, feeling and reacting which is distinctive in each human group (Kluckhohn, 1951). In principle, *value* plays an important role in almost all cultural dimensions categorization proposed by leading scholars. Klucklohn and Strodtbeck (1961) defined his culture as the value orientation. Similarly, Trompenaars (1993, 1998) defined his culture in the sense of value and personal relationship where the later one was emphasized in the work by Hall (1981, 1990). Hofstede (1980, 2001), which I referred to as my main reference, also define culture in similar fashion as follow.

"The collective programming of the mind that distinguishes the members of one group or category of people from another" (Hofstede, 2001)

Originally, Clyde Kluckhohn (1951) argued that there should be universal categorization of culture:

"In principle...there is a generalized framework that underlies the more apparent and striking facts of cultural relativity. All cultures constitute so many somewhat distinct answers to essentially the same questions posed by human biology and by the generalities of the human situation...Every society's patterns for living must provide approved and sanctioned ways for dealing with such universal circumstances as the existence of two sexes; the helplessness of infants; the need for satisfaction of the elementary biological requirements such as food, warmth, and sex; the presence of individuals of different ages and of differing physical and other capacities (Kluckhohn, 1951)"

Albeit numerous ways of cultural dimension identification are proposed and studied, Hofestede's works become one of the most influential in various fields such as psychology, sociology, and business studies (Sondergaard, 1994). Five dimensions of cultures have been proposed. First, *power distance* is the degree of social inequality. It shows how different amongst the people within a particular society. For a vivid example, the status of monarchy members in some Scandinavian countries are almost the same as an ordinary people while some in Asian region are still possessing a god-like status quo. The higher the degree of power distance, the more different between the people within the society. Second, the masculinity versus femininity dimension refers to gender role differentiation. A distinction between man and woman within the society will positively influence the masculinity degree. Conversely, the similarity between two genders generates a bias toward femininity. Third, uncertainty avoidance refers to the extent to which uncertainty or ambiguity levels are acceptable or tolerated. For example, high uncertainty avoidance society members require a premium job security, career patterns, and retirement benefits. Empirically, it has been found that the cultural value of uncertainty avoidance (UA) had a significant effect: Compared to low UA cultures, individuals from high UA cultures were significantly more sensitive to controllability in perceiving strategic issues (Barr & Glynn, 2004). Fourth, long-term orientation puts an emphasis on firmness and preparation of the future betterment.

National character is the description of the pattern of enduring personality characteristics found among the populations of nations. There are two dimensions of national character those possess high level of agreement amongst scholars in sociology, psychology, and anthropology: the self and the authority. These two domains of national character are coherent with influential works of Inkeles and levinson (1969), Peabody (1985), Eysenck and Eysenck (1969), Kluckhohn and Stodtbeck (1961), and Hofstede (1980). Certainly, the dimensions of Hofstede's research those correspond to these two dimensions of national character are individualism and power distance respectively (Clark, 1990). Amongst these two dimensions, the most relevant cultural dimension related to cartel and strategic choice of firms might be individualism because the cartel is formed basically by a group of firms and the strength of their bond which determines the strength of cartel is largely related to individualist character of members (Brenner, 2011). Certainly, one of the most applied cultural dimensions of Hofstede's (1980) classification is individualism, as opposed to collectivism. This dichotomy has been evidently proved to be useful in different business perspectives (Kirkman, Lowe, & Gibson, 2006). In specific, individualism/collectivism has also been adopted in the study of cartel (Brenner, 2011). The most important characteristic of culture is an "unstated assumption" in the society. Definitely, individualists and collectivists have different sets of assumptions which Hofstede described the concept of individualism and collectivism as follows:

"Individualism stands for a society in which the ties between individuals are loose: Everyone is expected to look after him/herself and her/his immediate family only. Collectivism stands for a society in which people from birth onwards are integrated into strong, cohesive ingroups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty (Hofstede, 2001)."

Hofstede started the discussion in individualism by categorizing human as the *gregarious* animals. However, he further pointed out that different human societies show gregariousness to different degrees. That is where a fundamental dimension on which societies are different is originated. The main characteristics of cartel are the formation of firms and ruled by their within-group agreement. Strength of bonds among cartel members, therefore, is very important for cartel sustainability and could potentially affect strategic choice of firms (Spagnolo, 2006). Culturally, "Collectivism-Individualism" is one of the well-recognized cultural dimensions in the world (Hofstede, 1980; Nardon & Steers, 2009). Many leading scholars in cultural field take this dimension into their accounts e.g. Hofestede (1980, 2000), Trompenaars (1993), Triandis (1994) and GLOBE (2004). The following table exhibits the consequences of different level of individualism index which is adapted from the original version of Hofstede's work (Hofstede, 1984).

Low Individualism Index	High Individualism Index
Societal Level Consequences	
For wealthy economy, low IDV (Individualism index)	Diminishing economic growth. For developing
helps economic growth.	economy, high IDV helps economic growth.
Consequences for Religious Life and Psychological and Ideological Thinking	
Collective conversions.	Individual conversions.
Consequences for Organizations	
Less concern with fashion in management idea.	Managers try to be up-to-date and endorse modern
	management ideas.

# Table 1: Consequences of Difference in Level of Individualism (adjusted from Hofstede (1984))

By analyzing Table 1, in *societal level consequences*, developing countries will be able to gain advantages from being more individualism, since it helps improving the economic growth at the low level of economic wealth. Since the home-country institutions are the scope of this study, degree of individualism broadly influences the economy in general. However, in the context of this study, more specific influence of individualism index is required. In *Consequences for Religious Life and Psychological and Ideological thinking*, conversion characteristic potentially affects both competition policies and strategic choice of firms. High degree of individualism should lead to not only less sustainable cartel formation

but also more strategic choice due to firms' readiness to change themselves either by innovation or absorption (Triandis, 1973). Finally, in *Consequences for Organizations*, cartel deterrence induced by either antitrust or leniency program requires a certain level of rationality of cartelists, individuals especially those who make a decision should be calculatively involved in the process in order to correctly calculate their consequences and payoffs. The decision to implement a strategy happens more proactively and frequently in the place where managers are more active, that is, they try to be up-to-date and adjust to the environment. Therefore, the higher level of strategizing from firms characterized as more individualistic is expected.

Generally, the evidences have suggested that less-developed economies are relatively more "collective" than more developed ones. Hofstede claimed this difference as a consequence of the gap in the transfer of business knowledge and practices amongst countries. In particular, the *self-interest* aspect of argument should be considered. In retrospect, the historical roots of modern capitalist economics were laid in late 18th century Great Britain by David Hume (1711-1776) and especially by Adam Smith (1723-1790). Both their followers and their critics have rarely disputed the assumption, made explicitly by Smith, that each individual is motivated by self-interest. Although Britain in the 18th century was certainly less individualist than it is at present, there is much historical evidence that relative to other countries it represented a very individualist culture even then (Hofstede, 1984).

In countries nearer to the Collectivism end of the Individualism-Collectivism scale, the assumption that each individual is motivated by self-interest is culturally untenable. In a collectivist culture, the individual is motivated by group interests. The group can be the extended family, the clan, the tribe, or some other type of in-group with which people have learned to identify. In the context of this study, group of cartel is considered and if the group interests motivate the members, cartel is expected to be persistent. Moreover, Hofstede claims that economic behavior in such a society will be incomprehensible, and irrational to those who assume self-interest to be the ultimate motive. In a religion like Buddhism, mortification of material needs is seen as a higher goat than satisfaction of material needs. Culture also affects the attractiveness of economic systems: free-market capitalism in culturally collectivist countries often appeals less than systems of state capitalism and state socialism. These are political choices but underneath are cultural choices. Consequently, since selfinterest lies underneath the principle of cartel formation, it is not surprising to expect that the sustainability of collusion or cartel formation could be strengthened in more collectivist society compared to more individualist one.

Moreover, the priority that different level of collectivism puts into the task and relationship is evident. In individualist cultures, it is felt to be "right" that in business all people should be treated alike: friendships and enmities should not affect business deals. Business considerations should have precedence over personal friendships and preferences. Business behavior, to use a sociological term, should be universal. Of course, this norm is often violated but such violations are considered objectionable. In collectivist cultures, even in business, people think in terms of "we" "(our family, tribe, organization) and "they" (the others). Relations, friends, tribesmen get better deals than strangers and this is the way it should be. It is normal and right. The sociological term for such behavior is particularist (Hofstede, 1980). Considerations of personal trust and relationships should have precedence over business considerations. Whereas in individualist cultures, it is felt that the task should have priority over the relationships; in collectivist cultures, it is felt that the relationships should have priority over the task. When a person from an individualist culture wants to work in a collectivist culture, he or she will have to learn that before a task can be completed, he or she has to "invest" in personal relationships of trust. This will take time (from a few minutes to a few years, depending on the culture and on the type of relationship), which in the individualist culture would be considered as time wasted, but which in the collectivist culture represents an essential investment.

Also, it means that in the collectivist cultures integration is necessary between business life and private life. The latter playing a role in developing the relationship which is essential in business life. If the proper time is spent and the relationship is successfully established, the business partner is adopted in one's circle of friends and relatives. This is a lasting tie on the basis of which business can be done from then onwards much more quickly and effectively and mistakes will be more easily tolerated. Investing in personal relationships in most collectivist cultures also involves the giving of presents and the rendering of services, practices which in an individualist culture would be considered as bribes, in a collectivist, particular society, bribing is generally more socially acceptable than in an individualist societies to feet morally superior. Most collectivist societies have normal norms as to what bribes are to be given in what situations: these often represent an essential part of the economic system and of the compensation of civil servants who otherwise could not survive. "Corruption" starts where people abuse their position to extort bribes which surpass the informal norm.

Business practice in individualist societies is centralized in individuals, and this is reflected in mainstream business theories, e.g. management. For example, incentive system

that is bounded by the individual performance is relatively effective in these societies. Conversely, business in a collectivist society is about groups. Therefore, the extent to which people actually feel emotionally integrated into a group may differ from one situation to another. The factors those influenced integration of group are important to determine behaviors of the members. This difference implies that the incentive given to the both cultures are different. In the individualist societies, institutions that influence individual will be more effective. Meanwhile, institutions those affect a group but not individual interests will be less effective.

Since the characteristic of cartel association deviates in accordance with different level of collectivism/individualism, the outcomes of policy or regulation related to it are affected significantly in a similar manner. In leniency program, although individual cartelist may prefer to disclose the evidence to the authority, it conflicts the collective benefit of the group. Hence, it is expected that cartels those formed in relatively more collectivist attitude would be less likely to be destabilized by the regulations imposed (Brenner, 2011). Moreover, managerial behavior of firm might be also affected by the set of domestic cultural norms and values (Earley & Gibson, 1998). That is to say, strategy implementation of firms shall be affected in the similar manner. Besides the expected less degree of cartel formation amongst individualists, individualism is the manner in which individuals are more strongly guided by motivations of self-interest and this should lead to more level of strategy implementation because individualists care concern calculative aspects of work more than moral or other aspects else. Moreover, it is evident that firms in more individualism context managers try to be up-to-date and endorse modern management ideas (Hofstede, 1984). Consequently, individualism was claimed to be the essential reason of high innovation in western firms (Triandis, 1973). In addition, the cultural dimensions of Hofstede have been empirically tested their impact on the national competitiveness measured by global competitiveness index. Evidently, in countries where the individualism predominates, competitiveness is higher compared to countries where collectivism dominates (Mihaela, Claudia, & Lucian, 2011).

Additionally, individualism/collectivism affects strategic choices in the specific pattern. Instead of differentiating to gain the market share like in the U.S., Japanese firms tend to converge themselves into the similar status quo, especially defensive one (Kotha, Dunbar, & Bird, 1995). Moreover, clearly, the informal understandings between alliance partners are frequently exploited by collectivists while formal contracts are standard in the individualism societies (Bhagat, Kedia, Herveston, & Triandis, 2002). Overall, the strategic impact of culture is strongly evident. Furthermore, as it can be seen, culture hugely asserts its influence

on formal institutions (Adler, Brahm, & Graham, 1992). This interactive influence of informal and formal institutions implies the "moderating role" of informal institutions on the transition process. This is because the difference in an interval of change of formal and informal institutions is evidently nontrivial. Hofstede (2001) explicitly stated that culture is gradually changed and hardly changed in few generations while the laws or regulations could be amended in a tiny span. Therefore, the difference in the culture does not directly affect the change in competition level or the change in strategic choice. Being relatively more individualist certainly influence the cartel formation and strategic choice, it however does not influence the change in both cases. Conversely, change in formal institutions in the different cultures is obviously influenced by the status quo of informal institutions. They hence play the role as a moderator instead of the direct antecedents of the change in transition process. Moreover, Pareek (1968) argued that choice to develop one is a function of high "need for achievement" minus the "need for affiliation." While individualists possess higher level of the former, collectivists possess relatively higher level of the latter. The enthusiasm of implementing a strategy relies mainly on a choice to develop the firms and individualists seem to possess a higher level of this measure.

Consequently, the level of cartel formation is expected to be less sensitive to the change in competition laws in relatively more collectivist group. This is because collectivist property sustains the cartel and increases the cost to deviate from the cartel group, given the same level of competition law strictness. Moreover, the level of cost leadership strategy implementation is less sensitive to the change in competition law in relatively more collectivist group. There are two paths toward this expectation. First, due to less sensitivity in competition to competition policy, less competition pressure gives less incentive to implement strategy. Second, the characteristic of managers in collectivist group is less sensitive to change in innovation and new managerial practices (Triandis, 1973; Hofstede, 1984). In conclusion, the discussion in this section has drawn the last hypothesis regarding cultural moderating effects on the so-called transition process as follows:

*Hypothesis 3a*: Degree of collectivism reduces the magnitude of the relationship between Antitrust and leniency program and level of cartel formation.

*Hypothesis 3a*: Degree of collectivism reduces the magnitude of the relationship between the competition law and cost leadership strategy implementation.

In conclusion, the second chapter has discussed the relevance of the relationship between institutions and strategic choice of firms. Starting from the arguments in institutions literatures, there is a significance relationship between institutions and firms. In particular, home-country institutions in the developing economies are investigated. Firms in such an environment are expected to be significantly influenced by the institutional change (Peng, Wang, & Jiang, 2008). However, there is a call for the research agenda of how institutions actually affect firms (Peng M. W., Towards an institution-based view of business strategy, 2002). This research therefore empirically tests the significance of institutions and extends beyond the study how institutions affect firms. In the first hypothesis, competition law is claimed to influence the level of cartel formation which implicitly implies a higher level of market-based strategy implementation of firms or the strategic choice of firms. Last but not least, cultural characteristics, collectivism/individualism, are claimed to moderately influence the relationships in prior two hypotheses. In the next chapter, research design and methodology of this research will be discussed and elaborated.

## CHAPTER III RESEARCH DESIGN AND METHODOLOGY

This chapter describes the study design and methodology used to test the hypotheses proposed in Chapter II. The chapter is organized as the following order: (3.1) discussion of the overall design, including the causality criteria, the coherent research paradigms adopted in this study; (3.2) discussion of the issue of unit of analysis as it applies to this study; (3.3) discussion and definitions of the experimental design including variables and experimental procedure; (3.4) discussion of the analytical techniques used to analyze the data.

### 1. Design Overview

This study hypothesizes the consequences of institutional change on firms' strategic choice. Once consequence and cause are discussed, it is an argument of causation. It is obvious that relation does not imply causation. However, since causation always implies relation, there are additional conditions besides relations to be considered (Hill A. B., 1965). Moreover, Hill (1965) set the so-called "Bradford-Hill" criteria to verify causation as follows:

1. **Strength**: Strength of relationship or association between variables increases a likelihood of causation between them.

2. **Consistency**: Repeated findings from different sets of samples and methods increase the likelihood of causation between variables.

3. **Specificity**: The more specific of variables, the superior the possibility of a casual relationship.

4. **Temporality**: Variable that is claimed as an effect must occur after the cause.

5. **Biological gradient**: Generally, greater exposure to the treatment should lead to greater incidence of effect.

6. **Plausibility**: Supportive explanation between cause and effect should be stated.

7. **Coherence**: Coherence between theoretical explanation and laboratory explanation should be confirmed.

8. **Experiment**: It is among the best ways to manipulate data and show cause and effect.

9. **Analogy**: Effect of similar factors should be considered comparing to the case.

To be simplified, there are three crucial assumptions described by Max Born in 1949 as follows (Sowa, 2001):

1. Causality postulates that there are laws by which the occurrence of an entity B of a certain class depends on the occurrence of an entity A of another class, where the word entity means any physical object, phenomenon, situation, or event. A is called the cause, B the effect.

2. Antecedence postulates that the cause must be prior to, or at least simultaneous with, the effect.

3. Contiguity postulates that cause and effect must be in spatial contact or connected by a chain of intermediate things in contact.

Therefore, in statistical sense, the most fundamental test of causality is a statistical significance of the relationships between entities (e.g. phenomena). Moreover, the sequential aspect of entities should be clarified as well. The occurrence of cause has to be controlled or detected that it comes earlier or simultaneous with the effect. Most importantly, if there are other causes those could also affect the effect of interest, their existences are required to be negated either by control or dispersion.

In the context of this research, three main hypotheses are grounded on the consequence of one phenomenon on another. For example, the first hypothesis states the effect of enacting competition law which is expected to be a deterrence of cartel formation. Therefore, it is necessary to verify that:

- 1. Competition law amendment is statistically related to a deterrence of cartel formation
- 2. Competition law amendment occurs in prior to or simultaneously with a deterrence of cartel formation, and
- 3. Other causes of cartel formation do not affect a deterrence of cartel formation.

Since causality requires a particular conditions satisfaction, the subsequent part continues the discussion on the research design which is coherent with the causality and this study research question. There are three *"Elements of Inquiry"* suggested by John W. Cresswell (Cresswell,

2003). These three elements of inquiry serve as the very fundamental framework to be analyzed before choosing an approach to the research:

1. What knowledge claims are being made by the researcher? (Alternative knowledge claims)

- 2. What strategies of inquiry will inform the procedures? (Strategies of Inquiry)
- 3. What methods of data collection and analysis will be used? (Methods)

These three fundamental framework elements determine approaches to research. Approaches to research, in turn, influence the design processes of research as the Figure 3.1.



Figure 1: Research Methodology Framework (Cresswell, 2003)

In alternative knowledge claims, this is simply to say that "what assumptions to be set about how and what to learn". It is so-called "paradigm" (Lincoln & Guba, 2000). There are three main schools of thought: postpositivism<sup>9</sup>, constructivism and pragmatism. To put it simply, this study tries to claim that competition law determines the deterrence of cartel

<sup>&</sup>lt;sup>9</sup> Post-positivism school of thought is different from Positivism school of thought. *Positivist* considers the world and the universe as deterministic—they are operated by laws of cause and effects that could be discerned if applying the unique approach of the scientific method such as deductive reasoning to postulate testable theories. In contrary, *post-positivist* exploits critical realism which believes that a reality is independent of our scientific-study thoughts. To be précised, post-positivist is different from positivist because post-positivist critical realist recognizes that all observation is fallible and has error and that all theory is revisable. The goal of post-positivist is to hold consistently to the goal of getting it right about reality, even though we can never achieve that goal. Therefore, triangulation and constructs are convinced (Trochim, 2000). Ultimately, post-positivism is an amendment to positivism that incorporates the critiques against logical positivism. It still preserves the basic assumptions of positivism: ontological realism, the objective truth, and experimental methodology. Examples of academia in this school are Karl Popper (falsification) and Thomas Kuhn (paradigm shifts) (Phillips & Burbules, 2000).

formation and deterrence of cartel formation, in turn, determines strategic choices of firms. Postpositivism reflects a deterministic philosophy in which causes probably determine effects or outcomes (Philips & Burbules, 2000). Put differently, examining causes that influence outcomes is the main problem that postpositivism studies. Two most important perspectives of postpositivism are conjectural status of knowledge claim (no absolute truth, but failure to reject hypotheses) and being objective. Therefore, this perspective fits well with postpositivism paradigm.

Conversely, socially constructed knowledge claims believe that individuals seek understanding of the world and this understanding is subjective. Therefore, this study relies on, no matter whom, participant's views of the situation being studied. It is also useful to incorporate this perspective if the research question tries to create new theory or claim without strong background. This study is not groundless but connecting well-grounded theories together and tries to claim their linkages. As New-Institutional Economics and Institutional-Based View of Strategic Management claim the significance of institutions on the economic entities especially firms. Scholars in fields claimed that a change in institutions influence economic agents including firms in the jurisdiction (North D., 1990; Peng M. W., 2003). Competition law has been studied in both legal and Industrial Organization field regarding its effect on the anti-competition elimination (Shapiro & Kovacic, Antitrust Policy: A Century of Economic and Legal Thinking, 1999). Particularly, cartel behavior has been extensively analyzed by exploiting game theory and its policy has been implemented for decades (Motta & Polo, 2003; Spagnolo, Leniency and Whistleblowers in Antitrust, 2006). Moreover, cultures have been empirically confirmed its influence on the cartel behavior and suggested its relations with firm's strategic decision (Brenner, 2011; Hofstede, 2001). Accordingly, there are both new and well-developed ideas in this study. Therefore, it is also interesting to incorporate this perspective into this research approach.

In pragmatic knowledge claims, knowledge claims arise out of actions, situations, and consequences rather than antecedent conditions (Cherryholmes, 1992). It is, actually, a mixture of previous two paradigms which researchers put an emphasis on research questions rather than methods. However, the problem at hand is how these two paradigms being combined together and by which degree. It is going to be considerably complicated to take culture into account without using well-developed questionnaires. This is because this study does not put its main emphasis on developing new cultural theory or construct but tries to exploit widely accepted measures as a tool to study cultural effect on relationships of interest. This invalidates the usefulness of socially constructed knowledge claims. Moreover, normative behavior and actual behavior are sometimes totally different from each other

(Campbell D. T., 1975). Especially, if some behavior is clearly not morally correct, i.e. cartel, people tend to avoid answering it straightforwardly. This is going to be even more evident if they have nothing to gain or lose by answering such a question (Campbell D. T., 1969).

As a result, main part of this research seamlessly fits postpositivism paradigm. Moreover, a portion, relatively smaller, of socially construct knowledge claims should also be included. Therefore, in strategies of inquiry, more applied level of study will be investigated, that is, specific procedures in research design (Cresswell, 2003). In postpositivism school of thought, strategies of inquiry that have been invoked since long is quantitative methods. Quantitative methods involved true experiments, quasi-experiments, correlational studies (Campbell & Stanley, 1963), and specific single-subject experiments (Neuman & McCormick, 1995). On the other hand, socially knowledge claim leads to qualitative methods (Cresswell, 2003). There are many alternatives in qualitative approach's strategies such as Ethnographies, in which the researcher studies an intact cultural group in a natural setting over a prolonged period of time by collecting, primarily, observational data (Cresswell, 1998); Grounded theory, in which the researcher attempts to derive a general, abstract theory of a process, action or interaction grounded in the views of participants in a study (Strauss & Corbin, 1998). Even though there are so many interesting strategies in qualitative approach, dominant position of postpositivism paradigm in this study leads to an analysis of quantitative methods. There are two main candidates, namely, survey and experiments.

A survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. From the sample results, population's characteristics can be generalized or claimed. Conversely, in experiments, investigators may also identify a sample and generalize to a population; however, the basic intent of an experiment is to test the impact of a treatment (or an intervention) on an outcome, controlling for all other factors that might influence that outcome (Cresswell, 2003). Referring back to the initial purpose of this study, the causality amongst constructs are hypothesized and expected to be tested subsequently. Survey design, despite it possesses many advantages such as a larger group of sample, could hardly guarantee causality because it is lacking of the controlling authority. Conversely, experiments allow researcher to control all things by design the most appropriate settings of experiments and sequence of phenomena is clearly divided by the conductor. Therefore, experiments seem to be the most appropriate method in this study. Most experiments are of an exploratory nature, since the investigator is interested in finding out what factors have an influence on the outcome of a certain process (Hinkelmann & Kempthorne, 2008). For example, aircraft engineers find it useful to study a small-scale model in a "test bed" before trying to build and fly a new plane (Friedman &

Sunder, Experimental methods: A primer for economits, 1994). Likewise, economists and policymakers recently have found it is useful to study new institutions in the laboratory before introducing them in the field.

The next consideration is specific type of experiments. There are two major types of experiment categorized by level of control: true experiment and quasi-experiment. Donald T. Campbell stated as follows:

"There are many natural social settings in which the research person can introduce something like experimental design into his scheduling of data collection procedures (e.g., the when and to whom of measurement), even though he lacks the full control over the scheduling of experimental stimuli (the when and to whom of exposure and the ability to randomize exposures) which makes a true experiment possible. Collectively, such situations can be regarded as quasi-experimental designs..." (Campbell & Stanley, 1963, p. 34)

Therefore, true experiment is actually distinct from quasi-experiment by its power of control. Sometimes, quasi-experiment is called field experiment because avenue of experiment is no longer a laboratory. However, it is almost a truism that true experiment, if practical, is better than field experiment. This is because nuisances can be more effectively controlled within laboratory than outside (Cooper & Schindler, 2008).

"...It (experiments) has capability, under well designed, to exhibit the causality between phenomena..." (Hinkelmann & Kempthorne, 2008).

Since we would expect the causational relationship between law implementation and under-enforced parties, we couldn't rely on any legal effects on other types of statistical technique which could not disclose this type of relationship out of phenomena. Therefore, true experiments or laboratory experiment should be used. Moreover, field experiments become impractical because the rest of characteristics do not fit well with its lacks of control. Deterrence effect and strategic choice are almost impossible to detect out of laboratory. Inexistence of policy, especially leniency program, does not allow field experiments either.

Another reason supporting the choice of laboratory experiment is the fact that price leadership strategy is exploited as a strategic choice in the hypothesis. In the reality, firms do not only implement different strategies at the same time, they also, every so often, exploit both market power and strategy simultaneously (Perloff, Karp, & Golan, 2007). Consequently, if the analysis will be based on solely real firms' empirical data, it is extremely

difficult to tell whether particular thing (competition) affects their specific behavior (strategic choice) to move into exacting direction (positive relationship). Generic strategy could be broadly classified into cost leadership, differentiation and focus (Porter, 2003). Moreover, firms frequently choose to implement more than one type of strategy simultaneously. Even though there is a debate whether they will be stuck-in-the-middle and fail or they will be all-rounder and succeed, either of these possibilities does not affect this study (Hill C., 1988).

However, different choice and degree of strategy does affect this study significantly. In reality, even in the *ceteris paribus* assumption, this difference may create at least two difficulties. Firstly, it is difficult to draw any conclusion from firms' choice of strategy and degree when a valid measurement cannot be created. For example, firms may choose to differentiate their products differently e.g. choosing to use channel of distribution differently, choosing to use product characteristics itself differently. Therefore, it is difficult to measure their choice of differentiation strategy. Secondly, besides measurement problem, it is so difficult to explain why firms choose particular choice/choices of strategy. Generally, what this study has tried to articulate is simply that when firms are prohibited from using market power (forming cartel) they will choose to implement strategy (instead). However, specific choice of strategy to be implemented also relies on many other factors e.g. market condition, customer demands. Hence, research methodology is required to be able to control these difficulties.

In summary, the study employs laboratory experiments to test the hypotheses proposed in the chapter II. Next, the unit of analysis and experimental design shall be discussed

### 2. Unit of Analysis

The issue of unit of analysis is an issue of extreme importance in this study. The main question is simply who are the most appropriate participants in the experiments. In particular, it is not evident that the researches exploited laboratory experiments in the related topics with this study have ever exploited individuals as firms (Spagnolo, Leniency and Whistleblowers in Antitrust, 2006; Brenner, Self-disclosure at International Cartels, 2011). However, empirical researches in business-related fields have traditionally been exploiting individuals such as managers or executives as representatives of firms in empirical researches (Cooper & Schindler, 2008). Even though, in laboratory experiments, the exploitation of individuals as representatives of firms is not evident, it is necessary to develop a simple tool which could validate the choice of individuals as representative of firms. This is thus called "firm

representativeness of subjects". In this study, the terms subjects and participants are used interchangeably.

It is impossible to move firms into laboratory. However, this study does not require all aspects of firm in its details. The crucial aspect is the decision of firms. In reality, even though firm is an organization consisted of resources, its unarguably most important resource is a human resource. Human resource management scholars claimed that human resource plays important role on turnover, productivity, financial performance and, especially, competitive advantage of firm (Barney & Wright, 1998; Huselid, 1995). Consequently, human decision is more or less the firm decision. The crucial task, therefore, is how to seek the ones who can represent the firms. Therefore, it is necessary to verify the representativeness of subjects by selecting their specific characteristics and testing these characteristics in prior to the experiments.

In essence, the most important aspect of firms extracted from this study's hypotheses is their decisions. In the context of this study, the decisions of firms could be mainly in forming cartel or implementing strategy. Consequently, two main facts to be tested are their working experience and their self-evaluated matching decision making between themselves and firms. Working experience is required to be higher than middle manager and has considerable experience in their works (Javidan, Dorfman, deLuque, & House, February 2008). This study hence selects the *Executive MBA* students those required to have at least 8 years of work experience in their admission process. Moreover, subjects are asked to evaluate themselves whether their decisions in the past coherent with the firms' decisions or not. There are two ten-scale questions (see the questions in **Appendix D**). The first question asked how frequently their ideas are coherent with firm's decisions (mental representativeness) while the second asked how frequently their ideas were actually implemented as the firm's decisions (actual representativeness). In order to provide the threshold of representativeness, half score has been adopted as a criteria to determine whether subjects are good representative of firms or not.

Moreover, demographic and personal characteristics of participants are important determinants of their behaviors. Since the principle of causality requires a control over other causes of the effect of interested, these characteristics are not the causes those this study investigates and have to be controlled. Vernon Smith proposed an induced-value theory which stands as the most fundamental theory of experimental economics (Smith, Experimental Economics: Induced Value Theory, 1976). Induced-value theory states that if we use the proper reward medium, agents will be rational economics agents that we can, to certain extent, trust in their behavior during an experiment (Friedman & Sunder, 1994). By satisfying
conditions, it is going to increase the reliability of the result (Smith & Walker, 1992). There are three main conditions that induced-value theory claimed to be inducing agents' characteristics as follows:

1. Monotonicity

$$\frac{\partial V(m,z)}{\partial m} > 0$$

Given that,

V = Function of subjects' unobservable preference

m = reward medium

z = other things else

## 2. Salience

$$\frac{\partial A}{\partial m} and \ \frac{\partial m}{\partial A} \neq 0$$

Given that,

A = Function of subjects' actions

3. Dominance

$$\frac{\partial V(m,z)}{\partial z} \to 0$$

To make it simple, experiments should be conducted by motivating agents by reward medium (Monotonicity). Besides, agents or subjects should be explained clearly about their conditions that their rewards will depend on their actions (Salience). Finally, minimizing other influences' effects on subjects' preference will clarify the effect of reward medium on it (Dominance). In the first two conditions, subjects are notified the experiments instruction twice by the conductor and are asked to complete the test of understanding before conducting an experiment. Moreover, since the rewards have to depend on participants actions, the experimental design will be tailored accordingly which will be discussed extensively in the experimental design section. Simultaneously, the last condition is assured by the testing of demographic and personal characteristics. Next, the last issue regarding the unit of analysis is a number of subjects.

Idealistically, population should be the most desirable number of subjects to draw. This is, sometimes, not an impossible task since some particular actions do not occur simultaneously in too many places. However, it is rather the problem of an ability to completely define this number in reality, especially in the case of cartel where there is no case being detected in Thailand. The best database to be exploited might be the number of firms registered in Thailand up to date. There are 540,572 firms in Thailand now as in Table 2. However, this massive amount of subjects serves only as an upper limit of sample size. In reality, there is no experiment, up until now, that could include this amount of subjects and no one will easily make a try.

Type of Firms	Number (Percentage)
Limited Partnership, Ordinary Partnership,	539,680 (99.8350%)
and Company Limited	
Public Company Limited	892 (0.00165%)

Table 2: Number of Firms in Thailand (Ministry of Commerce, 2010)

Nonetheless, in the scope of this study, it requires only two subjects to form each pair of scenario (cartel), number of subjects, therefore, becomes not an issue of interest in market efficiency matter (Friedman & Sunder, 1994). However, statistical concern makes consideration of observation becomes the main issue in selecting number of subjects. That is to say, number of subjects should be large enough to be credibly tested by statistical method. This study is going to conduct in executive MBA class where 14 students are going to play at least 20 periods of experiment in each cultural group, hence, there will be at least 280 observations for both dependent variables.

In an experiment which tests for an effect (which might show up as a difference between control and treated individuals, for example), there are three related quantities:

- 1. The size of effect we would regard as important, that we would not want to miss.
- 2. The probability that if such an effect exists, we find it. (This is the *power* of the test.)
- 3. The number of subjects used in the experiment.

If any two of these are specified, the third may be determined. These calculations depend on having some idea of the variability between or within subjects, as the effect is expressed relative to this variability. It can be estimated from previous experiments or intelligently guessed. In this study, an estimate of within subject variability is required. When this has been obtained, you can determine the number of subjects needed for an experiment of a certain power to detect a specified effect.

In the Table 3, the first column, R, is the ratio of the difference you want to detect to the within-subject standard deviation. The next three columns give the number of animals needed

for detection probabilities of 80%, 90% and 95%. Even though longitudinal data has its own specific estimation, many scholars suggest that cross-sectional method provides a considerably precise suggestion for the sample size in the case of longitudinal data (Pan, 2001). Therefore, it could be seen that the expected sample size is sufficient for 95 percent confidence level and 0.4 ratio of the difference to the standard deviation.

р	POWER			D	POWER		
ĸ	80%	90%	95%	ĸ	80%	90%	95%
0.1	1571	2103	2603	2.6	5	5	6
0.2	394	527	652	2.7	5	5	6
0.3	176	235	291	2.8	5	5	5
0.4	100	133	164	2.9	4	5	5
0.5	65	86	106	3	4	5	5
0.6	46	60	74	3.1	4	5	5
0.7	34	45	55	3.2	4	4	5
0.8	27	35	42	3.3	4	4	5
0.9	22	28	34	3.4	4	4	5
1	18	23	28	3.5	4	4	4
1.1	15	19	23	3.6	4	4	4
1.2	13	17	20	3.7	4	4	4
1.3	12	15	17	3.8	4	4	4
1.4	10	13	15	3.9	4	4	4
1.5	9	11	13	4	4	4	4
1.6	9	10	12	4.1	4	4	4
1.7	8	9	11	4.2	3	4	4
1.8	7	9	10	4.3	3	4	4
1.9	7	8	9	4.4	3	4	4
2	6	7	9	4.5	3	4	4
2.1	6	7	8	4.6	3	3	4
2.2	6	7	7	4.7	3	3	4
2.3	5	6	7	4.8	3	3	4
2.4	5	6	7	4.9	3	3	3
2.5	5	6	6	5	3	3	3

 Table 3: Sample size for within-group experiment (Campbell, Julious, & Altman, 1996)

In summary, subjects are selected from the executive MBA students because of their qualification as experienced representatives of firms. At the beginning of the experiment, they are asked to take a firm representativeness test before conducting an experiment. In total, there 28 subjects and they are divided into two cultural groups. This separation and the rest of research design will be elaborated afterward.

## **3.** Experimental Design

In strategic choice, the evidence of experimental research is still not evident. Zhu, Wittmann, and Peng (2011) exploited an institution-based view to analysis the SMEs in China by using interview conducted with 82 top managers and owners at 41 SMEs in China. Even though this study shed light on how institution-based barriers affect innovation in SMEs, its implication still remains the static institutions in China and their effects on firms. In particular, competition fairness, and laws and regulations are two keys institutions barriers to innovation claimed by the study, they are treated as given. However, in the context of this study, institutional change affects firms and the emphasis is on the investigation of how the change affects firms. Therefore, although interview might be an appropriate methodology for the research questions posed by Zhu, Wittmann and Peng; it does not serve a proper response to the necessity of this study. Moreover, Brenner (2011) statistically tested the breakdowns of cartel under EU Leniency program also exploited the informal institutions as an explanation of difference in cartel deterrence or formation. Likewise, the research conducted mainly by using the secondary date of the cases in the field. Conversely, in the leniency program related issues, laboratory experiments have been widely exploited.

Apestaguja, Dufwemberg and Selten (2007) conducted their experiment to investigate the result, also, of leniency program and reward. This first experimental research on issue provided insights of experimental research in explaining leniency program. By using one-shot homogeneous discrete Bertrand oligopoly, their study embedded four competition policies: Ideal-there is no antitrust law, Standard-there is antitrust law, Leniency-there is immunity permission for confessed party, and Bonus-there is a reward for reporting firm. The level of cartel formation is extracted from a reduction in price level. The result turned out that the authorities wish to thwart cartels and promote competition effect is not evident. However, there are many expectable pitfalls appeared in their work. Even though Bigoni et al. (2008) later argued that homogeneous assumption is irrelevant because it does not reflect the reality, this study agrees with the choice of homogeneous assumption. If the heterogeneous product setting is included into the study, it implies that price does not completely reflect the effects of treatments in the study. Therefore, it means that by using the heterogeneous products hypothesis, a degree of controlling within experiment will be affected. This study hence chooses to hypothesize that product are homogenous to eliminate an unnecessary nuisance out of the study.

Another crucial dimension of experiment that Apestaguja, Dufwemberg, and Selten (2007) left out is a dynamic process of leniency program. As discussed, dynamic process of leniency program and cartel enforcement is crucial as it reflects the real situation more precisely and reasonably. The type of game which is required and more appropriate is the situation gives rise to dynamic game of a special kind: it is obtained by repeated play of the same static simultaneous-move game and is known as a repeated game. In repeated game, players would take into account a "reduced value" of future payoff in the decision process. The more level of discount factor is (which could be interpreted as the importance of future

relationship between players (Osborne & Rubinstein, 1994)), the more possibility to constitute of Sub-game Perfect Nash Equilibrium (SPNE) between players.

In the context of this study, SPNE is formed when cartel is sustained and cartelists agree to continue their collusion. This is the situation so-called "*Grim-trigger strategy*". In the prisoners' dilemma situation, there is a possibility of cooperative especially in repeated game. If we set up the rule that there is a possibility that relationship will end in the future with some positive probability, each player would try to cooperative and then, in the next period, play cooperative if there is no defection occurs, otherwise, they would be non-cooperative forever (which in an experiment, this is sensible). This could be proved as equilibrium if one can prove that temptation to cheat today is less than the value of reward-punishment tomorrow (future) (Friedman J. , 1971). Therefore, the dynamic aspect of cartel is substantial and the study takes it into account.

Bigoni et al. (2008) took into account the dynamic process of cartel. Additionally, they used fixed amount of fine instead of percentage of revenue in the period of conviction as other two experiment studies. They provided the reason of avoiding subjects confuse on the expected fine they perceive. Since the ultimate objective of experiment is controlling other variables and try to maximize effect of independent variables of interest. Furthermore, this study concurs with Bigoni et al. (2008) in the framing of experiment as explicitly cartel/antitrust game, that is, directly inform subjects. Since the neutral frame by Hinloopen and Soetevel makes no usefulness, because we need not to blind subjects from cartel situation since what we are interested is not on the difference between cartel and other types of corporate crime, but cartel specifically and its reflections on different policies. This study also adopts "rematching of subjects" process with positive and constant probability all along the treatments, because this would replicate the discount factor of repeated game as I discussed previously (Dal Bo, 2005).

Since the collectivism cultural dimension is the issue of interest in this research and it cannot be treated as a treatment because it is a fixed characteristic of subjects, I have to set it as two separated blocks (Friedman & Sunder, 1994). Therefore, questionnaire will be distributed to subjects in advance to separate them into two groups of collectivism and individualism by scores. For the usefulness of experiments, I simply separate subjects into balanced two groups beforehand and conduct experiments on each group separately.

In every stage game, the subjects have to take four types of decision as follows:

- Choosing price in discrete Bertrand game
- Deciding whether to form cartel or not

- Choosing to self report to competitive authority or not
- Choosing to adjust the cost structure or not

Hence, treatment variables would be the antitrust law enforcement institution details those are expected to create competitive market where treatments represent different type of competitive policy are as follows:

- Laissez Faire regime
- Fines (Antitrust)
- Leniency

Each would be given fine for profit+5 (except Laissez Faire). Also, initially, all policies are facing the same probability of detection " $\eta$ ". However, this  $\eta$  will be randomized in doubleblind fashion (both experimenters and subjects will not know this level). The explanation of choosing these levels shall be explained in variables definition later on. Figure 2 shows the research framework of this study. **Figure 2 Research Framework** 



Given that i = {Collectivism, Individualism}

## 3.1 Variables Defined

## 3.1.1 Independent Variables/Manipulated Variables

The independent variables or treatments of this study are mainly the *competition law regimes*. They are separated into three regimes: Laissez Faire, Antitrust, and Leniency. There are three types of treatments corresponding with the competition law regimes and the experiment will be conducted in the "within subjects" type. Therefore, every subject played under all treatments' condition. For example, one subject has to participate in all Laissez Faire, Antitrust, and Leniency treatments respectively. The treatments are exhibited in table 4 as follows:

Treatment	Fine (F)	Probability of Detection $(\eta)$	Report	Report's Effects
Antitrust	Profit + 5	Random	Yes	Pay the full fine
Leniency	Profit + 5	Random	Yes	No fine for reporter
Laissez Faire	-	-	No	-
(Control Group)				

**Table 4: Table of treatments** 

#### 3.1.2Moderating Variable

#### Collectivism (vs. Individualism)

Hofstede (1990, 2001) claimed that operationalizing constructs of human mental programs shall concern about two important aspects, which are, *Form of behavior* which can be either deeds, i.e. nonverbal behavior, or words, i.e. verbal behavior; and, *Outcome of behavior* which can be either provoked, i.e. stimulated by the researcher for purposes of the research, or natural, i.e. taking place or having taken place regardless of the research and the researcher. Moreover, as Hofstede (2001) mentioned, he extensively use the method for provoked and words category (e.g. interviews, questionnaires and projective tests). Since cultural characteristics of subjects cannot be manipulated, I therefore adopt the questionnaire from Hofstede's work directly. Another usefulness of this choice is that questionnaires allow subjects to speak more for themselves and take less subjective interpretation from researcher.

The individualism index developed by Hofstede (1976) in which the scores among IBM subsidiary employees in 40 countries are investigated. In the index, there are 30 total questions used during the period of survey (1968-1973). Nevertheless, there are only 14 questions those were used in all questionnaires and the factor analysis of the 14-goal, 40-country matrix produced two factors that together explained 46% of variance and both were of approximate strength both prior and after the rotation. These data are exploited only to

form individualism index but also masculinity index. All goals loaded .35 or more on one of the two factors. Two derived factors are as follows:

Factor 1 (Variance 24%)	Factor 2 (Variance 22%)
Individual/Collective	Social/Ego
Positive	Positive
.86 Personal time	.69 Manager
.49 Freedom	.69 Cooperation
.46 Challenge (2 <sup>nd</sup> loading)	.59 Desirable area
.35 Desirable area (2)	.48 Employment security
Negative	Negative
82 Training	70 Earning
69 Physical conditions	59 Recognition
63 Use of skills	56 Advancement
40 Benefits	54 Challenge
37 Cooperation (2)	40 Use of skills (2)

Moreover, besides 14 goals being exploited in all questionnaires, there are 22 questions left those are used in 1968-1971 questionnaires and 1989-1994 student surveys. Likewise, Hofstede (2001) conducted the factor analysis of these 22-goal, 19 country matrix and produced two interpretable factors explained 43% of the variance. Only factor loadings exceeds .35 were selected as follows:

Factor 1 (Variance 23%)	Factor 2 (Variance 20%)
Ego/Social	Individual/company
Positive	Positive
.90 Advancement	.79 Freedom
.68 Earnings	.69 Personal time
.61 Challenge	.65 Up-to-dateness
.50 Recognition (2 <sup>nd</sup> )	.48 Training
.45 Use of Skills	.43 Cooperation (2 <sup>nd</sup> )
.44 Modern company	.40 Physical conditions
Negative	Negative
79 Friendly atmosphere	88 Successful company
78 Desirable area	83 Contribute to company
70 Manager	53 Recognition
66 Cooperation	43 Modern company (2 <sup>nd</sup> )

Masculinity index was developed from the fact that the Factor 2 in 14-goal, 40country matrix and Factor 1 in 22-goal, 19-country matrix are virtually identical except the reversion of sign. However, for the individualism index, in the Factor 1 in 14-goal, 40country matrix differed from Factor 2 in the 22-goal, 19-country matrix because in the former the three company goals that form one pole of the 22-goal factor were missing. Moreover, these two factors are uncorrelated across the overlapping 19 countries. This explains why the labels in both factors are different. Finally, the factor scores have been used as a basis for computing the individualism index. The questions treated as the individualism index are presented in Table 5 as follows:

Short name	Full Questionnaire Wording
Positively related to individualism	
Personal time	Have a job which leaves you sufficient time
	for your personal or family life
Freedom	Have considerable freedom to adapt to work
	for your company as long as you want to
Desirable area	Live in an area desirable to you and your
	family
Up-to-dateness	Keep up to date with the technical
	developments relating to your work
Physical condition	Have good physical working conditions
	(good ventilation and lighting, adequate
	work space, etc.)
Negatively related to individualism	
Recognition	Get the recognition you deserve when you
	do a good job
Modern company	Work in a company which stands in the
	forefront of modern technology
Successful company	Work in a company which is regarded in
	your country as successful
Contribute to company	Have a job which allows you to make a real
	contribution to the success of your company
Training	Have training opportunities (to improve your
	skills or learn new skills)

**Table 5: Individualism index questions** 

In Hofstede's work, the values of the individualism index is formulated by  $IDV = 50 + 25 \times INV$ , in which INV is the factor score. However, in this study, the questions are distributed to the participants and collected before the experiment date. Moreover, the questions are randomized in their order to hide the pattern of questions and avoid the bias of selection by participants (see **Appendix C**). The study adopted 5-point scale as Hofstede (2001) exhibited. Since the questionnaires are used for the purpose of separating participants into two cultural groups, the summation of the raw scores are listed in ascending order. Median of the score is used as a threshold to separate data into two groups because the data are in ordinal scale. Given that the moderating variable is collectivism, the upper half of scores is categorized into collectivism block and the lower half into individualism block. These blocks are known before the experiment because participants have to be separated into two blocks in prior to the beginning of the experiment.

#### **3.1.3 Dependent Variables**

1) Cartel formation<sup>10</sup>

Throughout the experiment, the subjects could form cartels by discussing prices. At the beginning of every period, a communication is possible if and only if both subjects agreed to communicate. Note that this agreement is non-binding, cheating could occur both by deviation or self-reporting. Data of cartel formation will be collected across treatments pairs and periods as follow.

$$\begin{split} F_{i,j,t}^{a} \ given \ that \ \{F_{i,t}^{a} \in \{0,1\} | F = 0 \ if \ no \ formation, F = 1 \ if \ formation | \ a \\ &= (Lassaiz \ Faire, Antitrust, Leniency), i \\ &= individual \ in \ given \ time \ period, j \\ &= partner \ of \ i \ in \ given \ time \ period, t = time \ period\} \end{split}$$

## 2) Cost reduction (as a cost-leadership strategy implementation)

At the end of each period, subjects will be able to change their cost structure. They will be able to choose to invest on this restructuring process for x where  $\{x=R \mid x>0\}$ . Subjects have to pay this investment for 2 periods and then they can earn extra profit for the same amount until the end of the experiment. Data of cost restructuring will be collected across treatments pairs and periods as follow.

$$\begin{aligned} C^{a}_{i,j,t} \text{ given that } \{C^{a}_{i,t} \in \mathbb{N} \cup \{0\} \leq 5 \mid a = (\text{Lassaiz Faire, Antitrust, Leniency}), i \\ &= \text{individual in given time period, j} \\ &= \text{partner of } i \text{ in given time period, } t = \text{time period} \end{aligned}$$

## 3) Control (Nuisance) variables

Since causality requires a control over other related variables, the essence of experimental study is how to control other variables those could potentially affect the dependent variables in the study. That is to say, the purpose of identifying control variables is to deal with threats to validity of an experiment, especially internal validity and external validity threats (Cresswell, 2003). In general, even though the induced-value theory has

<sup>&</sup>lt;sup>10</sup> Cartel formation is the most accurate measurement of cartel deterrence effect. Since the reality cannot provide this information because there is no action occurs, the advantage of laboratory experiment could be optimized by exploiting this variable instead of price level (Bigoni, Fridolfsson, Coq, & Spagnolo, 2008).

ascertained the elimination of other nuisances in the experiment, some clear controlled variables are worthwhile considered and controlled because of their obvious significance. Partially, firm representativeness test was elaborated in the previous section. Nonetheless, the diverse characteristics of firm also play an important role on the different in firm decision and behavior. Therefore, firm size, revenue, resource and capability, and strategy are also controlled in this study to support the consequence of induced-value theory that unnecessary aspects of participants are eradicated from the experiment. Moreover, the probabilities of detection and re-matching are discussed in detail. Finally, some trivial nuisances are taken into account and controlled by the experimental design.

# 4) Firm Size and Revenue

Since the general characteristics of firm can affect its decision, firm size and revenue shall be controlled by setting them constant and equal across subjects (Friedman & Sunder, 1994). Theoretically, both SMEs and MNEs are affected similarly by competition on its competitiveness (Piteris, 2003) (Porter, 1990). Therefore it is reasonable to fix this variable at some certain level which firms are all equivalent.

#### 5) Firm Resource and Capability

In reality, each firm holds its own unique resources and capabilities and they can be in countless form (Penrose, 1959) (Barney J., 1991). However, in experiment, simplicity is an essential part to extract the crucial information (Smith, 1962). I therefore limit the resource and capacity of firms into their cost and price levels. It means that all that subjects can do is using price as a sole tool to compete with each other in regard to their cost levels.

# 6) Firm Initial Strategy and Choices of Strategy

Subjects' strategic choice is limited to "cost leadership" type of strategy (Porter, 1985). It is selected because of its coherence with the price level as a sole competing tool of firms. All subjects' initial strategy is nothing, since they will have to choose whether they will implement the cost leadership strategy or not later on. This fact, too, will be announced in the experiment instruction.

#### 7) Probability of Detection

If I use some specific number of probabilities (e.g. 0.2), the interpretation and perception of subjects would be different by their risk characteristics (risk averse, risk lover, and risk neutral; with different degrees) and I cannot assign this risk characteristics to subjects. On the other hand, since controlling is impracticable, randomizing becomes considerably sensible. If I selected "perceived" level of probability of detection by Thai

authorities, their perception would be still different. However, the latter holds more useful idea because, in reality, it's also impracticable to extract out the standard level of this value, since all firms would perceive this level differently by any circumstance this would randomize subjects' risk characteristics and their perceptions. Note that, I, more or less, fixed Thai authority as a control while other things become random. Furthermore, since we draw the subjects randomly, they would approximately represent Thai managers as well.

Therefore, using "perceived" level of probability provide at least as good as some specific level of probability. It provides us more comprehensive effect of the policy implementation without concerning about the mismatch of specific level of probability to the reality. For example, if I set 0.2 as a level of detecting probability, subjects would perceive it differently. In experiment, we have to separate the perception of subjects from the experimental conduct issue that we really randomize this detection process. Experimenters can set some specific level (e.g. 0.2) and use it in the process of experiment, but all subjects would not be informed this level of randomization, so it wouldn't affect their decision. Experimenters can possibly control 2 processes of randomization, first, randomize the level of probability, and, second, randomize the detection according to that level of probability. In conclusion, I can control the influence of policy (as Thai authority), but I cannot control the reaction and perception of subjects. So, I need to treat them as random which is unknown for both experimenter and subjects (double-blind).

# 8) Probability of Re-matching

Another probability that can affect subjects' behavior is probability of re-matching across periods. However, it can be eliminated the effect by randomizing the level. However, there is a tricky in setting this level of re-matching. Since, in game theory, prisoner dilemma will be sustainable in repeated game if the payoff is considerably high. This is so called a "Grim-trigger strategy". Therefore, the level of probability will be randomized within the range of (0, 0.85) (Bigoni, Fridolfsson, Coq, & Spagnolo, 2008). There are two layers of this randomization. First, probability of re-matching level will be randomized. Second, the partner that will be selected to switch with this pair will be also randomized.

#### 9) Personal Relationship between Pair in each period

At the beginning of experiment, each subject will be randomly assigned their identity number. After being assigned their identity numbers, they will be randomly assigned to be with their partner is each pair. By doing these process of randomization, we can guarantee that the personal relationship between pair will be diluted and it will not significantly affect the level of independent variables.

#### 10) Third Party Consideration

Bigoni et al (2008) considered their choice on using duopoly model instead of oligopoly model because they want to eliminate the so-called "Third-party effects". This effect can be explained that if using more than two subjects within the same group, one's decision to report on another will be affected by other members in the group. This nuisance therefore should be controlled by eliminating the possibility of this effect.

## 11) Product Characteristics and Elasticity of Demand to Price

However, as mentioned above, homogeneous product model is selected because I do not want to "dilute" the effect of competition policies (treatments) on price and cost restructuring (dependent variables). Since having homogeneous products among competitors, firms will purely compete through price level and change in price level will be clearer in reflecting the change in treatment variables. Therefore, by having homogeneous products among firms, cost function could be treated as fixed amount of money instead of cost function. I therefore refer to the work by Hinloopen and Soetevent (2005) which apply initial cost level of all subjects at 100. Subjects, at each period, can arbitrarily choose their price levels. Even though they have agreed upon some levels during a communication period, they are not abided by the agreement (they can betray). All consumers will go to the one who choose the lowest price level, while the others will get nothing. Nevertheless, if both subjects in the same pair choose the same price level, their profit will be divided equally (divided by two).

Since all variables involved in this study has been identified and discussed, induced-value theory states an importance of the understanding of subjects regarding experimental procedure and the fact that their rewards depend on the level of performance in the experiment. Therefore, instrumentation and materials are of importance and will be exhibited afterward.

#### 3.2 Instrumentation and Materials

Experiment Instruction will be provided to all subjects in advance of an experiment and is shown in **Appendix E.** 

#### **3.2.1 Computer Software**

Computer Program is specifically designed and coded for the experiment. I apply both web-based and application-based programming to create two identical programs. In web-based program, GWT (Google Web Toolkit) has been used to develop the software to conduct an experiment through network. Moreover, Comet has been employed to allow real-time and

direct communication among subjects. These systems require Apache-Tomcat-supported database to run all programs. Jetty® is one kind of web server which allows all of this system to run. JAVA is the language occupied to write the program and it was converted into JavaScript to be able to run on the web browser through GWT. In application-based program, Visual Basic is the language for coding. All system has been created by VB.NET compiler and this version of program supports network system also. However, application-based program requires an installation on each computer where internet-based does not. Screenshots of the program shall be exhibited in an **Appendix F**. In the next section, experimental procedure will be exhibited and discussed.

#### 3.3 Experimental Procedure

Here, procedure is separated into two levels, overview and within experiment.

## 3.3.1 Overview

## 1) Cultural blocking

Since individualism-collectivism, IDV hereafter, cultural dimension will be treated as moderating variable on all connections of variables; I treat the subjects separated into two groups in advance so-called blocking. Since it is difficult to claim the same level of IDV as in Hofstede's works or any other applications, I avoid doing so by using simply within subjects level of IDV. Firstly, I let all subjects to fill the questionnaire related to IDV in advance (see **Appendix C**). I then collect all questionnaires from subjects and separated them into two groups using median as a threshold<sup>11</sup>.

#### 2) Pilot experiments

Conducting pilots was conducted as a way of developing the design and procedures of experiments (Friedman & Sunder, 1994). So, this study conducts a pilot test with smaller group of sample, precisely 6 persons who are randomly selected from the computer lab while the testing was initiated. Primarily, pilot experiments are conducted to detect and solve the following potential problems:

- Ambiguities of instruction
- Missing information
- Unintended leakage of information
- Time consumption of activity, and this is crucial
- Insufficiency of assistance

<sup>&</sup>lt;sup>11</sup> Since all levels are in ordinal scale, median is the most appropriate descriptive statistics for this type of information.

#### - Lack of coordination

#### 3) Registration

Register is organized in advance. For the righteous, the study requests all subjects sign a legal form which provides statement of their rights. All subjects would be informed their bonus and salary at the beginning of this stage as well. Identity number would be assigned as a seat's number and be randomized in the randomization process later on.

## 4) Conductors

The conductors are hired to conduct the experiment. She is not informed the objective of the experiment but are requested to read the instructions and conduct the experiment accordingly.

## 5) Instruction

Besides reading instruction, oral instructions are provided to all subjects for both comprehensible and common knowledge among subjects (see **Appendix E**). At the same time, all questions possible from subjects would be clarified in this particular step.

#### 6) Dry-run periods

Before the real experiment, the first three to five periods are used as a dry run in which no payments are made for the performance. These dry-run periods are used for the purpose of creating familiarity and comprehension among subjects, and testing for conductors. These dry-run periods certainly are announced in advance.

#### 3.3.2 Within experiment

The easiest way to explain the process of experiment might be through flowcharts as in Figure 3 and simpler version in Figure 4. At the beginning, all subjects would have to create their username and password arbitrarily. This is for the purpose of randomization and data analysis later on. They would be informed that all of them are assumed to be the managers of firms and have to make a decision as representatives of firms.

At the beginning of each stage, all subjects are randomly separated into pairs with computerized random method, and the possibility of re-matching the same pair of subjects would be randomized but higher than separating them relatively (this for purpose of grim-trigger strategy possibility). Bigoni et al. (2008) chose the probability level of 15 percent to be re-matched (Bigoni, 2008). If the subject was drawn to switch the pair, all information in the past with their old pair would be deleted, that is, there is no detection for the past pair

behavior. The experiment would end if more than 20 periods<sup>12</sup> had passed or time passed for 45 minutes, and this information would be informed to subjects in advance. However, if the subject was randomly switched into new pair, the limitation would not beyond 45 minutes.

In the process of switching into new pair, this study therefore uses double randomization to guarantee unbiasedness and randomization in the procedure. Firstly, this study randomizes the probability level of being separated which ranged between 0.0 - 0.15. Subsequently, if the result turned out to be switching, this study therefore randomizes the new pair afterward. If the result turned out to be none switching, the same pair continues in the next period.

After informing the instruction, participants would be asked whether both of them are willing to communicate or not. If at least one declines to communicate, each will then select the price level separately. If both subjects of each pair agree to communicate, they will set price after a communication in the chatting box. In the communication process, there will be a single blind, that is, each individual will not know who exactly his or her partner in each period is but the experimenter knows it. This single blind is for the purpose of eliminating the personal relationship effect amongst the participants.

By changing cost structure, subjects are required to pay an initial investment for arbitrary amount of " $X_t$ " where the value of  $X_t$  is in the range of [0,5] and defined as follow:

$$X_t = b$$
 where  $b \in \mathbb{N} \leq 5 \cup \{0\} \mid t = period of decision, t \in \{1, 2, 3, ..., T\} \land T \in \mathbb{N} \leq 20$ 

If subject chooses to change cost at period t, this investment burden will be last long for 2 periods (t+1 and t+2) after the decision. However, in all periods left (t+3, t+4, ..., T), they will gain advantages by reducing cost for the same amount of "x" in every single period. For instance, in period 3, subject A's initial cost level is 500 baht and A chooses to change his/her cost structure for 5 baht. A will have to give up his/her money for this investment 5 baht in period 4 and 5 and cost level will become 505 for both period. Afterward, from period 6 onward, A's cost level become 495 baht until the end of an experiment.

<sup>&</sup>lt;sup>12</sup> By 20 periods, normally, firms set and adjust their price once in three months. Hence, 20 periods could be considered as 5-year range and this is considerably a long-run analysis. In long-run analysis, our randomization and unbiasedness will be validated in relative to short-run analysis.



process



## Figure 4: Steps in each stage of game

## 3.4 Empirical Methodology

By using the same subject repeatedly, the problem of correlation between different actions of the same subject would arise. I need to control for this problem also. In this study, the individual error component is assumed to be independent from regressor which is the dummy of treatments. This assumption will be partially confirmed in the characteristics test of subjects across blocks. Moreover, since the subjects across treatments are the same group of subjects, it is sensible to make this assumption in order to support the selection of random effect model instead of fixed effect model (Gujarati, 2003). Consequently, random effect regression (error components model (ECM)) would be used for this longitudinal data analysis. Since the distinction amongst levels of analysis and periods are not the issues of analysis, I just treated them in aggregation by using both across-period and across-subject random effects. In binary dependent variable case, collusion decision, logit model will be exploited as well.

The econometrics equations could be put as follows:

$$D_{hijk} = \beta_0 + \beta_1 LEN_ANT_{hijk} + \eta_{ijk} + \eta_{ik} \qquad \dots (1)$$

$$D_{hijk} = \beta_0 + \beta_1 ANT_L F_{hijk} + \eta_{ijk} + \eta_{ik} \qquad \dots (2)$$

$$D_{hijk} = \beta_0 + \beta_1 LEN_L F_{hijk} + \eta_{ijk} + \eta_{ik} \qquad \dots (3)$$

$$C_{hijk} = \beta_0 + \beta_1 LEN_ANT_{hijk} + \eta_{ijk} + \eta_{ik} \qquad \dots (4)$$

$$C_{hijk} = \beta_0 + \beta_1 ANT_L F_{hijk} + \eta_{ijk} + \eta_{ik} \qquad \dots (5)$$

 $C_{hijk} = \beta_0 + \beta_1 LEN_L F_{hijk} + \eta_{ijk} + \eta_{ik} \qquad \dots (6)$ 

*Given that*, subject h in the duopoly i at time j and in cultural group k has cost reduction for  $C_{hijk}$ . The decision to form collusion is represented by the binary variable  $D_{hijk}$  in which the value is equal to 1 when there is a collusion formation and 0 when there is no collusion formed.

Swamy and Arora (1972) suggest running two regressions to get estimates of the variance components from the corresponding mean square errors of the regressions in panel data system (Baltagi, 2005). The first regression is the within regression of each subject across time and the second is the between regression which runs the regression of averages in cross-section (Maddala, 1977). Moreover, for the robustness testing, non-parametric statistical methods are also adopted in all analyses to ascertain the result acquired from parametric one (Wu & Zhang, 2006). The Non-parametric statistical analysis that will be used are **McNemar's Change test (discrete dependent variable)**<sup>13</sup> and **Wilcoxon T test**<sup>14</sup> in repeated-measure cases (within the same cultural block) and **Chi Square (discrete dependent variable)** and **Wilcoxon/Mann-Whitney U test**<sup>15</sup> in randomized-group cases (between cultural blocks) (Tabachnick & Fidell, 2007). Furthermore, controlled variables are tested their differences across cultural blocks to certify their randomness. Additionally, price level is dropped out because it is certainly affected by the cost reduction decision and that is not a treatment of interest in this study. However, it will be included as a robustness test of the measurement in competition of collusion decision.

This concludes Chapter III where I have described the design and methodology of the study. The results of the analyses of transition process and its cultural effects are presented in the Chapter IV.

<sup>&</sup>lt;sup>13</sup> McNemar's test is a non-parametric method used on nominal data. By applying 2 x 2 contingency tables, it determines whether the row and column marginal frequencies are equal or not. The null hypothesis states that the two marginal probabilities for each outcome are the same (see McNemar (1947)).

<sup>&</sup>lt;sup>14</sup> Wilcoxon T test, so called Wilcoxon signed-rank test, is a non-parametric statistical hypothesis test used when comparing two related samples or repeated measurements on a single sample to assess whether their population means differ (see Wilcoxon (1945)).

<sup>&</sup>lt;sup>15</sup> Wilcoxon/Mann-Whitney U test, so called Wilcoxon rank-sum test, is a non-parametric statistical hypothesis test for assessing whether two independent samples of observations have equally large values (see Mann and Whitney (1947)).

# CHAPTER IV RESULTS

This chapter presents the results of the data analysis and hypothesis testing. The chapter is organized in three parts. (1) Research participants' tests are presented. (2) The related pre-experiment tests are provided. (3) The study presents results of hypotheses testing in hypotheses ordering.

## 1. Research Participants

Research participants are divided into cultural blocks and asked to fill the demographic and firm's representativeness questionnaires.

# 1.1 Subjects and Cultural Blocks

The research participants are randomly recruited from executive MBA students from the renowned public university. The total number of subjects participated in this study is 28 participants. They are separated by median into two cultural blocks (collectivism vs. individualism) by the questionnaire in prior to the experiment date.

## 1.2 Demographic and Characteristics

Moreover, the payoff was paid in accordance to the level of profit that each individual acquired. According to induced-value theory, I could reasonably ignore demographic data of subjects in this stage (Smith, 1976). Since they are assigned to base their decision on a particular scenario (e.g. same size of firms, no other resources except price and cost), they are controlled under the framework of the experiment not solely their initial characteristics.

# 1.3 Characteristics of Subjects by Cultural Blocks

To ensure that cultural blocks are separated by cultural characteristics not others, the equality of the characteristics between cultural blocks shall be tested. Table 7 reports the analysis of subjects' individualism score (Wilcoxon T Test (Wilcoxon Signed-Rank Test) = 4.388, p-value = <0.000) industry (Wilcoxon T Test (Wilcoxon Signed-Rank Test) = 0.735163, p-value = 0.4622), size of firm (Wilcoxon T Test (Wilcoxon Signed-Rank Test) = 1.585195, p-value 0.1129), Age (F-statistic = 0.304137, p-value = 0.5860), experience (F-value = 0.344262, p-value = 0.5624). The difference of individualism scores between two blocks is statistically significant. On the other way round, all characteristics variables' differences across blocks are not statistically significant. Therefore, the evidence suggests that

the participants are separated into two cultural blocks by their cultural characteristic while their other characteristics are still randomized across blocks.

## 1.4 Firm Representativeness Test

Since subjects are asked to act as if they are firms themselves, their representativeness was check by two ten-scale questions. The first question asked how frequent their ideas are coherent with firm's decisions (mental representativeness) while the second asked how frequent their ideas were actually implemented as the firm's decisions (actual representativeness). In order to provide the threshold of representativeness, half score has been adopted as a criteria to determine whether subjects are good representative of firms or not. As exhibit in Table 6, the result shows that all cases including mental, actual, and, aggregate representativeness of subject are significantly different from half-score threshold. Furthermore, between-block comparison reveals that the levels of firm representativeness of subjects between two blocks are not significantly different from each other. Therefore, to some certain extent, the interpretation of experiment could claim the same pattern of subject's behavior as firm's behavior as well.

Half-Score	Mental	Actual	Aggregate			
Threshold	Representativeness	Representativeness	Representativeness			
Difference Test						
Individualism	Mean = $6.4285^*$	Mean = $6.9285^*$	Mean = $13.3571^{**}$			
Block	(F-value ANOVA =	(F-value ANOVA =	(F-value ANOVA =			
	3.3574, p-value =	3.1061, p-value =	4.3696, p-value =			
	0.0743)	0.0897)	0.0465)			
Collectivism	Mean = $8.1428^{***}$	Mean = $7^{***}$	Mean = $15.1428^{***}$			
Block	(F-value ANOVA =	(F-value ANOVA =	(F-value ANOVA =			
	41.124, p-value =	21, p-value = <0.000)	197.1228, p-value =			
	<0.000)		<0.000)			
Between Blocks	ANOVA F-statistic =	ANOVA F-statistic =	ANOVA F-statistic =			
	0.6643, p-value =	0.006589, p-value =	0.2501, p-value =			
	0.4224	0.9359	0.6211			
*** = 1% significance level, ** = 5% significance level, * = 10% significance level.						

Table 6: Analysis of Firm Representativeness

Subject's Characteristics	Sample	Methods	Degree of Freedom	Value (p-value)	Notes
Individualism Score	28	$\chi^2$ -test	1	17.6458 (<0.0000)***	-Wilcoxon T Test
		Wilcoxon T Test (Wilcoxon Signed-Rank Test)		4.3880 (<0.0000)***	(Wilcoxon Signed-Rank
		Wilcoxon/Mann-Whitney U Test		19.4567 (<0.0000)***	Test) is a repeated-
Industry		$\chi^2$ -test	1	0.3733 (0.5412)	measure nonparametric
		Wilcoxon T Test (Wilcoxon Signed-Rank Test)		0.7351 (0.4622)	test of equality.
		Wilcoxon/Mann-Whitney U Test		0.5747 (0.4484)	-Wilcoxon/Mann-Whitney
Employee (Size)		$\chi^2$ -test	1	2.2974 (0.1296)	U Test (Wilcoxon Rank-
		Wilcoxon T Test (Wilcoxon Signed-Rank Test)		1.5851 (0.1129)	Sum Test) is a separated-
		Wilcoxon/Mann-Whitney U Test		2.5862 (0.1078)	group nonparametric test
Age		t-test	26	0.5514 (0.5860)	of equality
		ANOVA F-test	(1,26)	0.3041 (0.5860)	-Age and Experience are
Experience		t-test	26	0.5867 (0.5624)	measured in years,
		ANOVA F-test	(1,26)	0.3442 (0.5624)	- therefore, they could be
					tested in simple
					parametric test i.e.
					ANOVA.
					-Because there are two
					groups of sample for
					comparison, p-values of t-
					test and ANOVA are
					equal.
*** = 1% significance level,	** = 5% sign	ificance level, * = 10% significance level.	1	1	1

 Table 7 Analysis of Subject's Characteristics by Cultural Blocks

# 2. Analysis of Pre-Experimental Questionnaire

All subjects have to take a *manipulation check* test in prior to the experimental procedure in order to test their understanding on experiment materials. The result turns out to be that 80 out of 84 questions are correctly answered (95.24 %). This is an evidence of their adequate level of comprehension on the rules of experiment. Moreover, *risk preferences* of subjects among two blocks are compared to certify their similarity across blocks. Since subjects are divided into three discrete categories of risk preference, that is; risk lover, risk averse, and, risk neutral, **Kruskall-Wallis H test** is adopted to test the difference between blocks (Tabachnick & Fidell, 2007). The result of analysis states that there is *no significant difference of risk preferences between blocks* (Kruskall-Wallis H = 1.7148, p-value = 0.1904).

#### 3. Experiment

In the previous section, the exploration revealed the random assignment of the subjects across cultural blocks. Therefore, a separated-block analysis of experiment could be conduct in this section. Since subjects are divided into two separated blocks of cultural dimension (collectivism and individualism), the analysis is structured by the elaborations of two blocks respectively. By within-block analysis, *Hypothesis 1* and *Hypothesis 2* could be tested. However, in order to test *Hypothesis 3*, between-block analysis should be explored instead. The caveat is that, in order to confirm Hypothesis 1 and Hypothesis 2, all relationships within *both cultural blocks* (individualism and collectivism) must be statistically significant; otherwise there is a case of partial support.

#### 3.1 Within Collectivism block

The subjects have to make two crucial decisions in each period of the experiment and they have to make these choices repeatedly for at least twenty periods. First, each subject has to make a decision whether he or she will collude, agree upon price, with the partner or not. Second, each subject may choose to reduce the cost level. The first decision is exploited as indicators of competition which is the expected consequence of competition policies, i.e. antitrust and leniency program (Bigoni, Fridolfsson, Coq, & Spagnolo, 2008). The cost reduction is treated as an indicator of price leadership strategy implementation because it is the only tool available for subjects to beat their competitor by setting the lowest possible profitable price.

#### **3.1.1 Collusion Decision**

At the beginning of each period of experiment, the subjects are asked to make a decision whether he/she would like to agree the price level with his/her partner or not. If both choose to agree the price level, they will be switched toward the price-agreement screen. However, if there is only one subject proposes to agree the price level but another declines, there will be no price level agreement happens.

As two types of figures will be exploited throughout this study, an elaboration of these two types of figures shall be stated in prior. *The scatter plot* is used in order to exhibit the raw data and the overall pattern of them. Each unit of the vertical space represents each subject's data. It could be divided further into twenty periods. *The graph of means* presents the levels of mean of specific variable in different treatments. Horizontally, there are twenty periods because all panel data are cut into the balanced panel data. In each period, the mean of all subjects (fourteen subjects) is exhibited as a representative of all subjects' choice within that particular period.

Figure 5 presents the scatter plot of the data in all three treatments of the subjects in collectivism block. Roughly, there is a clear pattern which could be noticed from the color of each treatment on the graph. The leniency program treatment, in green, seems to be majorly in the bottom of the binary-choice scatter plots. Meanwhile, antitrust and laissez faire treatment, in red and blue respectively, are clearly on the top. However, the analysis shall be scoped down on pair-by-pair basis.

In laissez faire and antitrust treatments, figure 6 and table 8 present the analysis of collusion decision between laissez faire and antitrust treatments in collectivism block. The collusion decision levels are significantly different between two treatments and the sign suggests that subjects form less number of cartel in an antitrust treatment ( $\beta_{GLS} = -0.3000$ , t = -5.2722, p-value = <0.000;  $\beta_{logit} = -1.5927$ , z = -7.5106, p-value = <0.000). It means that the introduction of antitrust policy significantly affects the decision of cartel formation among subjects, even though the level of competition shall be investigated further in price level analysis. Moreover, the robustness of parametric test has been checked by testing non-parametric test, *McNemar's change test*, and the result turns out to support each other ( $\chi^2 = 22.562$ , p-value = <0.000). Therefore, the evidence on this pair of treatment provides partial support for Hypothesis 1(b).

The introduction of leniency program produces a similar result to the case of antitrust. According to figure 7 and 8, and, table 9 and 10; the number of cartel formation in leniency program treatment reduces significantly comparing to both antitrust ( $\beta_{GLS} = -0.2071$ , t = -

2.9353, p-value = <0.000;  $\beta_{\text{logit}}$  = -0.8463, z = -4.8798, p-value = <0.000) and laissez faire ( $\beta_{\text{GLS}}$  = -0.5071, t = -6.8712, p-value = <0.000;  $\beta_{\text{logit}}$  = -2.4391, z = -11.3721, p-value = <0.000) treatments. As Hypothesis1 (a) hypothesizes that *Leniency program reduces the level of cartel formation in relative to the level of cartel formation when there is no leniency program*, the H1 (a) is supported in collectivism block. Therefore, H1 is supported in collectivism block.

Next, after level of collusion has been proved to be decreased by the policy implementation, the analysis of cost-leadership strategy should be considered.



Figure 5: Scatter Plot of Collusion Decision in Collectivism Block



Figure 6: Scatter Plot of Collusion Decision between Laissez Faire and Antitrust Treatments in Collectivism Block

Dependent	Independent	Method	Sample	Coefficient	Statistics (p-	Notes
Collusion Decision	Dummy of Laissez Faire and Antitrust (= 0 if Laissez Faire, = 1 if Antitrust)	Panel Estimated Generalized Least Square (Two-way random effects)	20 (560)	-0.3000***	F = 27.7963 (<0.000) $t = -5.2722$ (<0.000)	-Swamy and Arora estimator of component variances -White diagonal standard errors & covariance (d.f. corrected) -Both regressor and regressand are dummy variables.
		Maximum Likelihood - Binary Logit (Newton- Raphson Algorithm)		-1.5927***	z = -7.5106 (<0.000)	<ul> <li>Convergence achieved after 3 iterations</li> <li>Covariance matrix computed using second derivatives</li> </ul>
Collusion Decision of Antitrust	Collusion Decision of Laissez Faire	McNemar's Change Test	20 (280)		$\chi^2 =$ 55.556*** (<0.000)	-Repeated-measure data -Chi-square's continuity corrected -The null hypothesis of marginal homogeneity states that the two marginal probabilities for each outcome are the same. Therefore, in this case, we can reject this null hypothesis and these two treatments are statistically significant different from each other.

\*\*\* = 1% significance level, \*\* = 5% significance level, \* = 10% significance level.

 Table 8: Analysis of Collusion Decision between Laissez Faire and Antitrust Treatments in Collectivism Block



Figure 7: Scatter Plot of Collusion Decision between Antitrust and Leniency Program Treatments in Collectivism Block

Dependent	Independent	Method	Sample	Coefficient	Statistics	Notes
Variable	Variable		(Observations)		(p-value)	
Collusion	Dummy of	Panel Estimated	20 (560)	-0.2071***	F =	-Swamy and Arora estimator of
Decision	Antitrust and	Generalized Least			8.6154	component variances
	Leniency	Square (Two-way			(0.0034)	-White diagonal standard errors &
	Program (= $0$ if	random effects)			t = -	covariance (d.f. corrected)
	Antitrust, = 1 if				2.9352	-Both regressor and regressand are
	Leniency				(<0.000)	dummy variables.
	Program)					
	-	Maximum		-0.8463***	z = -	- Convergence achieved after 3 iterations
		Likelihood -			4.8798	- Covariance matrix computed using
		Binary Logit			(<0.000)	second derivatives
		(Newton-Raphson				
		Algorithm)				
Collusion	Collusion	McNemar's	20 (280)		$\chi^2 =$	-Repeated-measure data
Decision of	Decision of	Change Test			22.562***	-Chi-square's continuity corrected
Leniency Program	Antitrust				(<0.000)	-The null hypothesis of marginal
						homogeneity states that the two marginal
						probabilities for each outcome are the
						same. Therefore, in this case, we can
						reject this null hypothesis and these two
						treatments are statistically significant
						different from each other.
*** - 10/ significant	rad lavel ** - 5%	significance level * -	1007 significance	laval		•

\*\*\* = 1% significance level, \*\* = 5% significance level, \* = 10% significance level.
 Table 9: Analysis of Collusion Decision between Antitrust and Leniency Program Treatments in Collectivism Block



Dependent	Independent	Method	Sample	Coefficient	Statistics	Notes
Variable	Variable		(Observations)		(p-value)	
Collusion	Dummy of	Panel Estimated	20 (560)	-	F =	-Swamy and Arora estimator of
Decision	Laissez Faire	Generalized Least		0.5071***	47.2139	component variances
	and Leniency	Square (Two-way			(<0.000)	-White diagonal standard errors &
	Program $(= 0 \text{ if})$	random effects)			t = -6.8712	covariance (d.f. corrected)
	Laissez Faire, =				(<0.000)	-Both regressor and regressand are
	1 if Leniency					dummy variables.
	Program)	Maximum		-	z = -	- Convergence achieved after 3 iterations
		Likelihood - Binary		2.4391***	11.3721	- Covariance matrix computed using
		Logit (Newton-			(<0.000)	second derivatives
		Raphson				
		Algorithm)				
Collusion	Collusion	McNemar's	20 (280)		<i>χ</i> 2 =	-Repeated-measure data
Decision of	Decision of	Change Test			22.562***	-Chi-square's continuity corrected
Leniency Program	Laissez Faire				(<0.000)	-The null hypothesis of marginal
						homogeneity states that the two marginal
						probabilities for each outcome are the
						same. Therefore, in this case, we can
						reject this null hypothesis and these two
						treatments are statistically significant
						different from each other.
*** = 1% significan	ce level, $\overline{**} = 5\%$ s	significance level, $* = 1$	10% significance	level.		

Figure 8: Scatter Plot of Collusion Decision between Laissez Faire and Leniency Program Treatments in Collectivism Block

 Table 10: Analysis of Collusion Decision between Laissez Faire and Leniency Program Treatments in Collectivism Block

#### **3.1.2 Cost Reduction**

In the very last step before moving on to the next period, the subjects are asked to arbitrarily reduce their costs from zero to five. Straightforwardly, if subject chooses to change their cost at zero, it means he/she chooses not to change cost in a given period. However, there is a condition for the trade off as stated in the methodology part and all subjects are well informed this condition in prior to the experiment.

In Figure 9 and 10, these two plots suggest that there should be a difference between the levels of cost reduction in laissez faire and antitrust treatment. Even though it might not be clearly distinct in the scatter plot, means between two treatments are obviously different in the graph of mean as in Figure 10. As it is expected, Table 11 presents the analysis of cost reduction of laissez faire and antitrust treatments in collectivism block. There is a significant relationship between the dummy of Laissez Faire and Antitrust treatment and the cost reduction level of these two treatments ( $\beta = 0.8535$ , t = 9.4644, p-value = <0.000). It means that the means of cost reduction of these two treatments are significantly different from each other and the level of cost reduction in antitrust treatment is relatively higher. Since H2 (b) states that *in antitrust scenario, firms choose to implement cost-leadership strategy more frequently than Laissez Faire scenario*, the result partially, only in collectivism block, confirms this hypothesis. For the robustness check, the Wilcoxon T test is also exploited to confirm the result and it confirms accordingly (z = 7.4200, p-value = <0.000).

H2 (a) proposed that *in leniency program scenario, firms choose to implement costleadership strategy most frequently comparing to other scenarios.* Therefore, two pairs of comparison are required to support this hypothesis: Antitrust and Leniency Program, and, Laissez Faire and Leniency Program. The first pair's result is exhibited in Figure 11, Figure 12, and, Table 12. Similar to the previous paragraph, the figures provide an informative clue to the conclusion of numerical analysis. The result presented in Table 12 partially supports H2 (a) ( $\beta = 1.7928$ , t = 16.9203, p-value = <0.000). Another pair's result is presented in Table 12. According to Table 13, the analysis of cost reduction in Laissez Faire and Leniency Program treatments satisfies that the difference between the levels of cost reduction in both treatments is statistically significant ( $\beta = 2.6464$ , t = 33.087, p-value = <0.000). This partially supports H2 (a). Moreover, Wilcoxon T test also ascertains the relationship in non-parametric approach (z = 18.7291, p-value = <0.000). Thereby, the H2 (a) is supported in collectivism block. Next, the same line of analysis will be conducted in the individualism block.



Figure 9: Scatter Plot of Cost Reduction of Laissez Faire and Antitrust Treatments in Collectivism Block



Figure 10: Graph of Means of Cost Reduction of Laissez Faire and Antitrust Treatments in Collectivism Block
Dependent	Independent	Method	Sample	Coefficient	Statistics (p-value)	Notes
Variable	Variable		(Observations)			
Cost Reduction	Dummy of	Panel Estimated	20 (560)	0.8535***	F =89.5751	-Swamy and Arora estimator of
	Laissez Faire	Generalized Least			(<0.000)	component variances
	and Antitrust	Square (Two-way			t = 9.4644	-White diagonal standard errors &
	(= 0 if Laissez	random effects)			(<0.000)	covariance (d.f. corrected)
	Faire, = 1 if					-Both regressor and regressand are
	Antitrust)					dummy variables.
Cost Reduction	Cost	Wilcoxon T Test	20 (280)		7.4200***(<0.000)	-Wilcoxon T Test (Wilcoxon Signed-
of Antitrust	Reduction of	(Wilcoxon				Rank Test) is repeated-measure
	Laissez Faire	Signed-Rank				nonparametric test of equality.
		Test)				
*** = 1% signification	ance level, $** = 5$	% significance level,	* = 10% signific	ance level.		

 Table 11: Analysis of Cost Reduction of Laissez Faire and Antitrust Treatments in Collectivism Block



Figure 11: Scatter Plot of Cost Reduction of Antitrust and Leniency Program Treatments in Collectivism Block



Figure 12: Graph of Means of Cost Reduction of Antitrust and Leniency Program Treatments in Collectivism Block

Dependent	Independent	Method	Sample	Coefficient	Statistics (p-value)	Notes
Variable	Variable		(Observations)		_	
Cost Reduction	Dummy of	Panel Estimated	20 (560)	1.7928***	F =286.2983	-Swamy and Arora estimator of
	Antitrust and	Generalized			(<0.000)	component variances
	Leniency	Least Square			t =16.9203 (<0.000)	-White diagonal standard errors &
	Program (= 0	(Two-way				covariance (d.f. corrected)
	if Antitrust, =	random effects)				-Both regressor and regressand are
	1 if Leniency					dummy variables.
	Program)					
Cost Reduction	Cost	Wilcoxon T Test	20 (280)		13.5598***(<0.000)	-Wilcoxon T Test (Wilcoxon Signed-
of Leniency	Reduction of	(Wilcoxon				Rank Test) is repeated-measure
Program	Antitrust	Signed-Rank				nonparametric test of equality.
		Test)				
*** = 1% signific	ance level, $** = 5$	5% significance level	* = 10% signific	ance level.		

 \*\*\* = 1% significance level, \*\* = 5% significance level, \* = 10% significance level.

 Table 12: Analysis of Cost Reduction of Antitrust and Leniency Program Treatments in Collectivism Block

Dependent	Independent	Method	Sample	Coefficient	Statistics (p-value)	Notes
Variable	Variable		(Observations)			
Cost Reduction	Dummy of Laissez Faire and Leniency Program (= 0 if Laissez Faire, = 1 if Leniency Program)	Panel Estimated Generalized Least Square (Two-way random effects)	20 (560)	2.6464***	F = 1089.579 (<0.000) $t = 33.0087$ (<0.000)	-Swamy and Arora estimator of component variances -White diagonal standard errors & covariance (d.f. corrected) -Both regressor and regressand are dummy variables.
Cost Reduction of Leniency Program	Cost Reduction of Laissez Faire	Wilcoxon T Test (Wilcoxon Signed-Rank Test)	20 (280)		18.7291***(<0.000)	-Wilcoxon T Test (Wilcoxon Signed- Rank Test) is repeated-measure nonparametric test of equality.
*** = 1% signific	cance level, $** =$	5% significance leve	el, * = 10% signif	icance level.		

 Table 13: Analysis of Cost Reduction of Laissez Faire and Leniency Program Treatments in Collectivism Block

# 3.2 Within individualism block

As in the collectivism block, two crucial decisions will be investigated: Collusion Decision and Cost Reduction. Note that, combination of the results from both blocks is required to claim the support of either *Hypothesis 1 or 2 or both*.

#### **3.2.1 Collusion Decision**

Figure 13 exhibits the aggregate view on the pattern of collusion decision of all treatments. Even though the distinction between laissez faire and antitrust treatments are not so outstanding, obvious intensity of leniency program treatment on the zero line is evident. As usual, the pair-by-pair numerical analysis will be presented as a result.

Laissez Faire and Antitrust treatments' cost reduction data is descriptively exhibited in the Figure 14. According to Table 14, the experimental result suggests the subjects will form a cartel less in an existence of Antitrust ( $\beta_{GLS} = -0.3214$ , t = -4.2564, p-value = <0.000;  $\beta_{logit} = -1.3777$ , z = -7.5452, p-value = <0.000). The robustness of result has been checked by McNemar's Change test and it confirms the relationship ( $\chi^2 = 53.520$ , p-value = <0.000). As H1(b) hypothesizes that Antitrust reduces the level of cartel formation in relative to the level of cartel formation when there is a laissez faire, the results support this claim.

In H1 (a), two pairs of treatment are studied to give an answer to the hypothesis. Figure 15 and Table 15 show the evidence that the difference of collusion decision between Antitrust and Leniency Program treatments is statistically significant ( $\beta_{GLS} = -0.1642$ , t = -2.6820, p-value = 0.0075;  $\beta_{logit} = -0.7439$ , z = -4.0741, p-value = <0.000). Meanwhile, Figure 16 and Table 16 present the result of the difference of collusion decision between Antitrust and Leniency Program treatments. It is significant ( $\beta_{GLS} = -0.4857$ , t = -5.7391, p-value = <0.000;  $\beta_{logit} = -2.1217$ , z = -10.9722, p-value = <0.000). Therefore, H1 (a) is supported in individualism block.



Figure 13: Scatter Plot of Collusion Decision in Individualism Block



Figure 14: Scatter Plot of Collusion Decision of Laissez Faire and Antitrust Treatments in Individualism Block

Dependent	Independent	Method	Sample	Coefficient	Statistics	Notes
Variable	Variable		(Observations)		(p-value)	
Collusion	Dummy of	Panel Estimated	20 (560)	-	F =	-Swamy and Arora estimator of
Decision	Laissez Faire	Generalized Least		0.3214***	18.1176	component variances
	and Antitrust (=	Square (Two-way			(<0.000)	-White diagonal standard errors &
	0 if Laissez	random effects)			t = -4.2564	covariance (d.f. corrected)
	Faire, = 1 if				(<0.000)	-Both regressor and regressand are
	Antitrust)					dummy variables.
		Maximum		-	z = -	- Convergence achieved after 3 iterations
		Likelihood - Binary		1.3777***	7.5452	- Covariance matrix computed using
		Logit (Newton-			(<0.000)	second derivatives
		Raphson				
		Algorithm)				
Collusion	Collusion	McNemar's	20 (280)		$\chi^2 =$	-Repeated-measure data
Decision of	Decision of	Change Test			53.520***	-Chi-square's continuity corrected
Antitrust	Laissez Faire	-			(<0.000)	-The null hypothesis of marginal
					, í	homogeneity states that the two marginal
						probabilities for each outcome are the
						same. Therefore, in this case, we can
						reject this null hypothesis and these two
						treatments are statistically significant
						different from each other.
*** = 1% significan	the level, $** = 5\%$ s	ignificance level, * = 1	0% significance	level.	1	

 \*\*\* = 1% significance level, \*\* = 5% significance level, \* = 10% significance level.

 Table 14: Analysis of Collusion Decision of Laissez Faire and Antitrust Treatements in Individualism Block



Figure 15: Scatter Plot of Collusion Decision of Antitrust and Leniency Program Treatments in Individualism Block

Dependent	Independent	Method	Sample	Coefficient	Statistics	Notes
Variable	Variable		(Observations)		(p-value)	
Collusion	Dummy of	Panel Estimated	20 (560)	-	F = 7.1935	-Swamy and Arora estimator of
Decision	Antitrust and	Generalized Least		0.1642***	(0.0075)	component variances
	Leniency	Square (Two-way			t = -2.6820	-White diagonal standard errors &
	Program (= 0 if	random effects)			(0.0075)	covariance (d.f. corrected)
	Antitrust, = 1 if					-Both regressor and regressand are
	Leniency					dummy variables.
	Program)	Maximum		-	z = -	- Convergence achieved after 3 iterations
		Likelihood - Binary		0.7439***	4.0741	- Covariance matrix computed using
		Logit (Newton-			(<0.000)	second derivatives
		Raphson				
		Algorithm)				
Collusion	Collusion	McNemar's	20 (280)		<i>χ</i> 2 =	-Repeated-measure data
Decision of	Decision of	Change Test			19.471***	-Chi-square's continuity corrected
Leniency Program	Antitrust				(<0.000)	-The null hypothesis of marginal
						homogeneity states that the two marginal
						probabilities for each outcome are the
						same. Therefore, in this case, we can
						reject this null hypothesis and these two
						treatments are statistically significant
						different from each other.
*** = 1% significan	the level, $** = 5\%$ s	significance level, * = 1	0% significance	level.		

 \*\*\* = 1% significance level, \*\* = 5% significance level, \* = 10% significance level.

 Table 15: Analysis of Collusion Decision of Antitrust and Leniency Program Treatements in Individualism Block



Figure 16: Scatter Plot of Collusion Decision of Laissez Faire and Leniency Program Treatments in Individualism Block

Dependent	Independent	Method	Sample	Coefficient	Statistics	Notes
Variable	Variable		(Observations)		(p-value)	
Collusion	Dummy of	Panel Estimated	20 (560)	-	F =	-Swamy and Arora estimator of
Decision	Laissez Faire	Generalized Least		0.4857***	32.9380	component variances
	and Leniency	Square (Two-way			(<0.000)	-White diagonal standard errors &
	Program (= 0 if	random effects)			t = -5.7391	covariance (d.f. corrected)
	Laissez Faire, =				(<0.000)	-Both regressor and regressand are
	1 if Leniency					dummy variables.
	Program)	Maximum		-	z = -	- Convergence achieved after 3 iterations
		Likelihood -		2.1217***	10.9722	- Covariance matrix computed using
		Binary Logit			(<0.000)	second derivatives
		(Newton-Raphson				
		Algorithm)				
Collusion	Collusion	McNemar's	20 (280)		$\chi 2 =$	-Repeated-measure data
Decision of	Decision of	Change Test			103.551***	-Chi-square's continuity corrected
Leniency Program	Laissez Faire				(<0.000)	-The null hypothesis of marginal
						homogeneity states that the two marginal
						probabilities for each outcome are the
						same. Therefore, in this case, we can
						reject this null hypothesis and these two
						treatments are statistically significant
						different from each other.
*** = 1% significant	nce level, $** = 5\%$ s	significance level, * =	10% significance	level.		

 \*\*\* = 1% significance level, \*\* = 5% significance level, \* = 10% significance level.

 Table 16: Analysis of Collusion Decision of Laissez Faire and Leniency Program Treatements in Individualism Block

#### 3.2.2 Cost Reduction

Figure 17 and 18 provide the aggregate picture of data in all treatments. In Figure 19 and 20, these two plots suggest that there should be a difference between the levels of cost reduction in laissez faire and antitrust treatment. Even though it might not be clearly distinct in the scatter plot, means between two treatments are obviously different in the graph of mean as in Figure 20. As it is expected, Table 17 presents the analysis of cost reduction of laissez faire and antitrust treatments in individualism block. There is a significant relationship between the dummy of Laissez Faire and Antitrust treatment and the cost reduction level of these two treatments ( $\beta = 2.2714$ , t = 17.0934, p-value = <0.000). It means that the means of cost reduction in antitrust treatment is relatively higher. Since H2 (b) states that *in antitrust scenario, firms choose to implement cost-leadership strategy more frequently than Laissez Faire scenario*, the result partially, only in individualism block, confirms this hypothesis. For the robustness check, the Wilcoxon T test is also exploited to confirm the result and it confirms accordingly (z = 13.6557, p-value = <0.000).

H2 (a) proposed that *in leniency program scenario, firms choose to implement costleadership strategy most frequently comparing to other scenarios.* Therefore, two pairs of comparison are required to support this hypothesis: Antitrust and Leniency Program, and, Laissez Faire and Leniency Program. The first pair's result is exhibited in Figure 21, Figure 22, and, Table 18. Similar to the previous paragraph, the figures provide an informative clue to the conclusion of numerical analysis. The result presented in Table 19 partially supports H2 (a) ( $\beta = 1.8464$ , t = 15.5985, p-value = <0.000). Another pair's result is presented in Figure 23, Figure 24, and Table 20. According to Table 21, the analysis of cost reduction in Laissez Faire and Leniency Program treatments certifies that the difference between the levels of cost reduction in both treatments is statistically significant ( $\beta = 4.1178$ , t = 55.1562, p-value = <0.000). This partially supports H2 (a). Moreover, Wilcoxon T test also ascertains the relationship in non-parametric approach (z = 13.6638 and 20.3272, p-value = <0.000 and <0.000). Thereby, the H2 (a) is supported in individualism block.

In conclusion, Hypothesis 2 is supported in individualism block. In individualism block, implementation of competition policy incentivizes subjects to reduce their cost more than *ex ante*. Next, the same line of analysis will be conducted in the individualism block.



Figure 17: Scatter Plot of Cost Reduction in Individualism Block



Figure 18: Graph of Means of Cost Reduction in Individualism Block





Figure 20: Graph of Means of Cost Reduction of Laissez Faire and Antitrust Treatments in Individualism Block

Dependent	Independent	Method	Sample	Coefficient	Statistics (p-value)	Notes
Variable	Variable		(Observations)			
Cost Reduction	Dummy of Laissez Faire and Antitrust (= 0 if Laissez Faire, = 1 if Antitrust)	Panel Estimated Generalized Least Square (Two-way random effects)	20 (560)	2.2714***	F =292.1871 (<0.000) t = 17.0934 (<0.000)	-Swamy and Arora estimator of component variances -White diagonal standard errors & covariance (d.f. corrected)
Cost Reduction of Antitrust	Cost Reduction of Laissez Faire	Wilcoxon T Test (Wilcoxon Signed-Rank Test)	20 (280)		13.6557***(<0.000)	-Wilcoxon T Test (Wilcoxon Signed- Rank Test) is repeated-measure nonparametric test of equality.
*** = 1% signific:	ance level, $** = 5$	% significance level	, * = 10% signific	ance level.		

Table 17: Analysis of Cost Reduction of Laissez Faire and Antitrust Treatments in Individualism Block





Figure 22: Graph of Means of Cost Reduction of Antitrust and Leniency Program Treatments in Individualism Block

Dependent	Independent	Method	Sample	Coefficient	Statistics (p-value)	Notes
Variable	Variable		(Observations)			
Cost Reduction	Dummy of Antitrust and Leniency Program (= 0 if Antitrust, = 1 if Leniency Program)	Panel Estimated Generalized Least Square (Two-way random effects)	20 (560)	1.8464***	F =243.3133 (<0.000) t =15.5985 (<0.000)	-Swamy and Arora estimator of component variances -White diagonal standard errors & covariance (d.f. corrected)
Cost Reduction of Leniency Program	Cost Reduction of Antitrust	Wilcoxon T Test (Wilcoxon Signed-Rank Test)	20 (280)		13.6638***(<0.000)	-Wilcoxon T Test (Wilcoxon Signed- Rank Test) is repeated-measure nonparametric test of equality.
*** = 1% signific	ance level, $** = 5$	5% significance level	* = 10% signific	ance level.		

 Table 18: Analysis of Cost Reduction of Antitrust and Leniency Program Treatments in Individualism Block



Figure 23: Scatter Plot of Cost Reduction of Laissez Faire and Leniency Program in Individualism Block

Figure 24: Graph of Means of Cost Reduction of Laissez Faire and Leniency Program Treatments in Individualism Block

Dependent	Independent	Method	Sample	Coefficient	Statistics (p-value)	Notes
Variable	Variable		(Observations)			
Cost Reduction	Dummy of Laissez Faire and Leniency Program (= 0 if Laissez Faire, = 1 if Leniency Program)	Panel Estimated Generalized Least Square (Two-way random effects)	20 (560)	4.1178***	F = 3042.207 (<0.000) $t = 55.1562$ (<0.000)	-Swamy and Arora estimator of component variances -White diagonal standard errors & covariance (d.f. corrected)
Cost Reduction of Leniency Program	Cost Reduction of Laissez Faire	Wilcoxon T Test (Wilcoxon Signed-Rank Test)	20 (280)		20.3272***(<0.000)	-Wilcoxon T Test (Wilcoxon Signed- Rank Test) is repeated-measure nonparametric test of equality.
*** = 1% signific	ance level, $** = 5$	5% significance level	* = 10% signific	cance level.		

 Table 19: Analysis of Cost Reduction of Laissez Faire and Leniency Program Treatments in Individualism Block

## 3.3 Between blocks

The between-block analysis serves as a tool to analyze a moderating effect of culture on the relationships in *Hypothesis 1 and 2*. There are two main subjects' decisions as the previous two separated-block analyses.

## 3.3.1 Collusion Decision

Figure 25, Figure 26, and Figure 27 Present the scatter plots of each between-block pair comparing with the same treatment. Table 20, Table 21, and Table 22 present three pairs of comparison across blocks in numerical manner. Each pair stands for one type of competition policy. In Laissez Faire treatment, the difference of collusion decision level between Collectivism and Individualism blocks is statistically significant (U = 6.1818, p-value = 0.0129). In Antitrust treatment, the difference of collusion decision level between Collectivism and Individualism blocks is also statistically significant (U = 8.5561, p-value = 0.0034). Finally, in the leniency program treatment, the difference of collusion decision level between Collectivism and Individualism blocks is statistically significant (U = 4.1925, p-value = 0.0406). Therefore, the results suggest that moderating effects of culture (Collectivism v. Individualism) are statistically significant on all pairs of comparison. As H3 (a) hypothesizes that *Degree of collectivism is (a) negatively related to effectiveness of leniency program*, the results support H3 (a).



Figure 25: Scatter Plot of Collusion Decision of Laissez Faire Between Blocks

Dependent	Independent	Method	Sample	Coefficient	Statistics	Notes
Variable	Variable		(Observations)		(p-value)	
Collusion	Dummy of	Panel Estimated	20 (560)	-	F = -26.7396	-Swamy and Arora estimator of
Decision	between groups	Generalized Least		0.1390***	(<0.000)	component variances
	Laissez Faire	Square (Two-way			t = -12.2908	-White diagonal standard errors &
	Treatment $(= 0$	random effects)			(<0.000)	covariance (d.f. corrected)
	if Laissez Faire					-Both regressor and regressand are
	Collectivism, =					dummy variables.
	1 if Laissez	Maximum		-	z = -3.6079	- Convergence achieved after 3
	Faire	Likelihood - Binary		0.4924***	(<0.000)	iterations
	Individualism)	Logit (Newton-				- Covariance matrix computed using
		Raphson				second derivatives
		Algorithm)				
Collusion	Collusion	Wilcoxon/Mann-	20 (280)		6.1818***	-Randomized-groups data
Decision of	Decision of	Whitney U Test			(0.0129)	
Laissez Faire	Laissez Faire	(Wilcoxon Rank-				
Collectivism	Individualism	Sum Test)				
*** = 1% significant	nce level, $** = 5\%$ s	ignificance level, $* = 1$	0% significance	level.		

 Table 20: Analysis of Collusion Decision in Laissez Faire Treatment between Blocks



Figure 26: Scatter Plot of Collusion Decision of Antitrust Between Blocks

Dependent	Independent	Method	Sample	Coefficient	Statistics	Notes
Variable	Variable		(Observations)		(p-value)	
Collusion	Dummy of	Panel Estimated	20 (560)	-0.5100***	F = -26.4275	-Swamy and Arora estimator of
Decision	between groups	Generalized Least			(<0.000)	component variances
	Antitrust	Square (Two-way			t = -19.5852	-White diagonal standard errors &
	Treatment $(= 0$	random effects)			(<0.000)	covariance (d.f. corrected)
	if Antitrust					-Both regressor and regressand are
	Collectivism, =					dummy variables.
	1 if Antitrust	Maximum		-	z = -3.3792	- Convergence achieved after 3
	Individualism)	Likelihood -		0.36010***	(0.0007)	iterations
		Binary Logit				- Covariance matrix computed using
		(Newton-Raphson				second derivatives
		Algorithm)				
Collusion	Collusion	Wilcoxon/Mann-	20 (280)		3.3776***	-Randomized-groups data
Decision of	Decision of	Whitney U Test			(0.0007)	
Antitrust	Antitrust	(Wilcoxon Rank-				
Collectivism	Individualism	Sum Test)				
*** = 1% significant	nce level, $** = 5\%$ s	significance level, * =	10% significance	level.		

 Table 21: Analysis of Collusion Decision in Antitrust Treatment between Blocks



Figure 27: Scatter Plot of Collusion Decision of Leniency Program Between Blocks

Dependent	Independent	Method	Sample	Coefficient	Statistics	Notes
Variable	Variable		(Observations)		(p-value)	
Collusion	Dummy of	Panel Estimated	20 (560)	-	F = -26.9500	-Swamy and Arora estimator of
Decision	between groups	Generalized Least		0.0780***	(<0.000)	component variances
	Leniency	Square (Two-way			t = -9.2184	-White diagonal standard errors &
	Program	random effects)			(<0.000)	covariance (d.f. corrected)
	Treatment $(= 0$					-Both regressor and regressand are
	if Leniency					dummy variables.
	Program	Maximum		-0.2960**	z = -2.5636	- Convergence achieved after 3
	Collectivism, =	Likelihood - Binary			(0.0104)	iterations
	1 if Leniency	Logit (Newton-				- Covariance matrix computed using
	Program	Raphson				second derivatives
	Individualism)	Algorithm)				
Collusion	Collusion	Wilcoxon/Mann-	20 (280)		2.5622**	-Randomized-groups data
Decision of	Decision of	Whitney U Test			(0.0104)	
Leniency Program	Leniency	(Wilcoxon Rank-				
Collectivism	Program	Sum Test)				
	Individualism					
*** = 1% significant	ice level, $** = 5\%$ s	significance level, * = 1	0% significance	level.		

\*\*\* = 1% significance level, \*\* = 5% significance level, \* = 10% significance level.Table 22: Analysis of Collusion Decision in Leniency Program Treatment between Blocks

#### 3.3.2 Cost Change

Figure 28 and Figure 29 exhibit the scatter plot and graph of Laissez faire treatment across blocks. Table 23 presents the analysis of cost reduction of Laissez faire treatment between collectivism and individualism blocks. There is a significant relationship between the dummy of Laissez Faire and Antitrust treatment and the cost reduction level of these two treatments ( $\beta = 0.3785$ , t = 4.6689, p-value = <0.000). It means that the means of cost reduction are significantly different from each other and the level of cost reduction in individualism is relatively higher. Since H3 (b) states that *Degree of collectivism is negatively related to the relationship between the competition policy and level of firms implementing the strategy*. The result partially confirms this part of hypothesis. For the robustness check, the Wilcoxon/Mann-Whitney U Test (Wilcoxon Rank-Sum Test) is also exploited to confirm the result and it confirms accordingly (z = 7.4600, p-value = 0.0063).

Since there are other two treatments left to be compared across blocks, Antitrust and Leniency Program, these two pairs are required to be tested further. Figure 30 and 31 represent the former while the latter is showed in Figure 32 and 33. The first pair's result is exhibited in Table 24. The result presented in Table 24 partially supports H3 (b) ( $\beta$  = 1.7964, t = 12.555, p-value = <0.000). Another pair's result is presented in Table 25. According to Table 25, the analysis of cost reduction in Leniency Program treatment across blocks satisfies that the difference between the levels of cost reduction in both groups is statistically significant ( $\beta$  = 1.8500, t = 24.9065, p-value = <0.000). This partially supports H3 (a). Moreover, Wilcoxon T test also ascertains the relationship in non-parametric approach (z = 126.8412 and 298.2183, p-value = <0.000 and <0.000). Thereby, the H3 (b) is supported. *There is a significant moderating effect of culture on the relationships between competition policies, cartel formation, and, cost reduction.* 

This concludes the chapter IV. The results of the experiment are exhibited and elaborated. In the next chapter, the study hence concludes the implications, discusses the results, and proposes limitations.



Figure 28: Scatter Plot of Cost Reduction of Laissez Faire Treatment between Blocks

Figure 29: Graph of Means of Cost Reduction of Laissez Faire Treatment between Blocks

Dependent	Independent	Method	Sample	Coefficient	Statistics (p-value)	Notes	
Variable	Variable		(Observations)		-		
Cost Reduction	Dummy of	Panel Estimated	20 (560)	0.3785***	F =21.7994	-Swamy and Arora estimator of	
	Laissez Faire	Generalized			(<0.000)	component variances	
	Collectivism	Least Square			t = 4.6689	-White diagonal standard errors &	
	and Laissez	(Two-way			(<0.000)	covariance (d.f. corrected)	
	Faire	random effects)					
	Individualism						
	(= 0 if Laissez						
	Faire						
	Collectivism,						
	= 1 if Laissez						
	Faire						
	Individualism)						
Cost Reduction	Cost	Wilcoxon/Mann-	20 (280)		7.4600***(0.0063)	-Wilcoxon/Mann-Whitney U Test	
of Laissez Faire	Reduction of	Whitney U Test				(Wilcoxon Rank-Sum Test) is a	
Collectivism	Laissez Faire	(Wilcoxon Rank-				randomized-groups nonparametric test	
	Individualism	Sum Test)				of equality.	
*** = 1% significance level, ** = 5% significance level, * = 10% significance level.							

 Table 23: Analysis of Cost Reduction of Laissez Faire Treatment between Blocks



Figure 30: Scatter Plot of Cost Reduction of Antitrust Treatment between Blocks

Figure 31: Graph of Means of Cost Reduction of of Antitrust Treatment between Blocks

Dependent	Independent	Method	Sample	Coefficient	Statistics (p-value)	Notes	
Variable	Variable		(Observations)		*		
Cost Reduction	Dummy of	Panel Estimated	20 (560)	1.7964***	F =157.6302 (<0.000)	-Swamy and Arora estimator of	
	Antitrust	Generalized			t = 12.5550 (< 0.000)	component variances	
	Collectivism	Least Square				-White diagonal standard errors &	
	and Antitrust	(Two-way				covariance (d.f. corrected)	
	Individualism	random effects)					
	(= 0 if						
	Antitrust						
	Collectivism,						
	= 1 if						
	Antitrust						
	Individualism)						
Cost Reduction	Cost	Wilcoxon/Mann-	20 (280)		126.8412***(<0.0000)	-Wilcoxon/Mann-Whitney U Test	
of Antitrust	Reduction of	Whitney U Test				(Wilcoxon Rank-Sum Test) is a	
Collectivism	Antitrust	(Wilcoxon				randomized-groups nonparametric	
	Individualism	Rank-Sum Test)				test of equality.	
*** = 1% significance level, ** = $5\%$ significance level, * = 10% significance level.							

 Table 24: Analysis of Cost Reduction of Antitrust Treatment between Blocks



Figure 32: Scatter Plot of Cost Reduction of Leniency Program Treatment between Blocks

Figure 33: Graph of Means of Cost Reduction of of Leniency Program Treatment between Blocks

Dependent	Independent	Method	Sample	Coefficient	Statistics (p-value)	Notes	
Variable	Variable		(Observations)		_		
Cost Reduction	Dummy of	Panel Estimated	20 (560)	1.8500***	F =620.3339 (<0.000)	-Swamy and Arora estimator of	
	Leniency	Generalized			t = 24.9065 (<0.000)	component variances	
	Program	Least Square				-White diagonal standard errors &	
	Collectivism	(Two-way				covariance (d.f. corrected)	
	and Leniency	random effects)					
	Program						
	Individualism						
	(= 0 if						
	Leniency						
	Program						
	Collectivism,						
	= 1 if						
	Leniency						
	Program						
	Individualism)						
Cost Reduction	Cost	Wilcoxon/Mann-	20 (280)		298.2183***(<0.0000)	-Wilcoxon/Mann-Whitney U Test	
of Leniency	Reduction of	Whitney U Test				(Wilcoxon Rank-Sum Test) is a	
Program	Leniency	(Wilcoxon				randomized-groups nonparametric test	
Collectivism	Program	Rank-Sum Test)				of equality.	
	Individualism						
*** = $1\%$ significance level, ** = $5\%$ significance level, * = $10\%$ significance level.							

 \*\*\* = 1% significance level, \*\* = 5% significance level, \* = 10% significance level.

 Table 25: Analysis of Cost Reduction of Leniency Program Treatment between Blocks
# CHAPTER V CONCLUSION AND DISCUSSION

This dissertation was designed to examine the causal relationship between institutional change and strategic choice of firms, so-called *Transition process*. Moreover, the moderating role of culture was also tested. This chapter discusses the empirical results for each hypothesis. Then, the significance and contribution of the study for research and practice are discussed. The chapter concludes with discussion of the limitations of the study and the implications for future research.

#### 1. Discussion of Empirical Results

The discussion of the empirical results is organized by the hypotheses. However, at the beginning, the brief review of all the research process will be summarized. As discussed in the previous chapter, hypotheses are tested by the chronological order and the moderating effect has been finally discussed. As a whole, the results are significant. In a big picture, the empirical results confirm an existence of transition process. It virtually means that institutional change could eventually lead to strategic choice of firms. Therefore, two pairs of relationship are linked: competition law and competition, and competition and strategic choice. Moreover, as individualism also significantly moderates both relationships, the role of culture on transition process is confirmed. The results are coherent with the broad argument that institutions matter and also partially respond to the question "how institutions affect firms?" by showing that institutions change influences firm's strategic choice by giving an incentive for them to switch to another choice of behavior. This switching could be designed by changing the institutions by imposing the cost on one choice (cartel in this context) and giving an incentive to another (cost leadership strategy in particular) simultaneously. Moreover, since difference in cultures moderates the magnitude of relationships within a causal mechanism, taking the level of culture into account is of a great importance when institutional change is introduced.

The research question is experimentally explored by computer laboratory experiment. The experiment is a blocked within-subject design with competition policy as independent variable and cultural characteristic as blocking or moderating variable. The competition policy is manipulated in three different levels, Laissez Faire, Antitrust, and Leniency Program. Meanwhile, blocking or moderating variable is divided into two different groups, Collectivism and Individualism, 14 participants each. Every subject in both blocks has to participate in all three treatments.

The 28 research subjects are recruited from executive MBA class because they are experienced middle managers of firms. The subjects' characteristics are explored to ensure the random assignment of subjects to two cultural blocks i.e. Collectivism and Individualism. Because subjects in each block will come across all treatments (laissez faire, Antitrust, and, leniency program), this is a within-group experiment and it is not necessary to compare subjects' characteristics across treatments. All characteristic variables (industry, employee (size), age, and experience) are not related to the experimental conditions. The evidence suggests that the participants are randomly assigned to two blocks. In the literature review chapter, this study does not develop the hypotheses under the certain characteristics' effect on the experimental result is necessary. Moreover, by the result of this test, causal mechanisms in the hypotheses become relatively more valid because its nuisances have been proven insignificant already.

The subjects are asked to rate their *representativeness of firm*. The self-assessed scores of the subjects across blocks on their representativeness are not different from each other. However, their scores are significantly different from the half-score threshold. This implies that their level of representativeness is considerably high and not different across blocks, that is, subjects are good representatives of firms and their level of representativeness does not affect their behavior in each block differently. Furthermore, subjects take a *manipulation check* test and the score reflects their sufficient level of material's and experiment's understandings. Their *risk preferences* are not significantly different between blocks. It suggests that risk preferences play no part in the difference of behavior across blocks and treatments. All of these justifications benefit the interpretation of this study. Induced-value theory claimed that if the participants understand the conditions well, their personal characteristics will be less influencing and the effect of the treatments on dependent variables is relatively cleaner. Subsequently, all hypotheses are analyzed and discussed.

Hypothesis 1 (H1 (a) and (b)) and hypothesis 2 (H2 (a) and H2 (b)) are tested separately in both Collectivism and Individualism blocks. In hypothesis 1 (H1), H1 (a) proposed that leniency program reduces the level of cartel formation in relative to the level of cartel formation when there is no leniency program. The experimental results provide support to H1 (a). In Collectivism block, the level of cartel formation in leniency program treatment is significantly different from and less than both Antitrust and Laissez Faire treatments. The same result is presented in the Individualism block. This shows that, amongst competition

policies being introduced to the subjects, Leniency Program is the most effective one in cartel deterrence. Therefore, the results fully support H1 (a). H1 (b) hypothesized that Antitrust reduces the level of cartel formation in relative to the level of cartel formation when there is a Laissez Faire. The results show that the subjects in Antitrust treatment form the cartel relatively less than when they are in Laissez Faire treatment, which is consistent with H1(b).

This result is different from the empirical result in Apestaguja, Dufwemberg, & Selten (2007) which disregarded the effect of leniency program on the cartel formation. However, the design of research is totally different. Obviously, this research incorporated a dynamic relationship between participants which Apestaguja, Dufwemberg, & Selten (2007) did not. An inclusion of dynamic relationship between participants in this study makes the result coherent with a similar research design in Bigoni et al. (2008). This is because the reality and essential aspect of cartel and leniency program required dynamic and repeated relationship amongst cartelists to make strategic moves. Consequently, sub game perfect Nash equilibrium could be formed and the introduction of leniency program destabilizes this process. The difference between treatments requires a possibility of forming cartel which naturally depends on the dynamic and repetitive relationship between participants before the different treatment will make an impact on this relationship differently. Therefore, another alternative explanation of Apesteguja, Dufwenburg, & Selten (2007) insignificant result is an absence of initial cartel formation possibility which eventually makes its elimination becomes indifferent. Certainly, for the case of Laissez Faire, firms would be deterred from forming cartel if they are restricted by the policy instead of an absence of it. Recall that the *participation constraint* could be satisfied when the cost of forming cartel exists  $(E(A^{C}))$  and net benefit of forming cartel is negative. This negative result is literally impossible to achieve in an absence of all competition laws.

By combining H1(a) and H1(b), each of policy introduces increasing effectiveness in deterring cartel formation. Therefore, it could be claimed that Leniency Program is the most effective policy, Antitrust is the second-best choice, and Laissez Faire or the absence of policy is the least effective scenario. Therefore, institutional change influences firm behavior and the influence is incremental not binary. That is to say, in the same given situation like cartel, not only introduction of competition law influences an elimination of cartel formation but also different competition laws influence the level of cartel formation differently. This extends our understanding on the institution-based view in strategic management that even in the same purpose and context of institutions, difference in the institutions also influence the firm's behavior differently. Since the experiment is designed and tested to be able to confirm the casual mechanism between institutions and actions, the research result could be concluded

that introduction of competition laws directly influence the level of cartel formation. Thailand currently has no leniency program implemented and the research result encourages an amendment of the program. However, this research does not limit the objective on competition. It also claimed that the strategic choice will be influenced by these institutional changes as well. In other words, since leniency program is relatively more influential than traditional antitrust and both are relatively more effective than an absent case, similar pattern should be transferred to the strategic choice of participants. The most pressure from competition in leniency program should maximize the level of strategic choice, switching from cartel formation to implement the cost leadership strategy. The results regarding these hypotheses, H2(a) and H2(b), are articulated subsequently.

Hypothesis 2 (H2) aimed to answer the consequence on strategic choice of firm which is the end of transition process. Changes confirmed in the first hypothesis means virtually nothing if elimination or reduction of cartel cannot be transitioned toward cost leadership strategy in this study. Therefore, the result of hypothesis 2 essentially completes an argument of this study. Likewise, H2 is separated into two sub-hypotheses: H2 (a) and H2 (b). H2 (a) hypothesized that, in Leniency Program treatment, subjects choose to reduce cost level more frequently in relative to the other two treatments. The results of both Collectivism and Individualism support H2 (a). As expected, since each policy introduces increasing effectiveness in cartel deterrence, reduction of cartel formation incentivizes firms to implement strategy as an alternative. In the same vein, H2 (b) hypothesized that introducing antitrust increases the level of cost-leadership strategy implementation in comparing to an absence of policy (laissez faire). The results in both Collectivism and Individualism support H2 (b). For that reason, the experimental results of H2 (a) and H2 (b) show that an elimination of cartel creates an incentive for firms to implement a strategy, cost-leadership in particular.

The result implies that a change in "rule of game" significantly affects firm to reshape its strategy. In an absence of either antitrust or leniency program, firm frequently form the cartel and the cartel formation process relies virtually on a trust between both a firm and its competitors (Miller, 2007). After introducing the new rule of game, firm adjusted its behavior accordingly. Even though both antitrust and leniency program prohibit firms from cartel formation by the possibility of being caught, they are significantly different in the level of possibility created (Spagnolo, Optimal Leniency Programs, 2000). The exact consequence of elimination of cartel does not only create competition but also level of strategy implementation. The mechanism is simplified such that the choice of forming cartel becomes costly due to an increase in the possibility of being detected, firms hence choose to form less cartel. However, firms are still competing to win the market share in the market. In an extreme scenario like the design of this study, deviation in price means the loss of all customers. Therefore, firms have to compete to reduce their price while maintaining the profit. This is applicable if they choose to reduce the cost level simultaneously because the choice allows them to compete with the competitors while still maintaining their profit level. Consequently, firm eventually decided to implement cost leadership strategy when their choice of cartel formation is limited or costly.

In the reality, Zhu, Wittmann, and Peng (2011) also exhibited the similar situation in the innovation of SMEs in China. In particular, unfair competition reduces an incentive to innovate which the situation is analogized to the cartel formation reduces an incentive to implement the cost leadership strategy. Moreover, as price sensitivity is relatively higher in the low-income countries; this study hence fits better to developing economies implication (Wright, 1987). The assumption of the experiment is a perfect price sensitivity of customers. Therefore, the result of this experiment which price leadership strategy is triggered by an elimination of cartel is viable for developing economies in particular. This is because the incentive to compete in price level is high since market share could be gain through it due to a high level of price sensitivity in the market (Baack & Boggs, 2008).

After two hypotheses, H1 and H2, are supported by the experimental result, the *Transition Process* therefore exists based on the evidence provided by the experiment. To some certain extent, introducing competition policy could eventually incentivize firms to implement strategy. In this particular case, cost-leadership strategy could be adopted if the choice of price-fixing cartel formation is limited.

The previous discussions are assumed an absence of culture because all results are interpreted in both blocks. Since both blocks' empirical results are statistically significant, they are jointly analyzed to conclude the hypothesis 1 and hypothesis 2. However, informal institutions are hypothesized as the main moderating effect on the causal relationships in the earlier hypotheses. Essentially, even though all relationships in the previous two hypotheses are statistically significant, they differ in the magnitude of relationship. In other words, the competition laws influence level of competition and strategic choice differently in the dissimilar individualist level. Hypothesis 3 (H3) hypothesized the negative moderating effect of collectivist degree on the relationship between competition law and competition and strategic choice.

As usual, H3 is separated into two sub-hypotheses, H3 (a) and H3 (b), testing competition and strategic choice as a consequence respectively. Generally, H3 (a) and H3 (b) proposed that culture affects the *Transition Process*. To be exact, culture is expected to affect

the relationships within *Transition Process* as a moderating variable. Moreover, the specific cultural dimension of interest is Collectivism/Individualism. In specific, H3 proposed that subjects in Collectivism block are relatively more difficult to be deterred by competition policy and more difficult to eventually implement strategy in opposed to the Individualism block.

The experimental results show that participants in the Collectivism block formed cartel significantly higher than in the Individualism block. To be precise, by comparing the same treatment between blocks (e.g. Laissez Faire Collectivism with Laissez Faire Individualism), the level of cartel formation in each treatment of Collectivism block is significantly higher than of Individualism block. This supports H3 (a). There is no need to test the sequence of order amongst treatments (e.g. Leniency program is more effective than Antitrust and Laissez Faire) because the order will be the same as being tested in H1 and H2 previously. This result is coherent with the study by Brenner (2011) which conducted an empirical study on international cartel. It is therefore evident that individualist influences the level of cartel formation as expected. The higher degree of collectivist in opposed to individualist increases the strength of the bond amongst cartelists. Therefore, given the same regime of law being amended, the level of change in participants' behavior has not changed equivalently. The resistance was created because the characteristics of collectivists such that they tend to take the group interest into account relatively more than individualists do (Bierbrauer, 1994). Moreover, since the leniency program relies on the incentive of self interest, individualist possesses a higher degree of concern regarding this dimension of incentive as well (Spagnolo, Optimal Leniency Programs, 2000). However, culture does not solely influence the decision to form cartel but also the decision to implement the price leadership strategy. In conclusion, the experimental results also support H3 because the levels of cost change in all treatments of Individualism block are significantly higher than their respective levels in Collectivism block.

The result of the cultural impact on transition process is greatly contributing. Mainly, the resistance of cartel in collectivist society is evidently strong. This is because firms conduct business by concerning more on group and less individual. Since the cartel persists to the force from self-interest offer from the leniency program is less effective, collectivist firms have less incentive to implement strategy. This is the most direct consequence. Additionally, Hofstede (1990) also claimed that the behavior of the manager in collectivist society is less active. That is to say, managers in collectivist societies are less sensitive to the innovation or adjustment because the self-interest driver which is crucial for the innovation or strategic initiation requires a certain degree of individualist. Therefore, this study confirms the

moderating effect of culture, individualism in particular, on the relationship between competition and strategic choice of firm. Since collectivist-status sustains the cartel and influences the characteristics of firms, it differentiates the transition process significantly. In the next section, the significance and main contributions of the study are discussed.

#### 2. Significance and Contribution of the study

This study is significant for several reasons. First of all, it addresses a question of the linkage between institutions and strategic choice which has not been examined previously and is very fundamental, i.e., the transition process from institutional change to the strategic choice. Moreover, Institutions are examined in both formal and informal aspects hence the more complete picture of institutions is studied. As it was argued above, the linkage being proved by the experiment in this study forms a very fundamental understanding of the effect of institutions on firms. Since Peng (2003) posed the question on "how institutions affect firms", this study partially responds to the call by examining the strategic choice of firms after institutional change occurs. Moreover, since the experimental design and conduct ascertain the causality between variables, it is more certain that institutional change provides a real incentive for firms to implement strategy. In particular, it has been tested that elimination of cartel gives an incentive for firms to implement price leadership strategy. This study has advanced our knowledge of the effects of both formal institutional change and informal institutional difference on the firm's strategic choice. It certifies the claim that competition law may serve as a foundation of the competitiveness of firms and nations because it fundamentally gives an incentive for firms to implement market-based strategy and create competitive advantage which could be exploited in the market competition worldwide later (Sakakibara & Porter, 2001).

Secondly, theoretically, this study also has significant contributions. Since the institution-based view has been coined as the third pod of the tripod of international business, its confirmation in experimental settings is still not evident. Since the repetition process of sciences is required to test theory or proposition proposed, conducting an experiment helps complete the circle of theory testing. This study serves as the first experimental study conducted to test the significance of institutions on firms. Since other related variables are controlled, the causal relationship between two constructs is empirically confirmed for the first time. It has been claimed the firms need to conform to remain legitimacy (Peng, 2003). This study empirically proves that the claim is true. Firms adjust their investment in cost reduction because the agreement upon price fixing is not practicable anymore. Conversely, collectivist firms are induced to sustain cartel formation relatively more than individualist

ones. Therefore, this study fills the gap between theoretical claim of institution-based view and empirical evidence of it.

Thirdly, this study contributes to the interdisciplinary study. IB itself has been claimed as one of the most suitable arena for the interdisciplinary study because of its diverse research agendas (Dunning, 2001). This study incorporates at least three growing ideas of different fields—institution-based views of strategic management, new institutional economics, and experimental economics. Additionally, this study disregards the traditional assumptions that institutions are homogeneous across locations (Chacar, Newburry, & Vissa, 2010). Conversely, it confirms that institutions change could happen and it influences firms significantly. Furthermore, this research emphasizes an important of informal institutions those traditional works put less emphasis on. Even though the result might not be able to generalize universally, it partially supports the claim of Shenkar and Von Glinow (1994) that institutions may be the most applicable paradigm for explaining organizational behavior in developing countries. This is simply because institutional change could potentially occur in relatively larger magnitude and the consequence of change hence becomes superior.

Fourthly, the experiment has proved that an elimination of personalistic transactions eventually leads toward productivity behavior. It is obvious that a deterrence of cartel gives firms an incentive to implement strategy which reduces the cost level. Since North (1991) states that the productivity-raising institutions are the distinctive character of developed nations and developing nations, the creation of productivity-raising and its consequence benefit developing countries including Thailand. Moreover, we have also learnt that culture plays an essential role in this process. Degree of collectivism significantly affects the degree of personalistic transactions. In the context of this study, personalistic transactions are obviously cartel formations. Since the result revealed that degree of collectivism is positively related to the degree of cartel formation and negatively related to the cartel deterrence, culture hence determines the level of personalistic transactions and, consequently, non-productivity behavior.

The design of experiment actually implies the scope of this study which is stated in Chapter II. Developing home-country institutions serve as a benchmark of this study. The design of experiment starts from even the control group of "Laissez Faire" where formal institution does not exist. In the reality, there is hardly any country in the world which still legislates none of competition law. In essence, the change of institutions is occurring consistently. The treatments are introduced in three-level manner and they follow the chronological order of developing competition law related to cartel. Antitrust act was implemented for a century after cartel had been practicing for a much longer in the history. Recently, the newly-designed policy, leniency program, has been legislated to deal with cartel problem specifically. Therefore, in retrospect, the result and conclusion of this study could refer back to the uniqueness of the situation occurring in developing countries because they are exposed to the most level of institutional transitions (Peng, Wang, & Jiang, 2008).

Moreover, fifthly, this study is also important in policy analysis. Since Thailand has never adopted leniency program, the result of this study reveals a significant improvement in the cartel reduction after introducing it. Therefore, in the policy implication, cartel deterrence could be enhanced by the introduction of leniency program. Additionally, significant effect of cultural dimension also indicates another crucial factor determining the result of competition law legislation. This study has empirically tested the significance of collectivist characteristic of firms on the cartel sustainability. Since the degree of collectivism is positively related to the cartel sustainability, policymakers are expected to confront a higher level of difficulty dealing with cartel in collectivist countries including Thailand. Therefore, the study implies that the punishment of Antitrust or degree of leniency should be relatively intense in relatively collectivist society like Thailand. If Thailand really decides to adopt the leniency program, the characteristics of the country which its leniency program model will be studied in the drafting process should be of a certain similarity in cultural aspect to Thailand, especially in an individualism index level.

Finally, this study is important because it sets a rich framework abundant with ideas for future research. Possible directions to generalize and expand this particular study include, for example, other type of competition laws and behaviors besides cartel, difference strategic choice of firms, more dimensions of culture, etc. In the next section, the future research and limitation of this study will be further discussed.

#### 3. Limitations of the Study and Future Research

As discussed in the previous section, this study has significant theoretical and policy contributions. Nevertheless, it does have limitations. First, clearly, the specific cases of cartel and cost leadership strategy are very limited and generalization seems to be an obvious pitfall. Since the non-productivity behavior could be prompted or caused by many variables, the test of cartel deterrence in this study cannot be universally generalized that other causes of non-productivity behavior will give that same or similar result. For example, lacking of good entrepreneurship makes firms in well-developed institutional environment struggle to succeed in the market. Conversely, there are many institutions influencing productivity behavior. For example, intellectual property law has a significant effect on innovation of firms because it

gives an incentive for firms to develop advanced innovation and gain a privilege to exclusively exploit it (Shapiro, 2005).

Second, Smith (1976) claimed that experimental results could be generalized if other factors are controlled under the well-designed experimental setting. Therefore, the result of this study could be generalized into the larger context as well but it does not span all contexts. For instance, vertical and horizontal integrations might be treated as both productive and non-productive conduct of firms hence an elimination of these integrations might not deliver the productive consequence as in the result of this study. Actually, firm's strategy could be broadly divided into two levels: business-level and corporate-level strategies. Not only are other business-level strategies such as differentiation and focus, there also number of corporate-level strategies such as diversifications could be taken into account. This study cannot cover every strategy in every categorization and level. The relevance of institutions and firms strategic choice should be considered on case-by-case basis and the linkage between everything to everything contributes nothing to the body of knowledge.

Third, types of goods in the market might influence the result of the study more or less. Chacar, Newburry, and Vissa (2010) separated markets into three main categories: Product, Financial and Labor markets. All markets are claimed to more or less allocate resources in an economy and believed to be key factors to the economic development level of firms from a country and companies' success and emergence (Khanna & Palepu, 1997). However, the test could not be treated too simply, since the characteristics of each market are very distinctive. For example, service is totally different from product in the aspect of transaction between customers and providers and, normally, the business in service sector has been studied separately (Fladmoe-Lindquist & Jacque, 1995). Future research hence could develop further in the different markets and implicitly tests the validity of the result of this study.

Fourth, leniency program itself also has different regimes and types. The closest regime to the one exploited in the experiment might be the United States system of amnesty program which the first cartelist will be given a full amnesty. However, there are also other types of leniency program which their details might change the result of the study. For example, EU type of leniency program allows not only first-comer but also late-comer(s) to receive a leniency. The change in a detail of leniency program certainly affects the result and separated research design must be tailored for it. Additionally, formal institutions rely hugely on the legal system of each country. For example, Thailand has a written law system (civil law system) which all laws must be legislated or amended by the parliament while the United States have a common law system whether the laws are made by judges and laws are

generally implemented in the policy form. Therefore, the difference in legislation process might cause

Fifth, since the study was conducted in the computer lab and the number of subjects is limited, an increase in the sample size will certainly magnify the validity of the data especially in the parametric statistical analysis because the law of large number could be satisfied. Moreover, the expansion of the sample with new country and group of subjects will provide opportunities to test the hypotheses repeatedly in different contexts. This study is a good starting point in examining the replication researches afterward. However, more research is needed to see the clearer picture of the same result whether it is valid in different contexts or not.

Sixth, during the process of experiment, due to the limitation of time constraints, subjects are available for the experiment just one continuous period. Therefore, internal validity might arise as an issue. It would be better if the subjects could be sought in a higher amount and "between-group" experiment could be used as an alternative as well. Moreover, the computer program developed by this study is still imperfect because of the limited resource of developer. In particular, more efficient program should be developed further from the computer program created in this study.

Seventh, even though the general nature of firms as the profit maximizer could be extracted and induced-value theory helps validating the generalizability of the result, difference of firm's type could also contribute to the research questions posed in this study as well. For example, Brenner (2011) found that MNEs are relatively more sensitive to the institutions in a particular location more than other types of firm. The future study could continue this study by scoping into a particular type of firms and investigating the effect of institutions on it. Also, duopoly assumption is unarguably another limitation of this study. In the reality, firms usually form cartel in more than two members. If researchers could develop the mechanism to control for the third-party nuisance, exploiting more than two members of cartel should reveal more interesting and precise picture of the reality.

Eighth, since the scope of this study has been limited to the ending point where firms implement cost leadership strategy as a consequence of institutional change, the subsequent process is still not proved. Since competition policy potentially drives firms' market-based strategy, consequences of this change is worthwhile considered. As always consistently argued by Kiyoshi Kojima (Dunning, 2001), country-specific differences between countries (especially, Japan and US) explain much on the structure and behavior of foreign investment and this was influenced by differences in the home institutional and social structure in which firms operate, and in the strategic goals and industrial policies of the home government.

Intense rivalry within industry becomes an opportunity instead of threat. Such rivalry drives firms to constantly improve and innovate, which not only creates higher level of competitiveness within a domestic industry, but also results in stronger international competitiveness (Porter, 1990).

Sakakibara and Porter (2001) conducted a research in Japanese industries and find the positive relationship between competitiveness and competitive market domestically. This study supports the continuity in competition policy within country which, consequently, will promote domestic firms to be able to compete abroad (Sakakibara & Porter, 2001) Moreover, Ito and Pucik (1993) also supported this idea empirically. The study reveals patterns of domestic competition and the international competitiveness of Japanese firms especially in export firms by using firm- and industry-level data (R&D spending, domestic competitive position, and firm size) instead of macroeconomics variables (factor endowment and relative prices, exchange rates, and trade policies) (Ito & Pucik, 1993)

Many observers have cited the ability of Japanese manufacturing firms to use their strength in the domestic market as the foundation of their international competitive strategies. The achievement of economies of scale, as well as relentless quality improvement and cost reduction programs—targeted first at domestic customers— enabled many Japanese firms to penetrate foreign markets with a large volume of low-cost but high quality standardized products, and then move to higher value-added niches (Abbegglen & Stalk, 1985). Those are the case studies of Europe and Japan. To be conclusive, one may claim that firms that do not have to compete at home rarely succeed abroad. Economies of scale are best gained through selling globally, not through dominating the home market especially in small economy (Porter, 2004). Potter (1990) also discredited the availability of national champion theory such as failure of British Leyland. One factor is low product standard which, in turn, makes the dominant domestic firm to rely on local factors costs instead of upgrading competitive advantage.

Besides, there is an interesting fact that all pillars except innovation in global competitiveness index, such as institution and infrastructure, are running into diminishing returns. It states further as follows:

"...in the long run, standards of living can be enhanced only by technology innovation" (Schwab & Porter, 2008; Schwab, 2010)

The way to create innovation is mainly through the strategic activities such as an investment in research and development (R&D), extensive collaboration in research between universities

and industry, and the protection of intellectual property. There activities are clearly strategic choices of firms rather than market power using. Put it differently, it is a legal way to gain market power through innovativeness instead of using illegal and unproductive ways. Moreover, innovation and business sophistication served as a key driver for innovation-driven economies which is the most advanced group of countries' competitiveness level (Schwab, 2010).

Moreover, there are many traditional economics articles and books that support the significant relationship between innovation and international competitiveness. Gee Sherman states in his book that innovation serves as one of the most fundamental driver for international competitiveness in the 19<sup>th</sup> century and its magnitude of importance will be growing continuously (Gee, 1981). Both comparative and absolute advantages put their emphasis on technology differences between trade partners by shifting the production possibility frontier of each country and that leads to international competitiveness also (Mascolell, Whinston, & Green, 1997; Amendola, Dosi, & Papagni, 1993). Empirically, there are numerous works support the relationship between innovation and international competitiveness. In television industry, innovativeness of Japan made Japanese firms achieved dramatically superior performance in terms of both productivity and quality in relative to European and US firms (Sciberras, Technical Innovation and International Competitiveness in the Television Industry, 1982). In computer industry, the similar pattern as in television industry was suggested (Sciberras, 1983).

Scoping down toward developing economies, studying Turkish manufacturing industry exhibits an evidence of significant difference between innovator and non-innovator firms in international competitiveness (Özçelik & Taymaz, 2004). In Thailand, there is a system called "the national innovation system (NIS)" which served as a conceptual framework for technological change analysis. Interestingly, Thailand's NIS does not link to its economic structural development level. It implies that Thailand's innovation level is still lacking behind. This mismatch creates negative effect on Thailand's competitiveness. Consequently, the result supports a requirement to improve innovation within country as a first priority (Intarakumnerd, Chairatana, & Tangchitpiboon, 2002).

As the study has pointed out the consequence of an improvement of strategic choice and competitive advantages stimulated by the introduction of institutions, this claim would be worthwhile tested in experimental research in order to prove the causal relationship between them. Moreover, it is interesting that cost leadership strategy might not be useful in some particular location such as developed markets where price sensitivity is low. In this study, the condition posed in an experimental setting makes price sensitivity sky-high. A relaxation of this condition might provide more insight toward to effect of institutional change in more advanced economies.

Ninth, this dissertation was also limited to the theoretical frameworks used for conceptualizing and developing the hypotheses and research framework. Although the institution-based view and institutional transition concepts are widely recognized as the main theoretical explanation of institutions and entities under their jurisdiction, it would be helpful if the future study could incorporate different theoretical frameworks to elaborate on the similar research questions. For example, resource-based view might be exploited to extend the research into different perspective or the firm-side-only perspective.

Last but not least, the cultural questionnaire adopted in this study is a direct adoption from Hofstede's work. However, it would be more valid and reliable if the future work could potentially develop the questionnaire of itself to measure the index. Moreover, the mixture of different works will contribute to the quality of research as well. Besides Hofstede's works in cultural dimensions, there are other scholars who conduct a similar research in cultural dimensions and their measurements vary. Therefore, a better questionnaire could be developed further for the experimental design. Moreover, other cultural dimensions could also be incorporated. Brenner (2011) also incorporated uncertainty avoidance as another cultural dimension potentially affects cartel formation and deterrence. Future research hence will be able to incorporate different cultural dimensions into the analytical context.

#### 4. Concluding Comments

In conclusion, this dissertation has demonstrated overall support for the existence of "*Transition Process*". Results demonstrated significant relationships between independent variable—competition law—and dependent variables—cartel formation and strategic choice. Moreover, moderating effect of individualism also significantly affects both relations. The fundament of the issue that was examined here and the advancement of methodological tools lay to foundation for a research in institution-based view in the future. There are some interesting questions that the future research could potentially address as follows:

- 1. What are the following consequences of strategic choice of firms after the elimination of non-market-based choice? Would firms in general be able to compete internationally by exploiting the competitive advantages created from the market-based strategy?
- 2. How will the result change if more dimensions of competition policy are involved?

- 3. What is the result of other specific type of institutions and its related informal institutions? For example, the change in IP law protection and innovation of firms could also be conducted a laboratory experiment to validate their causal relationship.
- 4. What is the specific consequence of difference amongst industries in the context of institution-based view?

These and many other questions that were raised in this dissertation will advance our knowledge of the institutions' role in international business context which institution-based view plays a crucial role in the future of international business studies.

## REFERENCES

- Abbegglen, J. C., and Stalk, G. <u>Kaisha, the Japanese Corporation</u>. New York: Basic Book, 1985.
- Adler, N., Brahm, R., and Graham, J. Strategy Implementation. <u>Strategic Management</u> Journal, 1992: 449-466.
- Amendola, G., Dosi, G., and Papagni, E. The Dynamics of International Competitiveness. <u>Review of World Economics</u> 129, no. 3 (1993): 451-471.
- Arlman, S. Crime But No Punishment: An empirical study of the EU's 1996 Leniency Notice and Cartel Fines. <u>Article 81 proceedings</u>. 2005.
- Asker, J. Leniency and Post-Cartel Market Conduct\_Preliminary Evidence from Parcel Tanker. International Journal of Industrial Organization, 2010.
- Astley, G. W., and Van de Ven, A. H. Central perspectives and debates in organization theory. <u>Administrative Science Quaterly</u>, 1983: 245-273.
- Baack, D. W., and Boggs, D. J. The difficulties in using a cost leadership strategy in emerging markets. International Journal of Emerging Markets, 2008: 125-139.
- Bain, J. S. Relation of Profit Rate to Industry Concentration: American Manufacturing. <u>Quarterly Journal of Economics</u>, 1951: 293-324.
- Baltagi, B. H. <u>Econometric Analysis of Panel Data.</u> Chippenham, Wiltshire: John Wiley & Sons Inc., 2005.
- Barney, J. B., and Wright, P. M. On Becoming a Strategic Partner: The Role of Human Resources in Gaming Competitive Advantage. <u>Human Resource Management</u> 37, no. 1 (1998): 31-46.
- Barney, J. B. Firm Resources and Sustained Competitive Advantage. <u>Journal of Management</u>, 1991: 99-120.
- Barr, P., and Glynn, M. Cultural variation in strategic issue interpretation. <u>Strategic</u> <u>Management Journal</u>, 2004: 59-67.
- Becker, G. S. Crime and Punishment: an economic approach. Journal of Political Economy, 1968: 169-217.

- Bhagat, R., Kedia, B., Herveston, P., and Triandis, H. Cultural variations in the cross-border transfer of organizational knowledge. <u>Academy of Management Review</u>, 2002: 204-221.
- Bierbrauer, G. Toward an understanding of legal culture: Variations in individualism and collectivism between Kurds, Lebanese, Germans. <u>Law and Society Review</u>, 1994: 243-264.
- Bigoni, M., Fridolfsson S. O., Coq, C. L., and Spagnolo, G. <u>Fines, Leniency, Rewards and</u> <u>Organized Crime: Evidence from Antitrust Experiments.</u> Stockholm: Research Institute of Industrial Economics, 2008.
- Bork, R. H. The Antitrust Paradox. New York: Free Press, 1978.
- Boumol, W. J. Productivity Growth, Convergence, and Welfare: What the Long-Run Data Show. The American Economic Review, 1986: 1072-1085.
- Brenner, S. An empirical study of the European corporate leniency program. <u>Humboldt-University Berlin Website</u> (Online). March 15, 2005. Available from : http://www.fep.up.pt/conferences/earie2005/cd\_rom/Session%20VII/VII.G/brenner.p df [2009, March 3].
- Brenner, S. Self-disclosure at International Cartels. Journal of International Business Studies 42, no. 2 (2011): 221-234.
- Brisset, K., and Thomas, L. Leniency Program : A New Tool in Competition Policy to Deter Cartel Activity in Procurement Auctions. <u>European Journal of Law and Economics</u>, 2004: 5-19.
- Brue, S, and Grant, R. <u>The evolution of economic thoughts.</u> Mason, OH: Thomson Higher Education, 2007.
- Buccirossi, P., and Spagnolo, G. <u>Leniency Programs and Illegal Exchange: How (Not) to</u> <u>fight corruption.</u> Working paper in Economics and Finance No. 451, Stockholm School of Economics, 2001.
- Buccirossi, P., and Spagnolo, G. Leniency Programs and Illegal Transactions. Journal of <u>Public Economics</u> 90, no. 6-7 (2006): 1281-1297.
- Campbell, D. T. Reforms as experiments. American Psychologist, 1969: 409-429.

- Campbell, D. T. The Social Scientist as Methodological Servant of the Experimenting Society. In <u>Policy Studies and the Social Sciences</u>, by Stuart S. Nagel, 27-30. Washington D.C.: D.C. Heath and company, 1975.
- Campbell, D. T., and Stanley J.C. Experimental and Quasi-experimental Designs for Research. In <u>Handbook of Research on Teaching</u>, by Nathaniel Gage, 1-76. Chicago: Rand-McNally, 1963.
- Campbell, M. J., Julious, S. A., and Altman, D. G. Estimating sample sizes for binary, ordered categorical, and continuous outcomes in two group comparisons. <u>Bio-Medical Journal</u>, 1996: 1145-1148.
- Chacar, A. S., Newburry, W., and Vissa, B. Bringing Institutions into Performance Persistence Research: Exploring the Impact of Product, Financial, and Labor Market Institutions. Journal of International Business Studies 41, no. 7 (2010): 1119-1140.
- Cherryholmes, C. H. Notes on Pragmatism and Scientific Realism. <u>Educational Researcher</u>, no. 14 (1992): 13-17.
- Child, J. Strategic Choice in the Analysis of Action, Structure, Organizations and Environment: Retrospect and Prospect. <u>Organization Studies</u>, 1997: 43-76.
- Clark, T. International Marketing and National Character: A review and proposal for an integrative theory. Journal of Marketing 54, no. 4 (1990): 66-79.
- Coase, R. R. The Nature of the Firm. Economica, 1937: 386-405.
- Connelly, B. L., Tihanyi, L., Certo, S. T., and Hitt, M. A. Marching to the Beat of Different Drummers: The Influence of Institutional Owners on Competitive Actions. <u>Academy</u> of Mangement Journal 53, no. 4 (2010): 723-742.
- Cooper, D. R., and Pamela S. Schindler. <u>Business Research Methods.</u> 10th Edition. New York, NY: McGraw-Hill, 2008.
- Cresswell, J. W. <u>Qualitative Inquiry and Research Design: Choosing Among Five Traditions.</u> Thousand Oaks, CA: Sage, 1998.
- Cresswell, J. W. <u>Research Design: Qualitative, Quantitative, and Mixed methods Approaches.</u> Thousand Oaks, CA: Sage Publications, Inc., 2003.
- Dacin, T. M., Goodstein, J., and Scott, W. R. Institutional Theory and Institutional Change. Acedemic Management Journal, 2002: 45-57.

- Dal Bo, P. Cooperation Under the Shadow of the Future: Experimental Evidence from Indefinitely Repeated Game. <u>American Economic Review</u> (American Economic Review), 2005.
- D'Aveni, R. A. Waking up to the New Era of Hypercompetition. <u>The Washington Quarterly</u>, 1997: 183-195.
- D'Aveni, R. A., and MacMillan, I. C. Crisis and the Content of Mangerial COmmunications: A Study of the Focus of Attention of Top Managers in SUrviving and Failing firms. <u>Administrative Science Quarterly</u>, 1990: 634-657.
- Deaton, A. Household survey data and pricing policies in developing countries. <u>The World</u> <u>Bank Economic Review</u>, 1989: 183-210.
- Drucker, P. F. The information execultives truly need. Harvard Business Review, 1995: 58.
- Dunning, J. H. The Eclectic (OLI) Paradigm of International Production: Past, Present and Future. Journal of the Economics of Business (2001): 173-190.
- Dunning, J. H. The Key Literature on IB Activities: 1960-2000. In A. M. Rugman, & T. L. Brewer, <u>The Oxford Handbook of International Business</u> (pp. 36-68). New York: Oxford University Press Inc, 2001.
- Earley, P. C., and Gibson, C. B. Taking Stock in Our Progress on Individualism-Collectivism: 100 Years of Solidarity and Community. Journal of Management, 1998: 265-304.
- Easterly, W. Inequality does cause underdevelopment: Insights from a new instrument. Journal of Development Economics 84, no. 2 (2007): 755-776.
- Eisenhardt, K. M., and Bourgeois III, L. J. Politics of Strategic Decision Making in Highvelocity Environments: Toward a Midrange Theory. <u>Academy of Management</u> Journal 31, no. 4 (1988): 737-770.
- Ellis, C., and Wilson, W. <u>Cartels, Price-Fixing, and Corporate Leniency Policy.</u> Manuscript, University of Oregon, 2002.
- Festerling, P. International Cartel Prosecution. Aarhus University, 2005.
- Fladmoe-Lindquist, K., and Jacque, L. L. Control Modes in International Service Operations: The Propensity to Franchise. <u>Management Science</u>, 1995: 1238-1249.
- Friedman, D., and Sunder, S. <u>Experimental Methods: A primer for economists.</u> New York: Cambridge University Press, 1994.

- Friedman, J. A non-cooperative equilibrium for supergames. <u>Review of Economic Studies</u>, 1971: 1-12.
- Gee, S. <u>Technology Transfer, Innovation and International Competitiveness.</u> New York, NY: Wiley, 1981.
- Geroski, P. A., and Jacquemin, A. The persistence of profits: A European comparison. <u>The</u> <u>Economic Journal</u> 98, no. 391 (1988): 375-389.
- Ghemawat, P. Semiglobalization and International Business Strategy. Journal of International Business Studies 34 (2003): 138-152.
- Grimm, C. M., and Smith, K. G. <u>Strategy in action, industry rivalry and coordination.</u> Mason, Ohio: Thomson, 1997.
- Gujarati, D. N. Basic Econometrics. New York, NY: McGraw-Hill Education, 2003.
- Hammond, S. D. Conerstones of an effective leniency program . <u>ICN Workshop on Leniency</u> <u>Programs.</u> Sydney, 2004.
- Hammond, S. D. Detecting and Deterring Cartel Activity Through an Effective Leniency Program. <u>U.S. Department of Justice website</u> (Online). 2000. http://www.usdoj.gov [2009, March 3].
- Harrington, J. <u>Corporate Leniency Programs and the Role of the Antitrust Authority in</u> <u>Detecting Collusion.</u> the Competition Policy Research: the International Symposium on Towards an Effective Implementation, 2006.
- Harrington, J. <u>Optimal Corporate Leniency Programs.</u> Manuscript, John Hopkins University, 2005.
- Hill, A. B. The Environment and Disease: Association or Causation? <u>Proceedings of the</u> <u>Royal Socity of Medicine</u> 58 (1965): 295-300.
- Hill, C. Differentiation Versus Low Cost or Differentiation And Low Cost. <u>Academy of</u> <u>Management Review</u>, 1988: 401-412.
- Hinkelmann, K., and Kempthorne, O. <u>Design and Analysis of Experiments.</u> NJ: John Wiley & Sons, Inc., 2008.
- Hinloopen, J. An Economic Analysis of Leniency Programs in Antitrust Law. <u>De Economist</u>, 2003.

Hofstede, G. Culture's Consequences. Beverly Hills; CA: Sage, 1980.

- Hofstede, G. <u>Culture's consequences: Comparing values</u>, <u>behavior</u>, <u>institutions</u>, <u>and</u> <u>organizations across nations</u>. Thousand Oakes, California: Sage Publications, Inc., 2001.
- Hofstede, G. <u>Culture's Consequences: International Difference in Work-related Values.</u> Newbury Park, CA: SAGE Publication, Inc., 1984.
- Hoskinsson, R., Eden, L., Lau, C., and Wright, M. Stretegy in Emerging Economies. Acedemy of Management Journal, 2000: 249-267.
- Huselid, M. A. The Impact of Human Resource Management Practices on Turnover, Productivity, and Corporate Financial Performance. <u>The Academy of Management</u> <u>Journal</u> 38, no. 3 (1995): 635-672.
- Hymer, S. The Internationalisation of Capital. Journal of Economic, 1972: 91-111.
- Intarakumnerd, P., Chairatana P., and Tangchitpiboon, T. National Innovation System in Less Successful Developing Countries: the Case of Thailand. <u>Research Policy</u>, 2002: 1445-1457.
- Ito, K., and Pucik, V. R&D Spending, domestic competition, and export performance of Japanese manufacturing firms. <u>Strategic Management Journal</u>, 1993: 61-75.
- Javidan, M., Dorfman, P. W., deLuque, M. S., and House, R. J. In the Eye of the Beholder: Cross-cultural Lessons in Leasership from Project GLOBE, <u>Academy of</u> <u>Management Perspective</u>, February 2008: 75.
- Johanson, J., and Vahlne, J. E. The Internationalization Precess of the Firm A Model of Knowledge Development and Increasing Foreign Market Commitment. Journal of International Business Studies, 1977: 20-29.
- Joshua, J. M. Leniency in U.S. and EU Cartel Cases. Antitrust, 2000: 19-22.
- Kang, D. C. Transaction Costs and Crony Capitalism in East Asia. <u>Comparative Politics</u>, 2003: 439-458.
- Kaplow, L., and Shavell, S. Optimal law enforcement with self-reporting of behavior. Journal of political economy, 1994: 583-606.
- Karnani, A., and Wernerfelt, B. Multiple Point Competition. <u>Strategic Management Journal</u>, 1985: 87-95.
- Khanna, T., and Palepu, K. Why focused strategies may be wrong for emerging markets. <u>Harvard Business Review</u> 75, no. 4 (1997): 41-51.

- Kirkman, B. L., Lowe, K. B. and Gibson, C. B. A Quarter Century of Culture's Consequences: A Review of Empirical Research Incorporating Hofstede's Cultural Values Framework. <u>Journal of International Business Studies</u> 37, no. 5 (2006): 285-320.
- Kluckhohn, C. The study of culture. In <u>The policy sciences</u>, by Daniel Lerner and Harold D. Lasswell, 86-101. Stanford, CA: Stanford University Press, 1951.
- Koffman, F., and Jacques, L. A prisoner's Dilemma Model of Collusion Deterrence. Journal of Public Economics, 1996: 117-136.
- Kogut, B. Joint ventures: Theoretical and empirical perspectives. <u>Strategic Management</u> <u>Journal</u>, 1988: 319-332.
- Kogut, B, and Singh, H. The Effect of National Culture on the Choice of Entry Mode. Journal of International Business Studies, 1988: 411-432.
- Koh, Kyung-Min, and Jung-Won Hyun. <u>Competition Law in the Republic of Korea.</u> AH, The Netherlands: Kluwer Law International, 2011.
- Kostova, T., and Zaheer, S. Organizational Legitimacy under Conditions of Complexity: The Case of the Multinational Enterprise. <u>Academy of Management Review</u>, 1999: 64-81.
- Kotha, S., Dunbar, R., and Bird, A. Strategic action generation. <u>Strategic Management</u> Journal, 1995: 195-220.
- Kotler, P., and Armstrong, G. <u>Principles of Marketing.</u> Upper Saddle River, New Jersey: Pearson Education, Inc., 2008.
- Krugman, P. Myths and realities of US competitiveness. In <u>Pop Internationalism</u>, by Paul Krugman, 87-103. Cambridge and London: MIT Press, 1996.
- Lincoln, Y., and Guba, E. Paradigmatic Controversies, Contradictions, and Emerging Confluences. In <u>Handbook of Qualitative Research</u>, by Norman Denzin and Guba Egon, 163-188. Thousand Oaks, CA: Sage, 2000.
- Maddala, G. S. Econometrics. New York, New York: McGraw-Hill, 1977.
- Malik, A. Self-Reporting and the Design of Policies for Regulating Stochastic Pollution. Journal of Environmental Economics and Management, 1993: 241-257.
- Mankiw, G. Principles of Economics. Florence, KY: South-Western College Publisher, 2008.

- Mas-colell, A., Whinston, M. D., and Green, J. R. <u>Microeconomic Theory.</u> Oxford Press, 1997.
- Matthews, J. A. Dragon Multinationals: New Players in 21st Century Globalization. <u>Asia</u> <u>Pacific Journal Management</u>, 2006: 5-27.
- Mihaela, H., Claudia, O., and Lucian, B. Culture and National Competitiveness. <u>African</u> <u>Journal of Business Management</u>, 2011: 3056-3062.
- Miller, N. <u>Strategic Leniency and Cartel Enforcement.</u> PhD Thesis, CA: University of California Berkeley, 2007.
- Ministry of Commerce. <u>Statistics of Business Registration</u>. November 15, 2010. Available from : http://www2.moc.go.th/main.php?filename=index\_design4 (Online) [2010, November 16].
- Moen, O., and Servais, P. Born Global or Gradual Global?: Examining the Export Behavior of Small and Medium-Sized Enterprises. Journal of International Marketing, 2002: 49-72.
- Motta, M., and Polo, M. Leniency Programs and Cartel Prosecution. <u>International Journal of</u> <u>Industrial Organization</u>, 2003: 347-379.
- Nagle, T. T., and Hogan, J. E. <u>The strategy and tactics of pricing.</u> New Jersey: Pearson Education, Inc., 2006.
- Nardon, L., and Steers, R. M. The Culture Theory Jungle: Divergence and convergence in models of national culture. In <u>Cambridge Handbook of Culture, Organizations and</u> <u>Work</u>, by Rabi S. Bhagat and Richard M. Steers, 3-22. Cambridge: Cambridge University Press, 2009.
- Narula, R., and Nguyen, Q. T. K. <u>Emerging country MNEs and the role of home countries:</u> <u>separating fact from irrational expectations.</u> Masstricht, The Netherlands: UNU-MERIT, 2011.
- Neuman, S. B., and McCormick S. <u>Single-subject Experimental Research: Applications for</u> <u>Literacy.</u> Newark, DE: International Reading Association, 1995.
- Nikomborirak, D. The Political Economy Of Competition Law: The Case Of Thailand. Northwestern Journal of International Law & Business, 2006: 597-619.
- North, D. C. Institutions. The Journal of Economic Perspectives 5, no. 1 (1991): 97-112.

North, D. C. <u>The role of institutions in economic development.</u> ECE Discussion Papers Series 2003-2, UNECE, 2003.

North, D. C. Institutional Change: A framework of analysis. In Institutional Change: theory and empirical findings, by Sven-Erik Sjostrand, 35-46. Armonk, New York: M.E. Sharpe, Inc., 1993.

- North, D. C. Institutions, Institutional Change, and Economic Performance. New York: Norton, 1990.
- OECD. Fighting Hard Core Cartels: Harm, Effective Sanctions and Leniency Programmes. Paris, 2002.
- OECD. Scoping Paper for Possible Revisions to the Cartel Recommendations. 2003. Available from : http://www.oecd.org/findDocument/0,2350,en\_2649\_37463\_1\_1 \_1\_37463,00.html [2010, May 9].
- OECD. Using Leniency Program to Fight Hard Core Cartels. 2003.
- Osborne, M. J. An introduction to game theory. Oxford University Press, 2004.
- Osborne, M. J., and Ariel Rubinstein. <u>A Course in Game Theory.</u> Cambridge: MIT Press, 1994.
- Özçelik, E., and Taymaz, E. Does Innovativeness Matter for International Competitiveness in Developing Countries?: the Case of Turkish Manufacturing industries. <u>Research</u> <u>Policy</u>, 2004: 409-424.
- Pan, W.. Sample Size and Power Calculations with Correlated Binary Data. <u>Controlled</u> <u>Clinical Trials</u>, 2001: 211-227.
- Pananond, P. Thai Multinationals: Entering the Big League. In <u>Emerging Multinationals in</u> <u>Emerging Markets</u>, by Ravi Ramamurti and Jitendra V. Singh, 312-351. Cambridge: Cambridge University Press, 2009.
- Parsons, T. The motivation of economic activities. <u>The canadiam Journal of Economics and</u> <u>Political</u>, 1940: 187-202.
- Peng, M. W, Wang, D. Y. L., and Jiang, Y. An institution-based view of international business strategy: a focus on emerging economies. <u>Journal of International Business</u> <u>Studies</u>, 2008: 920-936.
- Peng, M. W. Institutional transitions and strategic choices. <u>Academy of Management Review</u>, 2003: 275-296.

- Peng, M. W. Towards an institution-based view of business strategy. <u>Asia Pacific Journal of</u> <u>Management</u>, 2002: 251-267.
- Penrose, E. The Theory of the Growth of the Firm. Oxford: Basil Blackwell, 1959.
- Perloff, J. M., Larry S. Karp, and Amos Golan. <u>Estimating Market Power and Strategies</u>. Cambridge: Cambridge University Press, 2007.
- Philips, D. C., and Burbules, N. C. <u>Postpositivism and Educational Research.</u> Lanham, MD: Rowman & Littlefield, 2000.
- Pigou, A. C. The Economics of Welfare. London: Mcmillan, 1920.
- Piteris, C. (2003). Privatisation, regulation and domestic competitition policy. In G. Wignaraja, & G. Wignaraja (Ed.), <u>Competitiveness Strategy in Developing Countries:</u> <u>A manual for policy analysis (pp. 239-273)</u>. New York City: Routledge.
- Porter, M. E. (2004). Building the Microeconomic Foundations of Prosperity: Findings from the Business Competitiveness Index. In K. S.-i.-M. M.E. Porter (Ed.), <u>The Global</u> <u>Competitiveness Report 2004-2005 (pp. 19-50)</u>. Palgrave Macmillan.
- Porter, M. E. Competitive Advantage. New York: The Free Press, 1985.
- Porter, M. E. <u>Competitive Strategy: techniques for analyzing industries and competitors.</u> New York: The Free Press, 1980.
- Porter, M. E. The Competitive Advantage of Nations. Free Press, 1990.
- Porter, M. E. The economic performance of regions. Regional Studies, 2003: 549-578.
- Porter, M. E. Towards a dynamic theory of strategy. <u>Strategic Management Journal</u>, 1991: 96-117.
- Ramaswamy, K, A. Thomas, and R. Litschert. Organizational performance in a regulated environment. <u>Strategic Management Journal</u>, 1994: 63-74.
- Rey, P. Towards a Theory of Competition Policy. In <u>Advances in Economics and</u> <u>Econometrics: Theory and Applications</u>, by M. Dewatripont, L.P. Hansen and S.J. Turnovsky. Cambridge University Press, 2003.
- Rutherford, M. Institutions in Economics: The old and the new institutionalism. New York: Cambridge University Press, 1994.

- Sakakibara, M., and Yamawaki, H. What determines the profitability of foreign direct investement? A subsidiary-level analysis of japanese multinationals. <u>Managerial and</u> <u>Decision Economics</u> 29, no. 2-3 (2008): 277-292.
- Sakakibara, M., and Porter, M. Competing at home to win abraod: Evidence from Japanese Industry. <u>Review of Economics and Statistics</u>, 2001: 310-322.
- Schwab, K. Global Competitiveness Report. Geneva: SRO-Kundig, 2010.
- Schwab, K., and Porter, M. E. Global Competitiveness Report. Geneva: SRO-Kundig, 2008.
- Sciberras, E. New Competition and Technical Change in the Computer Industry. <u>Technovation</u>, 1983: 17-26.
- Sciberras, E. Technical Innovation and International Competitiveness in the Television Industry. <u>Omega: Inthernational Journal of Managment Science</u>, 1982: 585-596.
- Scott, R. Institutions and Organizations. Thousand Oaks, CA: Sage Publishing, 1995.
- Shapiro, C. <u>Antitrust, Innovation, and Intellectual Property: Testimony Before the Antitrust</u> <u>Modernization Commission.</u> Antitrust Modernization Commission, 2005.
- Shapiro, C, and Kovacic, W. E. Antitrust Policy: A Century of Economic and Legal Thinking. Working Paper No. CPC99-09, 1999.
- Shenkar, O., and von Glinow, M. A. Paradoxes of organizational theory and research: Using the case of China to illustrate national contingency. <u>Management Science</u>, 1994: 56-71.
- Sjöstrand, S. Institutional change: theory and empirical findings. Armond, New York: M.E. Sharpe Inc., 1993.
- Smith, V. An Experimental Study of Competitive Market Behavior. Journal of Political Economy, 1962: 111-137.
- Smith, V. Experimental Economics: Induced Value Theory. <u>American Economic Review</u>, 1976: 274-279.
- Smith, V, and Walker, J. Rewards, Experience and Decision Costs in First Price Auctions. Economic Inquiry, 1992.
- Sondergaard, M. Hofstede's Consequences: A study of reviews, citations and replications. Organizational studies 15, no. 3 (1994): 447.

- Sowa, J. F. Processese and Causality. John F. Sowa personal website (Online). 8 25, 2001. Available from : http://www.jfsowa.com/ontology/causal.htm [2010, November 3].
- Spagnolo, G. Leniency and Whistleblowers in Antitrust. Forthcomings, 2006.
- Spagnolo, G. Leniency and Whistleblowers in Antitrust. In <u>Handbook of Antitrust</u> <u>Economics</u>, by P Buccirossi. forthcoming.
- Spagnolo, G. Optimal Leniency Programs. Milan, 2000.
- Spagnolo, G. <u>Self-Defeating antitrust laws: How Leniency Programs Solve Bertrand's</u> <u>Paradox and Enforce collusion in Auctions.</u> F.E.E.M. nata di lavoro No. 52.00, Milan: Fondazione ENI, 2000.
- Spratling, G., and Arp, J. D. The Status of International Cartel Enforcement Activity in the U.S. and Around the World. <u>American Bar Assiciation Section of Antitrust Law, Fall</u> <u>Forum.</u> Washington DC, 2005.
- Stahl, M. J., and Grigsby, D. W. <u>Strategic management.</u> Oxford: Blackwell Publishers Ltd, 1997.
- Stephan, A. <u>An Empirical Assessment of the 1996 Leniency Notice: CCP Working Paper 05-</u> <u>10.</u> Norwich: ESRC Centre for Competition Policy and The Norwich Law School, University of East Anglia, 2005.
- Stigler, G. J. A Theory of Oligopoly. <u>The Journal of Political Economy</u>, 1964: 44-61.
- Strauss, A., and Corbin, J. <u>Basics of Qualitative Research: Grounded Theory Procedures and Techniques.</u> Thousand Oaks, CA: Sage, 1998.
- Tabachnick, B. G., and Fidell, L. S. <u>Experimental Designs Using ANOVA</u>. Thamson Brooks/Cole, 2007.
- Tabachnick, B. G., and Fidell, L. S. <u>Using Multivariate Statistics</u>. Boston, Massachusette: Pearson Education, Inc., 2007.
- Taylor, M. D. <u>International Competition Law: A New Dimension for WTO.</u> Cambridge: Cambridge University Press, 2006.
- The World Bank. <u>Competition Policy in a Global Economy: An Interpretive Survey.</u> Washington DC: The World Bank, 1998.
- Triandis, H. Subjective Culture and Economic Development. <u>International Journal of</u> <u>Psychology</u>, 1973: 163-180.

- Weber, Y., Shenkar, O., and Raveh, A. National and Organizational Culture Fit in Mergers/Aquisitions. <u>Management Science</u>, 1996: 1215-1227.
- Whinston, M. D. Lectures on Antitrust Economics. MIT Press, 2006.
- Williamson, O. The Economic Institutions of Capitalism. New York: Free Press, 1985.
- Wright, P. A refinement of Porter's strategies. <u>Strategic Management Journal</u> 8 (1987): 93-101.
- Wu, H., and Zhange, J. T. <u>Nonparametric Regression Methods for Longitudinal Data</u> <u>Analysis.</u> Hoboken, New Jersey: John Wiley & Sons, Inc., 2006.
- Zaheer, S. Overcoming the Liability of Foreignness. <u>Academy of Management Journal</u>, 1995: 341-363.
- Zhu, Y., Wittmann, X., and Peng, M. W. Institution-based barriers to innovation in SMEs in China. <u>Asia Pacific Journal of Management</u>, 2011: 1-12.

APPENDICES

# **APPENDIX A: LENIENCY PROGRAM**

#### **1. Introduction to leniency program**

From the beginning, Prisoner's Dilemma game theoretic model was among the first model adopted by academia to analyze the situation where reduction of sanction was used to incentivize wrongdoers to confess and provide necessary information to prove guilty of their partners (Osborne, 2004).

The literature on law enforcement did analyze leniency and self-reporting, but focusing on individual wrongdoers committing occasional crimes. Some mentioned about the effects on reducing the cost of prosecution or auditing (Malik, 1993; Kaplow & Shavell, 1994). Later on scholars turned their interests more on leniency prevention of collusion in hierarchy. However, in static principal-agent model *a la* Koffman and Jacques (Koffman & Jacques, 1996), they proposed the benefit of adopting two principals (or supervisors) for the reason of creating prisoner dilemma setting between two principals. Consequently, it could be seen that lenient treatment and reward were adopted for a long time throughout history. Another main example is leniency for information exchange at the prosecution stage. In the US, plea bargains, these post-detection exchanges of a lenient treatment have been introduced for a long time, all over the world, and many legal systems<sup>16</sup>. Public promises of prizes or leniency before detection and/or prosecution have also often been used for a long time, including Thai system.

In principle, self-reporting is not a new enforcement or detecting method. Self-reporting benefits society by controlling harmful externalities, so called "Pigouvian Tax" (Pigou, 1920). This idea was used all along our history, both in criminal and civil law systems. Fundamentally, the logic of this issue is simply that parties voluntarily report their behavior because they fear more severe treatment if they do not (Kaplow & Shavell, 1994). Even though it's desired in identifying perpetrators, there is not always the case where it's worthwhile to do so. Investigation would be efficient only with some probability of detection (Becker, 1968). For informants, they will decide to report harmful action only if their

<sup>&</sup>lt;sup>16</sup> Thai Criminal Code also enacted "Extenuating Circumstances" in section 78 paragraph 1 "If appears to has extenuating circumstances...if court deems advisable, perpetrator may be reduce the punishment not more than a half..." and paragraph 2 "extenuating circumstances are...repentance and try to minimize the injurious consequence, voluntary surrender to officer or provide knowledge which benefit judicial proceedings..."

certainty sanction is equal to certainty equivalent of not reporting the case (Kaplow & Shavell, 1994). This is also coherent with recent practice of U.S. leniency program which is trying to ensure transparency for boosting up a confidence of informants (Hammond, 2004).

However, these literatures although insightful, they are all static. Consequently, they can't be fully adopted to explain the situation in which parties have to maintain long run relationship among each other, to be precise, dynamic game. Furthermore, most of them are single agent crime which is, in many facets as we will analyze, different from cartel. Therefore, an analysis where some essential characteristics of cartel are captured—long-term, dynamic, and self-enforcing—is required.

#### 2. Leniency programme in competitive law

One of the most distinguished characteristics of leniency programme in competitive law which differs from other types of it (e.g. Plea bargain) is its "ex ante" enforcement. This particular topic is principally important in the countries where investigation or detection authorities have relatively less power of detection, such as developing countries. As this policy directly exercised to wrongdoers whom haven't yet been detected or indentified, this policy was designed for the process before prosecution began.

Furthermore, this policy is generally enacted in provisions of law. This implies that the policy is "general" and applies to everyone under codified situations. Also, codification implies about public status of this policy, since everyone must, assumingly, be informed via some forms of announcement<sup>17</sup>.

Leniency programme implementation's aims could be separated into three main effects<sup>18</sup>,

- a) Deterring effect (Preventing)
- b) Detecting effect<sup>19</sup> (Discovering)

<sup>&</sup>lt;sup>17</sup> In Thailand, we have "Government Gazette" which necessarily be announced for every law implementation.

<sup>&</sup>lt;sup>18</sup> Effects of leniency program could also be categorized into temporal divisions. In short run, it would create "prisoner dilemma" situation, and create conspirators an incentive to confess (cheat). Kaplow, L. and S. Shavell (1994). "Optimal law enforcement with self-reporting of behavior." <u>Journal of political economy</u>: 583-606.

Besides, in long run, leniency deters conspirators from forming a new cartel.

<sup>&</sup>lt;sup>19</sup> Detection of cartel seems to be the most problematic process in anti-cartel regime. Because cartel itself owns specific characteristic, secrecy, authorities always find it out difficultly. Conspirators always keep this action in secret and no one else other than themselves could identify it.

Leniency programmes can break the code of silence among cartel conspirators. The programmes that have been the most successful give complete amnesty to the first conspirator to come forward and reveal the inner workings of the cartel to competition law enforcers. That information and the

#### c) Desistence effect (Stopping)

To achieve all of these anchors, especially the first two, policy implementation shall necessarily be general and public<sup>20</sup>. Since these two characteristics would reduce uncertainty and discretionality, hence stimulate self-reporting incentive. That is the reason why DOJ actively held many road shows during an initial stage of policy adoption(Spagnolo 2006).

#### 3. Criteria of success in leniency programme

As mentioned in introduction part, the increasing number of cases detected couldn't guarantee efficiency of the policy. Besides, from legal principle, the most desirable circumstance would be Utopia-like, where there is no regulation required and all people are deterred from wrongdoings. However, that idea is almost idealism. For that reason, we need law and regulation. The second-best case, hence, would be the circumstance where regulation exists and all deter from wrongdoings<sup>21</sup>. Accordingly, the achievement of law enforcement shall be measured by deterrence effects.

Many scholars such as Motta & Polo (2003), Rey (2003), Spagnolo (2000) and Harrington (2005) have emphasized the optimal design of anti-cartel policies based on the provision of incentives to breach trust and to self-report. As mentioned previously, deterrence effect is the main concerned for policy effectiveness and efficiency in this study. There are some important effects that worth to be mentioned as follows:

conspirator's continued co-operation in the subsequent prosecution are highly effective in convicting the other participants in the cartel.OECD (2003). Using Leniency Program to Fight Hard Core Cartels.

<sup>&</sup>lt;sup>20</sup> There is an interesting caveat from adoption of this particular policy in Italy for Mafia and terrorist fighting. One obvious mistake in the implementation of this policy is letting applicant reveal information selectively. It makes this policy ineffective for control this type of crime. Therefore, we have to make an **assumption all through this study that information that firms provided is "Hard information" and fully provided.** 

Note that, "Hard evidence" (Smoking gun) is an evidence that highly suggestive in favor of a particular hypothesis. This word was coined by Sir Conan Doyle.

<sup>&</sup>lt;sup>21</sup> Spagnolo (2006) mentioned about other important issues such as justice, fairness or victim compensation. However, I considered these concerns as subjective-based topic, and could be debated without an end; so, it's not worthwhile to consider those issues in this study which is not a "law per se" study. Besides, he also condemned the objectives of detection and desistence as a creation of pure deadweight loss in prosecution process, which I agree. Moreover, one can further interpret cost of prosecution as ineffectiveness of process in some specific countries. In this way of interpretation, a Thai authority is presumed to have relatively high cost of prosecution than many developed countries.

Besides, prosecution costs include, inter alia: the budgets of involved courts and agencies which gain from taxes. Also, there are other types of cost, such as time loss, social costs of type I errors (i.e. convictions of innocent).

The protection from fines effect: Since the amnesty would be offered only to the first firm reporting before an investigation, this may produce deterrence effects by ensuring that if a cartel member wants to undercut the cartel, it can report and avoid paying the fine (Spagnolo, 2000; Rey, 2003; Harrington, 2005).

The reporting as a threat effect: The threat of self-reporting to punish a conspirator that did not behave as the cartel agreed upon may also become credible, and may be exploited to enforce cartels that would not be sustainable otherwise (Spagnolo, 2000; Buccirossi & Spagnolo, 2001; Buccirossi & Spagnolo, 2006; Ellis & Wilson, 2002).

The reward effect: Many scholars suggest that rewards could further increase deterrence by generating stronger temptations to undercut the cartel and cash the reward by reporting (Spagnolo, 2000; Buccirossi & Spagnolo, 2001; Buccirossi & Spagnolo, 2006).

**Tacit Collusion and post-conviction price**: Tacit collusion is a case where firm manages to coordinate on and sustains high prices without explicit communication. Antitrust fines may have the effect of inducing firms to increase collusive prices following conviction, either because they do not realize they are a "sunk cost" and try to recover them through higher margins, or because paid fines help firms coordinating on higher post-conviction prices sustained by tacit collusion (Whinston, 2006).

These effects will be elaborated separately in the following two topics, i.e., expected and adverse consequences of leniency programme.

### 3.1 Expected Consequences of Leniency Programme<sup>22</sup>

The most fundamental theoretical background of leniency programme is creating the prisoner's dilemma situation among conspirators. When prisoner's dilemma situation occurs, parties would, in equilibrium, prefer to confess instead of remaining silent. Even though, it's clear that the most desirable for both parties is the case where both cooperating and gain market power benefit, they would not trust each other because one could yield better benefit if she chooses to deviate from cooperative agreement. This argument could simply be understood by a relationship between probabilities of detection overtime or level of generosity of leniency program with potential defections. It can be shown that these two

<sup>&</sup>lt;sup>22</sup> Normally, economics analysis suffers from rationality of agents in model which is rarely true in reality. However, since corporate crime such as cartel is committed by firms, they deserve more recognition as a rational economic agent. In firms' decision making, decisions are made by skilled, strategic and forward-looking managers (Spagnolo, Leniency and Whistleblowers in Antitrust, 2006).

values are positive related with potential defections for the purpose of increasing profits and reducing the expected fines respectively (Hinloopen, 2003).

Turning to my initial purpose of implementation, I consider the most important case as deterrence effect. This prisoner dilemma situation would lead to undermining trust between wrongdoers by increasing risk of deviation unilaterally. Furthermore, the less desirable case, but still desirable, is an increasing in number of detection. Since, this would make party who loss of confidence and would like to come forward comes forward to provide crucial information to authority.

Dynamically, post-detection situation was analyzed similar to the case of plea bargaining. Even though, this leniency would reduce the overall level of sanction, it would provide an increasing in deterrence effect. Suggestions also expand to reallocation of resources into detection process, since the cost of investigation could be reduced by the process of leniency (Motta & Polo, 2003). However, the model becomes too unrealistic because one of assumptions is that defected firm cannot report information on former partners which would eliminate the effect of deterrence from undermining trust among cartelists. This assumption makes this study far from complete, and its subsequent results<sup>23</sup> also become irrelevant. Some conclusions in this study, therefore, conflict with the suggestion of cornerstones in leniency programme by DOJ, US (Hammond, 2004). Especially, Motta and Polo (2003) claims that leniency is the second-best lower than the traditional antitrust policy. This claim is not sensible in reality and conflict with recent practices everywhere. This deviated conclusion might be the consequence of assuming that cost of enforcement is constant, despites of its reduction in reality by implementing leniency program.

Later on, there are studies investigating about deterrence effect before detection. Spagnolo (2000) developed that model *a la* Motta and Polo. However, this model eliminated unrealistic assumptions by Motta and Polo (2003), that is, a defecting firm cannot be convicted for having taken part to a cartel, nor can report information on former partners. This model provides some insights which are coherent with the cornerstones suggestion by DOJ (see Hammond (2004)). Mainly, this model supported the conclusion of optimality in providing only firstcomer a leniency. Moreover, Spagnolo (2000) also supported a cause of coming forward as avoiding fines, and reward as a dominant strategy for authority to other type of program.

<sup>&</sup>lt;sup>23</sup> Motta and Polo (2003) suggest that leniency program for firms under investigation are necessary. All firms' applications are necessarily permitted. However, these conclusions came up since the assumption of prohibition in providing information of other parties is activated, therefore, it would not occur since this information provision is available and crucial in reality which makes effectiveness of program far from this model's assumption.

Afterwards, more sophisticated models by Rey (2003) and Spagnolo (2004) discussed about dropping out the unrealistic assumption mentioned previously. These studies suggested strongly that even if leniency program was not implemented, the authority still should act as if it was implemented. They also confirm effectiveness of leniency program as long as the reduced fine is smaller than expected fines of firm without leniency (So, it's worthwhile to come forward). In addition, riskiness becomes another important factor that creates deterrence effect among potential cartelists. Leniency program would create the risk among potential cartelists; therefore, it can be shown that leniency programs always strictly increase the riskiness of entering to collusive agreement. This, in turn, makes cost of forming cartelists and being defected later on higher, which could create the situation of deterring eventually.

Since firms' incentive of forming cartel could also be created from having leniency program, Ellis and Wilson (2001) proposed the possibility of using leniency program as a tool for eradicating rivals. Being convicted by antitrust authorities would definitely create cost for firms (e.g. cost in paying fines, cost of defamation). For me, I see no evil in this particular purpose of defection, since this would, eventually, create distrusted atmosphere among potential cartelists which is the desirable effect also. Hence, the result of this unique reason is the same as other reasons.

In conclusion, basically, potential cartelists would be deterred from forming cartel if cost of forming is higher than benefit of forming it. Scholars have elaborated deeply in detail to be able to understand more insights behind firms' incentives. Fundamentally, firms simply adopt leniency program to avoid fines they have to pay if being detected. However, they also have other incentives by using leniency program as a tool to wipe out rivals. This makes firms become more aware of collaboration between each other, and, consequently, leads to deterrence effect. The more generosity, certainty in leniency program combined with uncertainty and cost of colluding; the more effective of deterrence effect in dealing with cartel problem.

Besides mechanism and incentive of leniency programme above, international aspect of leniency effectiveness is also worthwhile being considered. Leniency application in one country doesn't guarantee any amnesty in other countries, international firms, therefore, reluctant to come forward and provide information to the authority. Even though such authority with leniency program may be able to guarantee secrecy of information provided, after the court's conviction, all information might be disclosed (Festerling, 2005). Authorities in other countries may possibly perceive this information and use it as a starting point for investigation. This consequence, therefore, would negatively affect the decision of firms to report to authority in one country as a consequence of other countries' unavailability of the programme.

#### 3.2 Adverse Consequences of Leniency Programme

Albeit leniency seems to be the efficient program which could destabilize cartel and deter potential cartelists from forming cartel, it could also stabilize and create negative effect on cartel forming. These undesired consequences of leniency programme due to "imperfection of design" (Spagnolo, 2006). The unwelcomed consequence of leniency program could be analogized to the side effect of drugs which sometimes is unavoidable but could be lightened.

One potential negative consequence of leniency program is formed by the strategy of cartel's members. Since leniency program could make one member being softened its punishment, while others would be received higher-than-usual possibility of conviction because the secret information would be provided to authority by informant. This fact could be adopted as a bargaining condition among cartelists in formed cartel and fines of Antitrust law would be counted as a punishment among cartelists (Buccirossi & Spagnolo, 2001) (Ellis & Wilson, 2002). The easiest way to deal with this situation is increasing the cost of forming the cartel, as proposed, by giving a reward for informant (Buccirossi & Spagnolo, 2006).

#### 3.3 Stimulating effect of leniency program by rewards

Since the easiest way to deter potential cartelists from forming any cartel is increasing net profit of defection from forming cartel to be higher than net profit of forming cartel, reward policy was proposed to be the first best policy possible to increase the benefit of defecting and, therefore, deter wrongdoers from forming a cartel.

This could be, numerically, shown that even the low powered designed leniency program could have productive effect by using reward (Brisset & Thomas, 2004). However, the reward amount should be lower than the fine collected from other wrongdoers in order to avoid the case where cartel is formed to cash the reward. This theoretical perspective is not that serious in reality since the money fine is not the only damages to firms but also their reputation and long run relationship with state, therefore, this incentive is rarely possible in the real world.

Reward policy could be considered as the first best policy to deal with cartel. By promising the first wrongdoer that applies for the leniency a fines-financed reward, this could induce cartelists to come forward and self report to the authority. Besides, in the very low detection probability case, no matter how high the level of fine is; leniency policy may
become totally ineffective (especially, in extreme, if the probability of detection becomes zero) (Becker, 1968). This benefit of defection, therefore, provides an alternative for authority to deal with the problem of lacking in resource of detection (Spagnolo, 2000).

## 4. Leniency program in practices

Cartel becomes one of the most difficult tasks for competition authorities to detect. It requires very proactive authority in order to invade into the cloaks of cartelists, and get information out of them. Even some developed countries, such as U.S., EU and Japan, were confronting with huge constraint in order to detect this policy, or deter it by law. However, since August 1993, Antitrust division of US DOJ revised its corporate leniency program. The first cartel participant applied for leniency program and was granted amnesty in 1996. Before being assembled, there are only 4 applicants qualified out of 17 applicants since 1978 (Spratling & Arp, 2005). Until now, there are many countries all over the world that have been adopting this program and there are some crucial differences between countries in adopting leniency program.

## 4.1 General Characteristics

Leniency programme could be simply defined as a public offering to capture wrongdoers a lenient treatment in exchange for information. "Leniency" will be used here to describe all programs that provide any reduction in sanction in exchange for information and co-operation. The more precise term "amnesty" will be used to describe a program that promises no penalty to the first party to come forward to the enforcement agency and comply with the agency's requirements. Logically, amnesty is included within the more general concept of leniency (OECD, 2002). In EU, there are multi levels of leniency, from immunity (100%, for first comer) to Leniency (less than 100%, for latecomers). Meanwhile, in U.S., there is only one level of leniency, so called amnesty, viz. the leniency treatment is full and given only for the first-comer (Hammond, 2004). These are countries that adopt leniency program: Austria, Australia, Belgium, Brazil, Canada, Cyprus, Czech Republic, European Free Trade Association, European Union Finland France, Germany, Hungary, Ireland, Israel, Japan, Korea, Latvia, Lithuania, Luxembourg, The Netherlands, New Zealand, Poland, Romania, Slovakia, South Africa, Sweden, United Kingdom and United States of America.

### 4.2 Countries and Systems of Leniency

There are two largest jurisdictions as representatives of two widely adopted competitive law enforcement system. First, Adversarial System, juries and judges decide on the case at the beginning. Second, Administrative or Inquisitorial system, public agency has both prosecutorial and judicial power over the case, before parties appeal to court afterward. Another difference is the number of cartelists who were allowed to be immunized. In US, only the first comer would be protected by the law, this is based on the game theoretic model that would capitalize the probability of the situation called "prisoner dilemma". However, in EU, not only first comer would be sheltered from penalty, but also the followers with hierarchical reduction in immunity.

# 4.2.1 Adversarial system in progress: US Leniency Policy<sup>24</sup>

US leniency programme was first implemented in 1978 by Department of Justice (abbreviated as DOJ since then). However, this policy was not quite successful in its enforcement power and number of cases prosecuted<sup>25</sup>. In 1993, the programme, therefore, was revised and amended drastically. The content could be separated into two major sections. Section A makes the awarding of complete amnesty to the first conspirators that confess and report automatically. However, in section A, the full leniency or amnesty award would be authorized to applicant only if there is no investigation taken place before application. That is, section A would be applied only for the case where the report of applicant initiates the investigation. Additionally, if first reporting firm reports after an investigation has begun, it is still able to obtain leniency grant. In section B, corporate leniency policy award for firm that report after an investigation has begun, but DOJ is still unable to find "likely to result in a sustainable conviction". This amnesty is given to all individuals of the applicant firms who cooperate with the investigation. One year later, 1994, the Individual Leniency Policy was executed. This allows individuals to directly apply and receive amnesty independently of their company. This individual leniency policy was enacted for the purpose of stimulate inside-firm competition, and, hopefully, firm would be more active and rush to apply for leniency programme before its workers (Hammond, 2000).

<sup>&</sup>lt;sup>24</sup> Almost every case in U.S. was awarded with full amnesty in United StatesInvalid source specified.

<sup>&</sup>lt;sup>25</sup> Under the 1978 program, violators who came forward and reported their illegal activity before an investigation was underway were *eligible* to receive a complete pass from criminal prosecution. The grant of amnesty, however, was not automatic and the Division retained substantial prosecutorial discretion in the decision-making process. In 1993, the Division dramatically expanded its Amnesty Program to increase the opportunities and raise the incentives for companies to report criminal activity and cooperate with the Division. The Amnesty Program was revised in three major respects. *First*, the policy was changed to ensure that amnesty is *automatic* if there is no pre-existing investigation. That is, if a corporation comes forward prior to an investigation and meets the program's requirements, the grant of amnesty is certain and is not subject to the exercise of prosecutorial discretion. *Second*, the Division created an alternative amnesty, whereby amnesty is available even if cooperation begins *after* an investigation is underway. *Third*, if a corporation qualifies for automatic amnesty, then all directors, officers, and employees who come forward with the corporation and agree to cooperate also receive automatic amnesty (Hammond, 2004).

The big revisions in 1993-1994 of this program affect effectiveness of this policy enforcement. There are increasing both number of applications and magnitude of penalties imposed. Simultaneously, increasing in leniency correlates with increase in sanctions both corporate and individual fines and jail sentences (OECD, 2002). However, this increase in sanction may be caused by an increase in quantity and quality of evidence obtained from leniency applicants. By this increase of sanction, in turn, firms would be incentivized to apply for this program more (Spagnolo, forthcoming). Here, I exhibit the Figure 6 which reflects this interaction effect as in figure 29.



Figure 34: Relationship among effect of evidence, sanction and applicants

Even though the program seems to be successful, concerns remained in the antitrust division and commentators that the prospect of treble damage lawsuits was dissuading some antitrust wrongdoers from participating in the programme. Since immunity from leniency program doesn't cover damages they have to pay for treble-damage by joint liability rules (Rey, 2003). However, this issue was relieved by an implementation of Criminal Penalty Enhancement and Reform Act in 2004. This legislation limits the total private civil liability of corporations that have entered into leniency agreements to actual damages. Firms who obtain amnesty are no longer liable for treble but only single damages, and are no longer jointly liable for damages suffered by their co-conspirators' customers (Spagnolo, forthcoming).

# 4.2.2 Administrative or Inquisitorial system in progress: EU Leniency policy<sup>26</sup>

The European Commission introduced a Leniency Program in 1996, following U.S.' Leniency Program. The first EU leniency program was not very effective because of its

 $<sup>^{26}</sup>$  In EU, during 1999-2007, 21 (or 7.8 %) of all guilty cartelists were recipients of full leniency and 144 (or 53.5 %) received partial leniency. Out of 50 cartels, 42 % of the EU cartels were detected because of whistle-blowers Invalid source specified..

uncertainty, discretion and low sanction. As a consequence, these characteristics of program couldn't incentivize firms to come forward. In 2002, Commission revised its old leniency program. Alternation and Amendment in leniency program reduced its discretion and increases its sanction. Also, commission started offering almost automatic immunity from fines to the first member of a cartel that come forward before an investigation take place (Paragraph 8a and 9 of leniency program). Similar to U.S., EU provides subsequent leniency to one comes when the EU has very little information but has started an investigation already. Note that ringleaders can also obtain leniency, provided no coercion of participation of cartel members. This execution provided a spectacular impact on leniency application in EU. Number of cases increased dramatically since this amendment was established<sup>27</sup>.

Leniency in EU program is not confined to non-prosecution as in the US; it includes the reduction of the otherwise appropriate penalty. There are three different leniency situations, described in sections B, C, and D of the Notice (Joshua, 2000).

In section B treatment, section B provides for the non-imposition of fines or a fine reduction of at least 75 percent from the otherwise appropriate fine. Applicants must meet five conditions to receive this top level of favorable treatment:

- Information has been informed before investigation and commission does not already have sufficient information to establish the existence of the alleged cartel.

- The informant is the first to come forward.

- The informant immediately end its involvement in the cartel

- The informant maintains continuously and completes cooperation throughout the investigation; and

The informant did not give compelled another company to take part.

In section C treatment, undertaking satisfies conditions (b) through (e), but inform after investigation has already established. The applicant still benefit from reduction of 50-75 percent of what it would otherwise have been fined.

Finally, in section D treatment, other cases those mismatch with section B or C, but still benefit an investigation process of Commission. The applicant would benefit from reduction of 10-50 percent.

In extension, there is another ratio of reductions which was adopted by many countries, those are, Japan's fair trade commission, UK. Table 24, 25 and 26 shows the conclusion of three main systems in the world (Harrington, 2006).

<sup>&</sup>lt;sup>27</sup> Between 1996 and 2002, there are only 16 applications for leniency, and only 3 of them granted. After 2002, within 1 year in 2003, there are more than 20 applicants for leniency were filed, and most of them satisfied paragraph 8a, 9. Invalid source specified.

## EU system

Time\Order	First	Second	Third	Fourth
Before	100 %	30-50 %	20-30 %	< 20 %
Investigation				
After Investigation	30-100 %	20-30 %	<20 %	<20 %

Table 26: EU system of leniency program: the level of punishment reduction(Harrington, 2006)

## US system

Time\Order	First	Second	Third	Fourth
Before	100%	_28	-	-
Investigation				
After Investigation	100%	-	-	-

# Table 27: US system of leniency program: the level of punishment reduction(Harrington, 2006)

## Japan system

Time\Order	First	Second	Third	Fourth
Before	100%	50%	30%	-
Investigation				
After Investigation	30%	30%	30%	-

# Table 28: Japan system of leniency program: the level of punishment reduction(Harrington, 2006)

These 3 main policies were adopted around the world. Table 31 exhibits countries those adopted this

Country	Authority			
US system				
United States of America	Department of Justice			
Australia	Australia Competition and			
	Consumer Commission			
Brazil	Secretariat of Economic Law of			
	Ministry of Justice (SDE)			
Canada	Competition Bureau			

<sup>&</sup>lt;sup>28</sup> Plea Bargain is possible to reduce the punishment of wrongdoers too; however, I would control it as constant in my study.

Finland	Finnish Competition Authority			
Ireland	Ireland Competition Authority			
Israel	Israel Competition Authority			
Latvia	Competition Council			
New Zealand	New Zealand competition			
	Authority			
South Africa	RSA Competition Commission			
Sweden	Swedish Competition Authority			
EU s	ystem			
EU and EFTA	European Commission -			
	Directorate General			
	for Competition			
Hungary	Hungarian Competition			
	Authority			
Czech Republic	Office of the Protection of			
	Competition			
Romania	Romanian Competition Council			
The Netherland	Netherlands Competition			
	Authority (NMa)			
Japan	system			
Japan	Japan Fair Trade Commission			
Germany	Bundeskartellamt			
Korea				
United Kingdom	UK Competition Commission			

# Table 29: Countries and systems (source: countries' authority websites)

There are 2 aspects to consider these policies differences, relative gain to report before an investigation and relative gain to report first. The logic behind this relative consideration is that; even though U.S. DOJ claims that their amnesty program acts as the optimal policy to induce cartelists to come forward (Hammond, 2004), the relative level of gain by report before an investigation would be different from after investigation in Japanese system, because no matter which order a member comes forward, if the investigation begun already, all applicants would be lenient at most 30 % equivalently. In the U.S. system, as long as a member can be the first to come forward, it doesn't matter whether that member comes before or after investigation.



Figure 35: Matrix of different policies 1 (source: Harrington 2006)

Furthermore, another two aspects to be compared is relative potential information and relative incentive to come forward. Generally, we would expect that information from many members would be more than information from one. Therefore, given that there is no exception, information in E.U. leniency program would be expected to be the highest, because it provides most number of members a leniency. On the other hand, U.S. leniency program allows only one and the first cartelist an amnesty; therefore, information would be relatively less. However, the full amnesty in U.S. would be able to incentivize cartelist the most, while E.U., conversely, has the least incentive among three due to the fact that it provide leniency up to four members.



Figure 36: Matrix of different policies 2 (source: Harrington 2006)

From information presented, we, hence, can observe many differences among countries' policies. However, these policies yield some superiors to the others, simultaneously, some inferiors to the others. Therefore, by adopting these policy characteristics, we need to consider about them carefully and fit it with our environment. Stephan (2005) was analyzed the EU leniency programme and questioned on the credibility of program, since majority of cases are detected via prior detection of U.S. Program or had failed prior to investigation (Stephan, 2005). For U.S. leniency program, there's still only Miller (2008) works that showed an improvement (reduced by 60% both) of detection and deterrence of cartel formation between pre- and post-1993 programme.

This study does not specifically create a section to explain Japan Leniency program is because Japan's leniency program does not differ in its essences from EU. The only main difference between two systems that I categorize earlier is the ratio of punishment (Harrington, 2005).

# **APPENDIX B: THAILAND COMPETITION ACT**

The Thailand Trade Competition Act (hereafter called "The Competition Act", or "TCA") began with the enactment of the Price Fixing and Anti-Monopoly Act of 1979. The 1979 Act consists of two parts, viz. the price fixing part and the anti-monopoly part. The Thailand Trade Competition Act empowers the Central Committee to look after business structures that may create monopoly and conduct restrictive business practices. However, it created problems for enforcement, the Department of Internal Trade, which is in charge of the said Act, made an adjustment to the Act by separating it into 2 Acts: The Price of Goods and Services Act and the Competition Act. The Price of Goods and Services Act and the Competition Act. The Price of Goods and Services Act and the Competition Act came into effect on 1999. (2001)

The Price of Goods and Services Act B.E. 2542 (A.D. 1999) applies to businesses, enterprises, and business activities in Thailand with the exception of central, provincial, and local agencies, and certain activities exempted by Ministerial Regulations. Parliament adopted the Act to protect consumers from price fixing and unfair service charges, and to ensure the supply of goods sufficient to meet domestic demand.

The Act sets up a Central Board Governing Prices of Goods and Services with the authority to prescribe goods and services to be controlled by the Act, fix the sale/purchase prices of controlled goods and services, ensure that there is sufficient supply of goods or services to meet the domestic demand, consider complaints of distress or damage arising from unfair price practices, lay down regulations governing the payment of rewards and money, and prescribe bases, procedures, and conditions regarding the display of goods and services prices. In order to help the Central Board, the Act grants for the founding of Provincial Boards Governing Prices of Goods and Services

The Act generally applies only to "controlled" goods or services to be announced from time to time, and covers all types of unfair pricing of products and services. As a result, it will not be enforced over goods or services unless they have been announced by the Central Board as controlled goods or services. The penalty for violating any section of this Act can include a fine of up to THB 140,000 and/or imprisonment for up to seven years. Note that such penalties may be applied not only to the enterprises but also to their managing director, managing partner, or person in charge of operations, unless the offense in question was committed without his/her knowledge or consent, and/or reasonable measures were taken to prevent such offense.

*The Trade Competition Act B.E. 2542 (A.D. 1999)* applies to all enterprises and business activities in Thailand with exception of state enterprises, cooperatives, agricultural and cooperative groups, government agencies, and certain other exempted enterprises. By approving the Act, Parliament intended to put in place a set of rules allowing the government to monitor and ensure the development of equitable private sector competition in Thailand. The Act further establishes a Trade Competition Commission with authority to oversee and ensure compliance with the Act as well as give recommendations to the Ministry regarding forthcoming Ministerial Regulations. The Act is in some instances vague or ambiguous. This makes interpretation and compliance difficult. Ministerial Regulations should be adopted in the near future. Until then, interpretation as to its scope of application will be left to the Trade Competition Commission and courts to decide.

While some unfair practices covered by the Act are strictly prohibited, others may be exempted upon Commission approval. Failure to abide by the provisions of the Trade Competition Act could result in imprisonment for up to seven years and/or fines from THB 2,000 to THB 6,000,000. Note that under the Act, such penalties may be applied not only to the enterprises but also to their managing director, managing partner, or person in charge of operations, unless the offense in question was committed without his/her knowledge or consent and/or reasonable measures were taken to prevent such offense.

Note that such penalties may be applied not only to the enterprises but also to their managing director, managing partner, or person in charge of operations, unless the offense in question was committed without his/her knowledge or consent, and/or reasonable measures were taken to prevent such offense. In this study's case of interest, cartel, it falls under the virtue of TCA act. I therefore out my emphasis on TCA before moving on to the specific characteristics of cartel.

TCA were originally enacted based on the South Korean Monopoly Regulation and Fair Trade Act (MRFTA), the Taiwanese Fair Trade Law (FTL), the Japanese Antimonopoly Law of 1947and the German Act Against Restraints of Competition(Thanitcul 2002). In majority, TCA relies mostly on MRFTA, because working committee think that domestic market of Thailand and Korea is similar because there are monopolistic and oligopolistic markets. While, the committee also included another most coherent with Thai market system, Taiwan's FTL. The reason for the latter inclusion is that 98 % of firms in Taiwan are SMEs.

The "Thai Fair Trade Commission" (hereafter called "the Commission") which consists of the Minister of Commerce as Chairman, the Permanent-Secretary of the Ministry

of Commerce as Vice-Chairman, the Director-General of the Department of Internal Trade as Member and Secretary, and the Permanent-Secretary of the Ministry of Finance, and no more than twelve other qualified persons as members shall be responsible for the enforcement of the Act. These qualified persons appointed as members must not be political members, holders of political positions, executive members or holders of positions with the responsibilities in the administration of political parties. They shall hold office for a term of two years and not more than two consecutive terms in case they are re-appointed. The Commission shall have the powers and duties to consider complaints, to prescribe rules for dominant position, to consider an application for permission to merge business or to initiate the joint reduction or restriction of competition to give orders for suspension, cessation, correction, or variation of activities by business operations.

The Office of the Commission was established in the Department of Internal Trade, Ministry of Commerce, with the Director-General of the Department as the Secretary who is responsible for the official affairs of the office.

For substantive law of TCA, this law aim to regulate behavior of business rather than the actual structure of the businesses (Thanitcul 2002) which is not applied to state-owned enterprises (SOEs), Administration, Groups recognized by law and having business objectives for the benefit of farmers, and others those to be identified by ministerial regulations. TCA prohibits

i. Business with dominant position and their ability to abuse their market power;

ii. Any merger that may create monopolistic power or reduce competition are prohibited, unless the merger get permission from the Commission in the case that it is necessary in the business and beneficial to the economy;

iii. A business operator from conspiring, colluding or collaborating with another business operator in order to create monopolistic power, or reduce competition. In the case where it is reasonably necessary in the business and has no serious harm to the economy, the business operators shall submit an application for permission to the Commission. The Commission has already approved forms, rules and procedures to apply for permission of any kinds of anti-competitive agreements.

iv. Agreements between domestic and oversea business operators performing an activity which will restrict the freedom or opportunity of a person residing in the Kingdom

from purchasing goods or services for his/her own use directly from business operators outside the Kingdom.

v. A business operator from performing any act which is not free and fair competition and which results in destroying, impairing, obstructing or impeding or restricting business operation of other business operators or preventing other persons from carrying out business or causing the cessation of business.

Finally, Sanctions of TCA were written on section 51, the TFTC may impose a maximum three-year term of imprisonment, or a criminal fine up to six million Thai Baht, or both. Then, I move forward to an explanation of cartel and its unique characteristics.

Section 4: This Act shall not apply to the act of:

- 1. Central administration, provincial administration or local administration;
- 2. State enterprises under the law on budgetary procedure;
- 3. Farmers' groups, co-operatives or co-operative societies recognized by law and having as their object the operation of businesses for the benefit of the occupation of farmers;
- 4. businesses prescribed by the Ministerial Regulation, which may provide for exemption from the application of this Act in whole or only in respect of any provisions thereof.

Section 25: A business operator having market domination shall not act in any of the following manners:

- 1. unreasonably fixing or maintain purchasing or selling prices of goods or services;
- 2. unreasonably fixing compulsory conditions, directly or indirectly, requiring other business operators who are his customers to restrict services, production, purchase or distribution of goods, or restrict opportunities in purchasing or selling goods, receiving or providing services or securing credits from other business operators;
- 3. suspending, reducing or restricting services, production, purchase, distribution, deliveries or importation without justifiable reasons, destroying or causing damage to goods in order to reduce the quality to that lower than the market demand ;
- 4. Intervening in the operation of business of other persons without justifiable reasons.

**Section 26:** A business operator shall not merge businesses, which may result in monopoly or unfair competition as prescribed and published in the Government Gazette by the Commission unless the Commission's permission is obtained.

The publication by the Commission under paragraph one shall specify the minimum amount or number of market share, sale volume, capital, shares or assets in respect of which the merge of businesses is governed thereby.

The merger of businesses under paragraph one shall include:

1. a merger made by a manufacturer with another manufacturer, by a distributor with another distributor, by a manufacturer with a distributor, or by a service provider with

another service provider, which has the effect of maintaining the status of one business and terminating the status of the other business or creating a new business;

- 2. a purpose of the whole or part of assets of another business with a view to controlling business administration policies, administration and management;
- 3. a purpose of the whole or part of shares of another business with a view to controlling business administration policies, administration and management;

The application by a business operator for the permission under paragraph one shall be submitted to the Commission under section 35.

Section 27: Any business operator shall not enter into an agreement with another business operator to do any act amounting to monopoly, reduction of competition or restriction of competition in the market of any particular goods or any particular service in any of the following manners:

- 1. fixing selling prices of goods or services as single price or as agreed or restrict the sale volume of goods or services;
- 2. fixing buying prices of goods or services as single price or as agreed or restrict the purchase volume of goods or services;
- 3. entering into an agreement to have market domination or control;
- 4. fixing an agreement or condition in a collusive manner in order to enable one party to win a bid or tender for the goods or services or in order to prevent one party from participating in a bid or tender for the goods or services;
- 5. fixing geographical areas in which each business operator may distribute or restrict the distribution of goods or services therein of fixing customers to whom each business operator may sell goods or provide services to the exclusion of other business operators from competition in the distribution of such goods or services;
- 6. fixing geographical areas in which each business operator may purchase goods or services or fixing persons from whom business operators may purchase goods or services;
- 7. fixing the quantity of goods or services which or to which each business operator may manufacture, purchase, distribute, or provide services with a view to restricting the quantity to be that lower than the market demand;
- 8. reducing the quality of goods or services to a level below that of previous production, distribution or provision, whether the distribution is made at the same or at a higher price;
- 9. appointing or entrusting any person as a sole distributor or provider of the same goods or services or those of the same kind;
- 10. Fixing conditions or procedures in connection with the purchase or distribution of goods or services in or order to ensure the uniform or agreed practice.

In the case where it is commercially necessary that the acts under (5),(6),(7),(8),(9) or (10) be undertaken within a particular period of time, the business operator shall submit to the Commission under section 35 an application for permission.

**Section 28**: A business operator who has business relation, with business operators outside the Kingdom, whether contractual or through policies, partnership, shareholdings or in the form of relation of any other similar description, shall not carry out any cat in order that a person who is in the Kingdom and intends to purchase goods or services for personal

consumption will have restricted opportunities to purchase goods or services directly from business operators outside the Kingdom.

Section 29: A business operator shall not carry out any act which is not free and fair competition and has the effect of destroying, impairing, obstructing, impeding or restricting business operation of other business operators or preventing other persons from carrying out business or causing their cessation of business.

# APPENDIX C: QUESTIONNAIRE OF INDIVIDUALISM-

# COLLECTIVISM

Questions	Very	Dislike	Moderate	Like	Very Like
	Dislike (1)				(5)
Live in an area desirable to					
you and your family (+)					
Have training opportunities					
(to improve your skills or					
learn new skills) (+)					
Get the recognition you					
deserve when you do a					
good job (-)					
Have good physical					
working conditions (good					
ventilation and lighting,					
adequate work space, etc.)					
(+)					
Have considerable freedom					
to adapt your own					
approach to the job (+)					
Have a job which leaves					
you sufficient time for your					
personal or family life (+)					
Keep up to date with the					
technical developments					
relating to your work (+)					
Work in a company which					

is regarded in your country			
as successful (-)			
Have a job which allows			
you to make a real			
contribution to the success			
of your company (-)			
Work in a company which			
stands in the forefront of			
modern technology (-)			

# APPENDIX D: QUESTIONNAIRE FOR DEMOGRAPHIC AND FIRM'S REPRESENTATIVENESS

แบบสอบถาม (ข้อมูลทั้งหมดจะถูกเกีบเป็นความลับ)

Questionnaire (All information kept secretly)

- 1. ขนาดของบริษัทของท่าน (หรือบริษัทสุดท้ายที่ทำงานด้วย)
- 1. Size of your company (or the latest one)
  - a. จำนวนของพนักงานโดยประมาณ
  - a. Number of employees (approximate)
    - o น้อยกว่า 500 o Less than 500 o มากกว่า 500 o More than 500
  - b. จำนวนทุนจดทะเบียนโดยประมาณ \_\_\_\_\_
  - b. Registration Cost (Approximate)\_\_\_\_\_
- 2. สถานที่ตั้งของบริษัท
- 2. Company location
  - o กรุงเทพ และปริมณฑล o Bangkok o ต่างจังหวัด o Others
- 3. ลักษณะของบริษัท
- 3. Company characteristics
  - 3.1 การทำธุรกิจระหว่างประเทศ
  - 3.1 International Business Activities

o ทำธุรกิจระหว่างประเทศอย่างเดียว (90 - 100% ของรายได้) o International only (90 - 100% of income) oทำธุรกิจระหว่างประเทศเป็นหลัก (50 - 90% ของรายได้) o International mainly (50 - 90% of income) oทำธุรกิจระหว่างประเทศส่วนหนึ่ง (1 - 50% ของรายได้) o International partly (1 - 50% of income) oไม่มีการทำธุรกิจระหว่างประเทศเลย (0% ของรายได้) o No international (0% of income) 3.2 บริษัทของท่านเป็นบริษัท 3.2 Type of company

oบริษัทแม่ (Parent firm) หรือ บริษัทเดี่ยว(Standalone) oบริษัทลูก (Affiliate)

3.3 ธุรกิจของบริษัทท่านอย่างในอุตสาหกรรมใด

# 3.3 Industry

- oธุรกิจสิ้นค้า o Goods market oธุรกิจบริการ o Services market oทั้งสองกรฉี o Both
- 4 ข้อมูลส่วนบุคคล

# 4. Personal Information

- 4.1 อาขุ \_\_\_\_\_
- 4.1 Age\_\_\_\_\_
- 4.2 เพศ

# 4.2 Gender

Oชาย o Male oหญิง o Female 4.3 สถานภาพสมรส

## 4.3 Marital Status

0 โสด		
o Single		
Oแต่งงานแล้ว		
o Married		
Oอื่นๆ		
o Others		
4.4 ประสบการณ์การทำงาน	ปี	
4.4 Working experience		_years
4.5 สาขาที่จบการศึกษา		
4.5 Major graduated		_

4.6 ตำแหน่งปัจจุบัน \_\_\_\_\_

4.6 Current career position\_\_\_\_\_

- 5 ความเป็นตัวแทนของบริษัท
- 5 Firm' representativeness
  - 5.1 ในสิบครั้ง มีกี่ครั้งที่การตัดสินใจ หรือความคิดของคุณสอดคล้องกับกลยุทธ์ หรือ นโยบายของบริษัท
  - 5.1 In ten times, how many times have your thoughts or decisions been coherent with the strategy or policy of the company?
  - 5.2 ในสิบครั้ง มีกี่ครั้งที่การคัดสินใจ หรือความคิดของคุณได้ถูกนำไปใช้เป็นกลยุทธ์ หรือนโยบายของบริษัท
  - 5.2 In ten times, how many times have your thoughts or decisions have been actually implemented as a strategy or policy of your company?
- 6 กรุณาตอบคำถามดังต่อไปนี้
- 6 Please answer the following question.
  - 6.1 กรณีใดที่คุณต้องการมากกว่า
  - 6.1 Which one do you prefer?
    - o ได้รับเงินสด 500 บาทแน่นอน
    - o getting 500 baht for sure.
    - o มีการโยนเหรียญ ถ้าออกหัว คุณได้ 0 บาท ถ้าออกก้อย คุณได้ 1000 บาท
    - o tossing a coin, if there is a head, getting 0 baht. If there is a tail, getting 1000 baht.
    - 0 ไม่ต่างกัน
    - o Either of the above choices.
  - 6.2 ความคิดเห็นทั่วไปเกี่ยวกับการทดลองนี้
  - 6.2 General\_suggestion\_\_\_\_\_

# **APPENDIX E: INSTRUCTION OF EXPERIMENTS**

Instruction for transition process experiments

1. ทั่วไป

1. General

คุณได้เข้าร่วมการทดลองเกี่ยวกับการตัดสินใจในตลาด โดยการวิจัยจะเสร็จลงภายใน หนึ่งชั่วโมง หรือเร็ว กว่านั้น ถ้าคุณปฏิบัติตามคำแนะนำการใช้นี้ และตัดสินใจอย่างถี่ถ้วน คุณจะได้รับค่าตอบแทน ภายหลังจบการ ทดลอง ตามผลงานที่คุณทำได้ พร้อมทั้งยังจะได้รับเกียรติบัตร หากคุณทำอันดับได้ดีที่สุดสิบอันดับแรก

You are participating an experiments related to market decision and this experiments is going to finish within an hour or sooner. If you strictly follow this instruction and carefully make a decision, you will get money in accordance with your performance after finishing the experiments. Moreover, you will receive a diploma, if you are ranked in the top-ten in net profit.

คำแนะนำการใช้ดังกล่าวนี้ จะถูกอ่านออกเสียงให้ได้ยินโดยทั่วกัน หลังจากนั้นคุณจะมีเวลาอ่านซ้ำอีกรอบ หนึ่งเพื่อทบทวนความเข้าใจพร้อมทั้งตอบคำถามสั้นๆเพื่อวัดความเข้าใจของคุณ หากมีสิ่งใดไม่เข้าใจ คุณ สามารถยกมือขึ้นเพื่อขอความช่วยเหลือเป็นการส่วนบุคคลได้ทันที

This instruction will be verbally announced to you and you will have time to re-read it again. After reading an instruction, you will have to answer some short questions to check your understanding. If there are any enquiries, you may raise your hand to get a personal assistance immediately.

โดยสรุปแล้ว คุณจะได้เจอกับสถานการณ์ดังต่อไปนี้ คุณเป็นตัวแทนของบริษัท และมีอีกบริษัทคู่แข่งที่เป็นคู่ แข่งขันของคุณ ทั้งคู่มีอำนาจเต็มในการตัดสินใจทุกอย่างของบริษัท ทั้งสองบริษัทผลิตสินค้าที่เหมือนกันทุก ประการ และขายอยู่ในตลาดเดียวกัน เมื่อตั้งต้นระดับต้นทุนของทุกบริษัทจะเท่ากัน สิ่งๆเดียวที่คุณใช้ในการ แข่งขันซึ่งกันและกันคือระดับราคาที่คุณและคู่แข่งขันตั้ง โดยใครก็ตามที่ตั้งราคาต่ำกว่า จะสามารถขายสินค้าได้ ทั้งหมด โดยที่อีกฝ่ายที่ตั้งราคาต่ำกว่าไม่ได้กำไรเลย แต่หากตั้งราคาเท่ากัน ทั้งคู่จะได้ส่วนแบ่งจากกำไรคนละ ครึ่ง In conclusion, you will confront these following situations. You are a firm's representative and there is another firm which is your only competitor. Both you and your competitor have full authority to make any decision for your firms. Both firms produce exactly identical products and sell them in the same market. At the very beginning, cost of both parties will be identical. The only one thing you may use to compete with your competitor is price level. All customers will go for the one who set the lower price no matter how much it is lower. If both of you set the same price level, profit will be equally divided for both you and your competitor.

อย่างไรก็ตาม คุณและคู่แข่งขันสามารถเลือกที่จะตกลงตั้งราคาล่วงหน้าร่วมกันได้ โดยทั้งคุณและคู่แข่งขัน ต้องยินยอมร่วมกัน จึงจะสามารถตกลงราคาได้ ทั้งนี้เมื่อถึงเวลาตั้งราคาจริงนั้น คุณมีสิทธิที่จะตั้งราคาเท่าใดก็ ได้ อาจเท่ากับ หรือไม่เท่ากับที่ตกลงไว้กับคู่แข่งขันก็ได้

However, you and your competitor may choose to agree on price level in advance. Both of you can agree upon price level if and only if both of you agree to do so. Note that, even though both of you have agreed to set price at a specific level, you and your competitor are not abided by that agreement when you and your competitor actually set price.

หากคุณและคู่แข่งขันเลือกที่จะตกลงตั้งราคาล่วงหน้าร่วมกันแล้ว การกระทำดังกล่าวถือเป็นการผิด กฎหมาย และคุณอาจถูกปรับเมื่อหน่วยงานของรัฐสามารถสืบสวนพบ แต่หากสืบสวนไม่พบ ก็จะไม่มีการ ลงโทษ ยิ่งไปกว่านั้น คนใดคนหนึ่งอาจจะเลือกที่จะรายงานการตกลงราคาดังกล่าวต่อเจ้าหน้าที่ คนแรกที่ รายงานต่อเจ้าหน้าที่จะได้รับการยกเว้นโทษ ในขณะที่อีกคนไม่ว่าจะรายงานแต่ช้ากว่า หรือไม่ได้รายงาน จะถูก ลงโทษโดยไม่ต้องมีการสืบสวนอีก

If you and your competitor choose to agree on price level in advance, this action is illegal. You and your competitor may be fined if the authority could investigate the agreement. If the authority cannot detect, there will be no punishment. However, either you or your competitor may choose to report to the authority. The first one who reports the agreement to the authority will be given leniency while another one, no matter she reports later or does not report, will be fined without any investigation.

ในแต่ละรอบของการตั้งราคาสินค้า คุณสามารถเลือกที่จะลงทุนเพื่อปรับลดต้นทุนลงได้ แต่ไม่เกิน 5 หน่วย ในการปรับลดต้นทุนนั้น คุณจำต้องลงทุน ซึ่งส่งผลให้ต้นทุนสูงขึ้นในปริมาณที่เท่ากันในอีกสองรอบถัดไป หลังจากนั้นต้นทุนของคุณจะลดลงในทุกรอบ จนกว่าการทดลองจะสิ้นสุดลง โดยคุณสามารถปรับลดต้นทุนได้ ไม่จำกัดครั้ง

In each stage of price setting, you may choose to reduce your cost level for no more than 5 units. In cost reduction process, you have to invest for it. This shall temporarily increase your cost level for two periods. Afterwards, your cost will be lower for the same amount until the experiments is over. You may adjust your cost level at any period.

#### 2. รายละเอียด

- 2. Detail
  - a. เวลาในการทดลอง
  - a. Time

ในการทดลองนี้คุณจะได้ทำการตัดสินใจหลายรอบด้วยกัน โดยในแต่ละรอบของการตัดสินใจ คุณจะได้รับการ จับคู่กับอีกหนึ่งคน แต่คุณจะไม่ทราบว่าคู่ของคุณเป็นใคร เพียงแต่จะทราบเมื่อมีการเปลี่ยนคู่ คู่เริ่มต้นของคุณ ในรอบแรกนั้น จะได้มาจากการสุ่มอย่างสมบูรณ์ หลังจากนั้นในทุกๆรอบ จะมีการสุ่มว่าคุณจะต้องเปลี่ยนคู่ หรือไม่ โดยความน่าจะเป็นในการเปลี่ยนคู่ของคุณจะอยู่ในช่วง 0 ถึง 15 เปอร์เซ็น ตัวอย่างเช่น หากคุณอยู่กับคู่ เดิมมาสองรอบแล้ว ความน่าจะเป็นที่จะเปลี่ยนคู่ในรอบถัดไปจะอยู่ในช่วง 0 ถึง 15 เปอร์เซ็น และหากคุณยังอยู่

In the experiments, you will be able to make a decision in many periods. In each period, you will be matched with another one. However, you will not be informed whether who is your competitor. You will be informed when there is a switching. In the very beginning period, all pairs will be completely

้กับคู่เดิมมาสิบรอบแล้ว ความน่าจะเป็นที่จะเปลี่ยนคู่ในรอบถัดไปจะอยู่ในช่วง 0 ถึง 15 เปอร์เซ็น เช่นเดิม

randomized. Subsequently, in each of later periods, there will be a probability between 0 to 15 percents that you and your competitor will be separated. Otherwise, you will be with your same competitor in the next period. This level of probability will not be changed no matter how many times you have been with your competitor.

หากคุณต้องเปลี่ยนคู่ คุณจะได้รับการสุ่มให้เปลี่ยนคู่และจะได้รับแจ้งถึงการเปลี่ยนคู่ดังกล่าว อย่างไรก็ตาม หากคุณอยู่กับคู่เดิมของคุณมาเท่ากับ หรือ มากกว่า 20 รอบ การทดลองจะเป็นอันสิ้นสุดลง ตัวอย่างเช่น คุณอยู่ กับคู่เดิมมา 19 รอบ และไม่มีการเปลี่ยนคู่ในรอบที่ 20 คุณและคู่ของคุณจะได้กำหนดราคาในรอบดังกล่าวเป็น รอบสุดท้าย หลังจากนั้นการทดลองจะจบลง

If you are randomized to switch pair, you will be completely randomized with your new competitor. However, if you have been with the same competitor for 20 periods, the experiment ends.

การกระทำของคุณในแต่ละรอบจะเป็นเอกเทศ กล่าวคือ การตกลงราคาที่ไม่ถูกจับในรอบที่แล้ว จะไม่มีการ สืบสวนในรอบใดๆหลังจากนั้น และไม่สามารถถูกรายงานต่อเจ้าหน้าที่ได้

All of your action in each period will be singular. That is to say, all of your agreements in the previous periods will not be detected in the periods after and cannot be reported to the authority again.

การทดลองคาดว่าจะเสร็จสิ้นลงภายในหนึ่งชั่วโมง แต่เวลาที่แน่นอนไม่สามารถระบุได้แน่ชัด ด้วยเหตุผลเรื่อง เงื่อนไขความน่าจะเป็นดังกล่าวข้างต้น เราจะทำการเลิกการทดลองก่อนเวลาหนึ่งชั่วโมงหากการทดลองไม่ สิ้นสุดด้วยตนเองก่อนเวลาดังกล่าว

The experiment should finish within one hour. Nonetheless, certain time cannot be specified because of the condition above. No matter what, an experiment will be terminated at one hour.

ก่อนเริ่มการทดลอง จะมีการทดลองให้ท่านได้ทดลองก่อน 5 รอบ และการทดลองดังกล่าวไม่ส่งผลต่อรายได้ของ ท่านแต่ประการใด เมื่อมีการเริ่มการทดลองจริง ทุกท่านจะได้รับการจับคู่ใหม่ Before an experiment starts, you will have a chance to make a trial for 5 periods. These trial periods does not affect your final performance at all. When the real experiment begins, you will be matched with new competitor.

- b. ราคาและผลกำไร
- b. Price and profit

ในแต่ละรอบ คุณจะได้เลือกราคาของสินค้าที่ต้องการ ถ้าราคาของคุณต่ำกว่าของคู่แข่งขัน คุณจะได้รับกำไร ทั้งหมด หากเท่ากัน คุณและคู่แข่งขันจะแบ่งกำไรกันคนละครึ่ง แต่หากราคาของคุณสูงกว่าคู่แข่งขัน คุณจะไม่ได้ รับกำไรใดๆในรอบนั้น คุณสามารถตั้งราคาได้เป็นจำนวนเต็มซึ่ง ไม่ต่ำกว่าต้นทุนในรอบนั้นๆ และ ไม่เกิน 520 หน่วย

In each period, you will choose a price level. If your price level is lower than your competitor, you will get all profit. If both of you and your competitor set the same price level, profit will be equally divided. If your price level is higher than your competitor, you will get no profit in this period. You may set any price level which is no less than your cost at that period and less than 120 units.

ตัวอย่างเช่น หากต้นทุนของคุณเท่ากับ 500 หน่วย คุณตั้งราคา 509 หน่วยในขณะที่คู่แข่งขันของคุณตั้งราคาที่ 512 หน่วย คุณจะได้กำไรเท่ากับ 9 หน่วยในรอบนั้น หรือ หากต้นทุนของคุณเท่ากับ 100 หน่วย คุณตั้งราคา 509 หน่วยในขณะที่คู่แข่งขันของคุณตั้งราคาที่ 509 หน่วยเท่ากัน คุณและคู่แข่งขันจะได้รับกำไรเท่ากับ 4.5 หน่วย เท่ากัน

For example, if your cost is equal to 500 units and you set your price level at 509 units while your competitor sets price at 512 units, you will get profit for 9 units in this period. If you and your competitor set price at 509 units, each of you will get profit for 4.5 in this period.

- C. การปรับและลงโทษ
- c. Fine and punishment

ในทุกรอบ คุณและคู่แข่งขันจะได้รับโอกาสในติดต่อและตกลงราคากัน และหากทั่งคุณและคู่แข่งขันตกลงที่จะ ตกลงราคากัน ถือว่าคุณได้กระทำความผิดแล้ว และคุณอาจจะได้รับการลงโทษ โดยมีสองวิธีที่คุณอาจได้รับการ ลงโทษ

In every period, you and your competitor will be able to negotiate and agree on price level. If both of you agree to do so, both of you will be counted as a wrongdoers and might be fined. You may be fined by two possible cases:

วิธีแรก คุณ และ คู่แข่งขันของคุณจะมีโอกาสในการรายงานการตกลงราคาต่อเจ้าหน้าที่ หากใครเป็นผู้ ที่รายงานต่อเจ้าหน้าที่ก่อน ผู้นั้นไม่ต้องจ่ายค่าปรับใดๆ ในขณะที่คู่แข่งขันต้องจ่ายค่าปรับ คือ ขาดทุน 5 หน่วย ในรอบนั้นๆ โดยในการรายงานต่อเจ้าหน้าที่นั้น มีโอกาสให้รายงานสองรอบด้วยกัน กล่าวคือ ในรอบแรก ภายหลังจากที่มีการตกลงราคาแล้วแต่ยังไม่ได้กำหนดราคา แต่หากในรอบแรกไม่มีผู้ใดรายงานต่อเจ้าหน้าที่ ภายหลังจากมีการกำหนดราคาของทั้งคู่ และทั้งคู่ทราบราคาที่กำหนดแล้ว จะมีการเปิดโอกาสให้รายงานต่อ เจ้าหน้าที่อีกครั้งหนึ่ง

First, you and your competitor will be able to report to the authority about the agreement. The one who reports earlier will be given a leniency and will not be fined. Another one who was reported will certainly be fined in that period. The fine will make you loss for 5 units in that period. There are two stages to report. In first possible stage, you may report to the authority after agreeing on price but before setting price. If there is no report in the first possible stage, after setting price and both you and your competitor know the price levels of each other, you may report to the authority in this stage instead.

วิธีที่สอง ถ้าไม่มีผู้ใดรายงานต่อเจ้าหน้าที่ เจ้าหน้าที่อาจสืบสวนพบการกระทำความผิดได้เอง ด้วย ความน่าจะเป็นที่สุ่มขึ้นมาในแต่ละรอบของการแข่งขัน ตัวอย่างเช่น ในรอบที่ 2 ภายหลังจากที่มีการตกลงราคา กันของคุณและคู่แข่งขัน มีการสุ่มค่าความน่าจะเป็นได้เป็นตัวเลข 13 เปอร์เซ็น และเลข 13 เปอร์เซ็นนี้จะถูกใช้ เป็นค่าความน่าจะเป็นในการสืบสวนพบว่ามีการกระทำความผิด ในขณะที่ค่าความน่าจะเป็นในการสืบสวนไม่ พบการกระทำความผิดเท่ากับ 87 เปอร์เซ็น

Second, if there is no report to the authority. The authority may investigate and detect the offense by itself. The level of probability to detect the offense will be completely randomized in each step. For example, in period 2, randomization process gives the level of probability to detect equal to 13 percents. This level of probability will be used to investigate the offense.

- d. การปรับลดต้นทุน
- d. Cost Reduction

ในแต่ละรอบ คุณมีสิทธิที่จะลงทุนเพื่อปรับต้นทุน โดยคุณสามารถเลือกที่จะปรับลดต้นทุนเท่าไรก็ได้ แต่ไม่เกิน 5 หน่วยต่อรอบ โดยคุณต้องแบกรับต้นทุนที่เพิ่มขึ้นในจำนวนเท่ากัน ในสองรอบถัดไป หลังจากนั้นต้นทุนของคุณ จะลดลงด้วยจำนวนที่เท่ากันไปในทุกรอบจนจบการทดลอง คุณสามารถเลือกที่จะปรับลดต้นทุนได้ในทุกรอบ ของการทดลอง

In each period, you will be able to reduce your cost level for no more than 5 units. However, before getter cost reduction, you have to invest for the same amount temporarily. In the next two periods after making a decision to reduce cost, your cost level will increase for the same amount. Afterwards, your cost level will be reduced by the same amount until the experiment ends.

ตัวอย่างเช่น ในรอบที่ 2 คุณเลือกปรับลดต้นทุน 5 หน่วย จากต้นทุนเดิม 500 หน่วย ในรอบที่ 3 และ 4 ต้นทุน ของคุณจะเท่ากับ 505 หน่วย นับตั้งแต่รอบที่ 5 เป็นต้นไป ต้นทุนจะเท่ากับ 95 หน่วย แต่หากในรอบที่ 3 คุณ เลือกที่จะลดต้นทุนอีก 4 หน่วย ต้นทุนของคุณในรอบที่ 4 จะเท่ากับ 500+5+4 = 509 หน่วย และต้นทุนในรอบที่ 5 เท่ากับ 500+4-5 = 499 หน่วย ต้นทุนรอบที่ 6 เท่ากับ 500-4-5 = 491 หน่วย และต้นทุนรอบที่ 7 เป็นต้นไปจะ เท่ากับ 491 หน่วย หากไม่มีการปรับต้นทุนอื่นใดนอกจากนี้ เป็นต้น

For example, in the second period, you choose to reduce cost for 5 units from your initial cost level 500 units. In the third and fourth periods, you cost will be equal to 505 units. From the fifth period on,

your cost level will be equal to 495 units. However, in the same scenario, if you choose to reduce cost again in the third period by 4 units, your cost in the fourth period will be equal to 500+5+4 = 409 units and your cost in the fifth period will be equal to 500+4-5 = 499 units. Finally, your cost from the sixth period on will be equal to 500-4-5 = 491 units until the experiment ends.

#### e. รายได้

e. Income

รายได้ของคุณจะเท่ากับจำนวนกำไรสุทธิที่คุณทำได้ภายหลังจากจบการทดลอง โดยหากคุณเป็นผู้ที่ทำกำไรได้ สูงสุดสามอันดับแรก คุณจะได้รับรางวัลพิเศษเป็นประกาศนียบัตรเชิดชูเกียรติ และเงินรางวัลพิเศษเพิ่มจากกำไร สุทธิที่คณได้ดังต่อไปนี้

Your income will be equal to your net profit after the experiment ends. Moreover, if you can make the top-three highest profit, you will receive an extra income as follows:

อันดับที่ 1 ได้รับเกียรติบัตรเชิดชูเกียรติพร้อมเงินรางวัลพิเศษอีก 500 บาท

Rank 1 Extra incomes for 500 baht

อันดับที่ 2 ได้รับเกียรติบัตรเชิดชูเกียรติพร้อมเงินรางวัลพิเศษอีก 300 บาท

Rank 2 Extra incomes for 300 baht

อันดับที่ 3 ได้รับเกียรติบัตรเชิดชูเกียรติพร้อมเงินรางวัลพิเศษอีก 200 บาท

Rank 3 Extra incomes for 200 baht

นอกจากนั้น หากคุณสามารถทำกำไรได้สูงสุดเป็นสิบอันดับแรก คุณจะได้รับเกียรติบัตรเชิดชูเกียรติเช่นกัน แต่ ไม่ได้รับเงินรางวัลพิเศษแต่ประการใดนอกเหนือจากกำไรสุทธิที่ต้องได้รับอยู่แล้วนั้น

Furthermore, if you are ranked at the top-ten, you will be awarded the diploma also.

อย่างไรก็ตาม หากภายหลังจากการทดลองสิ้นสุดลง และปรากฏว่าคุณขาดทุน คุณจำต้องจ่ายเงินในส่วนที่ ขาดทุนดังกล่าวด้วยเช่นกัน

However, if the result turns out to be loss, you have to pay this loss also.

เงินค่าตอบแทนทั้งหมดดังกล่าวข้างต้น จะมีการทำการเบิกจ่ายแก่ท่านภายหลังการทดลองสิ้นสุดลง ในรูปของ เงินสด

All of payments will be paid to you in cash after the experiment finishes.

- f. การตัดสินใจในแต่ละรอบ แบ่งออกเป็น 8 ขั้นตอน
- g. Each period decisions comprise of 8 stages

# <u>ขั้นตอนที่ 1</u> การจับคู่ และ ตกลงตั้งราคา

#### Stage 1 Matching and Price Agreement

ในทุกๆรอบจะมีการแจ้งให้ท่านทราบว่ามีการเปลี่ยนคู่แข่งขันใหม่หรือไม่ การสับเปลี่ยนเป็นไปโดยสุ่ม แต่ความ น่าจะเป็นในการสับเปลี่ยนคู่แข่งขันจะไม่เกินกว่าร้อยละ 15 หลังจากนั้นคุณจะได้รับการสอบถามว่า ต้องการที่ จะตกลงตั้งราคากับคู่แข่งขันหรือไม่ การตกลงตั้งราคาจะเกิดขึ้นต่อเมื่อ ทั้งคุณและคู่ของคุณตกลงที่จะตั้งราคา ด้วยกันทั้งคู่

In every period, you will be informed whether there is any matching or not. Matching process will be randomized within the range of 0 to 15 percents of probability. After that, you will be asked whether you want to agree on price level with your competitor or not. The negotiation process will occur if and only if both of you agree to do so.

# <u>ขั้นตอนที่ 2</u> การตกลงตั้งราคา

# Stage 2 Price Negotiation

หากทั้งคุณและคู่ของคุณตกลงที่จะตั้งราคา หน้าจอในการตกลงตั้งราคาจะปรากฏ คุณสามารถเลือก เสนอราคาของคุณ และเห็นราคาของคู่แข่งขันของคุณ อย่างไรก็ตาม คุณหรือคู่แข่งขันของคุณ ไม่ผูกมัดที่จะต้อง ตั้งราคาตามที่ตกลงกันไว้แต่ประการใด

If both you and your competitor agree to negotiate price level, negotiating screen will appear. You may choose to propose your desired price level and you could also see your competitor's offer. The negotiation process will be terminated, if both of you offer the same price level. However, either of you are abided by this price level.

# <u>ขั้นตอนที่ 3</u> การตั้งราคา

Stage 3 Price Setting

เมื่อคุณเข้ามาสู่การตั้งราคาของตัวคุณเอง คุณสามารถเลือกระดับราคาที่ต้องการขายได้ตามแต่ ต้องการ โดยราคาดังกล่าวจะไม่ต่ำไปกว่าต้นทุนของคุณในรอบนั้นๆ และไม่สูงเกินไปว่า 520 ในขณะที่ตั้งราคา คุณและคู่แข่งขันจะยังไม่ทราบราคาของกันและกัน

Later on, you have to set a price level. You may choose any price level you want. However, your price level must be at least equal to your current cost level and less than or equal to 520. In this stage, you still do not know your competitor's price level.

<u>ขั้นตอนที่ 4</u> การแจ้งเจ้าหน้าที่ก่อนมีการแสดงราคาของทั้งคู่

Stage 4 Report to Authority

คุณสามารถเลือกที่จะแจ้งเจ้าหน้าที่ถึงการตกลงราคาในขั้นตอนที่ 2 ได้ โดยหากคุณเป็นคนที่กดแจ้ง เจ้าหน้าที่ก่อน คุณจะได้รับการยกเว้นโทษ และคู่แข่งขันของคุณจะถูกลงโทษในรอบนั้นๆอย่างแน่นอน

You may choose to report the agreement and negotiation in stage 2 to the authority, If you are the first who reports, you will be given leniency and will not be fined certainly.

้<u>ขั้นตอนที่ 5</u> การแสดงราคา และการแจ้งเจ้าหน้าที่ภายหลังการแสดงราคาของทั้งคู่

Stage 5 Price Report and Second Chance to Report to Authority

ในขั้นตอนนี้ ระดับราคาที่คุณและคู่แข่งขันเลือกจะถูกแสดงขึ้น

In this stage, your price level and your competitor's price level will be reported to both of you.

หากไม่มีการแจ้งเจ้าหน้าที่ในขั้นตอนที่ 4 เกิดขึ้น จะมีหน้าจอเพื่อให้คุณสามารถเลือกที่จะแจ้ง เจ้าหน้าที่ถึงการตกลงราคาในขั้นตอนที่ 2 ได้ โดยหากคุณเป็นคนที่กดแจ้งเจ้าหน้าที่ก่อน คุณจะได้รับการยกเว้น โทษ และคู่แข่งขันของคุณจะถูกลงโทษในรอบนั้นๆอย่างแน่นอน

If there is no report in stage 4, you will be asked whether you would like to report to the authority or not. Again, if you are the first one who chooses to report, you will be given a leniency and will not be fined certainly.

<u>ขั้นตอนที่ 6</u> การสืบสวน

Stage 6 Investigation

หากมีการตกลงตั้งราคากันเกิดขึ้น และไม่มีการแจ้งเจ้าหน้าที่แต่ประการใด จะมีการสืบสวนเกิดขึ้น โดยความน่าจะเป็นที่การตกลงตั้งราคาดังกล่าวจะถูกจับได้จะเป็นไปโดยสุ่ม หากมีการสุ่มแล้วท่านถูกจับได้ จะ ถูกลงโทษโดยปรับให้ท่านขาดทุนเป็นจำนวนเท่ากับ 5 หน่วย

If there is an agreement on price and no report to the authority, there will be an investigation. The probability level of detection will be randomized and this probability level will be used to randomize whether the offense will be detected or not. If you are detected, you will be fined to loss for 5 units.

# <u>ขั้นตอนที่ 7</u> ปรับลดต้นทุน

# Stage 7 Cost Reduction

ในทุกรอบ คุณจะมีสิทธิเลือกที่จะปรับต้นทุน เป็นจำนวนเท่าใดก็ได้ ตั้งแต่ 0 ถึง 5 โดยเมื่อเลือกปรับ ต้นทุนแล้ว คุณจะต้องแบบรับต้นทุนที่เพิ่มขึ้นเป็นจำนวนเท่ากันไปอีกสองรอบถัดไป ก่อนที่จะได้รับการปรับ ต้นทุนตามที่คุณต้องการไปจนจบการทดลอง

In every period, you may choose to reduce cost level for no more than 5 units. If you choose to reduce your cost, you will have to invest for the same amount in the next two periods first. After that, your cost will be reduced for the same amount until the experiment ends.

# <u>ขั้นตอนที่ 8</u> สรุป

### Stage 8 Conclusion

ในขั้นตอนนี้ คุณจะได้ทราบถึงการตัดสินใจทั้งหมดในรอบที่ผ่านมานี้ ทั้งระดับราคา กำไรในรอบนี้ กำไรสุทธิของทุกรอบที่ผ่านมา การปรับและการตรวจจับ ของทั้งคุณและคู่แข่งขัน

In this stage, you will be informed all of your decisions and your competitors' decisions in this period. Both periodical and net profits of both of you will be shown.

## 3. การจบการทดลอง

3. End of Experiment

การทดลองจะสิ้นสุดลงเมื่อมีคุณและคู่แข่งขันแข่งขันติดต่อกัน 20 รอบโดยไม่มีการสับเปลี่ยนคู่ หรือการทดลอง ผ่านไป 1 ชั่วโมง

The experiment will be terminated after the same pair has been together for 20 periods or time has passed for 1 hour.

ภายหลังจบการทดลอง ขอความกรุณาให้คุณได้ตอบคำถามในแบบสอบถามภายหลังจากการทดลองจนเสร็จ After the experiment ends, please fill in the questionnaire.

ข้อมูลทั้งหมดจะถูกเก็บไว้เพื่อใช้ในการประเมินผลการทดลองต่อไป

All information will be kept for data analysis later on.

ขอความกรุณาให้คุณอ่านข้อมูลนี้ด้วยตัวคุณเองอีกครั้งหนึ่ง หากมีปัญหาประการใด ขอให้ยกมือขึ้นเพื่อซักถาม และเราจะตอบคำถามของคุณเป็นรายคน

Would you please read this instruction by yourself once again? If you have any queries, please do not hesitate to raise your hand up or call any experimenter. You will be informed personally.

ขอบพระคุณสำหรับความร่วมมือในการทดลองนี้เป็นอย่างยิ่งครับ ขอให้สิ่งศักดิ์สิทธิ์ดลบันดาลให้ ท่านโซคดีและประสบความสำเร็จ

I thank you very much for your participation. Good luck.

**APPENDIX F: SCREENSHOTS OF COMPUTER PROGRAM** 

0.00 Economic Experiment - Mozilla Firefox		
Ele Edit View History Bookmarks Bools Help		
👙 🗤 🔹 😋 🔕 🛕 🔳 http://192.168.1.33.8080/econex.pr/	🖸 🔹 🔯 🕯 Cooge	a.)
📷 Most Visited 🐐 🛞 Getting Statied 😓 Latest Headlines 🐐		
🖀 Economic Experiment 🛛 🔶		
Litténa eri vu		
ofani w		

ลิตาอิน ถึงไม่เคยลงของปีกร ลงของปีกระที่นี่ได้เลย

Screenshot 1: Starting screen of all users including server

201

👲 💩 🚯 Economic Experiment - Mozilla Firefox		
Ele Lat View Higtory goolman's Join Help		
A the A G O O O O O O O O O O O O O O O O O O	Z. A. M. A. Couchs	-
Most Visited * Getting Started Latest Headlines *		
Economic Experiment		,
rviasinu eee		
Bandhu		
ถึงในโดยและกระเนียน และกระนี้ยนที่มีได้และ		
Done		

Screenshot 2: Server: putting username and password to be a server (username: yok and password: yok)



Screenshot 3: Server: Starting page of server when there is no client connected

Ele Lot ylew Higtory Bookmarks Bolts Help		
🐗 🎼 🕐 😋 🔕 🛕 http://192.168.1.33.8080/econex.pr/	( +) (4 + Groupe	0,
most Visited * 🗑 Getting Started 🔂 Latest Headlines *		
Economic Experiment X Economic Experiment X 🌵		
Variante da La Carte da Carta da Cart		
entani vedina ke		
amuticul		
กลับใบพืชให้สุกอิน		

Screenshot 4: Client1 and Client2: starting page for new client.

Done
● ● ● Economic Experiment - Mozilla Firefox		
Elle Edit View History Bookman's Sols Help		
· · · · · · · · · · · · · · · · · · ·		
Most Visited *   Getting Started  Latest Headlines *		
Conomic Experiment 🗙 🔛 Economic Experiment 💥	Economic Experiment X 😌	*
	Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 0001)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = ppr = 000120 pp. 0 = 4(512 = 000)         Prove (Tride 1 = 00011 = 21 = pp. 0 = 000120 pp. 0 = 4(512 = 000120	
Done		

Screenshot 5: Server: clients have logged in already (client 1 = wwww, client 2 = qqqq)

	Conomic Experiment - Mazilia Firefax				
	💷 💮 🔻 😋 🚫 🚫 🔳 http://192.168.1.13.8080/wco	vexpri		🗇 🕈 🔣 🕈 Cócodie	
Itexamic Lippeiniert       X       Itexamic Lippeiniert       X       Itexamic Lippeiniert       X         Value       Value       Value       Value       Value       Value         Value       Value       Value       Value       Value       Value	Most Visited * Getting Started Dilatest Headlines *				
4	Conomic Experiment X Economic Experiment	X D Economic Experime	ert X +		
	Economic Experiment 3	K Economic Expension	No.         No.           Ymper(         The information of a contract in (2000)           Ymper(         The information of a contract in (2000)		

Screenshot 6: Client 1: client's screen after logging in (client 1 = wwww, client 2 = qqqq)

# รายชื่อผู้ทดลองที่ออนไลน์แล้ว(2 คน):

www.(7h5e1m6011a21mgeo06c39pjp-ba gggg(7h5e1m6011a21mgeo06c39pjp-4c	ee062c) 5fleb9)
เริ่มต้นการทดลอง!	
🔍 แบบไม่มีการฟ้องตำรวจ	
🗅 โบบไม่มีการสอบสวน	
จบการทดลอง รอบนี้เป็นรอบสุดท้าย	
ล้างฐานข้อมูลทั้งหมด(3)	

Screenshot 7: Server: server may choose to use antitrust treatment (default treatment is leniency program)

# รายชื่อผู้ทดลองที่ออนไลน์แล้ว(2 คน):

wwww(7h5elm60lla2lmgeo gggg(7h5elm60lla2lmgeo	06c39pjp-bae 06c39pjp-4c5	e062c) ofleb9)		
เริ่มต้นการทดลอง!				
แบบไม่มีการสอบสวน				
3มการของง รอบนี้เป็นระ	อมสุดท้าย			
-	1040010			
ล้างฐานข้อมูลทั้งหมด(3)				

Screenshot 8: Server: Server: server may choose to use Laissez Faire treatment (default treatment is leniency program)

# รายชื่อผู้ทดลองที่ออนไลน์แล้ว(2 คน):

wwww(7h5elm60lla21mgeo06c39pjp-baee062c) gggg(7h5elm60lla21mgeo06c39pjp-4c5fleb9)
ขณะนี้กำลังทำการทดลองแล้ว
🔲 แบบไม่มีการฟ้องตำรวจ
🦳 แบบไม่มีการสอบสวน
จบการทดลอง รอบนี้เป็นรอบสุดท้าย
ล้างฐานข้อมูลทั้งหมด(3)

Screenshot 9: Server: Server chooses default (leniency program) treatment and clicks the button to start experiment

รอบนี้เป็นรอบที่ : 	L
รหัสของคุณคือ v	www
ดันทุนของคุณตอ	นนี้คือ 100
กำไรสุทธิ:0	
รหัสของคู่แข่งขอ	งคุณคือ qqqq
คู่แข่งของคุณมีตั	นทุน 100
จำนวนรอบที่คุณ	คยเล่นกับคู่แข่งคนนี้คือ 0
มีความเสียง แต่มันก็สาม และหักหลัง การตกลงร ต้องการตก ต้องการ	ในการโดนสอบสวนโดยเจ้าหน้าที่และโดนปรับเงินได้ ารถทำให้เราทราบข้อมูลของคู่แข่ง คู่แข่งโดยการเป็นคนไปแจ้งเจ้าหน้าที่ก่อน และขอสิทธิละเว้นการลงโทษ เคาจะเกิดขึ้นได้ หากทั้งสองคนยินยอมที่จะตกลงกัน ลงราคากับคู่แข่งหรือไม่ ไม่ต้องการ
	รายงานผล
	ในรอบนี้ เราได้สุ่มจับคู่แข่งขันของท่านใหม่ OK

Screenshot 10: Client 1: the experiment begins by informing client that he/she was matched to the new pair (1<sup>st</sup> period)

รอบนี้เป็นรอบที่ 1 รหัสของคุณคือ wwww ดันทุนของคุณตอนนี้คือ 100 กำไรสุทธิ:0 \_\_\_\_\_ รหัสของคู่แข่งของคุณคือ qqqq คู่แข่งของคุณมีต้นทุน 100 จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0 การตกลงราคากับคู่แข่งเพื่อฮั้วราคากันในการขายสินค้าต่างๆ มีความเสี่ยงในการโดนสอบสวนโดยเจ้าหน้าที่และโดนปรับเงินได้ แต่มันก็สามารถทำให้เราทราบข้อมูลของคู่แข่ง และหักหลังคู่แข่งโดยการเป็นคนไปแจ้งเจ้าหน้าที่ก่อน และขอสิทธิละเว้นการลงโทษ การตกลงราคาจะเกิดขึ้นได้ หากทั้งสองคนยินยอมที่จะตกลงกัน ต้องการตกลงราคากับคู่แข่งหรือไม่ ด้องการ ไม่ต้องการ

Screenshot 11: Client 1: After clicking OK button, client was asked to make a decision whether they would like to negotiate price with competitor or not.

รอบนี้เป็นรอบที่	1	
รหัสของคุณคือ (	ppp	
ดันทุนของคุณตล	อนนี้คือ 100	
กำไรสุทธิ:0		
รหัสของคู่แข่งขอ	งคุณคือ www	N
คู่แข่งของคุณมีต้	ันทุน 100	
จำนวนรอบที่คุณ	เคยเล่นกับคู่แ	ย่งคนนี้คือ 0
การตกลงร มีความเสี่ย แต่มันก็สาม และหักหลัง การตกลงร ต้องการตก ต้องการ	าคากับคู่แข่งเร่ งในการโดนสอ มารถทำให้เราห คู่แข่งโดยการ าคาจะเกิดขึ้นไ ลงราคากับคู่แ ไม่ต้องการ	งื่อฮั้วราคากันในการขายสินค้าต่างๆ บสวนโดยเจ้าหน้าที่และโดนปรับเงินได้ เราบข้อมูลของคู่แข่ง เป็นคนไปแจ้งเจ้าหน้าที่ก่อน และขอสิทธิละเว้นการลงโทษ ด้ หากทั้งสองคนยินยอมที่จะตกลงกัน ข่งหรือไม่

Screenshot 12: Client 2: Another client will be asked the same.

เอบนี้เป็นรอบที่ 1	
หัสของคุณคือ wwww	
<i></i> ล้นทุนของคุณตอนนี้คือ 100	
ำไรสุทธิ:0	
หัสของคู่แข่งของคุณคือ qqqq	
<u>ู่แข่งของคุณมีต้นทุน 100</u>	
่านวนรอบที่คุณเคยเล่นกับคู่แข่งห	คนนี้คือ 0
การตกลงราคากับคู่แข่งเพื่อม มีความเสี่ยงในการโดนสอบส แต่มันก็สามารถทำให้เราทรา และหักหลังคู่แข่งโดยการเป็น การตกลงราคาจะเกิดขึ้นได้ ง ต้องการตกลงราคากับคู่แข่ง ต้องการ ไม่ต้องการ	ชั้วราคากันในการขายสินค้าต่างๆ เวนโดยเจ้าหน้าที่และโดนปรับเงินได้ เบข้อมูลของคู่แข่ง นคนไปแจ้งเจ้าหน้าที่ก่อน และขอสิทธิละเว้นการลงโทษ หากทั้งสองคนยินยอมที่จะตกลงกัน หรือไม่

Screenshot 13: Client 1: Supposed that client 1 chooses to negotiate by clicking OK button.

รอบนี้เป็นรอบที่ 1	
รหัสของคุณคือ www	
ดันทุนของคุณตอนนี้คือ 100	
กำไรสุทธิ:0	
 รหัสของคู่แข่งของคุณคือ qqqq	
คู่แข่งของคุณมีตันทุน 100	
จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0	
การตกลงราคากับคู่แข่งเพื่อฮั้วราคากันในการขาย มีความเสี่ยงในการโดนสอบสวนโดยเจ้าหน้าที่และโ แต่มันก็สามารถทำให้เราทราบข้อมูลของคู่แข่ง และหักหลังคู่แข่งโดยการเป็นคนไปแจ้งเจ้าหน้าที่ก่ การตกลงราคาจะเกิดขึ้นได้ หากทั้งสองคนยินยอม ต้องการตกลงราคากับคู่แข่งหรือไม่ คุณได้เลือกตกลง กรุณารอคู่แข่งตัดสินใจชักครู่	สินค้าต่างๆ เดนปรับเงินได้ ่อน และขอสิทธิละเว้นการลงโทษ ที่จะตกลงกัน ไม่ต้องการ

Screenshot 14: Client 1: each subject has to wait for his/her competitor to make a decision in each stage of period.

มนี้เป็นรอบที่ 1 		
ของคุณคือ wwww		
กุนของคุณตอนนี้คือ 100		
รสุทธิ:0		
 เของคู่แข่งของคุณคือ qqqq		
ข่งของคณมีต้นทน 100		
เวนรอบที่คณเคยเล่นกับค่แข่งคนเ	นี้คือ 0	
ราคาที่คุณเสนอ	ราคาที่คู่แข่งเสนอ	
	รายงานผล	
	ด่แข่งขั้งสองสนใจที่จะตกองราดาจ่างหม้ากัง	
ตกลงกับคู่แข่งล่วงหน้าว่าจะขาะ		แข่ง ยกเลิกการตกลงราคา
	UK	

Screenshot 15: Client 1: If both subjects choose to negotiate price level, the negotiating screen will appear.

รหัสของคุณคือ www ดันทุนของคุณตอนนี้คือ 100 กำไรสุทธิ:0

รหัสของคู่แข่งของคุณคือ qqqq คู่แข่งของคุณมีตันทุน 100 จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0

าก กกุณสมย				เบิงอางสนอ		
	\$					
เกลงกับคู่แข่งล่วงห	หน้าว่าจะขายสินค้าใ	ในราคา 100 ⊽	บาท	ตกลงราคานี้	กับค่แข่ง	ยกเลิกการตกลงราคา

Screenshot 16: Client 1: Negotiating screen comprises of two sections that show both parties' offers.

รหัสของคุณคือ www
ดันทุนของคุณตอนนี้คือ 100
กำไรสุทธิ:0

รหัสของคู่แข่งของคุณคือ qqqq คู่แข่งของคุณมีตันทุน 100 จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0

Screenshot 17: Client 1: suppose that client 1 (www) chooses the price level 113 units and click to offer.

รหัสของคุณคือ wwww

ต้นทุนของคุณตอนนี้คือ 100

กำไรสุทธิ:0

รหัสของคู่แข่งของคุณคือ qqqq

คู่แข่งของคุณมีต้นทุน 100

จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0

Screenshot 18: Client 1: the offering price will be shown on both parties' screen.

รหัสของคุณคือ qqqq ตันทุนของคุณตอนนี้คือ 100 กำไรสุทธิ:0

รหัสของคู่แข่งของคุณคือ www คู่แข่งของคุณมีต้นทุน 100

จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0

าคาทีคุณเสนอ	ราคาที่คู่แข่งเสนอ
	113
กลงกับคู่แข่งล่วงหน้าว่าจะขายสินค้า	้ในราคา 100 ⊽ บาท ตกลงราดานี้กับเด่แข่ง ยกเลิกการตกลงราคา

Screenshot 19: Client 2: the offering price will be shown on both parties' screen.

รหัสของคุณคือ qqqq ตันทุนของคุณตอนนี้คือ 100 กำไรสุทธิ:0

รหัสของคู่แข่งของคุณคือ wwww คู่แข่งของคุณมีตันทุน 100 จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0

าคาที่คุณเสนอ	ราเ	กาที่คู่แข่งเสนอ	
	11	.3	
กลงกับคู่แข่งล่วงหน้าว่าจะขายสินศ์	าในราคา 112 ▼ บา	ท ตกลงราคานี้กับคู่แข่ง	ยกเลิกการตกลงราคา

Screenshot 20: Client 2: subjects can respond price level back and forth

รอบนี้เป็นรอบที่ 1 ------

-----

รหัสของคุณคือ www ตันทุนของคุณตอนนี้คือ 100 กำไรสุทธิ:0

รหัสของคู่แข่งของคุณคือ qqqq คู่แข่งของคุณมีต้นทุน 100

จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0

113	112

Screenshot 21: client 1: all offers will appear on screen.

รหัสของคุณคือ www ดันทุนของคุณตอนนี้คือ 100 กำไรสุทธิ:0

-----

รหัสของคู่แข่งของคุณคือ qqqq

คู่แข่งของคุณมีต้นทุน 100

จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0

าคาที่คุณเสนอ	ราคาที่คู่แข่งเสนอ
113 111 117 115	112 110 118
ากลงกับคู่แข่งล่วงหน้าว่าจะขายสินเ	าในราคา 115 ▼ บาท กรุณารอคำ เอบจากคู่แข่งก่อน ยกเลิกการตกลงราคา

Screenshot 22: client 1: all offers will be shown ordering by time.

รหัสของคุณคือ qqqq ตันทุนของคุณตอนนี้คือ 100 กำไรสุทธิ:0 ------รหัสของคู่แข่งของคุณคือ wwww

คู่แข่งของคุณมีดันทุน 100

จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0

ราคาทศูแขงเลนอ
113
111
117
115
115 ♥ บาท ตกลงราคานี้กั∖ุคู่แข่ง ยกเลิกการตกลงราคา

Screenshot 23: client 2: all offers will be shown ordering by time

รอบนี้เป็นรอบที่ 1 รหัสของคุณคือ qqqq ต้นทุนของคุณตอนนี้คือ 100	
กำไรสุทธิ:0 	
รหลของคูแขงของคุณมีตันทุน 100 จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0	
ราคาที่คุณเสนอ	ราคาที่คู่แข่งเสนอ
112 110 118 115	113 111 117 115
รายงานผล การตกลงราคากับค่แข่งเร	ป็นผลสำเร็จ ราคาที่ตกลงกันไว้คือ115
ตกลงกับคู่แข่งล่วงหน้าว่าะ	ยกเลิกการตกลงราคา

Screenshot 24: Client 2: Negotiation will be ended when both offer the same price level (115 in this case)

รอบนี้เป็นรอบที	1
รหัสของคุณคือ	www
ดันทุนของคุณต	เอนนี้คือ 100
ก <mark>ำไรสุทธิ</mark> :0	
รหัสของคู่แข่งข คู่แข่งของคุณมี จำนวนรอบที่คุถ	- องคุณคือ qqqq ตันทุน 100 นเคยเล่นกับค่แข่งคนนี้คือ 0
ต้องการที่	จะแจ้งเจ้าหน้าที่ว่ามีการตกลงกันล่วงหน้าเกิดขึ้นเพื่อได้รับการยกเว้นโทษ ในขณะคู่แข่งขันถูกลงโทษหรือไม่

Screenshot 25: Client 1: subject will be asked whether they would like to report to the authority or not.

รหัสของคุณคือ wwww	
ดันทุนของคุณตอนนี้คือ 100	
กำไรสุทธิ:0	
รหัสของคู่แข่งของคุณคือ qqqq	
คู่แข่งของคุณมีดันทุน 100	
จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคน	เน็คือ 0
4	
L	
<u>L</u>	
<u></u>	
L	
	รายงานผล
	รายงานผล ดูณได้แจ้งเจ้าหน้าที่เรียบร้อยแล้ว
	รายงานผล ดุณได้แจ้งเจ้าหน้าที่เรียบร้อยแล้ว OK

Screenshot 26: Client 1: If he/she reports to the authority, they will be confirmed by the small notice on the screen.

รอบนี้เป็นรอบที่ 1
ดันทุนของคุณตอนนี้คือ 100
กำไรสุทธิ:0
 รหัสของคู่แข่งของคุณคือ qqqq
คู่แข่งของคุณมีตันทุน 100
จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0
กำหนดราคาที่ต้องการ ระหว่างท่านกับคู่แข่งใครตั้งราคาถูกกว่า ลูกค้าจะชื้อของคนนั้น หากท่านและคู่แข่งตั้งราคาเท่ากัน ลูกค้าจะชื้อของแต่ละท่านอย่างละครึ่งนึง (ท่านไม่จำเป็นต้องเหมือนกับที่ตกลงกับคู่แข่งเอาไว้) 100 ▼ กำหนดราคา

Screenshot 27: Client 1: Subject has to choose desired price level.

รอบนี้เป็นรอบที่ 1	
รหัสของคุณคือ wwww	
ดันทุนของคุณตอนนี้คือ 100	
กำไรสุทธิ:0	
รหัสของคู่แข่งของคุณคือ qqqq	
คู่แข่งของคุณมีดันทุน 100	
จำนวนรอบที่คุณเคยเล่นกับค่แข่งคนนี้คือ 0	
กำหนดราคาที่ต้องการ ระหว่างท่านกับคู่แข่งใครตั้งราคาถูกกว่า ลูกค้าจะชื้อของคนนั้น หากท่านและคู่แข่งตั้งราคาเท่ากัน ลูกค้าจะชื้อของแต่ละท่านอย่างละค (ท่านไม่จำเป็นต้องเหมือนกับที่ตกลงกับคู่แข่งเอาไว้) 113 กำหนดราคา	รึ่งนึง

Screenshot 28: Client 1: In this case, subject chooses price level equals to 113 units.

รอบนี้เป็นรอบที่ 1
รหัสของคุณคือ wwww
ต้นทุนของคุณตอนนี้คือ 100
กำไรสุทธิ:0
รหัสของคู่แข่งของคุณคือ qqqq
กู่แข่งของคุณมีดันทุน 100
จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0
กำหนดราคาที่ต้องการ ระหว่างท่านกับคู่แข่งใครตั้งราคาถูกกว่า ลูกค้าจะชื้อของคนนั้น หากท่านและคู่แข่งตั้งราคาเท่ากัน ลูกค้าจะชื้อของแต่ละท่านอย่างละครึ่งนึง (ท่านไม่จำเป็นต้องเหมือนกับที่ตกลงกับคู่แข่งเอาไว้) 113 ♥ กำหนดราคา

Screenshot 29: Client 1: After choosing desired price level, subject has to click confirm button.

รหัสของคุณคือ wwww	
ค้นทุนของคุณตอนนี้คือ 100	
ำไรสุทธิ:0	
รหัสของคู่แข่งของคุณคือ qqqq	
บู่แข่งของคุณมีตันทุน 100	
ว่านวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0	

Screenshot 30: Client 1: As always, subject has to wait for his/her competitor to finish choosing price.

3

ตกลง

Screenshot 31: Client 1: both price levels are shown.

5	งอบนี้เป็นรอบที่ 1 
-	รหัสของคุณคือ qqqq
Ġ	ค้นทุนของคุณตอนนี้คือ 100
1	ำไรสุทธิ:0
	 รหัสของคู่แข่งของคุณคือ wwww
P	กู่แข่งของคุณมีต้นทุน 100
als D	ง่านวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้
	internet to the second second
	ราคาของท่าน: 113 บาท
	ราคาของคู่แข่งของท่าน:113 บาท
	ตกลง

Screenshot 32: Client 2: Both price levels are shown.

\_\_\_\_

รหัสของคุณคือ wwww ตันทุนของคุณตอนนี้คือ 100 กำไรสุทธิ:0

รหัสของคู่แข่งของคุณคือ qqqq คู่แข่งของคุณมีต้นทุน 100 จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0



Screenshot 33: Client 1: Waiting screen.

รอบนี้เป็นรอบที่ 1	
รหัสของคุณคือ www.	
ดันทุนของคุณตอนนี้คือ 100	
กำไรสุทธิ:13	
 รหัสของคู่แข่งของคุณคือ qqqq	
คู่แข่งของคุณมีตันทุน 100	
จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0	
มีการสอบสวนโดยเจ้าหน้าที่ ในการตกลงราคาล่วงห ผลปรากฏว่า ท่านไม่มีความผิด แต่คู่แข่งของท่านโด กำไรของท่านคือ: 13 กำไรของท่าน รวมเป็นสุทธิ 13 กำไรของคู่แข่งคือ -5 กำไรของคู่แข่ง รวมเป็นสุทธิ -5 ตกลง	น้ากันระหว่างท่านกับคู่แข่ง นจับ เพราะท่านได้แจ้งเจ้าหน้าที่เรื่องนี้ก่อน

Screenshot 34: Client 1: Conclusion screen after setting price. In this case, Client 2 is fined because Client 1 reported to the authority.

Screenshot 35: Client 2: Conclusion screen after setting price. In this case, Client 2 is fined because Client 1 reported to the authority.

รอบนี้เป็นรอบที่ 1
 รหัสของคุณคือ www
ดันทุนของคุณตอนนี้คือ 100
กำไรสุทธิ:13
รหัสของคู่แข่งของคุณคือ qqqq
คู่แข่งของคุณมีตันทุน 100
จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0
ท่านสามารถปรับลดต้นทุนให้ต่ำลงเพื่อเพิ่มความสามารถในการแข่งขันกับคู่แข่ง ท่านสามารถปรับลดต้นทุนได้ตั้งแต่ 1 บาทถึง 5 บาท แต่ท่านต้องเสียค่าใช้จ่ายเป็นจำนวนเท่ากันในรอบหน้าและรอบถัดไปของรอบหน้า และต้นทุนของท่านจะลดลงตั้งแต่รอบถัดไปของรอบถัดไปของรอบหน้า ตลอดไป กรุณาเลือกจำนวนต้นทุนที่ต้องการลด โปรง ลดต้นทุนตามจำนวนที่เลือก

Screenshot 36: Client 1: Subject will be asked to choose the level of cost reduction. Subject may choose zero to change no cost.

รอบนี้เป็นรอบที่ 1
 รหัสของคุณคือ www.
ต้นทุนของคุณตอนนี้คือ 100
กำไรสุทธิ:13
 รหัสของคู่แข่งของคุณคือ qqqq
คู่แข่งของคุณมีดันทุน 100
จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0
ท่านสามารถปรับลดต้นทุนให้ต่ำลงเพื่อเพิ่มความสามารถในการแข่งขันกับคู่แข่ง ท่านสามารถปรับลดต้นทุนได้ตั้งแต่ 1 บาทถึง 5 บาท แต่ท่านต้องเสียค่าใช้จ่ายเป็นจำนวนเท่ากันในรอบหน้าและรอบถัดไปของรอบหน้ และต้นทุนของท่านจะลดลงตั้งแต่รอบถัดไปของรอบถัดไปของรอบหน้า ตลอดไป กรุณาเลือกจำนวนต้นทุนที่ต้องการลด 5

Screenshot 37: Client 1: Suppose that subject chooses to change cost for 5 units.

รอบนี้เป็นรอบที่ 1 รหัสของคุณคือ wwww ต้นทุนของคุณตอนนี้คือ 100 กำไรสุทธิ:13 รหัสของคู่แข่งของคุณคือ qqqq คู่แข่งของคุณมีต้นทุน 100 จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0 ท่านสามารถปรับลดต้นทุนให้ต่ำลงเพื่อเพิ่มความสามารถในการแข่งขันกับคู่แข่ง ท่านสามารถปรับลดต้นทุนได้ตั้งแต่ 1 บาทถึง 5 บาท แต่ท่านต้องเสียค่าใช้จ่ายเป็นจำนวนเท่ากันในรอบหน้าและรอบถัดไปของรอบหน้า และต้นทุนของท่านจะลดลงตั้งแต่รอบถัดไปของรอบถัดไปของรอบหน้า ตลอดไป กรุณาเลือกจำนวนต้นทุนที่ต้องการลด 5 ▼ ลดต้นทุนตามจำนวนที่เลือก 2

Screenshot 38: Client 1: Click the confirm button.

รหัสของคุณคือ wwww ดันทุนของคุณตอนนี้คือ 100 กำไรสุทธิ:13 -------รหัสของคู่แข่งของคุณคือ qqqq คู่แข่งของคุณมีต้นทุน 100 จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0

### ในรอบนี้

กำไรจากการค้าขายของท่านคือ: 13 ค่าใช้จ่ายของท่านในการลดต้นทนครั้งที่ 1 จากรอบที่แล้ว: 0 ค่าใช้จ่ายของท่านในการลดต้นทุนครั้งที่ 2 จากสองรอบที่แล้ว: 0 กำไรของท่านหลังจากหลักค่าใช้จ่ายในการลดต้นทุนแล้ว: 13 กำไรของท่านสุทธิ: 13 ในรอบนี้ ท่านได้ลงทุนเพื่อลดต้นทุนเป็นจำนวน: 5 ดันทุนของท่านในรอบนี้: 100 ด้นทุนของท่านในรอบถัดไป: 105 ด้นทุนของท่านในรอบถัดไปของรอบถัดไป: 105 ต้นทุนของท่านในรอบถัดไปของรอบถัดไปของรอบถัดไป: 95 กำไรจากการค้าขายของคู่แข่งคือ: -5 ค่าใช้จ่ายของคู่แข่งในการลดต้นทุนครั้งที่ 1 จากรอบที่แล้ว: 0 ค่าใช้จ่ายของคู่แข่งในการลดตันทุนครั้งที่ 2 จากสองรอบที่แล้ว: 0 กำไรของคู่แข่งหลังจากหลักค่าใช้จ่ายในการลดต้นทุนแล้ว: -5 กำไรของคู่แข่งสุทธิ: -5 ในรอบนี้ คู่แข่งได้ลงทุนเพื่อลดต้นทุนเป็นจำนวน: 4 ต้นทุนของคู่แข่งในรอบนี้: 100 ด้นทนของค่แข่งในรอบถัดไป: 104 ต้นทุนของคู่แข่งในรอบถัดไปของรอบถัดไป: 104 ต้นทุนของคู่แข่งในรอบถัดไปของรอบถัดไปของรอบถัดไป: 96 ตกลง 😽

รหัสของคุณคือ qqqq ต้นทุนของคุณตอนนี้คือ 100 กำไรสุทธิ:-5 -------รหัสของคู่แข่งของคุณคือ wwww คู่แข่งของคุณมีต้นทุน 100 จำนวนรอบที่คุณเคยเล่นกับคู่แข่งคนนี้คือ 0

#### ในรอบนี้

กำไรจากการค้าขายของท่านคือ: -5 ค่าใช้จ่ายของท่านในการลดต้นทุนครั้งที่ 1 จากรอบที่แล้ว: 0 ค่าใช้จ่ายของท่านในการลดต้นทุนครั้งที่ 2 จากสองรอบที่แล้ว: 0 กำไรของท่านหลังจากหลักค่าใช้จ่ายในการลดต้นทุนแล้ว: -5 กำไรของท่านสุทธิ: -5 ในรอบนี้ ท่านได้ลงทุนเพื่อลดตันทุนเป็นจำนวน: 4 ด้นทุนของท่านในรอบนี้: 100 ด้นทนของท่านในรอบถัดไป: 104 ต้นทุนของท่านในรอบถัดไปของรอบถัดไป: 104 ต้นทุนของท่านในรอบถัดไปของรอบถัดไปของรอบถัดไป: 96 กำไรจากการค้าขายของคู่แข่งคือ: 13 ค่าใช้จ่ายของคู่แข่งในการลดต้นทุนครั้งที่ 1 จากรอบที่แล้ว: 0 ค่าใช้จ่ายของคู่แข่งในการลดตันทุนครั้งที่ 2 จากสองรอบที่แล้ว: 0 กำไรของคู่แข่งหลังจากหลักค่าใช้จ่ายในการลดต้นทุนแล้ว: 13 กำไรของคู่แข่งสุทธิ: 13 ในรอบนี้ คู่แข่งได้ลงทุนเพื่อลดต้นทุนเป็นจำนวน: 5 ดันทุนของคู่แข่งในรอบนี้: 100 ด้นทุนของคู่แข่งในรอบถัดไป: 105 ต้นทุนของคู่แข่งในรอบถัดไปของรอบถัดไป: 105 ต้นทุนของคู่แข่งในรอบถัดไปของรอบถัดไปของรอบถัดไป: 95

ตกลง

Screenshot 40: Client 2: Period conclusion screen.


Screenshot 41: Both Clients: Subjects are informed that the period is over.



Screenshot 42: Both Clients: Subjects are informed overall ranking.

อันดับที่	ชื่อ	<mark>รายได้สุทธิ</mark>
1	www	13
2	pppp	-5

Screenshot 43: Both Clients: If both subjects finish, they can choose to go on the next period.

รหสของคุณคอ	1999
ด้นทุนของคุณต	อนนี้คือ 104
กำไรสุทธิ:-5	
รหัสของคู่แข่งขอ	งคุณคือ www
คู่แข่งของคุณมีต่	ันทุน 105
จำนวนรอบที่คุณ	แคยเล่นกับคู่แข่งคนนี้คือ 1
การตกลงร มีความเสี่ย แต่มันก็สา:	าคากับคู่แข่งเพื่อฮั้วราคากันในการขายสินค้าต่างๆ งในการโดนสอบสวนโดยเจ้าหน้าที่และโดนปรับเงินได้ มารถทำให้เราทราบข้อมูลของคู่แข่ง เค่แข่งโดยการเป็นคนไปแจ้งเจ้าหน้าที่ก่อน และขอสิทธิละเว้นการลงโทษ

Screenshot 44: Client 2: The second period begins with updated information on the top.

รอบนี้เป็นรอบที่	2
รหัสของคุณ <mark>คื</mark> อ เ	
ดันทุนของคุณต	บนนี้คือ 105
กำไรสุทธิ:13	
รหัสของคู่แข่งขอ	งงคุณคือ qqqq
คู่แข่งของคุณมีต้	ันทุน 104
จำนวนรอบที่คุณ	เคยเล่นกับคู่แข่งคนนี้คือ 1
การตกลงร มีความเสี่ย แต่มันก็สาม และหักหลัง การตกลงร ต้องการตก	าคากับคู่แข่งเพื่อฮั้วราคากันในการขายสินค้าต่างๆ งในการโดนสอบสวนโดยเจ้าหน้าที่และโดนปรับเงินได้ มารถทำให้เราทราบข้อมูลของคู่แข่ง คู่แข่งโดยการเป็นคนไปแจ้งเจ้าหน้าที่ก่อน และขอสิทธิละเว้นการลงโทษ าคาจะเกิดขึ้นได้ หากทั้งสองคนยินยอมที่จะตกลงกัน ลงราคากับคู่แข่งหรือไม่
ตองการ	121015143112

Screenshot 45: Client 1: The second period begins with updated information on the top.

## BIOGRAPHY

Mr. Peerapat Chokesuwattanaskul was born on August 7, 1986 in the family of Professor (Clinic) Dr. Payap Chokesuwattanaskul, M.D., and Mrs. Vacharee Chokesuwattanaskul, Pharm. He has 2 siblings: Dr. Ronpichai Chokesuwattanaskul, M.D., and Dr. Susama Chokesuwattanaskul, M.D. Mr. Peerapat went to Bangkok Christian College in the elementary school level. Afterward, he attended Patumwan Demonstration School and Traimudomsuksa School in the junior high school and high school level respectively.

In the university level, Mr. Peerapat received the Bachelor of Law (LL.B.) degree from the Faculty of Law, Chulalongkorn University in academic year 2006. He also graduated Master of Arts (M.A.) in International Economics and Finance degree from the Faculty of Economics, Chulalongkorn University in academic year 2007.