

Institutionalised Corruption and Privilege in Asian Economies: A General Equilibrium Analysis

Ke LI^a, Songlin LI^b and Yuping GUAN^c

^a*Graduate School of Business, Nihon University, Tokyo 102-8275, Japan*

^b*Department of Economics, Nanjing University, Nanjing 210008, China*

^c*Graduate School of Business, Nihon University, Tokyo 102-8275, Japan*

Abstract. This paper develops a Walrasian general equilibrium model with division of labour, economies of specialisation, and endogenised corruption. It extends the general “consumer-producer” framework to consider the effects of institutionalised corruption on economic welfare, network size of division of labour and productivity. Examining both implicit corruption and explicit corruption indicates that the privileged groups will always achieve extra benefit and interest over other commoners and cause them hardship. The situation will become worse if the privileged groups acquire more control and influence over the economy. The model shows that in an equilibrium (fixed point), the degree of corruption, the degree of division of labour, and productivity are interdependent, and it demonstrates that the network size of division of labour and productivity will increase when the institutional efficiency of enforcement of anticorruption and property rights improve. Although the model is developed in order to explain corruption in Asia, it is also potentially relevant to other countries with entrenched privileged groups.

1. Introduction

Significant literature has emerged analysing the problems of corruption in Asia. Much of this literature is written from a political or sociological perspective (Lee 1990; Root 1996; Alatas 1999; Lu 2000). While there have been a few attempts to model different aspects of corruption in Asia (Liew 1993; Manion 1996), generally there is a dearth of formal economic models on the corruption problem in Asia. There is sizeable theoretical literature on corruption using game-theoretic, imperfect information and principal-agent models (Buscaglia 2001; Fisman 2001; Klitgaard 1988; Murphy *et al.* 1991; Mauro 1995; Rauch 2001; Sloof 2000). However, following Becker and Stigler (1974) these researchers used a partial equilibrium framework (see Banfield 1975, Rose-Ackerman 1975, Laffont and N’Guessan 1999).

This literature defines corruption as an illegal payment to a public agent to obtain a

^a Corresponding author. Email: kli@gsb.nihon-u.ac.jp.

We wish to thank Xiaokai Yang and Shuntian Yao for suggesting the initial idea and graciously providing their previous work on which this paper is based. Earlier versions of this paper were presented at the *International Symposium of Economics of Impersonal Networking Decisions* held at Monash University in July, 2001, a workshop on *Economics Beyond Neoclassical Limits* held at Virginia Polytechnic Institute and State University in June 2002, as well as seminars at St. Joseph’s University, University of Pennsylvania, Georgetown University, Monash University and Nanjing University. We appreciate the valuable feedback provided by the audiences at each of these presentations. Paul Milgrom, James Buchanan, Eric Maskin, Aris Spanos, Monchi Lio, Yew-Kwang Ng, George Prendergast, Nancy Fox and Milica Bookman all provided valuable comments which we highly appreciate. We are solely responsible for the views expressed and any remaining errors.

benefit that may or may not be deserved, or the abuse of public office for private gains (Rose-Ackerman 1975; 1978; Klitgaard 1988; Shleifer and Vishney 1993). Lui (1985) shows how bribes minimise the waiting costs associated with queuing, therefore reducing inefficiency in public administration in a Nash equilibrium. Corrupt officials may intentionally delay the queuing process to extract more bribes (Myrdal 1968), perhaps in part because corruption contracts are not enforceable in courts (Shleifer and Vishney 1993). Empirical literature on corruption that emerged in the 1990s also suggests a negative relationship between corruption and economic growth. For example, Mauro (1995) who was the first to look at how corruption affects growth in a cross-country sample, concludes that corruption causes slower growth.

This paper aims to make two contributions to the literature on corruption. The first is to endogenise corruption as a rational choice problem using a Walrasian general equilibrium model with division of labour and economies of specialisation. This paper extends the general consumer-producer framework developed by Yang and Ng (1993) for modeling specialisation to consider the effects of corruption on economic welfare, network size of division of labour and productivity.¹ The second is to examine the effect of institutionalised privilege and corruption on resulting income differences in Asia.

The model developed shows that corruption increases the economic welfare of privileged groups in Asia at the expense of the rest of society. Corruption is an important issue because high level profiteering is a major cause of disaffection amongst the working class in Asia and was one of the main causes of the 1989 Tiananmen Square demonstrations in China (Ostergaard and Peterson 1991; Levy 1994: 7-9), Suharto's fall in Indonesia, and the social, political and financial crises in Philippines and South Korea (Moran 1999).

We use the term implicit corruption to refer to the situation where select individuals constituting a privileged group are chosen to work as high-level administrators, while all other individuals (commoners) are only allowed to produce consumption-goods. In these circumstances, it is arguable that inequality in wealth distribution between *ex ante* identical individuals is directly generated by the nature of the economic system itself, which allows, and sometimes encourages, the systemic institutionalisation of privilege. We use the term explicit corruption to refer to the situation where officials, their relatives and those who have influence along with them achieve additional benefits through utilising connections, bribery and collusion.

The next section sets the scene with a brief discussion on corruption and privilege in Asia. A model of corruption and privilege is then developed in Section 3. In this section, we first compute a Walrasian equilibrium in a market economy where every individual can choose his/her occupation freely. Then, we consider the effects on welfare when a privileged group is chosen to work as high-level administrators, i.e. a select few individuals possess such privileges which we term as implicit corruption; while all other individuals are only allowed to produce consumer goods. Finally, we allow for explicit corruption among high level administrators through introducing an administrator's agent who acts in the interests

¹ See Yang and Ng (1993) for an extensive survey of the "consumer-producer" approach for modeling the division of labour and specialisation.

of all the administrators by introducing an entrance fee – in effect a bribe – which people outside the privileged group must pay in order to do business; while the price of their services is still determined by the supply and demand of a Walrasian market.

2. Corruption and Privilege in Asia

Until the recent financial crises in Thailand, South Korea, Malaysia, and Indonesia in 1997, the problems of corruption, cronyism, and nepotism had often been marginalised in Asian studies. Why has corruption become a serious problem in Asian countries? Is it possible to control or to minimise corruption in these countries? The experiences of Asia suggest that there are relationships of corruption with social, political systems, as well as economic development strategies. Corruption is seen as a manifestation of a specific set of state-society relations, political system, developmental trajectory and a form of external linkages. Although these elements can be disaggregated, in practice they are dynamic and deeply integrated with the course of development and political evolution, rather than with pathological phenomena. Corruption may have variable demonstrations and patterns in different countries, while as a whole Asia has experienced institutionalised corruption. The variables of state ideology, state-society relations, state-business relations and the effect of international linkages provide the dynamics which shape the current situation. Asians have experienced profound political change, but this has not removed corruption.

As it is not possible to measure the actual extent of corruption in a country, scholars usually rely on the reported extent of corruption. The Corruption Perception Index (CPI), published by Transparency International in 1995 and updated in 1996 and 1997, is a robust index that captures more than a single indicator and combines several measures of political corruption for each country. According to Transparency International, the CPI is “an attempt to assess the level at which corruption is perceived by people working for multinational firms and institutions as impacting on commercial and social life” (*TI Newsletter* 1996: 5). From Tables 1 and 2, this picture of pervasive corruption in Asia is shown by individual portraits of corruption in such countries as Bangladesh, the People’s Republic of China, Hong Kong, India, Japan, Pakistan, Taiwan, and Thailand. Table 1 shows the levels of corruption in 13 Asian countries and regions according to three indexes: the BLI (Bribery Level Index), CPI (Corruption Perception Index), and GCRI (Gross Corruption Rate Index). Singapore is perceived to be the least corrupt Asian country by all three indexes. This perception is confirmed by the Hong Kong-based Political and Economic Risk Consultancy Ltd., whose 1996 Survey showed that Singapore “maintained its reputation as a ‘corruption-free’ haven in a region in which shady practices are all too common” (*Straits Times* 1996: 3). Conversely, Indonesia and Thailand were perceived as the most corrupt Asian countries on the BLI. The CPI ranked Bangladesh as the most corrupt Asian country, and the GCRI identified Indonesia and the Philippines as the two Asian countries with the highest levels of corruption.

In Bangladesh, a 1997 national household survey on corruption conducted for Transparency International Bangladesh confirmed the country’s perceived high level of corruption, as revealed by the following findings: 41 per cent of households paid a ‘donation’ and 3.6 per cent a direct payment for the admission of children into schools, while 36 per cent of households made payments to or through hospital staff or other ‘influential persons’

to secure admission into hospitals; 65 per cent had bribed land registrars for recording a false lower sale price when registering a land transaction, while 54 per cent had bribed either bank employees or 'influential persons' to secure bank loans; 33 per cent paid money to obtain electricity connections, while 32 per cent paid less for water 'by arrangement with the meter reader'; 47 per cent were able to reduce the holding tax assessment on house and property 'by arrangement with municipal staff on payment of money,' while 65 per cent found it impossible to obtain trade licenses without money or influence; 63 per cent of those involved in litigation had paid bribes to either court officials or the opponents' lawyers, 89 per cent of those surveyed were of the view that judges were corrupt; 97 per cent thought the police service was corrupt (Jayawickrama 1998: 3). Similarly, businessmen in Bangladesh have complained that "their high costs are due to the payoffs they have to make to government officials for sanctions, bank loans, and permits" (Kochanek 1993: 199). The politics of patronage and corruption have plagued all governments in Bangladesh since 1971. Corruption "led to a massive gap between policy and implementation," as under Ershad, "law and policy had little meaning" as "decisions were made on an arbitrary basis with little accountability or appeal" (Kochanek 1993: 266-267).

Given the perceived high level in corruption in Asia as indicated in Table 1, it is not surprising that corruption has been institutionalised as their anticorruption measures may not be adequate. At the start of the 1990s, bureaucrats were given permission to set up businesses in China. As early as 1993, there were 900,000 administrative enterprises engaged in commercial activities (Pan 1993). These were profit-making enterprises set up by government institutions. The decision to let government institutions set up businesses was aimed at reducing the size of the bureaucracy and boosting private enterprise. To limit the potential for corruption, Chinese Communist Party officials were expected to give up their official salaries and benefits and live on the profits of their newly established businesses. However, few officials have cut their ties with their parent departments, preferring instead to utilise them to increase profits. Root (1996: 748) points out that in some cases "officials manage economic enterprises without resigning their government positions". It is more common, though, for officials to resign their positions as government bureaucrats, but still use their connections within departments to circumvent regulations. This created what is known as gray markets (Fan 1988; Li 1996). "A gray market is one in which transactions may be blocked due to residual government regulations. However, a government bureaucrat or government agency can properly work around the obstacles and make the transaction possible" (Li 1996: 3). This places cadre-entrepreneurs in a better position than ordinary business people to obtain inputs through administrative channels.

Corruption as a dominant component has been institutionalised in the public service in parts of Asia. Political leaders have pledged to eradicate corruption to the public, while in most cases it is hard to succeed as corruption in these countries has been institutionalised. In the next section, a general equilibrium model will be developed to explain the particular features of Asian corruption and privilege.

Table 1: Level of corruption in Asian countries

Country	BLI (1-10 scale)*	CPI97 (1-10 scale)*	GCR197 (1-7 scale)*
Singapore	1.00	2.34	1.24
Hong Kong	3.00	3.72	1.52
Japan	2.25	4.43	2.07
Taiwan	4.25	5.98	3.22
Malaysia	5.00	5.99	3.97
South Korea	5.25	6.71	4.34
Thailand	9.50	7.94	5.55
Philippines	6.50	7.95	5.56
P. R. of China	NA	8.12	4.10
India	5.75	8.25	5.11
Indonesia	9.50	8.28	5.56
Pakistan	7.00	8.47	NA
Bangladesh	7.00	9.20	NA

Source: Wei 1998: 5; and Quah 1999: 493.

*According to Wei & Quah, the original BLI, CPI, and GCRI were re-scaled so that higher scores imply more corruption. Thus, for all three indexes, a higher score means a higher level of corruption.

Table 2: Ranking of 12 Asian countries on Transparency International's corruption perceptions index, 1995 – 2001

Country	1995	1996	1997	1998	1999	2000	2001	Average
Singapore	3	7	9	7	7	6	4	6
Hong Kong	17	18	18	16	15	15	14	16
Japan	20	17	21	25	25	23	21	22
Taiwan	25	29	31	29	32	28	27	28
Malaysia	23	26	32	29	32	36	36	31
S. Korea	27	27	34	43	50	48	42	39
Thailand	34	37	39	61	68	60	61	52
China	40	50	41	52	58	63	57	52
Philippines	36	44	40	55	54	69	65	52
India	35	46	45	66	72	69	71	58
Pakistan	39	53	48	71	87	NA	79	63
Indonesia	41	45	46	80	96	85	88	69

Source: Compiled from Transparency International's Corruption Perceptions Index, 1995-2001.

3. The Basic Model

Considering a large economy E with two consumer goods - good x and good y, it is assumed that there is a continuum of individuals and consumer-producers, with a measure of M,

which may be represented by all the points in the closed interval of $[0, M]$.² Moreover, assume all the individuals are *ex ante* identical, and each consumer-producer has identical, non-satiated, continuous, and rational preference represented by the following utility function:

$$u = f(x^c, y^c), \tag{1}$$

where $x^c \equiv (x + x^d)$ and $y^c \equiv (y + y^d)$ are the amounts of the two final goods that are consumed, x and y are the amounts of the two goods that are self-provided, x^d and y^d are the amounts of the two goods that are purchased from the market, and $f(\cdot)$ is continuously increasing and quasi-concave. For simplicity, it is assumed that

$$f(\cdot) = (x^c) \cdot (y^c)$$

To produce these two consumer goods, while labour is always a necessary input, we assume an intermediate good, good z , is also required; and good z refers to administrative service, a service which provides permits for setting up business or major financial assistance. Assume that each individual has the same Cobb-Douglas production functions for the production of good x and good y :

$$\begin{aligned} x^p &= (x + x^s) = (z + z^d)^\beta \cdot (I_x - b), \\ y^p &= (y + y^s) = (z + z^d)^\beta \cdot (I_y - b), \\ \text{and } z^p &= z + z^s = \text{Max}\{0, I_z - c\}. \end{aligned} \tag{2}$$

Here, x^p and y^p are the amounts of the two final goods produced, z^p is the amount of the intermediate good produced, z^d is the amount of intermediate good purchased from the market, x^s , y^s and z^s are the amounts of the three goods sold. b and c are the fixed learning and training cost in producing goods x , y and z , and $b \in (0, 1)$, and $c \in (0, 1)$. The parameter β represents the elasticity of output of good x or y with respect to input level of intermediate good z . $\beta + 1 > 1$ implies that there are increasing returns in producing the final good x . From Eqn. 2, the production function of any consumer good is weakly convex in the labour input, and is strictly concave in the input of the administrative service.

The endowment constraint for each individual endowed with one unit of working time is given as follows:

$$I_x + I_y + I_z = 1, \tag{3}$$

where I_i is the amount of labour allocated to the production of good i . This system of production implies that as each individual's labour productivity increases, her range of production activities is narrowed. As shown by Yang (2001: chap. 2), the aggregate production schedule for three individuals discontinuously jumps from a low profile to a high profile as each person jumps from producing three goods to a production pattern in which at least one

² This assumption implies that population size is very large. It avoids an integer problem of the numbers of different specialists which may lead to non-existence of equilibrium with the division of labour (see Sun *et al.* 1998).

person produces only one good (specialisation). The difference between the two aggregate production profiles is considered as positive network effects of division of labour on aggregate productivity. This network effect implies that each person's decision of his/her level of specialisation, or gains from specialisation, depends on the number of participants in a large network of division of labour, while this number is determined by all individual decisions in choosing their levels of specialisation (the so-called Young theorem (Young 1928)). Since economies of specialisation is individual specific (learning by doing must be achieved through individual specific practice and cannot be transferred between individuals), labour endowment constraint is specified for each individual, so that increasing returns are localised.

The budget constraint for an individual is

$$k_x p_x x^s + k_y p_y y^s + k_z p_z z^s = p_x x^d + p_y y^d + p_z z^d, \text{ and } k_i \in (0, 1) \quad (4)$$

where p_i is the price of good i . Fraction $1-k_i$ of a good sold disappears in transit due to an iceberg transaction cost, or k_i is a trading efficiency coefficient which represents the conditions governing transactions.³ k_i relates to transportation conditions and the general institutional environment that affects trading efficiency. Here, for simplicity, we assume $k_x = k_y = k$, and the transaction efficiency coefficient for the administrative service is 1, i.e., $k_z = 1$.

Due to the continuum number of individuals and the assumption of localised increasing returns in this large economy, a Walrasian regime prevails in this model. The specification of the model generates a trade-off between economies of division of labour and transaction costs. The decision problem for an individual involves deciding on what and how much to produce for self-consumption, to sell and to buy from the market, which means the individual has to choose nine variables $x, x^s, x^d, y, y^s, y^d, z, z^s, z^d \geq 0$. Hence, there are $2^9 = 512$ possible corner and interior solutions.

For simplicity without losing generality, this model assumes the fixed learning cost b and c have the following relationship.

$$b + c \geq 1. \quad (5)$$

The implication of equation (5) is that any individual who offers administrative services specialises in their provision, and people cannot self-provide administrative services and one of the two consumer goods simultaneously.

The set of candidates for each individual's optimum decision includes many corner and interior solutions. In order to narrow down the list of the candidates, Yang and Ng (1993), and Yang (2001) used the Kuhn-Tucker conditions to establish the following lemma:

Lemma 1: Each individual sells at most one good, but does not buy and sell the same good, nor buys and self-provides the same good at the same time.

³ The specification of such iceberg transaction cost is a common practice in the equilibrium models with the trade-off between increasing returns and transaction costs (Krugman 1995). This specification avoids notoriously formidable index sets of destinations and origins of trade flows.

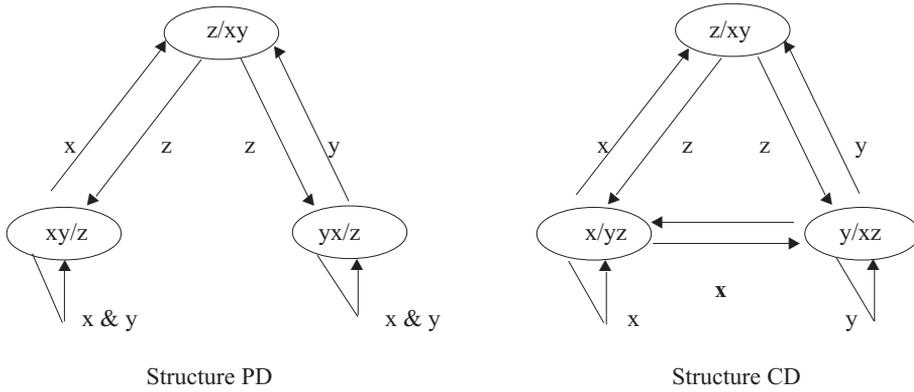


Figure 1: Configurations and structures

We define a *configuration* as a combination of zero and positive variables which are compatible with Lemma 1. A combination of all individual's configurations that is compatible with market clearing condition constitutes a *market structure*, or *structure* for short. Let us examine all structures that might occur in equilibrium.

3.1. The Market Economy

We first consider a market economy in which every individual can choose his/her occupation freely, and compute a Walrasian general equilibrium for the above mentioned economy E . Because of the symmetry in good x and good y , we expect an equilibrium price vector of $(1, 1, p)$ which can clear all the markets, where p is the equilibrium price of the administrative service.

According to Lemma 1, we may divide the producers into two groups with each of them being characterised by the single good its members are selling. At equilibrium, we can expect that the amount of good x sells, M_x , should be the same as the amount of good y sells, M_y , i.e. $M_x = M_y = m$. Hence, the total amount of professional administrators is $M - 2m$. Here, M is the total population of the economy E , and the value of m is to be determined.

To examine the decision of any individual, we have to compute his/her maximum utility in each and every possible configuration. Because administrative services are a necessary input in any production process, an individual can only achieve a utility of zero in the autarky structure. Hence, we need only consider two market structures: (1) Structure PD, which is people buying good z , producing both consumer goods, and selling one consumer good; and (2) Structure CD, which is people buying good z and one consumer good, while producing and selling the other one (see Figure 1).

In structure PD, the decision problem for an individual choosing configuration (xy/z) is

$$\text{Max: } u_x = x.y, \tag{6}$$

which is subject to the following constraints

$$x + x^s = (z^d)^\beta (I_x - b), \quad y = (z^d)^\beta \cdot (I_y - b), \quad I_x + I_y = 1, \\ \text{and} \quad kp_x x^s = p_z z^d. \quad (7)$$

An individual choosing configuration (y/x/z) has the following decision problem:

$$\text{Max: } u_y = x \cdot y, \quad (8)$$

subject to the following constraints:

$$y + y^s = (z^d)^\beta \cdot (I_y - b), \quad x = (z^d)^\beta \cdot (I_x - b), \quad I_x + I_y = 1 \\ \text{and} \quad kp_y y^s = p_z z^d. \quad (9)$$

An individual choosing configuration (z/xy) and providing the administrative service has the following decision problem:

$$\text{Max: } u_z = x^d \cdot y^d, \quad (10)$$

subject to the following constraints:

$$z^s = I_z - c, \quad I_z = 1, \quad \text{and} \quad p_z z^s = p_x x^d + p_y y^d. \quad (11)$$

The two utility equalisation conditions across three configurations yield the corner equilibrium relative prices of goods x , y over z as

$$p = \frac{p_z}{p_x} = \frac{p_z}{p_y} = (1 - 2b) \cdot (k \cdot \beta)^\beta \left(\frac{1 - \beta}{1 - c} \right)^{1 - \beta} \quad (12)$$

The two independent market clearing conditions for goods x and z (the other market clearing condition is not independent due to Walras' law) yield the corner equilibrium relative number of specialists producing goods x , y , and z .

$$m = \frac{M_x}{M_z} = \frac{M_y}{M_z} = \frac{M \cdot (1 - \beta)}{2(1 - \beta + k\beta)} \quad (13)$$

where M_x is the number of x specialists choosing (xy/z), M_y is the number of specialist producers choosing (yx/z), and M_z is the number of individuals choosing (z/xy). The relative number of specialists, together with population size identity $M_x + M_y + M_z = M$, yield the corner equilibrium numbers of different specialists. Plugging relative prices into an indirect utility function of any of three configurations yields the per capita real income in this structure:

$$u_{PD} = \left(\frac{(1 - 2b) \cdot (1 - c)^\beta \cdot (k \cdot \beta)^\beta \cdot (1 - \beta)^{1 - \beta}}{2} \right)^2 \quad (14)$$

In Structure CD, an individual produces one final good, while purchasing the other consumer good and intermediate good z from the markets. The decision problem for an individual choosing configuration $(x/y/z)$ is:

$$\text{Max: } u_x = x \cdot y^d, \tag{15}$$

which is subject to the following constraints:

$$x + x^s = (z^d)^\beta (I_x - b), \quad I_x = 1 \text{ and } kp_x x^s = p_z z^d + p_y y^d. \tag{16}$$

An individual choosing configuration $(y/x/z)$ has the following decision problem:

$$\text{Max: } u_y = x^d \cdot y, \tag{17}$$

subjecting to the following constraints:

$$y + y^s = (z^d)^\beta (I_y - b), \quad I_x = 1 \text{ and } kp_y y^s = p_z z^d + p_x x^d \tag{18}$$

An individual choosing configuration (z/xy) and providing the administrative service has the following decision problem:

$$\text{Max: } u_z = x^d \cdot y^d, \tag{19}$$

which is subject to the following constraints:

$$z^s = I_z - c, \quad I_z = 1 \text{ and } p_z z^s = p_x x^d + p_y y^d \tag{20}$$

The two utility equalisation conditions across three configurations yield the corner equilibrium relative prices of goods x, y over z as:

$$p = \frac{p_z}{p_x} = \frac{p_z}{p_y} = (1-b) \cdot k^{\frac{1-\beta}{2}} \cdot \beta^\beta \left(\frac{1-B}{1-c} \right)^{1-\beta}. \tag{21}$$

The corner equilibrium relative number of specialists producing goods $x, y,$ and z is as,

$$m = \frac{M_x}{M_z} = \frac{M_y}{M_z} = \frac{M(1-\beta)}{2 \left(1-\beta + \beta k^{\frac{1-\beta}{2(1-\beta)}} \right)} \tag{22}$$

Plugging relative prices into an indirect utility function of any of the three configurations yields the per capita real income in this structure:

$$u_{CD} = \left(\frac{(1-b) \cdot (1-c)^\beta \cdot k^{\frac{1-\beta}{2}} \cdot \beta^\beta \cdot (1-\beta)^{1-\beta}}{2} \right) \tag{23}$$

According to the Yao Theorem (Yang 2001: Chap. 6), the general equilibrium in this model is the corner equilibrium that yields the highest per capita real income and in which nobody has an incentive to unilaterally deviate from it. Other corner equilibria are not general equilibrium. Therefore, we will compare per capita real incomes among corner equilibria in all structures and check if individuals have incentives to deviate from it. In order to do this, we will partition the parameter space (k, β, b, c) into several sub-spaces within each of which a particular corner equilibrium generates the highest per capita real income and therefore is the general equilibrium. This is referred to as total cost-benefit analysis, which is the second step in the inframarginal analysis.

Comparing the per capita real incomes in structure PD and CD, it is easy to show that $u_{CD} > u_{PD}$ when the following condition holds:

$$k \geq \left(\frac{1-2b}{1-b} \right)^{\frac{2}{1-3\beta}} \tag{24}$$

If we define a departure of equilibrium from the Pareto optimum as endogenous transaction costs, then our preceding analysis can be summarised in the following proposition: Proposition 1: *When the transaction efficiency k is sufficiently large, $u_{CD} > u_{PD}$, which implies that each individual will specialise in producing one good if the transaction efficiency improved sufficiently.*

Basically Proposition 1 explains well the experience and observations of economic development in Asia during the past decades. Compared with the period prior to the introduction of economic development strategies and restoration after World War II, division of labour in the region has developed to a relatively high level due to the improvement of transaction efficiency and other social and political reforms. Hence, for the sake of simplicity, we always assume that k is sufficiently close to 1 in the following discussion.

3.2. The Market Economy with the Privileged Groups and Corruption

In this subsection we model two forms of corruption, which we term implicit and explicit corruption. We use the term implicit corruption to refer to the situation where select individuals constituting a privileged group are chosen to work as high-level administrators while all other individuals (commoners) are only allowed to produce consumption-goods. In these circumstances, it is arguable that inequality in wealth distribution between *ex ante* identical individuals is directly generated by the nature of the economic system itself, which allows, and sometimes encourages, the systemic institutionalisation of privilege. We use the term explicit corruption to refer to a situation where officials, their relatives and those who have influence with them achieve additional benefits through utilising connections, bribery and collusion.

In a hierarchical structure, high-level administrative positions are often held by the privileged group who are either high-ranked party members, or their relatives. The top leaders of these parties intentionally restrict the number of these high-level positions to secure and strengthen their economic and political power and influence, which we term implicit corruption. To model such an economy, where a few select individuals possess such privileges, let us assume that a small portion of population t is chosen by the party leaders to become high-level administrators; while all the other individuals are only allowed

to produce consumer goods. Given this restriction, even at equilibrium we can no longer guarantee utility equalisation across the whole population. Although the decision problems for each specialist are still valid, the market-clearing condition for Structure CD must be replaced by

$$t \cdot M \cdot (1-c) = (1-t) \cdot M \cdot \left[\frac{(1-b) \cdot k \cdot \beta}{p_t} \right]^{1-\beta} \quad (25)$$

Comparing the market-clearing condition of the last section, we have the following relationship on the price of administrative services under privileges

$$\frac{p_t}{p} = \left[\left(\frac{1-t}{t} \right) \cdot \left(\frac{\beta \cdot k^{\frac{1+\beta}{2(1-\beta)}}}{1-\beta} \right) \right]^{1-\beta} \quad (26)$$

Substituting Eqn. 26 into the decision problem of the administrative, the equilibrium utility for administrative service professionals, u_t , will increase by

$$\frac{u_t}{u} = \left[\left(\frac{1-t}{t} \right) \cdot \left(\frac{\beta \cdot k^{\frac{1+\beta}{2(1-\beta)}}}{1-\beta} \right) \right]^{2(1-\beta)} , \text{ and } \frac{du_t}{dt} < 0 \quad (27)$$

The equilibrium utility for any consumer good producer, U_t will decrease by,

$$\frac{U_t}{U} = \left[\left(\frac{t}{1-t} \right) \cdot \left(\frac{1-\beta}{\beta \cdot k^{\frac{1+\beta}{2(1-\beta)}}} \right) \right]^{2\beta} , \text{ and } \frac{dU_t}{dt} < 0 \quad (28)$$

With the presence of the privilege, the utility of the ordinary people will decline, while the utility of any member of the privileged group will increase due to the positions held by the privilege group. The more serious the privilege situation, the more the ordinary people will suffer, while the officials will enjoy more benefits. Here, this inequality in the wealth distribution over *ex ante* identical individuals is directly generated by the economic system itself which allows and sometimes encourages the systemic, institutionalised privileges, and we use the term implicit corruption to describe this category of corruption issues.

Next, we discuss explicit corruption, that is, the officials and their relatives achieve extra benefit and interest through connection, bribery, baksheesh and collusion. To model this sort of corruption, we assume that although the administrators are chosen by the party leaders, the price of their services is determined by the supply and demand of a Walrasian market. Hence, the price cannot be too high because of competition among administrators. However, based on their political background, these high-level administrators have built up very strong political and economic connections and collusion since coming into power, and especially in recent decades. Thus in Asian economies, these officials and their relatives are not actually price-takers, but possess large amounts of market power and influence. Therefore, to revise our model in the last sub-section, we assume there is an agent who acts in the interests of all the administrators, and who will utilise his/her monopoly power by introducing a two-part tariff. Every individual outside the privileged group is required to pay an entrance fee, the bribery, to achieve the right of doing business and obtaining the necessary administrative services from them. Let us assume that the entrance fee s can be paid by credit in terms of the individual's product. Taking the decision problem for an individual choosing configuration $(x/y/z)$ for an example, the new decision problem of any good x producer is

$$\text{Max: } u_x = x \cdot y^d, \tag{29}$$

which is subject to the following constraints:

$$x + x^s = (z^d)^\beta (I_x - b), \quad I_x = 1, \quad \text{and } kx^s = (1 + s) \cdot p \cdot z^d + y^d. \tag{30}$$

The administrative service has the following decision problem:

$$\text{Max: } u_z = x^d \cdot y^d, \tag{31}$$

which is subject to the following constraints:

$$z^s = I_z - c, \quad I_z = 1 \quad \text{and } (1 + s) \cdot p \cdot z^s = x^d + y^d \tag{32}$$

It is easy to verify that the price for the administrative service is just the same as that which was determined in the last sub-section. Of course the entrance fee will change the equilibrium utility level of the administrative and ordinary producers. A comparison of the utility level of officials with the consumer good producer, shows that from each consumer good producer, the agent of the privileged group can charge an entrance fee equal to

$s \cdot (1 - b) \cdot k^{\frac{1-\beta}{2}} \cdot \beta^\beta \cdot \left(\frac{1-\beta}{1-c}\right)^{1-\beta}$ units of produce. Thus each member in the privileged group can increase his/her utility by a multiple of $(1 + s)^2$ and $\frac{du_z}{dt} < 0$. On the contrary, the equilibrium utility of each consumer good producer will decline by $\left(\frac{1}{1+s}\right)^{\frac{2\beta}{1-\beta}}$ and $\frac{dU}{ds} < 0$. We name this sort of inequality in wealth distribution as explicit corruption,

which is generated by political and social monopoly power founded on connections and collusion. With the presence of explicit corruption, the consumption and the utility of any privileged group member is much larger than of any ordinary individual, and this situation will become more serious if we allow the amount of bribery, s , to increase.

The analysis of the above cases can be summarised in the following proposition.

Proposition 2: Under conditions of both implicit corruption and explicit corruption, the privileged group member will achieve extra benefit and interest from the other consumers–goods producers, and cause them hardship. The situation will become worse if the privileged groups hold more control and influence over the economy.

Proposition 2 indicates that if corruption has been institutionalised, the consequences of corruption can be minimised only if the government has an effective anti-corruption strategy and implements it impartially. Specifically, the more effective anti-corruption measures are, the greater their impact on society in terms of reducing the negative effects and the level of corruption. From our model, the effectiveness of anti-corruption measures depends on two factors: (1) the adequacy of the measures in terms of the comprehensiveness of their scope and powers; and (2) the level of commitment of political leaders to the goal of minimising corruption. In other words, for anti-corruption measures to be effective, they must be properly designed, and must be sponsored and upheld sincerely by political leaders. The most elaborate and well designed anti-corruption measures will be useless if they are not enforced by political leadership and followed by the reform and evolution of the systems (Quah 1982: 174-75). It is not surprising then that anti-corruption strategies have been ineffective in some countries because corruption in these countries has been institutionalised; moreover their anti-corruption measures are inadequate and political leadership's commitment is weak in minimising corruption. Effective strategies require that both adequate anti-corruption measures are in place and political leaders are strongly committed to eradicating corruption. For instance Singapore, has the Prevention of Corruption Act and the Corrupt Practices Investigation Bureau while Hong Kong has the Prevention of Bribery Ordinance and the Independent Commission Against Corruption. If the aim is minimising corruption, then political leaders need to be sincerely committed to this task by impartially implementing comprehensive anti-corruption measures, together with the political and social reforms and evolution of Asian systems.

4. Concluding Remarks

This paper develops a Walrasian general equilibrium model with division of labour, economies of specialisation, and endogenised corruption as a rational choice of each individual. It extends the general 'consumer-producer' framework, developed by Yang and Ng (1993), to consider the effects of corruption on economic welfare. To examine the effect of privilege and corruption, and resulting income differences in Asia, we first computed a Walrasian equilibrium in a market economy where every individual can choose his/her occupation freely. Then, we considered the effects on welfare when a privileged group is chosen to work as high-level administrators, i.e. a few select individuals possess such

privileges while all the other individuals are only allowed to produce consumer goods. Finally, we allowed for explicit corruption among high-level administrators through introducing an administrator's agent who acts in the interests of all the administrators by introducing an entrance fee – in effect a bribe – which people outside the privileged group must pay in order to do business while the price of their services is still determined by the supply and demand of a Walrasian market.

Examining both the conditions of implicit corruption and explicit corruption, indicates that the privileged group member will always achieve extra benefit and interest from the other consumer good producers and cause them hardship. The situation will become worse if the privileged groups acquire more control and influence over the economy. Our model, shows that if corruption has been institutionalised, the consequences of corruption can be minimised only when the government has an effective anti-corruption strategy and implements it impartially. Specifically, the more effective anti-corruption measures are, the greater their impact on society in terms of reducing the negative effects and level of corruption. The model demonstrates that the network size of division of labour and productivity will increase when the institutional efficiency of enforcement of anti-corruption measures and property rights improve. Although the model is developed in order to explain corruption in Asia, it is also potentially relevant to other countries with entrenched privileged groups.

References

- Alatas, S. 1999. *Corruption and the Destiny of Asia*. Singapore: Prentice Hall and Simon & Schuster (Asia).
- Banfield, E. 1975. Corruption as a feature of government organization. *Journal of Law and Economics* **18(2)**: 587-605.
- Barnathan, J. 1992. Beijing's children of privilege. *Business Week*, pp. 18-19, November 2.
- Becker, G. and G. Stigler. 1974. Law enforcement, malfeasance and the compensation of enforcers. *Journal of Legal Studies* **3(1)**: 1-19.
- Buscaglia, E. 2001. An analysis of judicial corruption and its causes: an objective governing-based approach. *International Review of Law and Economics* **21(2)**: 233-249.
- Fan, G. 1988. A theory of the gray market. *Economic Research*:1-15 (in Chinese).
- Fisman, R. 2001. Estimating the value of political connections. *American Economic Review* **91(4)**: 1095-1102.
- Ghosh, A. 1997. Corruption: reform's dark side. *Far Eastern Economic Review*, pp. 18-20, 20 March.
- Gilley, B. 1996. Don't cry uncle: travails of Deng Xiaoping's Niece. *Far Eastern Economic Review*, p. 54, 11 July.
- Girling, J. 1997. *Corruption, Capitalism and Democracy*. London: Routledge
- Gong, T. 1997. Forms and characteristics of China's corruption in the 1990s: change with continuity. *Communist and Post-Communist Studies* **30(3)**: 277-288.
- Han, S. 1989. South Korea: Politics in transition. In *Democracy in Developing Countries: Asia*, ed. Larry Diamond, Juan J. Linz, and Seymour Martin Lipset, pp. 122-141. Boulder: Lynne Rienner Publishers.

- Jayawickrama, N. 1998. Corruption: Legal and Institutional Reform in Asian Countries. Paper presented at the *United Nations Development Program Regional Workshop on Integrity in Governance in Asia*, Bangkok, Thailand, 29 June – 1 July.
- Kidd, J. and F-J. Richter. 2003. *Corruption and Governance in Asia*. New York: Palgrave Macmillan.
- Kim, Y. 1994. *Bureaucratic Corruption: The Case of Korea*. 4th ed. Seoul: Chomyung Press.
- Klitgaard, R. 1988. *Controlling Corruption*. Berkeley, CA: University of California Press.
- Kochanek, S. 1993. *Patron – Client Politics and Business in Bangladesh*. New Delhi: Sage Publications.
- Krugman, P. 1995. *Development, Geography, and Economic Theory*, Cambridge: The MIT Press.
- Kwong, J. 1997. *The Political Economy of Corruption in China*. Armonk, NY: M.E. Sharpe.
- Laffont, J. and T. N'Guessan. 1999. Competition and corruption as an agency relationship. *Journal of Development Economics* **60(2)**: 271-295.
- Lee, P. 1990. Bureaucratic corruption during the Deng Xiaoping era. *Corruption and Reform* **5(5)**: 29-47.
- Levy, R. 1994. Corruption, economic crime and social transformation since the reforms: the debate in China. *Australian Journal of Chinese Affairs* **33(1)**: 1-25.
- Li, D. 1996. A theory of ambiguous property rights in transition economies: the case of the Chinese non-state sector. *Journal of Comparative Economics* **23(1)**: 1-19.
- Liew, L. 1993. Rent-seeking and the two-track price system in China. *Public Choice* **77(2)**: 359-377.
- Lui, F. T. 1985. An equilibrium queuing model of bribery. *Journal of Political Economy* **93(4)**: 760-781.
- Lu, X. 2000. Booty socialism, bureau-preneurs, and the state in transition – organizational corruption in China. *Comparative Politics* **32(3)**: 273-294.
- Manion, M. 1996. Corruption by design: bribery in Chinese enterprise licensing. *Journal of Law, Economics and Organization* **12(1)**: 167-195.
- Manion, M. 1998. Issues in corruption control in post-Mao China. *Issues and Studies* **34(9)**: 1-21.
- Mauro, P. 1995. Corruption and growth. *Quarterly Journal of Economics* **110(3)**: 681-712.
- Moran, J. 1999. Patterns of corruption and development in East Asia. *Third World Quarterly* **20(3)**: 569-587.
- Murphy, K., A. Shleifer and R. Vishney 1991. The allocation of talent: implication for growth. *Quarterly Journal of Economics* **105(2)**: 503-530.
- Myrdal, G. 1968. *Asian Drama II*. New York: Random House.
- Ostergaard, C. and C. Peterson. 1991. Official profiteering and the tiananmen square demonstrations in China. *Corruption and Reform* **6(2)**: 87-107.
- Pan, X. 1993. Why quit government jobs? *Zhongguo Xingzheng Guanli* **15(7)**: 40-42.
- Prudhisan, J. 1998. Thailand: constitutional reform amidst economic crisis. *Southeast Asian Affairs 1998*. Singapore: Institute of Southeast Asian Studies.
- Quah, Jon S. T. 1982. Bureaucratic corruption in the ASEAN countries: a comparative analysis of their anti-corruption strategies. *Journal of Southeast Asian Studies* **13(1)**: 153-177.
- Quah, Jon S. T. 1999. Corruption in Asian countries: can it be minimized? *Public Administration Review* **59(6)**: 483-494.

- Rauch, J. E. 2001. Leadership selection, internal promotion, and bureaucratic corruption in less developed polities. *Canadian Journal of Economics* **34(1)**: 240-258.
- Root, H. 1996. Corruption in China: has it become systemic? *Asian Survey* **36(8)**: 741-757.
- Rose-Ackerman, S. 1975. The economics of corruption. *Journal of Public Economic* **4**: 187-206
- Rose-Ackerman, S. 1978. *Corruption: A Study in Political Economy*. New York: Academic Press.
- Sardar, Z. 2001. Among Asians, bakshish is just another word. *New Statesman* 130(4530): 11-12, 26 March.
- Shleifer, A. and R. Vishney. 1993. Corruption. *Quarterly Journal of Economic* **108(3)**: 599-617.
- Sloof, R. 2000. Interest group lobbying and the delegation of policy authority. *Economics and Politics* **12(3)**: 247-274.
- Straits Times*. Political and Economic Risk Survey 1996. p. 3, 9 April.
- Straits Times*. Political and Economic Risk Survey 1998. p.14, 1 August.
- TI Newsletter*: 1996. A briefing on the TI Corruption Perception Index.
- Wei, S. 1998. Corruption in Asian economies: beneficial grease, minor annoyance, or major obstacle? Paper presented at the *United Nations Development Program Regional Workshop on Integrity in Governance in Asia*, Bangkok, Thailand, 1-29, June.
- Yang, X. 2001. *Economics: New Classical versus Neoclassical Frameworks*. Cambridge, MA: Blackwell, 2001.
- Yang, X. and Y.K. Ng, 1993. *Specialisation and Economic Organization: A New Classical Microeconomic Framework*. Amsterdam: North Holland.
- Yao, S. 1997. Corruption and the anti-corruption movement: the modeling and analysis of the situation in China. *Australian Economic Papers* **36(68)**: 156-165.
- Young, A. 1928. Increasing returns and economic progress. *The Economic Journal* **38**: 527-542.