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Good Capitalism versus Bad Capitalism: Effects of Political Monopoly of the Ruling Elite on the Extent of the Market, Income Distribution, and Development

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GOOD CAPITALISM VERSUS BAD CAPITALISM:
EFFECTS OF POLITICAL MONOPOLY OF THE RULING ELITE ON THE EXTENT OF THE MARKET, INCOME DISTRIBUTION, AND DEVELOPMENT

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Abstract

This paper develops a general equilibrium model to simultaneously endogenize the level of division of labor, the extent of the market, the degree of inequality of income distribution, and aggregate productivity. It shows that good capitalism with free markets for all goods including government services generates equal income distribution, which entails great extent of the market. Hence, the equilibrium level of division of labor and aggregate productivity are high. Political monopoly by the ruling elite generates unfair relative prices of government services to other goods and inefficient inequality of income distribution, which results in a narrow market, thereby generating inefficient equilibrium level of division of labor and aggregate productivity. The degree of inefficient inequality of income distribution caused by bad capitalism is positively dependent on the degree of commoners' tolerance of unfair income distribution inequality. This degree can be reduced by free migration between countries and competition between different governments. As rivalry between sovereigns and free migration reduces such tolerance in a country with political monopoly of the elite group, the equilibrium degree of inefficient inequality of income distribution decreases. This implies attenuated rents of political monopoly. This shrink political rent will lead to good capitalism with no political monopoly by the elite group. The story of our model is consistent with historical phenomena documented by economic historians. This model may be used as a working hypothesis for analyzing what is going on in the newly industrialized economies.

I. Introduction

The purpose of this paper is to develop a general equilibrium model to investigate political economics that involves interplays among political monopoly of the ruling elite, inefficient inequality of income distribution, the extent of the market, the level of division of labor, and aggregate productivity. We try to formalize the following observation in the literature of economic history. The absence of political monopoly by an elite group within a country (such as Britain after 1688 Glorious Revolution) stimulates competition between statesmen or between elite groups. This reduces explicit or implicit prices of government services for given quality or raises government service quality for a given price. Hence, inefficient inequality of income distribution between the ruling elite and commoners is reduced and the extent of the market is enlarged. This leads to a higher level of division of labor, higher aggregate productivity, and prosperity of the country.[1] In contrast, for a country with political monopoly by the ruling elite, real prices of government services are very high (in terms of low quality for a given nominal price or in terms of high predatory tax, which is the price of government service, for a given government service quality). The ruling elite uses its political monopoly to squeeze rents from commoners, so that income distribution is inefficiently unequal between the elite group and commoners (or between urban areas where elites reside and rural areas). Hence, the extent of the market is very limited and the level of division of labor and aggregate productivity are low. Sachs

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[1] According to North and Weingast (1989), the Constitutional Monarch and parliamentary democracy that emerged from the Britian's Glorious Revolution in 1688 provided the credible commitment of the government to the constitutional order. This significantly reduced the government's predatory behavior and state opportunism. Hence, endogenous transaction costs caused by rent seeking and opportunism were reduced and long-term political stability could be secured.

and Yang (2001) consider such state opportunism as a major detriment of economic development.

According to Landes (1998), many travelers including Voltaire (in exile in England, 1726-1729), found that income distribution in Britain was much more equal than under the Old Regime in France. Hence, "'The English,' wrote Charles marquis de Biencourt, 'have the wit to make things for the people, rather than for the rich,' which gave them a large and steady custom" (Landes, 1998, p. 222). But political monopoly in the Old Regime in France generated inefficiently unequal income distribution. Hence, commoners could not afford many goods and a substantial production capacity of the economy was devoted to the production of luxuries for the elite group. This implies a very limited extent of the market, which generated a low level of division of labor and low aggregate productivity. This difference in institutions between post Glorious Revolution Britain and the Old Regime in France generated significant difference in per capita real income and wealth of the nation between the two countries, which was partly responsible for the outbreak of the French Revolution.[2] Many historians also attribute disappointing development performance in the Latin America, compared to the North America, to political monopoly by the elite group, which generates inefficiently unequal income distribution and in turn leads to the limited extent of the market and low aggregate productivity (see Murphy, Schleifer, and Vishny,

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[2] Mantoux (1962, p. 419) documented people's feeling of the gap. "When Arthur Young was in France, on the eve of the Revolution, he found that the condition of his own people [British] compared favorably with the misery and sufferings of the French. Every pages of his book is full of his proud consciousness of the enviable superiority of England over France and all continental countries." According to Mokyr's estimate (1993, p. 45), per capita GNP in Britain was 30% higher than that in France in 1788.

1989, and their references, and the work of North, Summerhill, and Weigast, 2000, on a comparison between development experiences of North and Latin Americas).[3]

This is true also for a region. Many historians attribute the successful economic development which led to industrialization of the Western Europe to the absence of a single overarching political power in Europe and the rivalry between hostile sovereignties. The most famous of the observations is Baechler's (1976, p. 80): "Fundamental springs of capitalist expansion are, on the one hand, the coexistence of several political units within the same cultural whole and on the other, political pluralism which frees the economy."[4] This claim receives supports from many scholars and historians including Hall (1987), Mokyr (1990), Jones (1981, pp. 226-35), Braudel (1984, pp. 128-9), Weber (quoted in MacFarlane,

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[3] According to Murphy, Shleifer, and Vishny, income distribution in the USA was more equal than in Britain, so that the extent of the market was larger in the former than in the latter in the 18th –19th century. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (forthcoming) have found indirect empirical evidence for the phenomenon. According to their regression, Catholic religion and civil laws have negative effects on growth performance, while Protestant religion and common laws have positive effects on growth performance. Latin America and other places with bad capitalism are precisely associated with Catholic church dominance and continental laws which are more conducive to political monopoly (a follower cannot set up a Catholic Church branch without approval from Rome and continental laws are government made laws). Most countries with good capitalism (the USA, Canada, Australia, Britain) are associated with the dominance of Protestant churches and common laws which are more conducive to the absence of political monopoly (each Protestant can set up a Protestant church without anybody's approval; common laws are people made laws based on litigation cases in fair trials).

[4] Baechler (1976, pp. 78-79) tries to explain why political monopoly did not prevail in Europe. "The reasons why the West experienced political pluralism are complex, … I tend to see in this development a kind of historical miracle; that is, an historical event of extreme improbability. All power tends toward the absolute. If it is not absolute, this is because some kind of limitations have come into play. First there is the Church which, because of its transnational status could not be absorbed by the State. Next, are social elites derived from feudalism and not from service to the State, the growth of cities and the bourgeoisie. And finally were village communes that were generally autonomous, if not with respect to the local authorities, at least with respect to the State. One may add the role of emulation and the canalization of energies and aspirations towards objectives provided from without. In this area, from the end of the seventeenth century the role of the English model for the political destinies of the West appears to me as being crucial."

1988, pp. 186-7), McNeill (1974),[5] Laslett (1988, p. 235), Hoffman and Norberg (1994),[6] and Landes (1998, p. 36)[7].

In contrast, the ruling elite's political monopoly in China was considered by Fairbank as a major reason for its backwardness in the 19th century. "Oriental societies, organized under centralized monolithic governments in which the bureaucracy was dominant in almost all aspects of large-scale activity – administrative, military, religious, and economic – so that no sanction for private enterprise ever became established. The merchant was kept in check by the official as an ally whose activities could be used and milked in the interest of either the officials personally or of the state. As Etienne Balazs pointed out, commercial transactions were always subject to the superintendence and taxation of the officials. Government monopolies of staple articles, like salt and iron in ancient times, or like tea, silk, tobacco, salt, and matches more recently, expressed the overriding economic prerogatives of the state. No merchant class had been allowed

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[5] According to McNeill (1974, p. 125), "The political pluralism of early modern Europe was, I think, fundamental and distinctive. When all the rest of the civilized world reacted to the enhanced power cannon gave to a central authority by consolidating vast, imperial states, the effect in western and central Europe was to reinforce dozens of local sovereignties, each consciously competing with its neighbors both in peace and, most especially, in war. Such a political structure acted like a forced draft in a forge, fanning the flames of rival ideologies and nurturing any spark of technical innovation that promised some advantage in the competition among states."

[6] Hoffman and Norberg (1994), "In sum, all of the monarchs of early modern Europe had to confront powerful obstacles to their will; none raised revenue without negotiation, consultation, and sometimes bribery" (p. 305). "Absolutist regimes despite their pretentions were not able to borrow or tax at will. Only governments with strong representative institutions could extract huge revenues and borrow large sums. Taxation and despotism were in the end incompatible." "In the end, liberty was a necessary precondition for the emergence of a strong state, a state of wealth and power" (p. 310).

[7] Landes states that "Despotisms abounded in Europe, too, but they were mitigated by law, by territorial partition, and within states, by the division of power between the center (crown) and local seigneurial authority. Fragmentation gave rise to competition, and competition favored good care of good subjects. Treat them badly, and they might go elsewhere. Ecumenical empires did not fear flight, especially when, like China, they defined themselves as the center of the universe. There was no other place to go."

to rise independently and encroach upon these prerogatives. This was ensured in practice by the official disregard for private property. This meant that official patronage and support were necessary to protect any big commercial undertaking. The result was a close community of interest between the merchant and the official. ... In short, capitalism failed to prosper in China because the merchant was never able to become established outside the control of the landlord gentry and their representatives in the bureaucracy." (Fairbank, 1992, p. 179).[8]

In the present paper, we develop a general equilibrium model with endogenous structure of division of labor to describe the phenomena documented by economic historians. Our story runs as follows. In an economy, each individual is a consumer-producer who can choose her number of goods purchased and her number of goods self-provided, which determine her level of specialization. Each consumer-producer prefers diverse consumption and specialized production due to economies of specialization in producing each good. There is a transaction cost when an individual buys goods from the market. Hence, there is a trade-off between economies of division of labor and transaction costs. Because of the trade-off, as a transaction cost coefficient for a unit of traded good decreases, the equilibrium level of division of labor, which is determined by all individuals' decisions in choosing their levels of specialization, increases. We assume that there is an occupation providing government services, such as administration of

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[8] See also Mokyr (1990, p. 236): "China has, in Needham's term, always been a 'one-party-state' and for 2,000 years it was ruled by the 'Confucian party'. In the Qing (Manchu) era, the bureaucracy did not encourage intellectual or political deviants, although the violent religious intolerance of Europe was alien to the Chinese. In contrast to Europe, there were no small duchies or city-states to which bright men with new ideas could flee." Elvin (1973) shows that commercial capitalism and technology were well developed since Song Dynasty in China. However, it could not develop to a fledged industrialization, because of its regime of bad capitalism with free market under political monopoly.

infrastructure, judicial services, law enforcement, and transaction services, which affect the transaction cost coefficient for all individuals.

We first consider a regime where all individuals can freely choose an occupation including the one providing government services. This regime is a free market without political monopoly, which is called "good capitalism". Free entry into each occupation and flexible prices will generate an equilibrium that not only sorts out the efficient resource allocation, but also determines an efficient level of division of labor, by efficiently trading off economies of division of labor against transaction costs and trading off resource costs for production of goods against that for transaction services. The equilibrium level of division of labor and resource allocation under this regime is Pareto efficient.

We then consider a regime with political monopoly by a group of individuals who provide government services. This elite group can indirectly manipulate relative prices of their services to other goods by blocking entry into their occupation and manipulating relative size of the government service output to outputs in other sectors. In this regime, prices of all goods and services are still flexible and all individuals are free to enter all sectors other than the government sector. We call this regime "bad capitalism". The elite group in this regime will use its monopoly power to restrict the supply of government services, thereby indirectly raising the relative price of government services to other goods. This creates rents which make per capita real income of the elite group much higher than that of commoners.[9] This unfair terms of trade not only generates unequal income distribution, but also restricts the extent of the market. Hence, the equilibrium level of division of labor is lower than the Pareto optimal one. Because

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[9] Such rents from political monopoly are sometimes associated with rampant corruption (Sachs, Woo, and Yang, 2000).

of economies of division of labor, the equilibrium level of aggregate productivity in this regime is also lower than the Pareto optimum.

Here, the most challenging job is to endogenize the level of division of labor, the extent of the market, the degree of inequality of income distribution, and aggregate productivity at the same time. As Allyn Young (1928) pointed out, not only division of labor is dependent on the extent of the market, but the extent of the market is also dependent on the level of division of labor. This implies that economies of division of labor are network effects. Not only gains to each person's level of specialization depend on the number of participants in the network of division of labor (the extent of the market), but also the number of participants is determined by all individuals' decisions in choosing their levels of specialization. If all other individuals choose autarky (that is, they do not buy and sell), then a person cannot specialize since she cannot buy what she does not produce and cannot sell her produce. In other word, each person's decision of her level of specialization determines not only her productivity, but also the extent of the market for others' produce, thereby setting up a constraint on others' decisions in choosing their levels of specialization, which affect their productivities. This is just like the case where a single telephone set is useless without operation of other telephone sets and its value positively depends on the number of telephone sets in use.

Not only the level of division of labor and the extent of the market are interdependent, but also, the income distribution, the level of division of labor, the extent of the market, and aggregate productivity are interdependent in a general equilibrium framework. Hence, we should consider not only the effects of income distribution on the extent of the market and thereby on the aggregate productivity, but also all feedback loops between each pair of the endogenous variables. The notion of general equilibrium (fixed point) is a powerful vehicle for figuring out a

mechanism that simultaneously determines all the interdependent variables. In a conventional general equilibrium model, each individual's decision in choosing quantities demanded and supplied is dependent on prices, while equilibrium prices are determined by all individuals' decisions of quantities. A general equilibrium mechanism simultaneously determines all interdependent prices and quantities. In our model, not only the number of interdependent endogenous variables is greater than in a model of resource allocation, but also the equilibrium network size of division of labor, equilibrium degree of income distribution inequality, and extent of the market are endogenously determined.[10]

Our model shows that a free market with political monopoly will generate inefficient inequality of income distribution that restricts the extent of the market. Hence, the equilibrium level of division of labor and related degrees of market integration, trade dependence, variety of occupations, and diversity of economic structure, and aggregate productivity are lower than the Pareto optimum levels.

The remainder of the paper is organized as follows. Section II presents the model. Section III and IV derive the equilibria in free market with and without political monopoly. Section V concludes the paper.

II. Model

Let us consider an economy with m consumer goods and a continuum of consumer-producers of mass M.[11] The assumption of the absence of dichotomy between pure consumers and pure producers is to allow individuals to choose their levels of self-sufficiency, or its reciprocal: levels of specialization. We can then formalize Allyn Young's idea (Young, 1928) that the decision in choosing level of

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[10] In Murphy, Shleifer, and Vishny's (1989) model, income distribution inequality is exogenously given. Also, each person's level of specialization is not endogenized in that model.

specialization generates network effects which imply that each person's decision of level of specialization depends on the extent of the market or the number of participants in the network of division of labor, while this number is determined by all individuals' decisions of their levels of specialization (so-called the Young theorem: not only the level of division of labor depends on the extent of the market, but the extent of the market is also determined by the level of division of labor). Each consumer-producer has the following *ex ante* identical utility function.

$$(1) \qquad u = \prod_{i=1}^{m} (y_i + K_i y_i^d)$$

where y_i is the amount of good i self-provided, y_i^d is the amount of good i purchased from the market. $1 - K_i$ is a fraction of a unit of good i purchased that disappears in transit because of transaction cost. Hence, K can be interpreted as a trading efficiency coefficient of a unit of goods purchased.[12] It is assumed that $K_i = k_i + k_i^d$ where k_i is the amount of transaction service of good i self-provided and k_i^d is the amount of transaction service of good i purchased from specialist providers of such service. $y_i + K_i y_i^d$ is then the amount of good i that is received for consumption. Each individual has the following system of production functions for goods and transaction services.

$$(2a) \qquad y_i + y_i^s = \max\{0, l_i - a\} \qquad a \in (0,1) \text{ and } i = 1,...,m$$

(production function for good i)

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[11] Zhou, Sun, and Yang (1998) have shown that in a general class of models of endogenous specialization equilibrium may not exist if the set of consumer-producers is finite.
[12] 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 (see Krugman 1995). This specification avoids notoriously formidable index sets of destinations and origins of trade flows. For the trade-off between economies of division of labor and endogenous transaction costs (distortions caused by opportunism), see the models in Chapter 9 and 10 of Yang (2001).

(2b) $\qquad k + k^s = \max\{0, l_k - b\} \qquad\qquad b \in (0,1)$

(production function for transaction service k) ,

where a and b are the fixed learning costs of producing a good and transaction service, respectively. l_i and l_k are the amount of labor allocated to the production of good i and transaction service, respectively. In here, we use l_k rather than l_{k_i} since we assume transaction service is homogeneous across goods. Each individual is endowed with one unit of working time,

(3) $\qquad \sum_i l_i + l_k = 1 \qquad\qquad l_i, l_k \in [0,1]$

We may interpret transaction services as public infrastructure, judicial service, law enforcement, mediation services, transportation services, public administration services, and other government services that affect trading efficiency. As shown in Yang (2001, Chapter 2), this system of production functions and endowment constraint displays economies of specialization, that is, each person's labor productivity increases as her scope of production activities narrows down since her total fixed learning cost decreases and thereby her production time increases as she becomes more specialized. Here, the endowment of labor is specified for each person since learning by doing process, which generates economies of specialization, is individual specific and cannot be transferred between individuals. This implies that economies of specialization are localized increasing returns which are compatible with a competitive market.

Each consumer-producer maximizes her utility with respect to $y_i, y_i^d, y_i^s, k_i, k_i^d$, $k^s, l_i, l_k \geq 0$, subject to the production functions, endowment constraint, and the budget constraint:

(4) $\qquad \sum_i (p_i y_i^d + p_k k_i^d) = \sum_i p_i y_i^s + p_k k^s$

where p_i is the price of good i and p_k is the price of transaction service.

In order to understand network effect of the division of labor on aggregate productivity, we use a modified graph of Houthakker (1956) to define this concept. The graph in Figure 1 shows that a positive network effect of division of labor on aggregate productivity exists for the production condition defined in (2) and (3) with $m = 2$. An individual's transformation curve can be derived from her production functions and endowment constraint as EFGH in Fig. 1. The aggregate transformation curve for the two persons when each of them produces two goods, with no division of labor, is segment DI where two persons' total learning cost is $4a$. The aggregate transformation curve for the division of labor, which implies that at least one person producing only one good, can be obtained in the following way.
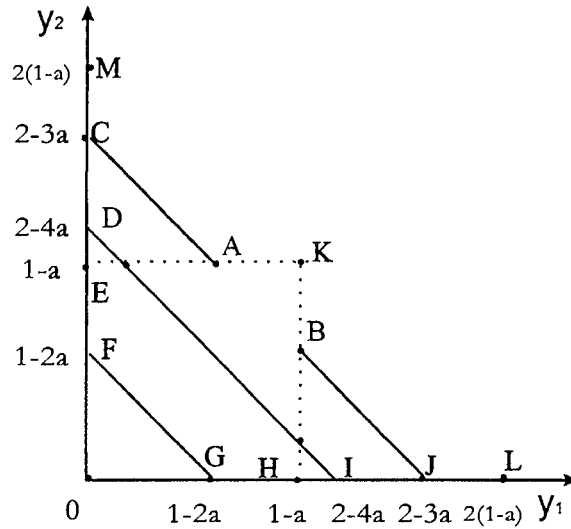

Fig. 1: Economies of Division of Labor Generated by Fixed Learning Costs

Suppose that an individual (she) produces only good 1. Her output level is represented by the vertical line HK. Assume that the other individual (he) can choose any production configuration, so that his transformation curve is still EFGH. By moving the individual transformation curve horizontally to the right by distance $1-a$, the aggregate transformation curve for the two individuals can be then obtained as

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KBJL. Suppose now, alternatively, that she produces only good 2 instead of good 1, while he can still choose any production pattern. Now the aggregate transformation curve is MCAK. Therefore, in the simple two-good-two-person case, the aggregate transformation curve for the division of labor, where at least one individual produces only one good, is MCAKBJL.

It is obvious that the aggregate transformation curve for the division of labor is higher than the aggregate transformation curve for autarky, even if the two persons are *ex ante* identical or even if exogenous comparative advantage is absent. This is because each individual's total learning cost is $2a$ if she produces both goods and her total learning cost is reduced to a if she produces only one good. That is, her time for production increases from $1-2a$ to $1-a$ as she reduces the number of goods produced from two to one. Hence, the total learning cost for the economy with two individuals is $4a$ in autarky, $3a$ for partial division of labor (segment CA or BJ), and $2a$ for complete division of labor (point K) in an economy with two individuals. The economies of division of labor are represented by the difference between the transformation curve for the division of labor, MCABJL (which is also the PPF), and the transformation curve for autarky, DI. As we indicate previously, the economies of division of labor are network effects since a person's decision determines not only her productivity, but also the extent of the market for others' produce, thereby setting up a constraint on others' decisions in choosing their levels of specialization, which affect their productivity. As transaction efficiency is improved, the equilibrium aggregate production schedule jumps from line DI to point K, generating positive network effects on aggregate productivity.

Charles Babbage (1832, pp. 170-74) noted this phenomenon more than a century ago, pointing out that the division of labor can save on fixed learning cost by avoiding duplicated learning and training. Becker (1981), Barzel and Yu (1984), and Rosen (1983) have formalized the idea that division of labor can increase the

utilization rate of a fixed learning and training investment. Tamura (1992) and Yang (1996) have explored the general equilibrium implication of fixed learning cost for the endogenization of individuals' levels of specialization.

The economies of division of labor are generated by endogenous comparative advantage. When *ex ante* identical individuals choose different levels of specialization in an activity, a specialist endogenously acquires a higher productivity than a novice. Consider the two-person-two-goods example in Fig. 1, where the two individuals choose complete division of labor at point K. If person 1 specializes in producing good 1 (accordingly choosing $l_1=1$), her labor productivity in that good is $\max\{(l_1-a)/l_1,0\}=1-a$. For person 2, specializing in good 2 (and thus choosing $l_1=0$), labor productivity in good 1 is $\max\{(l_1-a)/l_1,0\}=\max\{-\infty,0\}=0$. The difference in productivity between the specialist and novice is endogenous comparative advantage.

The following story may provide intuition for positive network effects of division of labor generated by fixed learning cost. Suppose there are two individuals: a professor (he) and a secretary (she). If they do not have division of labor, then each of them must engage in both research and secretarial support work. The first type of work needs education at the Ph.D level, while the second type of work needs education in a secretarial school. Hence, each of them must get two types of education to do the two kinds of jobs. If the professor specializes in research and the secretary specializes in secretarial work, the professor can avoid the cost of training at secretarial school and the secretary can avoid the cost of training for a Ph.D. For each of them, the utilization rate of the investment in specialized learning increases as they spend more time in their specialties. The benefit of division of labor can be reaped by both of them. The secretary is able to begin working several years earlier than she could if she were in school during those years, so that her lifetime income is

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increased. Similarly, specialization increases the professor's productivity in research and in the utilization rate of his learning investment in a Ph.D program, and reduces his total fixed learning cost.

Economies of division of labor based on fixed learning cost are more ubiquitous than they seem, since fixed learning cost can be caused by a trial-and-error learning process that is common in all production activities. The next two sections investigate how the market sorts out the efficient trade off between transaction costs and economies of division of labor based on the fixed learning cost.

III. Equilibrium in a Regime of Good Capitalism

Since all decision variables can take on zero value, each individual's decision problem is a nonlinear programming problem. There are $6m$ independent decision variables y_i, y_i^d, y_i^s, k_i, k_i^d, k^s (l_i, l_k are not independent of the other decision variables).[13] Each of them can be either positive or zero. Hence, there are 2^{6m} possible interior and corner solutions of the nonlinear programming problem. The Wen theorem (Wen, 1998) can be used to rule out the interior solution and most corner solutions from consideration. According to this theorem, an optimum decision does not involve selling and buying the same goods, does not involve self-providing and buying the same good, and sells at most one good although many goods can be produced and self-provided. This theorem, together with the budget constraint and a positive utility requirement, imply that we can divide the population between many occupations. Each occupation is characterized by the good sold by a specialist choosing this occupation. The Wen theorem implies that for a person selling good i, her occupation is characterized by

(4a) $\qquad y_i, y_i^s, k_r^d, l_i, y_r^d, y_j, l_i, l_j > 0$ and

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y_i^d, y_r, y_r^s, k_i^d, k_r, k_i, k^s, l_r, l_k, k_j, k_j^d, y_j^d, $y_j^s = 0$ for $\forall r \in R$ and $\forall j \in J$

where R is the set of $n - 1$ goods that are purchased from the market and J is the set of $m - n$ non-traded goods.

The decision configuration of individuals providing transaction services, who might be government officials, politicians, public administrators, middlemen, judges, lawyers, policemen, and infrastructure builders, differs from that of sellers of goods. She specializes in producing and selling transaction services; She never buys transaction service as she self-provides it. Therefore, the decision configuration of this occupation is defined by the following conditions:

(4b) y_r, y_r^s, k_r^d, k_j, k_j^d, l_r, y_j^d, $y_j^s = 0$ and

y_j, l_j, y_r^d, k_r, k^s, $l_k > 0$ for $\forall r \in R'$ and $\forall j \in J$

where R' is the set of n goods that are purchased from the market by a specialist provider of transaction services. Note that a specialist provider of transaction services does not sell any good. Hence, she buys all n traded goods. Without loss of generality, we assume each person trades goods $1, 2, ..., n$ and self-provides goods $n + 1, n + 2, ..., m$.

Use the condition (4a) and symmetry of the model, the decision problem for a consumer-producer selling good i is

(5a) $\max u_y = y_i (k_r^d y_r^d)^{n-1} y_j^{m-n}$

subject to

(5b) $y_i + y_i^s = \max\{0, l_i - a\}$ (production function for traded good i)

(5c) $y_j = \max\{0, l_j - a\}$ (production function for non-traded good j)

(5d) $l_i + (m - n)l_j = 1$ (endowment constraint for working time)

(5e) $p_i y_i^s = (n-1)p_r y_i^d + (n-1)p_{kr} k_r^d$ (budget constraint)

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[13] The transaction service supplied k^s is homogenous across different traded goods.

where p_i, p_r and p_k are the price of good i, good r, and transaction service, respectively, $\forall r \in R$. Under this specification, the consumer-producer self-provides and sells one final good; buys $n-1$ final goods and transaction services for $n-1$ goods from the market.

This decision problem generates demand functions for good r and transaction services of good r, supply function of good i, and indirect utility function which depends on relative prices of good i to good r and transaction service of good r.

Utility maximizing behavior implies that *ex ante* identical individuals will keep changing occupation until utility is equalized across occupation. Let n indirect utility functions, which involve $n-1$ relative prices of n traded goods be equalized. We can obtain $n-1$ symmetric equations. These equations hold simultaneously only if prices of all traded goods are the same. Hence, we have $p_i = p_r$ for any i and r. Use this symmetry, we can simplify the decision problem of a representative consumer-producer selling a good (for instance, good 1). The non-constrained optimization problem for the consumer-producer is:

(6)
$$\max_{k^d, y_1^s, l_1} u_y = \left(l_1 - a - y_1^s \right) \left(k^d \right)^{n-1} \left[\frac{y_1^s}{(n-1)} - Pk^d \right]^{n-1} \left(\frac{1-l_1}{m-n} - a \right)^{m-n}$$

where $P = p_k / p_1$. The first order conditions for the optimization problem (6) are:

(7)
$$\frac{\partial \ln(u_y)}{\partial k^d} = 0, \quad \frac{\partial \ln(u_y)}{\partial y_1^s} = 0, \quad \frac{\partial \ln(u_y)}{\partial l_1} = 0, \quad \frac{\partial \ln(u_y)}{\partial n} = 0$$

The first order conditions yield the demand functions for transaction service of good r, k_r^d, and for good r, y_r^d, the supply function of good 1, y_1^s, and the optimal amount of labor allocated to produce good 1, l_1, as functions of n and $P \equiv p_k / p_y$.

$$(8) \qquad k_r^d = \frac{1 - a(m - n + 1)}{P(m + n - 1)}, \quad y_r^d = \frac{y_1^s}{n - 1} - k_r^d,$$

$$y_1^s = \frac{2(n - 1)[1 - a(m - n + 1)]}{m + n - 1},$$

$$l_1 = \frac{m(2n - 1) + n(3 - 2n) - 1}{(m + n - 1)(m - n + 1)} - \frac{2a(m - n)(n - 1)}{m + n - 1}$$

where the amount of labor allocated to the production of good 1, l_1, is called the person's level of specialization. Inserting the optimal decision from (8) into the utility function, we can then express utility of the consumer-producer as a function of a, m, and n, and the relative price of good 1 and transaction service.

$$(9) \qquad u_y = \left(\frac{p_1}{p_k} \right)^{n-1} \left[\frac{1 - a(m - n + 1)}{m + n - 1} \right]^{m+n-1}$$

The above utility function shows that the per capita consumption of each good or service is $[1 - a(m - n + 1)]/(m + n - 1)$, where $1 - a(m - n + 1)$ is the time allocated to produce the good sold and $m - n$ non-traded goods after the total fixed learning cost is deducted. As n increases, the amount of time available for the production increases as the total learning cost incurred for non-traded goods production, $a(m - n)$ reduces. $m + n - 1$ is a person's total number of types of goods and services, which includes: (i) $m - n$ non-traded goods; (ii) $n - 1$ traded goods bought in the market; (iii) one self-provided good, which is sold as well, and (iv) $n - 1$ types of transaction services used in the process of buying $n - 1$ traded goods. Since the marginal labor productivity of each good is 1, the per capita consumption can be considered also as the per capita output of each good or service.

Each individual will maximize her utility with respect to n for given prices. The first order condition

(10) $du_y / dn = 0$

yields the optimum $n*$ as a function of relative prices. Plugging this $n*$ into (9) yields the indirect utility function for a person selling good 1.

Let us now consider the decision problem for a person selling transaction service. Use the condition (4b) and symmetry of the model, the constrained optimization problem is,

(11a) $\max u_k = (k_r y_r^d)^n y_j^{m-n}$

subject to

(11b) $k + k^s = \max\{0, l_k - b\}$ (production function for transaction service)

(11c) $y_j = \max\{0, l_j - a\}$ (production function for non-traded good j)

(11d) $l_k + (m - n)l_j = 1$ (endowment constraint for time)

(11e) $p_k k^s = np_r y^d$ (budget constraint)

where $k = nk_r$ because of symmetry. The person produces transaction services buys n traded goods. Each traded good requires k_r to facilitate the transaction. She also produces m-n non-traded goods.

The non-constrained optimization problem of a person providing transaction services can be then simplified as follows.

(12) $\max\limits_{k^s, l_k} u_k = \left[\left(\dfrac{l_k - b - k^s}{n} \right) \left(\dfrac{Pk^s}{n} \right) \right]^n \left(\dfrac{1 - l_k}{m - n} - a \right)^{m-n}$

Due to symmetry, we omit subscript r of k when no confusion is caused. The first order conditions for the optimization problem (12) are:

(13) $\dfrac{\partial \ln(u_k)}{\partial k^s} = 0$; $\dfrac{\partial \ln(u_k)}{\partial l_k} = 0$

which yield the supply function of transaction service k^s, the demand function of good r, and optimum level of specialization in producing the service l_k.

(14)
$$k^s = \frac{n[1-b-a(m-n)]}{m+n}, \quad l_k = \frac{2n+(m-n)(b-2an)}{m+n}, \quad y^d = \frac{p_k k^s}{p_r n}$$

The solution can be used to express utility of a person providing transaction service as a function of relative prices, a, b, m, and n.

(15)
$$u_k = \left(\frac{p_k}{p_1}\right)^n \left(\frac{1-b-a(m-n)}{m+n}\right)^{m+n}$$

The utility equalization condition between a person selling a good and a person selling transaction services:

(16)
$$u_y = u_k$$

yields the equilibrium price of transaction service purchased in terms of a traded good as a function of a, b, m, and n:

(17)
$$P \equiv \frac{p_k}{p_y} = \left[\frac{1-a(m-n+1)}{m+n-1}\right]^{\frac{m+n-1}{2n-1}} \left[\frac{m+n}{1-b-a(m-n)}\right]^{\frac{m+n}{2n-1}}$$

where p_y is the price of a traded good. Plugging P back into the indirect utility function in (9) or (15) will give utility as a function of n,

(18a)
$$u(n) = \left[\frac{1-a(m-n+1)}{m+n-1}\right]^{\frac{n(m+n-1)}{2n-1}} \left[\frac{1-b-a(m-n)}{m+n}\right]^{\frac{(n-1)(m+n)}{2n-1}}$$

The Yao theorem (see Yang, 2001, Chapter 6) shows that the general equilibrium in such a model with an endogenous structure of division of labor is the Pareto corner equilibrium. In our model here, for a given value of n utility equalization and market clearing conditions give a corner equilibrium. The Pareto optimum corner equilibrium is determined by a value of n that maximizes (18a). Hence, the Yao theorem implies that in our model, the general equilibrium that is given by n^* in (10) and utility equalization and market clearing conditions is

consistent with the value of n that maximizes (18a). Hence, the first order condition for maximizing (18a),

(18b) $du(n^*)/dn = 0$

generates the equilibrium number of traded goods $n^*(a,b,m)$ as a function of a, b, m. (18b) is equivalent to

(18c) $df(n^*)/dn = 0$,

where $f(n^*) = \ln[u(n)]$. Inserting $n^*(a,b,m)$ into (18a) yields per capita real income under the *free market regime without monopoly in the sector providing transaction services*. If we consider the sector providing transaction service as political, administrative, judicial, and law enforcement services that affect trading efficiency, we can call this free market system with free entry into any sector including the government service sector "good capitalism". The level of division of labor and the extent of the market are characterized by $n^*(a,b,m)$. It represents the number of different traded goods, which relates to diversity of occupations. It positively relates to each person's level of specialization. Following Yang (1996), we can show that the degrees of trade dependence, of commercialization, of production concentration, of market integration, and aggregate productivity all positively relate to n.

A general equilibrium is defined by relative prices and numbers of individuals choosing various occupations and associated quantities of goods produced, traded, and consumed, that satisfy the following conditions: (i) Each individual chooses her labor allocation among all production activities of goods and services and her trade plan, which generate her consumption bundle, to maximize her utility for given prices of traded goods and given numbers of individuals choosing various occupation configurations. (ii) The prices of traded goods and numbers of individuals choosing various occupations clear all markets.

Let M_i be the number (measure) of individuals selling good i. The market clearing conditions for good i and transaction service are, respectively,

(19)
$$M_i y_i^s = \sum_{r\in R} M_r y_i^d(r) + M_k y_i^d(k), \qquad i=1,2,...,n$$

$$M_k k^s = \sum_{s\in R'} (n-1) M_s k_r^d(s)$$

where i is an element of the index set of n traded goods, $y_i^d(r)$ and $y_i^d(k)$ are the demand function for good i by a person selling good r, and transaction service k, respectively. $k_r^d(s)$ is the demand function for transaction service of good r by a person selling good s. Due to symmetry, $\sum_{r\in R} M_r y_i^d(r) = (n-1) M_r y_i^d(r)$ and $\sum_{s\in R'} (n-1) M_s k_r^d(s) = n(n-1) M_s k_r^d(s)$. One of $n+1$ equations in (19) is not independent of other equations due to Walras' law. The n independent equations, together with the population size identity $\sum_s M_s = M$, where $s = 1, 2, ..., n, k$, yield the n equilibrium numbers of specialists selling n traded goods and the number of specialists providing transaction (or government) services. The symmetry of the market clearing conditions across goods and the population size identity, $nM_y + M_k = M$ implies that

$$M_y = (M - M_k)/n,$$

where M_y is the number of specialists selling a traded good. This, together with (19), generate the relative number of specialists selling transaction services and that selling a traded good.

(20)
$$\frac{M_y}{M_k} = \frac{P(m+n-1)[1-b-a(m-n)]}{(n-1)(m+n)[1-a(m-n+1)]} - \frac{1}{n}$$

where $P \equiv p_k / p_y$ is given by (6). (20) displays a reverse relationship between the relative number of different specialists and relative price of two goods/services sold by the specialists. This, together with the fact that each specialist's indirect

utility function is an increasing function of the price of good sold by her and a decreasing function of goods purchased by her, entails a negative feedback mechanism. If the relative price of goods 1 and 2 is higher than its equilibrium level, then utility of specialists of good 1 is higher than that for good 2. All individuals will have incentives to shift from specialization in good 2 to specialization in good 1, so that the relative number of two occupations increases and excess demand for good 2 increases and excess demand for good 1 declines (specialists of good 1 demand for good 2 and supply good 1 and specialists of good 2 demand good 1 and supply good 2). This will reduce relative price of goods 1 and 2 via the effects of (20). This negative feedback mechanism will keep prices to change and individuals to shift between occupations, until the economy settles down in equilibrium.

IV. Free Market with Political Monopoly

In this section we consider monopoly in the sector providing transaction (government) services. Such monopoly can be viewed as political monopoly of the ruling elite or guild's monopoly in trade. If it is interpreted as political monopoly, we can consider it as generated by some particular characteristics of government services. For instance, law enforcement and defense need uniform and legitimate police or military violence, which can easily lead to monopoly of such services. Some ideology and belief system, such as ideology of communism, Nazism, and mercantilism, may generate political monopoly or guild's monopoly.[14] Political

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[14] The economic development of France prior to the end of 18th century was vastly lagging behind its English rival, partly due to the local monopoly of the guilds who served to protect the shrinking local markets from outside competition. North (1981, p. 150) points out that such mercantilism "… provided a solution but required an elaborate agency structure to monitor the system. The resultant bureaucracy not only siphoned off part of the resultant income but became an entrenched force in the French political structure. While revenue to the crown and bureaucracy increased, the consequence for productivity was to discourage economic growth.

monopoly is characterized by effective block of entry into the sector providing government services and by government manipulation of relative number of the ruling elite group to specialists in other occupations.[15] Hence, self-interested elites may team up to choose a relative number of specialists of their profession to other specialists to maximize utility of each member of the elite group.

In this section, we shall show that the equilibrium level of division of labor and extent of the market, n, is smaller when the ruling elite monopolizes the sector providing government services. We consider the case where the government officials will only rent-seek up to a certain extent, otherwise it will trigger the political or social upheaval led by the publics who can no longer put up with the recurring exactions by the elite group. In other words, the ruling elite will continue to exploit the public by charging indirectly a higher price for their services, via manipulation of relative numbers of different specialists, but it will not exceed a certain price that is determined by the general public's tolerance level. Let us define θ as a commoner's utility level such that when her utility is lower than this

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The French economy remained regional in nature and as a result the gains from a growing market were sacrificed. The benefits of competition were lost to numerous local monopolies that not only exploited their legal position but also discouraged innovation. ... As a consequence, France did not escape the Malthusian crisis of the seventeenth century." Although this system was existed in Britain, its impact was trivial especially since the onset of the Industrial Revolution. The demise of guilds during this era was alongside with the escalating power of the market force. "After 1760, guilds came under pressure in France and Germany, and were abolished in 1764 in the southern Netherlands. The French Revolution abolished them in France in 1791 and subsequently in areas that fell under French domination. By 1815 guilds had either been fatally weakened or abolished altogether on the Continent." (Mokyr, 1990, p. 258).

[15] Such block of free entry is represented by the government monopoly of the banking sector, foreign trade, retailed wholesale businesses, and other twenty sectors in China in the 1950s-1990s. Stiff license system, government approval system for setting up firms, and residential registration system are all used to block free entry into lucrative businesses (Sachs, Woo, and Yang, 2001). Also, political persecution of opposition parties, such as Chinese Democratic Party, is an obvious action by the ruling party to block entry into politic arena. In the pre-Glorious Revolution Britain, such block of free entry was represented by many monopoly privileges of Crown (North, 1981, and Morky, 1990, 1993).

level, she will, together with her fellow commoners, initiate a revolution or will emigrate to another country. We call θ intolerance level of commoners.

We abstract from the process in which elite group's monopoly power emerges and members of this group team up and coordinate among themselves. We assume that some elite members have charismatic personality, which, together with special characteristics of government services, generate an elite group which can effectively block entry into the occupation providing government services. This group will use its monopoly power in political arena to maximize utility of each member of the elite group by manipulating the relative size of their sector and other sectors selling goods. We assume that relative prices are determined by free market, so that the market clearing conditions in (19) still hold. Hence, the reverse relationship between relative size of two sectors and relative price of goods produced by the two sectors, given in (20) still holds in the extended model with political monopoly. The manipulation power of relative numbers of different specialists will indirectly affect relative prices of government services and other goods via the reverse relationship between the relative size of two sectors and relative price of goods produced by the two sector, as shown in (20).

The new model with political monopoly is the same as in the proceeding section except that utility will not be equalized between elites and commoners because of the absence of free entry into the elite group. Hence, relative price of government services to other goods is not determined by utility equalization condition between elites and commoners. Since indirect utility function of each individual is an increasing function of the relative price of good sold to that of goods bought, as shown in (9) and (15), the ruling elite's utility increases and a commoner's utility decreases as the relative size of elite group and commoners decreases. Therefore, the ruling elite will use political monopoly to restrict the size

of elite group provided commoners will not rebel or run away. The non-rebellion constraint is:

$$u_y \geq \theta.$$

Since maximization of the ruling elite's utility is equivalent to the minimization of a commoner, the ruling elite group will manipulate relative size of government sector to other sectors such that the equality holds in the non-rebellion constraint. This, together with utility equalization conditions across all occupations of commoners, generate the relative price of government services to other goods in the model of political monopoly

$$(21) \qquad P \equiv \frac{p_k}{p_1} = \left[\frac{1 - a(m-n+1)}{m+n-1} \right]^{\frac{m+n-1}{n-1}} \theta^{-\frac{1}{n-1}}, \qquad \text{where } \partial P / \partial \theta < 0.$$

Under this equilibrium relative price, utility of an elite is:

$$(22) \qquad u_k(n, \theta) = \left[\frac{1 - a(m-n+1)}{m+n-1} \right]^{\frac{n(m+n-1)}{n-1}} \left[\frac{1 - b - a(m-n)}{m+n} \right]^{m+n} \theta^{-\frac{n}{n-1}}$$

The equilibrium level of division of labor in the presence of political monopoly, $\bar{n}$, is a function of θ, given by the first order condition,

$$(23a) \qquad du_k(\bar{n}, \theta)/dn = 0 \quad \text{or equivalently } dg(\bar{n}, \theta)/dn = 0$$

where $g(n, \theta) = \ln[u_k(n)]$. Let the equilibrium level of division of labor be $\bar{n}(\theta)$. The application of the envelope theorem yields:

$$(23b) \qquad du_k/d\theta = \partial u_k/\partial \theta < 0 \text{ or equivalently } dg/d\theta = \partial g/\partial \theta < 0.$$

(21) and (23b) imply that if the intolerance level is higher (i.e., θ is greater), the equilibrium price of government service in terms of other traded goods will be lower and thereby elite's utility will be smaller. A comparison between $g(\bar{n}, \theta)$ in (23a) and $f(n^*)$ in (18c) indicates that

$$(24a) \qquad g(\bar{n}(\theta), \theta) > f(n^*) \text{ iff } \theta < \theta_0,$$

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where θ_0 is given by $g(\bar{n}(\theta_0),\theta_0) = f(n^*)$, $\bar{n}(\theta)$ is given by (23a), n^* is given by (18b), and $dg(\bar{n}(\theta),\theta)/d\theta < 0$, as shown in (23b).

If $\theta \geq \theta_0$, which implies that commoners cannot tolerate a utility level of elite that is higher than their own per capita real income, then no rent of political monopoly exists. For this case, the relative price of government services and other goods will be determined by utility equalization condition between elites and commoners. Hence, the equilibrium with political monopoly degenerates to the general equilibrium without political monopoly when $\theta \geq \theta_0$. When $\theta < \theta_0$, $u_k(\bar{n},\theta) - u_y = u_k(\bar{n},\theta) - \theta > 0$. Since $du_k(n,\theta)/d\theta < 0$, as shown in (23b), we can show that $d(u_k - u_y)/d\theta < 0$. This implies that as the degree of intolerance of inequality increases, the degree of inequality of income distribution decreases.

Next, we prove that the equilibrium level of division of labor $\bar{n}$ increases with θ. To do this, we first take log of (22),

$$\ln u_k = g(n,\theta) = h(n) - \frac{n}{n-1}\ln\theta$$

where

$$h(n) \equiv \frac{n(m+n-1)}{2n-1}\left\{\left[\ln(1 - a(m - n + 1)\right] - \left[\ln(m + n - 1)\right]\right.$$
$$\left. + \frac{(n-1)(m+n)}{2n-1}\left\{\left[\ln(1 - b - a(m - n)\right] - \left[\ln(m + n)\right]\right\}\right.$$

The first order condition in (23a) is equivalent to

$$\frac{\partial g}{\partial n} = h'(\bar{n}) + \frac{\ln\theta}{(\bar{n} - 1)^2} = 0$$

Differentiating this equation again and using the implicit function theorem, we can show

(24b)
$$\frac{d\bar{n}}{d\theta} = -\frac{\partial^2 g/\partial\theta\partial n}{\partial^2 g/\partial n^2} > 0$$

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where $\partial^2 g/\partial n^2 < 0$ is required by the second and first order conditions for utility maximization and $\partial^2 g/\partial\theta\partial n = 1/[\theta(\bar{n}-1)^2] > 0$. (24b) implies that as the degree of intolerance θ increases, the equilibrium level of division of labor in the presence of political monopoly, $\bar{n}$, increases. This analysis leads us to the following proposition.

Proposition 1: The general equilibrium with political monopoly degenerates into the general equilibrium without political monopoly if the degree of commoners' intolerance of inequality of income distribution is sufficiently high or if $\theta > \theta_0$. For $\theta < \theta_0$, political monopoly prevails and elite's per capita real income is always higher than commoners'. Income inequality decreases and the equilibrium level of division of labor and related extent of the market and aggregate productivity increase when the intolerance level of the commoners increases.

This proposition shows that for $\theta < \theta_0$ political monopoly will be used by elites as a powerful vehicle for rent seeking, meanwhile using propaganda, official ideology, and media control to justify political monopoly as a means for enhancing social welfare. This rent seeking behavior by the elite group is called state opportunism which is considered by North and Weigast (1989) and Sachs, Woo, and Yang (2001) as a major obstacle of economic development. To verify their conjecture, we have to prove that the equilibrium level of division of labor is lower in the presence of political monopoly than that in the absence of it. A lower level of division of labor, represented by a smaller number of traded goods, means a lower aggregate productivity in our model of endogenous structure of division of labor, as shown in Fig. 1 where n can be either 0 or 2.

We first define some notations. Let $u(n^*)$ be the equilibrium per capita real income in the absence of political monopoly, where n^* represents the equilibrium level of division of labor in this regime, given by (18b). Let $u(\bar{n},\theta)$ be the equilibrium per capita real income in the presence of political monopoly, where $\bar{n}$ represents the equilibrium level of division of labor in this regime, given by (23a). It can be shown that (see Appendix for detailed proof):

(25) $du(n)/dn > du(n,\theta)/dn$, for any positive n if θ is sufficiently small.

We now consider the neighborhood of the equilibrium level of division of labor in the presence of political monopoly, $\bar{n}$. Since $\bar{n}$ maximizes $u(n,\theta)$, $u(n,\theta)$ is concave in n within this neighborhood and $du(\bar{n},\theta)/dn = 0$. We can see that within this neighborhood, $du(\bar{n})/dn > du(\bar{n},\theta)/dn = 0$ because of (25). This implies that when $u(n,\theta)$ is maximized at $\bar{n}$, $du(\bar{n})/dn$ is still positive, so that $u(n)$ can still be raised by an increase in n at $\bar{n}$. In other words, $\bar{n}$ does not maximize $u(n)$ and n^* that maximizes $u(n)$ is greater than $\bar{n}$. This establishes the claim that the general equilibrium level of division of labor in the absence of political monopoly, n^*, is higher than the general equilibrium level of division of labor in the presence of political monopoly, $\bar{n}$. Indeed, (18b) and (23) imply that for $\theta < \theta_0$, $\bar{n} < n^*$ and that as θ increases, $\bar{n}$ increases. When θ tends to θ_0, $\bar{n}$ tends to n^*.

Because of positive network effects of the division of labor on aggregate productivity in our model with endogenous specialization, a higher level of division of labor implies a higher aggregate productivity and a higher per capita real income for commoners. Following Yang (1996, 2001, Chapter 11), we can prove that each individual's level of specialization, the extent of the market (aggregate market demand for all traded goods by all individuals), and the degrees of commercialization (the ratio of commercialized income to total income which includes self-sufficient income), of trade dependence, of market integration (the

reciprocal of the number of separate local business communities), of production concentration (the reciprocal of the number of producers of each trade good), the extent of endogenous comparative advantage (difference in productivity of a traded good between its seller and buyer), and of diversity of occupations and economic structure, all increase with the level of division of labor, while degree of self-sufficiency (ratio of self-provided income to total income) decreases with the level of division of labor. This leads us to the following proposition.

Proposition 2: The general equilibrium level of division of labor, aggregate productivity, and commoners' per capita real income in the absence of political monopoly are higher than in the general equilibrium in the presence of political monopoly. Political monopoly generates inefficient inequality of income distribution, which restricts the extent of the market and is detrimental to economic development. Compared to good capitalism in the absence of political monopoly, it reduces commercialization, market integration, production concentration, endogenous comparative advantage that can be utilized, and diversity of occupations and economic structure as well.

Propositions 1 and 2 imply that as the degree of intolerance of unfair inequality increases, the equilibrium level of division of labor increases, the extent of the market, aggregate productivity, the extent of endogenous comparative advantage, market integration, commercialization, and variety of occupations all increase. Such evolution of division of labor and economic structure is shown in Fig. 2.
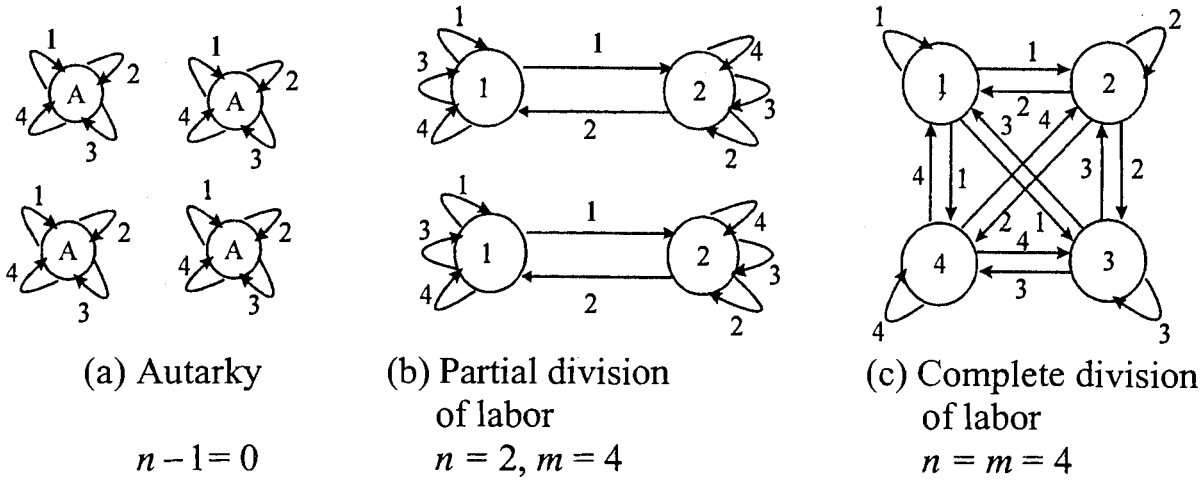
(a) Autarky	(b) Partial division	(c) Complete division
	of labor	of labor
$n - 1 = 0$	$n = 2, m = 4$	$n = m = 4$

Fig. 2: Evolution of Division of Labor caused by Increases in Intolerance of Unfair Inequality

In Fig. 2 the number of goods (m) and the population size (M) are assumed to be 4. The lines denote goods flows. The small arrows indicate the directions of goods flows. The numbers beside the lines signify the goods involved. A circle with the number i denotes a person selling good i. Panel (a) illustrates the case of autarky, where each person self-provides 4 goods, due to an extremely high cost of transaction services when the intolerance level θ is low. Panel (b) shows how an increase in θ lowers the cost of transaction services, which leads to partial division of labor, where each person sells one good, buys one good, trades two goods, and self-provides three goods. Panel (c) shows how a high θ of individuals results in complete division of labor, where each person sells and self-provides one good, buys three goods, and trades four goods.

Assume that there are two countries with similar sizes and individuals are allowed to freely migrate between them. Let us consider the rivalry between Britain and France in the 17-18th century. Britain's per capita real income was

30% higher than in France in the late 18th century.[16] This difference in per capita real income will raise French people's intolerance parameter θ. It was this increase in intolerance of inefficient inequality between elites and commoners that was partly responsible for the French Revolution, which initiated a long process for France to transform from the Old Regime to a republic that abolished political monopoly by the ruling elite. Collapse of socialist block in the Eastern Europe and Soviet Union in the end of 1980s can be attributed to free migration between Eastern and Western Europe and stalling difference in per capita real income between two political regions. This increased intolerance of inefficient inequality between elite group and commoners in Eastern Europe and triggered mass migration from Eastern Germany to Western Germany which brought Berlin Wall and the Soviet style political and economic system down. This has not happened in China partly because of the large size of China's population. Mass migration of Chinese to free world that may threat the existence of political monopoly of the Chinese communist party is practically impossible since no country in the world can possibly absorb such mass migration from China. This explains why when per capita real income in Taiwan and Hong Kong is many times of that in China,

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[16] As Mokyr (1993, p. 45) indicates, "by taxing according to prespecified and well-understood rules, and by gradually abandoning the Tudors' and Stuarts reliance on monopoly rights as a source of crown revenues, the post-1689 regime continued a trend that had begun long before and was certainly well established by the Restoration of 1660. In 1788, British GNP per capita is estimated to have been about 30 percent higher than that of the French, though such comparisons are inherently hazardous. The tax burden in Britain was almost twice what it was in France: 12.4 percent of GNP as opposed to 6.8 percent. British national debt as a proportion of GNP exceeded that of the French by more than threefold; yet because French finances were much less sound than the British, the annual debt service ratio was comparable."

political monopoly of the Chinese communist, which generates very inefficient inequality of income distribution and social injustice can still survive.[17]

When free migration is practical, the significant difference in per capita real income between countries will raise θ and reduce degree of commoners' tolerance of political monopoly in the country with a lower per capita real income. As θ increases to θ_0, rent of political monopoly disappears, so that the elite class may voluntarily give up political monopoly. This implies initiation of constitutional negotiation, political reconciliation, and political reforms. This process not only abolish political monopoly of the elite group, but also reduces inefficient inequality of income distribution, enlarges the extent of the market, raises the level of division of labor and degrees of diversity of occupations, of commercialization, of market integration, and trade dependence. What has happened in Korea, Taiwan, and in Thailand in the 1990s may be considered as consistent with the prediction of our model. Also, transition in many old European monarchies (Netherlands, Sweden, Spain) to constitutional monarchies is consistent with our model.

V. Concluding Remark

This paper develops a general equilibrium model based on corner solutions to simultaneously endogenize the level of division of labor, the extent of the market, the degree of inequality of income distribution, and aggregate productivity. It shows that good capitalism with free markets for all goods including government services generates equal income distribution, which entails great extent of the market. Hence, the equilibrium level of division of labor and aggregate

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[17] Such inefficient inequality of income distribution in China is reported in Sachs, Woo, and Yang (2001). The Gini coefficient, which ignores inequality hided by free high quality houses and cars provided to the ruling elites, was as high as 0.45 in China in the 1990s.

distribution, extent of the market, level of division of labor and productivity. Hence, it provides deeper insights into the interplay of the variables than informal description of historical events.

A possible extension of this model is to explicitly endogenize stealing activities which affect trading efficiency. Then a government can be specified to tax residents and to play the third party function in enforcing laws that penalize theft. Such an extended model can be found from Li (2001).

efficient unequal income distribution is categorically different from inefficient income distribution in bad capitalism.

productivity are high.[18] Political monopoly by the ruling elite generates unfair relative prices of government services to other goods and inefficient inequality of income distribution, which results in a narrow market, thereby generating inefficient equilibrium level of division of labor and aggregate productivity.

The degree of inefficient inequality of income distribution caused by bad capitalism is positively dependent on the degree of commoners' tolerance of unfair inequality. This degree can be reduced by free migration between countries and competition between different governments. As rivalry between sovereigns and free migration reduces such tolerance in a country with political monopoly of the elite group, the equilibrium degree of inefficient inequality of income distribution decreases. This implies attenuated rents of political monopoly. This shrink political rent will lead to good capitalism with no political monopoly by the elite group.

This story is roughly consistent with historical phenomena documented by scholars cited in the introductory sections. It may be used as a working hypothesis for analyzing what is going on in the newly industrialized economies. But as well known, historians and scholars of other disciplines agree to disagree about driving mechanisms of political and economic development. Our model is too simple to include many very complicated cultural, political, and economic factors. We are cautious about applicability of our model for predicting what is going to happen to China and other countries with bad capitalism. However, our model pushes formal general equilibrium analysis of political economics one step forward by endogenizing more variables (inequality of income distribution and individuals levels' of specialization) than the existing similar models. This general equilibrium analysis can figure out circular causation between inequality of income

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[18] Sachs, Yang, and Zhang (2000) have shown that if individuals are *ex ante* heterogenous, then the equilibrium income distribution will be efficiently unequal in a good capitalism. But such

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Appendix

This appendix provides the algebra for the claim in (25) that for any positive n, $du(n)/dn > du(n,\theta)/dn$, if θ is sufficiently small.

Let $\ln(u(n)) = f(n)$ and $\ln(u(n,\theta)) = g(n,\theta)$. We have therefore

(A1)
$$f(n) = \frac{n(m+n-1)}{2n-1}\big(\ln(1-a(m-n+1)) - \ln(m+n-1)\big)$$
$$+ \frac{(n-1)(m+n)}{2n-1}\big(\ln(1-b-a(m-n)) - \ln(m+n)\big)$$

(A2)
$$\frac{df(n)}{dn} = \left[\frac{2n(n-1)-m+1}{(2n-1)^2}\right]\ln\left[\frac{1-a(m-n+1)}{m+n-1}\right]$$
$$+ \left[\frac{2n(n-1)+m+1}{(2n-1)^2}\right]\ln\left[\frac{1-b-a(m-n)}{m+n}\right]$$
$$+ \frac{a}{2n-1}\left[\frac{n(m+n-1)}{1-a(m-n+1)} + \frac{(n-1)(m+n)}{1-b-a(m-n)}\right] - 1$$

(A3)
$$g(n,\theta) = \frac{n(m+n-1)}{n-1}\big(\ln(1-a(m-n+1)) - \ln(m+n-1)\big)$$
$$+ (m+n)\big(\ln(1-b-a(m-n)) - \ln(m+n)\big) - \left(\frac{n}{n-1}\right)\ln(\theta)$$

(A4)
$$\frac{dg(n,\theta)}{dn} = \left[\frac{n(n-2)-m+1}{n-1}\right]\ln\left[\frac{1-a(m-n+1)}{m+n-1}\right] + \ln\left[\frac{1-b-a(m-n)}{m-n}\right]$$
$$+ \left(\frac{n}{n-1}\right)\left[\frac{a(m+n-1)}{1-a(m-n+1)} - 1\right] + \frac{an(m+n)}{1-b-a(m-n)} - 1 + \frac{\ln\theta}{(n-1)^2}$$

For all positive n, $df(n)/dn > dg(n,\theta)/dn$ if θ is sufficiently close to 0, since $\ln\theta$ and thereby $dg(n,\theta)/dn$ in (A4) tends to negative infinity as θ tends to 0.

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