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# Governance Model and Rents Allocation in Asymmetrical Power Relations: The Case of Notebook Computer Industry

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# Governance Model and Rents Allocation in Asymmetrical Power Relations: The Case of Notebook Computer Industry

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**Abstract:** International subcontracting relationships are often characterized by considerable power asymmetries. The actors in global value chain obtained different profits. Different governance dominant modes reflect different roles of countries and enterprises played in the global value chains and result in different industrial international competitiveness in the end Through a relation model of upstream and downstream nodes and a case study of notebook computer industry, the paper identified the status of actors and the market structures in different value nodes influences the rents distribution among global value chains. The leader firms in the global value chains that possess status advantages and market power account for income growing gap between developed and developing countries.

Keywords: Governance Model, Rents Allocation, Asymmetrical Power Relations

## 1. INTRODUCTION

International outsourcing has been identified as a strategic means for U.S. and European-based firms to select world-class suppliers and effectively minimize costs (Kaufman, Wood, & Theyel, 2000; Mol, Pauwels, Matthyssens, & Quintens, 2004). Lots of small and middle sized firms in Pacific Rim countries have been swarming into the supplying army, which obviously enhance the degree of competition among manufactures. As a result, the formation of Global value chain results in geographically and inter-organizationally separation of organizational activities and causes boundary of corporations and industries transcending national scope [1] . International division of labor based on value chains is a new outcome of international division of labor and has led to massive increases in international trade and investment that extend industries beyond national borders. The power of the large lead firms has been growing fast as they capture more and more of the global market share and exploit economies of scale at unprecedented levels. International subcontracting relationships are often characterized by considerable power asymmetries. "Governance" is applied in the research literature of different transaction to describe authority to control, influence and configure the modes and rules of interactions (Balgobin, 2008).Compared to the governance of individual business; governance in the backdrop of global value chains seems even more complex.

In the Prior literature on this topic, the relation between governance model and rents allocation has attracted great attention, but for what and how does the governance model influence the rents allocation in asymmetrical Power Relations needs more empirical support.

## 2. LITERATURE REVIEW

### 2.1 Governance model: from single dimension to multi-dimensions

The rules that participants should obey are marked by the leader of the industry in the Value-Chains, not decided by the free market, and in this way the Value-Chains-Governance is put forward. Gereffi (1994) divided it into two types: producer-driven" value chains and buyer-driven value chains. Sterne (2002) come up with the national model of the governance of the value chains which is based on the research of Lee's and that is Japanese model, Germany model, Italian model, and American model. This model can vary from three kinds:

leadership (Japan and Korea), relational (German and Italy), modular (America). Based on the production network theory of Stern and Powell, Gereffi, etc. (2003), presented a relatively complete system of strict framework, with the combination of the value chains theory, transaction cost economics, technological capability and enterprise learning theory. They summed up five typical governance model of notebook computer, drawn the extent of the asymmetry between the external coordination and the rights, among the value chains subjects ,by a low to high order of priority for the market type, modular type, relational type,captive and hierarchy type.

In the backdrop of globalization, massive governance deficit has appeared (Gereffi and Mayer, 2007; Coe and Hess, 2008). Gereffi et al. studied the matter of industrial governance, proposing five types for the governance of global value chains[2] .Different from the single dimension of industrial governance in his study, Liu Lingqing, Tan Liwen and Ma Haiyan(2011) constructs the industrial two-dimensional governance model of the developing countries in the context of global value chain based on the interaction between industry governance and market governance, and also presents five typical governance modes，such as free to market dominant mode，public governance dominant mode, industrial governance dominant mode，joint governance dominant mode and network governance dominant mode. Different governance dominant modes reflect different roles of countries and enterprises played in the global value chains and result in different industrial international competitiveness in the end [3].

## 2.2   Relation rents and network rents

Global value chain in fact is an intricate production network consisting of plenty interacted firms, urging the involved actors to realize that it is nonsensical to be an effective sole island in an ineffective ocean without an integrated valid process restructure; on the other hand, it is crucial to keep horizontal cooperation aiming to retain competitive advantage, specifically, small and middle sized firms reduce risk and cost by collaborated marketing and procurement, shared service etc. Therefore Lorenzoni & Lipparini(1999)advanced，firms` competitive advantage can be gained through effective relations management. Rents embedded in corporation group in global value chain can be summarized into relational rent and network rent.

Dyer & Singh(1998)，Kale, Singh & Perlmutter (2000) figured that internal economic factor like incentive to complementary resource, external environmental factor such as resource scarcity and other non-economic factor   are three kinds of motive and determinants for collaborated relationship among organizations. Relational rent can be obtained then further transforming into organizational competitive advantage through leveraging of inter-organizational relation [4]. Luomin&Luo Hongling（2007）pointed out that the most evident character of relational rent is relationship, not only super profit [5.] Special cooperate relationship after long term cooperation between organizations is crucial resource to obtain competitive advantage. The crucial resource maybe span firm boundary and embed to inter-firm routine and procedure which then give rise to relational rent. Additionally, long term cooperation produces intricate interconnectedness and creates source privates and target scarcity which will establish imitation obstacle to relational rent. Rational rent emphasizing dyadic relationship greatly enhances possibility for organization to get super rents. The dyadic view is unlike the cognition from transaction cost theory and resource-based view on rational rents in nature. Rent is particular for manufacture in resource-based view and is unique in trade from transaction cost view, which both embraces a common hypothesis that whatever the rent source is, manufactures` collaborated profit will be affected. Relational rents stresses its analyzing unit is dyadic relationship and believes specific allied relationship after a long term symbiosis is a crucial resource for competitive advantage. This key resource may transcend firm boundary and embed into routine and convention in corporations then create relational rent. Additionally, the interconnectedness can build up

source proprietary and become imitation barrier [5].

There are obvious differences between fellowship in GVC and in fair trade market. Fellowship in fair trade market is feature with low specific asset investment, low information exchange, separated technical function system, low transact cost and lowest investment in governance mechanism under which situation buyer can change transact fellow with low punishment and in nature, relation between trade two sides is competitive. GVC calls for great collaboration among laces. Establishing close relationship among Firms inter-chain are not only driven by transaction, but also inspired by technology collaboration, co-purchase, information sharing etc. Relation between firms needs coordination besides competition. Therefore, fellowship is capable of creating relational rent and competitive advantage.

When one-to-one dyadic relationship among individuals develops into Tribal relationship between groups, several social relations in network organization have seen a new perspective to study, which is network rent. Called network rent is a positive surplus after general profit created by all members in network organization having counterbalanced their sum of single profit. In transaction cost theory , trade can be harmonized by three kind government system, called  market, hierarchy and mix pattern and network governance theory should be regarded one kind social system, in which trust mechanism, reputation mechanism and collected trade mechanism will reduce transaction cost[6]. Network is not only beneficial to reduce transaction cost, but also facilitate to create rents [7]. Besides relational rents, network is regarded as locus of innovation. Actors in network organization with various backgrounds and capabilities are capable to expand technical options through upgrading knowledge aggregation[8]. Concluding present paper, we can find that effect created by network rent mainly shows in complementary effect in network resource, exterior effect in knowledge learning and innovation, external scale effect and amplification effect of marketing control power [9].

Therefore, taking transaction cost saving in mind, network organization possess production and innovation function non-substitute by market or individual firm. This is unique characters of network organization break out individual limited in abilities. Industry cluster which is a best embodiment for network rent in GVC. Industry cluster is one important form of global distribution of GVC whose nature is a kind of network form. Enright(2001) regards firms in cluster can create super profit through collaboration and can perform better than firms outside cluster. Competitive advantage of cluster is presented by collective efficiency, specifically expressed in external economics, combined actions and system effect.

## 3.    MODEL ANALYSIS: GOVERNANCE MODEL AND RENTS DISTRIBUTION

Network, as strategic resource, can bring rents to firms which are key resource for firm's competitive advantage. A relative question comes up naturally: how is rent allocated? Only for relational rent, many empirical study prove that it not average allocation between collaborated firms. Then, how to get more percentage in rent allocation?

The paper divides product into the first order and second order according to Lu Feng (2004). Product of the first order refers to the product can bring certain consumer and product function into play independently [10]. Product of the second order, having no independent consumption and production, can be specific components itself of after transformation through assembling or processing procedure. Actors in global value chain have being portrait collaboration of upstream and downstream industry taches. The collaboration between upstream and downstream enterprises can be realized through product of the second order, which become the determinants of the coordinated relation.

Multinational corporations of developed countries have played critical roles in global value chain. To

simplify our model, we suppose that production divided into upstream and downstream stages and upstream enterprise provides the second product which then is affected by market structure of both two streams.

Combined model of Hay and Morris (1991), we assumed upstream enterprise product and sale a sort of the second order product S, an input of production process of downstream enterprise. Downstream enterprise yield product of the first order X. one unit of the two order product are corresponding to each other, i.e. a unit S produce one unit X. There are m enterprises of the first order product and n enterprises of the second order product. The outputs are homogeneity without cahoots [11].

For product of the first order in downstream market, anti-demand function is $p_\chi = f(Q)$, $Q = m \times q_\chi$, $q_\chi$ shows quantity of every enterprise producing the first order product. $c_\chi$ is variable cost excluding the second order product; $F_\chi$ is fixed cost; so profit function of downstream enterprises is

$$\pi_\chi = p_\chi q_\chi - p_s q_\chi - c_\chi q_\chi - F_\chi \tag{1}$$

Based on the first derivative condition of profit optimization, when profit is optimized

$$\frac{d\pi_\chi}{dq_\chi} = p_\chi \left[ 1 + \frac{q_\chi dp_\chi}{p_\chi dq_\chi} \right] - p_s - c_\chi = 0 \tag{2}$$

Order $\varepsilon_\chi$ as demand flexibility of the first order product and aggregate profit optimization condition of m enterprises.

$$p_\chi \left[ 1 - \frac{1}{m\varepsilon_\chi} \right] = p_s + c_\chi \tag{3}$$

After settled, causing demand curve from the first order function to the second product S is:

$$p_s(Q) = p_\chi(Q) \left[ 1 - \frac{1}{m\varepsilon_\chi} \right] - c_\chi = M R_\chi(m) - c_\chi \tag{4}$$

In the product of second order, anti-demand function is $p_s = f(Q)$, $Q = n \times q_s$, $q_s$ is the quantity of every enterprise of the second order product. $c_s$ is variable cost and $F_s$ is fixed cost input by upstream enterprises; so profit function of upstream enterprises is

$$\pi_s = M R_\chi(m) q_s - c_\chi q_s - c_s q_s - F_s \tag{5}$$

According to the first derivative condition of profit optimization for the second order product, when profit is optimized

$$\frac{d\pi_s}{dq_s} = M R_\chi(m) \left[ 1 - \frac{1}{\varepsilon_{MR}} \right] - c_s - c_\chi = 0 \tag{6}$$

Through aggregating profit optimization condition of every product of the second product enterprises, equilibrium condition of the second order product market can be found:

$$M M R_s(n) = M R_\chi(m) \left[ 1 - \frac{1}{n\varepsilon_{MR}} \right] = c_s + c_\chi \tag{7}$$

$M M R_s(n)$ is marginal curve of anti-demand function of the first order product. The second order product anti-demand function of the second order enterprises is $P_s(Q) = M R_\chi(m) - c_\chi$, So the marginal income function of the second order enterprises is $M M R_s(n) - c_s$, when MR=MC, i.e.

$$M M R_s(n) - c_\chi = c_s \tag{8}$$

From above, quantity $Q^*$ and equilibrium price $ps^*$ of the second product can be achieved. In addition, the marginal cost of first order product in downstream is $ps^*+cx$. According to the first derivative condition of profit optimization MR=MC, so,

$$\mathrm{M\,R}_\chi(m) = p_s^* + c_\chi \tag{9}$$

The quantity Q* and equilibrium price $p_s^*$ of the second product can be obtained.

The model showed that the smooth production process in upstream and downstream production depend on the demand equilibrium [12]. The profit of actors in global value chain is mainly determined by market structure of the two order product that is the quantity of m and n.

Asymmetry of leader power in GVC in fact have reacted asymmetry in relational rent allocation. Higher in leader power, higher allocation quotient of relational rent firm will get. That is to say, asymmetry of leader power is one of important factor account for income growing gap between developed and developing countries. On the other hand, we find that GVC is dynamic and the governance kind is also dynamic. With improvement in standard, technology skill and supplier ability, modularization is becoming a mainly kind in nowadays.

## 4     GOVERNANCE MODEL AND RENTS ALLOCAITON IN NOTEBOOK COMPUTER IDNUSTRY

### 4.1   Methodology

In this article we present an exploratory research process using a case study approach (e.g. Merriam, 1998; Yin, 1989).We selected the notebook computer industry as the empirical base for our asymmetrical power relations research for several reasons. Firstly, after more than ten years of development, production of notebook computers has formed global co-production, the product of the international division of labor within the industry model. Secondly, on the whole, industry of notebook computer has significant characteristic of the "producer-driven" commodity chains and classical asymmetrical relations among actors in global value chains.

### 4.2   Formation and evolvement of governance model in notebook computer industry

Microsoft, Intel and other U.S. companies are in the center part, Microsoft's Windows operating system (Windows) and Intel's central processing unit (CPU) team , forming a notebook computers software and hardware industry standard, that has the characteristics of strong technology-intensive. Technical architecture standards proposed by they has become a "baton" to guide industrial development, Manufacturer of notebook computers components and peripherals must design products in accordance with these industry standards, so that Microsoft and Intel are in the center position in the coordination of the commodity chains network, control of raw materials and parts suppliers forwards, close contact with the distributor retailer backwards.In industry of notebook computer parts supply network, the key components such as CPU, computer chips, dynamic random access memory, etc, these high-tech products gathered in the United States, Japan, South Korea and China Taiwan, the general components such as motherboard, video card, mouse, etc produced mainly by the Chinese mainland, China Taiwan and so on. Taiwan has become the world's largest manufacturer of notebook computers since 1994. In 2012, almost 65 percent of the notebook computers sold under the international brand were designed and manufactured by Taiwanese firms under OEM arrangement.

The industry of value chains of notebook computer closer to the hybrid value chains. In industry of value chains of notebook computer, the most critical participants are the brand-led business and first-class supplier. In sales terminals, brand-led company has a strong brand and global sales network brands have a lot of power in the value chains governance and income distribution, a certain extent, their orders determine the survival and profitability of manufacturers, the value chains tends to brand-driven value chains; In production, the first class supplier directly accept orders from brand-led companies, R & D products rely advantage of their technical capabilities, and organize production using the production

network having been formed. Since the first class supplier technological capabilities in research and development, sub-suppliers needed to produce the corresponding parts ancillary products based on their design, form technology-driven value chains between the first class supplier and sub-suppliers. And rapid technological advances shortened product life cycles, requiring faster product replacement; brand-led companies face large time pressure in the promotion of products, which in turn requires form the reciprocity close relationship between the brand-led businesses and all levels of suppliers to meet market needs and flexible production.
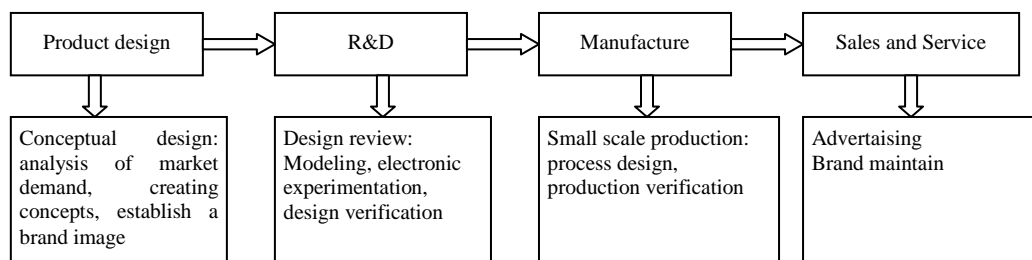
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┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐
│  Product design │ ──> │       R&D       │ ──> │    Manufacture  │ ──> │ Sales and Service│
└─────────────────┘     └─────────────────┘     └─────────────────┘     └─────────────────┘
        │                       │                       │                       │
        v                       v                       v                       v
┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐
│ Conceptual      │     │ Design review:  │     │ Small scale     │     │ Advertaising    │
│ design:         │     │ Modeling,       │     │ production:     │     │ Brand maintain  │
│ analysis of     │     │ electronic      │     │ process design, │     │                 │
│ market demand,  │     │ experimentation,│     │ production      │     │                 │
│ creating        │     │ design          │     │ verification    │     │                 │
│ concepts,       │     │ verification    │     │                 │     │                 │
│ establish a     │     │                 │     │                 │     │                 │
│ brand image     │     │                 │     │                 │     │                 │
└─────────────────┘     └─────────────────┘     └─────────────────┘     └─────────────────┘
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**Figure 1.    Notebook computer industry value chains**

### 4.3    The status of firms, market structures and rents allocation in notebook computer industry

In industry of notebook computer parts supply network, the key components such as CPU, computer chips, dynamic random access memory, etc, these high-tech products gathered in the United States, Japan, South Korea and China Taiwan, the general components such as motherboard, video card, mouse, etc produced mainly by the Chinese mainland, China Taiwan and so on (see Table 1).

**Table 1.    Notebook computer global fragmentation of Production system**

| Country or Region | Enterprise | Major division |
|---|---|---|
| United States | Microsoft, Intel | Control of the PC market, the main products monopolistic |
| United States, Japan, China Taiwan | Dell, HP, Toshiba, Acer, etc. | Brand, marketing, channel |
| China Taiwan | TSMC, UMC, Inventec, Mitac, Tatung | ODM / OEM manufacturing, global logistics |
| Japan, Korea, China Taiwan | NEC, Hitachi, Toshiba, Samsung, Hyundai, BenQ | Key parts LCD, CRT, DRAM |
| China, China Taiwan | Lite, Delta, Hongji, should have, Fu Hua | Shell, mouse, keyboard, battery, connectors |

Resouce：According to Foster etc. (2006), Zhang Ji (2006) collation

In the production network notebook computer industry, most other manufacturers entrust China Taiwan contract maker producing the notebook computers, in addition to Japanese manufacturers still insist on producing some of notebook computers by themselves. The CM and ODM companies linked to the suppliers of parts and peripherals in order to meet requirements for product brands, thus becoming the sticking point of industry production operations. In 2012, quantity of notebook computer OEM in Taiwan is 94% the world's total quantity of notebook computer OEM (Shui Qing Mu Hua Research Center, 2012). These headquarters and R & D center of Taiwan ODM companies generally located in Taipei, in order to protect intellectual property and improve competitive advantage, large enterprises expand R & D institutions actively in Taipei, and in order to reduce costs, most of the production facilities are located in China Changjiang River Delta (Shanghai, Kunshan, Suzhou), many notebook computer manufacturers settled in Chongqing in 2010, the Chinese mainland has become the world's largest production base of notebook computers .

94% of global notebook computer computers are assembled by Taiwanese vendors, mostly ODMs instead of OEMs. The notebook computer production transferred to western China. Although all notebook

computer ODMs are from Taiwan, their production bases are located in Mainland China. China's notebook computer output was 244 million in 2011, of which 230 million ones were exported. In 2010, notebook computer manufacturers accessed to Chongqing successively. Their production bases put into production in 2011 when 24,073,900 notebook computers were produced in Chongqing, up 25.4-fold. Quanta powerfully regained the No.1 position from Compal in 2010 since Acer, the largest client of Compal, performed poorly in quarter 4 with grave inventory. Wistron also failed to meet the shipment objective in 2010, Inventec invariably hovered at the low level and rejected the low-price orders of HP. Hon Hai persevered in developing the notebook computer contract manufacture, but it strictly controlled the contract scale, increasingly difficult to obtain profits. Notebook computer OEM field is characterized by fierce competition and the gross margin of the OEMs is usually between 3%-5%(see Table 2).

**Table 2.   Shipment of major notebook computer ODMs in the World, 2010-2011 (Unit: mln)**

| Compan/ year | 2010 | 2011 | Major Clients |
|---|---|---|---|
| Quanta | 53.44 | 55.8 | HP, Dell, Lenovo, Toshiba, Asus |
| Compal | 45.1 | 40.5 | Acer, Dell, Lenovo, HP, Toshiba |
| Wistorn | 27.5 | 31.6 | Acer, Dell, Lenovo |
| Inventec | 16.0 | 16.0 | HP, Toshiba |
| Hon Hai | 8.0 | 12.0 | HP, Asus |

Global value chains of notebook computer evolve from a single market to the global market, from the whole production to the production of global integration with supply chains in the mode of production, which not only lower costs of production, sales and other costs, also the level of service extends from OEM to ODM, and it provide direction for notebook computer enterprises to enhance their core competitiveness.

The formation of the global value chains of notebook computer makes the international division of labor more and more detailed in notebook computer industry, the governance model is particularly important among brand owners, contract makers and suppliers. From a governance perspective, notebook computer enterprises that specialized division of labor will form different relationships in the value chains: as it often requires exchange information on the product conceptual design and product development between leading brand enterprises and tier one suppliers, but the information can be encoded degree is lower at this stage of the value chains, value chains governance is mainly relational value chains; When the product has been put into production through development trial, the degree of information can be encoded increase, the value chains model is closer to the modular value chains between tier one suppliers and sub-suppliers.
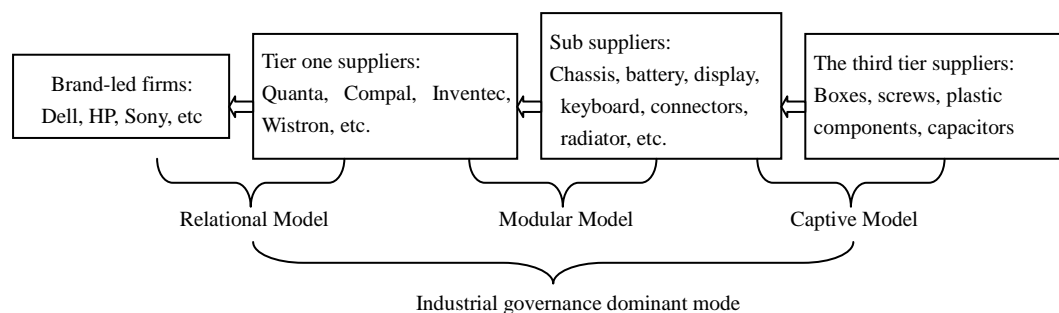


**Figure 2.   Different governance models in notebook computer industry**

### 3.   CONCLUSIONS AND DISCUSSION

Not every link of the global value chain that involves numerous firms from different countries creates value. The status of actors and the market structures in different value nodes influences the rents distribution among global value chains. Lead firms control strategic links and possess the power to coordinate and manage global value chain, while suppliers are led by them. Notebook computer enterprises have formed multiple governance relations in the value chains. With the uneven of profits distribution and rents distribution, Chinese notebook computer firms are in low value-added location, it has brought many predicaments to enterprise upgrading. Chinese notebook computer industry ranges from simple assembly components along the industry chains gradually, intermediate products and R&D and other more advanced stage of development. By attracting foreign investment, it reduces the gaps of the mainland enterprise technology capability, so that production and export structure has been significantly improved. But local businesses are still in the underlying network of production. With the rising cost of factors of production, labor cost advantage comparative to other mainland Asian or South American countries are also reduced, which makes upgrading the key issues whether local companies can growth healthily. To break the plight of industrial upgrading to obtain the benefits of joining the global value chains needs the support of the macro-environment and micro base guarantee.

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