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## **The Governance Structure of Transactions in Enterprise Clusters: the Case of Bicycle Industry in Rural China**

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Based on the field investigation of bicycle enterprise cluster in Wang Qingtuo, this paper points out that the institutional bases for transactions and contracting are linkage games. And it is the bilateral linkage games that make transactions among enterprises in the cluster in the form of relational contracts. Meanwhile, the bundling of different economic domains and the intervention of the third party further improve the governance structure of enterprise cluster. In this paper, we argue that the cluster's early rapid development did rely on the embeddedness of economic domains and social exchange domains. However, because of the fact that traditional village norms still have some deficiencies of the pre-market economy, TVE clusters may advance through the introduction of the third parties.

### **INTRODUCTION: THE MIRACLE OF RAPID DEVELOPMENT OF SMALL BUSINESSES IN WANG QINGTUO**

Wang Qingtuo is a town near Tianjin City. Because of the scarcity and barrenness of their land, people in the town have a tradition of engaging in small article dealing, carrying trade and handicraft trade. In 1994, to satisfy the demand of farmers who undertook transport service, some workers who once worked in the Supply and Marketing Cooperative founded a bicycle workshop. They bought bicycle parts from Tianjin City, and assembled them into bicycles for special use. In this way, the bicycle industry in Wang Qingtuo emerged.

One year later, in 1995, the number of small bicycle firms in Wang Qingtuo increased to more than 20. The output of bicycles they produced was up to 120 million. Bicycle industry in Wang Qingtuo grew up quickly. In 2001, Wang Qingtuo had 95 bicycle assembly firms and 145 bicycle part firms. Bicycle output of the town increased to 420 million, about 40% of that of Tianjin and close to 10% of whole country. The assets, sales, profit, and export income was respectively \$25 million, \$100 million, \$8.75 million, and \$1.8 million. The rise of bicycle industry was named as "Wang Qingtuo Phenomenon".

In course of increasing output and improving product quality, many firms began to emphasize their credit and brand. Now, some trademarks have some good reputation in bicycle industry. A lot of part firms have become fixed part supplier for assembly firms. The bicycle firms in Wang Qingtuo not only produce inexpensive but also high quality

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bicycles. Their products are the first choice of low-income consumers.

Driven by the bicycle industry, the economy of Wang Qingtuo has been promoted and diversified. Now, in Wang Qingtuo, the down-stream and up-stream industries, which are closely related to bicycle production, including part and fitting firms, raw material firms, wholesale and retail firms, have formed.

Nearly all residents of Wang Qingtuo no longer engage in planting. About 80 percent of the habitants are engaging in bicycle and relevant industry, and the others are doing services. Wang Qingtuo has turned to be the largest bicycle producing and circulating area in north of China.

Wang Qingtuo was a small town and engaged in agriculture, and had no industrial foundation. What they had were a few workers who were able to assemble bicycles. So, it seems a puzzle that the town became a famous bicycle production base. We did some field inquiry to find the answer to the puzzle. We argue that industry cluster theory may be well applied to this case.

Enterprise cluster is a group of firms in one industry closed one another due to commonness and complementarily (Porter, 1998). Traditional economic geography argues that industry clusters come into being when firms minimize transportation costs by taking the location advantage. But recent studies found that enterprise cluster may form in a place that wasn't adjacent to raw material producing area, major market and traffic center. These Town and Village Enterprise (TVE) cluster has concerned many economists.

The New institutional economics argues that enterprise cluster is a type of economic organization between market and firm that can decrease transaction costs. Thus, enterprise cluster transcends market and firm. As an institutional innovation under demand constraint, Wang Qingtuo owes its success to institutional adaptability that enterprise cluster has (Xie and Huang, 2003). However, different from the mature industry areas of Japan, Silicon Valley, Italy, etc., the enterprise cluster in Wang Qingtuo is constituted of TVEs, so it depends more on informal institutions such as community norms. From the perspective of contract and governance structure, we will analyze the reasons of success in Wang Qingtuo. Furthermore, we will provide some advice for the future development of enterprise cluster in Wang Qingtuo.

## LITERATURE REVIEW

Williamson (1979) said, there were intermediate product transactions and intermediate organizations between market and firms. "The question of why there are so much market vertical integration remains interesting, but no more so than the question of why there are so many market- (and quasi-market) mediated transactions".<sup>3</sup> Following Macneil's three-way classification of contract, Williamson put contracts into classical (completely randomized), neoclassical (the third party participated) and relational (durable and long-term) categories. According to different types of uncertainty, frequency and idiosyncrasy of assets, he identified three types of governance structure:

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<sup>3</sup> Williamson, Oliver, 1979. Transaction-cost economics: the Governance of Contractual Relations, *Journal of Law and Economics*, Vol. pp234.

non-specific, quasi-specific and idiosyncratic governance structure. In the eyes of Williamson, intermediate organizations, the diversity of transactions and the governance structures of transactions as a whole became the domain of new institutional economics.

However, Williamson simply distinguished the types of transactions, contracts and governance structure, he didn't consider the environments and conditions that the intermediate transactions and organizations depended on and, the adaptability of organizations. In other words, although Williamson argued that intermediate organizations could reduce moral hazards resulted from opportunistic behaviors, he didn't clarify how intermediate organizations occurred and what their institutional basis were. Aoki (2001) extended the study of the diversity and adaptability of institutions by applying game theory. He argued that in a self-organized market transaction domain, the parties could form common knowledge and harmonious actions and, thus, endogenous governance structure by bargaining. Since the system is complex, the equilibrium in a single domain is a partial equilibrium and always unstable. Different transaction domains, namely, the fundamental institution unit, get involved and bundled one another.<sup>4</sup> As a result, different institutions substitute and complement one another.

With regard to the institutional basis of transaction structure, namely the contract relationship, contracts are neither specific nor complete and transaction risks exist due to asymmetric information. Meantime, the asymmetric information enables contracting parties to take opportunistic behaviors to protect themselves, which result in prisoner's dilemma. Folk Theorem shows that if the intertemporal discount rate is relatively small, repeated game can avoid prisoner's dilemma and bring a Pareto improvement. However, the punishment mechanism of repeated game's subgame Nash equilibrium is relentless (Lei Yang and Yang Yao, 2002). So, the result is not robust. Once one party deviates from the equilibrium due to the non-systematic error or exogenous shock, the game will be terminated. Thus, this trigger strategy is not rational and not common in reality.

In fact, institutions function well only when they are organic whole and, thus, different domains affect one another. The institutional complementarily effect of different domains make transacting parties compute costs and returns in the scope of all related domains and, thus, break through the constraint of prisoner's dilemma. The institutional linkage of different transaction domains result in linkage game equilibrium. Or we can say, enterprises in cluster don't need the hate-to-hate punishment mechanism of repeated game. The relational contracts between enterprises make transacting parties transcend the static comparison of costs and returns and get collaborative results by computing the present value of expected return streams. Because the relational contracts inside cluster are based on local human and spatial relationship, which makes every member in cluster have enough incentives to observe collaborative norms and punish anybody who doesn't honor the norms. Moreover, these social norms can realize a "return evil with good" mechanism by implicit forgiveness and confidence. In other words, they can sustain exogenous shock and disturbance of system, allow of participators' temporal

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<sup>4</sup> Aoki (2001) argued that human behaviors can be classified into different game domain, such as transaction domains, political domains, etc. These domains are the set of actions of game participators. He described the relation of domains by the concepts of bundling, linkage, embeddedness, etc.

non-systematic deviations and, thus, make transactions inside cluster a more stable and flexible institutional arrangement.

### SUPPLY CHAINS: RELATIONAL CONTRACTS BASED ON LOCAL HUMAN AND SPATIAL RELATIONSHIP

Relational contracts are fundamental institution arrangement of enterprise cluster and they are a set of related bilateral contracts that are based on confidence of transacting parties. In TVE clusters, relational contracts are common in enterprises that are connected by kinship and other personal relationship. Thus, they form supply chains of clusters. Compared with complete market transactions and integrated specific transactions, these supply chains have advantages of minimizing entry costs and improving transaction efficiency. In Wang Qingtuo, we observed that supply chains have a positive effect on the development of bicycle enterprise cluster.

#### **The Effectiveness and Adaptability of Transactions**

After the midterm of 20th century, industrialization came into the problem of opportunistic risks and scale rigidity of organizational integration. For China's emerging TVEs, it is costly to adopt any types of organizations mentioned above. So, a new type of intermediate organization form, which is different from complete market contracts and complete integrated organizations, came into being.

In TVE enterprise clusters, due to the function of the human and spatial relationship, transactions among firms develop a pooling effect of collecting and handling information and, thus, reducing the costs of searching information and expanding new market. In the same time, the small firms in supply chains are independent law entities, so they have complete residual claim right. In addition, enterprises in cluster are always small family firms, so they have low management costs because of their relatively simple organization and, thus, are flexible to adapt to new market changes and can meet the individual demand of small scale and diverse variety. Therefore, the case of Wang Qingtuo demonstrates that, enterprise clusters have effectiveness and adaptability and for traditional industries whose manufacturing stages can be divided.

#### **The Quasi-specific of Contracts**

The basis of specific transactions is stable and long-term contract. To make contracts stable, contracting parties must take some commitments by making specific investments. But enterprises have difficulties in adjusting specific assets as market demand varies so these assets become sunk costs. In Wang Qingtuo, the up-stream and down-stream enterprises don't need the commitment of making specific investments. They maintain a stable relationship by mortgaging social capital.<sup>5</sup> Mortgaging social capital not only reduces the costs of establish reputation, but also avoids the rigidity of adjusting specific assets. In addition, social capital insures stable transactions in cluster without prohibiting transacting counterparty from making business with other enterprises.

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<sup>5</sup> Social capital is the social status; the recognition and the sense of belonging that resulted from long-term association and cooperation with other members of the same community (Aoki, M., 2001).

**The Stability and the Enforcing Flexibility of Contracts**

Completely random market contracts emphasize transaction rules, formal documents and automatic market clearing mechanism. Once one party violates contracts, the other parties can only resort to law, so market contracts have little self-adjusted ability. Therefore, "relatively informal, legally unenforceable contractual practices predominate in business relations and that reliance on explicit legal sanctions is extremely rare."<sup>6</sup> In enterprise cluster, supply chain, as a type of relational contracts, is not a formal institution arrangement, but it is more efficient than formal contracts. For example, under the relationship of formal contracts if one firm delays providing goods because of unpredicted contingencies, maybe it will be sued and claimed for loss. But, in Wang Qingtuo, because of the existence of stable and long-term contracts between enterprises, these enterprises may make forgiveness and a postponement. These informal coordinating mechanisms among enterprises in cluster can not only lower the cost of enforcing contracts (avoiding lawsuit), but also make contracts stable and effectively enforced (avoiding terminating contracts) due to marginal adjustment.

**The Controllability of Uncertainty and Opportunistic Behavior**

Frank Knight argued that, due to the uncertainties in probability distribution, market transactions can't adapt to external changes and, thus, it is difficult to avoid opportunistic behaviors. Similarly, integrated firms as a nexus of factor contracts substitution for commodity contracts couldn't avoid opportunistic behaviors either (Cheung and Steven N. S., 1983). Different from market transactions and factor contracts inside integrated firms, firms in TVE cluster are linked by relational contracts and social capital. Thus, TVE cluster has a capability of controlling opportunistic behaviors resulted from uncertainty. Because this problem involved social embeddedness, we will focus this problem section 4.

**THE INTERVENTION OF THE THIRD PARTY: THE BUNDLING OF TRANSACTION DOMAINS AND THE EXTENSION OF TRANSACTIONS**

The analysis above shows that relational contracts, which are based on local human relationship and spatial relationship, make transactions inside cluster in the form of supply chains. But supply chains are only one characteristic of transactions inside cluster, intermediate trader and social intermediaries are another important elements for the development and expansion of enterprise cluster. The intervention of the third party breaks through the equilibrium of bilateral game, brings forth a trilateral game equilibrium and, thus, expands transaction domain. As Aoki said, the existences of an effective and formal third party mechanism makes great contributions in developing a stable expectation of enforceability of contracts and safety of property rights and, thus, extend the domain of contracts.<sup>7</sup> The development of enterprise cluster in Wang Qingtuo illustrated the process and effect of the third party mechanism.

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<sup>6</sup> Klein, B., R. Crawford & A. Alchian, 1978. Vertical Integration, Appropriable Rents, and the Competitive Contracting Process, *Journal of Law and Economics*, Vol. 21, pp304.

<sup>7</sup> Aoki, M., 2001. *Toward a Comparative Institutional Analysis*, MIT Press.

### **The intervention of distribution agents**

In the early stage of development of bicycle enterprise cluster in Wang Qingtuo, there were only several bicycle assembly firms. Besides, the distribution channels were not stable, so the (market) transaction costs were very high.

Following the increase of quantity, selling whole bicycle is profitable. So some residents began to engage in selling whole bicycles. The intervention of distribution agents is a case of bundling of transaction domains. This bundling experienced two stages. At the beginning, local distribution agents went out of Wang Qingtuo and developed market for bicycle firms in Wang Qingtuo. Then, dealers outside Wang Qingtuo requested to be distribution agents on their own initiative.

After the emergence of part and fitting firms and raw material firms, some distribution agents who dealt with parts and fittings and raw materials grew up and developed a relatively independent circulating market. So the producing market in cluster and the circulating market were bundled.

### **The Intervention of Other Service Industries**

Accompanying the bundling of manufacturing industries and distribution system, other factor markets and service industries, such as labor market, transportation, hotels, restaurants, etc. grew up. These industries, which were served for manufacturing system and distribution system, were bundled with processing system and distribution system, so the transaction costs of cluster decreased further. At the same time, the transaction domains of cluster expanded further. This expansion not only promoted the development of the third industries, but also abstracted many peasants from neighborhood area. Related to the production of bicycles, the second and the third industries flourished in Wang Qingtuo and its neighborhood counties.

### **The Intervention of Industry Association**

In course of the development of cluster, the competition in enterprise cluster experienced a spontaneous stage to a self-conscious stage. Industry associations of Wang Qingtuo were independent and didn't belong to any party of a linkage game. They functioned as intermediaries to link different domains and, thus, improved the efficiency of governance structure. Industry associations of Wang Qingtuo certified firms' qualifications and set entry permits. By setting permits and certifying qualifications, industry associations made entry barriers to small firms and lowered competition among firms. Although there were many small firms in Wang Qingtuo, industry association enables incumbent firms to have an average margin rate by preventing excessive entry.

## **THE EFFECT OF SOCIAL EMBEDDEDNESS ON GOVERNANCE STRUCTURE OF TVE CLUSTER**

In the first section, we pointed out that the linkage of different domains make transacting parties compute costs and returns in the scope of all related domains and, thus, break through the constraint of prisoner's dilemma. But the rapid development of enterprise cluster depends on supply chains, which are developed by relational contracts, and the complementarity of different domains based on supply chains. In TVE cluster of

Wang Qingtuo, the linkage between domains is realized by social embeddedness, which means the phenomenon of mutual penetration, entry and linkage of different institutions. This linkage can create some external effect, make all or some participators benefit from linkage and, thus, make it continue.<sup>8</sup>

In Wang Qingtuo, producers and traders nearly all are residents of the town. Before the emergence of bicycle industry, there were harmonious neighborhood relationship and good community ethics accumulated for years. When the production and transaction of bicycles grew up in Wang Qingtuo, the existing local human relationship and community ethics would naturally extend into business activities and developed a community norm of keeping credit, reciprocal cooperation and benefit, which became an effective governance mechanism in enterprise cluster.

First, social embeddedness made traders in cluster maintain a competitive and cooperative relationship. From the perspective of economic exchange domains, members in a same cluster compete for profit; while from the perspective of social exchange domains, members are in a same network of human relationship and share social capital, so they cooperate in a sense. The cooperation in enterprise is realized by tacit and the community norm of keeping credit, reciprocal cooperation and benefit. From enterprise cluster of Wang Qingtuo, we saw the positive effect of country community norm on the development of rural economy, the mutual complementarity and co-existence of market transaction domains and social exchange domains, and the adaptability and effectiveness of incorporation of formal transaction institutions and informal social norms.

Second, the members of enterprise cluster in Wang Qingtuo shared social capital of community, namely, human relationship and marketing channels. So, the members of cluster can transfer the benefit of sharing social capital to transaction domain and, thus, reduce transaction cost, searching cost by sharing marketing channels. In addition, the mutual familiarity and confidence between members in cluster decreased the opportunistic risk of transaction.

Finally, although the introduction of social capital allows the temporary deviation of equilibrium path, transacting parties must abide by community norms, constrain themselves and enforce contracts when the expected returns from sharing social capital is high enough. Obviously, even bounded rational transaction parties are not willing to take risk of ruining their reputation through violating these norms and getting temporary returns.

From the analysis above, we know, in the vast county of China, specially the outskirts, there are many small enterprise clusters or embryos embedded in community norms. Although these areas didn't have technological and capital advantage, due to the institution advantage produced by social embeddedness, small enterprise clusters of traditional industries (mainly traditional manufacturing industries and commercial industries) mushroomed. A good case in point is Wang Qingtuo's rapid development into a nation-widely famous bicycle production and circulation area.

Nowadays, TVEs confront the problem of how to develop continuously. Usual method is to incorporate small TVEs into bigger ones by administrative means. However, government direct intervention in the acquisition of enterprises may violate the rule of efficiency. Enterprise clusters as institutional equilibrium results of the mutual penetra-

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<sup>8</sup> Aoki, M., 2001. *Toward a Comparative Institutional Analysis*, MIT Press.



tion and embeddedness of market economy and traditional country society, can transform TVEs' comparative advantage into competitive advantage. Therefore, enterprise cluster is applicable to China's dual economy situation and is a viable institution choice for the industrialization of rural economy.

However, that governance structures are fit to the current dual economy situation doesn't mean that they can achieve optimal result. In fact, enterprise clusters that have good norms and mutual confidence relationship sometimes have bad reputation in a greater transaction domain such as nationwide market. For example, some of these small enterprise clusters started up by imitating famous brand of goods and producing shoddy goods. The media for producing inferior bicycles once exposed some bicycle firms in Wang Qingtuo.

It is obvious that traditional country norms contribute to the self-enforcement and mutual constraint of governance mechanism in enterprise cluster. While outside community, these norms don't work. Therefore, as china's market economic systems are being perfected continuously, the positive effect of community norms on the promotion and consummation of governance structure is decreasing. So, the further development of TVEs cluster will depend on the intervention of the third parties and the constitution and consummation of formal institutions such as law systems.

However, we should pay attention that industry associations in Wang Qingtuo are in an initial stage and have no capability of solving this low-technology level repetitive construction and low-price competition. It is just a major factor that influences the development of bicycles industry of Wang Qingtuo. To change this situation, Wang Qingtuo must optimize its transaction organizations, specially, intermediaries such as industry organization. Their functions shouldn't rest only on single functions like firms' registration.

Compared with the Bicycle Industry Association of Wang Qingtuo, Tianjin Bicycle Industry Association has been playing an important coordinating role as a third party. It has begun to host the North China International Bicycle Fair since 2002. Tianjin Bicycle as a brand-mark representing more than 660 bicycle firms showed up in the exhibitions, which improved the reputation and competitive advantage of bicycle industry of Tianjin in domestic and international market. Furthermore, they set technical standards, safeguarding firms' rights and interests, etc., so they play an active role in promoting the bicycle industry in Tianjin.

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