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**Market, Hierarchy, and Network:  
Three Coordination Mechanisms  
in China's Rural Firms**

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**Market, Hierarchy, and Network:  
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**Abstract**

This study attempts to examine coordination mechanisms operating in post-socialist China. We argue that, first, rural firms in China use all three coordination mechanisms. Second, relative effects of market, hierarchy, and network and their combinations in coordinating economic behavior differ from firm to firm, and from functional operation to operation in firms. Third, there are organizational and personal factors that may affect the use of the coordination mechanisms in rural firms in China. The results of a questionnaire survey of 859 rural firms support our hypotheses.

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## **Introduction**

Some attention has been paid to the coordination mechanism(s) operating in socialist or post-socialist societies in recent years. For example, Stark (1996) and Grabher and Stark (1997) have explicitly noted the three coordination mechanisms of market, hierarchy, and network in the transition from the planned economy to the market economy in East European countries. Lin (1995) and Boisot and Child (1996) have explicitly or implicitly identified the three mechanisms in reforming China.

However, several important issues need further exploration. For example, how do these coordination mechanisms operate at the organizational level, say, in China's rural firms? Do rural firms in China use only one or all three coordination mechanisms? If so, do coordination mechanisms vary from firm to firm? Do they differ from operation to operations? What are the most popular coordination mechanisms? What factors affect the use of the coordination mechanisms?

This study attempts to examine those issues in order to contribute to the research on the three coordination mechanisms and economic transition. In the following sections, we first review the research literature on market, hierarchy, and network coordination mechanisms in the West as well as in China. Next, we propose and test, several hypotheses regarding the use of the three mechanisms, using a random sample of 859 rural firms of China. Finally, we discuss findings and contributions of the study as well as possible directions for future studies.

## **Literature Review**

### *From Classical Economics to the Embeddedness Approach*

The role of the market as a coordinating force has long dominated the field of the classical and neoclassical economics. In classical and neoclassical economics, the market operates through prices (Granovetter, 1985; Powell, 1990). Prices "capture all the relevant information necessary for exchange" (Powell, 1990: 297). Market transactions are straightforward and non-repetitive so that actors in the market might never be known to each other. Actors in the market are rational and self-interested and are minimally affected by social relations (Granovetter, 1985:481).

Market, however, is not the only coordination mechanism in economic interaction because in reality there is no perfect market. At the macro level, central planning is a realistic alternative to the laissez-faire market (Hayek, 1945: 521). At the micro level, internal organization is seen as a substitution for market-mediated exchange, given bounded rationality, uncertainty, and idiosyncratic knowledge (Williamson, 1975:5).

Williamson's transaction cost theory, however, "overestimates the efficacy of hierarchical power" and "fails to appreciate the embeddedness of economic life in social relations," as in the classical and neoclassical economics

(Granovetter, 1985). The transaction cost approach considers existing social structure influences on market behavior as exceptions (Granovetter, 1985). Dissatisfied with the previous research on economic life, Granovetter (1992) proposes an embeddedness model which argues that the pursuit of economic goals is typically accompanied by that of such noneconomic ones as sociability, approval, status, and power.

Consistent with this line of reasoning, some scholars such as Powell (1990), and Grabher and Stark (1997) argue that at the organizational level, a viable pattern of economic organization is network. Network can be contrasted with market and hierarchical governance structures. Network forms of organization are characterized by trust, reciprocal patterns of communication, and exchange. Know-how, the demand for speed, and trust are three critical components of network forms of organization (Powell, 1990).

Bradach and Eccles (1989) further argue that there are three control mechanisms that govern economic transactions between actors, price, authority, and trust. They are independent and can be combined in a variety of ways. In the plural form, organizations simultaneously operate distinct control mechanisms for the same function. Because prices are a key element of market, authority is a key element of hierarchy, and trust is a basic element of network, their argument implies that market, hierarchy, and network are independent and can be also combined in different ways.

Although previous research has identified three coordination mechanisms, there is no quantitative examination of their relative effects on economic behavior and institutions. Another problem is that the aforementioned theories derive basically from Western societies. It is not clear whether they are applicable to a culturally and politically different society such as that of China.

#### *Immature Market, Diminishing Hierarchy, and Lingering Network*

In China, a post-socialist society in transition from a planned economy to a market-oriented economy, three coordination mechanisms co-exist. Lin (1995) noticed that in order to better understand China's reform processes and local variations, bureaucratic coordination, market coordination, and local (network) coordination should be taken into account.

Many researchers observed that China has been transformed from a planned economy to a market-oriented economy, and the influence of redistributive power has been declining (Nee and Matthews, 1996; Wu, 2002). Therefore, the market coordination mechanism has become a dominating coordination mechanism.

However, some other studies explicitly or implicitly suggest that the state (Zhou et al., 1996, 1997) and local governments (Jiang and Hall, 1996; Nee, 1992; Oi, 1992; Walder, 1995) play a much more important role in shaping economic behavior and institutions in urban and rural China than in the West. Market coordination in reforming China is far from complete and is much less regulated than in the West in spite of its increasing role (Nee, 1989; Oberschall, 1996). According to a recent study, "the local party committees still succeed at keeping their fingers in the decision-making process even after

two decades of economic transition, due to diverse lock-in effects between the party and various areas of the institutional environment” (Opper et al., 2002).

Lin and other scholars of China studies, however, further suggest network coordination plays the “pivotal role” in China (Lin, 1995). *Quanxi* (or informal network) is unique in the Chinese context because “it is so pervasive and dominant in the entire society, throughout its historical, political and economic contexts” (Lin, 1997). Boisot and Child (1996) also argue that “China’s rapid economic development is being accomplished through a system of industrial governance and transaction that differs from Western experience.” They call the system “network capitalism.”

Three main factors have contributed to the co-existence of three coordination mechanisms in post-socialist China. First, drastic economic reform since the late 1970s has transformed the Chinese economy from a centrally planned economy to a market-oriented economy.

Second, under the transitional economy, governments still make the production plans that, to varying degrees, influence organizations, especially large state-owned enterprises, although the plans are not mandatory to most firms. At the same time, market coordination is becoming more important but is poorly regulated, uncertain, and unstable. Transition cost in this incomplete market might be extremely high.

Third, socio-culturally, China is characterized by pervasiveness of interpersonal relations (*quanxi*) or informal network. Informal network is a commonly used coordination mechanism in economic life in China (Bian, 1997; Boisot and Child, 1996; Gold, 1985; Jiang and Hall, 1996; Lin, 1997; Walder, 1986; Whyte and Parish, 1984; Xin and Pearce, 1996; Yang, 1994). Among these three coordination mechanisms, network seems most important in China. We argue that network is an alternative to the problematic market and hierarchy systems in China.

Since 1978, the market system has gradually been used to coordinate economic activities in China. However, because of the short history of the market as a coordination mechanism, combined with the lack of legal regulations, a complex system of financial institutions, and other conditions required in a fully developed market system (Oberschall, 1996:1033), opportunistic transactions exist everywhere. New and small businesses such as rural firms in China cannot afford this high-risk expense and must find ways to protect themselves from opportunism in the market.

In addition, formal bureaucratic hierarchies are problematic. Rural businessmen deeply doubt fairness and universalistic principles of hierarchical coordination in the market. Thus, they are likely to seek interpersonal network to protect their self-interests from bureaucratic hierarchies and to prevent any potential damage from them.

In comparison to the deeply problematic market and hierarchy coordination mechanisms, network coordination has at least the following advantages. First, network generates strong and long-term cooperation. The second advantage is that network provides quick access to reliable information (Powell, 1990). The third advantage is that network, coupled with economic



rewards, creates incentives for learning and hard work, thus giving rise to high productivity.

Overall, previous studies explicitly identified and explained the coexistence of three mechanisms in Chinese society. However, there are still gaps that need to be filled. For instance, previous studies are based primarily on general observations of Chinese society as a whole. Can these observations be applied at the organizational level such as that in Chinese rural firms? In addition, no study has empirically tested the theoretical argument and further explored the variations of the use of these mechanisms.

## Hypotheses

Based on the previous studies, we would like to propose following hypotheses:

H1: Economic transactions in Chinese rural firms are coordinated by market, hierarchy, and network mechanisms and their combinations. Among them, network is the most important mechanism.

Market works through demand and supply, or prices. Idealized market is characterized by perfect competition, perfect information (Swedberg, 1994), well-defined laws and regulations, and others factors described by classical and neoclassical economics, as noted previously.

Hierarchy refers to “a superior-subordinate relationship” (Williamson, 1975:xv). However, broader than Williamson’s definition, hierarchy in this study includes not only the vertical relationship within an organization but also the vertical relationship between low-level and high-level organizations, such as between a company and its branch, between a business organization and a government agency, and between low-level and high-level government.

Network refers to a set of social relations or social ties between two or more actors. We distinguish formal network from informal network. Formal network is based on formal agreement and system trust without emotional or sentimental involvement (Macneil, 1978; Goldberg, 1980; Williamson, 1985; Mariti and Smiley, 1983; Bracach and Eccles, 1989; Richardson, 1972). Informal network is based on informal agreement and personal trust with moral, emotional, or sentimental involvement.

*H2: The use of the three coordination mechanisms differs in different organizations and depends on the ownership of the rural firms.*

Different firms in rural China have different conditions. In collective firms, local governments are the *de facto* owners. Thus, they are directly and indirectly involved in and control business operations (Jiang and Hall, 1996; Wan, 1994).

The mixed firms in this study refer to those that are neither purely collectively owned nor purely privately owned. Hierarchical involvement and control in the mixed firms are much less than in collective firms but may be more than in individual private firms. Also, the mixed firms are more formalized than individual private firms.

Individual private firms hold almost all responsibility in the areas of financing, hiring, firing, buying, selling, and other decisions. Compared with collective and mixed firms, private firms have the lowest codification/formalization and thus are least controlled by formal rules.

H3: The use of the three coordination mechanisms or a combination of the mechanisms depends on the functional operations of the firms.

Within a firm, business operations face different conditions and thus may use different coordination mechanisms with regarding finance, information, equipment, facilities and employees.

H4: Organizational characteristics and personal characteristics of owners/managers may affect the use of the three coordination mechanisms and/or combinations.

Access to needed resources for Chinese rural firms is affected by three main organizational factors. First, types of rural firms affect the accessibility of resources. Second, the environment in which Chinese rural firms operate may also affect the use of coordination mechanisms. Third, the size of the firm usually leads to a higher level of formalization. In addition to organizational factors, personal characteristics of owners/managers of the firm may also affect the accessibility of resources. For instance, age, gender, educational level and cadre experience may all affect the use of coordination mechanisms.

## **Data and Variables**

The data for this study came from a questionnaire survey conducted in Hubei province, China in 1996. Based on the level of economic development, we first classified all 72 counties and equivalent cities in the province into advanced, middle, and low levels and then selected one county or city from each level. Then, three towns were selected from each sampling county or city. Within each sampling town, six villages or equivalents were chosen. Two were at the advanced level, two at the middle level, and two at the low level. Then all firms in the sampling villages or equivalents were surveyed (including those out of business in the past ten years). This multistage cluster sampling was the best choice because no updated list of rural firms in the province was available.

We sent out 1,000 questionnaires and received 915 questionnaires back. The response rate was 91.5 percent. The number of final useful questionnaires was 859. The respondents were either owners or managers of 859 rural firms.

In this study, we asked five questions to measure the use of hierarchy, market, and network, or combinations of all three coordination mechanisms including (1) money to start a business, (2) relevant information, (3) equipment for production, (4) facilities, and (5) employees. We believe that these are five of the most important operations in the Chinese rural enterprises.

**Table 1. Measurements of Three Coordination Mechanisms in Five Operations**

<b>Coordination</b>	<b>Market</b>	<b>Hierarchy</b>	<b>Network</b>
<b>Functional areas</b>			
<b>Capital</b>	Bank loans Employee shares Foreign investors	Government direct investments Government loans	Family Relatives Friends Partners
<b>Information</b>	News media Market Similar businesses within the township Similar businesses outside the township	Franchiser. Government agency Government documentation Similar businesses within the township	Family Relatives Friends Neighbors
<b>Equipment</b>	Market Similar businesses within the township Similar businesses outside the township	Government	Family Relatives Friends Neighbors
<b>Facility</b>	Market Similar businesses within the township Similar businesses outside the township	Government	Family Relatives Friends Neighbors
<b>Employees</b>	Employment advertisement	Government allocation Government recommendation	Family Relatives Friends Relatives' friends Friends' friends

We included several individual variables in the study: gender, age, education, cadre experience, and number of family members and relatives. In addition, we also include some organization variables in the study such as ownership of the firm, the size of the organization, and the level of competition.

## Results

### *Overall Use of the Three Coordinating Mechanisms*

Table 2 shows that Chinese rural firms do use all three coordination mechanisms and combinations of those mechanisms. Use of network, generally speaking, was the most popular mechanism while use of hierarchy was the least popular mechanism. Use of market was the second most popular mechanism followed by combinations of the three. Differences between use of network and use of other mechanisms are statistically significant ( $P. < .001$ ). Also, market was used more than hierarchy and combinations ( $P. < .001$ ). The difference between hierarchy and combination use is not significant.

**Table 2.** *Total Use of Market, Hierarchy, Network and Combinations by Ownership*

Mechanism	Overall		Collective		Mixed		Private	
	No	%	No	%	No	%	No	%
<b>Network</b>	1816	46	68	8	129	36	1585	64
<b>Market</b>	980	25	246	27	61	17	605	24
<b>Hierarchy</b>	304	8	232	26	42	12	19	1
<b>Mixed</b>	813	21	350	39	130	36	279	11

**Notes:** 1. Mechanisms 1, 2 and 3 indicate that network, market and hierarchy operated independently in finance, information collection, lease or purchase of workplace and hiring. Mechanism 4 includes combinations between and among network, market and hierarchy.

The results in Table 2 also indicate that there are differences in using coordination mechanisms among collective, mixed, and private firms. First, private firms used network coordination more than any other coordination mechanism and more than collective firms did, as expected. Second, collective firms used hierarchy, market, and combinations more than network and used hierarchy more than private firms did, as expected.

Overall, the results support our hypotheses 1 and 2. First, Chinese firms use all three coordinating mechanisms, and network is the most popular of the

three. Second, ownership of the firms definitely affects the use of coordinating mechanisms.

*Variations of Using Three Coordinating Mechanisms*

Table 3 presents relationships between business operations for each of the three types of the coordination mechanisms—market, hierarchy, and network. The results reveal obvious variations in the use of three coordination mechanism from operation to operation.

**Table 3. Associations (Lambda) Matrix**

	Network C	Network I	Network E	Network F	Network H
Network C	1	.035 (.024)	.012 (.032)	.000 (.000)	.133*** (.023)
Network I		1	.395*** (.035)	.222*** (.042)	.098*** (.020)
Network E			1	.439*** (.036)	.107* (.044)
Network F				1	.000 (.000)
Network H					1

  

	Market C	Market I	Market E	Market F	Market H
Market C	1	.000 (.000)	.065* (.024)	.000 (.000)	.110*** (.027)
Market I		1	.053 (.037)	.000 (.000)	.000 (.000)
Market E			1	.237*** (.045)	.078*** (.022)
Market F				1	.000 (.000)
Market H					1

  

	Hierarchy C	Hierarchy I	Hierarchy E	Hierarchy F	Hierarchy H
Hierarchy C	1	.035 (.034)	.012 (.069)	.000 (.058)	.133*** (.067)
Hierarchy I		1	.395*** (.041)	.222*** (.032)	.098*** (.038)
Hierarchy E			1	.439*** (.052)	.107* (.067)
Hierarchy F				1	.000 (.000)
Hierarchy H					1

**Note:** 1. C=Capital, I=Information, E=Equipment, F=Facility, H=Hiring. Network C refers to use network to obtain capital. Same principle applies to all categories. 2. \*P. <0.05, \*\*\*P. <0.01, \*\*\*P. <0.001

Table 4 further reveals variations in using network, market, and hierarchy and their combinations both among business operations and between collective and private firms. The results support our hypotheses 3.

**Table 4.** *Percentage Distribution of Use of Market, Hierarchy, and Network and Combinations in Five Business Operations Controlled by Ownership\**

Mechanism	Operation				
	Capital (n=452)	Information (n=547)	Equipment (n=464)	Facility (n=475)	Hiring (n=550)
<i>Private</i>					
	%	%	%	%	%
<b>Network</b>	76.5	31.1	59.3	57.1	95.1
<b>Market</b>	5.3	44.1	34.1	37.1	1.1
<b>Hierarchy</b>	0.0	1.0	0.0	2.5	0.0
<b>Mixed</b>	17.7	24.1	6.5	3.4	3.8
<i>Collective</i>					
	%	%	%	%	%
<b>Network</b>	11.2	7.1	4.4	2.4	12.6
<b>Market</b>	22.5	46.7	33.7	18.5	13.7
<b>Hierarchy</b>	24.2	7.1	27.6	53.0	20.2
<b>Mixed</b>	42.1	39.0	34.3	26.2	53.6

**Note:** 1. Mechanisms 1, 2, and 3 indicate that network, market and hierarchy operated independently in finance, information collection, lease or purchase of workplace and hiring. Mechanism 4 includes combinations between and among network, market and hierarchy.

*Factors that May Affect the Use of the Coordination Mechanisms*

Table 5 shows the regression coefficients of selected individual and organizational variables on the use of coordination mechanisms. The dependent variable Mechanism in Table 5 is the coordination mechanism used in all five operations. As discussed previously, we listed several measures of network mechanism, hierarchy mechanism, and market mechanism in Table 1. If any measure of network mechanism was used, it scored 3, otherwise 0. If any

measure of hierarchy mechanism in Table 1 was used, it scored 2, otherwise 0. If any measure of market mechanism in Table 1 was used, it scored 1, otherwise 0. A higher score of the variable Mechanism means a higher possibility to use network as the main coordination mechanism exists.

**Table 5.** *The Effect of Selected Variables on Coordination Mechanisms*

Independent Variables	Dependent Variable Mechanism	
	B	Standard Error
<b>Constant</b>	-4.518	5.669
<b>Individual</b>		
<b>Age</b>	.101	.067
<b>Education</b>	1.269*	.506
<b>Cadre Experience</b>	-.653	.537
<b>Organizational</b>		
<b>Ownership</b>	2.935***	.828
<b>Firm Size</b>	.001	.010
<b>Level of Competition</b>	1.328	.769

Note : \*P. <0.05, \*\*P. <0.01, \*\*\*P. <0.001

The results show that ownership is a strong predictor of overall use of coordination mechanisms. The higher the level of a firm's privatization, the more likely the firm is to use network in running business. The data supports our hypothesis and agree with previous research. The results also challenge the conventional wisdom that the level of privatization is related to the level of market mechanism use. We agree that the level of privatization may eventually lead to a higher level of market mechanism use; however, we want to point out that at the early stage of privatization, use of network mechanism may be more important than use of market mechanism.

In addition, the results show that the education level of owners/managers also affects the overall use of coordination mechanisms. The higher the level of education of the owners/managers, the more likely they are to use network (not market). Building personal networks through education is quite popular in China. In general, in Chinese rural firms, those owners/managers who have a higher level of education tend to have large social networks, particularly through their classmates and teachers directly and indirectly.

However, the effect of cadre experience on the use of coordination mechanism is negative, though not significant. This is not surprising at all. As we know, cadres in China usually have access to all three coordination mechanisms. First, because of their positions in government, they have access to resources provided by hierarchy channels. Second, because they often control the firms that are going through the privatization process, they are also familiar with the market. Finally, undoubtedly, because of their positions in the society in general, they tend to have large networks.

Contrary to Western organization theories, the results show that size of the firm in China does not seem to have any significant effect on the use of

coordination mechanisms. A possible explanation is that China, especially rural China, is still in a transitional period during which the market is not well developed.

In line with our expectations, the level of competition and use of the network mechanism are positively related. The higher the level of competition, the more likely a firm is to use network mechanism in business operations. Nevertheless, the result is not statistically significant. Finally, the results show that age of owners/managers has no significant effects on the overall use of coordination mechanisms.

## **Conclusion and Discussion**

This study has examined coordination mechanisms in economic behavior and institutions in a post-socialist country, focusing on relative significance of market, hierarchy, and network. Advancement and differences of this study from previous research are reflected in both the conceptual and empirical aspects of the study. At the conceptual level, this study has argued that the relative effect of market, hierarchy, and network differs from organization to organization and from organizational operation to operation.

The definition of “hierarchy” in this study is broader than that offered by Williamson (1975). We have added the vertical relationship outside an organization in order to better understand economic behavior in China. We have identified the importance of the relationship between local government and organization in the Chinese economic activities.

Although the importance of formal network in coordinating economic behavior has captured scholars’ attention (see Nohria and Eccles, 1992, for examples), we have focused on informal network in the rule-by-person China. In rule-by-law societies, formal network may play a more important role than informal network in economic coordination while in rule-by-person societies the situation may be reversed. China is a rule-by-person society. Informal network plays an important role in China’s business activities.

At the empirical level, we have also contributed to the study of China and the organizational field. This study is the first to use quantitative data to test the coordinating functions of market, hierarchy, and network and their combinations in China’s reform.

Our study revealed the following specific findings. First, the results have shown that in China’s transition, economic transitions are coordinated by three mechanisms: market, hierarchy, and network. The most popular coordinating mechanism is network.

Second, our findings have revealed that use of market, hierarchy, network, and their combinations differs among collective, mixed, and individual private firms. At the same time, our results have shown that these coordination mechanisms function differently in the areas of finance, information collection, lease or purchase of equipment and workplace, and hiring.



Finally, this study also has explored possible factors that may affect the use of these three coordination mechanisms. The findings have revealed that private firms are more likely to use networks while collective firms are more likely to use market and hierarchy and combinations. In addition, among individual variables, the results indicated that education has a significant effect on the use of the coordination mechanisms.

Several issues need further research. First, ascribed network and acquired network need to be distinguished in the future studies. In examining the use of network, we found that cadre experience affects the use of network negatively (shown in Table 5) although it is generally believed that cadre experience helps increase personal networks and thus network use. The unexpected results may be due to integration of ascribed and acquired networks in our study.<sup>1</sup> Most of our measures of network are measures of ascribed network such as family, relatives, and villagers.

Second, this study is limited to firms in one rural area in China although the results shown here might be applicable to firms in other rural areas as well as firms in urban China. In addition, the issue of coordination mechanisms is relevant to other places, such as other post-socialist societies (see Grabher and Stark, 1997) and developed societies (see Nohria and Eccles, 1992).

As indicated previously, the original study was conducted in 1996; however, we did not finish the paper until recently, due one of the authors changing his career path. It should be noted that during this time, China and Chinese rural firms have undertaken some significant changes that might not be reflected in the current study.

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<sup>1</sup>Networks can be divided into two classifications: ascribed and acquired. Ascribed networks are in-born, such as family (including extended family), relatives and villagers. Acquired networks are established from education, work, or other social activities, such as classmates, co-workers and superior-subordinate relations.

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