

Shaping supply chain governance

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Shaping Supply Chain Governance

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Abstract:

The production process is becoming more complex and involving multiple companies and countries. A lot of research has focused on how these activities are coordinated and how inter-firm transactions are governed. However, the existing literature is neither complete nor clear enough to understand how external and internal factors influence the shaping of a firm's choice of mechanisms to govern transactions along the supply chain. Building from the existing literature, this paper proposes a conceptual model with two dimensions. The dimension of determinants includes three components: institution environment, industry structure and transaction characteristics. The dimension of governance patterns consists of five mechanisms a firm may use to govern its economic transactions along the supply chain: market contract, production contract, relational contract, relational production contract, and hierarchy. The paper provides prescriptions for the firm's choice among five supply chain governance patterns under different conditions of the above three components of determinants.

Keywords: Governance pattern; determinant; supply chain; transaction cost.

1. Introduction

The production process is becoming fragmented across geographic space and involving multiple companies. A lot of research has focused on how these fragmented activities are coordinated and how transactions between different actors along the chain of activities in the production, processing and distribution of products are conducted and governed (Gereffi et al., 2005). Research in this area mainly derives from one of three literature streams: Transaction Costs Economics (TCE), Network Theory, and the Global Value Chains approach (GVCs). These literature streams use different theoretical perspectives to explain the choice of various patterns of inter-firm relationships. TCE focuses on the effect of transaction characteristics on the associated coordination costs and hence governance patterns. Network Theory emphasizes different aspects of inter-firm relationships: trust and social embeddedness. The GVCs approach stresses the importance of industrial structure and production process characteristics. From these diverse perspectives, they propose different mechanisms, both formal (such as court or hierarchy) and informal (such as trust and reputation), to deal with uncertainty. They create key stones in the knowledge of how inter-firm transactions are coordinated. However, these literature streams are either incomplete or not clear enough to explain how external and internal factors influence the shaping of a firm's choice of mechanism to govern economic transactions along the supply chain¹ as well as which governance pattern is appropriate for a firm under different conditions such as the context of different institutional environments

and industrial structure characteristics.² Meanwhile, there has been no study on inter-firm relationships which either examines all three perspectives in a single framework or develops a comprehensive understanding of their comparative proficiencies in relation to each other. As a consequence, explanations of how transactions between firms might be organized remain incomplete, particularly when inter-firm transactions are embedded within the context of different institutional environments and industrial structure characteristics.

The institutional context in a developing and transitional country, where an increasing number of developed country firms extend their sourcing or outsourcing activities, is often characterized by the absence or weakness of formal legal enforcement of contracts. This raises more risks of behavioral uncertainty and high transaction costs for inter-firm transactions in developing and transitional countries (McMillan 1997; McMillan and Woodruff, 1999b, 2002). Some studies from institutional perspectives (McMillan and Woodruff, 2002; Johnson et al., 1995, 1997, 2002) found that due to the limited roles of courts for transactional assurance, firms in a transition economy have to compensate by employing a relational governance pattern which is coordinated by private ordering mechanisms such as trust, reputation and repeated game incentives. However, while relating the institutional environment and firms' choices of governance patterns to conduct economic transactions, these studies have ignored other aspects of inter-firm relationships such as transaction characteristics, the industrial structure and production-process characteristics. As a result, explanations of

firms' choices of governance patterns in the literature arising from institutional perspectives remain incomplete.

The above discussions point out that a wider theoretical perspective is needed for a better understanding of inter-firm governance patterns. This paper aims to develop a conceptual model to explain firms' choices between alternative governance patterns to conduct their economic transactions.

The paper is structured into five sections. After the introduction, the paper proceeds with Section 2 reviewing key theoretical issues. Section 3 points out the need for a wider approach by analyzing the drawbacks of existing literature strands. Section 4 develops an integrated framework for firms' choices of governance patterns. Section 5 concludes with a summary.

2. Theoretical backgrounds

Governance is a broad concept which covers the system of coordination, organization and control (Humphrey and Schmitz, 2000). It can be used in different organizational context levels such as international, nation-state, inter-firm and intra-firm. At the inter-firm level, governance refers to the inter-firm relationships and mechanisms through which both market and non-market co-ordinations of economic activities take place (Williamson, 1979; Humphrey and Schmitz, 2002). The literature uses different terminologies to describe inter-firm governance mechanisms such as 'governance structure' (Williamson, 1979), 'institutional arrangement' (North, 1990), 'form of governance' or 'governance pattern' (Humphrey and Schmitz, 2000; Gereffi et al., 2005). For consistency, this paper uses

the terminology 'governance pattern' which is defined by Furubotn and Richter (2005, 11) as 'a set of explicit (formal) or implicit (informal) rules that structures transaction between individuals in particular ways'. Therefore, the supply chain governance pattern can be understood in this paper as 'a set of formal and informal rules that structures transactions between economic entities in the supply chain in particular ways'.

The choice of governance patterns to conduct economic activity has been the subject of different strands of literature. At the inter-firm level, (i) Transaction Cost Economics (TCE); (ii) Network Theory; (iii) Global Commodity Chain; and (iv) Global Value Chains (GVCs) approaches are the major literature strands addressing the issue of inter-firm governance.

2.1. Transaction cost economics

The notion of transaction costs originated from Coase (1937, 390) who defines transaction costs as 'the cost of using the price mechanism'. Drawing from Coase (1937, 1960), Williamson (1975, 1979, and 1985) contributes to the operationalization of transaction costs by incorporating it into his analysis of governance structures. Williamson's theoretical framework of governance structures is referred to as Transaction Cost Economics. Transaction costs are made up of both *ex ante* and *ex post* costs of contracting. *Ex ante* costs are those arising in drafting, negotiating, and safeguarding an agreement. *Ex post* costs comprise mal-adaptation and adjustment costs which occur when a contract execution is misaligned (Williamson, 1985).

Williamson (1975, 1979, 1985, 1991) provides a basis for explaining firms' choice

of alternative modes of organization, with the optimal one depending on the particular characteristics of relationships, in searching for economizing on the total cost of transacting business. Williamson (1979, 1991, 1996) identifies three inter-firm governance patterns including markets, hierarchies and hybrid patterns between markets and hierarchies. Williamson (1996, 378) refers to the hybrid patterns as 'long-term contractual relations that preserve autonomy but provide added transaction-specific *safeguards*, compared with the *market*'. They include various patterns of franchising, long-term contracts, informal agreements and the like (Williamson, 1991).

The TCE framework is founded on two behavioural assumptions: bounded rationality and opportunism. Bounded rationality refers to the fact that individuals are limited in their foresight and cognition. Opportunism is described as 'self-interest seeking with guile' (Williamson, 1979, 234). These include moral hazard and hold-up problems.

To a certain extent, especially when a transaction is associated with asset specificity, the presence of bounded rationality and opportunism entail transaction costs, which firms aim to economize. The task of economic organization is to '*organize transactions so as to economize on bounded rationality while simultaneously safeguarding them against the hazards of opportunism*' (Williamson, 1985, 32).

Based on the above two assumptions, Williamson (1985) identifies three key dimensions of transactions which jointly determine the nature and level of transaction costs and hence, the extent to which firms

rely on market, hybrid or hierarchy patterns to execute business transactions. These include: (i) asset specificity; (ii) uncertainty; and (iii) frequency of transaction.

Asset specificity, so-called transaction specific investments, refers to 'durable investments that are undertaken in support of particular transactions'. *Uncertainty* refers to the degree of specificity of planned performance and predictability of the situation under which the contract takes place. *Transaction frequency* shows how often a specific transaction is repeated (Williamson, 1985, 55).

Having specified contextual factors (bounded rationality and opportunism) and characteristics of transactions, the next step of TCE is to align them to the appropriate governance structure. TCE highlights a causal link between the transactional nature of activities and governance structures under conditions of opportunism and bounded rationality. The combination of asset specificity, uncertainty and transaction frequency determines the nature and level of transaction costs and hence, the extent to which firms rely on market, hybrid or hierarchy governance patterns to conduct transactions. TCE suggests that market-based governance is most relevant for standardized products because the risks arising from asset specificity and opportunism in such cases are low. On the contrary, vertical integration (hierarchy governance pattern) is an appropriate way to execute transactions characterized by high degrees of asset specificity, uncertainty and frequency. In transactions involving a high level of asset specificity, the risk of opportunism is great enough to justify replacing the market with a hierarchy, since hierarchy is

one way of controlling the risk of opportunism, particularly hold-up problems. The risk of opportunism can be mitigated through hybrid governance or long-term contracts. However, given bounded rationality, all complex contracts are inevitably incomplete. Even if complete contracts were possible, contract enforcements are time consuming and costly. Therefore, hybrid governance will be relevant for transactions characterized by the lower level asset specificity, uncertainty and frequency.

2.2. Network theory

Network Theory is another strand of the literature on inter-firm relationships. Drawing from the TCE framework but extending the analysis into a broader social context, Network Theory provides perspectives to explore another way to deal with the problem of asset specificity, opportunism and coordination costs without resorting to vertical integration or complex contractual mechanisms of control. Network theorists (Thorelli, 1986; Powell, 1990; Jarillo, 1988; Lorenz, 1988) propose the network pattern as an alternative to market or hierarchy patterns. The terms network forms

of governance (Powell, 1990) or network governance (Jones et al., 1997) or inter-firm networks (Uzzi, 1997) have been used to refer to ‘interfirm coordination that is characterized by organic or informal social systems, in contrast to bureaucratic structures within firms and formal contractual relationships between them’ (Jones et al., 1997, 913). Rather than combining elements of markets and hierarchies, the network pattern of organization is a distinctly different pattern, which possesses its own characteristics (Powell, 1990). Table 1 makes a comparison between market, hierarchy and network patterns of governance.

Building on social exchange theory and the TCE framework, network theorists view a governance structure as not merely an outcome of economic rationality, but also of social rationality (Granovetter, 1985, 1992; Yeung, 2005).

Granovetter (1985) argues that economic exchanges are embedded in a system of social relations within which they exist. Two aspects of embeddedness are distinguished: relational embeddedness and structural embeddedness.

Table 1: Characteristics of market, hierarchy and network patterns of governance

Key feature	Market	Hierarchy	Network
Mean of Communication	Prices	Routines	Relational
Actor Choices	Independent	Dependent	Inter-dependent
Methods of Conflict Response	Haggling- Resource to courts for enforcement	Administrative fiat- Supervision	Norm of reciprocity - Reputation concerns
Normative Basis	Contract- Property Rights	Employment Relationship	Complementary Strengths
Degree of Flexibility	High	Low	Medium
Climate	Precision and/or Suspicion	Formal, bureaucratic	Open-ended, mutual benefits

Source: Powell (1990, 300).

The former refers to ‘personal relationships people have developed with each other through a history of interaction’ (Nahapiet and Ghoshal, 1998, 244). It focuses on the quality and intensity of a single dyadic tie. The key aspects of relational embeddedness comprise trust, trustworthiness, norms, mutual confiding, and information exchange (Uzzi, 1997; Putnam, 1995; Coleman, 1990; Granovetter, 1992). The latter can be defined as ‘the impersonal configuration of linkages between people or units’ (Nahapiet and Ghoshal, 1998, 244). In other words, structural embeddedness refers to the overall structure or pattern of network ties among parties (Granovetter, 1992; Uzzi, 1996). In contrast to relational embeddedness, which focuses on a single dyadic tie, the frame of structural embeddedness shifts from ‘dyad to triad’, and the focus of analysis shifts from ‘direct communication between actors to indirect channels for information and reputation effects’ (Gulati and Gargiulo, 1999, 1446-1447). This means that parties can connect with each other not only by direct relationships but also by indirect links through third parties (Jones et al., 1997). These mutual contacts allow channeling information, norms, and common understandings across group boundaries and parties. The structural embeddedness perspective also focuses on social control such as reputation, collective sanctions and restricted access that determines access of firms into networks (Jones et al., 1997).

These two perspectives of embeddedness provide explanations of two informal mechanisms to mitigate the problem of uncertainty (both environmental and behavioral

uncertainty), and the threat of opportunism and hence transaction costs associated with inter-firm transactions. First, the relational embeddedness, which is characterized by trust and information exchange resulting from prior direct ongoing interactions between transacting parties, provides an important basis for a firm to access information about a partner’s behavior as well as its reliability and specific capabilities. This reduces *ex ante* transaction costs (such as search, negotiating and screening costs) and diminishes uncertainty associated with potential exchange. Second, the structural embeddedness provides the conduits for the diffusion of values and norms as well as information about parties’ behaviors and strategies across group boundaries and parties (Gulati, 1995b; Jones et al., 1997). By doing so, structural embeddedness acts as a social control mechanism in terms of governing how parties behave or cooperate. This is because the information provided by the social networks guides firms’ choices of whom they transact with and how they interact. This mechanism imposes high social costs for opportunistic behaviors and thus discourages malfeasance. The structural embeddedness therefore enables ‘social mechanisms, such as restricted access, macro culture, collective sanctions, and reputation, to coordinate and safeguard exchanges’ (Jones et al., 1997, 924). These social mechanisms mitigate the risk of opportunism and hence, the *ex post* transaction costs associated with collaboration between parties.

The discussion above points out that in the networks of social relations, uncertainty and the threat of opportunism can be mitigated through

social relationships between firms. In other words, where social relations are in place, the social mechanisms such as trust and reputation can influence the choice of governance.

2.3. *Global commodity chain approach*

Based on differences in lead firms' characteristics and the nature of their relationships to other network members, Gereffi (1994; 1999) distinguishes two patterns of governance: producer-driven commodity chains (chains in which producers play a leading role in coordinating production systems coordination) and buyer-driven commodity chains (chains in which coordination is undertaken by buyers). In producer-driven commodity chains, large, vertically integrated transnational corporations play a dominant role in shaping decentralized production networks. This governance pattern is typical of capital and technology-intensive industries like automobiles, aircraft and electrical machinery where barriers to entry tend to be high. The producer driven value chain proposed by the Global Commodity Chain approach is similar to Hierarchy Patterns proposed by TCE. By contrast, buyer-driven commodity chains are found in labor-intensive consumer goods industries like agriculture, garments, and toys where barriers to entry in production are low. In buyer-driven commodity chains retailers and branded merchandisers at the marketing and retail end of the chain often play a central role. In short, according to the Global Commodity Approach, the industry structure and production process are determinants of governance patterns.

2.4. *Global value chains*

Drawing from TCE, Network Theory and

Global Commodity Chain, the GVCs approach (Humphrey and Schmitz, 2002; Gereffi et al., 2005) acknowledges the contribution of these three theories in specifying different ways to deal with contractual hazards associated with asset specificity. The GVC approach argues that trust, reputation, complex contractual arrangements and hierarchy are not the only way to deal with asset specificity. Sturgeon and Lee (2001) argue that avoiding investments in specific assets and hence reducing investment risks are especially important in a market characterized by high volatility and rapid technological changes. Since the 1990s, new technologies (particularly information technology) and the capabilities development of supply-base have enabled firms to reduce investing in specific assets by outsourcing many activities, especially in 'non-core' functions such as a range of intermediate manufacturing processes, to first-tier suppliers (Gereffi, 1999; Sturgeon, 2002). The first-tier suppliers respond to the demand from buyers by developing their manufacturing capabilities so as to provide a full range of customized global manufacturing services to multiple buyers. Industrial development and the emergence of open and widely accepted standards, suppliers can rapidly develop a common base process to serve several buyers. This gives suppliers a higher level of autonomy and therefore makes their investments become less specific. As a result, the outsourcing relationships can be maintained by neither vertical integration (internalization) nor social mechanisms (Sturgeon, 2002).

Through outsourcing, firms have become more 'buyer-like'. In other words, they

have been increasingly focusing on demand management functions while outsourcing manufacturing functions to contract manufacturers (first-tier suppliers) (Gibbon, 2004). Firms coordinate their outsourcing activities by setting, monitoring and enforcing a set of product, process and logistics parameters under which first-tier suppliers operate (Humphrey and Schmitz, 2002). They set, monitor and enforce these parameters to reduce the risk of supplier failure. In doing so, firms are required to efficiently transmit information about parameters and enforce compliance. This in turn, is determined by the nature of information (levels of complexity and codification) and the competence of suppliers in receiving and acting upon the information being transmitted. Therefore, the nature of information that is transmitted between firms and the capabilities of suppliers are especially important in determining firms' choice of governance patterns (Gibbon, 2004; Gereffi et al., 2005).

The emergence of outsourcing relationships (either via modular or captive linkages), in which firms govern their outsourcing activities by neither internalization nor social mechanisms highlight the need to reconsider the determinants of value chain governance patterns. On the above basis, Gereffi et al. (2005) have developed a framework for explaining the network relationships linking suppliers to lead firms. Their framework is intellectually shaped by the 'value chain' framework. In the Gereffi et al. (2005, 82) framework, although acknowledging that 'history, institutions, geographic and social contexts, the evolving rules of the game, and

path dependence matter', they focus only on industrial structure and production-process characteristics to explain how inter-firm relationships are structured. By considering institutional environments as external to their explanatory framework, Gereffi et al. (2005, 99) believe that: 'the variables internal to our model influence the shape and governance of global value chains in important ways, regardless of the institutional context within which they are situated'. In this perspective, Gereffi et al. (2005, 85) specify three factors that determine governance patterns:

The complexity of transactions, i.e. the complexity of information and knowledge transfer required to maintain a specific transaction. The higher level of the complexity of information and knowledge required to maintain a specific transaction results in greater interaction between firms. Thus, a transaction characterized by complex information and knowledge exchange, particularly those concerning product and process specifications, will likely require a closer relationship between transacting parties. Therefore, coordination costs are especially high in a transaction involving highly complex and customer-specific products.

The codifiability of transactions, i.e. the possibility to codify information and knowledge and to transfer it efficiently between transacting parties without high transaction outlays. The codifiability of transactions correlates to the complexity of transactions. The high complexity of a transaction often results in a low codifiability of such a complex transaction. In addition to the difficulties of codifying, it is difficult for an external supplier

Table 2: Determinants of value chain governance patterns

Governance Pattern	Complexity of transactions	Ability to codify transactions	Capability in the supply base	Degree of explicit coordination and power asymmetry
Market	Low	High	High	Low
Modular	High	High	High	
Relation	High	Low	High	
Captive	High	High	Low	
Hierarchy	High	Low	Low	High

Source: Gereffi et al. (2005, 87)

to comply with complex specifications. An external supplier also has little incentive to develop their capability in the supply base in this circumstance. Thus, the codifiability of transactions is also influenced by the competence of suppliers in receiving and acting upon such codified information (Sturgeon, 2006). Therefore, a transaction characterized by a low level of codifiability and low competence of the supply base often requires a high level of explicit coordination and power asymmetry between transacting partners (Table 2).

The capabilities of suppliers required to a specific transaction. The competence of suppliers influences their ability to receive and comply with the complex specifications defined by their transacting partners. In the circumstance where highly competent suppliers do not exist, firms have to internalize (vertical integration) or rely on captive suppliers (Sturgeon, 2006).

According to Gereffi et al. (2005), the combination of these three factors, in which each factor can vary from low to high, creates various patterns of governance. Along with two classic patterns of governance (market and hierarchy), the GVCs approach specifies three different patterns of network governance: modular linkages, relational linkages, and

captive linkages.

By identifying these three factors, Gereffi et al. (2005) acknowledge the importance of asset specificity which is specified by TCE, but also focus on the particular transaction costs: the costs of governance ('mundane transaction costs' in their terms), i.e. the costs associated with coordinating economic activities along the value chain. Baldwin and Clark (2000) argue that costs of coordination, rise when transactions involve non-standard products, products with integral architecture (these products tend to have complex and nonstandard interfaces), and products whose output is time sensitive. This is because a transaction involving just time supply and a high level product differentiation (high level of complexity) often requires a high degree of monitoring and control (Gereffi et al., 2005). There are three ways in which firms may reduce the complexity of transactions and hence mundane transaction costs: (i) developing technical and process standards in order to reduce the complexity of information and knowledge transmitted between firms; (ii) developing supplier capabilities to meet the complex requirements of the buyers by investing in the competences of existing suppliers and by reinforcing the existing relationships with

the most competent suppliers (This facilitates the concentration along the value chain); (iii) reconfiguring the value chain so as to reduce the complexity and extent of information transfers at the crossing points between firms (inter-firm links) (Humphrey, 2005; Gereffi et al., 2005). The combination of these three ways creates 'modular value chains', in which independent suppliers have high capabilities to provide a full-range of customized services to the multiple buyers.

3. The need for a wider approach

Four theoretical strands: TCE, Network Theory, Global Commodity Chain and the GVCs have created keystones in understanding how transactions between firms may be organized. However, these approaches reveal some shortcomings.

TCE has been criticized for the two major following shortcomings:

First, TCE does not take into account the effects of trust and other forms of social embeddedness. In the TCE framework, transactions are considered as discrete regardless of the knowledge of previous transactions. The TCE framework is thus static because it neglects the possibility of repeated transactions and the evolving processes resulting from previous transactions between parties (Ring and Van de Ven, 1992; Gulati, 1995a). During these processes, a record of prior exchange, often obtained secondhand or by imputation from outcomes of prior exchange, provides data on the exchange process. Thus, future transactions between parties are influenced by the basis of past and present transactions.

Second, the vertical integration as specified by TCE is not the only way of resolving the

contractual hazards associated with asset specificity. Recent studies have found that contractual hazards can be managed through a variety of methods such as trust and reputation (Powell, 1990; Jones et al., 1997) or tight coordination (Gereffi et al., 2005; Baldwin, 2007; Baldwin and Clark, 2003). Gereffi et al. (2005, 81) argue that 'recognizing the importance of transaction costs need not lead to the conclusion that complex and tightly coordinated production systems always result in vertical integration'.

The Network Theory addresses these two shortcomings by emphasizing different aspects of inter-firm relationships: prior to transactions, i.e. the history of transactions and the social context under which transactions are embedded (Hoetker, 2005). From the perspective that transactions are embedded in social relations that develop in time, Network theorists argue that the opportunistic behaviors which are associated with asset specificity, can be controlled through the effects of repeated transactions, reputation and other forms of social embeddedness (Jarillo, 1988; Lorenz, 1988; Gulati, 1995a; Granovetter, 1985; Uzzi, 1996;). These effects enable more complex forms of inter-firm relationships without resorting to vertical integration or complex contractual mechanisms of control. However, Network Theory omits the internal logics of sectors, such as industrial structure and production-process characteristics when studying the choice of governance (Bair, 2005).

The Global Commodity Approach (Gereffi et al., 1999) overcomes the shortcoming of Network Theory by considering industry structure and production-process

characteristics. The distinction between two types of commodity chains is relevant for some business sectors like the clothing and automobile industries. However, it does not adequately capture the diversity of recent coordination patterns in the value chains ranging from market-based patterns (arm's-length transactions) to hierarchical ones (Gereffi et al., 2005).

In an attempt to overcome shortcomings of both the Global Commodity Chain and Network approaches, the GVCs approach develops five governance patterns which are determined by transaction characteristics. GVC argues that trust and reputation are not enough to safeguard economic transactions. In a market characterized by high volatility and rapid technological changes, even where inter-organizational trust can be developed, market volatility can cause disruption to long term relationships that makes investment in assets specific to any single firm's products an unwise proposition since both absolute and relative market positions can change with breathtaking rapidity (Sturgeon and Lee 2001). In such a market, the risk of investments in specific assets can be reduced through outsourcing 'non-core' functions to competent first-tier suppliers. Coordinating these outsourcing relationships involves considerable costs in monitoring and enforcement, which Gereffi et al. (2005) refers to as 'mundane transaction costs'. To some extent, expenditures in mundane transaction costs can reduce opportunistic transaction costs. Thus, in addition to vertical integration, trust and reputation, expenditures in mundane transaction costs are another way to deal with opportunistic behaviors and uncertainty.

However, due to mainly focusing on mundane transaction costs to explain firm choice of governance, the GVCs approach has been criticized for being 'economist in orientation'. Although the GVC approach acknowledges the importance of the institutional context under which value chains are embedded, they consider it external to their framework. Their discussion of governance neglects the importance of the institutional environment under which transactions are embedded (Levy, 2005, 15).

Recent studies in developing and transitional economies have found that in institutional environments such as politics, law, the judiciary, norms and customs have influenced costs of governance and hence, the choices between alternative governance patterns in the value chain (Maertens and Swinnen, 2006; Ees and Bachmann, 2006; Fafchamps, 2004; McMillan and Woodruff, 1999b).

Therefore, the existing theoretical frameworks are inadequate for the studies which deal with choices of governance patterns of firms running businesses in different institutional contexts, e.g. in transitional economies. To study firm's choice of value chain governance in different institution contexts, an integrated model combining both external and internal factors of inter-firm linkages needs to be developed.

4. Shaping supply chain governance pattern

This paper develops a two-dimension model to explain firm's choice of governance pattern under different conditions of external and internal factors. On the dimension of governance patterns, five governance

patterns are introduced. On the dimension of determinants, three components: institution environment, industry structure and transaction characteristics are incorporated.

4.1. Supply chain governance pattern

The most common governance patterns explained by the four key literature strands reviewed above are summarized in Table 3.

The distinction of buyer driven and supply driven chain proposed by Global Commodity Chain reflects power relationships between actors in a chain. However, these distinctions lack applicability in explaining which mechanism (formal or informal rules) an actor can apply to govern transactions with others in a supply chain. Therefore, the patterns of buyer driven and supply driven chain will not be used in this paper's conceptual model.

Two governance patterns: Market and Hierarchy proposed by TCE are two basic mechanisms to govern economic transactions. Originally, when a firm needs an input, the firm either buys it from a market or invests in producing it in-house. The mechanism which a firm uses to govern these economic activities can be either "market contract" or "hierarchy/

vertical integration". Therefore, these two governance patterns with the characteristics described earlier by TCE are to be incorporated in this paper.

In between these two governance patterns lie various hybrid forms of governing economic activities, such as franchising, long-term contracts, informal agreements and the like (Williamson, 1991). Different types of organizational form are differentiated by different coordinating and control mechanisms and different types of contracts. The hybrid patterns therefore need to be specified further. Peterson et al. (2001) provides more detailed classification of hybrid patterns including specification contracts, relation-based alliances and equity-based alliances. The "specification contract" specifies detailed requirements for the production process. The mechanism of using contracts to specify requirements for products or production processes will be included in the conceptual model of this paper with the name "production contract governance". Relation based alliance is similar to the "Network governance" proposed by Network Theory or "Relation governance" proposed by GVC and will be discussed later. Equity based alliance

Table 3: Patterns of governance in different literature strands

Transaction Costs Economics	Global Commodity Chains	Network Theory	Global Value Chains
Market	[Assumed]	Market/Price	Market
Hybrid	Buyer-driven	Network/ Community/ Trust	Modular Relational Captive
Hierarchy	Producer-driven	Hierarchy/ Authority	Hierarchy

Source: Adapted from Sturgeon (2005).

is one form of vertical integration that will be regarded as a “hierarchy” pattern in this paper.

The introduction of a “network governance” pattern by Network Theory points out the importance of informal rules (social relation and social mechanism) in governing inter-firm transactions. In a nutshell, network governance is based on social relations. This governance pattern is similar to the “relation pattern” proposed by GVC. Economic transactions between firms are set up through social relations. Personal ties and trust and reputation are used as mechanisms to govern transactions. At an inter-firm level, it is clearer to use the term “relational governance” instead of “network governance” because the term “relational contract” directly mentions the use of social relations as a mechanism to govern economic transactions with others. This paper therefore uses the term “relational contract” to indicate the governance pattern between firms whose inter-firm transactions/contracts were built up and developed from social relations. The characteristic of the “relational contract” pattern are the same as described earlier by Network Theory.

The introduction of three governance patterns: modular, relation and captive by the GVC approach captures some important elements of forms of coordination in different functional positions in supply chains. However, in practice, in some supply chains, different governance patterns may exist at various links in the same supply chain (Humphrey and Schmitz, 2002; Gibbon and Ponte, 2005). In addition, the governance patterns may vary in particular industries and places (Gereffi et al., 2005). Therefore, the governance patterns of a

specific supply chain are best distinguished by emphasizing the characteristics of the linkages between separate supply chain activities.

Regarding modular or captive patterns, in a nutshell, they are both based on the use of production contracts as mechanisms to govern production outsourcing activities. GVC distinguishes between them via suppliers’ capability. In ‘modular value chains’, independent suppliers have high capabilities to provide a full-range of customized services to multiple buyers. Transactions can be governed purely by a production contract without investing in strong relationships with suppliers to tightly coordinate the transaction. This paper will use the term “production contract governance” mentioned earlier to indicate the use of a production contract as a mechanism to govern transactions between sourcing firms and high capability independent suppliers. When a supply base has low capabilities, a sourcing firm has to either vertically integrate or work closer with suppliers helping them upgrade capability. The investment in supporting suppliers therefore requires relational governance to safeguard against opportunism. Personal ties, trust and cooperative norms can be created and developed through a close working relationship. These mechanisms help to support the implementation of production contracts. Therefore, in case of low capabilities supply bases, transactions need to be governed by not only production contracts but also relational mechanisms. This paper uses the term “relational production contract” to indicate the use of production contracts and relational mechanisms to govern transactions between a sourcing firm and a low capability

dependent supplier.

In summary, this paper proposes five mechanisms: “market contract”, “production contract”, “relational contract”, “relational production contract” and “hierarchy” to govern economic transactions in a supply chain.

4.2. Institutional environment

‘Institutional environment’ refers to ‘the set of fundamental political, social and legal ground rules that establishes the basis for production, exchange, and distribution’ (Davis and North, 1971, 6). The institutional environment, thus, consists of: (i) the formal rules, which include laws and rules of society; (ii) the informal rules, which are comprised of sanctions, taboos, customs, traditions, norms, values and beliefs; and (iii) social capital, in which trust is the most important component. In short, the institutional environment is related to macrostructure such as politics, law, the judiciary and norms and customs.

The formal rules, e.g. the legal system for contract enforcement are critical determinants of transaction costs, particularly costs of governance. Prior studies in a number of developing and transitional countries have specified an important feature of the institutional environment in these countries that affect how transactions between firms are organized. This is the absence of, or weak formal legal enforcement of contracts (McMillan and Woodruff, 1999b, 2000; Johnson et al., 2002). Under unreliable legal systems for transactional assurance, prior studies suggest that firms have to compensate by employing a relational governance pattern which is coordinated by private ordering mechanisms such as trust, reputation and

repeated game incentives (McMillan and Woodruff, 1999b, 2000; Johnson et al., 2002). In other words, unreliable legal systems lead to a higher cost of market base transactions or production contracts. In order to reduce ex post costs arising when suppliers fail to fulfill obligations of the contracts in the context of an absent effective contract enforcement legal system, a firm needs to use either social relations or a relational production contract to govern transactions if they do not want to internalize. In a highly reliable legal system, opportunistic and behavior uncertainty are low. This reduces ex-post costs of a transaction, hence market-base governance or production contract governance can be a choice.

The informal rules, which comprise of sanctions, taboos, customs, traditions, norms, values and beliefs, and social capital such as trust, shape firms’ behaviors. Among informal rules, high level of trust and cooperative norms in a society lead to low level of behavior uncertainty. If there exists strong social ties between firms, opportunism and behavior uncertainty are mitigated. This reduces transaction cost and the need for vertical integration. In such situations, a firm may use “relational contract” or “relational production contract” to govern economic transactions.

4.3. Transaction characteristics

TCE proposes three dimensions including (1) the level of transaction specific investments; (2) uncertainty; and (3) transaction frequency as determinants of the choice of governance patterns. Among these, uncertainty and transaction specific investments are critical attributes (Williamson, 1979).

Drawing from the level of transaction

specific investments dimension proposed by TCE, the GVC approach provides a signification contribution by identifying three characteristics of transaction including *the complexity of transactions*, *the codifiability of transactions* and *the capabilities of supplier* which will influence on coordination cost and hence transaction cost. Costs of coordination, rise when transactions involving non-standard products, products with integral architecture (these products tend to have complex and nonstandard interfaces), and products whose output is time sensitive. This is because a transaction involving just in time supply and a high level of product differentiation (high level of complexity) often requires a high degree of monitoring and control (Gereffi et al., 2005). These three characteristics of transaction proposed by GVC approach will be incorporated in the conceptual model of this paper.

This paper incorporates an uncertainty dimension proposed by TCE in the analysis of the institution environment. There are two types of uncertainty that are commonly distinguished: environmental uncertainty and behavioral uncertainty (Williamson, 1985). Environment uncertainty refers to the unforeseen changes in environments surrounding a transaction between two transacting parties. Behavioral uncertainty arises from the difficulty in anticipating the actions of transaction partners, especially the possibility of opportunism by these partners (Williamson, 1985). Both of these sources of uncertainty raise the risk of higher transaction costs. Environment uncertainty may cause problems of communication, negotiation, and coordination and hence

the associated transaction costs. Behavioral uncertainty also may result in haggling and mal-adaptation costs. Environment and behavior uncertainty will increase if formal rules or legal systems are unreliable and/or nontransparent. Unreliable legal systems create possibilities for opportunism to develop which will raise transaction costs which lead a firm to select governance patterns other than market or production contracts. In other words, the reliability and effectiveness of the legal system will influence environment uncertainty and hence transaction costs and choice of governance pattern. In a society where informal rules such as trust and cooperative norms are highly appreciated and practiced, behavior uncertainty will be low. Market or production contract governance will be an adequate governance pattern. In a society where those values are not popularly emphasized, to avoid behavior uncertainty, instead of vertical integration, a firm may use relational contracts or relational production contracts to avoid the cost associated with opportunism.

4.4. Industry structure

Among five forces shaping an industry structure proposed by Porter (1990), rivalry will influence transaction costs and hence choices of governance pattern. Rivalry itself is determined by the number of players in the industry. Therefore, the concentration is a good indicator to reflect the industry structure.³ In an industry, where production is conducted in large amounts by firms or economic entities (i.e. the four largest firms in the industry have no significant market share), the industry is fragmented and concentration is considered low. In such a fragmented industry, low

Table 4: The determinants of supply chain governance patterns⁴

Governance Pattern	Transaction characteristics			Industry structure	Institution environment	
	<i>Complexity of transactions</i>	<i>Ability to codify transactions</i>	<i>Capability in the supply base</i>	<i>Concentration in the supply base</i>	<i>Reliability of legal system</i>	<i>Existence of Trust, Collectivism as social norm</i>
Market contract	Low	High	High	Medium	High	High
Production contract	High	High	High	Low	High	High
Relational contract	High	Low	High	High	Low	High
Relational Production contract	High	Low	High	High	Low	Low
Hierarchy	High	Low	Low	Low	Low	Low

concentration, dealing with a large number of suppliers will raise the cost of transactions, such as costs associated with navigating, evaluating suppliers, monitoring contracts or quality of products. To avoid or reduce such costs, a firm may be better off with vertical integration or use production contracts with some key suppliers in the market. Investment in relational governance may not be necessary because the industry is competitive due to the existence of a large number of producers and suppliers, competing for contracts.

In an industry where production is concentrated on a limited number of firms (i.e. four largest firms have a more significant market share as compared to the case of low concentration), concentration is semi-high. The costs associated with navigating, evaluating suppliers, monitoring contracts or quality of products are not high when dealing with a small number of firms. Therefore, market contracts or production contracts can be a good option.

In an industry where production is highly concentrated with a few largest firms, the cost of navigating, evaluating or monitoring contracts is not high, but the cost of procurement may be high due to the very small number of suppliers in the market. In this situation, firms may be better off with “relational production contract governance”. Investing in relational governance can help a firm to secure supply and procurement costs and hence transaction costs.

The combining of the three dimensions including transaction characteristics, industry structure and institution environment provides descriptions of appropriate choices between alternative governance patterns in a supply chain. The conceptual framework is summarized in Table 4.

5. Concluding remarks

At the inter-firm level of analysis, there are three pieces of research in the literature addressing how economic transactions may

be organized: TCE, Network Theory and the GVCs approach. These studies use different theoretical perspectives in explaining the choice of various patterns of inter-firm relationships. TCE focuses on the effect of transaction characteristics on the associated coordination costs and hence governance patterns. Network Theory emphasizes different aspects of inter-firm relationships: trust and social embeddedness. The GVCs approach stresses the importance of industrial structure and production-process characteristics. From these diverse perspectives, they propose different mechanisms including formal (such as complex contracts or vertical integration) and informal (such as trust and reputation) mechanisms to deal with uncertainty. The insights from these three theories are complementary. Therefore, their combination into an integrative framework will broaden the existing scope of analysis. This paper develops an integrated model from the three above-mentioned literature streams. It proposes a model with two dimensions. On the dimension of governance patterns, five governance patterns are introduced: “market contract”, “production contract”, “relational contract”, “relational production contract” and “hierarchy” to govern economic transactions

in the supply chain. On the dimension of determinants, three components: institution environment, industry structure and transaction characteristics are incorporated. The paper provides prescriptions for a firm’s choice among five supply chain governance patterns under different conditions of the above three components of determinants.

The contribution of this paper is thus to provide a better understanding of firms’ choices between alternative governance patterns to conduct their economic transactions. This paper raises two issues for the ongoing debate on inter-firm relationships. First, how inter-firm transactions are organized in specific contextual conditions of institutional environment, transaction characteristics and industrial structure and production-process characteristics. Second, why and under what conditions firms adopt and change these governance patterns. Further studies are needed to discuss these issues by exploring firms’ choices of governance patterns in the specific contextual conditions. In addition, further studies are also necessary to define the low or high existence of the 6 variables mentioned above.

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Notes:

1. A supply chain is defined by Christopher (1992) as: “a network of organizations that are interconnected, through upstream and downstream links, in the different business processes and activities that produce value in the shape of products and services to clients”. The activities which are embedded in a supply

chain consist of logistic activities (including procurement, distribution, maintenance, and inventory management), and other activities such as marketing, new product development, finance and customer service. These activities may be confined in a single firm or may embrace many firms, depending on input provisions and the state of markets it serves. The allocation and remuneration of activities within a supply chain also may be bound within national borders or across national boundaries and determined by 'comparative advantage, reciprocal demand, and transport costs' (Wood, 2001, 4)

2. Studies on inter-firm relationships in Vietnam specify that the Vietnamese institutional environment is characterized by the absence or weakness of formal legal enforcement of contracts (McMillan and Woodruff, 1999a, b; 2000). The institutional context of Vietnam thus creates the risk of behavioral uncertainty and high transaction costs for inter-firm transactions. Due to the limited roles of courts for transactional assurance, firms in Vietnam have to compensate by employing a relational governance pattern which is coordinated by private ordering mechanisms such as trust, reputation and repeated game incentives (McMillan and Woodruff, 2000; Johnson et al., 2002). However, while relating the institutional environment and firms' choices of governance patterns to conduct economic transactions, these studies have ignored other aspects of inter-firm relationships. The aforementioned shows that the institutional environment is only one aspect that affects the choice of governance patterns. These choices, however, are also influenced by transaction characteristics and the industrial structure and production-process characteristics. As a result, their explanation of firms' choices of governance patterns may remain incomplete. The study of relationships between farmers and middlemen in fruit markets in the Mekong Delta region of Vietnam by Tu Anh and Quinn (2008) found that farmers do not rely on extensive relationships to mitigate risk and uncertainty. Instead, they attempt to minimize risk associated with contract default by 'diversifying sales among strangers and repeated buyers' (Tu Anh and Quinn, 2008, 2). They also found evidence that stakeholders participating in the fruit markets use the competitive structure of these markets to identify reliable business partners (*ibid.*). Their study has two implications for the discussion about inter-firm relationships. First, institutional environment is not the only factor affecting firms' choices of governance patterns. The decisions on inter-firms relationships, however, are also affected by the market structure under which these relationships take place. Second, relying on the network of extensive relationships as suggested by Network Theory to compensate for the ineffective legal system is inadequate for transactional assurance, particularly in a spontaneous market characterized by a competitive structure.
3. In economics, rivalry is measured by indicators of industrial concentration. One of the common measures is concentration ratio (CR) which indicates market share held by 4 or 8 or 25 or 50 of the largest firms in an industry. The most common concentration ratios are the 4 and 8 largest firms (CR4 and CR8). Concentration ratios range from 0 to 100 percent. An industry with a CR4 between 0-50 percent is considered as low concentration. An industry with a CR4 between 50-80 percent is considered as medium concentration, and industries with CR4s between 80-100 percent are highly concentrated.
4. There are 729 possible combinations of 6 variables, in which 5 of them generate 5 supply chain governance types. A number of combinations are unlikely to occur, for instant, the combination of low complexity of transaction and low ability to codify. In addition, if the complexity of the transaction is low and the ability to codify is high, then low supplier capability would lead to exclusion from the supply chain.

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