

**The Socio-Economic Structure of Industrial Clusters:**  
*A Case Study of the Three Selected Indonesian Industrial Clusters*<sup>1</sup>

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## **Introduction**

This paper examines the socio-economic structure of industrial clusters in developing countries through analysing the existence of market and embedded factors in inter-firm relationships in three Indonesian industrial clusters. It also assesses the impact of both market and embedded relationships on the performance of firms including their business performance, basic capabilities, and innovation capability. The main question is whether those indicators of firm's performance can emerge both as results of market and embedded ties between firms or not. This paper will show that such different relationship efforts between firms within clusters stimulate the performance of individual local firms.

There is a lively debate on how to explain the dynamic of inter-firm relationships in industrial clusters. The existing literature tends to focus on either the social relationships (Becattini, 1990; Dei Ottati, 1994; Schmitz, 1995; 1998; Nadvi, 1997; Humphrey and Schmitz, 1998) or the market relationships (Porter, 1998; 2000; Sandee 1995; Klapwijck, 1997; Sato, 2000). As a result, these major studies neglect some essential features that should be included in analyzing the nature of clusters. Studies that place more emphasis on the cooperative aspects of clusters (Becattini, 1990; Dei Ottati, 1994; Schmitz, 1995; 1999; Nadvi, 1997; Humphrey and Schmitz, 1999) are inadequate for clarifying other available governance structures, repeated transactions, and the role of trust and reciprocity in inter-firm relationships in clusters. On the other hand, studies that put more emphasis on the competitive aspects of clusters (Porter, 1998; 2000; Sandee 1995; Klapwijck, 1997; Sato, 2000) lack a concrete account of how market ties between firms affect inter-firm relationships in clusters.

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Nevertheless, as a matter of fact, given that firms in clusters exploit the advantage of their locations in the clusters, they have to cooperate with each other to solve the problem that cannot be solved alone by individual firms. At the same time, firms in clusters have to consider some economic factors in their inter-firm relationships to pursue their efficiency in business. Thus, embedded ties or social relationships refer to the collective use of resources and skills to pursue common interests, whereas arm's length ties or market relationships refer to the use of resources and skills to make private gains in an attempt to outperform the partners.

By using Indonesian evidence, this study argues that neither market ties nor embedded ties appear in its pure form in inter-firm relationships in clusters. This study also assesses whether the simultaneity of both ties between firms within a cluster has a significant relationship with the performance of firms. Thus, it enables us to explain how local firms perform in the attainment of firm competitiveness. It will be shown that to describe the cluster as either market relationships or social relationships is an oversimplification. Rather, what actually exists among local firms within clusters is the simultaneity of both market and embedded ties and in this situation local firms pursue their good performance.

The study is based on the findings of a fieldwork carried out in the three Indonesian industrial clusters in two periods: from August 2007 to January 2008 and from May 2008 to July 2008. The data comes from a number of sources and were collected using a combination of methods: a closed questionnaire survey of 210 firms; in-depth interviews with selected manufacturers, artisans, and traders; interviews with the officials of business associations and government agencies; participant observation at meetings of artisans. The three Indonesian clusters are the Kotagede silver handicraft cluster, the Manding leather handicraft cluster, and the Kasongan ceramic handicraft cluster in Yogyakarta, Indonesia.

This paper will begin with an introduction of the concept of the simultaneity of market and embedded ties within an organization, industrial clusters and the effect of the simultaneity of both ties on the firm's performance. The theoretical reviews derive specific hypotheses that would be tested by regression analysis. Secondly, using the survey data, indices of the performance of firms, market and social relationships variables are

generated, and regression analysis is carried out to assess if there is a significant association between the performance of firms and the variables of market and embedded ties between firms in the three Indonesian clusters. I will also present, discuss, and conclude the results of the models of this study.

### **I. The simultaneity of market and embedded ties**

Some studies have concluded that business strategy in emerging economies is strongly influenced by their institutional context (North 1990; Hoskinson, Eden, Lau, & Wright 2000). Peng (2003) theorizes that as emerging economies undergo institutional transitions individual businesses increasingly adopt Western-style market driven strategies, moving away from business transactions embedded in strong personal and social relations. Moreover, Dielman and Sachs (2006) show that during the period of transition from a social-based relationship to a market-based mode of operation, the Salim Group experienced pull from both of these opposing poles in their comprehensive study of the largest ethnic Chinese conglomerates in the Asia-Pacific regional. However, they mention that ‘the movement is not linear, oscillating between the social-based and market-based relationships modes’ (Dielmand and Sachs, 2006).

A dominant theoretical view of the formation of inter-firm relationships emphasizes market relationships. The analysis of market-based relationships starts from the factors that have traditionally preoccupied economists. Self-interest motivates action, and actors regularly switch to new buyers and sellers to take advantage of new entrants or avoid dependence. In this view, the exchange is limited to price, product quality, and speed of delivery (Uzzi, 1997).

On the other hand, an alternative theoretical view emphasizes social relationships among firms (Pfeffer and Salancik 1978; Gulati 1995). It states that firms create relationships with others with whom they are interdependent with regard to resources and with similar others with whom they are connected through direct or indirect ties (Gulati 1995). Within this perspective, the business world is composed of a network of interdependent relationships developed and fostered through strategic collaboration with the goal of deriving mutual benefits (Miles and Snow 1986). In this view,

interdependencies and social factors are complementary drivers for the formation of inter-firm relationships.

Taken together, these two views highlight a fundamental tension that characterizes inter-firm relationships. While these two views together shell the duality of market and embedded ties, the weighing of these two logics by firms remains unclear. To mediate the conflicting pulls of both ties, some studies have introduced the concept of co-opetition as the simultaneity of both relationships (Brandenburger and Nalebuff 1996; Lado et.al. 1997; Tsai 2002; Grangsjö 2003).

Brandenburger and Nalebuff (1996), in their seminal book “Co-opetition”, draw the concept of co-opetition by introducing the map of value net. In this perspective, many companies are both competitors and ‘complementors’ with respect to their suppliers. Toshiba and Fujitsu, on the one hand, deal with the procuring input from limited supply of Intel’s chip. On the other hand, they are also ‘complementors’ with respect to Intel. Intel shares the cost among Toshiba, Fujitsu, and the other hardware makers to develop the next-generation chip. As a result, each one of hardware makers including Toshiba and Fujitsu will pay less to have Intel included in their product.

Furthermore, Brandenburger and Nalebuff (1996) also underscore the advantages of close proximity of the firms:

“..by locating near to one another, the antique stores become complementors too. Instead of having to choose only one store to go to –possibly the wrong one— shoppers can go to the Place de Grand Sablon, browse, and make a more informed choice. And because it is a lot more convenient, people are more willing to set out to buy antiques in the first place. The buyer can also be more confident that the merchandise will be of high quality, because a store with inferior products or inflated prices will have a much harder time staying in business if the superior competition is located right next door”. (page 33).

In a similar vein, Ford *et.al.* (2003) from the IMP (Industrial Marketing and Purchasing) Group, emphasize that ‘in fact all companies are intermediaries between other companies and a final consumer’. They use the term “intermediaries’ instead of complementarity as Brandenburger and Nalebuff (1996) did. Companies cannot be separated into neat groups, such as ‘manufacturers’, ‘wholesalers’ or ‘retailers’ while the companies in each group all are doing the same things and each group is different from the

others (Ford *et.al.* (2003). Ford *et.al.* (2003) introduce the term ‘cooptition’ to shell the simultaneous competition and cooperation among firms in a network.

This concept of cooptition is not different from Bradenburger and Nalebuff (1996)’s co-opetition. For an instance, they explain that cooptition occurs when the costs of developing a new component of output are high and can only be justified by high volume sales. This means that firms must restrict the number of technologies in which they invest and try to maximize the exploitation of technologies. This leads firms to sell to and buy from their competitors as well as more conventional consumers and suppliers.

## **II. The nature of co-opetition within industrial clusters: the simultaneity of market and embedded ties between firms**

Schmitz (1995; 1999) argues that the competitive advantage of clusters is a result of unplanned activities (the effect of external economies) and deliberate action (joint actions) among local firms. This is called collective efficiency of clusters (Schmitz 1995, 1999). External economies are part of common pools from which every economic agent can freely draw. Meanwhile, joint-action is deliberate and active cooperation by the members of the local associations or by groups of firms that explicitly decide to cooperate. These two aspects can also be linked clearly: joint actions by local firms can generate cluster-specific externality gains for others (Nadvi 1996).

But, what are the gains of external economies? Marshall (1964 (1890)) has identified a number of gains of external economies. The first is the existence and development of a local infrastructure. An infrastructure has the effect of shifting the cost curve of individual producers downwards and lowering barriers to entry. Secondly is the concentration of an industry within a local or regional economy encourages the growth of pools of labor, while the third is spillover-effects in technological know-how, research and innovation (Marshall 1964 (1890)). Thus, the externality benefits may not only raise efficiency, they may also make it possible for smaller firms to access markets through a division of labor.

In terms of a manifestation of joint actions, according to Piore and Sabel (1984), collective sourcing is especially relevant where firms need organizational capabilities, for

example when firms devise collective efforts to lobby their government for tax relieves or scan new opportunities in a global market. Local firms pool their common needs to manage these sourcing of collective inputs that an independent firm alone would not be able to acquire due to scale constraints. Moreover, active dimension of collective efficiency (joint actions) may include joint procurement of inputs, joint marketing of outputs, joint recruitment and sharing of workers, or self-help institutions of owners, managers or workers (industrial cooperative).

Nonetheless, promoting joint-action may be difficult given that in many clusters local producers are often also local rivals. While local market relationships can promote local development (Porter 1985), the possibilities of external economies and free rider gains can also discourage joint-action between local agents. As a result, a key conceptual issue for understanding the dynamics of clusters is how the simultaneity of market and embedded ties can exist.

Firms in clusters are deliberate to develop both relationships simultaneously in the attainment of the performance of individual firms. Hence, the tension here is not the option of either market or embedded ties but rather between the currently available assets of those ties that are required to cope with new demands or market opportunities. There can be distinct mixes in the principles of coordination within a small sub-network in a cluster. Embedded ties enrich the network, while market ties prevent the complete insulation of the network from market demands and new possibilities. Market relationships may facilitate performance when firms disperse their business amongst many competitors and avoiding small-numbers bargaining situations that can entrap them in inefficient relationships (Uzzi 1997).

Furthermore, the economic advantages can only be achieved if clusters have well developed internal and external networks. In internal networks within clusters, one finds two groups of firms, one making similar products and another making complementary products. According to Steiner and Hartmann (1998), clusters consist of groups of complementary firms (in production and service sectors) public, private and semi-public research and development institutions, which are interconnected by labor market, input and product and technological relations.

Maskell (2000) refers to them as vertical and horizontal dimensions of a cluster. The first type is cooperation among firms along the value chain. In these linkages, firms divide amongst themselves the work required for the manufacture of particular goods through specialization and subcontracting. With these linkages, a firm can focus on its core business and subcontracts other related works to other firms in a cluster. These vertical linkages involve severe challenges. Vertical dimensions of inter-firm relationships mean that different phases of production are carried out inside the firm, with lots of problems concerning the organization of the production cycle.

Given the costs of such linkages, firms are potentially encouraged toward more obligational, as opposed to arm's length or market ties. These changes clearly imply that firms in clusters can no longer rely purely on the passive dimension of collective efficiency in order to compete in the markets. They need to focus increasingly on upgrading their supply chains, which requires joint actions in local vertical linkages. Rabellotti (1996) finds that due to the existence of vertical linkages in the Italian footwear, the cluster of shoe firms was able to supply diversified, quality product in a time-to-market which was shorter when compared with the shoe industry in many other countries'.

Besides, there is another linkages called as horizontal linkages. Whatever the forms of linkages, in general, firms in clusters are connected horizontally to coordinate their joint actions. According to Rabelotti (1996), joint actions are especially relevant where firms need organizational capabilities that involve the larger scale small firms, such as when firms devise collective efforts to lobby their government for tax relieves (Pyke and Sengenberger 1992) or scan new opportunities in domestic and global markets (Bartlett and Ghoshal 1992) more effectively.

Through horizontal linkages, firms also can collectively achieve scale economies beyond the reach of individual firms and can obtain bulk purchased inputs, achieve optimal scale in the use of machinery, and pool together their production capacities to satisfy large-scale orders. It also gives rise to a collective learning process, where ideas are exchanged and developed and knowledge shared among individual firms in a collective attempt to improve product quality, upgrade technology, and move to more profitable market segments.

Thus, clusters are a specific type of network in which transactions are arranged not only by means of the market but also by social relations. Further, Rabellotti (1998) illustrates that a significant factor underlying the economic success of clusters lies in their ability to realize their competitiveness through networking and the provision of real business services and infrastructure which enables firms in clusters to compete with large firms in high value-added segments of markets. The advantages of close proximity limits transportation costs and lower switching costs for employees if there are low intensive interactions among firms in the clusters, which exceed traditional market exchanges (McMillan and Woodruff 2002).

Cooperation which is necessary to establish and exploit such economies is realized through institutional structures that build on existing areas of cooperation (trade associations) and that actively involve firms in the organization and strategy formulation (Rabellotti 1998). Dyer and Singh (1998) suggest that optimal network structure is a mix of market and social relationships, because each type of relationships performs different functions.

In a similar vein, in his explanation of the three broad ways, Porter (2000) argues that the effects of inter-firm relationships between cluster participants are included when the link among the nature of a cluster, productivity, innovation, and new business formation are described in detail (Porter, 2000). Furthermore, Porter (2000) explains inter-firm relationships within clusters affect firm's performance in three ways: (a) it increases the current (static) productivity of firms, (b) it increases the capacity of cluster participants for innovation and productivity growth, and (c) it stimulates new business formation that supports innovation and expands a cluster.

According to Samuelson (1983), there are three fundamental ways to know how market ties generate economic efficiency: (a) it enables firms to allocate scarce resources optimally; (b) it provides the impetus for innovation and entrepreneurship (Schumpeter 1934; Nelson, 1991); and (c) it reduces transaction costs between exchange parties (Williamson 1985).

In addition, in a resource-based view of strategic management (Amit and Schoemaker, 1993; Barney, 1986, 1991; Dierickx and Cool, 1989; Mahoney and Pandian,

1992; Wernerfelt, 1984) inter-firm relationships are critical determinants affecting resource choices and firm's capabilities. According to this resource-based view, resources and capabilities of firms enable them to generate above-normal rates of return and a sustainable competitive advantage. From this perspective, firm heterogeneity in acquiring and deploying resources and capabilities accounts for the generation of economic rents. Resources are input factors controlled and used by firms to develop and implement their strategies; capabilities are capacities to coordinate and deploy resources to perform tasks (Amit and Schoemaker, 1993; Rao, 1994: 29). Examples of valued resources and capabilities include reputation, buyer-supplier relationships, tacit knowledge, R&D expertise, and technological capabilities (Barney, 1991; Mahoney and Pandian, 1992; Rao, 1994; Schoemaker and Amit, 1994).

Thus, the key implication of this perspective is that a firm's ability to generate rents from resources and capabilities will depend primarily on the firm's effectiveness in managing their inter-firm relationships including their market and embedded ties. In addition, inter-firm relations diffuse shared beliefs and common understandings about what constitutes appropriate resources and capabilities. Hence, a local-firm's web of linkages in clusters can yield benefits that enhance the likelihood of the firms successfully.

Besides, the simultaneity of market and embedded ties between firms tend to stimulate innovation with respect to products, processes and ways of organizing businesses. Innovation is a product, service, or process that is new or perceived as new by its developers (Van de Ven, 1986). Innovation is the main source of competitive advantage for many organizations, including firms in clusters. Innovation may be manifested in new products or services –improved quality; new ways of production, marketing or distribution; new markets; new supply sources; and so on (Tien, 1998). Thus, innovation capability refers to a continuous improvement of the overall capability of firms to generate innovation for developing new ways of production and products to meet market needs.

Further, a key aspect of such cohesion in clusters is the ability to adapt to the neighbor firm's needs and requirements. It would entail flexibility to changes of partner's behaviors and the adoption of new ideas, including innovative behaviors (Visser, 1996). Inter-firm relationships may induce firms having a possibility to imitate what other firms

have created or designed to improve their production process or the quality of their products. From a strategic perspective, imitation is also viewed as a rational alternative to innovation when the risks and development costs of pioneering are high.

### **The negative effect**

There may be a situation where collective actions of local firms lead to a deterioration of their collective position in clusters, such as the inability of clusters to address a number of collective problems. Nadvi (1999a) introduces such a situation as collective failures of clusters. There are two possibilities on how collective failures of clusters happen: the negative impact of market ties where opportunistic behaviors of some firms influence the effectiveness of market relationships and the negative impact of embedded ties where embeddedness between firms results in free riding behaviors exists and their unwillingness to have network with external institutions from outside clusters.

In clusters, the same mechanism of market ties that gives rise to appropriable resources for firm's use can also constrain action or even derail it from its original goals. Firms that exhibit rivalrous behavior tend to perceive and structure relationships with their partner as zero-sum games, when one firm's gain is another firm's loss (Jarillo 1988). As Pfeffer and Salancik (1978) note, when a firm needs resources held by another firm, a competitive struggle often results in which only the firm that possesses or controls critical resources 'wins' or gains control over the other firm. Thus, market ties may encourage firms to behave opportunistically toward others (Griesinger 1990).

Williamson (1985) defines opportunism as a strategic nondisclosure, disguise, or distortion of information by a party before a transaction takes place: this leads to a risk of adverse selection on the side of the other party. While, Alchian and Woodward (1988) and Knorringa (1995) refer to the conduct of a party after a contract has been signed, and includes two subtypes: the risk of moral hazard, i.e., deviating behavior in a situation of interdependence; and the unilateral ending of transactions, or hold up.

Further, due to the frequent existence of vertical linkages, firms may also permits the survival of some inefficient firms, which only have very superficial market knowledge and which base their competitive edge on their ability to make shoes and take advantage of low entry barriers. This category of firms can be defined as followers or, even free-riders

of the district, because they usually tend to exploit resources created by other more innovative firms, for instance they imitate successful products at lower costs and lower quality (Rabelotti, 1996).

In a similar vein, a few other studies (Uzzi 1997, Brass and Labianca 1999, Gargullo and Benassi 1999) conclude that the combination of sectoral and geographical concentration can leave a town or region vulnerable to exogenous shifts in products and technology. That is why Sengenberger and Pyke (1991) stress the problem of many small manufacturers being isolated from their external environment.

### **III. Framework and Hypotheses**

#### **III.1. Framework**

Figure 1 presents the framework used in this study. This study focuses on discussing a socio-economic structure in industrial clusters. In clusters, there are inter-firm relationships. Through examining market and social factors in these relationships within clusters, the socio-economic structure can be assessed.

In general, in clusters inter-firm relationships consist of relationship between firms at the same stage and different stages of production activity. Subcontracting and trading relationships are examples of relationships among firms at the different stages of production (Sandee, 1995; Visser, 1996). Subcontracting relationships represent the connection between manufacturers and subcontractors or traders and subcontractors, while trading relationships indicates the connection between manufacturers and traders.

Subcontractors are persons who works for manufacturers or traders to do some parts of production process (Sandee, 1995). Manufacturers can divide their production jobs to some subcontractors within clusters, while traders who do not have any workshop can obtain their final products from asking and managing different subcontractors to work for each part of production process (Visser, 1996). Meanwhile, manufacturers who do not have showrooms can sell their final products to local traders. It is also common that traders take a finishing part of production in order to obtain more margin from their sales and to adjust final designs with their consumer's preferences.

The combination of those relationships is indicated by relationships between firms not only at the same stage but also at the different stage of production. They cooperate with

each other to solve their common problems. For that purpose, they often join together at their formal business associations or their informal group.

Since firms in clusters engage in multiple linkages (Sato, 2000) and in those linkages, transactions are not only arranged by means of the market mechanisms but also by social relations mechanisms (Rabelotti, 1996), this study also examining the simultaneity of market and social/embedded ties between firm in clusters. Market/arm's length mechanisms occur when inter-firm relationships are affected by market factors, whereas social/embedded mechanisms are influenced by social/embedded factors (Uzzy, 1997).

Market-based relationships happen when the purpose of firms to cooperate with each other are to increase their specialization, product quality, information availability, and new market access (Uzzy, 1997; Rabelotti, 1997; Schmitz, 1998; Sato, 2000). In a similar vein, price, quality of works are the main market factors for manufacturers or traders when choosing their subcontractors (Rabelotti, 1997; Uzzy, 1997; Schmitz, 1998; Sato, 2000). Other market factors for this kind of subcontracting relationships are speed delivery and where subcontractors are located (Visser, 1996). For trading relationships, manufacturers take into account high buying price and on-time payment from their traders as the main market consideration (Rabelotti, 1997; Schmitz, 1998). Location and orders from traders are other market factors to choose their traders (Rabelotti, 1997; Schmitz, 1998).

On the other hand, embedded factors depart from Granovetter's theory of embeddedness (1985; 1990). This focuses on characteristics such as friendships, reciprocity, and trust that people developed with each other (Granovetter 1985; 1990). Social-based relationships occur within clusters when firms consider more trust and reciprocal relationships between them in their connection (Granovetter, 1985, 1990; Humphey and Schmitz, 1998). For their subcontracting and trading relationships, the most influential social factor is trust (Sandee, 1995; Visser, 1996; Nadvi, K. 1999b).

To elaborate more about the existence of trust and reciprocity on inter-firm relationships, two variables are created. They are trust intensity and reciprocity intensity. The concept of trust developed here is designed to focus on trust in an organizational

setting involving two specific parties: a trusting party (trustor) and a party to be trusted (trustee). This definition of trust is applicable to a relationship with another identifiable party who is perceived to act and react with volition toward the trustor. Accordingly, this study outlines the four cognitive trust-building processes. They are trust based on cooperative behaviors (Shapiro, et.al., 1992), trust based on capability (Deutsch 1960; Mayer, et.al., 1995), interpersonal trust (Rotter, 1967; Linskold, 1978), and trust based on proof source from partners (Milliman and Fugate, 1988).

Following Gouldner (1960), this study defines reciprocity as the degree of equality or comparability, within a certain period of time, of the supportive actions performed for and by an individual. Thompson (1967) refers to this as a ‘feedback processes’. Manifestations of reciprocity at the network level can vary greatly in their level of generality (Rook, 1987). She determines whether specific kinds of support are given to one or more network members and whether these kinds of support are received from network members. In her view, a network is reciprocal if as many kinds of support are received as are given. Individuals over benefit from their network if more kinds of support are received than are given; they under benefit if more kinds of support are given than are received (Rook, 1987).

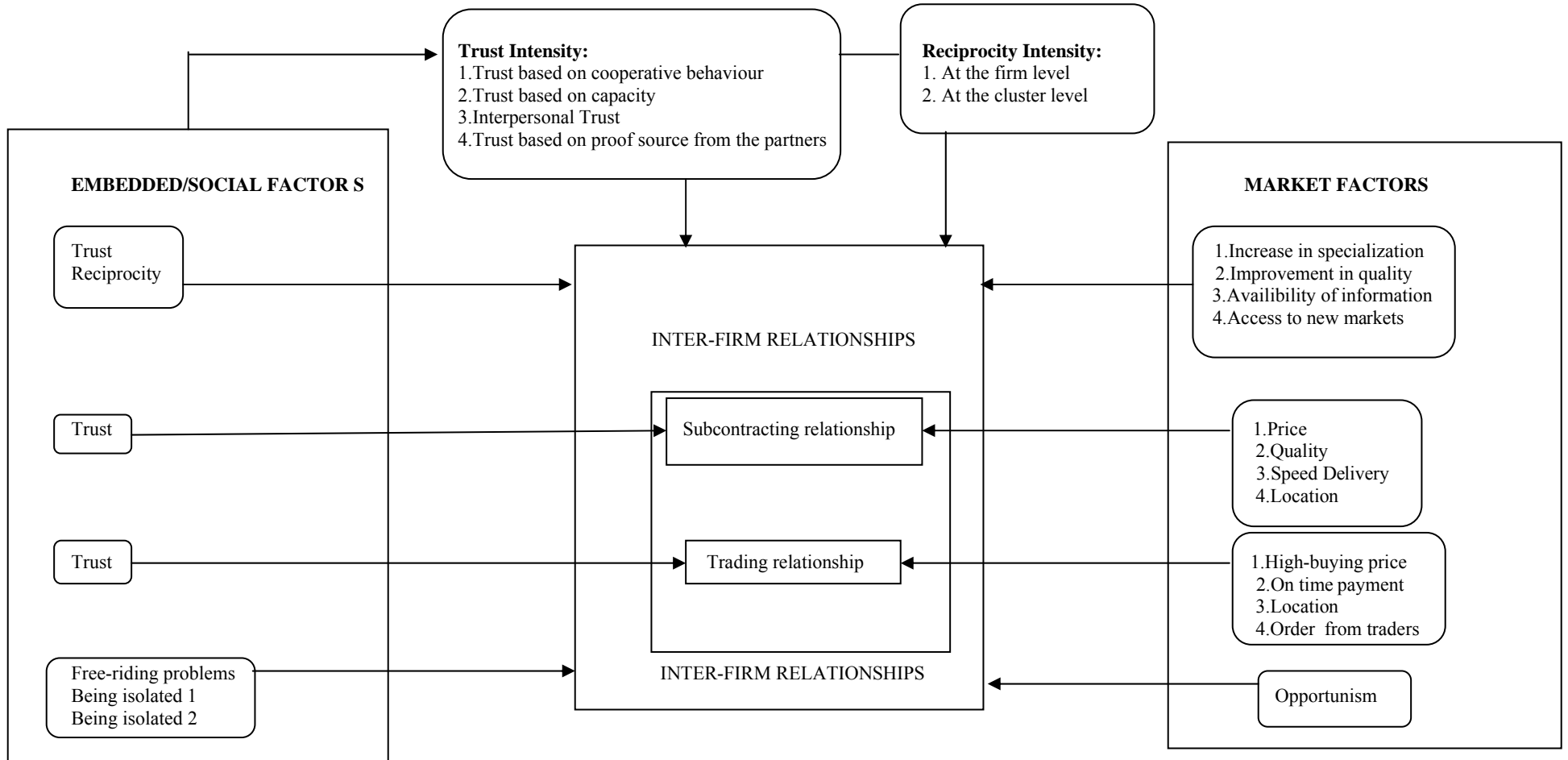
Nevertheless, both market and social factors may have negative impacts on inter-firm relationships within clusters. The influence of market factors on inter-firm relationships can stimulate some opportunistic behaviors from business partners (Williamson, 1985; Alchian and Woodward, 1988; Griesinger, 1990). Business partners for their own interest could cheat or make suffer other firms to pursue their own business goals. It is more likely to happen in clusters since it is common in clusters that business relationships between firms are not under formal agreements (Nadvi, K.1999b).

The situations in which embeddedness between firms can have a negative effect are when free-riding problems exist (Portes and Sensenbrenner, 1993; Rabellotti, 1996) and firms with their embeddedness isolates themselves from external environments, especially from training and technology centres (Portes and Sensenbrenner, 1993; Uzzy, 1997; Gargiulo and Benassi, 1999).

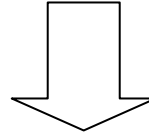
Finally, this study examines whether inter-firm relationships that are affected by

market and social/embedded factors will influence firm's business performance, basic capabilities and innovation capability. Firm's business performance is about the trend of the net profit and firm's business (Ruekert, et.al., 1985; Porter, 2000; Homburg, et.al., 2003), while firm's basic capabilities shows the strengths and the weakness that firms have regarding their labor skills, specialization, and marketing strategy (Barney, 1991; Mahoney and Pandian, 1992; Rao, 1994; Schoemaker and Amit, 1994; Oliver, 1997). The innovation capability of firms represents the capability of the firms to have technical process and product innovation (Van de Ven, 1986; Tien, 1998). This kind of innovation can build by their own efforts or with cooperation with neighbour firms within clusters (Sandee, 1995; Visser, 1996).

**Figure 1. Framework of the Study**



**Inter-firms relationships with market and social factors**



- 1. Firm's business performance:**
  - the last five years business trend
  - the last one year net profit
  - the last five years net profit
- 2. Firm's Basic Capabilities:**
  - labor skills
  - degree of specialization
  - marketing strategy
- 3. Firm's Innovation Capability**
  - technical process
  - new products
  - new designs

### **III.2. Hypothesis development**

The first set of hypotheses pertains to the effects of market ties within clusters on three indicators of firm's performance (firm's business performance, firm's basic capabilities, and firm's innovation capability). On an overall basis, we hypothesize positive effects of market ties variables on each of indicators of firm's performance. Consistent with prior research, we argue that market ties variables have a strong link with firm's business performance, firm's basic capability, and firm's innovation capability. According to Porter (1985), a firm's competitive behavior reflects a firm's orientation to achieve a position of superior performance and to generate competitive advantage over other firms.

Clusters consist of a multitude of formally independent highly specialized enterprises with a high density of transactions among them (Sato, 2000). Since mutual dependence is high, the exposure to opportunism is high, particularly so where firms make transaction specific investments and firms rely on other firms to be able to meet tight schedules and produce high quality (Nadvi, 1999a). Thus, a market orientation on inter-firm relationships called as market-based relationships in this study that can pursue firms to increase their specialization and product quality can improve an efficiency of firm's production activity and firm's sales.

**H1a:** Market-based relationships have a positive impact on firm's business performance.

**H1b:** Market-based relationships have a positive impact on firm's basic capabilities.

**H1c:** Market-based relationships have a positive impact on firm's innovation capabilities.

Subcontracting relationships that are influenced by market factors represents the effectiveness of the division of labor among firms that complement with each other. Considering quality works of subcontractors bring firms trying to produce a sophisticated final products. A reasonable payment to subcontractors may generate a superior margin for manufacturers or traders who ask some subcontractors to do part of their production

activity, or even until finalizing the products. In addition, market-based subcontracting relationships can encourage subcontractors to improve the quality of their works as well as the design of the products that they made. All actors in this market-subcontracting relationships are motivated to accelerate their basic capabilities regarding their labor skills and specializations since they have to compete with each other to get good partners in producing sophisticated products. Accordingly,

**H2a:** Market-based subcontracting relationships have a positive impact on firm's business performance.

**H2b:** Market-based subcontracting relationships have a positive impact on firm's basic capabilities.

**H2c:** Market-based subcontracting relationships have a positive impact on firm's innovation capabilities.

When firms take into account their rational consideration when choosing who will sell their products, they would be able to attain a higher business performance. Moreover, traders who would like to give a reasonable buying price will have a significant standard on choosing the products that they would sell from manufacturers/subcontractors. As a result, a market orientation on this trading relationship may affect the willingness of firms to innovate a new process as well as a new design. It is not avoidable, manufacturers/subcontractors are motivated to improve their specialization and the skills of labor employed at their workshop. Hence,

**H3a:** Market-based trading relationships have a positive impact on firm's business performance.

**H3b:** Market-based trading relationships have a positive impact on firm's basic capabilities.

**H3c:** Market-based trading relationships have a positive impact on firm's innovation capabilities.

However, market factors in inter-firm relationships can create a negative effect on those relationships in the form of opportunism problems. Firms that exhibit rivalvours behavior tend to perceive and structure relationships with their partner as zero-sum games,

when one firm's gain is another firm's loss (Jarillo, 1988). According to Visser (1996), opportunism results in an economic and business damage for all parties in a certain relationships. These arguments lead to the following set of hypotheses:

**H4a:** The negative side of market ties in the form of opportunism has a negative impact on firm's business performance.

**H4b:** The negative side of market ties in the form of opportunism has a negative impact on firm's basic capabilities.

**H4c:** The negative side of market ties in the form of opportunism has a negative impact on firm's innovation capabilities.

The second sets of hypotheses is related to the relationships between social/embedded ties variables and three indicators of firm's performance: firm's business performance, firm's basic capabilities, and firm's innovation capability. Smallborne and Welter (2001) show social ties can play a very important role for entrepreneurs in assisting them to mobilize resources in developing countries. In these countries, business communities can benefit from social relationships by pooling resources and reducing opportunism (Xin and Peace, 1996).

Embedded ties that emerges from trust and reciprocity between firms may minimize transaction costs as compared to formal contracts (Dyer, 1997). According to Uzzy (1997), contracting costs are avoided because firms trust that payoffs will be divided equitably, even when comparative market transactions do not exist. Social ties results in join problem solving arrangements which can increase the speed at which products are brought to market by resolving problems in real time during production (Bat, 2003). Accordingly,

**H5a:** Social-based relationships have a positive impact on firm's business performance.

**H5b:** Social-based relationships have a positive impact on firm's basic capabilities.

**H5c:** Social-based relationships have a positive impact on firm's innovation capabilities.

In subcontracting relationships, parties are often required to establish formal plans

and chronological schedules to govern their interdependent actions and decisions (Thompson, 1967). Moreover, because of the sequential and frequent nature of the process, parties may also find themselves devoting resources to the resolution of conflict related to conflicting points of view and opportunistic behaviour. Trust-based subcontracting relationships help ease such dilemmas by enabling them to coordinate their complementary sets of capabilities and also reduce the likelihood of opportunism-based conflicts to achieve greater levels of inventory and product flow efficiencies (Bat, 2003). These arguments lead to the following set of hypotheses:

**H6a:** Trust-based subcontracting relationships have a positive impact on firm's business performance.

**H6b:** Trust-based subcontracting relationships have a positive impact on firm's basic capabilities.

**H6c:** Trust-based subcontracting relationships have a positive impact on firm's innovation capabilities.

Furthermore, when trust becomes a main consideration in trading relationships, commitments for information exchange, especially on market demand conditions, enable parties to more accurately track the expectations of each other (Uzzy, 1997). Therefore, trust-based trading relationships can lead all parties pursuing their superior returns. For traders, they get more margins from selling products with higher price than they buy from manufacturers/subcontractors, while for manufacturers/subcontractors, they get benefits from the increase of trader's orders due to their sophisticated products. Hence,

**H7a:** Trust-based trading relationships have a positive impact on firm's business performance.

**H7b:** Trust-based trading relationships have a positive impact on firm's basic capabilities.

**H7c:** Trust-based trading relationships have a positive impact on firm's innovation capabilities.

The relationships, communities, cooperation, and mutual commitment could not exist without a reasonable level of trust (Granovetter, 1985). Moreover, trust may form in a variety of ways and how trust is established depend upon the societal norms and values

that guide people's behavior and beliefs (Hofstede 1980). Deutsch (1960) considers the reasons why one person would trust another person to produce some beneficial events. The 'individual must have confidence that the other individual has the ability and intention to produce it' (Deutsch 1960). In dealing with other people, one is better off to be cautious until they have provided evidence that they are trustworthy (Milliman and Fugate 1988). Given the high density of linkages within clusters, ease of trust is critical to their functioning and help explain firm's competitiveness. Thus,

**H8a:** Trust based on cooperative behaviors, partner's capability, interpersonal relations, and proof source from partners have a positive impact on firm's business performance.

**H8b:** Trust-based on cooperative behaviors, partner's capability, interpersonal relations, and proof source from partners have a positive impact on firm's basic capabilities.

**H8c:** Trust based on cooperative behaviors, partner's capability, interpersonal relations, and proof source from partners have a positive impact on firm's innovation capabilities.

With respect to the reciprocity, reciprocity within a relationship is seen as an indicator of the highest level of intimacy (Rook 1987). Thus it might be expected that a lack of balance, whether it involves more giving or more receiving of support, is associated with relatively low levels of well-being. The difference from regular market behavior is that transactions center not on money and material goods, but social intangibles (Gouldner 1960; Hechter 1987). Thus,

**H9a:** Reciprocity at the firm and cluster level have a positive impact on firm's business performance.

**H9b:** Reciprocity at the firm and cluster level have a positive impact on firm's basic capabilities.

**H9c:** Reciprocity at the firm and cluster level have a positive impact on firm's innovation capabilities.

Nonetheless, the ability to withdraw from social embeddedness that is no longer

advantageous has been often recognized as an important factor in the adaptability of firms to change in their environments (Uzzi 1997). The more intense and productive the ties with the old contacts were, the more difficult will it be to part with those relationships. Dense social ties in economic exchanges may restrict firms from new information and new opportunities (Gargiulo and Benassi 2000). Moreover, Weber (1978 (1922)) states that cozy intergroup relationships of the sort frequently found in solidarity communities can give rise to a gigantic free-riding problem. Accordingly,

**H10a:** The negative side of embedded ties in the forms of free-riding problems and being isolated from external environments has a negative impact on firm's business performance.

**H10b:** The negative side of embedded ties in the forms of free-riding problems and being isolated from external environments has a negative impact on firm's basic capabilities.

**H10c:** The negative side of embedded ties in the forms of free-riding problems and being isolated from external environments has a negative impact on firm's innovation capabilities.

This study adds one variable that also influence inter-firm relationships, in turn, the performance of firms. It is meeting intensity. Meeting intensity shows how frequent do firms meet with each other. The frequency of meeting between firms may influence the performance of firms as the possibility to discuss about their business problems and in turn, get a solution of the problems may occur (Nadvi, 1999b). Therefore,

**H11a:** Meeting intensity has a positive impact on firm's business performance.

**H11b:** Meeting intensity has a positive impact on firm's basic capabilities.

**H11c:** Meeting intensity has a positive impact on firm's innovation capabilities.

Accordingly, based on theoretical background and empirical evidence on the two sets of hypotheses mentioned above, for the last sets of hypotheses, we have:

**H12a:** The simultaneity of market and embedded ties within clusters have a significant impact on the business performance, basic capabilities, and innovation capability of firms.

**H12b:** Firms could not prevent the availability of negative impacts on their market and embedded ties that have a negative impact on the business performance, basic capabilities, and innovation capability of firms.

**Control variables.** Firms that employ more workers, earn more omzet, and stay longer in the clusters tend to affect more the business performance of the firms, their basic resources and capabilities and their innovation capability. Thus, we control for these three variables but do not hypothesize specific relationships between these constructs with the market and embedded ties variables.

#### **IV. Sampling, Measurement, and Models**

##### **IV.1. Sampling**

In order to examine the simultaneity of market and embedded relationships within clusters and the hypotheses set out in the preceding sections, fieldwork was carried out in the three Indonesian clusters. The three Indonesian clusters are the Kotagede silver handicraft cluster, the Manding leather handicraft cluster, and the Kasongan ceramic handicraft cluster in Yogyakarta, Indonesia.

By selecting these three clusters, the study captures the cluster's business development and socio-cultural diversities reasonably well. The silver handicraft Kotagede and the ceramic handicraft Kasongan clusters produce its goods for national as well as export markets. Inter-firm linkages in the clusters are complex, and specific stages of the production process are frequently outsourced to specialist firms within the clusters. In Manding, some leather handicraft producers have started to influence the development trajectory of the clusters and some enterprises produced for export through traders or wholesalers from outside the cluster. Thus, the Manding's cluster was relatively less developed than the Kotagede and Kasongan clusters.

Meanwhile, with respect to the socio-cultural condition, most people who live in Kotagede acknowledge their modern Islamic upbringing. Some were educated in the modern Islamic school and many of them have engaged in the activities of Muhammadiyah, one of Indonesia's largest modern Islamic organizations. Unlike people in Kotagede, the way of life of villagers in Manding and Kasongan is strongly influenced by the mix of the Javanese culture and the traditional Islamic value. In addition, Manding

and Kasongan are located in rural area, while Kotagede is in urban area. It implies that they have different social value systems. Moreover, since Kotagede is located nearby the centre of the Yogyakarta province, many people who are from outside the province come and stay in this town. As a result, the way of life of Kotagede people is also affected by the interaction with the outsiders with their own culture.

Hence, Kasongan and Manding represent the rural setting cluster in which people live with a mix of the traditional Islamic and Javanese culture as their socio-cultural identity but the development of the Manding cluster is less developed than the Kasongan cluster. In the meantime, Kotagede represents the urban setting cluster which have been developed like Kasongan but people live with their modern Islamic upbringing.

Qualitative information was collected through in-depth interviews and quantified responses came from a questionnaire survey covering the sample of 210 firms in the three clusters. The first questionnaire survey was administrated from August 2007 to January 2008 and the second from May 2008 to July 2008. The second survey was conducted after revising the first survey questionnaire based on the evaluation of the first survey. The pilot project was conducted in July 2007 before conducting the first survey. The first survey provided data for 78 firms from the first two clusters (Kotagede and Manding) and the second survey provided data for 210 firms from the three clusters (78 firms from the first survey sample which were re-interviewed with the last revised version of questionnaire and 132 new sample firms with the last revised version of questionnaire).

The sample survey includes 210 firms: 102 of them located in Kotagede, 23 firms in Manding, and 85 firms in Kasongan. The total number of firms in Kotagede is about 450 firms, in Manding, it is about 30 firms, and in Kasongan, it is about 200 firms. Based on their sales turnover per month, the total sample of this study is 94 micro firms, 93 small firms, 21 medium firms, and 2 large firms. The sample of large firms is not really big since there are only few large firms in Kasongan and Kotagede and even there is not any large firms in Manding.

To detect possible problems with non-response error, this study used two methods. First, according to the test for no response bias by Amstrong and Overton (1977), country-specific t tests between early and late respondents indicated no statistically significant

differences. Second, we conducted a small survey of 15 (in Kotagede), 5 (in Manding), 10 (in Kasongan), randomly selected non-respondents at the three clusters to determine whether there were any systematic differences between our firm sample and the rest of the population in the three clusters. This study carried out t-test for differences in the means of respondents and non-respondents firms on certain key variables and found no statistically significant differences. Hence, on an overall basis, non-response bias did not appear to be a problem in our study.

#### **IV.2. Measurement**

The first step in analyzing the data from the closed-questionnaire survey is to build some indices to aggregate market and embedded ties variables of the sample firms and the variables of the three kinds of firm's performance. With these methods, the following independent variables as well as dependent variables were built. The independent variables consist of market and embedded ties variables. Market ties variables include market-based relationship intensity index, market-based subcontracting intensity index, and market-based trading intensity index.

In the meantime, embedded ties variables consist of social-based relationship intensity index, trust-based subcontracting intensity index, trust-based trading intensity index, trust intensity index, reciprocity index, and meeting intensity index. Two other related variables that are the negative impact of both ties are the dark side of market ties in the form of opportunism problems and embedded ties in the forms of free-riding problems and being isolated from training centre and technology centre.

This study has three models. The three dependent variables of the models include three kinds of firm's performance. The performance of firms consists of business performance index of the firms, basic capabilities index of the firms, and the innovation capability of the firms. Table 1 reports the details of the measurement items and scales used to operationalize our theoretical constructs. Where available, we used measurement instruments from the literature to develop constructs. Some items were modified to reflect the specific context of the study. The Cronbach alpha reliability value for each construct is also reported in Table 1. The reliability values of the measurement scales all exceed the recommended value of 0.70 (Nunnally, 1978) with exception of that for the constructs of



<p><i>Market-based based trading relationships (X<sub>3</sub>)</i> The reasons for choosing the firm's traders:</p> <ul style="list-style-type: none"> <li>a.High buying price</li> <li>b.On-time payment</li> <li>c.Location</li> <li>d.Ordersl from traders</li> </ul> <p>(5= the 1<sup>st</sup> rank, 4= the 2<sup>nd</sup> rank, 3=the 3<sup>rd</sup> rank, 2=the 4<sup>th</sup> rank, 1=the 5<sup>th</sup> rank)</p> <p><i>Trust-based trading relationships (X<sub>6</sub>)</i> The reasons for choosing the firm's traders: e. Trust</p> <p>(5= the 1<sup>st</sup> rank, 4= the 2<sup>nd</sup> rank, 3=the 3<sup>rd</sup> rank, 2=the 4<sup>th</sup> rank, 1=the 5<sup>th</sup> rank)</p>	<p>0.763</p> <p>Only one variable</p>	<p>Sandee, 1995; Visser, 1996; Uzzy, 1997; Rabellotti, 1997; Schmitz, 1998; Sato, 2000</p> <p>Granovetter (1985,1990); Humphrey, J. and Schmitz, H. (1998).</p>
<p><i>Trust Intensity: (X<sub>7</sub>)</i></p> <ul style="list-style-type: none"> <li>a.The firm trust her/his partners within the cluster since they never cheat her/him or suffer her/him (trust based on cooperative behaviours)</li> <li>b.The firm trust her/his partners within the cluster since they can accomplish her/his assignments or her/his order (trust based on capability)</li> <li>c.The firm trust her/his partners within the cluster as a friend since they never lie and always do what they promised to her/his (interpersonal trust)</li> <li>d.The firm trust her/his partners within the cluster since they have a good cooperation with with other partners in the cluster (trust based on proof source from partners)</li> </ul> <p>(1 = Yes; 0 = No)</p>	<p>0.538</p>	<p>a.Shapiro, et.al., 1992</p> <p>b.Deutsch 1960; Mayer et.al., 1995</p> <p>c.Rotter, 1967; Linskold, 1978</p> <p>d.Milliman and Fugate, 1988.</p>

<p><i>Reciprocity: (X<sub>8</sub>)</i></p> <p>a.Firm-level Reciprocity (between the firm and other local firms in the cluster, there is over benefiting or reciprocal or under benefiting relationships)</p> <p>b.Cluster-level Reciprocity (between the firm and the cluster organizations, there is over benefiting or reciprocal or underbenefiting relationships )</p> <p><u>(3=overbenefiting, 2=reciprocal, 1=underbenefiting)</u></p>	0.468	Gouldner, 1960; Thompson (1967); Rook, 1987
<p><i>Meeting intensity: (X<sub>9</sub>)</i></p> <p>The firms meet and talk with each others in the cluster: never or occasionally or regularly or very frequently.</p> <p><u>(1=never, 2=occasionally, 3=regularly, 4=very frequently)</u></p>	Only one variable	Nadvi, K. ,1999b
<p><i>Dark side of market ties: (X<sub>10</sub>)</i></p> <p>There are firms in the cluster which cheat her/him or make her/him suffer (opportunism)</p> <p><u>(1 = Yes; 0 = No)</u></p>	Only one variable	Williamson, 1985; Alchian and Woodward ,1988; Griesinger, 1990;
<p><i>Dark Side of Embedded Ties: (X<sub>11</sub>)</i></p> <p>a. There are firms in the cluster which imitate the firm's product design without contributing anything at the product development process (free-riding problems)</p> <p>b.The firm does not have any contact with the training centre outer the cluster (being isolated 1)</p> <p>c.The firm does not have any contact with the technology centre outer the cluster (being isolated 2)</p> <p><u>(1 = Yes; 0 = No)</u></p>	0.603	<p>a. Portes and Sensenbrenner, 1993; Rabellotti 1996</p> <p>b and c. Portes and Sensenbrenner, 1993; Uzzi 1997; Gargiulo and Benassi 1999</p>
<p><b>The Dependent Variables</b></p>		

<p><i>Firm's Business Performance (Y<sub>1</sub>):</i></p> <p>a. The trend of the firm's business over the last five years has increased <i>or</i> no changed <i>or</i> decreased</p> <p>b. The net profit for the last one year was increasing <i>or</i> static <i>or</i> decreasing</p> <p>c. The trend of the firm's profit over the last five years has increased <i>or</i> no change <i>or</i> decreased (3=increased, 2=no change, 1=decreased)</p>	0.791	Ruekert <i>et.al.</i> 1985; Porter, 2000; Homburg <i>et.al.</i> 2003; Panayides, 2006
<p><i>Firm's Basic Capabilities (Y<sub>2</sub>):</i></p> <p>Indicates the strengths (+1) and the weaknesses (-1) of your firm:</p> <p>a. Labor skills</p> <p>b. Degree of specialization in the different production phases</p> <p>c. Marketing strategy (advertising, network, etc) (1=strength, -1=weakness)</p>	0.769	Barney, 1991; Mahoney and Pandian, 1992; Rao, 1994; Schoemaker and Amit, 1994; Oliver, 1997.
<p><i>Firm's Innovation Capability (Y<sub>3</sub>):</i></p> <p>a. Over the last five years, the quality of the firm's product has increased</p> <p>b. The firms develop technical innovation at her/her own firm</p> <p>c. Technical innovation comes from in cooperation with other local manufacturers</p> <p>d. The design of the firm's final product that are sold directly to consumers designed by her/his own preference</p> <p>e. The design of the product that are ordered by the certain traders designed by her/his own preference (1=Yes, 0 = No)</p>	0.235	Van de Ven, 1986; Sandee, 1995; Visser, 1996; Tien, 1998;

\*: Cronbach's alpha measures how well a set of items (or variables) measures consistency among individual items in a scale. It shows a single unidimensional latent construct. The recommended reliability value of the measurement scales is above 0.70 (Nunnally, 1978) but for some cases, the value which is 0.2 - 0.6 is still accepted for an exploratory study.

Firm's business performance (Y<sub>1</sub>) was measured by adopting the subjective approach (perceptual measure) where respondents were asked to state their firm's business

performance on criteria like the five years trend of their business performance, their profit and the one year trend of their net profit. Although quantitative financial performance measures are appropriate, subjectivity measures were preferred because of the difficulty in obtaining financial measures from managers or owners of the respondent firms in the three sample clusters and the fact that most companies are micro and small units. This subjective approach has been applied successfully in previous studies (Ruekert *et.al.* 1985;Homburg *et.al.*2003; Panayides, 2006).

Technically speaking, if Cronbach's alpha is low, the data must be not unidimensional. It implies that all items should not be combined to create one single scale. It can be seen from Table 1, four variables have a low Cronbach's alpha. The variables are market-based relationships (0.570), trust intensity (0.538), reciprocity (0.468), and firm's innovation capability (0.238). To solve the problem of multidimensionality of data and find sets of closely related items, factor analysis for each variable was conducted. However, the Cronbach's alpha of the new sets of item resulted from factor analysis was lower than the previous one presented in Table 1. In addition, for some cases, the value which is 0.2 – 0.6 is still accepted for an exploratory study like this study. That is why we still use the items for the four variables presented in Table 1 although they have a low Cronbach's alpha.

### **IV.3. Model**

In order to test the hypotheses stated above, this study employs ordinary least squares (OLS) model with some dummy variables. To consider the relationship between different categories of the respondents on the dependent variables of this study, two dummy variables were calculated. For  $D_1$ , the variable scored 1 if the firm respondents are artisans/manufacturers and 0 if respondents are not artisans/manufacturers. For  $D_2$ , the variable scored 1 if the firm respondents are manufacturers/traders and 0 if respondents are not manufacturers/traders. Thus, there are three categories of respondents of this study: an artisan/manufacturer, a manufacturer/trader, and a trader/non-manufacturer. An artisan/manufacturer refers to someone who is an artisan and also a manufacturer, while a manufacturer/trader is for a trader who has workshop to produce some output with at least one skilled workers/artisans.

In addition, to strengthen further the finding of this study, it would be important to see how the dependent variables of this study are influenced by other factors that are not directly related to market and embedded ties between the firms. This requires conducting a regression analysis with some control variables such as total workers ( $X_{12}$ ), total omzet ( $X_{13}$ ), and firm's age ( $X_{14}$ ). Thus, this study will test three different multiple regression equations for each dependent variables. They are treated as univariate systems. The equation of this study:

$$Y_{ki} = \beta_0 + \delta_{1i} D_{1i} + \delta_{2i} D_{2i} + \beta_{1i} X_{1i} + \beta_{2i} X_{2i} + \beta_{3i} X_{3i} + \beta_{4i} X_{4i} + \beta_{5i} X_{5i} + \beta_{6i} X_{6i} + \beta_{7i} X_{7i} + \beta_{8i} X_{8i} + \beta_{9i} X_{9i} + \beta_{10i} X_{10i} + \beta_{11i} X_{11i} + \beta_{12i} X_{12i} + \beta_{13i} X_{13i} + \beta_{14i} X_{14i} + e_i$$

$k = 3$  (three) dependent variables consist of the business performance of the firms ( $Y_1$ ); the basic capabilities of the firms ( $Y_2$ ), and the innovation capability of the firms ( $Y_3$ ).

$i = \text{firm } i (i = 1, \dots, 210)$

## **V. Results and Discussions**

### **V.1. Results**

As shown in table 2, the main finding of the regression analysis of the three models is that all the independent variables together affect significantly each dependent variable of the three models. It is proved by F test for the three OLS models. F-test for the model 1, 2, and 3 are 4.793; 5.852; 11.857. Each F-statistics of the models is statistically significant at the confidence level of 99 percents. It shows the overall significance of the effect of all the independent variables on the dependent variable. It also includes all the dummy variables as well as the control variables of the models. This finding means that all market and embedded ties variables together affects the business performance, the basic capabilities, and the innovation capability of the firm.



**Table 2. The OLS Results of the Models**

Dependent Variables	Firm's Business Performance (Model 1)			Firm's Basic Capabilities (Model 2)			Firm's Innovation Capability (Model 3)		
	Beta coeff. (t value)	Tolerance 1)	VIF 1)	Beta coeff. (t value)	Tolerance 1)	VIF 1)	Beta coeff. (t value)	Tolerance 1)	VIF 1)
Constant	1.702 <b>(4.861)*</b>			-.041 (-.288)			.167 <b>(1.561)*</b>		
Dummy Variable for Producers-Artisans (DV1)	-.267 <b>(-1.248)**</b>	.124	8.063	-.086 (-.995)	.124	8.063	.183 <b>(2.728)*</b>	.124	8.063
Dummy Variable for Producers-Traders (DV2)	.010 (.052)	.167	5.973	-.038 (-.479)	.167	5.973	.265 <b>(4.333)*</b>	.167	5.973
Market-based Relationships	-.097 (-.689)	.678	1.475	.105 <b>(1.857)*</b>	.678	1.475	.090 <b>(2.046)*</b>	.678	1.475
Market-based subcontracting relationships	.103 (2.128)	.422	2.372	.008 (.394)	.422	2.372	.012 (.817)	.422	2.372
Market-based trading relationships	-.053 (-.825)	.244	4.092	.021 (.797)	.244	4.092	-.060 <b>(-2.947)*</b>	.244	4.092
Social-based Relationships	-.004 (-.035)	.617	1.620	-.066 <b>(-1.352)*</b>	.617	1.620	-.011 (-.293)	.617	1.620
Trust-based subcontracting relationships	-.025 (-.839)	.808	1.238	.011 (.909)	.808	1.238	.012 <b>(1.249)**</b>	.808	1.238
Trust-based trading relationships	.065 <b>(1.910)*</b>	.387	2.581	.014 <b>(1.019)***</b>	.387	2.581	.004 (.387)	.387	2.581
Trust Intensity	-.184 <b>(-1.193)**</b>	.293	3.413	-.007 (-.112)	.293	3.413	-.049 <b>(-1.022)***</b>	.293	3.413

Reciprocity Intensity	.550 <b>(3.330)*</b>	.889	1.125	.072 <b>(1.087)***</b>	.889	1.125	.150 <b>(2.890)*</b>	.889	1.125
Meeting Intensity	-.322 <b>(-1.610)*</b>	.757	1.322	-.131 <b>(-1.623)*</b>	.757	1.322	.098 <b>(1.567)*</b>	.757	1.322
Dark Side of Market Ties	.046 (.503)	.823	1.216	.081 <b>(2.196)*</b>	.823	1.216	.021 (.740)	.823	1.216
Dark Side of Embedded Ties	-.079 (-.662)	.787	1.270	.066 <b>(1.370)**</b>	.787	1.270	.008 (.223)	.787	1.270
Total Worker	.008 (.993)	.437	2.287	.015 <b>(4.504)*</b>	.437	2.287	.005 <b>(2.063)*</b>	.437	2.287
Firm Age	-.006 <b>(-1.590)</b>	.865	1.157	-.004 <b>(-2.518)*</b>	.865	1.157	-.003 <b>(-2.427)*</b>	.865	1.157
Omzet per month	8.35E-009 <b>(2.445)*</b>	.514	1.946	-3.4E-010 (-.249)	.514	1.946	1.86E-009 <b>(1.735)*</b>	.514	1.946
<b>F - calculation</b>	4.793			5.851			11.857		
<b>R - square</b>	0.284			0.327			0.496		
<b>Adjusted R-Square</b>	0.255			0.271			0.454		

xxxx = not used in the model

\*: significant at the confidence level of 99 percents

\*\* : significant at the confidence level of 90 percents

1) This is a test for Multicollinearity. Multicollinearity exists when Tolerance is below 0.1; and VIF is greater than 10. In this case, there is not multicollinearity.

For the significance of each independent variable, the t-test was conducted. The results of each model present as follows.

*a. Model 1: The business performance index*

The first model specifies the relationship between the firm's business performance index and market and embedded ties variables indices. There is not any market ties variables indices are individually significant and statistically affect the business performance index. On the other hand, some embedded ties variables indices are individually significant and statistically affect the business performance index. They are trust-based trading relationships index ( $b_6 = 0.065$ ; t value = 1.910, significant at the confidence level of 99 percent); trust intensity index ( $b_7 = -0.184$ ; t value = -1.193, significant at the confidence level of 90 percent); reciprocity index ( $b_8 = 0.550$ ; t value = 3.330, significant at the confidence level of 99 percent); and meeting intensity ( $b_9 = -0.322$ ; t value = -1.610, significant at the confidence level of 95 percent). From the sign of their regression coefficients, there are two variables that have a positive relationship with the business performance index. They are trust-based trading relationships index and reciprocity index. While, trust intensity index and meeting intensity have a negative relationship with the business performance index. Test for multicollinearity for all market and embedded ties variables indices shows that multicollinearity does not exist since the value of tolerance for all variables is above 0.1; and VIF for all variables is greater than 10.

Constant and one dummy variable that indicate two categories of the respondents of this study are statistically significant to affect the business performance index. It means that the existence of traders and artisans-manufacturers influence the business performance of the firm within the clusters. The positive sign is for traders ( $b_0 = 1.702$ , t value = 4.861, significant at the confidence level of 99 percents, while the negative sign is for artisans-manufacturers ( $\delta_1 = -0.267$ , t value = -1.248, significant at the confidence level of 90 percents).

Two control variables which are firm's age and omzet per month are also significant and statistically affect the business performance index. Firm's age has a negative relationship with the business performance of the firm ( $b_{13} = -0.006$ ; t value = -

1.590 -- significant at the confidence level of 95 percents), whereas omzet per month of the firm has a positive relationship with the business performance of the firm ( $b_{14} = 8.35E-009$ ;  $t$  value = 2.445 -- significant at the confidence level of 99 percents).

*b. Model 2: The basic capabilities index*

The second model tests the relationship between the firm's basic capabilities index and market and embedded ties variables indices. Like the first model, test for multicollinearity for all variables including market and embedded ties variables indices shows that multicollinearity does not exist since the value of tolerance for all variables is above 0.1; and VIF for all variables is greater than 10. The  $t$ -test for the regression coefficients of each independent variable of this model shows two market ties variables indices and five embedded ties variables indices are statistically significant.

Market-based relationships index has a positive relationship with the basic capabilities index of the firm ( $b_1 = 0.105$ ,  $t$  value = 1.857, significant at the confidence level of 99 percents), on the other hand, social-based relationships index has a negative relationship with the basic capabilities index of the firm ( $b_2 = -0.066$ ,  $t$  value = -1.352, significant at the confidence level of 90 percents). Another market ties variable index which is significant is the negative impact of embedded ties, called as the dark side of market ties in the form of opportunism problems. The sign of its regression coefficient shows that a positive relationship between the basic capabilities index of the firm and the dark side of market ties in the form of opportunism problems ( $b_{10} = 0.081$ ,  $t$  value = 2.196, significant at the confidence level of 99 percents).

Three other embedded variables indices that are trust-based trading relationships index, reciprocity intensity index, and the dark side of embedded ties variables indices have a positive relationship with the basic capabilities index of the firm ( $b_6 = 0.065$ ,  $t$  value = 1.910, significant at the confidence level of 95 percents;  $b_8 = 0.550$ ,  $t$  value = 3.330, significant at the confidence level of 99 percents;  $b_{11} = 0.066$ ,  $t$  value = 1.370, significant at the confidence level of 90 percents, respectively). The dark side of embedded ties variable index is the negative impact of embedded ties in the form of free riding problems and being isolated from external environments. In the meantime, two other embedded variables indices that are trust intensity index and meeting intensity index

have a negative relationship with the basic capabilities index of the firm ( $b_7 = -0.184$ ,  $t$  value =  $-1.193$ , significant at the confidence level of 90 percents;  $b_9 = -0.322$ ,  $t$  value =  $-1.610$ , significant at the confidence level of 95 percents respectively).

There is not any dummy variable that is statistically significant, whereas there are two control variables that are statistically significant. Similar to the first model, firm's age has a negative relationship with the basic capabilities index of the firm ( $b_{13} = -0.004$ ,  $t$  value =  $-2.518$ , significant at the confidence level of 99 percents), whereas total worker has a positive relationship with the basic capabilities index of the firm ( $b_{12} = 0.015$ ,  $t$  value =  $4.504$ , significant at the confidence level of 99 percents).

*c. Model 3: The innovation capability index of the firm*

The last model examines the relationship between the innovation capability index of the firm with market and embedded ties variables indices. Constant and all dummy variables are statistically significant. They represent three categories of the respondent firms of this study. Constant represents the existence of traders, the first dummy is for the existence of artisans-manufacturers, and the second dummy is for the existence of traders-manufacturers. The existence of all categories of respondent firms has a positive relationship with the innovation capability index of the firm ( $b_0 = 0.167$ ,  $t$  value =  $1.561$ , significant at the confidence level of 95 percents;  $\delta_1 = 0.183$ ,  $t$  value =  $2.728$ , significant at the confidence level of 99 percents;  $\delta_2 = 0.265$ ,  $t$  value =  $4.333$ , significant at the confidence level of 99 percents, respectively).

Two market ties variables indices are significant and statistically affect the innovation capability index of the firms. However, market-based relationships index has a positive relationship with the innovation capability index of the firms ( $b_1 = 0.090$ ,  $t$  value =  $2.046$ , significant at the confidence level of 99 percents), but market-based trading relationships index has a negative relationship with the innovation capability index of the firms ( $b_3 = -0.060$ ,  $t$  value =  $-2.947$ , significant at the confidence level of 99 percents).

Three embedded ties variables indices are positive and statistically significant to influence the innovation capability index of the firm. They are trust-based subcontracting relationships index ( $b_5 = 0.012$ ,  $t$  value =  $1.249$ , significant at the confidence level of 90 percents), reciprocity intensity index ( $b_8 = 0.150$ ,  $t$  value =  $2.890$ , significant at the

confidence level of 99 percents), and meeting intensity index ( $b_9 = 0.098$ ,  $t$  value = 1.567, significant at the confidence level of 95 percents). Conversely, trust intensity index is negative and statistically significant to affect the innovation capability index of the firm ( $b_7 = -0.049$ ,  $t$  value = - 1.022, significant at the confidence level of 90 percents).

Unlike the first and the second model, all three control variables are significant to influence the innovation capability index of the firm although one of them has a different sign. Total worker and omzet per month have a positive relationship with the innovation capability index of the firm ( $b_{12} = 0.005$ ,  $t$  value = 2.063, significant at the confidence level of 99 percents;  $b_{14} = 1.86E-009$ ,  $t$  value = 1.735, significant at the confidence level of 99 percents), whereas firm's age has a negative relationship with the innovation capability index of the firm ( $b_{13} = -0.003$ ,  $t$  value = -2.427, significant at the confidence level of 99 percents).

## **V.2. Discussions**

The main objective of this study is to examine the simultaneity of market and embedded ties within clusters and its impact on the business performance, basic capabilities, and the innovation capability of the firms. With regression analysis on data from a sample of 210 firms in the three Indonesia industrial clusters, we tested the sets of hypotheses. The three models show clearly that together all the independent variables that include market and embedded ties variables affect the three indicators of firm's performance separately. Therefore, we can conclude that there is the simultaneity of market and embedded ties within the three clusters and it has a significant impact to the performance of the firms that consists of the business performance, basic capabilities, and the innovation capability of the firms (H12a, H12b, H12c).

The findings of model 2 and 3 confirm that market-based relationships in the clusters are the driver that propels the firms to improve their basic capabilities (H1a) and innovation capability (H1b), whereas the result of model 1 does not conclude these relationships have an impact on the business performance (H1c). When the firms cooperate with other firms due to their willingness to increase in specialization, improve in quality, increase in the availability of information and have an access to new markets, for instance, it induces the firms to strengthen their basic capabilities, such as the degree

of specialization, technology level, labor skills, product quality, and market development and their innovation capability on technical processes and products.

Conversely, market-trading relationships have a negative impact on the innovation capability and do not affect the business performance and basic capabilities of the firms. Qualitative information confirms this result. In the three clusters, most traders do not have their own workshop and do not engage in any stages of production activity. They buy final products from the manufacturers since there are a lot of manufacturers within the clusters. For the hypotheses for market-based subcontracting relationships, the three models do not support those hypotheses (H2a, H2b, H2c).

On the other hand, there is evidence that some embedded factors in inter-firm relationships of the firms affect the business performance (model 1), basic capabilities (model 2), and innovation capability of the firms (model 3). Trust-based subcontracting have a positive and significant relationship with the innovation capability (H6c). Local subcontracting relationships that are developed by trust affect the willingness of local manufacturers to cooperate with the local subcontractors. When the local manufacturers trust their local subcontractors, it lowers the costs of information, process requirements, and other variables that determine the process of their high-qualified products.

In a similar vein, based on the results of model 1 and model 2, trust-based trading relationships is positive and significant to influence the business performance and basic capabilities of the firms (H7a and H7b). When manufacturers trust their traders, it enhances the ability of them to adapt set of actions of their traders more adequately. In addition, trust among them influences the ease of sharing information and knowledge in order to improve the efficiency of the economic activity of firms. As a result, such relationships can lead firms to pursue higher business performance and stronger basic capabilities.

With respect to the reciprocity intensity, quantitative data results as well as qualitative information show that in the three clusters, there are reciprocal relationships at the clusters level between local firms. The more reciprocal relationships between the local firms are the more possible the firms to create technical process and product innovation. The result of model 1, 2, 3 shows that reciprocity intensity is also influential variables for

three indicators of the firm's performance (H9a, H9b, H9c). It means that the more reciprocal relationships between the local firms, the more possible the firms to pursue superior returns, improve their skills and specialization, also create technical process and product innovation.

The result of model 3 also shows that the meeting intensity index has a positive relationships with the innovation capability of the firms (H10c). The more frequent the local firms meet each other, the more the spillover of technology takes place between them. It includes information about new production techniques, new machines, new designs, and new marketing strategies. Conversely, meeting intensity index has a negative impact on the business performance (H11a) and basic capabilities of the firms (H11b). When they meet with each other frequently, they will loss much productive time, in turn, it will affect the ability of the firms to obtain higher profit and improve their business strategy.

Nevertheless, social-based relationships do not have any effect on the business performance and innovation capability of the firms but have a negative impact on the basic capabilities of the firms (H5b). It means that embeddedness between the firms in the clusters do not encourage the firms to improve their labor skills, specialization, and marketing strategy. As a matter of fact, there are lots of individual artisans, especially in Kasongan and Kotagede. Due to their embeddedness, certain artisans who works for certain traders or manufacturers can be "borrowed" when they are not fully employed in their regular workshop. It can reduce the willingness of manufacturers/traders to improve their workers/artisans' skills who work for them.

Lastly, trust intensity with the four kinds: based on cooperative behaviors, capability, interpersonal trust and proof-source from the partners only affect the business performance of the firms (H8a) and it is a negative effect. The more intensive trust between firms is the less the business performance they will get since this situation will influence the rational consideration of the firms in their relationships.

### **The evidence of the negative side of inter-firm relationships**

Unlike model 1 and 3 that shows there is no significant relationships between the negative side of market and embedded ties and the business performance and the

innovation capability, model 2 confirms the positive impact of dark side market ties and embedded ties on the innovation capability of the firms. It is converse with the hypotesis that this study have (H4c and H10c).

Indeed the challenge for the clusters is to address the negative side of both ties. The quantitative data as well as the qualitative data shows that there are several contributing factors, both social and economic factors to the negative side of inter-firms relationships within the clusters. The result of quantitative data concludes that the member of the three clusters can prevent the negative side to have a positive impact on the innovation capability of the firms.

## **V.6. Concluding Remarks**

This study represents an attempt to examine the socio-economic structure of industrial clusters in developing countries. By focusing on this issue, this paper takes up a neglected theme in the cluster literature. There is evidence of statistically significant positive relationships between market and embedded variables in inter-firm relationships and the business performance, the basic capabilities, and the innovation capability of the firms. As a result, this study has significant implications for theory and practice.

This study adds to a growing stream of literature in strategy and entrepreneurship dealing with the competitiveness of firms within clusters. Although several scholars have improved the understanding of particular issues involved in industrial clusters, there are only few studies that focus on how the potentially conflicting forces of local market and social relationships are reconciled. This study provides a new perspective and new results with respect to what has been happening clusters, particularly in emerging economies clusters by putting forth a theory model of clusters based on both economics and organizational theory concepts. My study integrated different linkages by putting both market and embedded ties variables into models and by linking them to the firm's competitiveness.

In attempts to explain the success of different coordination mechanism inside clusters, shared values of the group members and their identification with the collective goals of the group are often considered a key issue. Thus, the Indonesian context is appropriate to examine hypotheses about the simultaneity of market and embedded

relationships among firms in clusters. This study provides evidence that the formation of appropriate institutions that encourage networks of inter-firm and can significantly enhance the potential for the realization of collective interest. Indeed, when advocating clustering as a strategy for mobilizing rural resources, one would have to specify the necessary conditions for clusters to improve the ability of clustered firms to exploit some gains from a firm's location in a cluster.

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