

Manufacturing Performance: Industrial City to Superior in Competitive Advantage

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Abstracts

Competitive Advantage (CA) is defined as a company's strategy to create value of product or service that has uniqueness and distinctiveness to be beneficial for customers if compared to other competitors. This study empirically investigated whether the effects of manufacturing capability, dynamic capabilities, manufacturing performance, and competitive advantage on business development. The authors conducted a survey to test the hypotheses and designed a SEM to analyze them. The results showed that the manufacturing capability and dynamic capabilities were effective in influencing manufacturing performance. Manufacturing capability and dynamic capabilities were effective and directly influenced on competitive advantage. Moreover, this study demonstrated that the effect of competitive advantage was mediated by manufacturing performance. This finding integrated the insights in manufacturing performance framework into a generalization of the competitive advantage in industrial city. Furthermore, this research was expected to provide information for management at industrial city that had valuable suggestions for management practices to increase manufacturing performance and achieved the manufacturing goals especially in competitive advantage.

Keywords: competitive advantage, manufacturing performance, dynamic capability, manufacturing capability.

1. Introduction

In today's highly competitive environment, in order to be successful and to achieve world class manufacturing, organizations must possess effective manufacturing strategies (Jain & Ahuja, 2012). Competitive pressures in the global manufacturing environment are forcing manufacturing organizations to reengineer their strategy in order to become more competitive in the marketplace (Gomes et al., 2004). Strategic management theories invoke the concept of competitive advantage to explain firm performance and empirical research investigates competitive advantage and describes how it operates (Powell, 2001). As today's dynamic and turbulent environment is maintained, the technical infrastructure as well as people's knowledge and experience in many different fields, intimate conversations in the hallways of most people and staff in their knowledge of their exchange after a period of time that may be desired are not achieved, and technical or administrative units or design engineers as well as experts in other units may solve a specific problem or issue in relation to the roles they have assumed (Kaveh, Bamipour & Far, 2015). On the other hand, internal firm capabilities and resources have not been dynamic enough in the past to warrant the use of transient that too might change in the new business environment (Wang, 2014). There must be a focus on creating a competitive advantage by emphasizing cost, quality and on-time delivery (Chamsuk, Phimonsathien & Fongsuwan, 2015). Important implications for the managers of manufacturing can be drawn from the findings to help them to understand their environments as they move through the

different stages in a cross country business context (Elbeltagi, Hamad, Moizer & Abou-Shouk, 2016). Business to business provides many growth opportunities and benefits for firms, such as cost reductions, efficiency improvements, better supplier relationships, access to global markets, new customers and suppliers, productivity improvements, increased profits, and gains in competitive advantage (Fauska et al., 2013).

Therefore, the strategy aims to achieve best performance in manufacturing is on sustaining the process of improving human well-being (Sarjana, 2015). Manufacturing strategy refers to exploiting certain properties of the manufacturing function as a competitive weapon (Skinner, 1969). The resources based view implies that such innovations can only contribute to competitive advantage when they cannot be easily duplicated by competitors who have access to the factor markets (Schroeder et al., 2002). The industrial policy implications for cities are subsequently explored in terms of building new industrial districts to developing high skill ecosystems and fostering multinational webs of cities, all with the aim of ensuring the conditions exist in cities for creativity and development to flourish, notably a diverse and democratic economic system (Bailey & Cowling, 2011). Manufacturing basic activity is proven to have a positive and significant impact in pushing manufacturing development (Ahmad et al., 2013). Manufacturing activity is comprised of many processes, decisions, and actions (Hayes et al., 1988).

The manufacturing sector is important in relationship to its role in economic growth and the whole economy (Ahmad et al., 2013). The problem emerging from the manufacturing sector is that encouraging regions to increase their manufacturing performance has affected regional disparities (Szirmai, 2009). The capabilities of a manufacturing system are a key determinant of performance and drive competitiveness over time (Hayes et al., 1988). In dynamic industries where life cycles can be extraordinarily short, firms that are slow to market lose any launch advantages such as building an installed base or encouraging complementary goods. They may also be unable to fully amortize fixed costs because their product is obsolete (Shilling, 2010). The ability to connect two of the most popular concepts of today in the field of performance measurement is reflected in the use of economic value added as a measure of financial performance under the balanced scorecard model and the strategic management of the whole enterprise (Bogavac et. al, 2014). Business performance is examined by using financial measures of returns on investment, return on equity, and returns on sales. Business performance is obtained by combining seven measures describing manufacturing, marketing, and financial performance (Leachman et al., 2005). Selecting the most effective improvement programs is the main challenge of business managers to achieve superior operational performances (Hajirezaie et al., 2010). Manufacturing development can be pushed by increasing ethnic diversity which means acculturation from different cultures (Ahmad et al., 2013).

The city is an economic entity; the sum of its economic strength and resources, and the jobs and business opportunities it offers. The city is a social or demographic entity, made up of people who live in the city, their connections and relationships; and perhaps, albeit to a lesser extent, those who occupy it more briefly, such as commuters and visitors. The city is a physical entity, its geography, the vitality of its neighborhoods, the quality of its environment, and the soundness of its infrastructure. The city is a political entity, an entity within legally defined boundaries, containing a local government, with the public resources, capacity, and leadership it provides (Mallach, 2013). The city is emerging as the leader of transformation in terms of service sector development and attracting foreign direct investment (Drobniak & Skowronski, 2012). City development is related to industrial development, and industrial development is

related to city development (Bailey & Cowling, 2011). The city has received an important contribution to its identity and improved its quality of life (Ertas & Ozdemir, 2013).

2. Literature Review

2.1. Manufacturing Performance

Manufacturing performance is constructed around direct and indirect inputs as well as quantitative and qualitative outputs (Leachman et al., 2005). Performance measures of green manufacturing have been developed: top management commitment, knowledge management, employee training, green product and process design, employee empowerment, environmental health and safety, suppliers and materials management, production planning and control, quality, cost, customer environment performance requirement, customer responsiveness and company growth (Digalwar et al., 2013). Each dimension of manufacturing strategy has a significant positive correlation with financial and nonfinancial performances (Cheng & Wang, 2012). Top management can effectively contribute toward realization of manufacturing performance improvements by providing effective structure for ISO 9000 implementation, institutionalizing effective reward and recognition mechanisms in the organization and providing resources for managing change in the organization (Jain & Ahuja, 2012).

The manufacturing performance criteria consist of quality, delivery, cost, time, and labor (Amrina & Yusof, 2010). Manufacturing performance parameters are business related benefits, technological benefits, operational benefits, production benefits, supplier related benefits, employee related benefits, and customer related benefits (Jain & Ahuja, 2012). Manufacturing performance is measured by cost, quality, dependability, and flexibility. Manufacturing performance is evaluated base on a firm's ability to translate total manufacturing expenditures into vehicle production volume and vehicle field performance (Leachman et al., 2005). Lean operations practice such as human resources and supply chains and product system design have a significant and positive impact on three performance dimensions such as flow, flexibility, and quality (Taj & Morosan, 2011). A greater level of market orientation also has a positive influence on the four dimensions of manufacturing performance include cost, quality, delivery and flexibility (Gaur et al., 2011). To measure manufacturing performance, participants were asked to rank their plant on productivity, product quality, speed to complete manufacturing orders, customer satisfaction, flexibility to manufacture new products, and diversity of product line (Cordero et al., 2009). Degree of importance of the goals in performance comparisons consist of lower manufacturing cost, delivery speed, customer service, manufacturing quality, delivery reliability, and product range (Husseini & O'Brien, 2004). Manufacturing performance indicators consists of organizational achievements, productivity, quality, cost, delivery, safety, morale (Ahuja & Khamba, 2008). The manufacturing performance indicators are manufacturing conformance and product quality, volume and mix flexibility, time to market, customer service and support, delivery speed, delivery dependability, unit manufacturing cost, manufacturing lead time, labor productivity and inventory turnover (Hajirezaie et al., 2010).

Manufacturing strategies consist of competitive priorities which mainly focus on quality, cost, delivery, flexibility, innovation and responsiveness. Competitive priorities have been widely used as part of the measurement for manufacturing strategy performance (Zeng et al., 2008). Purchasing strategies create significant positive impact on manufacturing performance which comprises the competitive priorities of the firms in terms of quality, cost, cycle time, new product introduction time line, delivery speed and dependability and finally, customization responsiveness performance (Thrulogachantar & Zailani, 2011). Top management can

effectively contribute towards the realization of manufacturing performance improvements by providing effective structure for TPM implementation, institutionalizing effective reward and recognition mechanisms in the organization and providing resources for managing change in the organization (Ahuja & Khamba, 2008). The capability of the plant to incorporate internal and external learning into proprietary processes and equipment emerges as an important contributor to manufacturing performance (Schroeder et al., 2002). Components of a production competence construct consist of adaptation in manufacturing, cost efficiency of labor, delivery performance, logistics performance, production economies of scale, level of process technology, quality performance, through put and lead time, and degree of vertical integration (Leachman et al., 2005). Operational performance parameters consist of first past correct output, manufacturing lead time production, increase of productivity, inventory reduction, reduction in cost of conversion, and reduction in space requirement (Ghosh, 2013). Three key practices that affect manufacturing performance consist of R&D commitment, outsourcing policy, and production time compression. R&D commitment and time compression during production are positively linked to improved manufacturing performance (Leachman et al., 2005).

Top management can play a major role towards the achievement of improvements in manufacturing performance by providing competent framework for just in time implementation, implementing an efficacious reward and recognition system in the organization and providing resources for coping up with change in the organization (Singh & Ahuja, 2014). Development in industry comes out with new dimension which divert the focus of manufacturing strategy towards supply chain capabilities to obtain quality, cost, delivery, innovation and responsiveness goals (Das & Narasimhan, 2000). Three factors are sufficient to represent lean performance dimensions of flow, flexibility, and quality. Operations dimensions and retain factors such as value include delivery dependability, product reliability, after sale service, quality, product durability, and low production cost. Speed includes production time and delivery time. While the flexibility contains volume and modification flexibility and innovation contain new product development time and product mix flexibility (Taj & Morosan, 2011). The definition of manufacturing performance in this research are efforts that are achieved in the manufacturing operations to achieve the expected goals through improved productivity, satisfaction and innovation.

2.2. Competitive Advantage

Competitive advantage is obtained when an organization develops or acquires a set of attributes that allow it to outperform its competitors (Wang, 2014). Competitive advantage is about how the company practices generic strategy included cost leadership or differentiation in their daily actions (Porter, 1985). Competitive advantage is broadly covered in the literature in terms of cost reductions, differentiation, growth, and quality (Elbeltagiet al., 2016). Competitive advantage means that the firm can produce goods or services that their customers find more valuable than the goods or services produced as a result of the company competitors (Saloner et al., 2001). Roger (2010) described the sources of the competitive advantage such as cost advantage, differentiation advantage and marketing advantage. Competitive advantage consists of capabilities that enable organizations to differentiate itself from its competitors and is the result of important management decisions (Daghfous, 2004). The greatest impact on competitive advantage is a component of knowledge acquisition (Kavehet al., 2015). Quality as one of the components of competitive advantage could be achieved in different areas of the organization, such as product and service quality, information quality, quality of relations with

business partners (N`Da et al., 2008). The major managerial implication that companies should do is to strengthen their developmental and rational culture to attain and sustain a competitive advantage (Adriansah & Afiff, 2015).

Competitive advantage to a firm's performance develops when it is higher than normal finds and which is more worthy than the expected value resources (Barney, 2002). Sources of competitive advantage are cost advantage and the advantage of differences (Porter, 1985). A firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current of potential competitor and when these other firms are unable to duplicate the benefits of this strategy (Barney, 1991). Dimension competitive advantage includes cost, quality and delivery (Chamsuket al., 2015). Competitive advantage is universally accepted in strategic management courses and textbooks as an essential concept in strategy (Barney, 1997). The developments of competitive advantage theories help explain that competitive advantage has occupied the attention of the management community for the better part of half a century (Wang, 2014). Company can create and deliver more economic value than its competitors simultaneously by increasing the profit and offering higher benefit to the consumers rather than to the competitors as following condition of competitive advantage (Reniasi, 2016). Creating competitive advantage ex ante produces sustained superior performance (Powell, 2001).

Ambitious companies should always be concerned with how to achieve and sustain a competitive advantage (Elbeltagi et al., 2016). Knowledge can be considered as a competitive advantage that organizations can hardly imitate its competitors (Kaveh et al., 2015). Product innovation and service innovation affect competitive advantage with competition in foreign countries and needs to be a lifting capacity of supporting industries that can produce parts with quality, at a low cost which are delivered on time (Chamsuk et al., 2015). The way for current business environment has evolved, opportunities for leveraging competitive advantage are transient (Wang, 2014). Culture can only affect competitive advantage through absorptive capacity and innovation (Adriansah & Afiff, 2015). Competitive advantage in this research is defined as the company's strategy to create value of product or service that has uniqueness and differentiation so beneficial for customers if compared to competitors.

2.3. Dynamic Capabilities

Dynamic capabilities are crucial for an enterprise to be able to cope with changes in the environment by delivering the right knowledge at the right time to the right person, as well as encourage knowledge sharing in order to achieve organizational goals and enhancing organizational performance (Quinn, 1999). Dynamic capabilities as a process relates to the organizations' ability to reconfigure the basis of its resources in order to respond to more efficiently changes in a field of its activity (Masteika & Cepinskis, 2015). Dynamic capabilities are the firm's ability to create and utilize organizational embedded resources for achieving a sustainable competitive advantage (Tseng & Lee, 2014). Dynamic capabilities are the ability of a firm to deploy new configurations of operational competencies relative to the competition by effectively sensing the environment, as well as absorptive, integrating, innovative activities (Hou, 2008). Dynamic capabilities are indirectly defined as an ability to create and reconfigure the resources to adapt rapidly changing markets (Wang & Ahmad, 2007). Dynamic capabilities represent the ability of a firm to create new manufacturing processes and new products and services in order to rapidly respond to changing environments (Helfat et al., 2007). Dynamic capabilities also refer to a firm's ability to integrate, establish, and redeploy internal and external resources into the best configuration in order to be able to create and develop new

capabilities and create new market opportunities (Eisenhardt and Martin, 2000; Wu, 2007). According to Pavlou and El-Sawy (2011), dynamic capabilities are usually embedded in organizational processes and routines that allow an enterprise to adapt to the changing market conditions in order to reconfigure its source base, enable morphing and adaptation, and eventually achieve an edge over competitors. Wu (2006) further found that dynamic capabilities is a crucial intervening variable that transforms resources into performance, which means that if enterprises can utilize dynamic capabilities, it is possible to manage internal and external resources to enhance organizational performance and gain high competitive advantage. Dynamic capabilities view is the latest perspective trying to explain and guide firms on how they can achieve and sustain a competitive advantage (Breznik & Lahovnik, 2014).

Wang & Ahmad (2007) defined dynamic capabilities as the firm orientation stable behavior to renew, integrate, recreate and reconfigure their capabilities and resources. Reconstructing and upgrading their core capabilities in response to the dynamic market are considered essential to sustain competitive advantage. If a firm with highly dynamic capabilities is able to quickly cope with the dramatic changes in the external environment, it can establish competitive advantage and increase their market value. However, it is difficult to build a new capability as it demands effective organizational processes for new learning (Liu & Hsu, 2011). Dynamic capabilities are defined as the orientation stable behavior of firms to renew and integrate their capabilities and resources to upgrade their core capabilities in response to the dynamic market to sustain competitive advantage is used as moderating variable (Dadashinasab & Sofian, 2014). Pavlou & El Sawy (2011) explained four dynamic capabilities such as sensing, learning, integrating, and coordinating capabilities, as a sequential logic to reconfigure existing operational capabilities. Sensing capability is the ability to identify, interpret, and pursue opportunities in the environment, while learning capability is the ability to enhance existing operational capabilities with new knowledge. Integrating capability is the ability to assimilate individual knowledge with the unit's new operational capabilities, and coordinating capability is the ability to orchestrate and deploy tasks, resources, and activities in the new operational capabilities. There are three critical components of dynamic capabilities, which are capability possession that is having distinctive resources, capability deployment includes allocating distinctive resources, and capability upgrading that includes dynamic learning and building new capability (Luo, 2000).

The primary premise of the dynamic capabilities framework is that a firm has operational capabilities and resources that are directly involved in enterprise performance by converting inputs into outputs and dynamic capabilities that influence enterprise performance indirectly by updating, integrating and reconfiguring a firm's existing operational capabilities and resources (Teece, Pisano & Shuen, 1997). Dynamic capabilities emphasize the transforming of environmental characteristics and how the firms manage to adapt, integrate, and reconfigure the internal and external organizational resources to compete with the dynamic environmental conditions (Teece, 2007). Some capabilities act as both dynamic and operational capabilities and they are used to renew operational capabilities to simultaneously maintain a firm's current operations and to positively influence overall firm performance (Helfat & Winter, 2011). Dynamic capabilities creation processes are directly related with R&D (Hsu & Wang 2012). If the manager's perceptions of one particular situation are wrong, this will trigger the wrong dynamic capabilities and the consequences could be fatal for a firm (Breznik & Lahovnik, 2016).

A firm that understands how a given dynamic capabilities is linked to its existing operational capabilities will be more successful at renewing its operational capabilities and

gaining a competitive advantage than firms that lack such understanding (Gao & Tian, 2014). Two premises of the valuable dynamic capabilities are necessity and feasibility. Dynamic capabilities as a kind of organizational routines are source of transformation and stability which are consistent with organizational routine duality viewpoint. Based on the necessity of implement of dynamic capabilities, the adjustment time of the changes is needed (Tiantian et al., 2014). Firms should renew their resource based upon dynamic capabilities approach and which deploy relevant capabilities as dynamic capabilities hold the potential for a sustained competitive advantage especially in a turbulent environment (Breznik & Lahovnik, 2016). In this research, dynamic capabilities are defined as the ability and competence of the company to utilize its resources through the process of scanning, sensing, learning, integration and coordination in the face of global environmental change rapidly in order to create a competitive advantage.

2.4. Manufacturing Capability

Manufacturing capability (MC) refers to capability to simultaneously maintain a high level of balanced performance in productivity, quality, lead times, and flexibility. As mentioned above, this capability involves a system of consistent organizational routines that collectively control the efficient flow of good design information included value-added to customers (Fujimoto, 1999; 2007). Manufacturing capability is embodied by all available manufacturing resources and corresponding processes which can be performed by those resources, as well as the knowledge about how these resources and processes could be effectively, economically used (Zhao & Cheung, 1999). Manufacturing capability is the most basic part of the original capability and the core operational capability in manufacturing enterprise (Gao & Tian, 2014). MC has achieved the strategic capability in the process of manufacturing (Roth & Velde, 1991). Skinner (1969) considered that manufacturing capability is the most important element to construct the enterprise competitive advantage. Manufacturing can provide organizations with certain competitive power. These capabilities can be used as a competitive weapon, achieving manufacturing performance in cost, quality and time dimensions.

Manufacturing capability is the core operational capability in manufacturing enterprises and manufacturing capability as the operational capability in dynamic capability framework (Gao & Tian, 2014). Manufacturing capability information modeling involves mainly how to represent manufacturing processes, resources, the constraints imposed on them, and their relationships (Molina et al., 1995). Literature in the operations management field has currently classified manufacturing capability into five types that is quality, cost, delivery, flexibility, innovation (Ward et al., 1995). Manufacturing capability of the organization can be enhanced by investing in new equipment and technologies and gives little emphasis to improving infrastructure such as planning and measurement system and work force policies (Hayes & Wheelwright, 1984).

Manufacturing capabilities will affect the manufacturing strategy to be applied in the company and the priority of the chosen strategy will also affect the performance of the company. Manufacturing strategy in component manufacturers such as delivery, quality and cost strategies implied positive effect on manufacturing performance. Delivery, quality, and cost strategies are influential in determining manufacturing performance due to these three things are things that are considered important in the automotive companies (Nurchahyo & Wibowo, 2015). Manufacturing capability may be the intermediate link between supply chain coordination and performance (Gao & Tian, 2014). Manufacturing capabilities are defined as

the core capability on manufacturing process to efficiency utilizing of resources with standard of quality, flexibility, delivery, times dimension and cost strategy.

3. Theoretical Framework & Hypotheses

Zheng et al. (2011) explained that a firm can continually renew their knowledge base through its dynamic capabilities so that it is possible to respond to changing environments. Know-how, learning process, business secret, and reputation are examples of capabilities that create advantage to the firms as these capabilities are difficult to acquire from external business environments (Chen & Lee, 2009). Supply chain coordination influences enterprise performance through the renewal of a single manufacturing capability or several of them (Gao & Tian, 2014). The key to reverse the poor performance manufacturing is an increase in its investment, adequate capacity utilization, importation of technology to boost local manufacturing, export and exchange rate (Sola et al., 2013). Manufacturing capability has achieved the strategic capability in the process of manufacturing (Roth & Velde, 1991). Dynamic capabilities concept is extended from the resource base perspective. It is built based on the firm's ability to renew the resource base in form of intangible resources such as processes, skills, routines. These intangible resources when unique and difficult to duplicate will become the source of sustainable competitive advantage. When related to technology management, dynamic capability is entrepreneurial in nature where the innovative outcome of the renewed resource base is to create and/or respond to the opportunities and threats of the technological change (Zaidi & Othman, 2014). Dynamic capabilities influence enterprise performance by renewing operational capabilities (Gao & Tian, 2014). Manufacturing enterprises need to obtain competitive advantage through the supply chain coordination (Wong, Sakun & Wong, 2011).

That a positive impact on the achievement of manufacturing performance implies connections with the level of planning for human resources development and infrastructure preparation (Efstathiades et al., 2002). Dynamic capabilities increase organizational performance and provide competitive advantages (Tseng & Lee, 2014). Wang & Ahmed (2007) explained that dynamic capabilities help enhance corporate performance, particularly when an enterprise has a synchronized development capacity and corporate strategy, which can lead to superior performance. The primary premise of the dynamic capabilities framework is that a firm has operational capabilities and resources (Teece et al., 1997). When operating in a turbulent environment, improving new product development can be achieved in several ways. For instance, increasing development time for a one-off product will reduce the risk of forecasting errors and increase the likelihood of new product success. This strategy involves such things as simplifying operations, eliminating delays, eliminating steps, speeding up operations, and introducing parallel processing of steps (Calantone et al., 2003). Their relationship is always changing together with continuous change of the environment that creates gaps between the firms' current capabilities and the market needs (Grobler, 2007). Dynamic capabilities are focusing on modifying the firms' resources to match the changing environment (Bowman & Ambrosini, 2003).

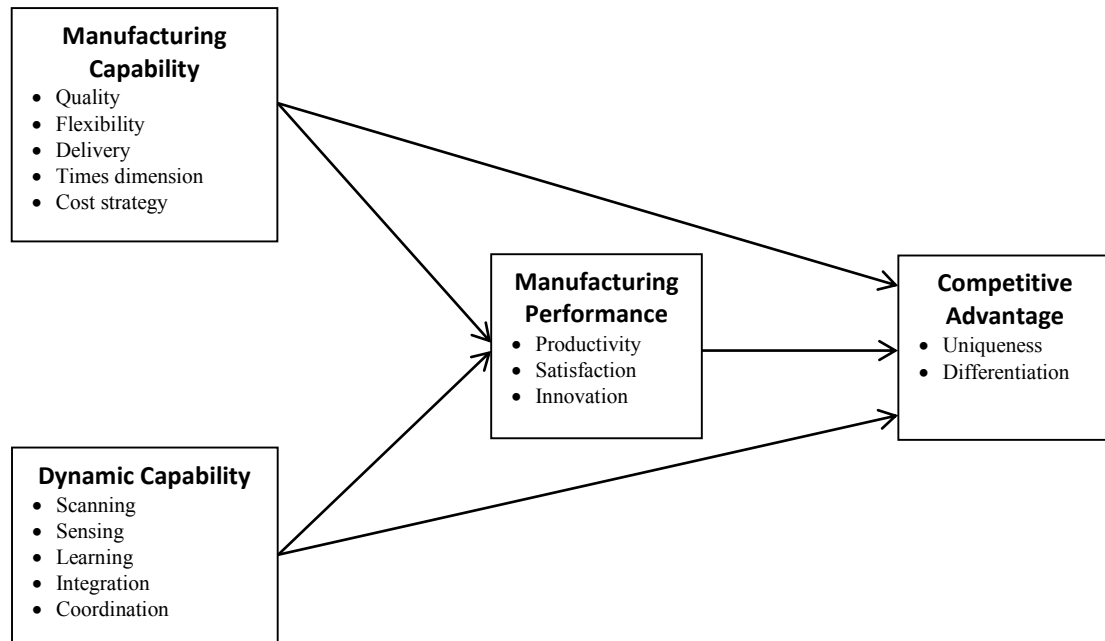


Figure 1. Research paradigm

The influence of industrial city on manufacturing performance and competitive advantage has been theoretically proposed. The importance of knowing if such influence exists in practice and determining its magnitude is because of the fact that this effect would provide empirical support for the idea that sustainability is an important source of competitive advantage (Fombrun, 1996). Hence, based on the previous literature review we proposed:

- H₁: Manufacturing capability has positive direct effect on manufacturing performance
- H₂: Dynamic capability has positive direct effect on manufacturing performance
- H₃: Manufacturing capability has positive direct effect on competitive advantage
- H₄: Dynamic capability has positive direct effect on competitive advantage
- H₅: Manufacturing performance has positive direct effect on competitive advantage

4. Methodology

This research focused on strategic management as its grand theory. The middle theories were its operation management and business management and its applied theories were industrial management and business strategy. This study was aimed in Indonesia that had implemented manufacturing performance as a sampling frame. Researches had taken places in various industries such as manufacturing industry (Kylaheiko & Sandstrom, 2007). Capabilities could be used as a competitive weapon to achieve manufacturing performance in cost, quality and time dimensions (Gao & Tian, 2014). The main objective of this research was to investigate the influence of manufacturing capability and dynamic capability toward manufacturing performance and implication on competitive advantage. Data analysis for the research was conducted by the researchers by using the Lisrel program to assist in the analysis of the variables as well as the application of the Structural Equation Modeling (SEM) analysis of the causal relationship between variables. Hair et al. (2010) had stated that the size of the sample had to be large enough to be used in the data analysis by the application of the model equations with the structure and the distribution of data.

The data were, therefore, collected from 300 manufactures engaged in industrial city by using stratified sampling. Subsequently, simple random sampling was applied for each stratified random sample to the data collected from 7 industrial regions from the surveyed population. The data were collected from manufacture managers through mailed questionnaires distributed through email and face to face conversations. From the target sample of questioners, 375 questionnaires were completed, 75 were rendered as incomplete and discarded. Hence, the final response rate was 80 percent. The data were gathered during the month of January 2016 in the Bekasi industrial city (Indonesia). The statistical results obtained from the questionnaire were analyzed. The final questionnaire comprised five parts included manufacturing capability, dynamic capability, manufacturing performance and competitive advantage. Finally, we decided to conduct our research in Bekasi industrial city, more specifically in the manufacturing industries sectors, for several reasons. First, it was a sector in which industrially responsible initiatives were developed; and second, this research field helped us avoid the limitation of manufacturing experiments, since data were obtained in real condition of use. The existing well-established multiple-item 5-point Likert scale were adopted to measure our variables, ranging from 1 (strongly disagree) to 5 (strongly agree). Research dimensions were measured by using a 10-item scale. The analyzed problems were solved with the use of mainly quantitative research methods.

5. Analysis and Result

The model indicated a Confirmatory Factor Analysis (CFA) procedure to access all constructs involved in the study. The data were the score of 300 managers in industrial city on construct activities. The arrows from the factors to the variables represented linear regression coefficients or factor loadings (Awang, 2012). The structural model result showed the achieved stable model fit estimation. The indicators of fit: $Cmin/df = 3.492$ ($Cmin = 293.36$, $df = 84$); $GFI = 0.87$; $RMR = 0.25$; $NFI = 0.88$; $CFI = 0.91$; $RMSEA = 0.099$. In sum, Figure 2 empirically showed that manufacturing performance had a highly significant influence ($\beta = 0.35$, $p = .0000$) on competitive advantage. These indices suggested that the structural model provided a good fit to the data at hand and yielded a corroborating value for the good model fit.

The analysis model showed that research model fit the data. Further, testing the hypothesis indicated an analysis of the influence of the manufacturing capability, dynamic capabilities, manufacturing performance and competitive advantage. Figure 2 showed the standardized coefficients for the structural relations tested. As it could be seen, the goodness of fit indices for the structural model showed a good fit and therefore it was feasible to test the proposed hypotheses. H_1 and H_2 were supported ($\beta = 0.15$; $\beta = 0.36$) as manufacturing capability and dynamic capability dimension in industrial city had a positive direct effect on manufacturing performance. H_3 and H_4 were confirmed ($\beta = 0.36$; $\beta = 0.03$) as the manufacturing capability and dynamic capability domain in industrial city had a positive direct effect on competitive advantage. These results provided empirical support to the idea that the efforts made by manufacture toward industrial city would be rewarded by the projection of a positive manufacturing performance that would lead to the increasing competitive advantage. Finally, H_5 expected that manufacturing performance would have a positive effect on competitive advantage. H_5 ($\beta = 0.35$) was supported. Therefore, the proposed model was totally supported by the results.

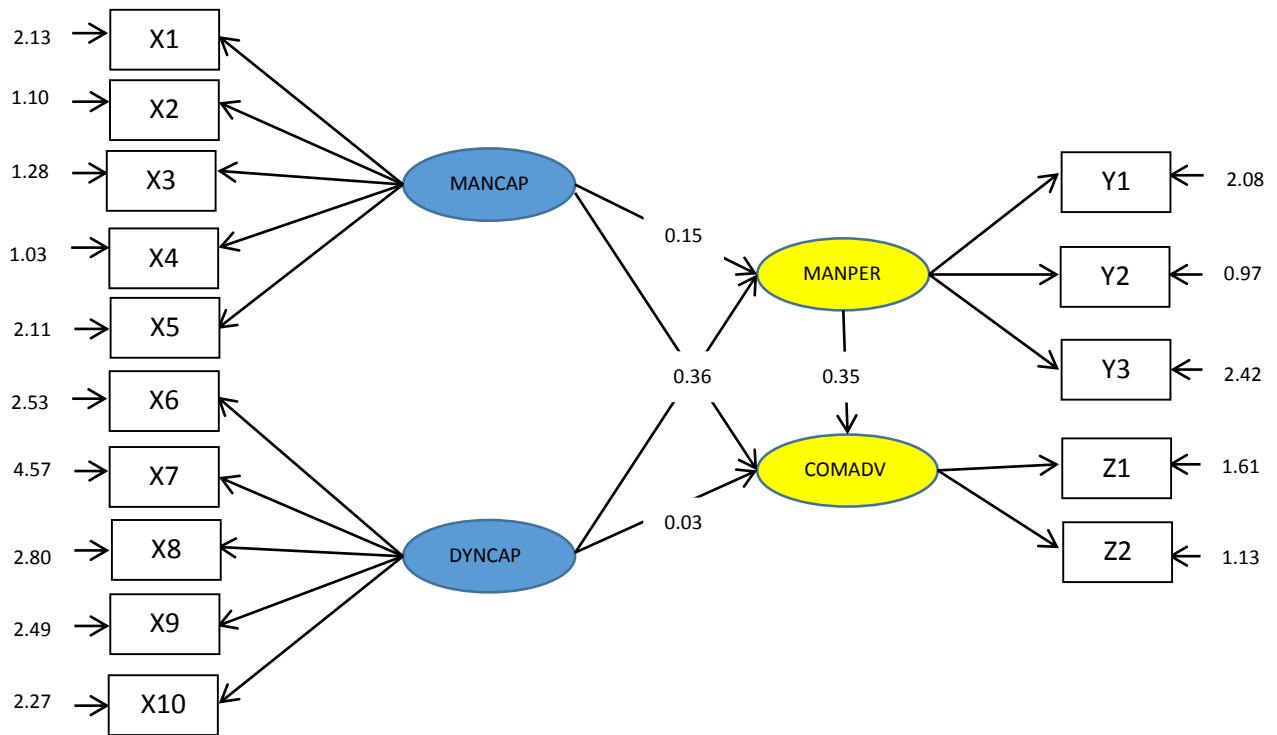


Figure 2. Structural model estimation

Table 1. SEM Result

| Hypotheses | Structural Relationship | Standard Coefficient (Robust t-value) | Contrast |
|-----------------------------------|--|--|----------|
| H1 | Manufacturing capability → manufacturing performance | 0.15 (1.84) | Accepted |
| H2 | Dynamic capability → manufacturing performance | 0.36 (3.81) | Accepted |
| H3 | Manufacturing capability → competitive advantage | 0.36 (3.81) | Accepted |
| H4 | Dynamic capability → competitive advantage | 0.03 (0.14) | Accepted |
| H5 | Manufacturing performance → competitive advantage | 0.35 (1.59) | Accepted |
| NFI = 0.88 NNFI= 0.89 CFI= 0.91 | | IFI= 0.91 | |
| $\chi^2= 330.80, df= 84, p=0.000$ | | RMSEA= 0.099 | |

Significant at $p < 0.05$

6. Discussions and Conclusions

Following the theoretical debate on the importance of industrial city in developing competitive advantage, this study empirically investigated whether there was an effect on the manufacturing capability, dynamic capabilities, manufacturing performance and competitive advantage. The authors conducted a survey to test the hypotheses and designed a SEM to analyze them. The first two hypotheses suggested that the manufacturing capability and dynamic capabilities were effective in influencing manufacturing performance. Similarly, hypotheses 3-4 proposed that the manufacturing capability and dynamic capabilities were effective and directly influenced competitive advantage. Our empirical evidence supported all the proposed hypotheses. Moreover, this study demonstrated that the effect of competitive advantage was mediated by manufacturing performance.

Such findings were relevant since they added several contributions to the existing strategic management literature. First of all, they provided empirical evidence of industrial city influencing manufacturing performance and competitive advantage. Since previous works had essentially focused on the role of sustainable manufacturing, this study added to our understanding of the effect manufacturing performance and competitive advantage. By providing relevant information to stakeholder about the industrial city, manufacture would obtain identities of city based on manufacturing performance and competitive advantage. Second, we showed that the principles of the differentiated school of thought regarding the effect manufacturing performance on competitive advantage were met in the research supporting the recent studies.

The present study had some implications for strategic management practitioners. The most important implication for practitioners was the fact that manufacturing capabilities and dynamic capabilities presented a direct and positive influence towards manufacturing performance and competitive advantage. Manufacturing resources helped to achieve enhanced performance in manufacturing performance (Pintado et al., 2015). Firms with a stronger commitment to deploying dynamic capabilities were more successful and held the potential for a sustained competitive advantage (Breznik & Lahovnik, 2014). This should give manufacturing managers the factors they needed to justify the policy that were associated with sustainable city issues. However, manufacturing must become much more interested in the strategic management implications of their sustainable city policy and action, including manufacturing capabilities and dynamic capabilities issues, since this research demonstrated the positive effect of these aspects on both manufacturing performance and competitive advantage. Manufacturing capability was defined as the operational capability in dynamic capability framework (Gao & Tian, 2014). In addition, these findings suggested that the areas of manufacturing capabilities, dynamic capabilities, manufacturing performance and competitive advantage were strongly interrelated; thus, it followed that these concepts could be managed in an integrated way. Manufactures were encouraged to explore how manufacturing capabilities, dynamic capabilities and manufacturing performance activities could positively be managed jointly in industrial city, since manufactures might manage these concepts in business. Finally, by involving stakeholders in defining the manufacturing activities, it would be possible to add legitimacy of how the notion of industrial city could be defined, measured and implemented within the region.

Finally, to refine the findings of this study, some limitation of this work were outlined below. The present research focused on the concepts of manufacturing performance, competitive advantage, manufacturing capabilities and dynamic capabilities. Our findings suggested that manufacturing capabilities and dynamic capabilities aspects were key components, richer, and in-depth views of this concepts and significant had direct effect between manufacturing performance and competitive advantage. Dynamic capabilities influenced firm performance indirectly by helping the firm renew its existing operations by updating, recombining and reconfiguring its existing operational capabilities (Gao & Tian, 2014).

Including this new variable in our model, future studies would contribute to a superior explanatory power and to better understanding of the nature of manufacturing performance and competitive advantage. Manufacturing performance was significantly conducted for sustainable economic development (Sola et al., 2013). In this sense, previous studies showed that to have a more coherent and stable manufacturing performance. Moreover, the current study had been conducted with consumers of industrial city in Indonesia and it was not clear in how far the

findings could be generalized to other sectors, stakeholders or countries. Future research could extend this research by including different stakeholder expectations of manufacturing capabilities, dynamic capabilities, manufacturing performance and competitive advantage. Therefore, it would be interesting to replicate this studio but considering various stakeholders to ensure that our results were extrapolated to all target cities such as arts, cultures, histories, commerce, religious, agricultures and so forth.

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