

THE MEDIATING EFFECT OF PROCESS INNOVATION ON FIRM
SPECIFIC CAPABILITY AND SUSTAINABLE INNOVATION
IN SMALL AND MEDIUM ENTERPRISES

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To my father, mother, and beloved daughters who are always motivate me

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ABSTRACT

Firms are propelled to be concerned about sustainable innovation as the impact of sustainable development effort affects environmental awareness, social impact and economic benefits. However, the effect of innovation needs to be clarified for sustainable innovation achievement considering that not all innovations have impact on sustainable development. This study investigated the mediating role of process innovation between the relationship of firm-specific capabilities of absorptive capacity, intrapreneurship and stakeholder integration with sustainable innovation in small and medium size enterprises (SMEs). In this research, quantitative methodology using questionnaires was adopted to collect primary data from 190 SMEs selected based on purposive sampling from the manufacturing industry in South Sulawesi province, Indonesia. Direct and mediating effects hypotheses were analysed with the equation modelling method of Partial least squares (SEM-PLS) version 2.0. Results of the research failed to support the hypothesized direct relationships of sustainable innovation from absorptive capacity and stakeholder integration. In contrast, intrapreneurship had a significant positive relationship with sustainable innovation. Absorptive capacity and stakeholder integration were found to be fully mediated by the process innovation for sustainable innovation with the exception of intrapreneurship which had partial mediation. Findings confirmed that process innovation is associated with sustainable innovation. The investigation of this study confirmed that practices of process innovation can be driven by firm-specific capabilities of absorptive capacity, intrapreneurship and stakeholder integration for sustainable innovation.

ABSTRAK

Perusahaan digalakkan agar memberikan perhatian terhadap inovasi mapan sebagai kesan daripada usaha pembangunan lestari yang mempengaruhi kesedaran terhadap alam sekitar, kesan sosial dan manfaat ekonomi. Namun begitu, kesan daripada inovasi perlu dijelaskan bagi pencapaian inovasi mapan dengan mengambil kira bahawa tidak semua inovasi mempunyai kesan terhadap pembangunan lestari. Kajian ini mengkaji peranan pengantara inovasi proses dengan hubungan keupayaan kapasiti daya serap perusahaan khusus firma, intrapreneurship dan integrasi pemegang taruh dengan inovasi mapan dalam perusahaan kecil dan sederhana (SMEs). Dalam kajian ini, kaedah kuantitatif yang menggunakan soal selidik digunakan untuk mengumpulkan data primer daripada 190 SMEs yang dipilih berdasarkan sampel bertujuan daripada industri pembuatan di wilayah Sulawesi Selatan, Indonesia. Hipotesis langsung dan kesan pengantara dianalisis dengan menggunakan kaedah Pemodelan Persamaan Berstruktur – Kuasa Dua Terkecil Separa (SEM-PLS) versi 2.0. Dapatan kajian gagal dalam menyokong hubungan langsung hipotesis inovasi mapan daripada kapasiti daya serap dan integrasi pemegang taruh. Sebaliknya, intrapreneurship memiliki hubungan positif yang signifikan dengan inovasi mapan. Kapasiti daya serap dan integrasi pemegang taruh didapati menerima pengantara inovasi proses sepenuhnya bagi inovasi mapan dengan pengecualian daripada intrapreneurship yang memiliki pengantara separa. Dapatan kajian mengesahkan bahawa inovasi proses dikaitkan dengan inovasi mapan. Kajian ini menunjukkan bahawa amalan inovasi proses dapat dipacu dengan keupayaan kapasiti daya serap perusahaan khusus firma, intrapreneurship dan integrasi pemegang taruh bagi inovasi mapan.

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LIST OF ABBREVIATIONS

MNC	-	Multinational corporation
NGO	-	Non Government Organizations
PLS	-	Partial Least Square
SMEs	-	Small and Medium sized Enterprises
UNDP	-	United Nations Development Programme
WBCSD	-	World Business Council for Sustainable Development
WCED	-	The World Commission on Environment and Development

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CHAPTER 1

INTRODUCTION

1.1 Overview

This study highlights process innovation to achieve sustainable innovation activated by firm-specific capabilities particularly in the SMEs. The study is focused on socio-technical approach in which human relation via the socio approach to support process innovation of best practices of process improvement in the current technology that is seen as new to the firm but not new in the industry, which has an impact on sustainable innovation in the manufacturing industry of Indonesian SMEs. The rest of this chapter is divided into seven sections. The following section provides background of the study. The second section presents statement of the problem. The third and fourth sections are research questions and objectives of the study. Scope of the study is presented in the fifth section followed by significance of the study. Final section presents operational definition of variables and the general structure of the proposal.

1.2 Background of the Study

Understanding the way small and medium sized enterprises (SMEs) use sustainable innovation to contribute to the achievement of sustainable development of better environment, human well-being and the economy has attracted increased attention over the past two decades (Oregon and Ghobadian, 2005; Fatimah *et al.*, 2012). SMEs, while producing products to fulfil and satisfy customer demands in a competitive manner, are challenged to pursue sustainability for the future generations

as declared in the Brundland report of Our Common Future (WCED, 1987) regarding their impact on the environment, society and economy by aligning with the role of innovation despite limited financial resources, skills and experiences, which is opposite to the circumstances of large firms. SMEs contribute an estimated 70 percent to global pollution (Revell *et al.*, 2010). On the other hand, sustainable innovation is known as the effort of attaining sustainable development by employing types of innovation as the method of change, such as change in product or processes (Charter and Clark, 2007; Hockerts and Wüstenhagen, 2010; Boons and Lüdeke-Freund, 2013; Schiederig *et al.*, 2012; Schaltegger *et al.*, 2012; Tukker and Tischner, 2006; Rashid *et al.*, 2015).

The term sustainable innovation is viewed in the two concepts of innovation and sustainable development in an integrated way, and has evolved into eco-innovation (Fussler and James, 1996; Andersen, 2002; Kemp and Pearson, 2008), environmental innovation (Rennings and Zwick, 2003), sustainability-driven innovation (Little, 2006) or sustainability-oriented innovation (Adams *et al.*, 2015), and often measuring dimensions of sustainable development by discrete focusing only on environment and social dimensions (Tseng *et al.*, 2013; Ketata *et al.*, 2014) or ecology independently (del Brio and Junquera, 2003; Klewitz *et al.*, 2012), or combination of environment and economy (Rennings *et al.*, 2006) rather than in the integrated way into triple bottom line of people, planet, and profit (Elkington, 1997).

However, effectiveness of innovation can be viewed either positively or negatively (Dressler, 2013; Harrison, 1994; Freel, 2005; Mazzarol and Rebound, 2008). This resonates with Bos-Brouwes (2010) in that not all innovation has an impact on sustainable innovation. In addition, a large number of studies have captured that progress in carrying out sustainable innovation in firms is influenced by size and region. Formerly, small firms frequently had less skill, money and technical expertise (Gunasekaran *et al.*, 2001; Collins *et al.*, 2007; Lee, 2009), were thus constrained in investment in contrast to larger firms that were able to train specialized personnel and to focus human resource capability on environmental issues (Biondi and Iraldo, 2002). Corporate Social Responsibility (CSR) initiative of SMEs has failed to integrate into a business strategy (Hoffman *et al.*, 1998; Szekely and Knirsch, 2005; Burke and Gaughran, 2006; Mendibi *et al.*, 2007). This is in

contrast to large firms that are able to control their practices of sustainable innovation on performance report (Kolk, 2004; Ballou *et al.*, 2006), and this is hard for smaller sized firms to do (Bos-Brouwes, 2010). In other words, these limitations of SMEs are guided into reactive approach for sustainable innovation adoption rather than proactive approach in the large firms (Johnson and Schaltegger, 2016).

The latter, entrepreneurs in the developing countries, do not always have stronger entrepreneurial intentions than in the developed countries (*e.g.*, Japan) influenced by degree of bureaucracy of institutional framework and government regulations in contrast to developed countries where small firms have established such business alliances (Dana, 1998, 2000; Paul and Shrivatava, 2016). On the other hand, less individual motivation in the diffusion process to adopt technology in the developing countries is shaped by central governments as long-term political support and put it into programmes such as in China and Nepal (Daxiong *et al.*, 1990; Bhat *et al.*, 2001; Chen *et al.*, 2010; Ortiz *et al.*, 2016). Notwithstanding less support from political organizations, these circumstances in the developing countries can be summarized as being challenged into ‘power perception’ as Western world’s achievement of sustainability (Uçaktürk *et al.*, 2013), despite the fact that sustainable innovation studies are mostly oriented in the developed countries instead of developing ones (Collins *et al.*, 2007; Vives, 2005; Williamson *et al.*, 2006; Kardos, 2012).

This research emphasized the impact of process innovation for sustainable innovation achievement in Indonesian SMEs as a developing country. Indonesia consists of 34 provinces, and SMEs contribute 60 percent to the GDP. SMEs have also proved their ability to survive as demonstrated by the economic crisis in 1998. Indonesia extends the development program of central government by dividing regional development to comply the with corridors of potential and regional competitiveness, and one of the areas focused on as a production and manufacturing centre is Sulawesi, particularly South Sulawesi. In addition, Indonesian government’s plan is to strengthen the SME industry due to imbalanced development program that mostly focused on Java provinces, and one of the provinces to receive additional government focus is South Sulawesi province (Indonesian Industrial Ministry, 2014).

The SMEs in South Sulawesi, as well as other provinces in Indonesia, not only contribute to strengthen the economic development but also contribute to the side effects of production activities on sustainability. For example, waste problem yielded by industrial activities (Tribunnews.com, 2016; Chandra, 2016), and welfare or betterment for employees (Haluan Harian, 2016). This is aligned with Pearce and Atkinson's (1993) finding that sustainable development of countries is associated with depreciation of man-made and natural resources and revealed that Indonesia is in the category of 'unsustainable'. This is supported by ASEM Eco-Innovation report based on indicators of eco-innovation that Indonesia has low score on 'eco-innovation capacity' and 'awareness of sustainability management' (ASEIC, 2011). The Indonesian government has put the social and environmental policy into laws, government regulations and ministry regulations so that social prosperity and environmental preservation are the responsibility of business actors, such as Law number 13, 2011 and Government Regulation No. 47 of 2012.

The purpose of this study is to examine the influence of process innovation for sustainable innovation achievement in SMEs considering that SMEs are associated more to process development that affects the product (Salavou and Lioukas, 2003). However, literature has emerged that offers contradictory evidence of sustainable innovation achievement as a result of change in SMEs. A large number of studies have suggested radical innovation of fundamental change (*e.g.*, Nill and Kemp, 2009; Smink *et al.*, 2015) as being disruptive of new creation, whether to customers or manufacturers (Markides and Geroski, 2005). thus leading to the view that SMEs pursue sustainable innovation in radical ways (Jovanovic, 1982; Cohen and Klepper, 1996) but some scholars are unsure with this approach, considering their incongruent resources (Gruber 2004, Gruber and Henkel, 2006, Bellamy, 2009; Prukvilailert and Wangskarn, 2011; Ghazilla *et al.*, 2015). From the study of manufacturing strategy literature, change is suggested using an incremental approach because a comprehensive framework that involves employees to be flexible in the process in the uncertain environment is needed (Quinn, 1978; Löffving *et al.*, 2014), although sustainability of manufacturers in the appropriate practices remains unclear (Despeisse *et al.*, 2013). Industrial experts agree that SMEs engaged with innovation are more oriented in value-added creation rather than core production technology (Salavou and Lioukas, 2003; Singh and Bhowmick, 2015).

To activate the innovation process, organizational literature largely supports a proactive approach for SMEs regarding their reactive concerned with sustainability as legislative compliance for strategic competitive advantage (*e.g.*, Worthington and Patton, 2005; Johnson and Schaltegger, 2016). SMEs apparently can be encouraged into proactive patterns (Bianchi and Noci, 1998) supported by less bureaucratic management through communication, flexible and lean organizational structures as informal ways that may overcome environmental and social problems (Jenkins, 2006; Bos-Brouwers, 2010; Klewitz *et al.*, 2012). Similarly, Borga *et al.* (2006) found that these firms are strong in stakeholder connections within their territory and have close relationships with employees. Some studies suggested internal capability to form process innovation regarding its practices within the development of routines to enhance sustainable innovation (Davenport, 1993; Phillips *et al.*, 2006; Srivardhana and Pawlowski, 2007). Still, less focus has been given on determining which capabilities are more appropriate to trigger process innovation for sustainable innovation achievement, particularly within SMEs.

In literature, many studies have contributed to finding an effective way to determine how to measure sustainable innovation achievement. This has become important for SMEs to determine which specific capabilities as initiative of firms with the existing resources can be aligned with process innovation in the development of routines that can lead to the economic, social and environmental dimensions of sustainable innovation. The literature has given considerable attention to the issue of sustainable innovation that evolved to the bias explanation with little empirical evidence, thus there is a need to clarify the influence of innovation on sustainable innovation. The sustainable innovation research, being focused on SMEs, has given attention to the capabilities for sustainable innovation, yet has paid little attention to the clarity of sustainable innovation.

1.3 Problem Statement

Indonesian economic development, which is built for the achievement of sustainable development, is more oriented on economic dimension, whereas SMEs' industrial activities have contribution to the impact of environmental and social

dimensions. In addition, the achievement of economic dimension in the operational business is pointed to the macroeconomic approach rather than seeing this as economic benefit of environmental protection activities as emphasized by Porter and van der Linde (1995). This can be caused by the inhibiting factors of the economy producer on the ability to make changes that is determined by entrepreneurs' innovativeness and personality to adopt innovation (Marcati *et al.*, 2008).

Production activities, with the aim of producing products for customers, require a flow of knowledge of technology and information. This can be obtained either internal or external to the SMEs. However, Indonesian circumstances with internal condition associates with quality of human development has a lack of human resource, money, managerial skills, and information and technology. External activities include institutional support for SMEs such as universities, private and public research institutions as a basis to create innovation is categorized at low level (Aldianto *et al.*, 2011). These pictures resonate to the Indonesian innovativeness within Global Innovation Index is ranked 88th (The Global Innovation Index (GII), 2016) and in the Global Competitiveness Report 2016-2017, the ranking fell from 37th to 41st (World Economic Forum (WEF), 2016).

Specifically, the contribution of South Sulawesi province to the Gross Regional Domestic Product (GDP) in 2013 was USD 13.3 million, with the highest contribution made by agriculture (24.79%) followed by commerce, hotels and restaurants (17.78%), services (17.52%), and manufacturing (12.23%). Even though these contributions have raised the GDP 7.64% higher than the average Indonesian national economic growth (5.94%), the human development index of South Sulawesi remained 69.15, which is lower than the national human development index (73.81), indicating that Indonesian development at sectoral level has begun to pay attention to the development of human resources (Plans of Local Government in South Sulawesi (RKPD), 2015) but are less involved in innovation activities in order to achieve sustainable development due to weak linkages between the science base and enterprises, particularly within processes (Kardos, 2012).

However, SMEs as a driving force of innovation associated with human activities and development, must consider economic, social and environmental impacts by innovating the role of change; however, this movement is determined by the readiness or willingness of the community to accept the change, whether in processes or products, and the support of political elite of the country. Anbumozhi and Kanda (2005) viewed that Asian businesses and governments implement sustainability effort as a voluntary initiative. Otherwise, ignoring the role of these communities, a firm as a business community has to face the community power as delineated by Ndraha (1987, p. 40), in that a community can lose its power if people as a society experience community disorganization. Hence, conducting sustainable innovation orientation within a firm is being debated (Székely and Knirsch, 2005). On one hand it is viewed as a demand of business regulation (Porter and Van der Linde, 1995; Cashore, and Vertinsky, 2000), while on the other, it is an opportunity to be a bigger business (Cohen and Winn, 2007). Bhasin and Venkataramany (2010) suggested that the Indonesian government provide policy support for SMEs development like that demonstrated in India and Singapore.

Nidumolu, Prahalad, and Rangaswami (2009) had studied initiative of firms on sustainability within 30 large corporations and discovered that the price of eco-friendly products was no different than other regular products whereas dealing with sustainability requires new equipment and processes. In contrast, Brunnermeier and Cohen (2003) studied the innovation contribution of environment-related in tackling the regulatory and non-regulatory matters within 146 U.S. manufacturing industries from 1983 to 1992 and found that there is positive relationship between successful environmental patent and decreasing the burdensome cost of pollution. Luken and Stares (2005), who examined SMEs in four Asian countries discovered that handling social issues in the workplace lead to the positive improvement of environmental sustainability, although in practise it is doubted by Williamson *et al.* (2006), who relate that the changing of manufacturing SMEs behaviour is viewed as an optional and costly practice. It shows that it is possible to obtain potential advantage by conducting sustainable innovation, but there is a need to clear up its efficacy that resulted from evolutionary change of process innovation.

This is supported by a case study conducted by Ren (2009) within U.S and European petrochemical industry, in that process improvement has contributed to energy savings. This researcher adopts the change process within large firms incrementally. However, this needs to be generalized regarding operational support of innovation process on large firms compared to the small firms, which are significantly different (Bos-Brouwes, 2010; Hockerts and Wustenhagen, 2010).

A pivotal role of SMEs in support of economic growth leads scholars to try to strengthen SMEs' position within a rapidly changing environment; however, their failures continue to be problems (Heeks, 2002; Wattanapruttipaisan, 2003; Ihua, 2009). High failures of SMEs are caused by ineffectiveness of process innovation, thus they need not only technical support, but organizational support as well (Loewe and Dominiquini, 2006).

The horizon of competitive manufacturing, specifically process innovation, consists of a trade-off of strategic decisions between risk-failure of resource allocation and management willingness and benefit-success of initiation and adoption of innovation (Sisaye and Birnberg, 2012). Berchicci, Tucci, and Zazzara (2013) tested arguments of innovation activities between product and process innovation through panel study of 622 Italian manufacturing firms in the period 1995-2003, and found that process innovation is more negatively related to potential revenue in the long term than product innovation. They suggested to strategically reallocate limited resources of the firms.

In contrast, it is possible for managerial effort to contribute more toward cost reduction than techno-economic factors (Lado, Wilso, and Wright, 1992). Kusunoki *et al.* (1998) presumed that the greater the influence of capabilities, the more product development efficiency will increase. Previous studies have indicated that internal and external capabilities and the combination can facilitate innovation achievement in SMEs (*e.g.*, Borch and Madsen, 2007). This current study develops the idea that most studies have captured in that there are potential internal, external, and combination of internal-external capabilities in utilizing intangible element for sustainable innovation achievement (Schaper, 2002; Paulraj, 2011; Hockerts and

Wüstenhagen, 2010; Boons and Mendoza, 2010; Boons and Lüdeke-Freund, 2013; Matos and Silvestre, 2013; Porter and Kramer, 2006; Schaltegger and Wagner, 2008; Arnold and Hockerts, 2011). These firm-specific capabilities are an application that is oriented on optimization of innovation which may foster sustainability transition, or what Nill and Kemp (2009) termed “transition management”.

In the organizational approach, sustainable innovation is a challenge for SMEs to adapt within their routines, however, they have specific capabilities that may support sustainable innovation achievement. Relying on current technology of incremental change process such as local technology supported by capability of indigenous knowledge can lead to the firm’s survival. This is proved by Uddin (2006) in small firms in Bangladesh. In addition, there is evidence that certain capabilities are able to influence SMEs in Indonesia to be more innovative. For example, entrepreneurship orientation (Kusumawardhani, 2013; Arief *et al.*, 2013; Samoedra and Setiawan, 2015), and absorptive capacity (Indarti, 2010). In the developed countries, some scholars have extended specific capabilities for sustainable innovation. For instance, Ketata *et al.* (2014) examined the role of internal capabilities towards sustainable innovation in German firms. They found that firms need to invest in absorptive capacity for sustainable innovation achievement. In the same vein, Ayuso *et al.* (2011) evaluates stakeholder orientation views as a promising capability for competitive advantage particularly in sustainable innovation orientation. These two studies looked at sustainable-oriented as innovation process or innovative activities which are measured under sustainable development awareness. These literatures need further investigation to test whether these capabilities are appropriate to utilize in the developing country.

Following Cassiolato *et al.* (2003) who suggested that specific capabilities are needed to be established, the effect of capabilities on the incremental change of process innovation and whether the influence of this relationship has an impact on the sustainable innovation must be clarified conclusively. This is alignment with the conceptual exploration of sustainable innovation. Fadhilah and Ramayah (2012) reviewed that practices that lead to sustainable innovation be put into an organization regarding sustainable innovation concept are not merely about the effect of innovation on sustainability, but determining the intention of management practices

in the organization is also required. Thus, the question arises as to what is the role of mediating effect of process innovation on a firms' specific capabilities and sustainable innovation in SMEs? As a result, this research study is focused on the influence of process innovation as a mediating role and in determining whether the specific capabilities of firms in SMEs serve as an activator for process innovation in attaining sustainable innovation.

1.4 Research Questions

Therefore, the research questions for this study are as follows:

- a) Do firm-specific capabilities activate process innovation in SMEs?
- b) Does process innovation influence sustainable innovation in SMEs?
- c) Does process innovation mediate relationships of firm-specific capabilities and sustainable innovation in SMEs?

1.5 Objectives of the Study

Based on the problem statements, the objectives of this research are designed as follows:

- a) To investigate the influence of firm-specific capabilities to the process innovation in SMEs;
- b) To examine the influence of process innovation on sustainable innovation in SMEs;
- c) To analysis the mediating role of process innovation in the relationship between firm-specific capabilities and sustainable innovation.

1.6 Scope of the Study

This study analyses antecedent of process innovation for sustainable innovation underpinned by concept of socio-technical approach. The socio approach

is explained by dynamic capability (Teece, Pisano and Shuen, 1997) specifically on firm-specific capabilities which consist of intrapreneurship, absorptive capacity and stakeholder integration. These three specific-capabilities are antecedents of process improvement by utilizing best practices of Ponsignon et al. (2013) of process innovation and have the role as a mediating variable. The relationship of antecedent of process innovation is targeted to measure sustainable innovation in the manufacturing sector of Indonesian SMEs, particularly South Sulawesi province. Based on Statistics Indonesia (Badan Pusat Statistik), respondent targets are managers/owners of SMEs, particularly small and medium sized businesses which employ 5-99 employees.

1.7 Significance of the Study

Numerous studies have attempted to identify and generalize the way of achieving sustainable innovation. In fact, previous studies have not been able to establish its definition. Some studies have defined sustainable innovation as innovative activity or innovation with economic, social and environmental dimensions (Boons and Ludeke-Freid, 2013; Ketata *et al.*, 2014). However, not all innovation has an impact on sustainable innovation (Bos-Brouwes, 2010). In the manufacturing sector, process innovation is inherent added value, such as reducing cost production (Samson, 2010; Williamson, 2011) and bottleneck (Lim *et al.*, 2006). Thus, it needs to confirm whether the value of this innovation has an impact on economic, social and environmental dimensions. On the other hand, dimensions of sustainable innovation are mostly tested partially rather than integrally and dominated within developed countries. Policy support of the awareness of sustainability between developed and developing countries are different and have a global impact such as climate change, and global warming (Gibbs, 2009).

Study of sustainable innovation has recorded varied findings, and an analysis of the common themes provides dynamic capability approach. Despite broad agreement on this relationship between capabilities of a firm and sustainable innovation, there is a lack of empirical research focused on specific capabilities suitable for SMEs to promote sustainable innovation aimed at developing countries.

Foxon (2002) identified two barriers to fostering sustainable innovation, technological and institutional lock-in. To anticipate this, management transition is offered by Nill and Kemp (2009) because change needs support from societally desirable transition, such as firm-specific capabilities. This is aligned with the picture of social-technical approach in which human sides relates to the technical system to succeed in the sustainable innovation achievement as suggested by several studies (Ruiz-Quintanilla *et al.*, 1996; Berkhout, 2010). However, many scholars empirically tested the relationship of firm-specific capabilities and sustainable innovation (*e.g.*, Ketata *et al.*, 2014) rather than determine the efficacy of process innovation on sustainability goals.

Hence, there are several important areas where this study makes an original contribution to sustainable innovation. First, firm-specific capabilities are developed as the way to achieve sustainable innovation by initiative of a firm in the interaction of internal and external factors with actors and the combination between them. In this case, specific capabilities for SMEs are extended into absorptive capacity, intrapreneurship and stakeholder integration. Second, process innovation is examined as incremental change that is new to the firm but not new to the industry. This innovation is considered as best practices adopting instrument of Ponsignon *et al.* (2013) which is set as mediating variable. Third, sustainable innovation is determined integrally by aiming at sustainable development goals with economic, social and environmental dimensions. Finally, this study is a first attempt to associate firm-specific capabilities and process innovation to impact sustainable innovation in the SMEs' manufacturing sector in Indonesia. Therefore, this study is the primary step to increase the attention given to the importance of firm-specific capabilities and process innovation in the Indonesian manufacturing industry.

1.8 Operational Definition of Variables

Specific-firm Capabilities: firm's ability to create value on a set of resources by matching the changing needs environment and gaining future opportunities through cognition and action of context-specific, dynamic, relational and humanistic

to the particular organizational routines of a firm (Teece *et al.*, 1997; 2007; Eisenhard and Martin, 2000).

Absorptive Capacity: specific capability of a firm to develop, exploit and reconstruct resources into potential absorptive capacity (PACAP) comprised of acquisition and assimilation of knowledge, and realized absorptive capacity (RACAP) that consist of transformation and exploitation of knowledge (Adler, 1965; Cohen and Levinthal, 1990; Van den Bosch *et al.*, 1999; Zahra and George, 2002).

Intrapreneurship: Employees or teams ability inside an existing organization in terms of capturing and exploiting opportunities by creating and improving resources in the concerting action of routines (Nielsen, Peters, and Hisrich, 1985; Zahra, 1991; Antoncic and Hisrich, 2001; Thompson, 2004; Morris *et al.*, 2008; Felicio *et al.*, 2012).

Stakeholder Integration: ability of firms to integrate stakeholders' expectations within operational firm (Donaldson and Preston, 1995; De-Burgos-Jiménez *et al.* 2011).

Process Innovation: applying change as the inherent added value through processes that are not new in the industry but new in the firm by way of improvement in operational process (Damanpour, 1988; Holt, 1992; Waterson *et al.*, 1999; Staw and Epsteins, 2000; Baer and Frese, 2003).

Sustainable Innovation: the impact of the change process which contributes to the economic, environmental and social performance (WCED, 1987; Rennings, 2000; Charter and Clark, 2007; Little, 2006; Bos-Brouwers, 2010).

1.9 Organization of Thesis

This research is organized in five chapters.

Chapter 1 presents an overview of the thesis that consists of background of the study, problem statement, research question, objective, scope, significance of the study, and operational definition.

Chapter 2 critically reviews the literature, gathering most related theories and studies in firm-specific capabilities. In addition, this chapter discusses firm-specific capabilities, process innovation and sustainable innovation. At the end of this chapter, researcher discussed framework development and hypotheses according to proposed research model.

Chapter 3 presents the research methodology employed to manage study comprehensively. A cross sectional survey method is chosen to confirm factors that support firm-specific capabilities, process innovation and sustainable innovation. Our research methodology contains research design, data gathering, measurement and analysis of data, and validity and reliability.

Chapter 4 exhibits data analysis result containing result description, discussion of research findings, and testing the research question and hypothesis. The analysis of quantitative data utilizes structural equation modelling (SEM) technique, and for the evaluation of survey data, the researcher utilized Software – Smart PLS 2.0 and SPSS 20 programs. The SmartPLS is used to analyse the measurement model and scrutinizes the relationship between latent variables.

Chapter 5 answers research questions and objectives, and provides discussion of findings, implications, limitations and recommendations for future research.

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