Creative destruction and knowledge creation as the mediation between innovation speed and competitiveness of food small and medium-sized enterprises in Malang, Indonesia

Stefanus Yufra M. Taneo
Department of Management, Ma Chung University, Malang, Indonesia, and
Djumilah Hadiwidjojo, Sunaryo Sunaryo and Sudjatno Sudjatno
Faculty of Economic and Business, University of Brawijaya, Indonesia

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Abstract

Purpose – This study aims to examine the role of creative destruction and knowledge creation which is a mediation between the speed of innovation and the competitiveness of food small- and medium-sized enterprises (SMEs). Creative destruction and the creation of competency-based and market-based knowledge are usually carried out by companies in power to create barriers to entry and expand distance with similar businesses, so the role of creative destruction and knowledge creation as mediation to strengthen competitiveness is investigated.

Design/methodology/approach – The data in this study were collected from 161 UKM which are the population of food UKM in Malang, covering three regions, namely, Malang City, Malang Regency and Batu City. Warp Partial Least Square-Structural Equation Modeling (WarpPLS-SEM) has greater statistical requirements than other covariance-based methods, which are more likely to give results that are in accordance with the conditions of the population (significant if it is actually significant in the population) so that it is very efficient.

Findings – It is very important for the pace of innovation development to improve the competitiveness of food SMEs. Innovation ideas are quickly realized and products that enter the market faster have greater opportunities to increase competitiveness through profits and productivity. The pace of innovation development increases the competitiveness of food SMEs. This study proves that competitiveness can be increased once the pace of innovation development is followed by creative destruction and knowledge creation. In this case, creative destruction is done through increased competence and maintain the innovations that have been achieved by food SMEs. Increasing business competence can be done through cost efficiency, improving product quality and improving worker skills. This is done while maintaining innovation achieved to strengthen market networks, customer service and innovation in product packaging. The basis of organizational learning is knowledge creation; this point is missing in organizational learning theories. The focus here is on the creation of knowledge as a process, a missing factor in theories about learning organizations.

Research limitations/implications – This study has limitations that this study analyzes processed foods and innovations in general. Future research should investigate one type of processed food based on an innovation typology so that it can provide more effective and efficient recommendations.

Originality/value – To the best of the authors' knowledge, this is the first known analysis of innovation speed and creative destruction for SMEs of food sector.

Keywords Innovation speed, Creative destruction, Competence-enhancing, Sustaining innovation, SMEs, Competitiveness

Paper type Research paper

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1. Introduction

Small- and medium-sized enterprises (SMEs) play a major role in the Indonesian financial sector in terms of employment and support for gross domestic product (BPS, 2013). Food imports in 2011 increased 48.6 per cent compared to the previous year, whereas exports grew 9.19 per cent. In 2016, the increase in the value of food imports increased by 13.61 per cent compared to the previous year, but the value of exports increased by 0.66 per cent compared to the previous year (BPS, 2017). This explanation shows that the production of the food business in Indonesia is low. Productivity is often referred to as an indicator that represents the company's long-term competitiveness (Ambastha and Momaya, 2012). Thus, it can be concluded that the competitiveness of Indonesian food SMEs is low.

The slow pace of innovation and the creative destruction of high competition among companies causes the low competitiveness of food SMEs in Indonesia (Kushadiani, 2006; Tambunan, 2008; USAID, 2013; ERIA SME Research Working Group, 2014). Thus, the competitiveness of food SMEs can be increased through the speed of innovation development and increased creative destruction (Baregheh et al., 2012). Previous research has largely focused on radicals and additions (Kushadiani, 2006), product and process innovation (Cainelli et al., 2006) and organizational and business innovations (Dixit and Nanda, 2011; Çakar and Ertürk, 2010; Laforet, 2013) and have not revealed the speed of innovation, the time spent between the discovery of innovation ideas and the introduction of goods and services to the market (Kessler and Cakrabarti, 1996). Innovation will have economic value if innovation enters the market (Susman, 2007). The speed of innovation shortens the product life cycle (Kessler et al., 2007) so that the ability to develop and launch innovative products to market faster than competitors will increase the company's competitiveness (Allocca and Kessler, 2006).

Now, an innovation is increasingly being replaced by innovation which results in creative destruction from competitors or even from the business itself as creative self-destruction (Liang, 2002; Kornai, 2010; Desai et al., 2010). Creative destruction is the way in which certain products and processes are replaced by better quality products and more efficient production methods (Freel, 2006; Bosma et al., 2011), with the aim of increasing productivity as a basis for competitiveness (Mckeown, 2008). Companies that only innovate are not enough, must be followed by creative destruction (Andersson et al., 2012; Kivimaa and Kern, 2015). Thus, creative destruction mediates innovation and competitiveness because creative destruction can improve business competence, maintain business uniqueness and maintain innovation that has been developed by business (Tushman and Anderson, 1986; Bosma et al., 2001; Bergek et al., 2013).

Creative destruction mediates the speed of innovation and competitiveness of SMEs through increasing competence and maintaining innovation mechanisms (Bergek et al., 2013). Increased competence is aimed at increasing the price or business performance based on existing knowledge and skills (Tushman and Anderson, 1986), by developing product design through improvement of certain components (Handerson and Clark, 1990). Increased competence is intended to strengthen the company's competitive position by exploiting its competencies and creating barriers to entry for new business (Gilbert, 2012). Meanwhile, mediation of creative destruction through sustaining innovation is achieved by strengthening the performance of existing products and providing something better to consumers (Christensen and Rosenbloom, 1995; Christensen, 2003). Companies can build and maintain an existing market network because they have experience compared to new companies entering the industry (Christensen, 2003).

Knowledge creation is considered as one of the main assets of innovative organizations, and innovative organizations are prepared by knowledge creation. It seems that innovation

and knowledge creation are defined by themselves. Nonaka and Takeuchi (1995) in their study of knowledge creation, as well as the earlier studies of Bell (1976) and Drucker (1969), focused very strongly on the production of new knowledge in the perspective of a knowledge economy. To Lindley (2003), the knowledge society is a long-run structural change in the economy, and the production, dissemination and use of knowledge will play a prominent role as a source of wealth creation and exploitation.

Competitiveness of a company is "the ability to win consistently over the long term in competitive situations" (Black and Porter, 2000, p. 213). Competitiveness can be accomplished through the following:

doing something better than others;

doing something difficult to imitate;

doing something of value to the customer;

doing something that is difficult to replace; and

doing something that has a greater profit margin than competitors (Black and Porter, 2000).

The essence of the five ways is innovation and is the capability, that is, the unique forms of resources owned by a company that is the source of competitiveness (Makadok, 2011). The four priority factors of capabilities that should be operated by a company to achieve competitive advantage are cost, quality, time and flexibility (Krajewski and Ritzman, 2005).

To date, research on innovation has focused more on innovation types such as radical and incremental (Sher and Yang, 2005; Kushadiani, 2006; Xin et al., 2008), product and process innovation (Avlonitis and Salavou, 2007; Cainelli et al., 2006), organizational and business innovation (Dixit and Nanda, 2011; Çakar and Ertürk, 2010; Laforet, 2013). Other studies have analyzed the relationship between innovation types and business performance (Garcia and Calantone, 2002) and competitiveness (Chen et al., 2006; Cho et al., 2008). The results of the study found a positive relationship between the types of innovation with business performance and corporate competitiveness.

Previous studies did not reveal the length of time spent or required between the time the innovation is found until the innovation provides economic benefits. Innovation will be economic value if the innovation gets into the market (Susman, 2007). Therefore, the pace of innovation development is a key factor to the success of innovation (Love and Roper, 2007). The speed of innovation is the time spent between the discovery of an idea of innovation and the introduction of goods and services in the market (Kessler and Cakrabarti, 1996). The pace of innovation shortens the product life cycle (Kessler et al., 2007) so it is necessary to develop new products in order to remain competitive. Thus, the ability to develop and launch innovative new products to market faster than competitors is key to gaining competitive advantage (Allocca and Kessler, 2006).

Information about the pace of innovation development with the competitiveness of SMEs is particularly important, but research is still very limited (Allocca and Kessler, 2006; Markman et al., 2005; Kessler et al., 2007; Chen et al., 2012; Baregheh et al., 2012a and 2012b). Existing studies have three limitations regarding the frame of mind, the object being studied and the research context, and the approach used. First, the research by Allocca and Kessler (2006) and Kessler et al. (2007) put the pace of innovation as a dependent variable without analyzing the outcome of the speed of innovation development for SMEs. The speed of the development of innovation in question is the competitiveness of SMEs. The speed of innovation is important in the face of rapid business environment changes (Eisenhardt, 1989, 1990; Vinton, 1992, 1992; Jones, 1993), but the pace of innovation has not provided a

better outcome (Rodriguez-Pinto et al., 2011). Secondly, the speed of innovation under study is still limited to large enterprises (Huang et al., 2002), manufacturing industry or SMEs but high tech and in the context of developed countries such as the USA (Allocca and Kessler, 2006 and Kessler et al., 2007) and South Korea (Cho et al., 2008). The results of these studies are different context and characteristics of the object thus that not necessarily can be applied in Indonesia even more so on food SMEs. Third, research on innovation on food SMEs by Baregheh et al. (2012a dan 2012b) using a qualitative approach and limited to the type of innovation (products and processes), does not analyze the pace of innovation development. Other research on the speed of innovations that have been studied in small businesses using a case study approach (Latona and LaVan, 1993; Price and Chen, 1993) cannot be generalized.

The above gap makes research on the effect of the speed of innovation development on the competitiveness of SMEs in Indonesia is important to do. It is important that SMEs play a major role in the economy and in view of the increasingly tight competition especially facing the ASEAN Economic Community starting in 2015. Globally, SMEs cover more than 90 per cent of businesses and contribute around 70 per cent to GDP (Family Firm Institute, 2012). The proportion of SMEs is dominant in some ASEAN countries, such as Malaysia (99.2 per cent) in 2006 and in Thailand reached 99,5 per cent (OSMERI, 2008). Nationally, data from the Ministry of Cooperatives and SMEs (2015) showed that small business units make up about 57.89 million (99.99 per cent of total business units) and absorb 114.1 million workers (96.99 per cent of total workers), and accounted for about 60.34 per cent of GDP. In East Java, the proportion of SMEs reaches 99.85 per cent, absorbs a lot of manpower (96.2 per cent of total workers) and contributes 54 per cent to PDRB (Department of Cooperatives and UMKM East Java Province, 2014). Data from the Office of Cooperatives and SMEs in Malang (Malang City, Malang District and Batu City) also showed the dominant SMEs (about 99 per cent of total business units) and accounted for 42-54 per cent of the Revenue (PAD).

Research on creative destruction and its relation to the competitiveness of food SMEs is still very limited. Previous studies were conducted on companies based on information and communication technologies such as Google and Apple (Walton and Oestreicher, 2012). Most of the research on creative destruction was about the national (Carrol and Teo, 1996; Chun et al., 2008; Bosma et al., 2011; Anderson et al., 2012; Lin and Huang, 2012; Erumban and Timmer, 2012) or city (Huang et al., 2007), and not yet on a micro scale. Thus, this study fills the gap by examining the role of creative destruction as the mediation between innovation speed and competitiveness of food SMEs. The results of this study are expected to provide scientific information to the government and entrepreneurs that innovation needs to be followed by creative destruction to strengthen competitiveness in a very tight competition.

2. Innovation speed and competitiveness of small and medium-sized enterprise

Before further discussing the relationship between the variables studied in this study, exposure differences and similarities with previous research was determined. It was conducted to ensure that this research is unique and original compared to previous research. Research result on the relationship between the pace of innovation development and the competitiveness of SMEs are three (3) differences (and several similarities) that require attention for further research. It was determined based on the research concept, the object studied, the research context, and the approach used.

First, the concept of the pace of innovation investigated by Allocca and Kessler (2006), and Kessler et al. (2007) were conducted on manufacturing SMEs with different thought frameworks. Allocca and Kessler (2006) identified 32 antecedent variables that facilitate or hinder the speed of SME innovation. Kessler et al. (2007) analyzed the effect of outsourcing and alliances as an external knowledge that influenced the speed of SME innovation. These two studies placed the pace of innovation as a dependent variable without analyzing the outcomes of the pace of innovation for SMEs. The pace of innovation outcomes in question is the competitiveness of SMEs. The pace of innovation is important in the face of rapid business environment changes (Eisenhardt, 1989, 1990; Vinton, 1992, 1992; Jones, 1993), but the pace of innovation has not provided better outcomes (Rodriguez-Pinto et al., 2011). Cho et al. (2008) research determined the outcome of the study as an outcome of innovation, not the pace of innovation.

Markman et al. (2005) analyze the pace of innovation as a dependent variable but in the context of the commercialization of technology from the University to the market. Outcomes of innovation according to Markman et al. (2005) are the acceptance of licenses and entrepreneurial activities which is different from this research plan, namely the competitiveness of food SMEs. The concept of the pace of innovation is also investigated by Chen et al. (2012) as one of the independent variables that affect the success of new product development. The object of research is the manufacturing industry in the USA. Therefore, this study will place the pace of innovation as a free variable with the outcome of innovation, ie the competitiveness of food SMEs as a dependent variable.

Secondly, the pace of innovation under study is still limited to the object of the manufacturing industry or to SMEs possessing high technology level. Moreover, previous studies have different contexts, i.e. developed countries such as the USA (Allocca and Kessler, 2006; Kessler et al., 2007). Cho et al. (2008) research on innovation, competitiveness, and performance in the Korean manufacturing industry.

The SMEs manufacturing industry has different characteristics than food SMEs. Najib et al. (2011) study on the competitiveness of small and medium-sized industry (IKM) food processing in Indonesia analyzed the issue through the location or cluster aspect. It is similar to Baregheh et al. (2012) research on innovation and SME food sector in the UK. In addition to different contexts, this latest study analyzes the level and type of innovation that supports innovation orientation or organizational innovation, not analyzing the pace of innovation. Thus, there is a research gap in the pace of innovation in food SMEs in developing countries such as Indonesia.

Third, previous research in food SMEs used a different approach as conducted by Baregheh et al. (2012) and Baregheh et al. (2012). The first study used a quantitative approach, while the second study used a qualitative approach. Moreover, the two studies are limited to the extent and type of innovation: product, process, position and innovation paradigm, not to the pace of innovation and outcomes or innovation outcomes. Therefore, there is still a research gap in the pace of innovation development regarding food SMEs in Indonesia.

Innovation is company-level competitiveness (Bartlett and Ghosal, 1989; Prahalad and Doz, 1999; Prahalad and Hamel, 1990; Cho and Moon, 2002). Competitiveness can be treated as a dependent variable or independent variable, depending on the approach adopted (Ambastha and Momaya, 2014). Three approaches can be used to identify competitiveness as a dependent variable or independent variable. First, competitiveness as a three-sided framework: performance competitiveness, potential competitiveness, and competitiveness of management processes (Man, 1998; Momaya, 2000). Second, competitiveness as a combination of assets and processes that transforms assets to gain economic benefits within

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the conceptual framework of asset-process-performance (Mamoya, 2000). Within this framework, performance is measured by, among others, profitability and productivity (Ambastha and Momaya, 2012). The last, competitiveness is measured by resource approaches (Bartlett and Ghosal, 1989; Doz and Prahalad, 1987; Hamel and Prahalad, 1989; Hamel et al., 1990; Grant, 1991; Barney, 2001; Barney and Clark, 2007). Competitiveness in this approach is seen from internal factors such as strategy, structure, and tangible and intangible resources to be able to compete. This study embraces competitiveness as a dependent variable based on performance and a combination of assets and processes, as measured by the profitability and productivity of food SMEs.

High profitability and productivity are the goal of companies, including food SMEs. Competition to achieve these targets is getting tighter because it is triggered by rapid technological changes resulting in a shorter product life cycle (Huang et al., 2002; Kessler et al., 2007). Therefore, the ability to develop and launch innovative products to market faster than competitors is one of the keys to gain competitive advantage (Allocca and Kessler, 2006; Love and Roper, 2007).

The speed of innovation is the time passed between an idea of innovation found until the result enters the market (Allocca and Kessler, 2006). The measurement of innovation speed is very relative because it starts from the idea found up to the product entering the market going through a process. Rosegger (1986) explains that there are three stages of the innovation process required from the discovery of ideas to products entering the market. The three stages are research and development, commercialization, and the diffusion or dissemination stage, which includes five steps with different outputs, activities, and agents. For example, the research and development stage begins with basic research activities with outputs being findings or ideas. These need to be followed up with applied research activities whose output is blueprint or development plan. Furthermore, the development test will produce a prototype that is ready to be mass-produced with process and product innovation, which is the stage of commercialization. Mass production that enters the market will also go through several stages of the diffusion process, from product introduction to market to consumer purchase decisions.

The research findings show that a product introduced to the market faster, the company will gain greater potential benefits, i.e. large number of customers, large market share, high profit margins, longer sales life, and safer competitive position (Cooper, 1984; Clark, 1989; Smith and Reinertsen, 1995). Companies that innovate quickly can improve product quality while reducing product development costs (Gupta and Souder, 1998; Kessler and Bierly, 2002). Uttal (1987) found that the cost of a product that is late in entering the market in a dynamic business environment is about half of its potential revenue. Other advantages of rapidly innovating companies are free to set prices and economies of scale (Smith and Reinertsen, 1992), ownership of technology through patents and licenses, indirect benefits through brands or reputation as innovators (Kessler et al., 2007). Markman et al. (2005) found that the faster the University Technology Transfer Offices commercialized patented technology, the greater the license receipt and the growing number of new businesses that could be developed. In other words, faster products introduced to the market company will have greater competitiveness compared to competitors.

Empirical research on SMEs conducted by Allocca and Kessler (2006) found that SMEs have different innovation speeds with large businesses, where the difference is determined by 32 antecedent variables. The successful introduction of innovative products is crucial to the endurance and success of SMEs, especially those based on advanced technologies (Wynarczyk, 1997). Therefore, Kessler et al. (2007) stated that the fundamental way for

SMEs to survive in dynamic competitive conditions is to constantly introduce new products that customer value and understand that the product life cycle will be shorter.

All previous studies show that innovation and competitiveness have a close relationship. In addition, the innovation forms, especially the current technological innovations, have become prima donna in increasing companies' competitiveness in the global world. Based on the above description, the following hypothesis is proposed:

H1. The speed of innovation is positively related to the competitiveness of food SMEs.

3. The role of creative destruction in increasing competitiveness of small and medium-sized enterprises

Creative destruction is the development of new techniques, business models, technologies, and markets that can disrupt the position of an existing business or product (Schulz, 2010). Bosma et al. (2011) states more firmly that creative destruction is the way in which certain products and processes are replaced by other products and processes that better quality and more efficient methods of production (Bosma et al., 2011). Creative destruction was first coined by Schumpeter to explain why the capitalist economy is experiencing periods of growth and decline (Huang et al., 2007). Schumpeter explains that profit seeking is what drives investment in creating new technology or innovation. The new investment then causes obsolescence of the existing technology. The interesting thing to learn is the innovation implications for the success or failure of companies that innovate in competition with potential and actual companies as a result of the creative destruction process.

Several theoretical frameworks have been developed to explain the success or failure of companies that innovate in competitive conditions. In general, the theoretical framework can be divided into two groups, namely competence-based and market-based explanation of creative destruction (Bergek et al., 2013). In the competency-based framework, the outcome of competition from the pace of innovation depends on the effect of innovation on the company's resources, skills and knowledge; some innovations improve the capabilities and competencies of existing technologies, while others are replaceable (Bergek et al., 2013). Tushman and Anderson (1986) termed innovations that improved competence as "competence-enhancing" and destructive innovation as "competence-destroying".

Competence-enhancing is a price or performance improvement built on existing knowledge and skills (Handerson and Clark, 1990). Competence that improves innovation is usually done by existing companies (Gilbert, 2012) and tends to strengthen competitive position because it allows companies to exploit their owned competencies and increase barriers to entry for new companies (Abernathy and Clark, 1985; Handerson and Clark, 1990; Tushman and Anderson, 1986). Thus an existing company innovates and is followed by competence-enhancing will enhance the competitiveness of the company. In other words, competence-enhancing mediate the innovations applied and the competitiveness of SMEs.

Competence-destroying, in contrast, fundamentally alters the skills and knowledge required to produce a product, and therefore obsolescence of existing knowledge (Tushman and Anderson, 1986). This competency tends to be done by new companies entering an industry and is done to prevent other new companies from entering the market because competitive advantage is lost when existing competencies become obsolete (Anderson and Tushman, 1990; Murman and Frenken, 2002). Operating companies tend to be hindered by past successes with the old technological paradigm (Tushman and Anderson, 1986), skills, abilities, and operational ways of blocking their actions and making it difficult for them to respond effectively to change (Leonard-Barton, 1992; Macher and Richman, 2004).

The market-based creative destruction focuses on the impact of innovation dichotomous performance: sustaining innovation and disruptive innovation. Maintaining innovation is done by reinforcing the performance of an existing product within an industry (Christensen and Rosenbloom, 1995) by giving customers something better in product attribute performance (Christensen and Bower, 1996; Christensen, 2003). Companies may have built a marketing network and therefore need not change the innovation strategy (Christensen and Rosenbloom, 1995). Small and medium-sized businesses that conduct sustaining innovation will improve competitiveness of SMEs concerned. Thus, market-based creative destruction that sustaining innovation acts as mediation between innovation and SME competitiveness.

Disruptive innovation, in contrast, implies a difference in performance over mainstream technology and customer value (Bower and Christensen, 1995). When an innovation is introduced, its performance will be lower than the product valued best by the customer. Therefore, new innovation products will only attract niche customers in small and growing markets (Ardner, 2002). However, over time, products with new innovations will grow faster than existing products that can compete in the mainstream market (Christensen and Bower, 1996). Products with such innovations can then invade mainstream markets and even replace products with existing technologies (Adner, 2002).

Based on the theoretical framework above it is clear that competence-enhancing is more suitable because the object under study is food SME that has long been operating, not newcomers in the food industry. Similarly, sustaining innovation is more suitable than disruptive innovation because the innovation undertaken aims to strengthen market performance has been achieved by food SMEs.

Empirical research by Carrol and Teo (1996) concluded that technical innovation created benefits for the company that created the innovation because the performance achieved interfere or even damage the company's competitors. Other research proved that innovation can change the structure of perfectly competitive markets into monopolistic competition (Chen et al., 2006) or monopoly through patents or other forms of intellectual property rights (Markman et al., 2005). Patents create barriers to entry for newcomers. As the consequence, the producer is the price-maker (Mankiw, 2007) and will remain a market participant. This means the company has the competitiveness gained through the ability to innovate. Food SMEs that innovate through product diversification will be more viable than those relying on only one type of product, as found in Freel's (2007) study in Northern England.

Foster (2010) found that creative destruction through government innovation policies to improve efficiency and productivity play a key role in accelerating entrepreneurial activity in large companies and SMEs. Andersson et al. (2012) found that the entry of new companies into the market provides a positive support of entrepreneurial activity to the productivity of existing companies. Chun et al. (2008) proved that creative destruction is done by companies that utilize information technology than companies that did not, therefore enlarge the distance with other companies. Information technology is competence-enhancing as it enhances the growth of total factor productivity. It can also be sustaining innovation through strengthening existing market networks into both the upstream and downstream sectors

Creative destruction is a process or a particular product replaced by a process or product that is better quality and more efficient method of production (Bosma et al., 2011). This way of replacement can be through innovations that improve competence to create barriers to entry of other companies or produce new products thereby obsolete existing technologies. The purpose of creative destruction is to increase productivity and efficiency as a base of competitiveness (McKewn, 2008). Thus, innovation speed supported by creative destruction will be able to create or maintain a company's competitiveness.

Food SMEs capable of creative destruction that are competence-enhancing and sustaining innovation not only improve product performance (Christensen and Rosenbloom, 1995; Christensen and Bower, 1996; Christensen, 2003) but also increase barriers to entry for new companies (Abernathy and Clark, 1985; Handerson and Clark, 1990; Tushman and Anderson, 1986) to improve the competitiveness of SMEs in the food industry. Thus, creative destruction serves as mediation between the speed of innovation and competitiveness of food SMEs.

Based on the above description, the following hypothesis is proposed:

H2. Creative destruction mediates the relationship between innovation speed and competitiveness of food SMEs.

4. The role of knowledge creation

The phenomenon of such knowledge creation is not studied; even according to Senge (1990), the system as a key factor between rationality and intuition does not focus on the creation of knowledge as a process. This is also the motive for Nonaka and Takeuchi to think about the process of creating knowledge, relying heavily on Polany (1997) work on personal knowledge. Different learning organizations are organizations that create knowledge. The focus here is on the creation of knowledge as a process, a missing factor in theories about learning organizations. This process is explained in one dimension: explicit (or codified) knowledge into implicit knowledge (or tacit knowledge); and four processes (socialization, externalization, internalization, and combination).

The learning process of the organization will be a necessary condition for knowledge generation, and this whole process of knowledge creation, innovation and information transformation (learning to learn) can be depicted as a cyclical and continuous process. Although it might look like a completely internal process, the impact of the outside world is clear. New knowledge will be induced – directly and indirectly – from outside into the processes of knowledge creation and innovation:

H3. The roles of knowledge creation are to moderate the correlation between innovation speed and the competitivess of food SMEs.

5. Methodology

5.1 Data

To analyze the relationship of innovation speed and competitiveness of food SMEs with creative destruction and knowledge creation, mediation data were collected from food SMEs in Great Malang that consist of three administrative areas: Malang municipality, Malang regency and the municipality of Batu. This area was selected for the following considerations. First, previous research by Arifin et al. (2012) and Subekti et al. (2010) found that food SMEs have potential in local economic development through product and process innovation, but have not revealed the speed of innovation and competitiveness. Kusumawardhani et al. (2015) found that MSMEs benefit from local science and technology in the form of increased productivity, marketing, and insight that views MSME as an economic sector. However, findings of those studies based only on qualitative approaches that need to be supported by a quantitative approach to more reliable results. Second, food SMEs play an important role in the economy in Great Malang in terms of employment and contribution to Local Revenue. Third, the vision and mission of each local government in Great Malang explicitly related to innovation and competitiveness of food SMEs.

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Food SME data obtained from the Office of Cooperatives and SMEs in the area of Great Malang. The definition of SMEs refers to the Central Bureau of Statistics, namely Small Business is a business with a workforce of 5-19 people and Medium Enterprises with a workforce of 20-99 people. This definition is more practical than the definition according to Law Number 20 Year 2008 regarding Micro, SMEs based on net worth and annual sales that are not easily obtained from SMEs. The number of registered SMEs was 171 business units, consisting of 149 small enterprises and 12 medium-sized enterprises. All registered food SMEs were studied so that this study was a census of all registered food SMEs. In the process of data collection, two business units were no longer operational; four business units were difficult to find because of incomplete address recording, three business units have the same address. After the data collection, there were two questionnaires that were not filled completely so it was not used in the process of data analysis. Thus, the food SMEs used as data sources as much as 161 business units.

SMEs operations are usually done by the owner. Therefore, respondents in this study are business owners who are considered most understand about the speed of innovation, creative destruction, knowledge creation and competitiveness of SMEs. Data were collected by personally administering questionnaire to respondents. This technique has the advantage of clarifying something that is less clear to the respondent and can immediately accumulate filled questionnaires thus ensuring a high rate of return despite high questionnaires in geographically dispersed samples (Sekaran, 2003) such as Great Malang covering 41 districts and 471 villages.

The questionnaire was tested its validity and reliability to 30 food SMEs prior to its distribution to all respondents. The validity test uses content validity and convergent validity based on the correlation significance between the item score and the total score of a latent variable, while the reliability uses Cronbach's alpha with a minimum value of 0.70 (Hair et al., 2010). All variables are valid and reliable so the instrument is feasible to use.

This study uses unstructured interviews to selected SME owners, to complement the quantitative data obtained through questionnaires. In unstructured interviews, information on the drivers of the speed of innovation and creative destruction, and knowledge creation and the procedures and constraints faced by SMEs in accessing government-provided facilities.

Unstructured interviews were conducted after statistical analysis to provide information in order to strengthen the discussion. Respondents were the owners or managers of food SME considered to understand the condition of the company. Respondents in unstructured interviews were determined by considering the respondent's ability to provide the required information and the representation of product type in each regency/city in Malang.

Unstructured interviews were conducted on eight owners and managers of food SMEs intended to obtain qualitative data or information on the answers or responses on the quantitative scale obtained through the questionnaire. In short, unstructured interviews were conducted to complement quantitative analysis. The informants were chosen by considering the products types such as chips, crackers, snacks, bread, and soybean-based food. Selection of informants also considered the location of businesses in the area of Malang City, Batu City and Malang Regency.

From the interview results, there were 30 respondents of small- and medium-scale food businesses spread in Malang. The results of the interview will be analyzed using the Structural Equation Model to strengthen the results of the previous quantitative methods. For that matter, the final results obtained in this study can be more comprehensive.

5.2 Variable

The variables studied are innovation speed as independent variable, creative destruction and knowledge creation as mediation variable, and competitiveness as dependent variable. Each indicator or item is measured using a Likert Scale with a score range of 1 (strongly disagree) up to 5 (strongly agree). The speed of innovation refers to the definition of Kessler and Cakrabi (1996), the time spent or spent between the discovery of an idea of innovation and the introduction of goods and services in the market. In this study, the speed of innovation is the perception of the owner of the food SMEs about the time spent between innovations by food SMEs and the introduction of products in the market. The innovation speed indicators were adopted from Kessler and Cakrabi (1996), Allocca and Kessler (2006), and Kessler (2007), i.e.:

realizing innovation ideas faster than planned;

launching new products to market as planned; and

innovating faster than before, over the past three years.

Creative destruction refers to the definition of Bosma et al. (2001), Bergek et al. (2013) and Tushman and Anderson (1986), the way in which certain products or processes are replaced by better products or processes, based on competence-enhancing and sustaining innovation. Creative destruction is translated into the following indicators:

competence-enhancing that enhances the ability of SMEs, measured by three items: more efficient production costs, better product quality and improved worker skills; and

sustaining innovation is to maintain existing innovation, measured by three items: strengthening the benefits of product packaging, providing the best service to customers, and maintaining an existing market network.

The phenomenon of knowledge creation as such was not studied, even Senge (1990) with his focus on systems thinking as the key factor between rationality and intuition does not focus on knowledge creation as a process. This is also the motive for Nonaka and Takeuchi to think about the process of knowledge creation, leaning heavily also on the work of Polany (1997) on personal knowledge. The knowledge-creating organization is a differentiation of the learning organisation. The focus is here on knowledge creation as a process, the missing factor in theories on learning organizations. This process is depicted in one dimension, explicit (or codified) knowledge to implicit (or tacit) knowledge, and four processes (socialization, externalization, internalization and combination).

Competitiveness refers to the definitions of Black and Porter (2000), Krajewsksi and Ritzman (2005) and Ambastha and Momaya (2012), i.e. the ability of SMEs to maintain and win the competition with similar businesses. The competitiveness of SMEs is analyzed from the business performance described in two indicators, namely:

(1) profitability as measured by three items: increase in profits, increase in capital, and increase in wealth; and

(2) productivity measured by three items: production targets, increasing production quantities, and offering products of the highest quality to the buyer's expectations.

5.3 Technical analysis

To test the hypotheses, Warp partial least square-structural equation modeling (WarpPLS-SEM) was applied based on the following two considerations (Vinzi et al., 2010;

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Sholihin and Ratmono, 2013; Hair et al., 2014). First, parameter estimation with WarpPLS-SEM is very efficient because it has greater statistical requirements than other covariant-based methods, which is more likely to deliver results that match the population condition (significant if that is in fact significant in the population). Second, WarpPLS-SEM can provide output value of indirect effect and total effect along with p-value, standard error, and effect size. This output is very helpful in testing the hypothesis of mediating variable so it is not necessary to do manual calculation as with Sobel test.

Model evaluation used fit and quality indices (Hair et al., 2014) and hypothesis test using t test (Hair et al., 2014; Sholihin and Ratmono, 2013). Output of indirect effect for paths with 2 segments was used to test H2. Further analysis is needed to find out creative destruction as complete mediation or partial mediation. According to Solimun (2017), analysis of mediation variables can be done through two approaches namely the difference coefficient and multiplication coefficients. The differences coefficient applies the method of examination by conducting analysis with and without involving the mediation variables, while multiplication method is done by Sobel method. This research uses examination method because it is more practical.

The method of examination is done through two steps:

(1) to estimate the direct effect, i.e. the speed of innovation with the competitiveness of food SMEs; and

(2) to do estimation of indirect effect simultaneously with triangle PLS SEM model, that is innovation speed with competitiveness of food SME, innovation speed with creative destruction, innovation speed with knowledge creation, creative destruction with competitiveness of food SME and knowledge creation with competitiveness of food SME.

The conclusions about mediation are as follows:

If the relationship of innovation speed with creative destruction and creative destruction with competitiveness are significant, while the relationship of innovation speed with competitiveness is not significant then creative destruction is said to be a complete mediation variable.

If the three relationships are significant with the coefficient of direct relationship of innovation speed with competitiveness decrease, creative destruction is said to be partial mediation.

The three relationships are significant, where the coefficient of direct relation without and with mediation is almost the same, the creative destruction is not as a mediating variable or both are insignificant then creative destruction is said not as a mediating variable (Solimun, 2017; Hair et al., 2010).

6. Findings

Table I shows that the PLS model meets statistical requirements so that it can be used to test the hypothesis.

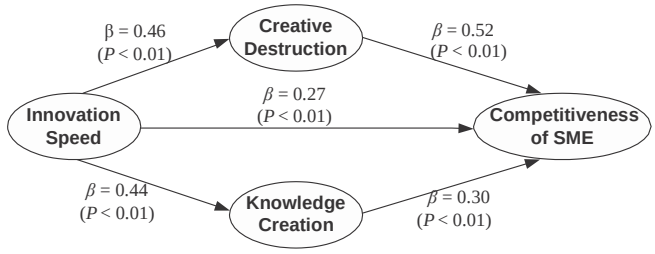
Figure 1 shows that the innovation speed (InSpeedI) is significantly related positively to the competitiveness of food SMEs ($p < 0.01$). The competitiveness (Compet) of food SMEs is also significantly reflected by profitability (Profit) and productivity/Productv ($p < 0.01$). Thus, H1 that innovation speed is positively related to the competitiveness of food SMEs is accepted.

Creative destruction and knowledge creation

Creative destruction mediates the relationship between innovation speed and competitiveness of food SMEs. Figure 1 shows the relationship between innovation speed and creative destruction is significant ($p < 0.01$) and the creative destruction with competitiveness is also significant ($p < 0.01$). Knowledge creation mediates the relationship between innovation speed and competitiveness of food SMEs. Figure 1 shows the relationship between innovation speed and knowledge creation is significant ($p < 0.01$) and the knowledge creation with competitiveness is also significant ($p < 0.01$). The direct relationship between innovation speed and competitiveness without creative destruction and knowledge creation (Figure 2) is significant ($p < 0.01$). The coefficient of the direct relationship decreases from 0.48 to 0.27 when including creative destruction and knowledge creation but remains significant. The total effect of innovation speed to the competitiveness of food SMEs through creative destruction is 0.23 that is smaller than direct relationship

Goodness of fit	Coeff. y(p-value)	Cut-off	Information
Average Path Coefficient (APC)	0.686 (0.001)	0.05	Significant (good)
Average R-Squared(ARS)	0.638 (0.001)	0.05	Significant (good)
Average Adjusted R-squared (AARS)	0.635 (0.001)	0.05	Significant (good)
Average Block VIF (AVIF)	1.201	# 5: acceptable # 3.3: ideal	Ideal
Average full collinearity VIF (AFVIF)	Inf	# 5: acceptable # 3.3: ideal	Because the relationship of all latent variables is significant
Tenenhaus GoF (GoF)	0.672	0.1: small 0.25: medium 0.36 big	Big
Sympson's paradox ratio (SPR)	1.000	0.7: acceptable 1: ideal	Ideal
R-squared contribution ratio (RSCR)	1.000	0.9: acceptable 1: ideal	Ideal
Statistical suppression ratio (SSR)	1.000	0.7: acceptable	Acceptable
Nonlinear bivariate causality direction ratio (NLBCDR)	1.000	0.7: acceptable	Acceptable

Table I.
Evaluation of goodness of fit model



Notes: Inspeed = Innovation speed; Compet = Competitiveness of SMEs; Profit = Profitability; Product = Productivity; C_Destr = Creative destruction; Compt_ba = Competence-based; Markt_ba = Market-based

Figure 1.
Creative destruction and knowledge creation as the mediation between innovation speed and food SMEs

(0.27). It means that creative destruction is partially mediate innovation speed and competitiveness of food SMEs. Thus, H2 and H3 are accepted.

Partial mediation maintains that the mediating variable accounts for some, but not all, of the relationship between the independent variable and dependent variable. Partial mediation implies that there is not only a significant relationship between the mediator and the dependent variable, but also some direct relationship between the independent and dependent variable. Partial mediation is the case in which the path from independent to dependent variable is reduced in absolute size but is still different from zero when the mediator is introduced. Note that a mediational model is a causal model.

7. Discussion

7.1 Innovation speed to competitiveness of food small and medium-sized enterprises

H1 shows that innovation speed is positively related to the competitiveness of food SMEs. The results show that launching new products into the market as planned contributes the most to the speed of innovation. This finding confirms that companies which are quicker to introduce new products to the market will gain greater potential benefits, such as large number of customers, larger market share, higher profit margins, longer sales lives, and safer competitive positions (Cooper, 1984; Clark, 1989; Smith and Reinertsen, 1995). Another advantage of companies that innovate quickly is the price-maker and economies of scale (Smith and Renertsen, 1995), ownership of technology through patents or licenses, direct profits through brands and reputation as innovators (Kessler et al., 2007).

Launching new products to market is very important because innovation will be economically valuable when the products successfully enter the market (Susman, 2007). Launching a product to the market, however, does not easy. In facts, most SMEs (88 per cent) experienced various obstacles to launch new products. Interviews with eight food SMEs owners found five major barriers. First, the interference of parents in decision making for young entrepreneurs whose capital assisted by parents. Parents are not sure of the success of new products that will be launched into the market because the entrepreneur is considered not experienced enough. Second, lack of capital makes food entrepreneurs hesitantly launching new products to market. Entrepreneurs do not want to borrow money from the bank because the process is long; testing new products into the market also requires a high cost. Third, market trial before launching products to the market requires tenacity and precision. Offering new products that are not yet known by consumers are often rejected so as not to be discouraged. New product trials also need to be meticulous, as they have to match the market segment. Fourth, unskilled labor and lack of initiative to learn new things. Fifth, raw materials are not always available at all times because agricultural products are seasonal.

These findings have implications for governments in pushing the speed of innovation of SMEs. The role of government is a catalyst in the transformation of the practice of government administration with entrepreneurial spirit (Osborne and Gaebler, 1992). The government plays several roles to support innovation speed of SMEs. First, facilitate the provision of credit to SMEs with an easier process and affordable interest costs. The

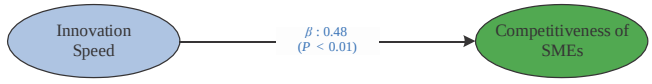


Figure 2.
Relationship between innovation speed and competitiveness of food SMEs

government of Indonesia has provided credit for SMEs namely People's Business Credit (KUR), but problematic in the distribution. According to Pratomo (2014), KUR disbursement faces five issues:

high interest rates, at 22 per cent per year considered to be very burdensome;

unequal distribution geographically or sectorally, less than 10 per cent for agriculture and fisheries;

KUR as a campaign tool for political parties; and

limited funds allocated by the government to KUR.

This credit (KUR) can be said to be successfully from the banking side because the Non-Performing Loan is relatively low (3-4 per cent), lower than the maximum level of 5 per cent set by the Central Bank, but it has not been successful since it has never been evaluated in terms of SME performance before and after receiving KUR (Tambunan, 2016).

Second, the government can facilitate capacity building especially technical and managerial training. Included in this technical training are hygiene and other food quality standards. The managerial training required by SMEs in accordance with the above findings is the skills of market analysis and entrepreneurial principles including decision-making and risks management. Third, the government should facilitate provision of raw materials for SMEs through the Agency for Logistics and Cooperatives Affairs. Indonesia is an archipelagic country so that raw materials for food SMEs are available in sufficient quantity but are spread geographically. The government can facilitate the distribution to be affordable for SMEs. Fourth, the government can push the triple helix cooperation as so-called ABG (Academician, Business/SME, and Government). Triple Helix is expected to be the base of knowledge-based economy (Leydesdorff and Meyer, 2010).

Research findings can be explained through the resource-based theory developed by Barney and Clark (2007). This theory is based on the assumption that enterprise resources can be heterogenous and immobile. To achieve sustainable competitive advantage, a company must have four properties, one of which is not fully imitable. Food SMEs that produce and launch new product, jackfruit chips for example, into the market with a certain flavor and match the color of the original fruit are considered not fully imitable. This jackfruit chips can be sold at a higher price based on value-pricing instead of cost-based pricing since it is in monopolistic competition market. The market structure will shift to the perfect market competition when many SMEs are able to produce the same jackfruit chips. However, innovation process can save production costs, enabling SMEs to compete through lower selling prices. Thus, superior economic performance can be achieved not only in imperfect competitive markets but also in perfectly competitive markets. This is in line with the general theory of competition (Hunt, 2001) which emphasizes that in a perfectly competitive market innovation becomes a key component to create a dynamic imbalance.

7.2 Creative destruction as mediation between innovation speed and competitiveness of food small and medium-sized enterprises

H2 that creative destruction as a partial mediation between innovation speed and competitiveness of food SMEs proves is accepted. Total effect through creative destruction is greater than the direct relationship of innovation speed to the competitiveness of SMEs. That is, the speed of innovation followed by creative destruction will be greater effect on the competitiveness of food SMEs. Creative destruction can be done by increasing competence and/or maintaining an existing market (Bergek et al., 2013). Increased competence aims to strengthen competitive position by increasing obstacles for new companies (Abernathy and

Clark, 1985; Tushman and Anderson, 1986; Handerson and Clark, 1990). Indications that food SMEs in Great Malang seeks to create barriers to entry for other businesses through efforts to control key success factors. Some attempts by SMEs to prevent their products from being replicated by other businesses are:

registered trademarks in order not to be copied;

maintaining quality with special recipes that have the potential to be trade secrets; and

flavoring or flavoring by owner or certain people only.

Creative destruction as a mediation between the pace of innovation and SMEs competitiveness through competence-enhancing mechanisms based on competence and market based sustaining innovation (Bergek et al., 2013). Increased competence is aimed at increasing the price or business performance based on existing knowledge and skills (Tushman and Anderson, 1986), by developing product design through improvement or improvement of specific components/parts (Handerson and Clark, 1990). Increased competence is intended to strengthen the company's competitive position by exploiting its competencies and creating barriers to entry for new ventures (Gilbert, 2012). Meanwhile, creative destruction mediation through sustaining innovation was conducted by strengthening the performance of existing products by providing something better to consumers (Christensen and Rosenbloom, 1995; Christensen, 2003). Companies can build and maintain an existing market network because they have experience compared to new companies entering the industry (Christensen et al., 2002).

7.3 Knowledge creation as mediation between innovation speed and competitiveness of food small and medium-sized enterprises

H3 that knowledge creation as a partial mediation between innovation speed and competitiveness of food SMEs proves is accepted. Total effect through knowledge creation is greater than the direct relationship of innovation speed to the competitiveness of SMEs. That is, the speed of innovation followed by knowledge creation will be greater effect on the competitiveness of food SMEs. Knowledge creation can be done by knowledge sharing and learning (Merx-Chermin and Nijhof, 2004). Indications that food SMEs in Great Malang seeks to create barriers to entry for other businesses through efforts to control key success factors. Some attempts by SMEs to prevent their products from being replicated by other businesses are:

registered trademarks in order not to be copied;

maintaining quality with special recipes that have the potential to be trade secrets; and

flavoring or flavoring by owner or certain people only.

The market approach aims to strengthen product performance in an industry (Christensen and Rosenbloom, 1985) by giving customers something better in the performance of product attributes (Christensen and Bower, 1996; Christensen, 2003). Maintaining market innovation can be done by packaging products superior to competitors, providing the best service to customers, and always developing the market network. In fact, food SMEs has not optimally maintained innovation, only 17 per cent are able to perform well. Around 57 per cent of SMEs studied could not carry out the product packing well due to limited capital and lack of skilled labor. Packaging is very important in the processed food industry because it ensures the handling and delivery of processed foods from production sites to final consumers, and the

development of packaging technology can reduce product loss, maintain quality, add value and extend shelf-life products and ensure food systems (Opara and Mditshwa, 2013).

Interviews with eight owners found that the problems facing SMEs in producing quality food products are:

(1) limited supply of raw materials;

(2) limited supply of cooking oil;

(3) mixed old and young potato tubers that affect the level of maturity in the frying process that ultimately affect the taste;

(4) limited labor skills in making the right bread dough. While the skills-related issues of labor are:

the mental worker is willing to work easily;

the skill of preparing quality of raw materials;

the proper skill of frying chips; and

the low level of discipline and worker honesty.

(5) the limited number of workers who master the composition of the spice mixture for flavor; and

(6) workers are still less diligent to learn something new.

These are the things that local governments must use to design a training program to really improve the competence of SMEs.

Some scientists argue that small businesses are more likely to innovate which is potentially creative destruction than large enterprises (Sutton, 1997; Blundell et al., 1999; Nicholas, 2003). They explain that agency issues reduce the effectiveness of research and development in large companies. Schumpeter's economic development theory explains that entrepreneurial small business is a fertile place for the invention of new technology (Nicholas, 2003).

This study proves the existence of creative destruction theory by Schumpeter (1943) which was later developed by Abernathy and Clark (1985), Christensen and Rosenbloom (1995), Christensen (2003), Yu and Hang (2009), Gilbert (2012), and Bergek et al. (2013). Schumpeter (1943) describes creative destruction as a process of transformation of that accompanies radical innovation. Abernathy and Clark (1985) emphasize that creative destruction is the motor of growth, by building a framework of analysis of the implications of innovation on competitiveness. Christensen and Rosenbloom (1995) affirm that companies that have built a strong marketing network do not need to change the company's innovation strategy as it maintains innovation strengthening performance in the industry. Yu and Hang (2009) explain that established companies tend to perform creative destruction through incremental innovation but fail to innovate radically. Gilbert (2012) adds that companies which have been in the industry succeeded in doing creative destruction through competence-enhancing. This study found that creative destruction that increases competence and maintains innovation (Bergek et al., 2013) significantly mediates the effect of the speed of innovation development on the competitiveness of food SMEs in Malang.

8. Conclusions and limitations

What can be concluded from this research is as follows:

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The pace of innovation development is very important to improve the competitiveness of food SMEs. Innovation ideas are quickly realized and products that enter the market faster have greater opportunities to increase competitiveness through profits and productivity.

The pace of innovation development increases the competitiveness of food SMEs. This study proves that competitiveness can be increased once the pace of innovation development is followed by creative destruction. Creative destruction, in this case, is done through increased competence and maintain the innovations that have been achieved by food SMEs. Increased business competence could be conducted through cost efficiency, enhancing product quality, and improving worker skill. This is done while maintaining innovation achieved to strengthen market networks, customer service and innovation in product packaging.

The government's role is proven not to strengthen the relationship of the pace of innovation development and competitiveness of food SMEs.

The role of the government is reflected through credit facilities, business licensing, promotion, marketing, and training. This has been done by the government. However, this activity did not produce a broad impact in strengthening the pace of innovation development to improve the competitiveness of food SMEs.

Building a spiral model of innovation, learning and knowledge creation, and trying entirely, is new not only for companies but also in the study of the development of human resources connected with innovation. It combines three concepts that have not been examined much in conjunction before. The model can help organizations to become aware of the relationship between these concepts and the factors that can influence them. This is increasingly important because of the shift from a predictable world paradigm to one governed by discontinuous change. The factors that influence the innovation, learning and knowledge creation spiral model can have an effect on the organization's ability as regards learning to learn and its ability to gain and apply knowledge.

This study found that innovation speed is very important to improve the competitiveness of food SMEs. The idea of innovation that is quickly realized and the result is faster entering the market has a greater chance to improve competitiveness. Innovation speed enhances the competitiveness of food SMEs, but this study found that competitiveness can be improved when innovation speed is followed by creative destruction. Creative destruction can increase competence and sustain innovation that enables food SMEs to create barriers to entry into new companies and widen their distance from similar companies, thus providing a stronger impetus for competitiveness.

This study has two limitations. First, this study analyzes processed foods in general so it cannot express the characteristics of each type of food. Research focusing on certain types of foods such as fruit chips or processed meat and fish can provide specific information to support programs such as One Village One Product. Second, this study analyzes the speed of innovation without differentiating type of innovation (product, process, organization, or business). Analysis of innovation speed based on the innovation type will be useful for improving competitiveness of food SMEs effectively and efficiently. Future research on the role of government as a catalyst in the empowerment of SMEs and the barriers of SMEs in utilizing government facilities needs to be done.

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Corresponding author
Stefanus Yufra M. Taneo can be contacted at: stefanus.yufra@machung.ac.id