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Keywords: Knowledge | Competitiveness | Fashion Industry Agglomeration

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Abstract *The purpose of this study was to explore how knowledge in a successful fashion industry is developed and used, and how this knowledge affects industry competitiveness. Based on a case study method, thematic themes explaining the relationship between knowledge and fashion industry competitiveness were identified through constant comparative analysis of the existing literature. In this study, the three knowledge characteristics (increasing returns to scale, non-rivalry and non-excludability, and tacit and codifiable nature) were systematically applied to the four major functional areas of fashion industry. Based on new growth theory, it was proposed that increasing returns to scale present in agglomerations helped increase fashion industry competitiveness through knowledge in all types of fashion industry through design, product development and supply chain management, marketing, and craftsmanship. The study provides implications for policy-makers and industry liaisons to improve the competitiveness of the fashion industry and a theoretical foundation for future fashion industry competitiveness research to further identify factors that determine fashion industry competitiveness.*

Key words *Knowledge, Competitiveness, Fashion Industry Agglomeration*

Introduction

With increasing competition in the global markets, various scholars acknowledged the importance of knowledge and industry agglomeration in industry competitiveness (Kapoor, 2013; Rantisi, 2002; Yam, Lo, Tang, & Lau, 2011). Knowledge in the competitiveness research area is defined as commercial

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knowledge in the production process that increase values in production output of an industry, given the same labor and capital inputs (Mudambi, 2008). Scholars believe knowledge increases efficiency in producing final products with the same inputs (Rantisi, 2002) because intellectual assets that a business possesses result in producing products with higher value (Mudambi, 2008). Because of the importance of knowledge in industry competitiveness, there are many studies ranging from the information and communications technology industry (Kapoor, 2013) to manufacturing industries (Rantisi, 2002; Yam et al., 2011). In the context of knowledge studies, scholars added the concept of location as indispensable in explaining how industry became competitive (Krugman, 1991; Romer, 1986). Location is especially important for industry agglomeration - or a set of interrelated businesses in a geographic proximity. The new growth theory by Romer (1986) and Krugman (1991) provided a good explanation for why some industries in certain locations become a center of knowledge creation and sharing; and as a result, provided a competitive environment to foster competitive industries.

Scholars believe the concept of knowledge in the fashion industry's competitiveness is especially important for developed countries (Dickerson, 1995; Jones, 1998). Most developed countries have a comparative disadvantage in labor cost, which is considered as one of the most important factors that determine fashion industry competitiveness (Dickerson, 1995). Scholars also believe most developed countries with additional capital investments in the fashion industry would not yield as much output and productivity growth as developing countries because of capital saturation in these industries (Jones, 1998). Acknowledging the current limitations of the investigation of labor cost and capital for improving competitiveness in the fashion industry of developed countries, a large number of scholars started investigating the importance of knowledge and industry agglomerations in the fashion industry (e.g., Bertacchini & Bonione, 2009; Merlo & Polese, 2006; Rantisi, 2002). Bertacchini and Bonione (2009) investigated the relationship between creativity and the agglomeration formation in cultural product industries (e.g., fashion) in Italy and found that metropolitan areas are more important in cultural content production and consumption and craft-based industry and design systems tend to locate in non-metropolitan areas. Merlo and Polese (2006) explored the reason for Milan became an international fashion hub and accredited its high level of knowledge - creativity and managerial capabilities - and resource accumulation as one of the factors. Rantisi (2002) found that localized knowledge in New York fashion industry resulted in specialized services and institutions which encouraged competitiveness of the industry. Even with various research on knowledge and industry agglomeration, there has been little holistic approach that explored how knowledge for each specific sector of the fashion industry in an industry agglomeration is formed and how it affects the industry competitiveness.

The purpose of this study was to explore how knowledge is developed and used, and how this knowledge affects industry competitiveness in a fashion industry agglomeration (Krugman, 1991; Romer, 1986). Based on a case study method (Yin, 2009), thematic themes explaining the relationship between knowledge and fashion industry competitiveness were explored through constant comparative analysis of the existing literature. The results explained the relationships between knowledge created in a fashion industry agglomeration and its competitiveness. The study provides implications for policy-makers and in-

dustry liaisons to improve the competitiveness of the fashion industry and a theoretical foundation for future fashion industry competitiveness research to further identify factors that determine fashion industry competitiveness.

Theoretical Framework

Knowledge and Industry Agglomeration in New Growth Theory

New growth theory provided a new paradigm to understand the importance of a geographic location as an environment, where an industry agglomeration is formed, and argued that it fostered industry competitiveness through knowledge, creation, and sharing (Krugman, 1996; Nell & Thirlwall, 2014; Romer, 1986). Scholars believed successful industry will form an industry agglomeration in a specific location where they could take advantage of business knowledge created by members of the community and shared through social networks of the agglomeration (Inkpen & Tsang, 2005). There are three major characteristics of knowledge: (1) increasing returns to scale, (2) non-rivalry and excludability, and (3) codifiability / tacitness that affects the formation of closely located businesses that benefit from each other (Romer, 1986). A combination of these characteristics results in the formation of an industry agglomeration by (1) providing extra value to final products (increasing returns to scale), (2) spreading knowledge across regions (non-rivalry and excludability) and (3) limiting the size of knowledge spread (codifiability / tacitness).

Increasing Returns to Scale

Knowledge allows an industry to become more competitive in producing products because of extra value created from the production process through increasing returns to scale. Increasing returns to scale happens when increase of the all inputs (e.g., labor) leads to a more than proportional increase in the output means. In a traditional production process, the unit increase in all inputs will yield less than proportional increase in the output return because they have decreasing returns to scale (Mert, 2016). Production processes that utilize only traditional input, labor and capital, will experience their returns to scale depreciating (Romer, 1986). In contrast, firms can continuously input new knowledge to their production process without depreciating its value (Jones, 1998). Furthermore, the accumulation of knowledge affects productivity by upgrading skill levels of labor in various ways by improving to acquire the existing knowledge and new knowledge. Workers with new expertise, and skills from new knowledge will be more efficient in generating new knowledge to further improve productivity (Audretsch & Feldman, 1996). For example, a product based on new knowledge (software), is developed. The company does not have to spend money to use the knowledge and can produce products based on this new knowledge, allowing their return to scale to remain the same (Evans, 1989).

Non-Rivalry and Non-Excludability

The concept of non-rivalry and non-excludability in knowledge explains how knowledge spreads out from

its source (Jones, 1998; Romer, 1986). Non-rivalry means the characteristics of goods that can be used by many people at the same time. Knowledge can be shared among many people at the same time because it is not a physical form, but a string of human thoughts. Once new knowledge is developed, multiple users can share it through verbal communications such as written messages or talking (Cortright, 2001). Another important characteristic of knowledge that contributes to its spreading is non-excludability. This is the ability not to exclude others from using the knowledge created. For example, the government cannot prevent some people from using the content of the internet, and many people use it simultaneously. These two characteristics of knowledge, non-rivalry and excludability, allow new knowledge to spread and be shared among companies in an agglomeration (Cortright, 2001).

Tacit and Codifiable Knowledge

The type of knowledge, codifiable or tacit, is critical to determine the boundary of knowledge spread in an agglomeration. Codifiable knowledge can be "written" and easily transmitted from one individual to another, whereas tacit knowledge is "learned from experience and cannot be easily transmitted from one individual to another" (Cortright, 2001, p. 20). The distance between the source of codifiable knowledge and a knowledge learner does not make a difference to obtain codifiable knowledge due to digitization of codifiable knowledge in documents through the spread of digital networks such as the internet (Cortright, 2001). However, the proximity between the source of knowledge and a knowledge learner becomes an issue when dealing with tacit knowledge (Jones, 1998). Tacit knowledge cannot be written on paper or typed on a computer and delivered to the learner. To learn, the learner should be at the site of the knowledge source because tacit knowledge is embedded in the knowledge source. The only way to learn tacit knowledge is to experience the knowledge from the knowledge holder. Therefore, the size of agglomeration is limited. The existence of tacit knowledge will also attract more workers; who, in turn, will learn from the existing tacit knowledge of the agglomeration and create new knowledge for further productivity growth (Romer, 1986).

Industry agglomeration is a set of closely located businesses that benefit from increasing returns to scale of knowledge (Ellison, Glaeser, & Kerr, 2010). The knowledge in the agglomeration will be widely spread inside and outside of the agglomeration because of the nature of no-rivalry and no excludability, but the spread has a geographical limitation because of the tacit nature of certain knowledge. Figure 1 summarizes the relationship between knowledge characteristics and the size of industry agglomeration. Once an agglomeration is formed, it is difficult to reverse creation because of the inflow of traditional production factors (e.g., labor) into the agglomeration (Lall, 2003). This inflow of traditional production factors helps an industry agglomeration through a virtuous circle of industrial competitiveness that creates high value added products through knowledge creation and sharing (Arthur, 1989). Therefore, it is hard to create an industry agglomeration in a new location unless there is "concerted policy action" from the government that intentionally injects knowledge development through industrial policies (Lall, 2003, p. 5).

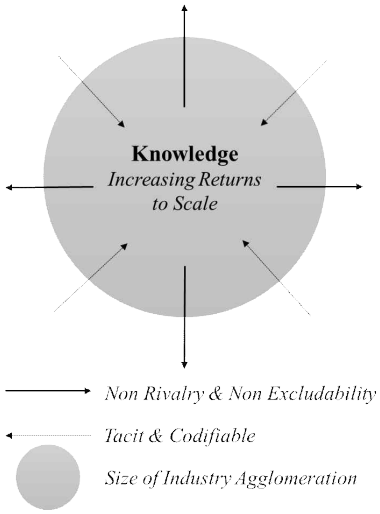

Figure 1.
The relationship between knowledge and the size of industry agglomeration.

Based on the new growth theory about industry agglomeration and knowledge characteristics, four research questions to explore the role of knowledge in fashion industry competitiveness were proposed:

1. How does knowledge help building a successful industry agglomeration in the fashion industry?
2. How do businesses in a fashion industry agglomeration benefit from knowledge to increase their productivity through increasing returns to scale?
3. How do businesses in a fashion industry agglomeration benefit from knowledge in the agglomeration based on its non-rivalry and non-excludability characteristics?
4. How do businesses in a fashion industry agglomeration lock/spread new knowledge based on tacit and codifiable characteristics of knowledge?

Methods

To understand what types of knowledge in the fashion industry are available and how the creation and sharing of knowledge work to increase industry competitiveness, this research utilized qualitative data analysis, namely constant comparative analysis, to understand the process of the creation and sharing of knowledge in fashion industry agglomeration. Qualitative research can be used to explain a phenomenon where only "partial or inadequate theories exist for certain populations" (Creswell, 2013, p. 48). Since there has been no one theory to specifically explain knowledge creation and sharing in fashion industry

agglomeration, this research aimed to "capture the complexity of the problem" of the topic using the qualitative research method (Creswell, 2013, p. 48).

The research used Krugman's new growth theory as an analytical framework to categorize emerging themes in fashion industry agglomeration congruent to the constructs of his theory (Creswell, 2013). This research also used new growth theory to identify patterns in literature in terms of knowledge creation and sharing in fashion industry agglomeration. After the deductive data patterning of the collected data, one of the authors inductively compared the patterned data to reflect the characteristics of the knowledge sharing and spread in a fashion industry agglomeration. During the qualitative data analysis, the authors "layer analysis into increasing levels of abstractions from codes, to themes, to the interrelationship of themes, to larger conceptual models" (Creswell, 2013, p. 52). Data was collected and organized "inductively into more abstract units of information" (Creswell, 2013, p. 45). As a result of the analysis, this research explored thematic themes explaining how knowledge in fashion industry agglomeration is created and shared.

In this research, twenty scholarly publications on knowledge in fashion industry agglomeration between 1989 and 2012 were collected and analyzed through a research database (i.e., Business Source Premier). Information on knowledge in fashion industry agglomeration was collected using the snowballing technique where one author found articles related to the subject matter and looked into other related articles in the reference list of the article. This study used a constant comparative analysis method to simultaneously compare newly collected information to the existing data, based on the new growth theory (Boeije, 2002). The analysis resulted in the following two major categories: (a) fashion industry agglomeration and (2) knowledge in fashion industry agglomeration. The authors further analyzed subcategories for knowledge in fashion industry agglomeration into (a) knowledge in design and product management, (b) knowledge in product development and supply chain management, (c) knowledge in marketing, and (d) knowledge in craftsmanship. Themes inductively retrieved from knowledge theory were used as a basis of further explanation of detailed characteristics of knowledge in each category.

Results and Analysis

Fashion Industry Agglomeration

Fashion industry agglomerations function as innovative centers of fashion design, production, and marketing and provide a large share of total domestic apparel production (Merlo & Polese, 2006). Because innovation in the fashion industry "takes the form of imitation - rather than variation" (Rantisi, 2002, p. 459), geographic proximity among rival firms strengthened instantaneous adoption of new fashion trends, which reinforced competitiveness of the industry sector (Rantisi, 2002). The formation of fashion industry agglomeration in developed countries was especially important because of the industries' comparative disadvantage in labor costs when competing with developing countries (Dickerson, 1995). For example, the New York City Garment District has traditionally been a center of women's fashion design and production with the support of various interrelated industries. This Garment District is an agglomeration of

4,000 fashion-related businesses, such as apparel manufacturers, contractors, textile suppliers, including "design school, buying offices, forecasting services, and trade associations" (Rantisi, 2002, p. 442). This agglomeration makes New York City a recognized world's fashion industry agglomeration.

Knowledge in the Fashion Industry

Design

Design in fashion industry agglomeration created commercial value from aesthetic attributes, symbolically reflecting social and cultural environment of a specific location (Tremblay, 2012; Wenting, 2008). Social and cultural environments of a specific location encompassed an accumulated knowledge of arts, which fashion designers, product developers and merchandiser translated into fashion products. Creation of high-value textile and apparel products was based on design expertise, incorporating "artistic creativity and technical excellence" into a final product (Wenting, 2008, p. 595). The accumulated artistic knowledge in the social and cultural environments of specific locations are found in local museums, galleries, and cultural events and even in street fashion and trends, subcultures and shopping experiences of the loci (Onohara, 2011). Some knowledge available in a location are shared easily with anybody because of their non-rivalry and non- excludability nature. Furthermore, a large number of accumulated artistic knowledge was coded and shared online through virtual museum catalogues or private photos on social networks. However, a large amount of accumulated artistic knowledge is tacit in nature, and only shared through direct interactions between the knowledge and the perceivers. Limited channels of communication between the accumulated artistic knowledge and perceivers are available, but lack of technology does not allow full artistic knowledge with perceivers. For example, details of a painting, the position of an artifact in relationship to other artifacts, and the coordination of the artifact to the environment (architecture), smells, music from artifacts in museums, pictures in galleries cannot be shared fully to perceivers if they are not in direct contact with the artistic work. Street fashion, social moods and atmosphere in relation to fashion industry also cannot be codifiable (Rieple & Gander, 2009). As a result, the locations of fashion industry agglomerations are bestowed with meanings of artistic excellence in fashion production; and production locale for high-end textile and apparel products translate into symbolic meanings and premiums for a product (Wenting, 2008).

The use of the accumulated knowledge for producing fashion products increased returns to scale because apparel origin in such an agglomeration can ultimately yield high-value-added to a final product through "an aura of authenticity" and "premium prices in the world market" (Scott, 2006, p. 1529), such as Paris fashion or Italian shoes (Bertacchini & Borrione, 2009; Pike, 2009). For example, the design knowledge Milan agglomeration endows is "the intangible and culture-laden qualities of such physical goods" (Bertacchini & Borrione, 2009, p. 13). An agglomeration in the Italian city of Milan, one of the world's fashion industry agglomerations, is a prime example of the fashion industry incorporating knowledge in design and product development processes into textiles and apparel (Bertacchini & Borrinone, 2009). Based on data analysis, knowledge of design has characteristics of increasing returns to scale, in-

creasing artistic excellence of a final product through the accumulated artistic knowledge in fashion industry agglomerations. The accumulated artistic knowledge was shared by the members of a local community through non-rivalry and non-excludability, but the size of the fashion industry agglomeration was limited because some accumulated artistic knowledge, such as architecture, had a tacit nature.

Product development and supply chain management

Firms in a fashion industry agglomeration also benefited from the network of suppliers, customers, and competitors, resulting in knowledge of product development and supply chain management (Chapple, 1999; Doeringer & Crean, 2006; Inogushi, 2011; Ross, 2004). As a part of the product development process, firms obtained knowledge for managing the complex aspects of businesses. "From compliance with labor laws to financing to engineering techniques, such as the use of specification sheets and time study" firms gained information through knowledge sharing among workers in the same work place and across different businesses because of non-rivalry (Chapple, 1999, p. 84). Companies in the fashion industry agglomeration accumulated knowledge about business management and coordinated "the scattered abilities and resources" (Inogushi, 2011, p. 208). Companies knew who to contact for each type of material, and what services and resources firms in the agglomeration offered (Inogushi, 2011). For example, successful Italian textile and apparel firms must possess information about any underground economy "that must stay hidden from view" (Ross, 2004, p. 211). However, knowledge about product development and supply chain management remained somewhat tacit. Outsiders found it difficult to know "where the scattered resources are or who has the superior ability" to supply the best quality materials in the fashion industry agglomeration, since the size of these firms in the agglomeration was too small to market themselves to other firms (Inogushi, 2011). Based on the data analysis, the knowledge of product development and supply chain management had characteristics of increasing returns to scale that increased the efficiency of a production process. Knowledge sharing among members of the agglomeration was achieved through non-rivalry and non-excludability, and the limit of knowledge sharing was set through the tacit nature of knowledge sharing among the members.

Marketing

Another important element of knowledge in fashion industry agglomerations was marketing, which promoted the spreading of "market trends and new design innovation" through rapid media circulation (Rantisi, 2002, p. 442). Marketing played a significant role in textile and apparel sales, especially for high-end products (Rantisi, 2002). Sales of high-end textile and apparel products depended highly on their symbolic meaning－a "strong semiotic" content－that products convey (Bertacchini & Borrione, 2009, p. 2). Produced by marketing, this symbolic meaning used runway shows and media coverage－internet, social media, fashion magazines, television, and newspaper fashion segments－that attached strong semiotic meaning to apparel products to generate sales (Rantisi, 2002).

As a part of marketing knowledge, branding also played an important role towards increasing re-

turns to scale of fashion industry agglomeration in developed countries (Evans, 1997). Textile and apparel firms in some developed countries accumulated extensive knowledge and skills in marketing and promotion that contributed to creating and maintaining a strong, consistent image of a brand, resulting in loyal customers around the world (Machhion, Danese & Vinelli, n.d.; Roth & Romeo, 1992; Tungate, 2008). For example, customers consumed the image of luxury and prestige of Christian Dior from France and Georgio Armani from Italy, and functionality, performance, and technology of Nike from the United States conveyed by marketing (Evans, 1997; Tungate, 2008). The characteristics for non-rivalry and non-excludability in knowledge benefited the marketing effort by fashion industry agglomeration the most because marketing, especially visual marketing in a form of codifiable knowledge, could be shared without a border, thanks to the development of informational technology. Based on new growth theory, the knowledge of marketing has characteristics of increasing returns to scale through branding. Knowledge in marketing was shared without a boarder because of its non-rivalry, non-excludability, and codifiable nature.

Craftsmanship

The fashion industry in many developed countries is known for craftsmanship and artisanal traditions of small- and medium-size firms (Ross, 2004). Some are famous for "industrial techniques for the production of physical objects" (Bailey, 1993; Bertacchini & Borrione, 2009, p. 4). The high-end of the apparel industry, especially the women's wear sector, is a craft industry. This sector is famous for frequent style changes and the need for highly skilled craft workers to perform complex and intricate work, such as tailoring skills, one-of-a-kind designs and customized production (Bailey, 1993; Martin, 1995; Pike, 2009) that yield increasing returns to scale to the industry by building as a luxury brand. The size of apparel firms in the high-value-added niche market is much smaller; each worker has a wide range of skills and sometimes a single worker makes an entire garment through extensive apprenticeship (Doeringer & Crean, 2006; Martin, 1995; Pike, 2009). For example, Ross (2004) mentioned Italian fashion industry consisted of craft industries highly influenced by the traditions "of making things by hand in artisanal workshops as old as the Renaissance" (p. 210). Another example is highly skilled workers in the Japanese apparel industry. These workers are not only famous for assembly work, but for beadwork and embroidery, and skills of dyeing and decoration (Martin, 1995). The workers with high craftsmanship show they are very versatile in terms of their techniques because of various, changing jobs they undertake to create a high value-added product in an apparel production, dependent upon moving fashion trends. This is a good example of increasing returns to scale transmitted to the worker's ingenuity to learn different skills faster and better. Additionally, the established craftsmanship reputation of fashion industry agglomerations draw young talent from around the world, who come to learn craftsmanship knowledge and acquire new skills, thus further developing innovation and competitiveness of these agglomerations (Porter, 1990). It was the tacit nature of craftsmanship education that determined apparel and textile agglomeration sizes because the training required residency of trainees, especially for hands-on

characteristics of apparel manufacturing for apparel assembly. Based on new growth theory, the knowledge of craftsmanship has characteristics of increased returns to scale through expertise of craftsmen. The knowledge of craftsmanship was hard to share outside of fashion industry agglomerations because of the tacit nature of craftsmanship training.

Discussion and Implications

The purpose of this study was to explore how knowledge in a successful fashion industry agglomeration is developed and used, and how this knowledge affects industry competitiveness (Krugman, 1991; Romer, 1986). Based on a case study method (Yin, 2009), thematic themes explaining the relationship between knowledge and fashion industry competitiveness were identified (Table 1). The three knowledge characteristics (increasing returns to scale, non-rivalry and non-excludability, and tacit and codifiable nature) were systematically applied to the four major functional areas of fashion industry. Based on new growth theory, it was proposed that increasing returns to scale present in agglomerations helped increase fashion industry competitiveness through knowledge in all types of fashion industry through design, product development and supply chain management, marketing, and craftsmanship as Audretsch and Feldman (1996), Krugman (1996), and Romer (1986) predicted. For example, fashion designers translated accumulated knowledge of arts into fashion products for the creation of high-value textile and apparel products in design. Knowledge in product development and supply chain management increased efficiency of a production process by increasing product quality and lead time. Creating and maintaining a strong, consistent brand through marketing also affected increasing returns to scale through consumer loyalty for a brand in a certain fashion industry agglomeration. Finally, mastery of craftsmanship in fashion industry agglomeration added additional value to final products.

Next, it was proposed that non-rivalry and non-excludability of knowledge supported the circulation of knowledge that bore increasing returns to scale across the agglomeration (Cortright, 2001), especially through knowledge sharing in design, product development, and supply chain management and marketing (Table 1). For example, fashion designers benefited from accumulated artistic knowledge (e.g., museums, opera houses, architecture, etc.) in social and cultural environments of a specific location where fashion industry agglomerations existed. Knowledge for increasing efficiency of a production process was also directly and indirectly shared in product development, and supply chain management among members of the agglomeration through direct communications and observations of what competitors were achieving. Fashion marketing also used the non-rivalry and non-excludability nature of knowledge to spread their messages without a border through informational technology.

The final characteristic of knowledge－tacit and codifiable nature－was also witnessed in various sectors of fashion industry agglomeration (Romer, 1986) that determined the size of the agglomerations (Table 1). In a design sector, all accumulated artistic knowledge in a location could not be easily transferred through visual and audio tools because of limited technology and the nature of the accumulated artistic knowledge (e.g., architecture). In product development and supply chain management sectors, tacit

Table 1.
Thematic themes of fashion industry competitiveness

	Design	Product Development and Supply Chain Management	Marketing	Craftsmanship
Increasing Returns to Scale	Accumulated knowledge of arts and culture designers translate into fashion products for creation of high-value textile and apparel products incorporating "artistic creativity and technical excellence" and cultural and social environment into a final product.	Increasing efficiency of a production process through knowledge sharing among agglomeration members.	Branding that contributes to creating and maintaining a strong and consistent image of a brand, resulting in higher profit for companies in a fashion industry agglomeration.	Expertise and versatility of workers in mastering different techniques of apparel production.
Non-Rivalry and Non-Excludability	Designers in fashion industry agglomerations are exposed to new trends in a demanding consumer market that can afford the latest fashion and styles due to status or other reasons. All firms benefit from the high fashion atmosphere constantly being renewed.	Knowledge sharing of product development and supply chain management among members of the agglomeration including technology & machinery, software for product development	Firms learn innovative marketing strategies by watching other firms' billboards, shows, and fashion weeks, etc. online or other outlets.	Location of top educational institutions in agglomeration (such as FIT and Parsons). Any firm in the agglomeration can hire top graduates, no firm is excluded
Tacit and Codifiable Nature	Difficult to transfer all accumulated knowledge of a location due to the nature of the accumulated artistic and cultural knowledge.	Knowledge and accessibility of best available sources for materials and services in the fashion industry agglomeration.	Firms create innovative marketing strategies from watching other firms' billboards, shows, fashion weeks, etc.	Craftsmanship training through apprenticeship that requires residency.

knowledge about where to locate the scattered resources hidden in the agglomerations also limited the growth of the size of the agglomerations indefinitely. This research also discovered the transfer of tacit knowledge in craftsmanship and know-how accumulation to adapt quickly for different techniques to master for experienced seamstresses in the location was also a very important factor that determined the size of fashion industry agglomeration.

As the previous research suggested, this research supported the existence of fashion industry agglomerations that helped competitiveness grow (Krugman, 1991 & 1996; Romer, 1986). The industry agglomeration in the fashion industry also showed they actively utilized the characteristics of knowledge to achieve increasing returns to scale in all fashion industry sectors including design, product development and supply chain management, marketing and craftsmanship. All of the sectors had strong non-rivalry and non-excludability natures that spread out knowledge in the agglomeration. The tacit nature of certain knowledge in design, product development and supply chain management, and craftsmanship caused the size of the agglomeration not to expand without a border.

This research provided theoretical and practical implications for improving fashion industry competitiveness. This research was the first to analyze how knowledge affected fashion industry competitiveness using new growth theory by Romer (1986) and Krugam (1991). From a practical perspective, this research provided policy implications on how to increase competitiveness in a fashion industry by encouraging the formation of an agglomeration and how to manage knowledge in favor of creating and reinforcing fashion industry agglomeration through understanding its characteristics in each sector of fashion industry agglomeration. Policy makers can pay attention to facilitate policies to create new knowledge which provides increasing returns to scale to the industry, to spread out the new knowledge through the non-rivalry and non-excludability nature and to contain the spread of the new knowledge in their location of interest by focusing on the tacit nature of knowledge.

This study is a preliminary study in exploring the relationship between production knowledge and competitiveness in the fashion agglomeration. The study, however, has limitation in data collection where the snowballing technique was used. The snowballing technique inherently limits the type of data collected will be only in the scope of the author's ability to find in the field (Biernacki & Waldorf, 1981). Another limitation includes the lack of validity and trustworthiness measures of the data that was collected through the snowballing technique. Based on that, future research can further investigate the topic with a bigger sample with a better representation of the population and a better measure of validity and trustworthiness. Future research based on this study should also include the investigation of how knowledge is created, shared, and managed in various steps of fashion industry agglomeration with different research methods such as interview or survey. Based on that, researchers can define the construct of knowledge in the fashion industry in different sectors that can be tested in the existing fashion industry agglomeration. Another possible research topic could include the investigation of how each sector of the fashion industry affects each other in terms of knowledge creation and knowledge sharing; and how the knowledge is transferred inside each sector and across each sector.

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