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Since Richard Florida's theory of the creative class was first introduced, many related studies of creativity, have been undertaken regarding analyzing the key features and predictors of the knowledge economy. Though the notion of the creative class has been popular for nearly two decades, not many studies have analyzed creativity in Japan. The objective of this dissertation is to analyze the geographical patterns of the creative class in the Greater Tokyo Area (GTA) to better understand the key predictors that drive the spatial variation of the creative class. Based on data from the Japanese Ministry of Internal Affairs and Communication, the spatial distribution of the creative class seemed highly uneven for the 138 cities and wards of the GTA with significant concentrations in Kawasaki, Tokyo and Yokohama. A stepwise regression analysis revealed that 68.9 percent of the spatial variation in the creative class by place of work could be best explained by the share of the labor pool in science research, professional and technical services, and also information and communication industries. On the other hand, 92.3 percent of distribution of creative class by place of residence could be explained by a more traditional human capital predictor, the percent of the population with a bachelor's degree. Those parts of the GTA with disproportionate shares of technical skills and high shares of educated individuals seem to generate highly creative labor markets. Since a key component of the creative class differs markedly by place of work and place of residence, it seems geography is a major factor in explaining the distribution of creative class in the GTA.

THE GEOGRAPHY OF CREATIVITY

IN THE GREATER TOKYO AREA:

2000-2010

by

Makoto Ikegaya

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APPROVAL PAGE

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TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

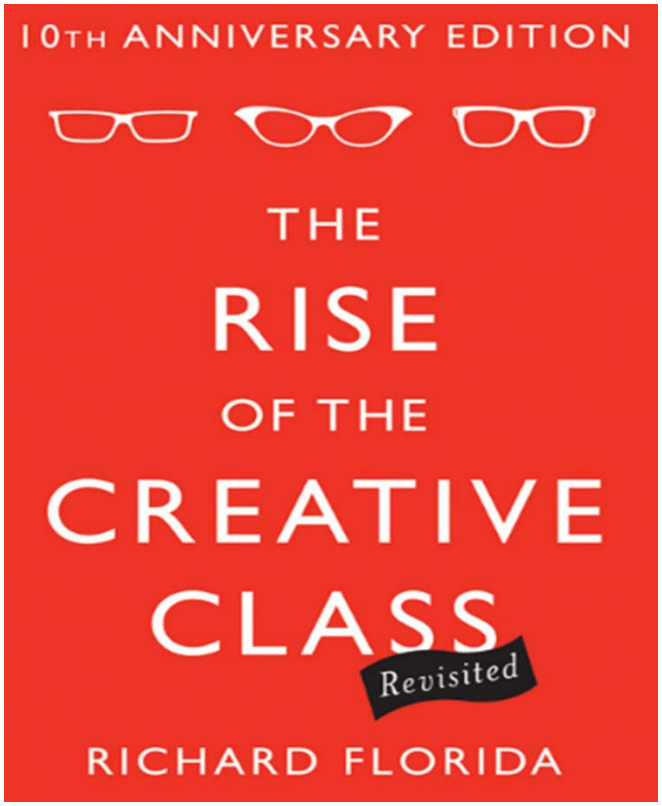
Page

CHAPTER I

INTRODUCTION

Richard Florida in *the Rise of the Creative Class* (2002) claimed that creative people, not industries, are the engine of regional economic growth (Figure 1).

Figure 1. The Rise of the Creative Class by Richard Florida



Source: https://www.huffingtonpost.com/richard-florida/the-creative-compact_b_1614218.html

The economic value of the creative class comes from their work which revolves around innovation, a quality seen as essential to urban growth. Florida argued that quality of place attracted the creative class to certain cities with various lifestyle amenities and employment opportunities (Florida 2002, 2003, 2005a, 2012, 2014; Bereitschaft and Cammack 2015). Since Florida's ideas on the creative class were first introduced (Florida 2002), many related studies of creativity, such as the creative cities and the creative industries' concepts, have been undertaken regarding analyzing the key features and predictors of creative environments (e.g. Peck 2005; Markusen 2006; Scott 2006; Landry 2008; Pratt 2008; Brennan-Horley and Gibson 2009; Florida and Mellander 2009; Andersson et al. 2011; Florida 2012, 2014; He and Gebhardt 2014; O'Connor and Gu 2014; Bereitschaft and Cammack 2015). The notion of the creative class has been popular for more than a decade, and several studies have analyzed creativity in Japan (Yoshimoto 2003, 2009; Westlund and Calidoni-Lundberg 2007; Sasaki 2010; Fukushima and Tachibana 2014; Ueno and Suzuki 2014; Watanabe 2014; Asada 2015; Kakiuchi 2016; Nohara et al. 2016; Konno and Itoh 2017).

The objective of this dissertation is to analyze the geographical patterns of the creative class for the 138 municipalities (cities and wards) within the nine contiguous prefectures (Jacobs 2011, 2012, 2014) of the Greater Tokyo area (GTA) to better understand the key predictors that drive the spatial variation of the creative class in Tokyo. Previous studies of creativity in Japan and Tokyo have focused only at the prefectural statistical level (Yoshimoto 2003, 2009; Westlaud and Calidoni-Lundberg 2007; Asada 2015) or on creative industries or creative cities as a whole (Sasaki 2010;

Lee and Kaga 2013; Fukushima and Tachibana 2014; Ueno and Suzuki 2014; Watanabe 2014; Kakiuchi 2016; Nohara et al. 2016; Konno and Itoh 2017). The primary findings of this dissertation suggest that Florida's creative class theory is mutually supportive of other urban development theories such as the World/Global City theories (Friedmann 1986; Sassen 1991, 2001), the Nested City theory (Hill and Fujita 2003; Jacobs 2003b, 2006, 2011), Innovative City theory (Simmie 2001, 2005; Fujita and Hill 2005), and Human Capital theory (Westlund and Calidoni-Lundberg 2007; Hoyman and Faricy 2009). The analysis of the spatial distribution of the creative class will be an important first step to better understanding the creative economy of the Tokyo area.

This dissertation will examine creativity as measured by the Japanese Standard Occupational Classification (SOC) system for the three most recent Population Census of Japan years of 2000, 2005 and 2010 that were available at the time of this study. In particular, employment in the creative class (discussed in detail in the literature review and methods sections) is analyzed for 138 political units of the Greater Tokyo Area.

The dependent variable for the dissertation is the percent of the creative class by sub-area in the GTA. The creative class dependent variable is subdivided into those that are part of Florida's super creative class (e.g. researchers), the creative professional class (e.g. government officials) and the creative class in aggregate. Additionally, the regression analysis for these three types of creative class is, in turn, subdivided by place of work and place of residence leading to six regression models in total. The independent variables selected for the regression analysis are based on previous scholarly work but also include other independent variables that might better capture the geography of the

creative class in the GTA. The purpose of this regression analysis is to specify and test the functional relationships that exist between the percent of the workforce that is classified as part of the creative class and various independent variables.

The following central research questions will be addressed: 1) How is Florida's original definition of the creative class that includes the super creative class, the creative professional class and the creative class in aggregate, distributed in the central GTA? 2) What socio-economic variables best explain this distribution? 3) To analyze the distribution of creative class between place of work and place of residence and which socio-economic variables best explain any particular differences in distribution? 4) Is Florida's theory applicable to Tokyo and what are the key western/non-western differences? The findings of this dissertation will be presented in two parts. First, this dissertation will serve to empirically frame some of the key issues affecting regional development as Tokyo evolves from a traditional global city to a more knowledge-based economy. It is expected that results will show that the size of the creative class is partly explained by a small set of independent variables, that an uneven geography exists and that a concentration of the creative class exists within parts of the Greater Tokyo Area. Secondly, the results of the regression analysis will be discussed. This analysis will specify and test the functional relationships that exist between the percent of the workforce that is classified as part of the creative class and various independent variables. It will be argued that the geography of the creative class in the Greater Tokyo Area is noticeably different when comparing the data by place of residence versus place of work.

In this dissertation, the following analytical techniques will be utilized to test the research hypothesis:

1. **Maps**: to show the spatial distribution of the creative class and the statistically significant independent variables.

2. **Tables**: to highlight the Standard Occupational Classifications System creative class data by sub-area in the central GTA.

3. **Regression models**: to determine if a link exists between the creative class and various independent variable

CHAPTER II

LITERATURE REVIEW

The theory of the creative class is a relatively new typology compared to other theories of economic and urban development, but the study of human capital began in the 1950s (Becker 1964; Hoyman and Faricy 2009; Glaeser 2005; Florida 2014).

2.1. What is the Creative Class?

The theory of the creative class by Richard Florida (2002) emerged at the beginning of the 21st century. Florida (2002, 2012) argued that the distinguishing characteristics of the creative class were that its members engaged in work whose primary function was to create meaningful new forms or ideas. He also argued that the creative class can have a significant impact on regional economic growth, even when controlling for the effects of education and other factors. For example, the creative class can help to raise overall productivity levels in regional economies by enhancing the entrepreneurial culture of the region (Florida 2002, 2012; Florida et al. 2012). Also the creative class can serve as an alternative measure of skill that is based not strictly on educational achievement but on the actual work that people do. In this way it is not a proxy for, but a direct measure of, jobs (Florida 2002, 2012; Westlund Calidoni-Lundberg 2007; Florida et al. 2010; Andersson et al. 2011; Lee and Kaga 2013; Mellander et al. 2013; Watanabe 2014).

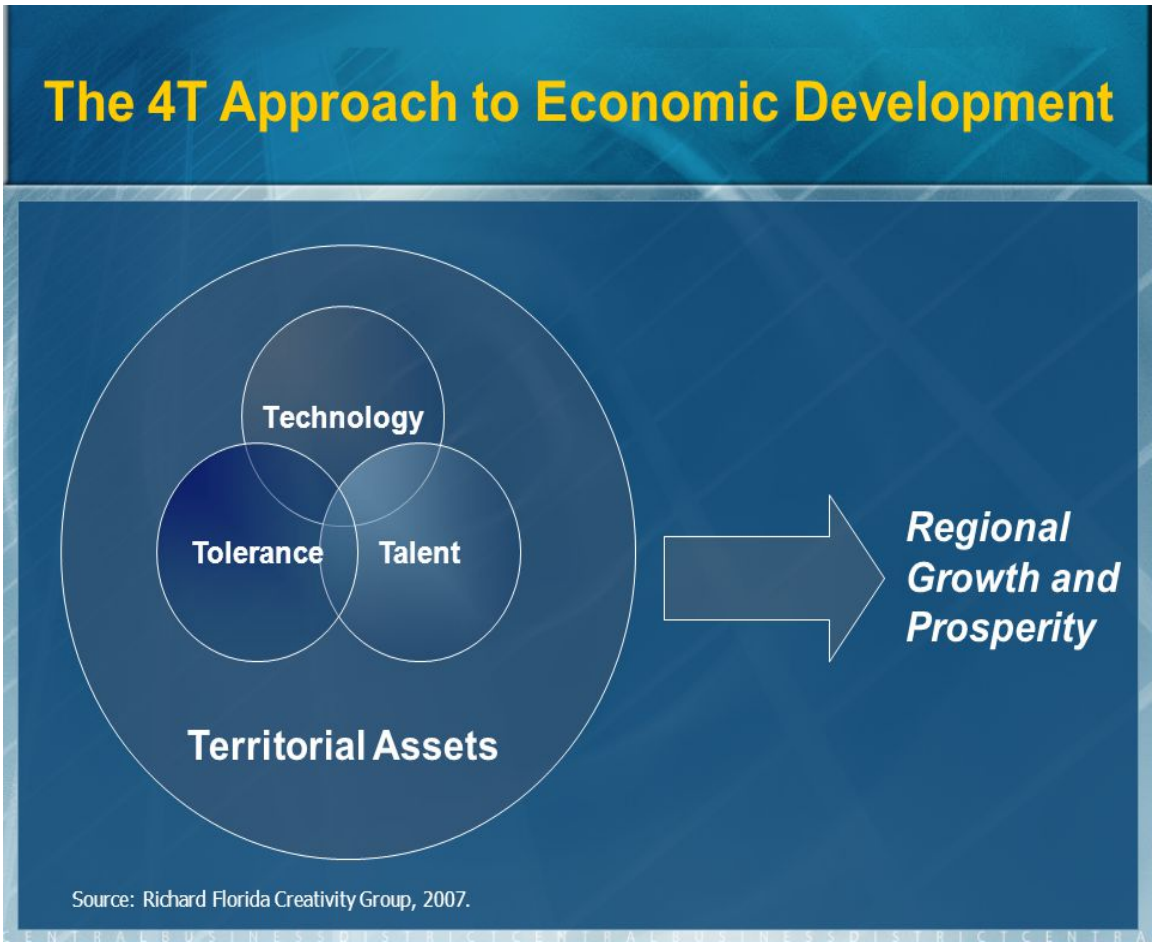
The economic value of the creative class comes from their work which revolves around innovation, a quality seen as essential to urban and regional growth. Florida argued that the quality of place and the cultural atmosphere can attract the creative class to certain cities with various lifestyle amenities and employment opportunities (Florida 2002, 2003, 2005a, 2012, 2014; Florida and Mellander 2009; Florida et al. 2010; Florida et al. 2011; Mellander et al. 2011; Bereitschaft and Cammack 2015; Kakiuchi 2017).

Florida suggested that high value-added economic development tended to involve high levels of creativity in metropolitan areas that celebrated the four T's of technology, talent, tolerance and territory (Figure 2). He argued that talented high-tech workers tend to seek out tolerant, diverse labor markets that welcome innovation and change (Florida 2002, 2012; Westlund and Calidoni-Lundberg 2007; Florida et al. 2010b; Dai et al. 2012; Kanno 2017). Many cities, industries and companies focused on increased profitability have evolved to better accommodate and promote the creative potential of their workforce (Florida 2003, 2005a, 2005b, 2008; Fukushima 2014; Kakiuchi 2014; Ueno and Suzuki 2014; Watanabe 2014).

The presence of creative individuals can signal open and inclusive regions that can in turn enhance its regional attractiveness to other talented individuals. Florida (2014, 202) argued that "a significant cultural economy amenity, such as the special role of tolerance in the cause-and-effect chain, increasing number of young singles, homosexuals, sophists, and trendoids as well as traditional nuclear families, can also help attract others to the region" Additionally, he argued that in order to increase the number of creative individuals, places must have a low barrier to entry and an openness to

diversity regarding the creative class (Florida 2007, 2014; Florida et.al. 2014; Mellander et al. 2013; Kakiuchi 2017).

Figure 2. Richard Florida's 4T Approach to Economic Development



Source : Richard Florida Creativity Group, 2007

Florida and his team, the Martin Prosperity Institution (MPI), applied a variety of empirical methods to prove that a positive relationship existed between regional economic growth and the productivity of human capital (Florida and Gates 2001; Florida, 2002, 2005a, 2005b, 2008, 2014; Westlund and Calidoni-Lundberg 2007; Florida et. al

2008; Hoyman and Faricy 2009; Gabe et al. 2012; Martin Prosperity Institute 2015). According to Florida (2012, 264), “We sought to show that it is not just the endowment of skill and talent that matters but its flow, and we wanted to test my notion that a low barrier to entry for human capital -- reflected by openness to diversity -- is a key factor for both talent and regional growth.”

Florida argued that the creative class plays a key role as dynamic agents of positive transformation in places (e.g. communities, cities or regions referring to the creative cities). Those creative individuals can assist to raise overall productivity levels in regional economies by enhancing the entrepreneurial culture of the region (Florida 2002, 2012). The creative class serves as an alternative measure of skill that is based not strictly on educational achievement but on the actual work that people do (Florida, 2002). In this way it is not a proxy for jobs, but a direct measure of them (Mellander et al. 2013). Florida contended that these more creative occupations are the magnets which draw mobile human capital, high-tech, and high-growth firms. In turn, he contended that tolerant or liberal communities and work environments attract the people who populate these critical occupations. Florida made an argument for attracting people in the creative occupations to specific places; this in turn, he claims, will cause hi-tech industries to move to that location to be close to such labor pools. Theoretically, the creative class will eventually lead to the future prosperity of the local, regional, and national economy (Trip and Romein 2010; Pratt 2011; Florida et al. 2012; Grodach 2012; Boren and Young 2013; Novy et al. 2013; Grant 2014). According to Florida (2002, 2012), the driving force in the

contemporary knowledge economy is the creative class which comprises more than 30 percent of the American workforce (Gabe et al. 2012).

Florida (2002, 2012) defined the creative class by the occupations that people have and divided it into two major components, the super creative class and the professional creative class (Figure 3).

Figure 3. The Creative Class and Other Occupational Classes

Source : Richard Florida the Rise of the Creative Class, 2002.

Florida argued that the elite level of the creative class, the so-called super creative class, produced new forms or designs that are readily transferable and widely useful. He suggested that the super creative class lies at the heart of the creative class. The super creative class included those whose occupations are in technology, business, medicine, the arts, education, and professional services. According to Florida, “their occupations

range from scientists and engineers, university professors, poets and novelists, artists, entertainers, actors, designers, and architects, as well as the thought leadership of modern society: nonfiction writers, editors, cultural figures, think-tank researchers, analysts, and other opinion-makers" (2012, 28-29). Florida (2002) suggested that the members of this super creative class frequently produced new forms or designs that are readily transferable and broadly useful, such as designing a product that can be widely made, sold, and used; coming up with a new theory or strategy that can be applied in different situations; or composing music that can be performed over and over (Barro 1991, 1997; Lucas 1988; Florida and Mellander 2009; Florida et al. 2012; Mellander at al. 2013; Fukushima and Tachibana 2014).

According to Florida (2012, 28-29) "beyond this elite level, the creative class also included the creative-professional class who worked in a wide range of knowledge-intensive occupations in high-tech sectors including financial services, the legal and health-care professions and business management" (2012, 28-29). Florida and others have argued that the creative professional classes engaged in problem-solving, drawing on complex bodies of knowledge to solve specific problems (Florida 2002, 2012, 2014; Glaeser 2005; McGranahan and Wojan 2007; Jacobs 2008; Andersen et al. 2010; Trip and Romein 2010; Marrocu and Paci, 2012; Mellander et al. 2013; Fukushima and Tachibana 2014). Florida also claimed that creative problem solving required a high level of human capital and educational attainment. Florida explained that people doing this kind of work may sometimes come up with methods or products that turn out to be widely useful. However, he also suggested why it is not part of their basic job description. According to

Florida (2012, 39), “what the creative professional class are required to do is to think on their own, apply or combine standard approaches in unique ways to fit different situations, exercise a great deal of judgement, and perhaps even try something radically new from time to time…. As they do more of this latter kind of work, perhaps through a career shift or promotion, they move up to the super creative core: producing transferable, widely usable new forms as their primary function.”

The proponents of the human capital theory, on which Florida’s idea relies, argue that the key to regional growth lies not in reducing the costs of doing business, but in the factor endowments of highly-educated and productive people (Becker 1964; Florida et al. 2008; Florida et al. 2010b; Florida et al. 2012; Florida et al. 2013; Kato et al. 2015). Jane Jacobs (1961) also noted the ability of cities to attract creative people and thus spur economic growth. The human capital theory demonstrated that creative people are a driving force in regional economic growth. From that perspective, economic growth will occur in places that possess highly educated people (Florida 2014).

From Florida’s perspective however, creative people power regional economic growth, and these people prefer places that are innovative, diverse, and tolerant. His theory differs from the human capital theory in two respects by 1) asserting that creative people are the key to economic growth, and 2) identifying the underlying factors that shape the location decisions of these people, instead of merely saying that regions are naturally endowed with various assets such as land, labor and capital (Florida 2002, 2014; Westlund and Calidoni-Lundberg 2007).

Economists established human capital as a robust predictor of per capita income levels. Human capital is also correlated with job growth and the influx of young, educated workers. Cities that invest in higher education could create and attract more educated workers and ensure the employability of their residents. Human capital theorists such as Glaeser (2005) argued that concentrations of educated individuals will produce high rates of long-term economic growth. Early proponents of human capital research argued that if individuals acquired more education, they would receive a higher rate of return via their wages (Marrocu and Paci 2012). However, Florida (2012, 2014) asserted clear distinctions exist between the creative class theory and human capital theory. He argued that human capital reflects richer places but the creative class is the one who makes a place more productive. According to Florida (2012, 265) "human capital relates more strongly to income but the creative class relates more strongly to wages. This is a critical difference, as wages are a better gauge not just of wealth, which can be imported from elsewhere, but of the productivity of a region."

2.2 Why is the Creative Class Important?

Florida (2003, 2005a, 2008; Florida and Mellander 2008, 2011) argued that knowledge workers tend to cluster in certain areas of selected cities over others. He (2002, 2012) describes quality of place as central to this clustering phenomenon. A number of factors which Florida and others consider to be important in the choice of region by the creative class include:

1) a large, dense labor market that facilitates job mobility;

2) a life style with a broad supply of leisure activities;

3) cafes and meeting places for social interaction; and

4) a region or place that is diverse with a tolerance for different ideas, lifestyles, cultures and ethnicities (Westlund and Calidoni-Lundberg 2007; Mellander et al.2013; Martin Prosperity
Institute 2015).

Ideas about the creative class evolved since their first introduction (Florida 2002). Many related studies of creativity, such as the creative cities and the creative industries' concepts, emerged and analyzed key features and predictors of creative environments (e.g. Peck 2005; Markusen 2006; Scott 2006; Stolarick et al. 2006; Yusuf and Nabeshima 2006; Landry 2008; Pratt 2008; Brennan-Horley and Gibson 2009; Florida and Mellander 2009; Andersson et al. 2011; Florida 2012, 2014; He and Gebhardt 2014; O'Connor and Gu 2014; Bereitschaft and Cammack 2015). Creativity is the main driver of economic development in many of these knowledge economies. Yet, human creativity is increasingly recognized as the source for new technology and industries, and therefore new wealth (Florida 2002, 2012; Fujita and Hill 2005). Many industries and companies focused on increased profitability evolved to accommodate and promote the creative potential of their workforce. The strong presence of creative individuals signals openness and inclusiveness across a region, enhancing its regional attractiveness to other talented individuals. Additionally, a significant cultural economy amenity can also help attract others to the region (Mellander et al. 2013).

The creative class is positively associated with overall good economic health — an index that captures employment, earnings, income, and unemployment — when

studying mid-sized Canadian urban areas with populations between 75,000 and 350,000 (Reese et al. 2010). Stolarick and Florida (2006) found direction connections between the artistic/cultural and technology/innovation communities of Montreal. Other studies in the United States (McGranahan and Wojan; 2007; Lee et al., 2004), the Netherlands (Stam et al., 2008; Anderson et al., 2010), Sweden (Mellander and Florida, 2007) and Canada (Florida et al., 2010; Reese et al., 2010), all found that the principal cities and counties of metropolitan areas that have a higher percentage of the creative class tended to have higher rates of productivity, population growth, and job growth.

Furthermore, the creative class was found to be a significant factor in determining economic growth rates, particularly in Western countries. According to the Martin Prosperity Institute (2015) ranking of the most creative nations in the world, Luxembourg leads the way with 53.7 percent of its workforce classified as creative, followed by Bermuda (48.0), Singapore (47.3), down from the top spot in 2011, and Switzerland (46.5). While the United States ranked just 34th, with 32.6 percent of its workforce classified as creative, Japan's creative class workforce accounted for only 19 percent of the workforce for a ranking of just 64th (Martin Prosperity Institute 2015). This finding raises important questions regarding the geography of the creative class in Japan and the capital city of Tokyo where the major node of the creative activity, and whether or not the key predictors in Japan differ from those in the rest of the world (Table 1). Other studies ranked Japan higher on various measures, suggesting a lack of consensus exists regarding the most significant measures of creativity.

Table 1. The Global "Creative" Index

	Creative Class Share (%)	The Global Creativity Index (Composition of the 3Ts)	The Global Technology Index (R&D Investment and Patents Per Capita)	The Global Talent Index (Educational Attainment)	The Global Tolerance Index (Racial and Ethnic Minorities, Gays and Lesbians)
Rank	Country	Country	Country	Country	Country
1	Lexembouurg (53.68)	Australia	South Korea	Australia	Canada
2	Bermuda (47.96)	United States	Japan	Iceland	Iceland
3	Singapore (47.30)	New Zealand	Israel	United States	New Zealand
4	Switzerland (46.53)	Canada	United States	Finland (tie with U.S.)	Australia
5	Iceland (45.43)	Denmark	Finland	Singapore	United Kingdam
Japan	64th (18.65)	24th	2nd	3rd	11th
United States	34th (32.61)	2nd	4th	58th	39th

Source: Martin Prosperity Institute. The Global Creativity Index 2015.

The creative class was studied extensively by region in Europe and North America (Brille 2012; Marrocu and Paci 2012). Though the notion of the creative class has been popular for more than a decade, not many studies have analyzed creativity in Japan or Tokyo (Yoshimoto 2003, 2009; Westlund and Calidoni-Lundberg 2007; Sasaki 2010; Ueno and Suzuki 2014; Asada 2015). This is a very surprising fact since Tokyo is one of only three World Cities (along with New York and London) that focus strongly on networks of highly specialized services such as accounting, finance, advertising, telecommunications and other management functions (Sassen 1991, 2001).

The proponents of the creative class and human capital theories frequently debate the level of educational attainment as a determining predictor. The human capital theory (Becker 1964; Lucas 1988; Glaeser 2005) argued that the key to regional growth is not in reducing the costs of doing business, but facilitating highly-educated and

productive individuals. From the perspective of the human capital theory, economic growth will occur in places that possess highly educated people (Gates and Florida 2001). Without capital (money or non-human resources), cities cannot build factories, housing, or infrastructure. But without suitable human resources, cities cannot be productive and innovative or, to put it in different terms, competitive and prosperous. As Glaeser (2005b, 596) stated, “Skilled people are the key to urban success”.

Along with human capital, social capital is another theory for explaining variation in regional or urban economy. Social capital refers to the strength of social networks and engaging in community organization at a local level. Putman (1995) described social capital as personal associations that represent a value-added resource, for social and economic affairs, that provides members with collectively produced capital that can be used in the pursuit of individual goals. Jane Jacobs (1961) treated social capital as a community resource that built trust, facilitated cooperation, and solved collective-action problems block by block in cities. A lack of social capital can diminish a region’s ability to capture the gains of economic growth or can hurt workers’ ability to advance professionally (Putnam 1993).

2.3 A Critique of the Creative Class

The creative class notion attracted several critics. Some critics suggested that much of Florida’s work merely describes symptomatic aspects of economic growth rather than focusing on the actual causal triggers of economic growth (Peck 2005; Markusen 2006; Hoyman and Faricy 2009; Perry 2011). As such, critics targeted the central concept of creativity introduced by Florida for its alleged fuzziness (Marcuse 2006; Ponzinit and

Rossi 2010). Urban and regional studies scholars critically evaluated Florida's ideas, especially in regard to their internal consistency and rigor (Markensen 2006; Scott 2006; Ponzinit and Rossi 2010). Florida's creative class notion also faced criticism for being elitist, tending to ignore or downplay the working class and more conventional service employment (Sasaki 2010; Ponzinit and Rossi 2010; Boren and Young 2013). Many argued that Florida avoids providing detailed prescriptions about how his theory should be applied to specific contexts of urban policy. Ponzinit and Rossi (2010) stated that Florida rarely addressed the complex sphere of urban policy and spatial planning. Rossi also suggested that Florida has not attempted to analyze the multifaceted relationships that exist between sectors, or the various resources such as political, legal, or economic, and the set of socio-spatial and socio-economic practices co-existing in the urban field (Ponzinit and Rossi 2010; Boren and Young 2013).

The creative class theory triggers a potentially mobilizing policy discourse. Like all urban and regional policies, the creative class initiative does not operate in a vacuum. It draws on pre-existing knowledge and institutional practices, governance structures and arrangements (Grant 2014, xv). The creative class theory is more than an academic theory, but more specifically functions as an intellectual technology used by political elite and policy-makers as a generative source of an active governmental rationality (Markusen 2006; Scott 2006; Ponzinit and Rossi 2010, 1053). Many dispute that certain forms of creativity become valued by creative class and those exclusive people enjoy support from public funding often with a global audience in mind (Sasaki 2010, S5; Rossi 2010, 1042; Boren and Young 2013, 1801).

Many argued that Florida avoided providing detailed prescriptions about how his theory should be applied to specific contexts of urban policy. Rossi (2010) stated that Florida rarely addresses the complex sphere of urban policy and spatial planning. Rossi suggested that Florida did not attempt to analyze the multifaceted relationships that exist among sectors, various resources such as political, legal, or economic, and the set of socio-spatial and socio-economic practices co-existing in the urban field (Ponzinit and Rossi 2010; Boren and Young 2013). Other critics of the creative class theory suggested that it only focused on Western cities.

Florida's contentions about the intersection between the creative class, diversity and urban space is also much at issue. By using metropolitan areas, Florida ignored the important spatial distribution of people by residence and workplace throughout the city. At the sub-metropolitan level, members of the highly educated occupations, including Florida's super creative class, disproportionately work and live in suburbs where homogeneity and low density are highly valued (Markusen 2006).

Other critics of the creative class theory suggest that it only focuses on large cities (Bereitschaft and Cammack 2015). They argue that much of the creative class literature completely overlooks the innate creativity, innovativeness, and entrepreneurialism of rural society, such as the farm sector (Gibson 2008; Bell and Jayne 2010; Hansen and Niedomysl 2009; Wojan and Lambert 2011; Argent et al. 2013, 90). Yet, some rural studies of creative class have taken place. For example, Andersen et. al. (2010) found that the business climate was the most important factor in explaining the location of the Nordic creative class. On the other hand, Petrov (2008, 162), draws on a case study of

northern Canada that explains how creativity can be “more positively associated with the aboriginality of the population.” Members of the creative class in rural locations also differ greatly from those in metropolitan areas (Verdich 2011; McGranahan et al., 2011).

The attraction of creative class members and the consequent increases in income and housing prices at a neighborhood level tend to gentrify lower- and middle-class areas and to produce marginalization and exclusion of long-term residents. However, many argued that Florida avoids providing detailed prescriptions about how his theory should be applied to specific context of urban policy. Florida’s work is to open to any kind of interpretation and application in policy field. Rossi states that Florida does not enter the complex sphere of urban policy and spatial planning. Rossi continued, Florida did not attempt to analyze the multifaceted relationship existing among sectors, resource such as political, legal, or economic, and the set of socio-spatial and socio-economic practices co-existing in the urban field (Ponzini and Rossi 2010, 1040; Boren and Young 2013, 1807). Markusen pointed out that Florida’s argument lacks a development theory applicable to particular local economy. She contended that although export-oriented economic theories have been in the mainstream as development theory for local economies. She argued that economic development in import-substitution industries is more desirable during the era of knowledge and information-based economies (Markusen and Schrock 2006 a, b: Pratt 2008, 107).

While the theory of creative class has been discussed widely in North America and Western Europe, there are few studies of the creative class outside these regions, and those existing studies are problematic. The creative class concept has developed parallel

to the creative industries concept originating from Britain in 1998 (DCMS 1998). By 2010, almost every province in China and major cities in Japan had their own definition and categorization of creative class or creative industry. Some have seen fit to draw on Florida; however, his conceptualization of the creative class is broad enough not to provide nuanced understandings of creative occupations in non-western contexts (Dai et al. 2012, 666).

2.4 Creativity – Ambiguous Term

Many scholars argued that creativity is important to the development of creative environment and their competitiveness in the global economy. Yet, defining creativity is difficult because it has been studied by different disciplines and from different perspectives. There is no single or simple definition of creativity (Comunian 2010, 2; Boren and Young 2013, 1801; Scott 2014, 568). In the notion of the city making, creativity is a complex phenomenon and associated with originality, imagination, inspiration, ingenuity and inventiveness (Girard 2011, 18). According to Girard (2011), creativity definitions form four standards. These are Person—identification of the characteristics of the creative person, Process— the components of creativity, Product—the outcome of creativity and Press—the qualities of the environment that nurture creativity. However, another P must be included in this standard, which is Place – a meaning segment of space combining location, locale, and sense of place (Relph 1976; Cresswell 2013).

One of the major obstacle of previous studies and analyses of creativity is the term of “creativity” itself (Pratt 2011, 14). Florida’s concept focuses on the importance of

creative talents. However, attracting people of the creative class does not automatically make a creative environment (Sasaki 2010, S3). The ideas of creative class and other creative studies should not be confused with each other. Allen J. Scott stated that for the development of creative industries that serve as economic engines for a creative environment or city, it is necessary to have a large workforce (creative class) with specific skills and the necessary industries to support that workforce (Pratt 2008, 107).

Creativity is defined in a cross-sectoral and in multidisciplinary ways, mixing elements of artistic creativity, economic creativity or innovation, scientific creativity, and technological creativity or innovation. All these characteristics of creativity in different areas are interrelated and involve technological creativity (Andersson et al. 2011, 14; Girard 2011). Charles Landry argued that describing individual or organization creativity is relatively easy to understand; yet to be creative as a city is a different proposition given the mix of cultures and interests involved that need to be brought together in some coordinated way (Landry 2008, xxvi). Creativity not only leads to economic and social innovation but also to artistic culture, civic and governance innovation. A combination of these factors generates successful places, including cultivating to attract economic gain and social cohesion to the creative cities.

2.5 Creative Cities – New Form of Urban Environment

The notion of creative cities has overlapping roots and implications. The concept of creative cities refers to a mobilization of the creativity inherent in art and culture to create new industries and employment opportunities (Trip and Romein 2010; Sasaki 2010; Pratt 2011; Grodach 2012; Boren and Young 2013; Novy et al. 2013; Grant 2014;

Lazzeretti 2015). Yet, attracting people of the creative class does not automatically make a creative city. Landry (2008, 2011) and Sasaki (2010) had put the issues of minorities, homelessness, social inclusion and the urban environment at the center of their respective visions of creative cities. In addition, solving problems such as the issues of minorities, homelessness, and social inclusion and other urban environment issues require creative cities in order to attract more creative individuals.

Creative cities are cosmopolitan cities. Creative cities are not homogenous geographic settlements and they have also some other features such as unsettled and dynamic structures (Boren and Young 2013). The dynamic structures require a transition into new and unexplored modes of organization and a transformation in social relationships and values. Therefore, a tension between a set of conservative forces and values and a set of radical values emerges. In other words, in the creative cities there is always tension between authenticity and novelty, but this tension can lead to creative changes. According to Hall (2002), the periods of structural instability, with great uncertainty about the future, offer a great potential for a creative change. When everything is uncertain a group of creative people can take the city or region to a new stable phase. A creative city brings together talented and diverse people who bring ideas, inspiration and passion to a place; high-quality built environments and natural places can bolster the creativity of residents and attract other creative people and new investments in the infrastructure of urban creativity from physical environment to social, cultural and institutional organizations. These factors together drive innovation in the creative cities.

The concept of the creative cities has dominated “creativity” discussion in Japan, however, despite the idea of creative cities being further introduced in the late 1980s (Comunian 2010; Fukushima 2014; Scott 2014; Kakiuchi 2017; Kanno 2017). Landry (2008, xxi) argued that “the creative cities adopt that conditions need to be created by individuals, plan and act with imagination in harnessing opportunities or solving seemingly intractable urban problems including improving the prosperity of a city to enhancing the visual environment or addressing a social problem such as homelessness”. The creative city, where people think, plan and act with imagination, advocates the need for a culture of creativity to be embedded within how the urban stakeholders operate. It implies reassessing the regulations and incentives regime and moving towards a more creative management (Landry 2008; Grant 2014). The notion of a creative city often focuses on the potential of the cultural industries as it seems that cities increasingly needed to concentrate on what made them unique and special.

Prior to the notion of the creative city becoming popular, the World City concept was predominant (Friedman 1986, 1995; Sassen 1991). Friedman argued (1986, 317) that “the world city hypothesis is about the spatial organization of the international division of labor.” According to Sassen (1991, 4), the World City is “key structures of the world economy are necessarily situated in cities”. She argued that “the world city is shaped its position in the new international division of labor and integral to contemporary globalization processes”. The World City not only represented economies of density, it was measured by the economic base although they engaged not simply as a result of the general shift from a manufacturing to service economy. The World Cities are also

economies of interaction, incorporating both quantity and quality, and the center of other major cities. These cities also reflected the varied history of mankind and are at the same time contemporaneous expressions of the diversity of urban culture to future generations. The model of the global cities focused strongly on networks of highly specialized advanced services such as accounting, finance, advertising, telecommunications and other management functions as well as R&D and scientific innovation. It was suggested that global cities with a concentration of these crucial functions, such as New York City, London, and Tokyo, were the leading players (Sassen 1991, Girade 2011, 413).

In this sense, the world cities have a particular component in their economic base. Such as a component rooted in those special and technical changes that give them a specific role in the world economy. World Cities are the leading economic centers of the world. While all cities contain a core of service industries and the leading cities of a country have long contained key banking functions, a more novel and specific process has taken place. The geographic dispersal of factories, offices, and service facilities and the reorganization of the financial industry contributed to the need for new forms of centralization for the management and regulation of the global network of production sites and financial market. These new forms of centralization entailed a shift in local control and management. Additionally, the production of a wide array of innovations and distribution in services and finance are central to the transformation of economic activity. The world cities emerged as key locations for the production of such innovations (Sassen 2001; Grant 2014).

However, the critical question regarding of the negative impacts of World Cities has been raised. Anyone could perform any activities anywhere, but there are only a limited number of skilled people who exercise such skills. Alternatively, the concept of other types of cities, including the creative cities, received attention in the late 1990s as an anti-world city concept (Hall 2002; Girard 2011). Like many other activities, industrial economic sectors are dependent on interaction, networking, or depending on a certain amount of person-to-person interaction, which had always been in traditional urban places. The central ubiquitous city has become the strategic sites, as they represent the ideal scale for the intensive, face-to-face interactions that generate the new ideas that paves knowledge-based innovation and become ideal environment for the creative individuals (Waitt et al. 2009; Trip and Romein 2010; Grant 2014).

Creative activities and culture have shaped the competitive character of cities by enhancing both its innovative capacity and the quality of place, which is crucial to attracting creative people (Florida 2012, Girard 2011; Lazzeretti 2015). The people's imagination is a city's greatest resource. Creativity can come from any source. There is a possibility that if the chance is given ordinary people can generate extra-ordinary things. Thus, the creative cities philosophy assumes that there is always more creative potential in a place. For instance, the high concentrations of diverse social groups with different cultural background and different ways of life have made cities incubators of culture and creativity (Girard 2011). Besides knowledge and innovation, culture and creativity have become the new key resources in which is main constitution is the creative city. Cultural

production in itself has become a major economic sector and a source for the competitive advantage of cities that are very distinctive from the global cities concept (Florida 2012).

People in creative cities are required to develop inclusively imaginative and innovative solutions to a wide range of social, economic and environment problems including economic stagnancy, urban shrinkage, social segregation, global competition or more (Girard 2011). The creative cities support the artistic and culture for their contribution to inclusion and different kinds of innovations (Pratt 2011). In creative cities, most strategies are focused on strengthening the cultural fabric. The cultural fabric - including a city's arts and cultural heritage, the media and entertainment industries, and the creative business-to-business services - are the drivers of innovation in such creative economies. Within a creative city, there is where competitions to attract, keep and grow creative people, while the factors that contribute to this such as quality of place are highly important. Also there is an integrated system of multiple organizations, and a blending of cultures in the public, private and community sectors in the creative city.

The creative cities provide many benefits to communities. For example, creativity produces many forms of aesthetic expression that enable urban residents from different backgrounds to live more respectfully together (Girard 2011). Girard (2011) has classified the benefits of creativity into five categories: governance innovation, civic innovation, economic innovation, social innovation, and artistic and cultural innovation. He states that "governance innovation refers to breaking with tradition and harnessing diversity. Breaking from some elements of traditional municipal administration, creative places are becoming more inclusive and open to new collaborations and new ways of

community involvement in the planning process. Civic innovation refers to applying new problem-solving skills to contemporary urban challenges such as managing growth and diversity in the larger cities, and shifting from more traditional natural resource to the knowledge and innovation economy in smaller community. Economic innovation is based on ideas, design and networking that is becoming more valued input and makes cities innovative milieu. Social innovation refers to social transformation and social inclusion" (37). A consolidation of these varied innovations can generate successful places and the creative cities.

2.5.1 Why Creative Cities?

Girard (2011) argued that the physical-spatial dimension of creativity refers to the creative milieu, creative cities, and quality of place. From an urban creativity perspective, the critical questions are; why are some places such as cities and regions more attractive than some others for creative activities? Another question is what are the essential locational factors that can attract new and creative activities (Landry 2000; Girard 2011; Grant 2011; Scott 2014).

According to Girard (2011), creative cities are in general understood and used in four ways. These are: 1) creative cities as arts and cultural infrastructure; 2) creative cities as the creative economy; 3) creative cities as synonymous with a strong creative class; and 4) creative cities as a places that fosters a culture of creativity. This concept was first developed by Landry, which has become the main reference document on creative cities. Landry's creative city philosophy is based on people's imagination and he

has described the creative city as places where people think, plan and act with imagination.

As a result, the city of the future needs to be thought of differently from cities in the past. In today's information economy, knowledge and creativity are increasingly recognized as key strategic assets and powerful engines driving economic growth (Landry 2008; Girard 2011). Knowledge, culture and creativity have also become the new keywords in the understanding of new urban transformation (Hall 2004). While cities are the key drivers of economic change, culture plays a crucial role in this process not just as a condition to attract the creative people but also as a major economic sector (Florida 2012). The existing literature shows that cultural and creative industries are deeply embedded in urban economies (Scott 2000; Pratt 2008). The role of cultural production in the new economy has radically changed the patterns of cultural consumption and cities have transformed from functioning as landscape of production to landscapes of consumption (Sasaki 2010, Girard 2011).

The creative cities produce goods and services with high cultural value added, through the integration of the skills and sensibilities of the artisans with high-tech devices in the production process. Cities create a tightly knit, organic industry-related structure of companies developing in the region, ranging from the cultural-goods industry to high-tech, software and design industries (Sasaki 2010). In creative cities, income circulate outside the city but still within the region, with an aim toward new cultural investment and consumption. For instance, the cultural investments go to the construction of museums and the support of private design research centers and orchestras, and the

increased cultural concentration in the city can results in the development and establishment in the region of high-tech/high-touch creative human resources. Cultural consumption can upgrade the quality of local consumer markets and stimulate the demand for a more cultural mode of production through consumers who have the ability to enjoy goods and services that have abundant cultural and artistic qualities (Sasaki 2010).

Previous studies have indicated that there are two types of infrastructures in creative cities, soft and hard infrastructures. Soft infrastructure provides a connective tissue that comprises the social networks and shared spaces facilitating interaction among creative people. It includes paying attention to how people can meet, exchange ideas and network. It shifts focus and encourages physical developments and place-making or urban design that fosters communication between people. Soft infrastructure promotes so-called “third places or gathering places”, which are neither home nor work where people can be together. This might be a café or other kinds of gathering places. Hard infrastructure, on the other hand, refers to the physical environment of highways, housing, public transit, sewer and water supply networks and so forth. It focuses largely on roads, affordable housing developments or undistinguished office buildings (Landry 2008; Trip and Romein 2010; Girard 2011).

2.5.2 Creative Cities - A New Sense of Place

The notion of the creative city focuses on a local scale (Brown 2014; Andersson 2015) rather than a global one, with emphasis on generally a new sense of place in urban areas. A sense of place, the human-made cultural landscape, is a key location where

cultural and economic capital, ideology, political activities and vernacular traditions are continually negotiated. It is where society literally reproduces itself as a spatial practice in particular places and times (Relph 1976; Lefebvre 1991; Pratt 2008). A sense of place is the product of a continuous evolutionary process. It is not a static image, but it is rather the result of concrete developments over time. Meanings attached to a place's identity become modified as social values evolve in response to changing patterns of socio-economic organization and lifestyles. A creative environment is a place that contains hard and soft infrastructure to generate a flow of ideas and inventions in order to attract creative people (Landry 2008; Trip and Romein 2010; Cresswell 2013). Ponzini and Rossi (2010, 1039) argued that the culture should be made by a heterogeneous ensemble of cultural and artistic activities taking place at the city and neighborhood level, to a properly normative narrative and also to prescriptive recommendations for local economic development (Boren and Young 2013).

The role of urban planning in creative cities intersects with human and social ecology reconstruction, building social bonds, sense of community, social capital and resilience. The "new" urban planning focuses on priorities such as the production and regeneration of public spaces, as specific areas of identity where social exchanges and life can also have a relevant role in managing relationships between the local community and immigrants. Public places are regarding a particular kind of public multifunctional space. Places are areas characterized by an extraordinary diversity. A particular flow of relations between people and stories can be maintained in some public places. The regeneration of the cultural heritage in older city centers can be a very creative urban

initiative as long as it is implemented by illustrate interpreting the spirit part of places, where it is able to attract new activities. Historic architecture can contribute to the regenerating of the urban economy (Girard 2011).

Cities that are already well endowed with strong historical, cultural and social associations clearly have a marked advantage in this respect. The cultural atmosphere of the city can attract creative people and they will produce high value-added goods and services (Trip and Romein 2010; Kakiuchi 2014). Place-making and place-promotion activities can, therefore, be elaborate programs of urban environmental renovation especially in cities where large cohorts of creative workers are employed in different sectors (Scott 2006). Building-sector activities and the regeneration of the physical environment have thus been pursued along with the goal of creating a more vibrant cultural atmosphere, sensitive to the needs of decentralized business interests, coalitions, and networks. In order to attract creative people who directly contribute to the local economy, cities, and regions are being increasingly pushed to improve their cultural liveliness, social inclusion and tolerance and, more generally, their quality of life (Rossi 2010).

One outcome of the creative city is dramatic change in central city neighborhoods; blue collars are replaced by white collars (Scott 2011; 2014). Many attempts have been made to redefine urban spaces by using terms as world cities, cultural cities, compact cities, creative cities, or endless cities (Sasaki, 1997, 2001; Landry, 2000; Florida 2002; Burdett and Sudjic, 2007). In the realm of urban governance, many cities have taken up urban revitalization as a theme of urban policy making and have begun

various actions with the goal to become creative cities (Okano 2010). This type of change is commonly referred to as gentrification or urban revitalization (Trip and Romein 2010; Gordon et al. 2011; Brown 2014). Gentrification is typically individually driven, while by contrast, urban revitalization is typically led by urban institutions, business interests or foundations. Whether gentrification of urban revitalization is the emphasis increasingly place, community organizations remain critical elements. Those newly formed urban spaces will be well differentiated rather than repetitive in terms of the order, variety, and types of goods and services provided. Spatial patterns in central city are highly irregular compared to an earlier time (Brown 2014).

In the creative city a cosmopolitan development is necessary. Public spaces that grow rooted in the nature and memories of a specific fixed place referring to a local. Multi-identification is with a multi-layered identity in the midst of globalization. On the contrary, public spaces reject multiple identities and try to enforce a singular identity based on nationalism, ethnicity, or race. Public space of global governance, that operate towards transcending the existing nationalist collectivity in order to overturn the other three types of space (Relph 1976; Okano 2010). The social context of cities can be transformed by citizen participation in arts and cultural activities, which is a route to the inclusion of marginalized communities and to revitalized neighborhoods. In this way, social innovation can make cities more inclusive places. Overall, creative cities can contribute significantly to meeting local and national policy goals such as economic innovation, social inclusion and environment sustainability (Girard 2011).

2.5.3 Policies in Creative Cities

Public policy plays a critical role in nurturing a city's creative assets and infrastructure (Boren and Young 2013). According to Grodach (2012), policy aimed at supporting the cultural economy, or the creative industry, needs to emphasize investments in place and human capital. Any policy for creative cities needs to be more than an overt policy measuring just creativity. The policy context is comprised of a complex mix of initiatives at different levels from national, regional to the local level. Public and private actions at the local level can be a key force for creating creative cities, however, the policies and regulatory decisions taken at higher level are equally important. These policies not only provide the core funding and regulatory support for cultural activities and organizations, but can also shape the broad background and context that lay the foundations for a socially inclusive and cohesive path to a creative city (Landry 2008; Pratt 2010; Okano 2010; Girard 2011; Taylor 2015). For example, Okano (2010, S12) stated that "Osaka, unlike Nara and Kyoto where a strong traditional system of urban management exists, a people centered style of public management was created that root into consideration the collective livelihood of the people living there." In other words, one can say people who moved into Osaka from the outside were offered a place in which to participate, knowledge from the outside was greedily absorbed that allowing creative talents contribute revitalization of the city (Sasaki 2010; Okano 2012).

Being a creative city requires interconnected policies, plans, programs and established practices and therefore, a collaboration among government departments, across levels of government and also the private sector and community organizations.

Another challenge for cities is building a creative urban governance system. Being a creative city requires taking some measured risks, widespread leadership, strategic principles and flexible tactics. Therefore, the next challenge for cities is developing a creative capability. Building creative capability is a complex undertaking that often involves shifting mindsets, re-balancing risk, envisioning a better future, building consensus among local people and establishing the conditions for people to become agents of change rather than victims of change. The last issue for cities and governments is to develop standard tools and manuals, strategies, policies and/or frameworks designed to build a culture of creativity as a city (Girard 2011; Boren and Young 2013). In order to link cultural policy to industrial policy, urban planning and welfare policy, the vertical administrative structure must be made more horizontal. Ordinary bureaucratic thinking must be eliminated and organizational culture must be changed. Nonetheless, the creative cities logic cannot solve all urban problems (Pratt 2010).

Immigration and settlement policy may have an impact on creative cities, especially since many immigrants settle in the same lower-income urban areas as artists. Regional policy can also provide the connective tissues between regions, in areas such as land use, green space production and public transit. On the other hand, local policy has a significant role in city land use and development, in order to preserve the rich or mixed use nature of creative neighborhoods (Pratt 2010; Girard 2011; Boren and Young 2013).

At a lower level, creative class policy favors the interests of local politicians and their institutional partners (Pratt 2010; Boren and Yong 2013). Politics provide the physical and social resources need for creative and economic opportunities to take root. A

good example would be that a city maintains a certain amount of garage space. Florida (2005, 259) argued that garages, warehouses, historic buildings and affordable housing– all of these are the places where dreams and economic innovation takes hold (Ponzini and Rossi 2010). The promotion of creative policy cannot be continued effectively if it is limited to just city government. It is essential to obtain the cooperation of a broad selection of citizens, including business leaders and NPOs (Sasaki 2010). Urban planning policy may also play a more sophisticated rule in the development of urban creativity. Particularly in building a vision of a dynamic, creative city with stakeholders and the community. The urban planning function, if imaginatively applied, may track the effects of creative change over the long-term, and when culture and creativity are used with a social purpose in urban planning policy, they can contribute to sustainable development and society (Girard 2011).

2.5.4 Opportunities and Barriers in Creative Cities

Although there are many opportunities to develop creative cities, there are equally many barriers, such as lack of awareness among policy and planning communities and the general public, poor collaboration within and between governments and an undervaluing of the contribution of the arts and culture. As Bradford (2004) argued, these barriers include: 1) the lack of clarity on the meaning of creativity and its relevance in an urban setting; 2) the lack of awareness in policy and planning circles about the creative city process; 3) the absence of a practical toolkit for planning in implementing creativity in cities; 4) the shortage of resources and skills at the municipal level to facilitate this process; 5) the lack of creative capital among a community's political, administrative,

business and community leaders; 6) research gaps in how artistic and cultural activities contribute to economic innovation and quality of life; 7) the lack of clear and applicable indicators to capture the creativity and heritage; and 8) the exclusion or marginalization of some people and culture (Girard 2011; Grodach 2012; Boren and Young 2013). These problems are due to the difficulty of understanding of what creativity for an urban place is. However, these barriers indicate that there are ways to transform the barriers into opportunities. For example, Girard (2011) suggested that mixing creative and business disciplines, developing new boundary-crossing collaborations, and capitalizing on the uncommon ground of core general education and industry-specific skills can be leveraged and engage citizens which will improve the creative capacity of cities. Nurturing creative cities can, therefore, a complex and long term process (Girard 2011; Florea 2015).

Pratt (2008) argued that Florida's "3Ts" do not automatically generate creativity, creative cities or creative workers (class) (Florida 2012). The 3Ts are simply posited as factors of attraction. While the creative class counts for only a small proportion of entire economic sector (Comunian 2010). Scott (2006) argued that the mere presence of creative people is certainly not enough to sustain urban creativity over a long period of time. This means that any viable developmental program focused on building a creative city must deal with setting up a local production system, training or attracting a relevant labor force, appropriate programming of urban space, and ensuing that all the different elements involved work more or less in harmony with one another (Scott 2006; Comunian 2010). Given these broad theoretical construction and illustration, this

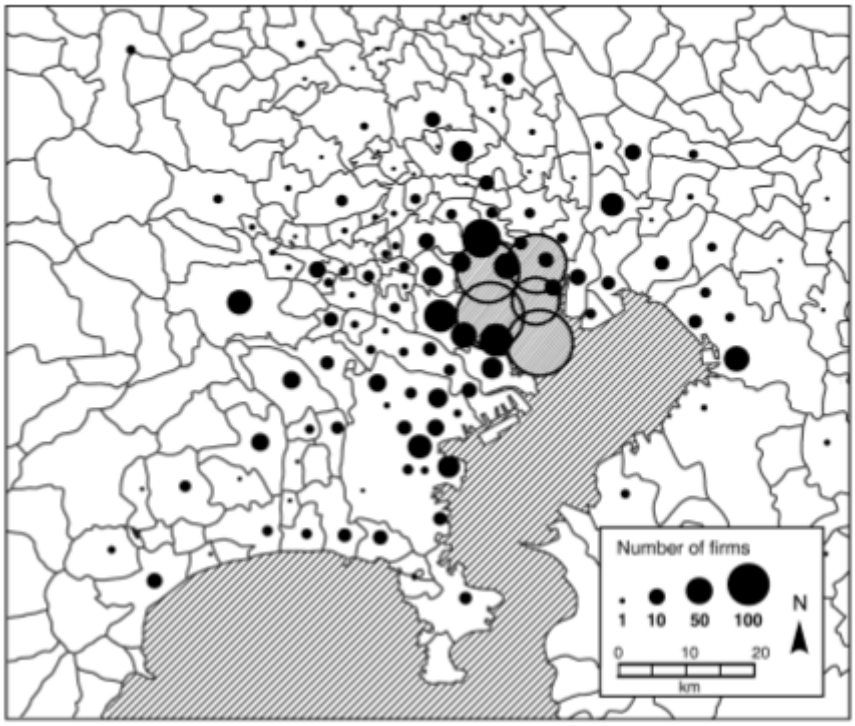
dissertation is a more detailed discussion of the creative class in Japanese and Chinese cities.

2.6. Cities in Japan

Tokyo is an example of an Asian city that currently attracts both native and expatriate Creative Class workers, especially in the information and communication technology (ICT) sector. Arai et al. (2004) explored how multimedia and Internet businesses can be assumed to receive measurable locational benefits in large metropolitan areas when compared with other types of Information Technology (IT) businesses in Tokyo. Their study utilized Geographic Information System (GIS) techniques in order to identify the territorial agglomerations in central Tokyo. Arai et al. (2004) indicated that approximately 60% of all multimedia and internet firms in Japan were located in metropolitan Tokyo. These firms were located in the central city's 23 Ku area, and 63% of the firms are concentrated in five sub-areas: Shibuya, Minato, Sinjuku, Chiyoda, and Chuo (Figure 4).

Arai et al. (2004) stated that the appearance of industrial agglomerations, shaped by the characteristics of multimedia and Internet businesses in such large metropolitan areas as San Francisco or New York, provide firm evidence of a concentration of creative class. They suggested that the multimedia and Internet industry has certain metropolis-oriented features similar to more traditional sectors such as the animated film industry (Scott 1984; Arai et al. 2004). Creative workers represent a distinct local labor market because of their characteristic preferences in work and lifestyle. Proximity to these local labor markets provided the basis of the growth of the cluster (Arai et al. 2004).

Figure 4. Distribution of Multimedia and Internet Firms in the Greater Tokyo Area



Source : Arai et al. (2004)

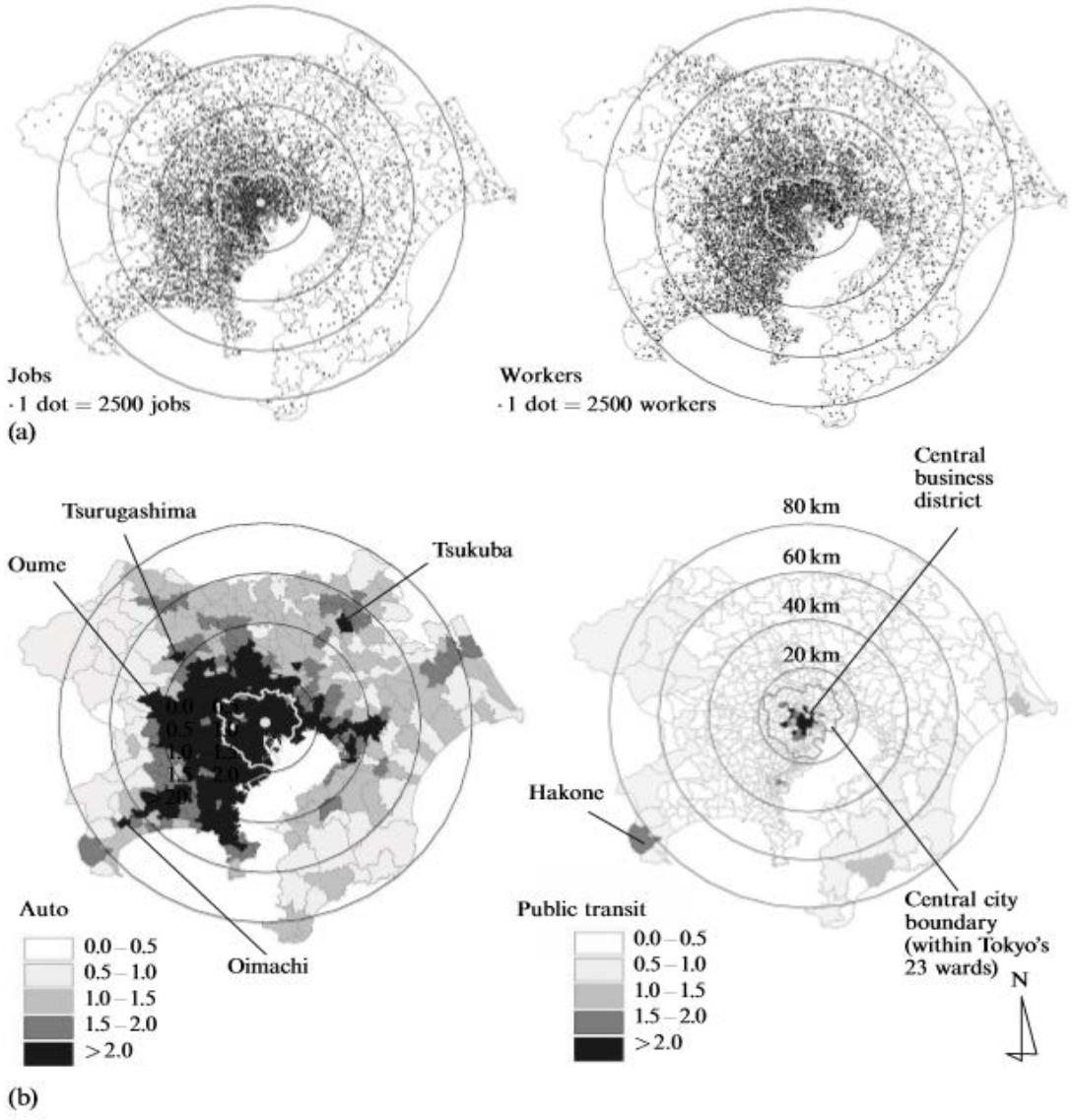
Another study of creative activities in Tokyo by Kawabata (2003, 2006) included analysis of Tokyo's urban spatial form from a perspective of residence, workplace, and transportation using a GIS-based analysis of Tokyo's urban spatial structure and examining the spatial distribution of jobs, workers, and job access by travel mode. Kawabata asked two research questions. What was the special distributions of jobs and workers in Tokyo? And what extent does the level of job accessibility vary by location and travel mode? In order to answer these questions, Kawabata applied GIS to visualize the spatial patterns of jobs, workers, and job access. Kawabata (2003, 2006) found that spatial distribution of jobs and workers in Tokyo were around CBD where had high

accessibility by automobiles and for public transportation. He also found that commuters in outer suburbs were more relied on automobiles (Figure 5).

Lee and Kaga (2013) performed density analysis using GIS to determine the spatial distribution of business service industries and other concentrations of creative industries in Osaka. They began by extracting corporate information and address data of business support industry companies. Then Lee and Kaga (2013) performed density analysis using GIS to highlight concentrated districts of creative design industries. Their GIS analysis proceeded in three stages: 1) Visualization of the geographic distribution of creative design industry businesses in Osaka; 2) Exploration and visualization of the concentrated areas, focusing on analysis of the creative design industry; and 3) Visual representation of concentration areas and non-creative districts.

Lee and Kaga's study (2013) presented important implications for the urban revitalization of the city. They found that knowledge-based industries are likely to locate in specific districts with different types of business classifications. More importantly, creative design clusters were more likely to be located near parks, riverfronts, and other amenity areas. Creative design clusters formed within a block or two from main streets or between main streets. They also found that a high integration value and connectivity prevailed. Another important finding was that both the business services clusters and "third places", such as cafes, bars, restaurants and galleries, have high integration values and connectivity.

Figure 5. Job Accessibility of Auto-oriented Urban Structure in Tokyo



Source : Kawabata. (2006)

Note: Spatial distribution of (a) jobs and workers, and (b) job accessibility (45 minutes) in Tokyo metropolitan area.

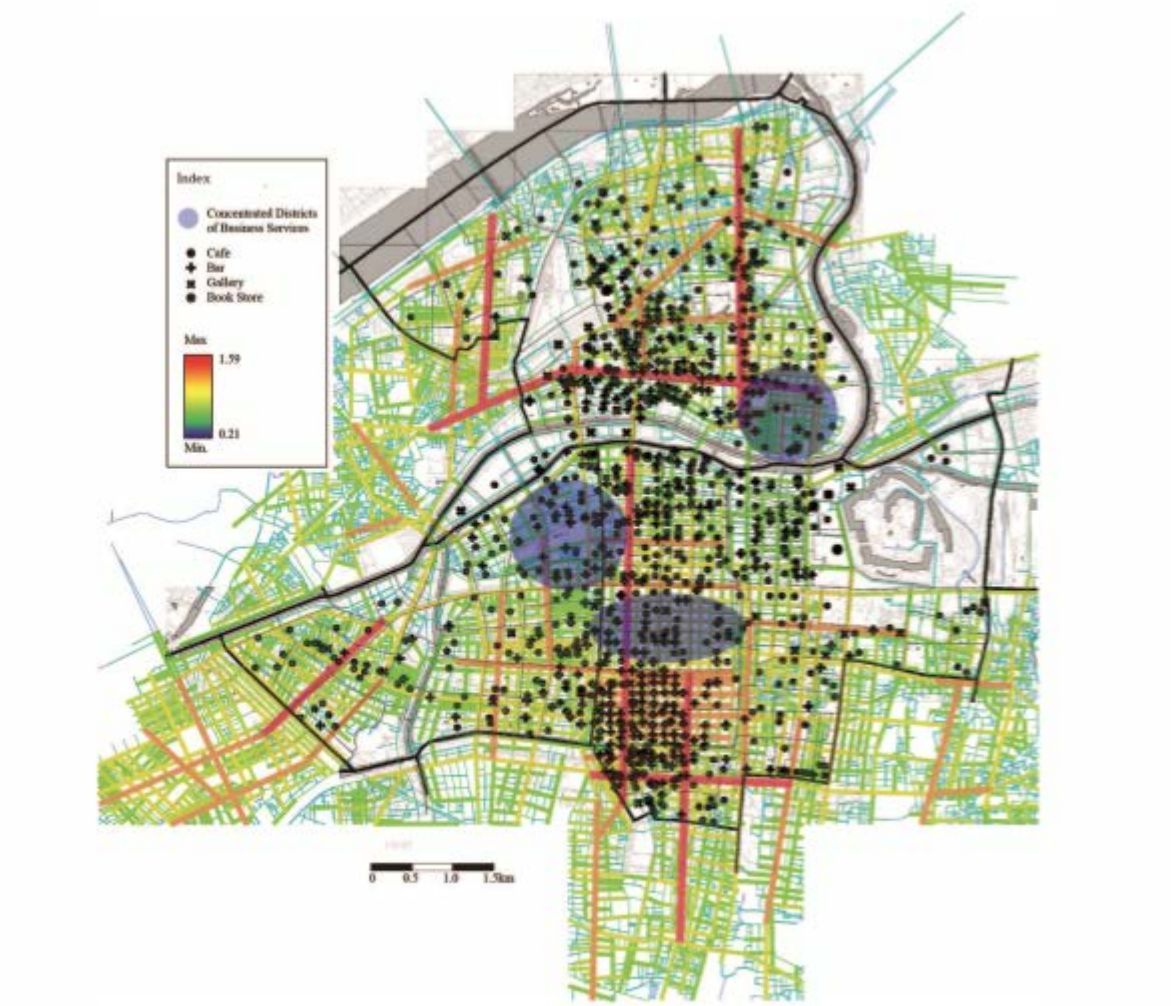
Lee and Kaga (2013) concluded that the streets near the park or riverfront in the concentrated districts of creative design companies generated highly local integration values and connectivity from the results of the local axial analysis (Figure 6).

Lee and Kaga's study (2013) presented important implications for the urban revitalization of the city. They found that knowledge-based industries are likely to locate in specific districts with different types of business classifications. More importantly, creative design clusters were more likely to be located near parks, riverfronts, and other amenity areas. Creative design clusters formed within a block or two from main streets or between main streets. They also found that a high integration value and connectivity prevailed. Another important finding was that both the business services clusters and "third places", such as cafes, bars, restaurants and galleries, have high integration values and connectivity. Lee and Kaga (2013) concluded that the streets near the park or riverfront in the concentrated districts of creative design companies generated highly local integration values and connectivity from the results of the local axial analysis (Figure 6).

Ueno and Suzuki (2014) examined the locational tendencies of creative industries in Yokohama based on statistical data from 2006 to 2009. The survey showed that there is a higher growth rate in Yokohama, compared to the national level. Their results' demonstrated that the formation of clusters of creative industries in the western part of Kannai District, an old downtown district were a major part of the promotional area for the Creative City Yokohama process. The authors concluded that the three creative city

policies, city revitalization, cultural policy and promoting high-growth industry, played a major role in facilitating the cluster of the creative industry.

Figure 6. Third Places in Osaka



Source : Lee and Kaga. (2013)

Westlund (2010) examined creative class and social capital in Japan and it regional developments based on an analysis of two major hypotheses. One is Florida's

hypothesis that a heterogeneous civil society with diverse values combined with tolerance is influencing regional growth in a positive way. Another hypothesis is Putnam's social capital hypothesis. According to Putnam, it is not primarily a diversified community with many loose networks where various lifestyles are tolerated that support regional development, but a community with strong social networks with homogeneous norms and values.

Putnam (1995) argued that a homogenous civil society with common norms, values, and trust between its citizens has a positive impact on regional development. Westlund (2010) contrasted the validity of these two hypotheses with the current regional structure development in Japan (Westlund 2010). He attempted to find whether there are strong positive correlations between human capital, accessibility and foreigners, or to a lesser extent between the group of trust-tolerance and the homogeneity/diversity Index. Westlund (2010) criticized ideas that a highly significant share of foreigners could be connected to Florida's idea of tolerance or diversity. However, his variables' strongly correlate with accessibility and is probably an indication on a general global level that the biggest city-regions with the highest national accessibility have higher international interaction and exchange. Westlund (2010) argued that the share of foreigners is mainly an expression of the prefectures' size, something which is positively connected to creativity. He concluded that civil society variables do not have any significant influence on any of the regional development variables, measured at the prefecture level.

2.7. Tokyo: World City or Nested City?

The GTA was selected for this dissertation because it is the most populous metropolitan area in the world. A 2015 estimate puts the population of the Greater Tokyo Area at 37 million (Jacobs 2005, 2011, 2012; Somusho 2015). The GTA is the largest urban agglomeration in Japan and is one of three major global centers of economy, trade and commerce, along with New York City and London (Cybriwsky 1998, 2011; Fujita 1991, 2003; Sassen 1991; Jacobs 2005, 2012, 2013). Unlike London and New York, however, Tokyo offers a more powerful lens for viewing the evolution and prospects of postindustrial cities including those in East Asia and other Asian countries (Yusuf and Nabeshima 2006). Furthermore, 19 percent of Tokyo's total workforce is classified as part of the creative class (Somusho 2015) (Figure 2). The central GTA is the principal metropolitan market and clearly the trendsetter for the rest of the country and wider region. Many of Japan's technology-intensive companies prefer to keep some of their leading research facilities in the Greater Tokyo Area (Fujita and Hill 2005; Yusuf and Nabeshima 2006). Over a third of Japan's firms' headquarters and sixty percent of Japanese companies with capital of more than 100 billion yen locate in the Greater Tokyo Area. Furthermore, a majority (60 %) of foreign firms, and the leading multinational corporations (MNCs) prefer to locate in Tokyo (Fujita and Hill 2005; Yusuf and Nabeshima 2006; Bureau of Industrial and Labor Affairs 2015).

The central GTA leads the field in terms of the number of major public and private universities and research institutions where clusters of the creative class tend to be located. Those universities and institutes are a source of talent, highly skilled knowledge

workers. They also lead in innovation and technology transfer through research, consulting and the informal contacts developed between faculties and business entities. Due to the availability of highly skilled and educated creative workers, the Greater Tokyo Area is attractive for business firms, especially in the high-tech and creative industries (Jiang and Harayama 2006; Yusuf and Nabeshima 2006; Kodama and Suzuki 2007). The population of the GTA continues to expand by absorbing migrants from other parts of Japan despite not attracting a large number of knowledge workers from abroad that would contribute significantly to diversity or tolerance (Fujita and Hill 2005; Jacobs 2013). This wealthy labor market in turn is fed from the natural growth of the population and by immigrants from other parts of Japan and a small number from abroad.

Jacobs (2008) suggested that company head offices have gravitated to Tokyo to be near key government agencies and knowledge-intensive business services (KIBS). Innovative City theory suggests that knowledge-based growth cities have contained larger concentrations of KIBS employment than other major cities in their region and nation (Simmie 2001, 2005; Yusuf and Nabeshima 2006; Jacobs 2008; Konno and Itoh 2017). Due to the availability of a substantial creative class in Tokyo, the GTA has been attractive for business firms, such as high-tech and creative industries. Some of these creative class in the central GTA are employed at research institutions and universities that conduct R&D (Jiang and Harayama 2006; Yusuf and Nabeshima 2006; Kodama and Suzuki 2007). However, other scholars argued that the central GTA has not induced the circulation of knowledge workers from abroad that would contribute significantly to diversity or tolerance (Fujita and Hill 2005; Jacobs 2013) due to the relatively

homogeneous nature of Japanese culture. Yet, many of Japan's technology-intensive companies do prefer to keep some of their leading research facilities in the central Greater Tokyo Area (Fujita and Hill 2005; Yusuf and Nabeshima 2006).

The most vocal opposition to applying World City theory to Tokyo comes from Nested Cities theorists led by Hill and Fujita (2003) and supported by Hill and Kim (2000) as well as Jacobs (2005, 2006, 2008, 2011). These Nested Cities theorists argued that Tokyo is a product of the Japanese Capitalist Developmental State. According to Hill and Kim (2000) and Fujita (2003), these scholars rejected the premise that urban Japan fits the world city status model in which large cities have been converging in ‘‘economic base, spatial organization and social structure’’ (Hill and Kim 2000, 2157). Instead, they argued that Japan's municipalities are not market-centered bourgeois cities, but rather are embedded within a state-centered plan-rational system**.** Hill and Kim (2000, 2176) also argued that "Tokyo's relationship to the world economy is not driven in the first instance by market efficiency, by a strategic concern to preserve national autonomy through global economic power ". Therefore, nested cities theorists conclude that, although there has been input from the private sector and local governments, the policies of the Japanese government have the greatest impact on that nation's urban spatial configurations (Jacobs 2005, 2008). For example, as Hill and Fujita (2003, 213) asserted that Tokyo has nested in relationships with the Tokyo Metropolitan Government (TMG) and the Kanto Region (GTA). On the other hand, another World City of New York City has nested ties of an entirely different political and cultural sort. In reference to the Japanese Developmental State, Hill and Kim (2000) contended that the Japanese government has utilized national

statutes, policies, and plans to keep a tight rein over corporate and local spatial investment decisions (Jacobs, 2003, 2004, 2008, 2011). Therefore, the Japanese government has remained leading agency in shaping Tokyo's development path.

Drawing their evidence from East Asian cities within developmental states, most frequently Tokyo, Hill and Fujita (2003) claimed that the world city hypothesis, the first has viewed hierarchy as a top-down, vertically controlled relationship. Conversely, the situation in Japanese cities has represented a second meaning, in which there was the nesting of parts within larger wholes.

While those urban theorists have emphasized the role of the Japanese State, Cybriwsky (1998), Sorenson (2000, 2001), Osada (2003) and Jacobs (2008) have argued that the central government's over-focus on industrial policy and national economic growth. At the same time, the State had regulated private development through plans, laws, taxation, infrastructure policies, and eminent domain in their effort to guide development to certain areas and away from other areas. Jacobs (2005, 2006, 2013) argued that the TMG shifted to more of an entrepreneurial approach. However, the TMG has heavily focus on development of some sub-areas (e.g. Minato-Ku, Shibuya-Ku), but other sub-areas are neglected from the State (e.g. Adachi-Ku, Arakawa-Ku). He (2005, 2006, 271) summarized that "the State planning and market interventions have had the greatest impact on development patterns within Japanese cities and metropolitan areas".

Fujita and Hill (2005) described the Tokyo model of industrial agglomerations, also known as industrial district or clusters, which is uniquely different from other World Cities (London and New York City). Industrial agglomerations are simultaneously an

aspect of uneven development and specialization, and serve as important locales of concentrations of economic activities such as job creation and innovation (Aoyama 2011). Additionally, the concept of industrial agglomerations influences how firms produce, use and diffuse knowledge. The Nested Cities theorists, led by Hill and Fujita (2003), Hill and Kim (2000) and Jacobs (2003, 2005, 2006, 2008, 2011) contest that despite the impacts of globalization, Tokyo's growth path has remained tightly embedded within its national and subnational contexts. For example, Japanese manufacturing processes, the *just-in-time* (JIT) flexible production system of Japanese automakers, with its heavy reliance upon local content and long-term commitments to suppliers, were credited with contributing to these outcomes (Fujita and Hill 2005). As Jacobs (2004b, 496) wrote: Since the JIT system has required the tight synchronization of parts and final assembly, it has produced closely-knit relations among assemblers, suppliers, and labor (Jacobs 2014, 762).

Fujita and Hill (2005) discussed the distinctiveness of Tokyo's spatial distribution of creative activity, employment and income. In major Western cities, for example, manufacturing innovation takes place in the peripheral suburban areas instead of urban cores. Moreover, income is polarized between the outside and center parts of the city. On the other hand, Tokyo's creative activity takes place in the city core and its suburbs, and there are no large disparities in income and occupational opportunity among the region. Fujita and Hill (2005) argued that the Tokyo model of industrial agglomerations, also known as industrial district or clusters, is uniquely different from other World Cities. Industrial agglomerations are simultaneously an aspect of uneven development and

specialization, and serve as important locales of concentrations of economic activities such as job creation and innovation (Aoyama 2011). Additionally, the concept of industrial agglomerations influences how firms produce, use and diffuse knowledge.

The Nested Cities theorists, such as Hill and Fujita (2003), Hill and Kim (2000) and Jacobs (2003, 2005, 2006, 2008, 2011) contested that Tokyo's growth path has remained tightly embedded within its national and subnational contexts. Hill and Fujita argued (2003, 213) that "urban life cannot be deducted from any structural or market deterministic logic". Rather, city and region have continued to follow its own unique development models within its own particular state (government), societal (historical, cultural and socio-demographic) and geo-spatial context (i.e. regional, national) (Jacobs 2006, 2016). Embeddedness plays a central role in the success of industrial districts in the Tokyo area through shared experiences, trust and cooperative competition within inter-form networks including knowledge spillover and specialized labor pools (Fujita and Hill 2005). Occupational innovation in Tokyo is embedded in a complex economic system that includes several component parts including numerous corporate headquarters, research and development (R&D) labs, pilot production known as "mother" plants, and test markets. Hill and Fujita (2003) argue that several districts of the Greater Tokyo's act as intense spatial agglomerations of commercial and industrial activities as well as culture. These densely developed districts play an especially critical role in the Tokyo's production network. Many new products and materials developed within this industrial agglomeration (Hill and Fujita 2003; Fujita and Hill 2005). All of these factors need to be

given full consideration in any analysis and the geography of the creative class in the GTA.

CHAPTER III

METHODS

3.1 Dependent Variables

The dependent variable in this dissertation is the percent of the creative class by political jurisdiction in the central Greater Tokyo Aare (GTA). The creative class dependent variable is subdivided into Florida's (2002) super creative class (e.g. researchers), the creative professional class (e.g. government officials) and the creative class in total. Additionally, these three types of creative class are, in turn, analyzed by place of work and by place of residence leading to six regression models in total since a large majority of GTA's workforce both lives and works within the region. The logic for differentiating the creative class into three major groups is that it helps to disentangle creativity based on different skill and talent levels. The geography and the key predictors of talent may differ by each creative group. Additionally, much of the literature has overlooked this important geographic distinction. Creative class occupational data by sub area (city, ward, town and village) was collected from the population census of Japan through the Ministry of Internal Affairs and Communication (MIC). Furthermore, the geography of the Greater Tokyo Area is quite complex and relatively unfamiliar to many Western researchers, so it is important that we have a clear understanding of how the political sub-units of the central GTA were chosen for the analysis in this dissertation.

3.2 Some Background on Local Autonomy in Japan

The local autonomy law, *Chiho-jichi-ho*, based on the constitution of Japan and adopted in 1947, provides for the basic elements relating to the organization and operation of local governments. This law specifies the relationship between the national and local governments, and the relationship among local governments. Local governments are classified into two types: ordinary local public entities and special local public entities. Prefectures and municipalities are ordinary local public entities (Jacobs 2005; Kayama 2010; Ohsugi 2011).

The current local autonomy system divides Japan into 47 prefectures comprised of *To* (metropolis), *Do* (a wider prefecture, only applied to Hokkaido), *Fu* (two urban prefectures: Osaka and Kyoto) and *Ke*n (43 normal prefectures). A prefecture's designation as *To, Do, Fu* or *Ken* is based on historical background and does not signify any systemic difference. Each prefecture consists of numerous jurisdictions, with 1,718 municipalities (790 cities, 745 towns and 183 villages) as of April 5, 2014 (Ohsugi 2011, Somusho 2016). Besides ordinary cities, there are large city systems including designated cities, core cities, and special cities. All four types of cities have enhanced powers (Table 2).

In order to be a city certain requirements need to be satisfied, such as having a population of 50,000 or greater. Towns and villages usually belong to a county. However, a county simply designates a geographical area and does not entail any administrative functions. Also, when comparing towns with villages, towns have a more urban appearance and more people engaged in urban-type work such as commerce and industry

(Kayama 2010). Government ordinance designated major cities, *Seirei Shitei Toshi,* are those with a population of 500,000 or more that has been designated by the Cabinet Order, which is the executive branch of the government of Japan. As of April 1, 2015, a total of 20 cities had such a designates. Designated cities represent the highest order of cities in Japan and possess powers similar to those of prefectures, including social welfare, public health, and urban planning functions. These cities have powers of self-government. Other individual laws grant them similar powers in fields such as the management of national roads and compulsory education (Jacobs 2003a, 2008, 2011).

Table 2. The Local Government System of Japan

		Number of Jurisdictions
Prefectures	To (metropolis)	1
	Do (a wider prefecture)	1
	Fu (urban prefecture)	2
	Ken (normal prefecture)	43
Ordinary	City (shi)	790
Public	Town (Cho or machi)	745
Jurisdictions	Village (mura)	183
Large Cities	Designated Cities	20
	Core Cities	47
	Special Cities	37
Special Local Public Jurisdictions	Special Wards of Tokyo (Ku)	23

Source: Somusho (Ministry of Internal Affairs and Communication, MIA), 2015

Some local public entities are designated as special because they have unusual geographic boundaries, organizational structures, or powers. The Tokyo prefecture, for example, encompasses 23 Special Municipal Wards (*Ku* with a large K), which

corresponds to the urban area of the former city of Tokyo which was abolished in 1943. Each of the 23 Special Municipal Wards of Tokyo are legally equivalent to a city (Local Autonomy Law Article 283). The scope of affairs handled by Special Municipal Wards is slightly narrower than that of ordinary cities, but the function of those 23 Wards is almost identical (Cybriwsky 1998, 2011; Fujita 1991, 2003; Jacobs 2003a, 2005, 2008, 2011, 2012, 2013; Kayama 2010; Ohsugi 2011; Somusho 2016).

Designated cities are also internally divided into administrative wards known as *ku* (with a small k) delineated in order to more efficiently manage their territory on a subarea scale. For example, in 2010, Osaka had 24, Yokohama 18, Nagoya 16, and Kobe and Kyoto had 11 *ku* each (Local Autonomy Law Article 252-20-1). Yet, there are fundamental difference between Tokyo's 23 *Ku* and Designated City *ku's*. For example, both the chief executive of the ward and the members of the assembly of each of Tokyo's 23 wards are chosen by public election. Each of the 23 wards has its own chief and local government structure with responsibilities for local affairs, as well as a main headquarters building. On the other hand, in the wards of the designated cities, only the chief executive is chosen by public election (Kayama 2010; Ohsugi 2011; Somusho 2016). Moreover, the scale in which they have implemented policy are different. The 23 Wards of Tokyo have consistently had more than 8 million residents, as compared with between 1.5 and 3.5 million in the five original Designated Cities (Steiner 1965; Jacobs 2010). According to Steiner (1965), wards in the designated cities are merely "jurisdictional areas of the branch offices of the city administration," not legal "local entities like the special wards in Tokyo" (I98). On the other hand, residents of those cities possess a greater direct voice

in municipal affairs than residents of Tokyo's wards. Those wards in the designated cities are merely administrative units (Isozaki, 1997; Jacobs, 2003a, 2005, 2010, 2011).

Cities with populations of more than 300,000 that have been designated by the Cabinet Order are known as core cities or *Chukaku shi*. As of April 1, 2015, there are 47 core cities. Core cities have health care centers and they are capable of handling the same affairs as designated cities, excluding those matters that are more efficiently and uniformly handled by prefectures across their broader jurisdictions (Local Autonomy Law Article 252-22-1). Cities with populations of more than 200,000 that have been designated by the cabinet are known as special cities, *Tokurei Shi* (Local Autonomy Law Article 252-26-3-1). There were 37 such cities in April 1, 2015. Excluding those matters which are more efficiently and uniformly handled by prefectures, affairs delegated to core cities are also delegated to special cities (Jacobs 2003a; Kayama 2010; Somusho 2016).

3.3 Defining the Greater Tokyo Area (GTA): Scale of Analysis

The Greater Tokyo Area (i.e. the Kanto Major Metropolitan Area, KMMA or GTA) was selected as the geographic unit of analysis for this dissertation because much of the creative class in Japan is located in the GTA. The GTA was also chosen because it is the most populous metropolitan area in the world (Jacobs 2005, 2011, 2012; Somusho 2015). The GTA is the largest urban agglomeration in Japan and is one of three major global centers of economy, trade and commerce, along with New York City and London (Cybriwsky 1998, 2011; Fujita 1991, 2003; Sassen 1991; Jacobs 2005, 2012, 2013; Waley 2013). Unlike London and New York, however, Tokyo offers a more powerful lens for viewing the spatial evolution and prospects of postindustrial cities and creativity in

East Asia and other Asian countries (Yusuf and Nabeshima 2006). The GTA is Japan's largest metropolitan area and is known for its high cost of living and its relatively lower levels of crime, income inequality, and racial-ethnic diversity (Cybriwsky 2011, Jacobs 2016).

Before discussing the GTA, however, there are several questions that must be asked. The first question is: As Jacobs (2005, 2012, 2016) asked, "What special unit of analysis for this dissertation was selected?" Are we studying just Tokyo's 23 Special Municipalities Wards that are the legal equivalent of the formally defined city of Tokyo? According to the Population Census of Japan, Tokyo's 23 special municipalities were home to 8.95 million people in 2010. On the other hand, this dissertation could examine *Tokyo-to*, the Tokyo Metropolitan Prefecture, which contains 23 Wards and 39 other cities, towns, and villages and had a 2010 Census population of 13.16 million. Another potential area of analysis could include the *Shuto-ken* (National Capital Region), a planning area also known as the Kanto Region, which includes the eight prefectures of Tokyo, Chiba, Gumma, Ibaraki, Kanagawa Saitama, Tochigi and Yamanashi. In 2010, this included 23 Wards and 323 other municipalities with a combined population of 43.5 million.

In this dissertation, the 2010 Population Census-defined Kanto Major Metropolitan Area (KMMA) was utilized. The KMMA is the commuter-shed for Tokyo's 23 Wards and the region's other central cities and ku including Chiba, Kawasaki, Saitama, and Yokohama and other municipalities (Table 3). Not all these sub-areas are included in this dissertation because the occupational data for the creative class by sub-

area was only available in those sub-areas with a population greater than 100,000. The end result is that this dissertation included 138 sub-areas in the GTA which was home, in aggregate, to nearly 37 million inhabitants in 2010 (Fujita and Hill 2005; Jacobs 2005, 2012, 2016).

Consequently, the Greater Tokyo Area captures the urban area in ways that are crudely similar to the classification system for U.S. metropolitan areas. Like US MSAs, the GTA is primarily defined by journey to work trip geography. Okamoto (1997) contends, “In the late-1980s, the bubble economy of Japan increased speculative demand for land, causing the price of commercial land to rise dramatically, which in turn affected the price of residential land. As a result, it became more and more difficult to obtain reasonable housing within Tokyo’s neighboring suburbs, and residential areas pushed further and further away from central Tokyo” (83). As a result, the population living in the suburbs and working in the central city has increased every year. The Greater Tokyo Area consists of the central cities and the surrounding political jurisdictions.

The central cities of the GTA include the 23 Special Municipalities Wards of Tokyo and the cities of Chiba, Kawasaki, Sagamihara, Saitama, and Yokohama as well as Tsukuba Science City. The 2010 census classified these central cities as key commuter nodes in this region (Isozaki 1997; Kayama 2010; Ohsugi 2011; Jacobs 2013). Other ordinary cities, towns or villages are considered as containing the surrounding jurisdictions where resident populations commute to those central cities (Jacobs 2008, 2012) (Table 3 and Figure 7).

Table 3. The Number of Local Municipalities in the GTA

Prefecture	City (shi)	Town (machi or cho)	Village (mura)	Ward (ku)	Special Ward (Ku)
Ibaraki	11	5	1	0	0
Tochigi	3	1	0	0	0
Gunma	1	2	0	0	0
Saitama	38 plus 1 designated city	20	1	10	0
Chiba	31 plus 1 designated city	16	1	6	0
Tokyo	27	3	1	0	23
Kanagawa	16 plus 3 designate city	12	1	28	0
Yamanashi	2	0	1	0	0
Shizuoka	1	0	0	0	0
Sub Total	129	59	6	44	23

Source: Somusho (Ministry of Internal Affairs and Communication, MIA), 2010

Note: Designated Cities are at least 500,000 population

The Statistics Bureau of Japan (SBJ) under the Ministry of Internal Affairs and Communication (MIC) defines a metropolitan area as an area consisting of one or more central cities and associated outlying or surrounding jurisdictions. According to the SBJ, to qualify as a central city a city must either be a designated city of any population or a non-designated city with a city proper population of at least 500,000. To qualify as a surrounding jurisdiction, a jurisdiction must have at least 1.5% of its resident population aged 15 and above commuting to school or work in one of the central cities (Somusho 2016).

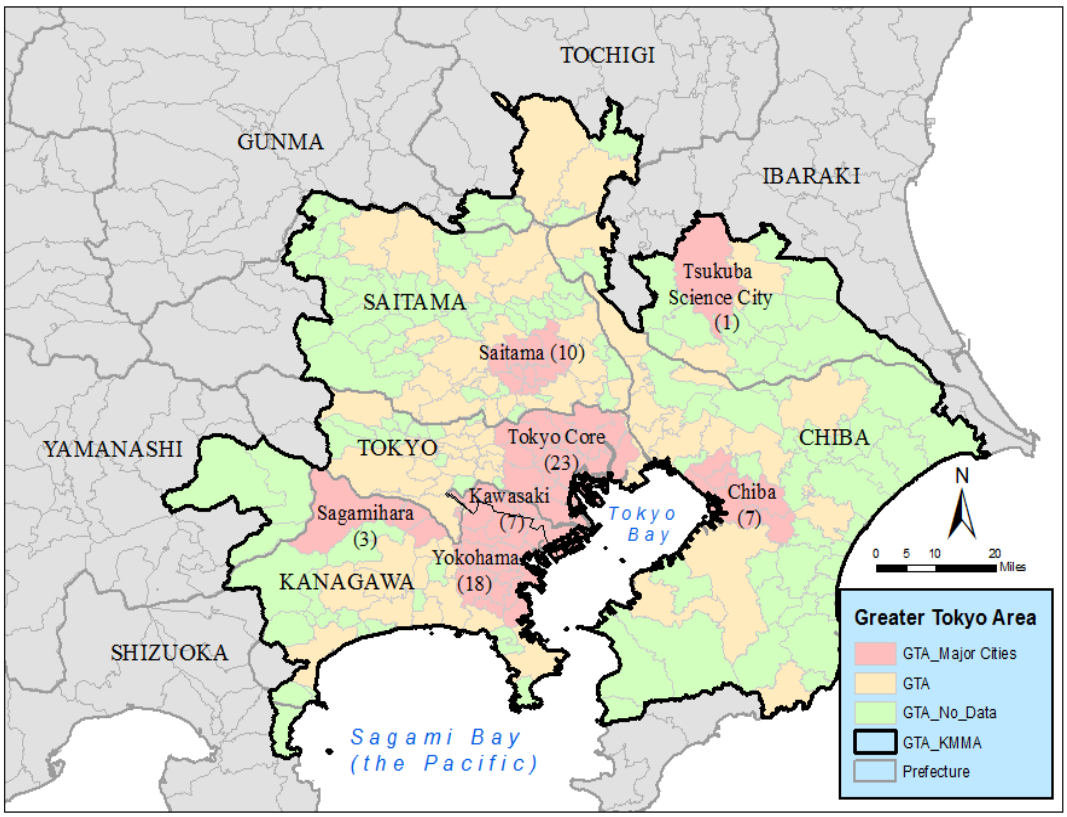
According to the Ministry of Internal Affairs and Communication (MIC), these designated cities must satisfy the following conditions:

i) The number of resident workers and students 15 years of age and over commuting to the central cities is 1.5 percent or more of its total resident population, and

ii) The area is contiguous to the central cities or to one defined as the surrounding area. In the case that the administrative unit area, where under 1.5 percent of

the resident population commutes to the central cities, is entirely enclosed by the areas defined as surrounding area, it is also regarded as a surrounding area (Somusho 2015).

Figure 7. The Greater Tokyo Area (GTA) (KMMA) and the Major Cities



Note 1: Pink shaded areas include the central cities (e.g. Kawasaki and Yokohama) plus the Tokyo Core and Tsukuba Science City (the number in parentheses represents the number of sub-areas); Note 2: Pink and orange shaded areas include those sub-areas with a population greater than 100,000 (N=138); Note 3: Green shaded areas include those sub-area populations less than 100,000 which have no SOC data.

Those designated cities have further administrative subdivisions or wards. Unlike the 23 Special Municipalities Wards of Tokyo, these wards are not politically independent municipalities. Additionally, those wards are not the same size (Jacobs 2003, 2005, 2011, 2012; Ohsugi 2011). However, the primary focus in this dissertation is attempting to

unravel the key predictors that determine the geography of the creative class in the Greater Tokyo area. It is acknowledged that the political authority of the different sub-units included in the Greater Tokyo are highly varied but it is also crucial that a refined disaggregated analysis of the Designated Cities is included since such a high proportion of the creative class are included within the wards of the central cities or designated cities of the Greater Tokyo Area.

3.4 Defining the Creative Class: The Standard Occupational Classification (SOC) System

Creative capital theory links the economic development of an area to the workers that are most likely to be innovative. Florida (2002, 2012) identified the occupations of the creative worker by utilizing the U.S. Standard Occupational Classifications (SOC) system developed by the U.S. Bureau of Labor Statistics (BLS). The Japanese Ministry of Internal Affairs and Communication (MIC) developed the equivalent of the American SOC system.

Florida's original definition of the creative class is used as the basis for this dissertation and acts as the dependent variable for the subsequent spatial and regression analysis. The creative class dependent variable includes the following occupational sectors (Table 4):

- Management government officials (SOC A-1 to A-3) (e.g., management government officials, officers of companies and organizations, management stuff of companies and organizations, other administrative and managerial workers),
- Researchers (SOC B-4) (e.g., natural science researchers, humanities, social science, other researchers),

Table 4. The Standard Occupational Classification (SOC) Used to Derive the Creative Class Dependent Variables

Richard Florida	Japan		USA	
	Ministry of Internal Affairs and Communications (MIC)		Department of Labor: Bureau of Labor Statistics (BLS)	
	Standard Occupational Classification(SOC)		SOC	
Creative Professionals	A	Administrative Managerial Workers	11	Management Occupations
	A-1	Management Government Officials		
	A-2	Officers of companies and organizations		
	A-3	Other Administrative and Managerial Workers		
	B-8	Legal Workers	23	Legal Occupations
	B-6	Health Care Workers	24	Healthcare practitioners and technical occupations
Super-Creative Class	B	Professional and Engineering Workers	19	Life, physical, and social science occupations
	B-4	Researchers		
	B-5	Engineering	17	Architecture and engineering occupations
	B-10	Teacher	25	Education, training, and library occupations
	B-15	Other Specialist		
	B-12	Authors, journalists, editors	27	Arts, design, entertainment, sports, and media occupations
	B-13	Artists, designers, photographers, film operators		
	B-14	Musicians, stage designers		
	C	Clerical workers		
	C-22	Office appliance operators	15	Computer and mathematical occupations

- Engineers (SOC B-5) (e.g., Architecture, civil engineers, manufacturing engineers and surveyors),
- Healthcare and medical related workers (SOC B-6) (e.g., doctors, nurses, medical technicians, dental hygienists and other health care workers),
- Legal Workers (SOC B-8) (e.g., judges, public prosecutors, attorneys, judicial screeners and other legal workers),

- Teachers and other specialist professionals (SOC B-10 and B-15) (e.g., university professors, secondary educational school teachers, elementary and junior and senior high school teachers, librarian, curators, sports professionals),
- Authors, journalists, editors, artists, designers, photographers, film operators, musicians and stage designers (SOC B-12 to B-14) (e.g., authors, journalists, editors, sculptors, painters, industrial artists, designers, photographers, film operators, musicians, dancers, actors and directors) and,
- Office appliance operators workers (SOC C-22) (e.g., personal computer operators, data entry device operators, other office appliance operators)

Overall, the dependent variable will be defined as the percent of the aggregate creative class by occupation relative to the total workforce in each of the 138 central GTA subareas. The spatial analysis will then largely focus on explaining why certain areas in the GTA generate disproportionately large numbers of creative workers relative to others

3.5 Independent Variables

Most of the previous studies of the geography of the creative class use a single equation regression framework to identify the direct effect of human capital and other factors on regional development (Mellander et al. 2013). Regression models will be performed on the creative class dependent variable to better understand what factors most influence the geography of the creative class in the GTA. Independent variables selected for the regression analysis are based on previous scholarly work, but also include other independent variables not previously analyzed. The source for each independent variable is also from Japan's Population Census by the Japanese Ministry of Internal Affairs and Communications (MIC) in 2010 unless otherwise specified (Table 5).

There are several measures of educational attainment that will be used in this dissertation (e.g. the percent of high school graduate and a bachelor's degree, etc.). The percent of the workforce with a bachelor's degree is the basis of human capital theory. It is hypothesized that human capital is fundamentally shaped by several key socio-economic variables (e.g. average age, income, sex ratio, etc.) that act to gauge the creative environment.

It is important to include this variable to determine and contrast its effect on the creative class for each part of the central GTA. Hoyman and Faricy (2009) argued that human capital is a strong and consistent predictor of job growth, average wage, average wage change and the net immigration of college graduates. Many scholars argue that human capital has been proven to correlate with urban growth both in the service and knowledge economies (Barro 2001).

The selected independent variables describe quality of life indicators and can be broken into two broad categories: population measures and socio-economic factors (Table 5).

First, **total population** and **population density** are analyzed to determine how the geography of absolute and relative population shape the creative class in the GTA. The compactness of people living in a city generates greater population densities. Cities are where people come together. Spontaneous face-to-face interactions frequently lead to innovation and knowledge spillovers (Henderson and Castells 1987; Aoyama 2011; Mansury et al. 2012).

Table 5. Descriptive Statistics for the Greater Tokyo Area;

Dependent and Independent Variables, 2010

	Mean	sd	Min	Max
Dependent Variable (Place of Work)				
Super Creative Class	10.40%	3.98	4.65%	24.41%
Creative Professional Class	6.73%	1.21	4.15%	10.52%
Creative Class Total	17.14%	4.21	8.98%	31.20%
Dependent Variable (Place of Residence)				
Super Creative Class	11.70%	2.89	4.99%	19.45%
Creative Professional Class	6.92%	1.85	4.58%	17.37%
Creative Class Total	18.63%	4	10.36%	29.43%
Independent Variable				
Population Characteristics	Mean	sd	Min	Max
Total Population	457304	2680106	47115	31895747
% of Employed Population	46.56%	2.24	41.61%	55.03%
Poplation Density Per Sq. Kilometer	7684.3	5042.4	550.8	21881.5
Average Age	43.53	1.52	38.33	47.56
Median Age	42.84	2.02	37.7	48.2
% Productive Age (15-64)	66.41%	2.53	58.88%	73.57%
% Age 65+	20.03%	2.48	11.70%	27.60%
% Unmarried Individual 15 years or older	26.03%	3.38	19.14%	38.32%
% Foreign Population	1.65%	1.2	5.07%	7.89%
% Single parent head of household	3.83%	2.3	13.62%	13.35%
Sex Ratio=male per 100 females	99.84%	4.14	87.88%	114.05%
% Unemployed Population	29.39%	0.47	16.61%	4.04%
DayNight	113.47	147.88	72.43%	1738.82%
Annual Household Income ($10-50K)	48.36%	6.01	32.35%	63.47%
Annual Household Income ($50-100K)	32.48%	4.47	19.08%	46.11%
Annual Household Income ($100K and Above)	9.74%	3.16	4.92%	22.81%
Education				
Completed University (4 years) and/or graduate scho	38.81%	10.57	17.51%	65.40%

% Employment by Major Industry					
Construction	6.47%	1.63	1.59%	10.35%
Education and Learning Support	4.52%	1.02	1.84%	7.71%
Finance, Insurance and Real Estate (FIRE)	6.19%	2.02	0.86%	15.31%
Information and Communication	5.66%	2.43	0.86%	13.10%
Living related and personal services and Amusement servic	3.65%	0.45	1.93%	6.32%
Medical, health care and welfare	8.60%	1.38	4.31%	13.16%
Science research, professional and technical services	4.68%	1.79	1.82%	15.17%
Public and Governmental Affairs	3.11%	1.2	1.42%	10.10%
Primary economic sector employment	1.36%	1.46	0.26%	10.41%
Secondary economic sector employment	22.24%	7.01	8.50%	38.63%
Tertiary Economic Sector employment	76.39%	7.74	54.69%	91.34%

Note1: The source for each variable is also from Japan's Population Census by the Japanese Ministry of Internal Affairs and Communications (MIC) in 2010. Note 2: However, household income is from housing and land survey in 2008.

Population is measured by the total persons living in each GTA subareas for the Japanese Census year of 2010 while population density is expressed in square kilometers. Population density is utilized because a sub-area's density level often is an indicator of urbanity. The lower the density level, the more rural or suburban a community is and the higher the density level the more likely the area is more urban potentially resulting in higher numbers of creative class jobs.

Second, the **household income** variable includes salary disbursements and consist of the monetary remuneration to employees and is often used as a proxy for skills and creativity (Florida et al., 2008). The income variable is useful for analyzing the creative class because members of the creative class frequently produce nearly 50 percent of the national wage while accounting for just 30 percent of the workforce (Florida 2002, 2012). Other scholars used wages to test the creative class thesis (Hoyman and Faricy 2009). In

the United States, for example, “the creative class has a much stronger positive relationship with wages” (Florida *et al.* 2008, 618).

The annual income variable is normalized by the total workforce yielding an average income. Sub-areas with higher average incomes are assumed to have a stronger, more diverse economy. It is also hypothesized that the annual average incomes variable is positively associated with the creative class. The household income of every sub-area in the GTA will be collected from the 2008 Japanese Housing and Land Survey.

Third, labor force structure, including **total employed** and the **unemployment rate** are really crucial workforce indicators. Metropolitan areas in the United States, for example, with higher percentages of the creative class are more likely to have lower rates of unemployment (Florida 2002, 2012) with similar findings for seven European countries (Clifton and Cooke 2009). It is expected that the creative class will cluster in areas with lower rates of unemployment in the GTA.

Fourth, the declining birth-rate and aging population is a growing problem in Japan and the percent of **the population in productive age (15-64)** and **the population over 65** is analyzed. By 2020, three out of ten will classified as elderly in Japan. This could affect the distribution of the creative class within the GTA. Sub-areas in the GTA with a disproportionately large elderly class are expected to have a negative impact on the number of creative class workers in that area. A more youthful population is often considered more likely to be innovative due to the open, more tolerant nature of young workers. It is hypothesized that the higher percent productive age within the GTA, the higher the concentration of the creative class.

Fifth, **the percent of single parent head of household** variable was not used in other research but is included here to determine if this variable affects the distribution of the creative class. Concentrations of single parent households could indicate areas with high unemployment rates and/or lower amenity levels. Members of the creative class typically reside in areas with high amenity or what Florida calls quality of place, the fourth "T" or Territorial Assets of economic development (Florida 2012, 280). The human-made cultural landscape - the quality of place - is a key location where cultural and economic capital, ideology, political activities and vernacular traditions are continually negotiated. It is where society literally reproduces itself as a spatial practice in particular places and times (Relph 1976, 33; Lefebvre 1991; Pratt 2008, 107). In order to attract creative people who directly contribute to the local economy, cities, or regions are increasingly pushed to improve their cultural liveliness, social inclusion and tolerance and, more generally, their quality of life (Ponzini and Rossi 2010, 1040). Overall, the single parent head of household variable is hypothesized to have a negative association with percent creative class.

Sixth, this dissertation will examine **percent foreign-born** in the GTA. One of the key characteristics of a creative community is an open-minded community and working conditions that encourage creative thought. Japan is a country with a large population, but only 1.7 % is of foreign descent (Westlaud and Calidoni-Lundberg 2007; Jacobs 2012; Asada 2015). These people may bring new ways to deal with and solve problems. The current Japanese policy discourages foreigners to come and stay due to strict and complicated rules regarding work-permits or visas (Westlund Calidoni-Lundberg 2007).

Segregated diversity within a sub-area can be negatively associated with the creative class. In the case of the U.S, there is a "negative correlation between concentrations of high-tech firms and the percentage of nonwhite population such as Black and Hispanic (Florida 2012). McGranahan and Wojan (2007) found that the creative class was negatively associated with higher percentages of minorities of people. Based on previous research (Fujita and Hill 2005; Yusuf and Nabeshima 2006; Jacobs 2012), it is hypothesized that the variables for the foreign or non-Japanese population will have no association with the creative class dependent variables since the percentage of non-Japanese population is extremely low.

Seventh, scholars note that Japan has always held education in high regard so many students enter higher education via junior colleges, technology colleges, universities and working schools (Westlund and Calidoni-Lundberg 2007). The number of Japanese students entering higher education in 2004 was 49.9 percent (Westlund Calidoni-Lundberg 2007). This dissertation uses several measures of education. **The percent of the workforce with a bachelor's degree** is the basis of much human capital theory. Even though other scholars found the bachelor degree variable has a strong positive relationship with the creative class, it is important to include this variable to determine and contrast its effect on the creative class for each part of the GTA.

Variety of employment composition, such as science research or FIRE industries, can be a crucial measurement for the creative analysis. Employment composition could be considered a proxy for quality of place as.

It is hypothesized that specific industrial specialization are more likely than other to generate a disproportionally share of creative workers (e.g. science-based workers).

Although the SOC system and e-Stat developed by MIC has many advantages for this dissertation since they are based on a national classification system, some key data limitations exist within this framework. The composition of the classification table developed by the MIC does not always perfectly match with the U.S SOC system. Additionally, while the GTA included many sub-areas (city, ward, town and village) in 2010, only 138 sub-areas were examined because the SOC data are only available for sub-areas of 100,000 or above in population.

CHAPTER IV

FINDINGS

In 2010, the GTA had 16 million workers of which 18.6 percent were classified as part of the creative class (2.85 million) by place of work (Table 6). According to Florida (2002), the most skilled workers were part of the super creative class while the second tier workers were classified as a part of the so-called creative professional class. In the GTA, 11.8 percent were considered super creative class while just 6.77 percent were part of the creative professional class. In this sense, the GTA can be considered a hyper-skilled market where the super creative class outnumbers the creative professional class at a nearly 2:1 ratio. Place of residence data showed similar trends.

Table 6. The Creative Class in the GTA, 2010

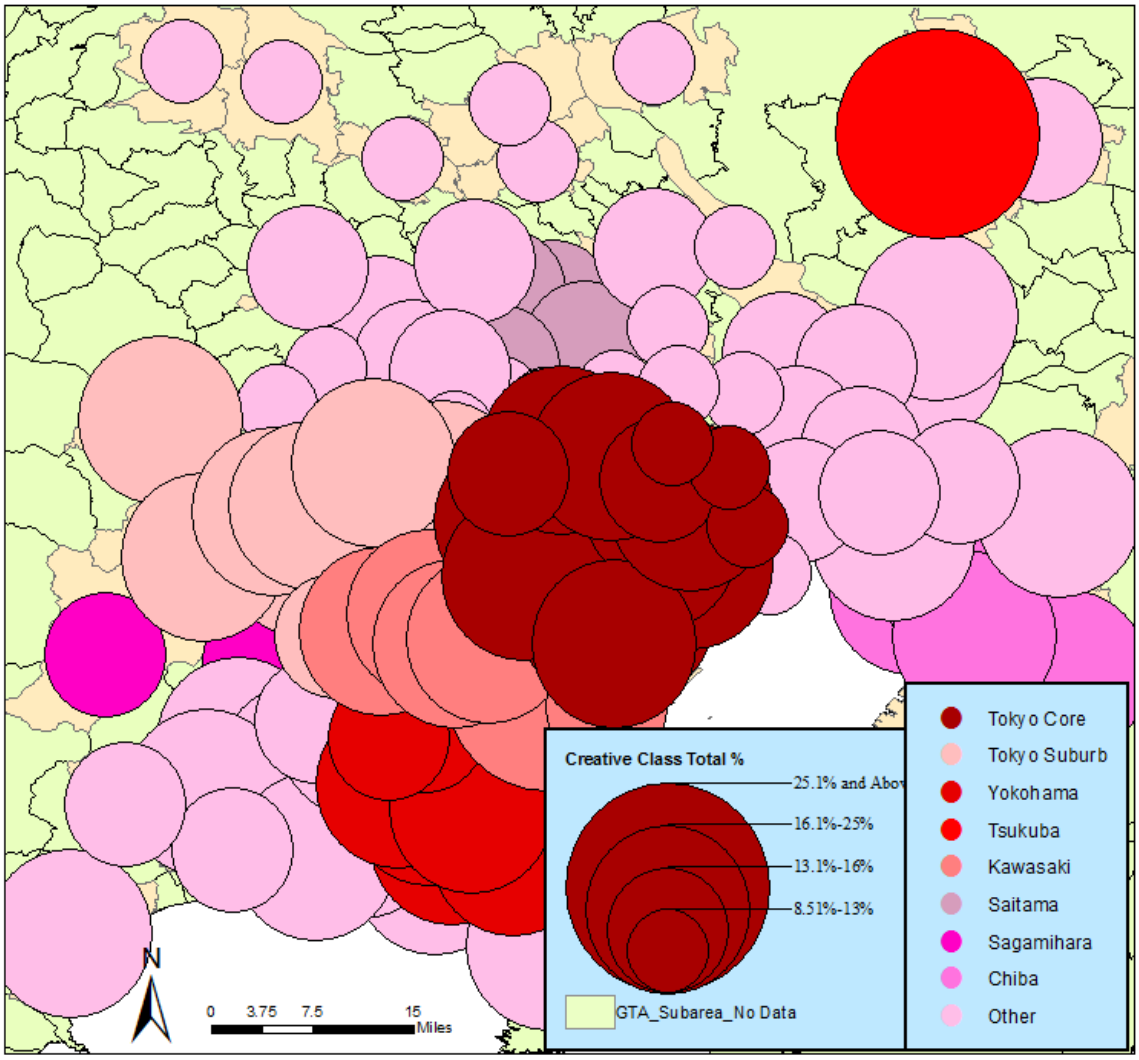
	Total Workers	Creative Class in Aggregate	Super Creative Class	Creative Professional Class
GTA Place of Work	15,314,730	2848980 (18.6%)	1811930 (11.8%)	1037050 (6.77%)
GTA Place of Residence	14,760,770	2753890 (18.7%)	1740440 (11.8%)	1013450 (6.87%)

4.1. Spatial Distribution of the Creative Class in Aggregate

The spatial distribution of the creative class in aggregate in the Greater Tokyo Area (GTA) is uneven and many subareas have disproportionate shares of the creative class by place of residence and place of work. A visual representation and spatial distribution of the creative class total by work place (Figure 8) and residence (Figure 9) illustrates an intense yet differentiated geographic distribution of the labor pool. The geography of the creative class by place of work or place of residence is relatively unevenly spread throughout the GTA. However, the creative class in aggregate by place of work is more spatially concentrated in the central part of the GTA. Tsukuba Science City is one of the few peripheral locations in the GTA that has a high concentration of creative class in total. By contrast, the geography by place of residence is more evenly distributed, including in the suburban northern and eastern sub-areas of the GTA. That said, a disproportionate share of the creative class in total is located in the central part of the GTA both by place of work and place of residence. Many creative workers tend to commute to the central part of the GTA during the daytime.

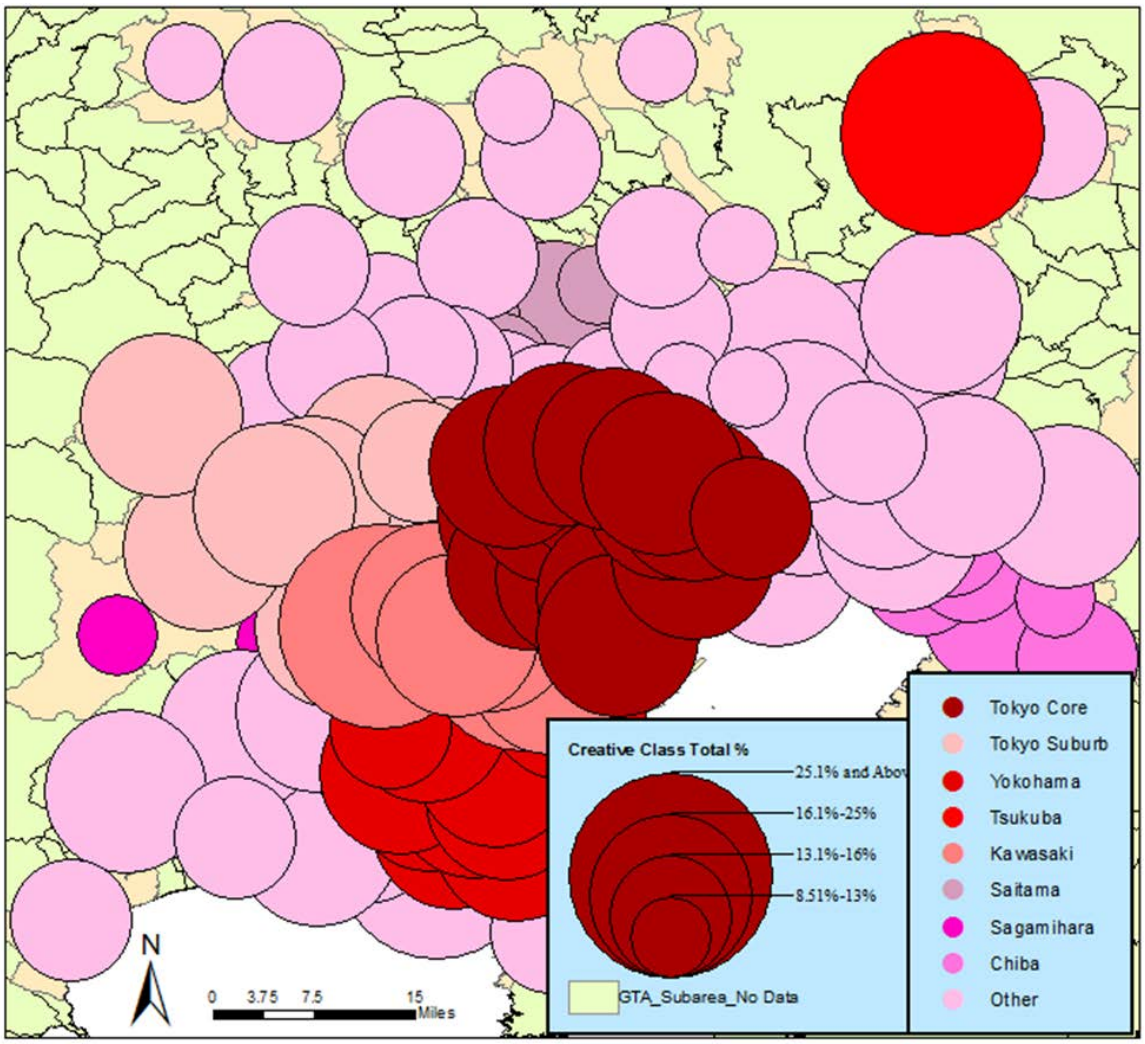
Overall, 18.6 percent of the GTA labor force by place of work was employed in the creative class in 2010 varying from a high of 31.48 percent in Kawasaki-shi Nakahara-ku, to a low of 8.98 percent for Kazo-shi Saitama-ken (Figure 8, Table 7a). An analysis of the spatial distribution of the creative class in aggregate by place of work in the GTA indicated that Kawasaki-shi (N=7: 22%), Yokohama-shi (N=18: 22%) and the Tokyo-Core (N=23: 20.7%) had the three highest concentrations of the creative class in aggregate.

Figure 8. Spatial Distribution of Percent Creative Class in Aggregate by Place of Work by Central GTA Sub-area, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

Figure 9. Spatial Distribution of Percent Creative Class in Aggregate by Place of Residence by Central GTA Sub-area, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
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On the other hand, the spatial distribution of the creative class by place of work in absolute number indicate different scenario. The highest number of the creative class workers found in Minato-Ku (750,900) and the Kamagaya-shi, Chiba-ken had the lowest number of the creative class (26,380) (Table 7b). Also, an analysis of the spatial distribution of the creative class in aggregate by place of work in the GTA in absolute number shift to the Tokyo-Core (N=23: 1,393,910) dominated. Yokohama-shi (N=18: 276,660) and the Tokyo-Suburbs (N=17: 244,430) had large number of the creative individuals as well.

By contrast, 18.7 percent of the GTA labor force by place of residence was employed in the creative class in 2010 varying from a high of 29.43 percent in the Tokyo Core Bunkyo-Ku, to a low of 10.36 percent for Fukaya-shi Saitama-ken (Figure 9; Table 7a). An analysis of the spatial distribution of the creative class total by place of residence in the central GTA indicated that Kawasaki-shi (N=7: 22%), Yokohama-shi (N=18: 21%) and the Tokyo-Core (N=23: 20.7%) had the highest concentrations. These percentages are similar to the spatial distribution of the creative class by place of work. Regarding the absolute number of the creative class by place of residence, the Tokyo-Core (N=23: 775,850), Yokohama-shi (N=18: 356,250) and the Tokyo-Suburbs (N=17: 317,160) had the three highest concentrations of the creative class in aggregate. Overall, 2,753,890 of the GTA labor force by place of residence was employed in the creative class in 2010 varying from a high of 92,350 in the Tokyo-Core, Setagaya-Ku to a low of 6,020 for Saitama-shi, Nishi-ku (Table 7b).

Table 7a. Creative Class in Aggregate (%) Top and Bottom 10 Sub-Areas by Place of Residence and Place of Work, 2010

	Place of Residence				Place of Work			
	Top Ten		*1	*2	**Top Ten**		*1	*2
1	**Bunkyo-Ku**	29.43%	27870	26	Kawasaki-shi, Nakahara-ku	31.48%	93670	52
2	Chiyoda-Ku	28.21%	6920	134	**Bunkyo-Ku**	28.23%	189810	18
3	**Minato-Ku**	27.61%	26640	29	Kawasaki-shi, Saiwai-ku	27.65%	65500	76
4	Musashino-shi	27.45%	17550	61	**Minato-Ku**	27.53%	750900	1
5	**Shibuya-Ku**	26.68%	24720	36	**Shibuya-Ku**	26.71%	375730	5
6	Kawasaki-shi, Asao-ku	26.17%	18480	56	Shinagawa-Ku	25.39%	333950	7
7	**Yokohama-shi, Aoba-ku**	25.98%	35510	19	Fuchu-shi	24.61%	115490	42
8	**Tsukuba-shi**	25.90%	25770	31	**Tsukuba-shi**	24.35%	116490	40
9	Kawasaki-shi, Nakahara-ku	25.83%	29280	22	Tama-shi	23.82%	63310	82
10	Kamakura-shi	25.61%	19000	52	**Yokohama-shi, Aoba-ku**	23.54%	77090	67
	Top Ten Average	26.89%			Top Ten Average	26.33%		
%	Overall Average (n=138)	18.63%			Overall Average (n=138)	17.15%		
#	Overall (n=138)	2753890			Overall (n=138)	2848980		
	Bottom Ten				**Bottom Ten**			
129	Ichihara-shi	12.92%	16370	69	**Fukaya-shi**	11.63%	64470	77
130	**Saitama-shi, Iwatsuki-ku**	12.86%	6640	135	**Misato-shi**	11.52%	51289	105
131	**Soka-shi**	12.63%	243855	81	Iruma-shi	11.40%	54580	95
132	**Adachi-Ku**	12.53%	37420	15	**Noda-shi**	11.37%	63580	81
133	**Noda-shi**	12.35%	9250	118	**Koga-shi**	10.97%	64190	79
134	**Narita-shi**	12.21%	7790	128	**Adachi-Ku**	10.73%	237140	10
135	**Misato-shi**	11.91%	7850	127	**Saitama-shi, Iwatsuki-ku**	10.62%	53370	97
136	**Kazo-shi**	10.87%	6190	137	**Soka-shi**	10.39%	82010	58
137	**Koga-shi**	10.66%	7710	129	**Narita-shi**	9.13%	98890	49
138	**Fukaya-shi**	10.36%	7260	132	**Kazo-shi**	8.98%	49130	110
	Bottom Ten Average	11.93%			Bottom Ten Average	10.67%		

Note1: Bold indicates sub-areas ranked top or bottom ten by place of residence and place of work; Note 2: Ku=Ward, Shi=City; Ku in Tokyo is quasi-independent. ku (with small k) in other cities are sub-components of the designated cities; *1=number of creative class in aggregate and *2=ranking of number

Table 7b. Creative Class in Aggregate (#) Top and Bottom 10 Sub-Areas by Place of Residence and Place of Work, 2010

Place of Residence		Place of Work	
Top Ten		**Top Ten**	
Setagaya-Ku	92350	Minato-Ku	750900
Ota-Ku	64260	**Chiyoda-Ku**	732360
Nerima-Ku	61730	Chuo-Ku	549510
Suginami-Ku	58750	Shinjuku-Ku	503490
Funabashi-shi	50360	Shibuya-Ku	375730
Hachioji-shi	47060	**Ota-Ku**	340350
Itabashi-Ku	43140	Shinagawa-Ku	333950
Koto-Ku	43000	**Koto-Ku**	326970
Edogawa-Ku	42330	**Setagaya-Ku**	305570
Ichikawa-shi	41250	Adachi-Ku	237140
Top Ten Average	54423	Top Ten Average	445597
Overall Average (n=138)	18.63%	Overall Average (n=138)	18.63%
Overall (n=138)	2753890	Overall (n=138)	2753890
Bottom Ten		**Bottom Ten**	
Koga-shi	7710	Chiba-shi, Midori-ku	34270
Fujimino-shi	7540	Toride-shi	34030
Kamagaya-shi	7430	**Saitama-shi, Sakura-ku**	33540
Fukaya-shi	7260	Koganei-shi	32920
Saitama-shi, Sakura-ku	7150	Abiko-shi	31560
Chiyoda-Ku	6920	Saitama-shi, Midori-ku	30800
Saitama-shi, Iwatsuki-ku	6640	Yokohama-shi, Sakae-ku	29630
Sakado-shi	6490	Fujimi-shi	27820
Kazo-shi	6190	**Saitama-shi, Nishi-ku**	27560
Saitama-shi, Nishi-ku	6020	**Kamagaya-shi**	26380
Bottom Ten Average	6935	Bottom Ten Average	30851

Note1: Bold indicates sub-areas ranked top or bottom ten by place of residence and place of work; Note 2: Ku=Ward, Shi=City; Ku in Tokyo is quasi-independent. ku (with small k) in other cities are sub-components of the designated cities

But how does the geography change when focus falls on just the super creative class and the creative professional class?

4.2 Spatial Distribution of the Super Creative Class

Overall, 10.4 percent of the GTA labor force was employed in the super creative class in 2010 varying from a high of 24.4 percent in Kawasaki-shi Nakahara-ku, Kanagawa-ken to a low of 4.65 percent for Adachi-Ku (Table 8). An analysis of the spatial distribution of the super creative class by place of work in the central GTA indicates that the Kawasaki-shi (15.1%), the Tokyo Core (12.4%) and Yokohama-shi (11.6%) had the highest concentrations of the super creative class.

The spatial distribution of the super creative class in the central Greater Tokyo Area (GTA) is uneven and many subareas have disproportionate shares of the super creative class by place of residence and place of work. A visual representation and spatial distribution of the super creative class by work place (Figure 10) and residence (Figure 11) illustrate an intense yet differentiated geographic distribution of the labor pool. The geography of the super creative class is more spatially concentrated in Kawasaki, Tokyo and Yokohama. Tsukuba, located in the northeastern part of the GTA, is the only peripheral area in the GTA that has a high concentration of the super creative class. Overall, the distribution of the super creative class by place of work has a higher concentration in the central part of the GTA. By contrast, the geography by place of residence is more evenly distributed especially in the suburban northern and eastern sub-areas of the GTA. That said, a disproportional share of the super creative class is located in the central part of the GTA both by place of work and place or residence.

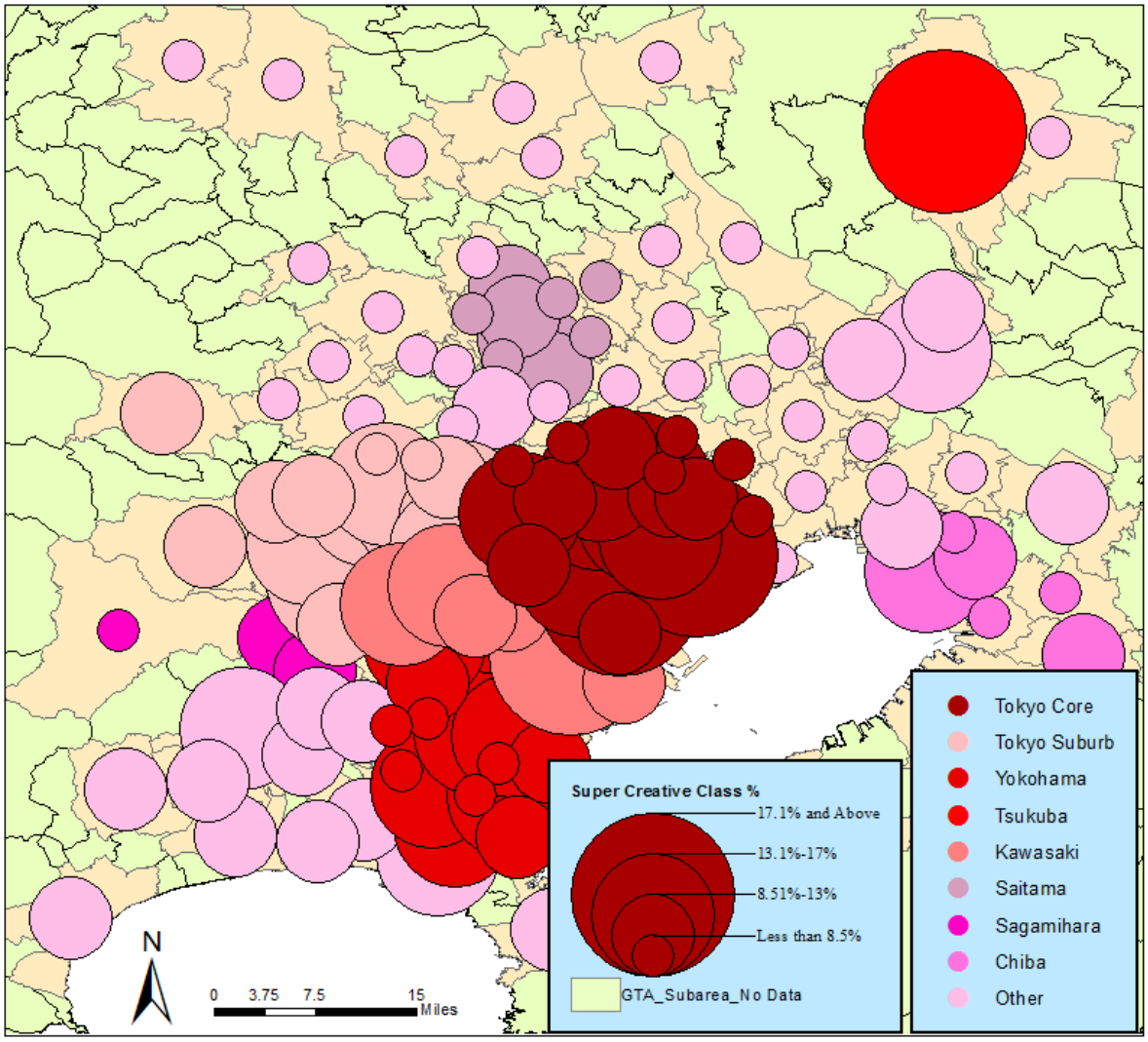
4.3. Super Creative Class by Place of Work

Overall, 10.4 percent of the GTA labor force was employed in the super creative class in 2010 varying from a high of 24.4 percent in Kawasaki-shi Nakahara-ku, Kanagawa-ken to a low of 4.65 percent for Adachi-Ku (Table 8). An analysis of the spatial distribution of the super creative class by place of work in the central GTA indicates that the Kawasaki-shi (15.1%), the Tokyo Core (12.4%) and Yokohama-shi (11.6%) had the highest concentrations of the super creative class.

However, the average percentage of the super creative class by GTA sub-area by place of work declined from 11.9 percent in 2000 to 10.4 percent in 2010 (Table 8). It is possible that the GTA may have seen an erosion in competitive advantage regarding skill levels and creativity. The same relative trends can be seen for the top ten average which decreased from 20.4 percent in 2000 to 18.8 percent in 2005 (although the share did increase to 19.6 percent in 2010) (Table 8). On the other hand, the absolute number of the super creative class by place of work suggests different scenarios. The total number of the super creative class declined from 1,887,692 in 2000 to 1,769,215 in 2005, although the number of the super creative class had increased to 1,811,930 workers by 2010.

Despite the drastic shifts in the share of super creative class workers both temporally and spatially in the central GTA, the list of top ten super creative class subareas was relatively stable.

Figure 10. Spatial Distribution of the Super Creative Class (%) by Place of Work by Central GTA Sub-area, 2010



Notes:

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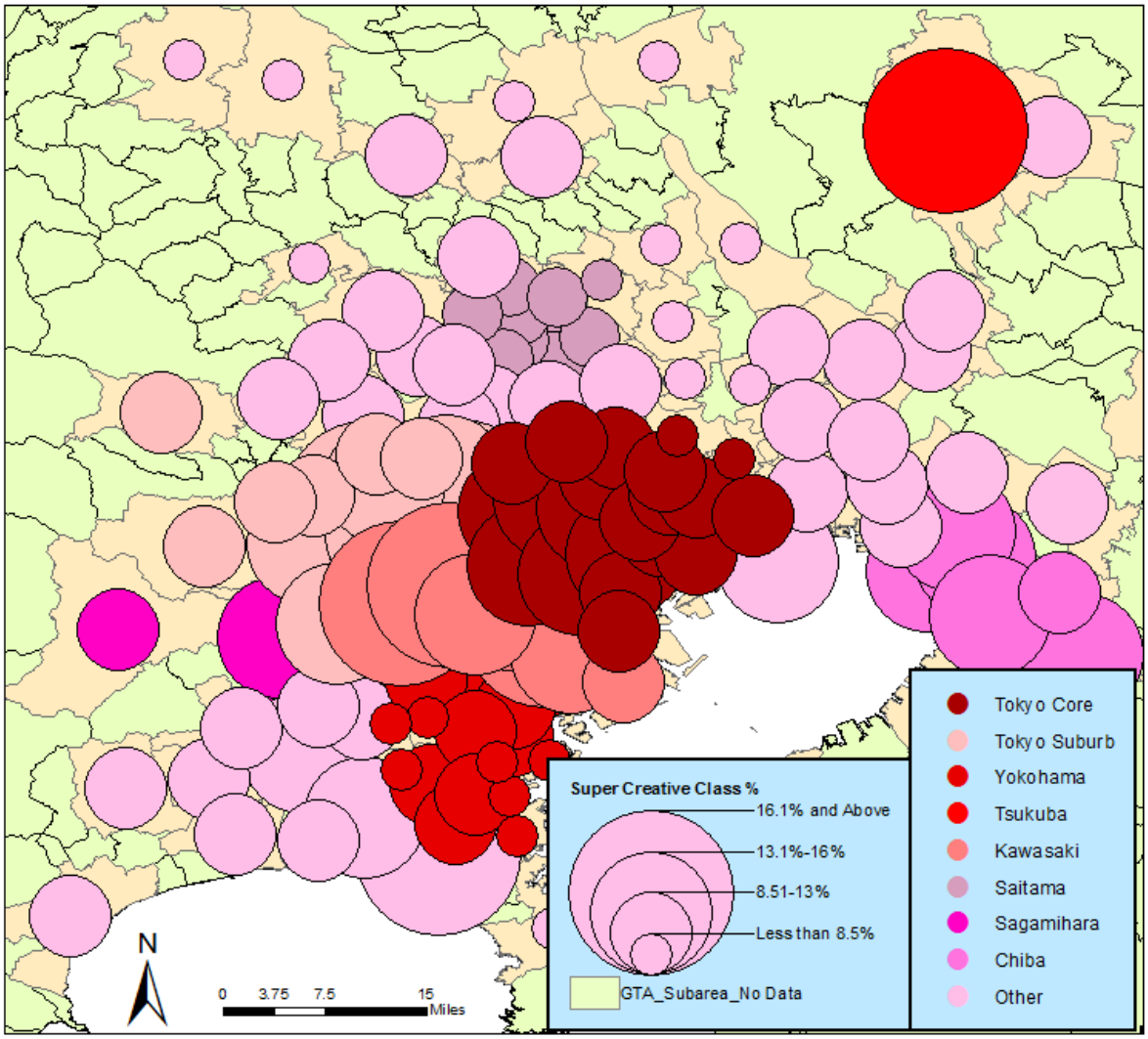
3. The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

Figure 11. Spatial Distribution of the Super Creative Class (%) by Place of Residence by Central GTA Sub-area, 2010



Notes:
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Table 8. Greater Tokyo Sub-Areas Ranked by Super Creative Class (%) Top and Bottom 10 By Place of Work: 2000-2010

	2000		2005		2010	
	Top Ten		**Top Ten**		**Top Ten**	
	Kawasaki-shi, Saiwai-ku	24.59%	**Kawasaki-shi, Saiwai-ku**	22.24%	**Kawasaki-shi Nakahara-ku**	24.42%
	Kawasaki-shi, Nakahara-ku	22.18%	**Kawasaki-shi, Nakahara-ku**	22.18%	**Kawasaki-shi, Saiwai-ku**	22.46%
	Tsukuba-shi	21.22%	**Shibuya-Ku**	18.80%	**Minato-Ku**	20.81%
	Shibuya-Ku	20.16%	**Minato-Ku**	18.40%	**Shibuya-Ku**	20.11%
	Chiba Abiko-shi	19.60%	Meguro-Ku	18.05%	Shinagawa-Ku	19.53%
	Bunkyo-Ku	19.46%	**Bunkyo-Ku**	17.99%	**Bunkyo-Ku**	18.64%
	Chiba-shi, Mihama-ku	19.25%	**Tsukuba-shi**	17.84%	Fuchu-shi	18.37%
	Minato-Ku	19.17%	Shinagawa-Ku	17.81%	**Tsukuba-shi**	17.37%
	Tama-shi	19.09%	Kokubunji-shi	17.26%	Tama-shi	17.37%
	Meguro-Ku	18.84%	Chiba-shi, Mihama-ku	16.89%	Koto-Ku	17.01%
	Top Ten Average	20.36%	Top Ten Average	18.75%	Top Ten Average	19.61%
%	Overall Average (n=119)	11.87%	Overall Average (n=131)	10.62%	Overall Average (n=138)	10.40%
#	Overall Average (n=119)	1887692	Overall Average (n=131)	1769215	Overall Average (n=138)	1811930
	Bottom Ten		**Bottom Ten**		**Bottom Ten**	
	Saitama Kasukabe-shi	7.26%	Saitama Koshigaya-shi	6.22%	**Saitama Kawaguchi-shi**	5.62%
	Saitama Fukaya-shi	6.97%	**Saitama-shi, Iwatsuki-ku**	6.12%	Saitama Toda-shi	5.55%
	Saitama Iwatsuki-shi	6.84%	Saitama Toda-shi	6.02%	**Saitama Soka-shi**	5.55%
	Saitama Fujimi-shi	6.60%	**Katsushika-Ku**	5.95%	Ibaraki Koga-shi	5.19%
	Katsushika-Ku	6.49%	**Saitama Soka-shi**	5.58%	**Saitama Misato-shi**	5.17%
	Saitama Koshigaya-shi	6.35%	**Saitama Kawaguchi-shi**	5.49%	**Saitama-shi Iwatsuki-ku**	5.06%
	Saitama Kawaguchi-shi	6.20%	**Adachi-Ku**	4.79%	Saitama Kazo-shi	4.82%
	Saitama Soka-shi	6.06%	**Saitama Misato-shi**	4.61%	**Katsushika-Ku**	4.80%
	Adachi-Ku	5.61%	Ibaraki Koga-shi	4.49%	Chiba Narita-shi	4.79%
	Saitama Misato-shi	5.40%	Chiba Narita-shi	4.10%	**Adachi-Ku**	4.65%
	Bottom Ten Average	6.38%	Bottom Ten Average	5.34%	Bottom Ten Average	5.12%

Note 1: Ku=Ward, Shi=City; Ku in Tokyo is quasi-independent. ku (with small k) in other cities are sub-components of the designated cities; Note 2: Bold indicates those sub-areas featured in all three years.

Four Tokyo sub-areas and two Kawasaki sub-areas feature in both the 2000 and 2005 top ten listing. Furthermore, in 2010, five of the top ten sub-areas were in the Tokyo Core while six of the bottom ten were in Saitama located immediately north of Tokyo.

The first detailed impression of the GTAs' sub-area rankings for the super creative class by place of work is that each of the top ten sub-areas has an above average share of engineering related occupations which accounts for roughly half of the super

creative class in the entire GTA. Another trend for the top ten subareas by place of work is the geographic proximity of the three leading geographic clusters of the super creative class including; 1) The Tokyo Core (Minato-Ku, Shibuya-Ku, Shinagawa-Ku, Bunkyo-Ku and Koto-Ku) and Kawasaki-shi (Nakahara-ku and Saiwai-ku); 2) along the Chuo main train line in the Tokyo Suburbs (Fuchu-shi and Tama-shi) and 3) Tsukuba Science City (Figure 6). Just like by place of residence, the only sub-area in the super creative class top ten by place of work that were not located in the central part of GTA was the Tsukuba Science City which is located in northeastern part of the GTA.

Kawasaki-shi (city) has the highest concentration of the super creative class in the central GTA and is located in the northeast of Kanagawa Prefecture, adjoining the Tokyo Prefecture across the Tamagawa River to its north and Yokohama-shi to its south. Kawasaki-shi features good traffic access and a comfortable living environment. Kawasaki-shi provides many business opportunities with its the concentration of global enterprises, leading-edge research and development institutes, advanced technologies and technology skill workers. Kawasaki-shi is full of attractive places, such as one of Japan's premier industrial nightscapes, world-class music halls, and pleasant shopping facilitates (Kawabata 2003, 2006; Tajima 2014; Watanabe 2014). Many industries locate along major railways' stations (Hall 1966; Koizumi and Wakabayashi 2014, 2015; Mori 2016; Konno and Itoh 2017). A common characteristic of those edge communities is their great access to Tokyo's CBD through major commuter trains. For example, many creative individual commute from Musashino-shi due to easy access to the central part of Tokyo and the abundance of commercial facilities near major train station in the city (Fujita and

Hill 2012). Tajima (2014) argued that easy access to public transit is the most important factor influencing peoples' choice of residential location. Florida (2002) asserted that center of the creative activities appear in efficient and heavily trafficked subway and light-rail system (Mansury et al. 201). Koizumi and Wakabayashi (2014, 2015) also argued that the number of white-collar workers, or creative individuals, increased in the areas around train stations. At the same time, they argued that the ratio of blue-collar workers significantly decreased around railroad stations.

According to Chorus and Bertolini (2016), the local government and the private railway operators involved in the development of railway corridors in Tokyo. The Tokyo metropolitan Government (TMG) concern conditioning and facilitating land-use development. On the other hand, each private railway company develops its planning of railway corridors. Those private operators including "Tokyu" own considerable amounts of land along their railway tracks and they construct houses, offices, shops and other facilities. Additionally, those private railways companies involve non-transportation activities (e.g. leisure, hotel, and other services) (Koizumi and Wakabayashi 2014, 2015; Konnno and Itoh 2017).

Kawasaki-shi includes seven smaller subareas or ku (wards) and has a large share of the labor force composed of the super creative class due to the high concentration of creative workers (Table 9). Not only Nakahara-ku and Saiwai-ku, but the entire city of Kawasaki generates a disproportionate share of the super creative class. There are over 100 foreign-financed companies whose strategic base in Japan is located in Kawasaki. Kawasaki City hosts several international research institutes, businesses, and other

organizations in developing a research and development base in life science including Shin-Kawasaki Science Park Saiwai. Some of the key companies driving the Kawasaki cluster of engineering include several factories that are Global Fortune 500 Companies such as Fujitsu, NEC (Nippon Electric Company) and Toshiba.

Table 9. Super Creative Class (%) by Place of Work in ku areas in Kawasaki, 2010

Super Creative Class Total	
Kanagawa Kawasaki-shi Nakahara-ku	24.42%
Saiwai-ku	22.46%
Asao-ku	13.77%
Tama-ku	13.21%
Takatsu-ku	12.22%
Miyamae-ku	9.93%
Kawasaki-ku	9.63%
Overall Average (n=7)	15.09%

Nakahara-ku in Kawasaki-shi, ranked first for the super creative class by place of work and is located in the center of Kawasaki-shi. The Musashi-Kosugi railway station in Nakahara-ku is a major travel node for the creative class. From this station, it takes less than a half hour to get to the central part of the GTA (i.e. Shibuya-Ku). New residential and industrial parks continue to expand around the station as a part of several urban redevelopment projects. Additionally, Nakahara-ku has the youngest median age (37.7) in the GTA, and the share of the productive age (between 15 and 64) is the second highest in the central GTA. The overall percentage of telecommunication industry employment is highest in Nakahara-ku (13.07). At the same time, however, lower rates of other subcomponents of super creative class can be found in the Nakahara-ku including

only 0.44 percent of researchers, slightly above the overall average of 0.34 percent, which ranks only 30th in the GTA (See Table 10).

Saiwai-ku, located south of Nakahara-ku in Kawasaki-shi, is ranked second for the percentage of the population employed in the super creative class by place of work in the central GTA with 22.5 percent of the workforce (Table 8). It should be noted that before 2010, Saiwai-ku ranked first in the super creative rankings in 2000 (24.6%) and 2005 (22.2%). The economy of Saiwai-ku is dominated by high-tech industry. Head offices of major corporations, such as Toshiba, Canon, Pioneer Corporation and Hitachi as well as the subsidiaries of Dell Japan are all located in Saiwai-ku. Major research institutions including Shin-Kawasaki Science Park are also located in Saiwai-ku. Many of those research institutions are engaged in advanced technology and the development of new products in collaboration with several major universities, as well as with supporting entrepreneurs and start-up businesses.

Nakahara-ku and Saiwai-ku dominate the top two positions of the super creative class ranking in 2000, 2005 and 2010. Nakahara-ku was ranked second in 2000 and 2005, and ranked higher in 2010. On the other hand, Saiwai-ku was second in 2010 but was ranked first in 2000 and 2005 (see Table 8).

The Tokyo Core, officially known as the 23 Special Municipalities Wards of Tokyo, features prominently in the creative class rankings. The Tokyo Core corresponds to areas that were part of the city of Tokyo before it was abolished in 1943.

Table 10. Greater Tokyo Sub-Areas Ranked by Super Creative Class (%) Top and Bottom 10 and its Occupational Sub-Components by Place of Work, 2010

Super Creative Class Total		Researchers		Engineering		Teacher		Other Specialists		Authors, jounalist, editors		Artist, designer, photographer		Musician, dancers		Office appliance operators	
Top Ten			Rank		Rank		Rank		Rank		Rank		Rank		Rank		Rank
Kawasaki-shi Nakahara-ku	24.42%	0.44%	30	19.24%	**1**	1.84%	108	1.57%	71	0.10%	97	0.74%	29	0.11%	64	0.40%	64
Kawasaki-shi, Saiwai-ku	22.46%	0.81%	14	18.27%	**2**	1.11%	129	1.05%	126	0.14%	75	0.37%	88	0.20%	35	0.50%	45
Minato-Ku	20.81%	0.20%	64	12.78%	4	0.58%	137	2.25%	24	0.86%	8	1.92%	**3**	1.26%	**2**	0.95%	7
Shibuya-Ku	20.11%	0.07%	111	8.16%	19	1.19%	128	2.88%	4	1.13%	4	3.68%	**1**	1.98%	**1**	1.01%	4
Shinagawa-Ku	19.53%	0.32%	43	14.39%	**3**	0.88%	135	1.35%	90	0.49%	18	1.13%	17	0.24%	29	0.73%	17
Bunkyo-Ku	18.64%	0.90%	8	7.96%	20	3.65%	10	1.83%	52	1.90%	**1**	1.36%	10	0.21%	33	0.85%	12
Fuchu-shi	18.37%	0.23%	54	12.73%	5	2.26%	76	1.41%	81	0.16%	65	0.62%	47	0.10%	70	0.85%	11
Tsukuba-shi	17.37%	7.33%	**1**	4.66%	53	2.88%	32	1.97%	42	0.08%	113	0.16%	132	0.02%	123	0.51%	43
Tama-shi	17.37%	0.08%	107	9.43%	9	2.46%	56	2.35%	19	0.87%	7	0.57%	51	0.32%	21	1.42%	2
Koto-Ku	17.01%	0.20%	63	12.25%	6	0.96%	133	1.31%	96	0.33%	30	0.76%	27	0.18%	38	1.01%	6
Top Ten Average	19.61%	1.06%		11.99%		1.78%		1.80%		0.61%		1.13%		0.46%		0.82%	
Bottom Ten																	
Saitama Kawaguchi-shi	5.62%	0.07%	112	1.66%	124	1.78%	110	1.19%	106	0.14%	78	0.47%	70	0.05%	105	0.27%	104
Saitama Toda-shi	5.55%	0.39%	37	1.77%	118	1.38%	123	1.11%	121	0.07%	120	0.36%	91	0.10%	67	0.37%	70
Saitama Soka-shi	5.55%	0.16%	76	1.71%	120	1.76%	114	1.11%	113	0.09%	105	0.29%	105	0.12%	58	0.27%	103
Ibaraki Koga-shi	5.19%	0.03%	126	1.73%	118	2.18%	84	0.97%	131	0.05%	129	0.06%	138	0.00%	138	0.17%	133
Saitama Misato-shi	5.17%	0.20%	65	1.66%	125	1.58%	119	1.11%	119	0.12%	121	0.20%	124	0.04%	109	0.33%	83
Saitama-shi Iwatsuki-ku	5.06%	0.13%	82	1.44%	131	1.95%	100	1.07%	124	0.04%	131	0.17%	131	0.00%	135	0.26%	108
Saitama Kazo-shi	4.82%	0.12%	85	1.69%	121	1.93%	102	0.68%	138	0.02%	138	0.16%	133	0.00%	136	0.22%	123
Katsushika-Ku	4.80%	0.11%	93	1.19%	138	1.78%	111	1.09%	123	0.11%	91	0.25%	114	0.07%	86	0.21%	125
Chiba Narita-shi	4.79%	0.05%	118	1.59%	128	1.29%	126	0.97%	91	0.08%	129	0.11%	136	0.02%	118	0.32%	86
Adachi-Ku	4.65%	0.04%	123	1.19%	138	1.67%	116	0.93%	132	0.11%	92	0.29%	106	0.09%	74	0.29%	96
Bottom Ten Average	5.12%	0.130%		1.563%		1.730%		1.02%		0.083%		0.24%		0.05%		0.27%	
Overall Average (n=138)	10.41%	0.34%		4.55%		2.37%		1.67%		0.26%		0.60%		0.19%		0.44%	

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities

Chiyoda-Ku, Chuo-Ku and Minato-Ku are considered to be the Central Business District (CBD) of Tokyo (Kawabata 2003, 2006; Arai et al. 2004; Cybriwsky 2011; Fujita and Hill 2012; Tajima 2014). Nearly 2.3 million commuters arrive each working day in these three Ku areas of Tokyo. Tokyo is the center of the metropolitan area and features good traffic access and an ideal work and life environment for creative individuals. The Tokyo

Core shows a very strong presence of the super creative class. Five Ku areas of the Tokyo Core dominate in the top ten rankings including Minato-Ku (3rd), Shibuya-Ku (4th), Shinagawa-Ku (5th), Bunkyo-Ku (6th) and Koto-Ku (10th) (Table 8).

Shibuya-Ku is well known for being the center of creativity in all of Japan. Many of these creative activities take place around Shibuya Station, which is the busiest railway station in Japan. Shibuya-Ku is famous as the fashion center of the country. Starting in the 1990s, Shibuya became the core area for IT industries. Shibuya-Ku is also famous for its scramble crossing, located in front of the Shibuya Station. Three large TV screens mounted on nearby buildings overlook the crossing, as well as many advertisement signs. Large Japanese corporations such as the "Tokyu" Railway Company, East Japan Railway Company and Taito Corporation have their headquarters in Shibuya-Ku. One of the major private universities of Japan, Aoyama Gakuin University is situated right outside the Shibuya Station.

Shibuya-ku is ranked fourth for the super creative class by place of work. Shibuya-Ku was ranked fourth for the super creative class by place of work in 2000 and third and in 2005 (Table 8). Although nearly half of all the super creative class workers in Shibuya are in engineering, it was only the 19th ranked super creative class sub-area based on its engineering workers. By contrast, it was the highest ranked cluster of artists, designers and photographers (3.68%) and musicians and dancers (1.98%) (Table 11). Shibuya-Ku was also ranked fourth in two other super creative class-related industries, including FIRE (10.41 percent) and scientific research, professional and technical

services (9.10 percent) employment (Table 11). It seems that the Shibuya super creative class cluster is one of the more diverse clusters in the GTA.

The Minato-Ku had the highest percent share of the super creative class in the GTA, outside of Kawasaki. Many headquarters of Japanese global corporations such as Honda, Mitsubishi Heavy Industries, Mitsubishi Motors Corporation, NEC, Sony, Fujitsu, Toshiba and All Nippon Airways (ANA) as well as international -national firms of Google and Apple are located in Minato-Ku. Additionally, major universities are located in Minato-Ku including Keio University, Kitasato University, the National Graduate Institute for Policy Studies (GRIPS), Shibaura Institute of Technology and the University of Tokyo Institute of Medical Science.

Minato-Ku is ranked third for the percent super creative class by place of work (20.8%) (Table 8). Also, it was ranked eighth in 2000 and fourth in 2005 and has long been a creative node in the GTA. A very strong presence of engineering (12.78 percent and ranked 4th in the entire GTA), artists, designers and photographers (1.92 percent/ranked 3rd) and musicians and dancers (1.26 percent/ranked 2nd) illustrate a very diversified super creative class node (Table 10). Minato-Ku had 15 percent of its labor pool employed in FIRE (Finance, Insurance and Real Estate), which is almost three times higher than the average of 6.2 percent (Table 11). Minato-Ku was also ranked second for scientific research, professional and technical services employment (12.3) (Table 11).

Other major sub-areas of super creative class employment in the Tokyo Core area included the Shinagawa-Ku located south of the Tokyo CBD which ranked fifth for the percent super creative class by place of work (Table 8). Shinagawa hosts many

companies including Isuzu, a major travel agency of JTB corporation, MOS Burger (a major Japanese fast food chain company), the Honda brand, Acura, and Japan Airlines (JAL).

Table 11. Greater Tokyo Sub-Areas Ranked by Key Predictor Variables: Science Research Industry Employment (%), Telecommunication Industry Employment (%) and FIRE Industry Employment (%), 2010

% Science Research Industry Employment		% Telecommunication Industry Employment		% FIRE Industry Employment	
Top Ten		**Top Ten**		**Top Ten**	
Ibaraki Tsukuba-shi	15.17%	Kanagawa Kawasaki-shi, Nakahara-ku	13.07%	Tokyo Minato-ku	15.31%
Tokyo Minato-ku	12.34%	Tokyo Shinjuku-ku	11.40%	Tokyo Chiyoda-ku	12.62%
Tokyo Shinjuku-ku	9.74%	Tokyo Minato-ku	11.11%	Tokyo Shinjuku-ku	12.42%
Tokyo Shibuya-ku	9.10%	Kanagwa Kawasaki-shi, Takatsu-ku	10.06%	Tokyo Shibuya-ku	10.41%
Tokyo Bunkyo-ku	7.98%	Kanagawa Yokohama-shi, Kohoku-ku	9.94%	Saitama Saitama-shi, Urawa-ku	10.24%
Tokyo Meguro-ku	7.88%	Tokyo Suginami-ku	9.86%	Tokyo Musashino-shi	9.99%
Tokyo Suginami-ku	7.63%	Kanagawa Kawasaki-shi, Tama-ku	9.78%	Tokyo Suginami-ku	9.65%
Tokyo Setagaya-ku	7.47%	Chiba Urayasu-shi	9.53%	Kanagwa Yokohama-shi, Aoba-ku	9.61%
Kanagawa Kamakura-shi	7.28%	Tokyo Musashino-shi	9.30%	Chiba Urayasu-shi	9.36%
Tokyo Chiyoda-ku	7.17%	Tokyo Shibuya-ku	9.23%	TokyoBunkyo-ku	9.03%
Top Ten Average	9.18%	Top Ten Average	10.33%	Top Ten Average	10.86%
Bottom Ten		**Bottom Ten**		**Bottom Ten**	
Saitam Misato-shi	2.74%	Ibaraki Tsukuba-shi	2.02%	Kanagawa Hadano-shi	3.55%
Tochigi Oyama-shi	2.72%	Tochigi Oyama-shi	1.94%	Chiba Ichihara-shi	3.55%
Saitama Saitama-shi, Iwatsuki-ku	2.70%	Ibaraki Tsuchiura-shi	1.82%	Kanagawa Isehara-Shi	3.53%
Saitama Kumagaya-shi	2.67%	Chiba Ichihara-shi	1.74%	Chiba Narita-shi	3.37%
Chiba Noda-shi	2.55%	Saitama Kazo-shi	1.60%	Saitama Kazo-shi	3.02%
Chiba Narita-shi	2.00%	Chiba Kisarazu-shi	1.52%	Ibaraki Tsukuba-shi	2.88%
Saitama Kazo-shi	2.00%	Saitama Fukaya-shi	1.37%	Saitama Fukaya-shi	2.76%
Tochigi Tochigi-shi	1.99%	Chiba Narita-shi	1.34%	Ibaraki Koga-shi	2.73%
Ibaraki Koga-shi	1.98%	Ibaraki Koga-shi	1.22%	Tochigi Oyama-shi	1.40%
Saitama Fukaya-shi	1.83%	Tochigi Tochigi-shi	0.86%	Tochigi Tochigi-shi	0.86%
Bottom Ten Average	2.32%	Bottom Ten Average	1.54%	Bottom Ten Average	2.77%
Overall Average (n=138)	4.68%	Overall Average (n=138)	5.66%	Overall Average (n=138)	6.20%

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities

Bunkyo-Ku of the Tokyo Core is ranked sixth for the super creative class by place of work and is home to Tokyo University (Table 8). Bunkyo-Ku is located just north of the Tokyo CBD and is well known for its publication companies. One of the major publishing companies of Japan, Kodansha has its headquarters in Bunkyo-Ku. Since the beginning of the modern period of Japan (starting from 1868), Bunkyo-ku has been known as a superior residential and educational location. Literati like Natsume Soseki, and many other scholars and politicians have lived in Bunkyo-Ku. Also, Bunkyo is home to the Tokyo Dome and judo's Kodokan where many creative activities take place. Bunkyo-Ku has the highest share of authors, journalists and editors in the GTA, comprising 1.9 percent of the total workforce. Bunkyo-Ku was also ranked sixth highest in educational attainment (58.2% of the population have at least BA or more) (Arai et al. 2004) (Table 8). Bunkyo-ku was also ranked fifth in percent of Scientific research, professional and technical Services employment (Table 12).

Other than the Tokyo Core Ku, other areas with a high percent of super creative class workers included several shi (city) in the western Tokyo area including Fuchu-shi and Tama-shi are located approximately 12 miles west of the CBD of Tokyo. These two cities also have great access from/to the Kawasaki-shi and Yokohama-shi. Fuchu-shi and Tama-shi are known as bedroom, commuter or edge communities of the Tokyo Core.

Table 12. Greater Tokyo Sub-Areas Ranked by Key Predictor Variables: Completed University (4 years) and/or Graduate School (%) and Annual Household Income $ 100,000 and above, Top and Bottom 10, 2010

% Completed University (4 years) and/or Graduate School		Annual Household Income $ 100,000 and above	
Top Ten		**Top Ten**	
Kamakura-shi	65.40%	Chiyoda-Ku	11.93%
Yokohama-shi, Aoba-ku	65.28%	Minato-Ku	8.63%
Kawasaki-shi, Asao-ku	63.23%	Yokohama-shi, Aoba-ku	6.86%
Musashino-shi	62.63%	Chuo-Ku	6.53%
Koganei-shi	58.48%	Bunkyo-Ku	5.82%
Bunkyo-Ku	58.22%	Urayasu-shi	5.80%
Saitama-shi, Urawa-ku	57.96%	Setagaya-Ku	5.79%
Suginami-Ku	57.83%	Yokohama-shi, Tsuzuki-ku	5.46%
Kokubunji-shi	57.03%	Meguro-Ku	5.15%
Chiyoda-Ku	56.51%	Shibuya-Ku	5.11%
Top Ten Average	60.26%	Top Ten Average	6.71%
Bottom Ten		**Bottom Ten**	
Tochigi Oyama-shi	23.27%	Ichihara-shi	1.48%
Saitama-shi, Iwatsuki-ku	23.04%	Akishima-shi	1.45%
Noda-shi	22.97%	Adachi-Ku	1.42%
Ichihara-shi	22.43%	Konosu-shi	1.40%
Misato-shi	22.38%	Hadano-shi	1.36%
Fukaya-shi	20.16%	Soka-shi	1.27%
Kisarazu-shi	19.92%	Kuki-shi	1.21%
Kazo-shi	19.48%	Kawasaki-shi, Kawasaki-ku	1.18%
Tochigi-shi	18.38%	Kasukabe-shi	1.15%
Koga-shi	17.51%	Tochigi-shi	0.83%
Bottom Ten Average	20.95%	Bottom Ten Average	1.27%
Overall Average (n=138)	38.81%	Overall Average (n=135)	2.62%

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities

Fuchu-shi and Tama-shi are ranked seventh (18.4 percent) and eighth (17.4 percent) respectively, in terms of the percent of all workers classified as part of the creative class (Table 8). Tama-shi has a large tertiary economic sector employment with nearly ninety percent (88.2 percent) of its employment in this economic sector, which is the fifth highest in the entire GTA.

Other than Kawasaki and Tokyo, the only other major area to appear in the super creative class ranking by place of work was Tsukuba Science City, a state planned science park developed in the 1960s, as a national research center for Japan. The logic was that Tsukuba would feed the high-growth economy of Japan and develop a competitive advantage similar to the logic behind the Research Triangle Park area in North Carolina (Hamley 1984; Cybriwsky 1998; Jacobs 2006).

Over sixty national research institutes and two national universities, including the University of Tsukuba, are located in this city. Tsukuba Science City has an international flair with 7,500 foreign students and researchers from over 130 countries. The city is located in the northern part of the GTA, in the Ibaraki Prefecture, 38 miles from the central Tokyo to avoid the high cost of urban land in Tokyo.

Tsukuba Science City was ranked eighth in the percent of the super creative class by place of work (Table 8). Although it has the smallest share of engineering workers (4.66%) in the top ten, it has the highest concentration of research workers (6.19%) and teachers (4.31%) in the top ten (Table 9). Tsukuba's overall unemployment rate of 2.09% was the fifth lowest among the GTA's subareas in 2010. Tsukuba also had the fourth lowest median age in the GTA (i.e. 38.7 compare to an overall average of 42.6 year).

Regarding the ten GTA sub-area with the lowest share of the super creative class workers, the overall impression is that these sub-areas are unevenly dispersed throughout the GTA (Figure 6). Some areas are remotely located, such as Koga-shi in Ibaraki prefecture. On the other hand, Adachi-Ku in Tokyo is located in the Tokyo Core. A common theme in the bottom ten is the weak presence of scientific research, professional and technical services, telecommunication and FIRE employment (see Table 11). These three industries are considered to be strong indicators of the presence or absence of creative workers by place of work. For example, Koga-shi ranked 132nd for the super creative class by place of work and had the lowest percent of scientific research, professional and technical services employment in the GTA at just 1.98 percent, which is significantly lower than the GTA overall average of 4.68 percent. Another notable trend in the bottom ten subareas is the low level of educational attainment which is considered a strong indicator of the presence or absence of creative workers. Koga-shi ranked just 121st for the percent super creative class by place of work and had the lowest level of educational attainment in the GTA (only 17.5 percent of the workforce obtained a BA or above) (Table 12). This is significantly lower than the overall average of 38.8 percent. Not only is there an absence of creative workers in the bottom ten, but none of these sub-areas have any major educational institutions.

One of the major airports in the world, the Narita International Airport, is located in Narita-shi in Chiba Prefecture. Narita-shi is located thirty miles west of the central part of the GTA and is the gateway between the GTA and the rest of the world. Due to its location, agriculture dominated the economy in Narita-shi. However, after the opening of

the airport in 1978, the local economy in the city shifted to transportation, logistics and tourism. Just over 84 percent of Narita's employment belongs to tertiary economic sectors (overall average of tertiary economic sector in the GTA is 76.4 percent). However, Narita is ranked second last for the super creative class by place of work in 2010 and was ranked last in 2005 (see Table 8). The majority of the percentage of the super creative class subcomponents occupations was also very low in Narita.

Adachi-Ku is located in the Tokyo Core, in the central part of the GTA. Due to its location, Adachi-Ku was expected to rank higher. However, Adachi-Ku is ranked 138th (out of 138) for the super creative class by place of work in 2010. Additionally, it ranked 127th (out of 131) in 2005 and 117th (out of 119) in 2000 (see Table 8). Just like Narita-shi, Adachi-Ku has a service sector economy but fewer occupational subcomponents of the creative class show up in Adachi-Ku. Further evidence of this subarea's weakness in the creative class is that Adachi-Ku has a very low percentage of higher educational attainment, only 23.6 percent of the population pursued a BA or higher, significantly lower than Bunkyo-Ku (nearly 58.2 percent) (see Table 12).

Since nearly half of all the super creative class workers in the Greater Tokyo Area in 2010 were engineers, it seemed useful to better understand how the geography of the super creative class looked when removing engineering-related occupations. The average percent of the labor force employed in the super creative class by place of work when excluding engineering-related occupations is about five percentage points lower than for the entire super creative class (i.e. 5.9% versus 10.4%) in the GTA. Additionally, the average for the top ten GTA sub-areas drops by nearly half from 19.6 % (with

engineering) to just over 10% (without engineering). Overall, the percent of the super creative class without engineering varied from a high of 12.95 percent in Tsukuba Science-shi to a low of 2.98 percent for Kawasaki-ku Kawasaki-shi (Table 10). Only three GTA subareas featured in both top tens and these included Shibuya-Ku and Bunkyo-Ku in central Tokyo and Tsukuba Science city. Furthermore, the two subareas of Kawasaki with the highest share of the super creative class (i.e. Nakahara-ku and Saiwai-ku) plummeted in the rankings when excluding engineering -- related occupations (see Table 13).

Table 13. Super Creative Class with/without Engineers (SOC #B-5) by Place of Work in the Greater Tokyo Area, 2010

A. SCC (including Engineers)

Top Ten	
Kawasaki-shi Nakahara-ku	24.42%
Kawasaki-shi, Saiwai-ku	22.46%
Minato-Ku	20.81%
Shibuya-Ku	20.11%
Shinagawa-Ku	19.53%
Bunkyo-Ku	18.64%
Fuchu-shi	18.37%
Tsukuba-shi	17.37%
Tama-shi	17.37%
Koto-Ku	17.01%
Top Ten Average	19.61%

B. SCC (Without Engineers)

Top Ten	
Tsukuba-shi	12.95%
Shibuya-Ku	11.95%
Koganei-shi	11.79%
Bunkyo-Ku	10.69%
Yokohama-shi Aoba-ku	10.25%
Meguro-Ku	9.93%
Suginami-Ku	9.56%
Kokubunji-shi	9.52%
Kawasaki-shi Asao-ku	9.17%
Musashino-shi	9.16%
Top Ten Average	10.50%

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note 3: Bold indicates that sub-areas that only ranked in the top removing Engineering and related occupations.

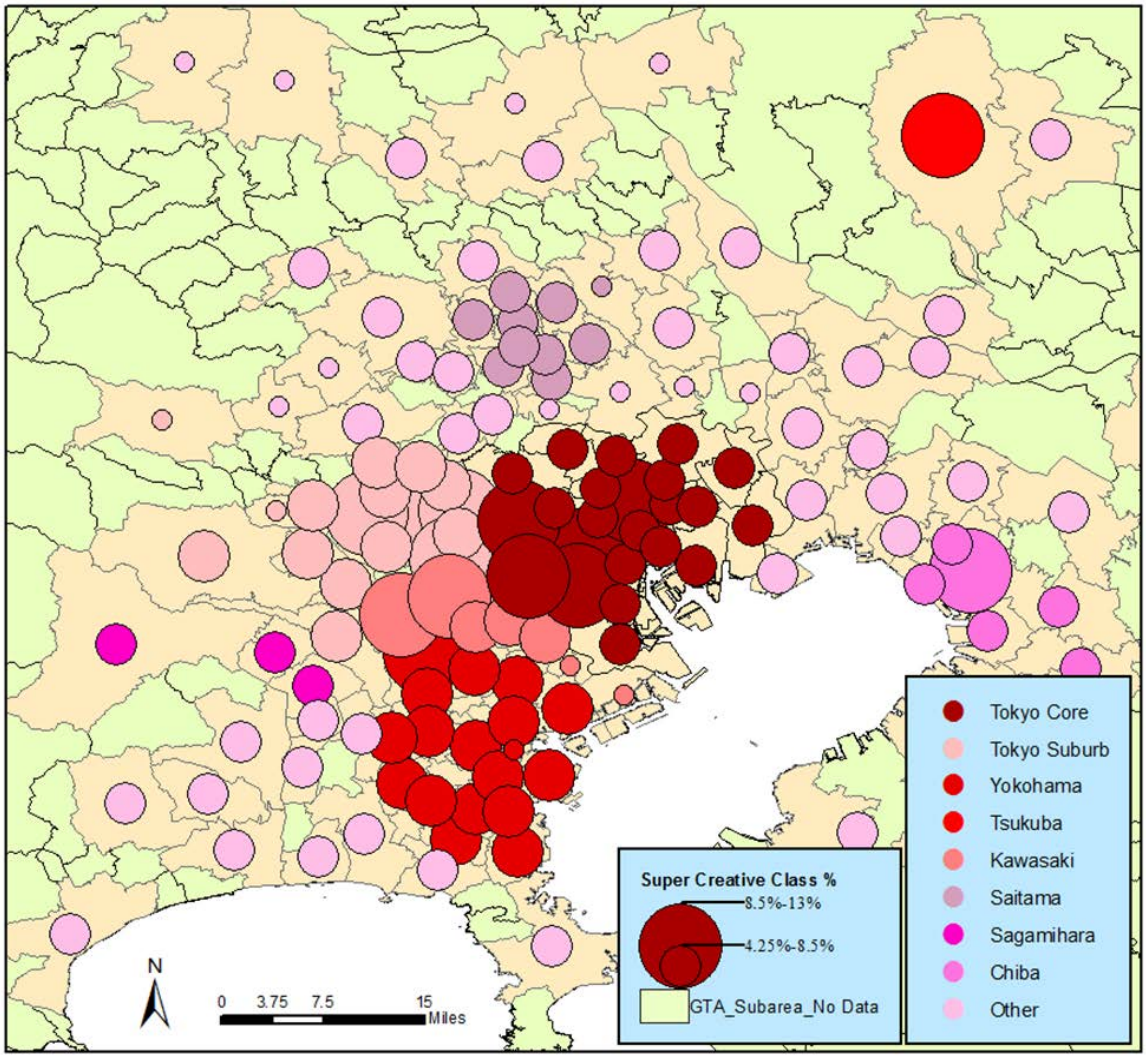
When removing engineering, a significant relative change in the geography of the super creative class in the central GTA is likely because nearly 50% of the super creative class are in engineering or related occupations in the GTA (i.e.0.88 million of the 1.8 million super creative class workers in the central GTA). However, other than engineering, the super creative class in the central GTA includes researchers, teachers, other specialists, authors, journalists, editors, artists, designers, photographers, musicians, dancers and office appliance operators (Table 12).

Overall, the distribution of engineer-related occupations has a higher concentration in the central part of the GTA. Sub-areas of the Tokyo Core are continued to well represent in the super creative class rankings. It continues to hold four of the top ten positions for the super creative class without engineering workers, albeit in different positions (Table 13).

Some of Tokyo's sub-areas have high-engineering workers. However, these sub-areas also have a high concentration of other creative workers. Only three subareas remain from the super creative class total ranking when it is removed from engineering related occupations. These three subareas are Shibuya-Ku and Bunkyo-Ku in Tokyo and Tsukuba-shi.

The first impression of the new GTAs' sub-area rankings when excluding engineering and related occupations is that the majority of the top ten sub-areas listed in Table 13 are located either in the Tokyo core (4 Ku areas) or the Tokyo suburbs (3 shi areas) (Figure 12) plus one sub-area of Yokohama and Kawasaki, and Tsukuba Science City.

Figure 12. Spatial Distribution of Super Creative Class (%) by Place of Work by Central GTA Sub-area, Without Engineers, 2010



Notes:
1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

By contrast, when including engineering and related occupations, the top ten includes five Tokyo Ku areas from core and only two shi from the Tokyo suburbs (Figure 12). It appears that the most intense super creative class clusters may prefer to locate in more suburban settings when excluding engineering and related occupations. Many of these super creative class clusters are located west of the core area of Tokyo but also immediately to the south in the Asao-ku, subarea of Kawasaki and the Aoba-ku, subarea of Yokohama.

A closer examination of the geography of the super creative class without engineering suggest an intense concentration in the Tokyo Core and Suburbs and parts of Kawasaki, Yokohama, Tsukuba and Chiba. However, Table 14 suggests that these areas offer a diversity of different creative occupations with no clear trend. Five of the top ten sub-areas each have their own unique super creative class identity and are ranked 1st in that niche.

For example, the Tsukuba Science City has the highest share of creative class worker when excluding engineering (i.e. 12.95%) and also ranked first in the GTA for its share of researchers (i.e. 8%). Shibuya is the only sub-area that had two top rankings which includes artists, designers and also photographers, and musicians and dancers (Table 14).

The major trend for the top ten sub-areas when excluding engineers is the geographic proximity of two major geographic units: 1) the bedroom communities along the Chuo main train Line in the Tokyo metropolitan area (TMA) (Koganei-shi, Kokubunji-shi and Musashino-shi), Meguro-Ku and Suginami-Ku and 2) Kawasaki-shi

(Asao-ku) and Yokohama-shi (Aoba-ku) (Figure 9). The central GTA provides a well-developed transit system. The railways in the area account for 53% of all trips which is twice as high as the national average of 29%.

Table 14. Greater Tokyo Top Ten Sub-Areas Ranked by Super Creative Class (%) and the Three Leading Occupational Sub-Components by Place of Work, 2010

	Top Ten		Occupations	%	Rank	Occupations	%	Rank	Occupations	%	Rank
1	Tsukuba-shi	12.95%	Researchers	7.99%	1	Teacher	2.88%	32	Office Appliance	0.51%	43
2	Shibuya-Ku	11.95%	Artist, designer,	3.68%	1	Musician,	1.98%	1	Authors,	1.13%	4
3	Koganei-shi	11.79%	Teacher	5.32%	1	Other Specialist	2.92%	3	Authors,	0.82%	9
4	Bunkyo-Ku	10.69%	Authors,	1.90%	1	Researchers	0.90%	8	Teacher	3.65%	10
5	Yokohama-shi Aoba-ku	10.25%	Other Specialist	3.09%	2	Researchers	1.06%	6	Musician,	0.67%	10
6	Meguro-Ku	9.93%	Artist, designer,	2.42%	2	Musician,	1.01%	4	Other Specialist	2.66%	7
7	Suginami-Ku	9.56%	Authors,	1.17%	3	Artist, designer,	1.69%	5	Musician,	0.72%	8
8	Kokubunji-shi	9.52%	Other Specialist	3.16%	1	Researchers	1.88%	2	Musician,	0.39%	18
9	Kawasaki-shi Asao-ku	9.17%	Other Specialist	2.84%	5	Musician,	0.69%	9	Teacher	3.66%	9
10	Musashino-shi	9.16%	Artist, designer,	1.37%	9	Authors,	0.76%	10	Musician,	0.53%	12
	Top Ten Average	10.50%									

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities

The major trend for the top ten sub-areas when excluding engineers is the geographic proximity of two major geographic units: 1) the bedroom communities along the Chuo main train Line in the Tokyo metropolitan area (TMA) (Koganei-shi, Kokubunji-shi and Musashino-shi), Meguro-Ku and Suginami-Ku and 2) Kawasaki-shi (Asao-ku) and Yokohama-shi (Aoba-ku) (Figure 9). The central GTA provides a well-developed transit system. The railways in the area account for 53% of all trips which is twice as high as the national average of 29%.

The southwestern part of the central GTA along the Tokyo Toyoko Line, for example, has been called the “white-collar-belt” (Kurasawa and Asakawa 2004; Asakawa 2006; Koizumi and Wakabayashi 2015; Mori 2016). Many creative individuals located in this white-collar-belt extend from downtown Tokyo including Shibuya and Shinjuku (Kanno and Itoh 2017). Additionally, the GTA is much less auto dependent than is the U.S. The proportion of households without autos is over four times higher than in the U.S. (Kawabata 2003, 2006; Sanders 2015). Additionally, the only sub-area in the super creative class without an engineering-related occupation in the top ten that is not located in the central part of GTA is Tsukuba Science City which is in northeastern part of GTA.

Although the top ten super creative class by place of work when excluding engineering-related occupations largely mimics the overall super creative class total rankings, subareas that moved up in the ranking had high concentrations of other super creative occupations (i.e. researchers, authors, arts, and other professional workers).

Koganei-shi, a suburb of Tokyo moved up from 27th for the super creative class total to 3rd for the ranking without engineering related occupations. The elevation of the creative ranking of Koganei-shi was not surprising. Koganei-shi is the home of Studio Ghibli, known as the Disney of Japan. Koganei-shi moved up to 3rd place for the creative ranking because this city is less dependent on engineering related economic activities. Koganei-shi loses only14.0 percent of its super creative workforce when engineering occupations are removed. The overall reduction in the GTA, from the super creative class total to super creative class without engineering related occupations, is nearly 50 percent.

One of the Tokyo Core sub-areas, Meguro-Ku, stands out because it is ranked 6th for the super creative class without manufacturing engineering but also it ranked 11th for the super creative class in total. Meguro-Ku is predominantly residential in character, yet there are key creative corporate head offices located in the area. Those head offices include Amazon Japan and Walt Disney Japan. Additionally, the Komaba campus of the University of Tokyo and fifteen foreign embassies and consulates are located in Meguro. Another Tokyo Core sub-area, Suginami-Ku ranked 38th for the super creative class in total but jumped to 7th when using the super creative class without engineering related occupations. Suginami-Ku has similar characteristics to Meguro-Ku because it is a more residential community with some major corporations including American Express. However, Suginami-Ku is also well-known as a node for animation industries (artists and designers) which is a major creative industry in Japan. There are about 400 animation studios in Japan and approximately 70 of those are located in Suginami-Ku. Well known animation studios include Sunrise, Bones, the Satelight and many smaller studios.

Urayasu-shi, Chiba, experienced the largest overall rank increase jumping from 102th ranked to 49th when excluding engineering related occupations. Urayasu-shi is located adjacent to Tokyo Core sub-area Edogawa-Ku. It is best known as the home of the Tokyo Disney Resort and the location of the headquarters of the Oriental Land Company.

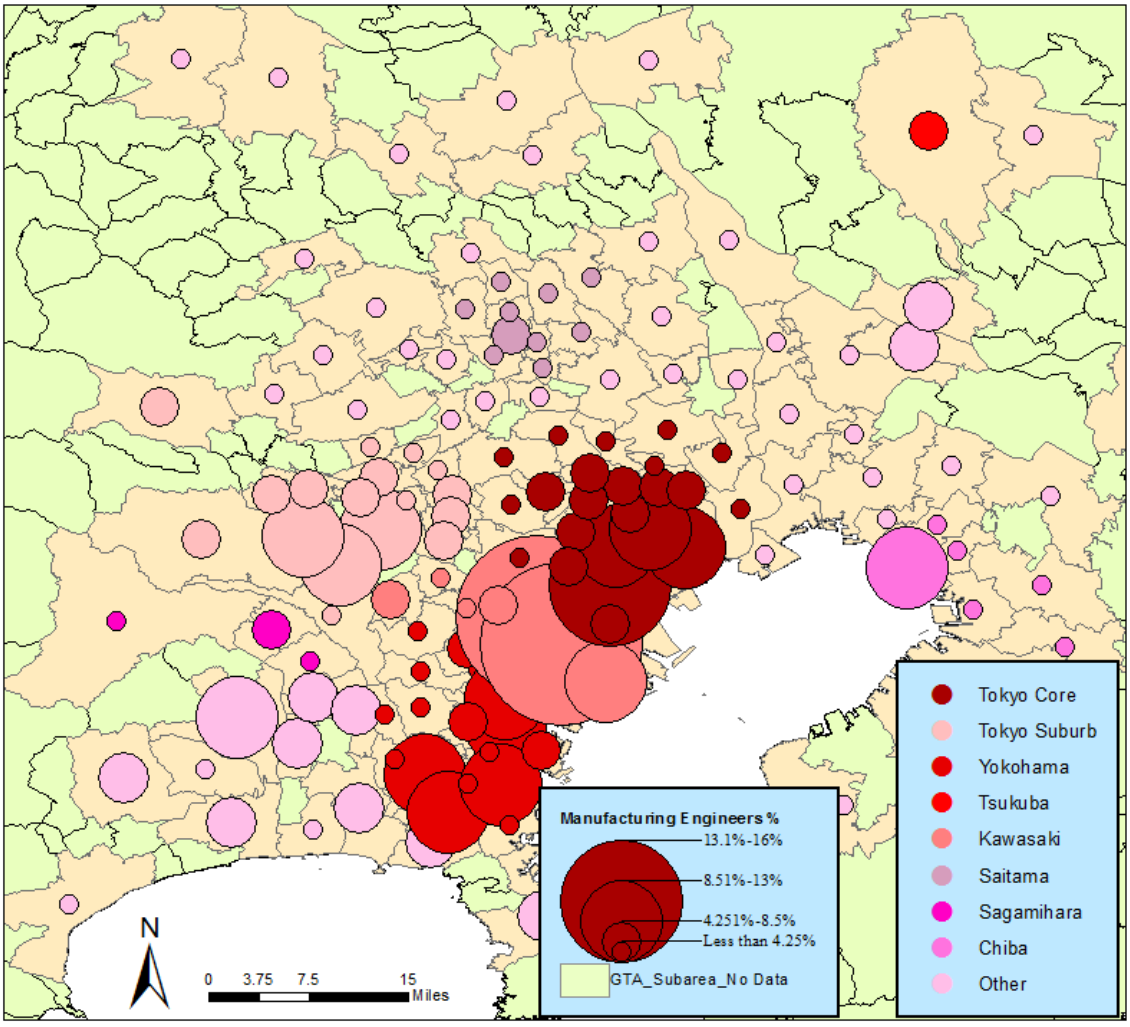
Kawasaki is a good case of a relatively undiversified sub-area that heavily relied on engineering workers. Nakahara-ku in Kawasaki is a major engineering subarea due to the presence of Global Fortune 500 Companies such as Fujitsu, NEC (Nippon Electric

Company) and Toshiba. Nakahara-ku was top ranked among the central GTA for the super creative class but it dropped to 77th for the super creative class model when engineering related occupations were removed from the equation. Another subarea of Kawasaki, Saiwai-ku also experienced a significant drop in the creative rankings. Saiwai-ku was ranked 2nd among the central GTA when engineering workers were included. However, it dropped to 116th (N=138) when engineering related occupations were removed.

A visual representation and spatial distribution of the percent of engineers by place of work (Figure 13) illustrate an intense geographic distribution of an engineering-related labor pool.

The geography of manufacturing engineers is more spatially concentrated in Kawasaki, especially in Nakahara-ku and Saiwai-ku, the Tokyo Core (i.e. Shinagawa-Ku, Minato-Ku, Koto-Ku), the Tokyo Suburbs (i.e. Fuchu-shi, Tama-shi, Hino-shi), Yokohama (i.e. Kohoku-ku, Totsuka-ku, Nishi-ku, Kanagawa-ku, Sakae-ku) and other sub-areas. Atsugi-shi, located in the western part of the GTA, is a peripheral area in the GTA that has a high concentration of manufacturing engineers. Chiba-shi Mihama-ku is another area that has a high concentration of manufacturing engineers. An analysis of the spatial distribution of the super creative class by place of residence in the central GTA indicates that Kawasaki-shi (15.6%), the Tokyo Suburbs shi-area (13.8%) and Yokohama-shi (13.7%) had the highest concentrations of super creative class.

Figure 13. Spatial Distribution of Engineers (%) by Place of Work by GTA Sub-area, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

Overall, 11.7 percent of the GTA labor force (total number=1,811,930) is employed in the super creative class occupations in 2010 varying from a high of 19.5 percent in Kawasaki-shi Nakahara-ku, Kanagawa-ken to a low of 5.0 percent for Fukaya-shi Saitama-ken (Table 15).

4.4. Super Creative Class by Place of Residence

The average percentage of the super creative class by GTA's sub-area by place of residence declined from 12.7 in 2000 to 11.7 in 2010. However, the absolute number of the super creative class by place of residence provided a different scenario. The total number of the super creative class declined from 1.8 million in 2000 to 1.7 million in 2005, yet the number of the super creative class increased slightly in 2010. The same trend can be traced in the case for the top ten average which increased from 17.07 percent in 2005 to 17.38 percent in 2010 (although the highest were in 2000 at 18.78 percent) (Table 15).

The average GTA's sub-area by place of residence has 11.7 percent of the labor force employed in super creative class occupations, varying from a high of 19.45 percent in Kawasaki-shi Nakahara-ku, to a low of 4.99 percent for Fukaya-shi, Saitama-ken (Table 15). The first impression of the GTA sub-area rankings for the super creative class by place of residence is that each of the top ten subareas listed in Table 15 has an above average share in other super creative class occupations relative to the overall GTA sub-areas. However, the major difference from the super creative analysis by place of work is that none of the Tokyo Core are ranked in the top 10 by Place of Residence (See Table 8).

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Another trend for the top ten sub-areas is the geographic proximity of three geographic units: 1) the southeastern part of the GTA: Kawasaki-shi (Nakahara-ku, Asao-ku and Tama-ku), Yokohama-shi (Kohoku-ku and Aoba-ku) and Kamakura-shi; 2) the Tokyo Suburbs along the Chuo Train Line (Musashino-shi, Kokubunji-shi and Koganei-shi) and 3) Tsukuba Science City (Figure 11).

The only sub-area in the super creative class by place of residence top ten that is not located in the central part of GTA is once again Tsukuba Science City, which is located in the northeastern part of the GTA. Tsukuba-shi is ranked second after Nakahara-ku for the super creative ranking by place of residence and is the only sub-area located on the periphery of the central GTA. Tsukuba was ranked first for the super

creative class by place of residence in 2000 and 2005 (Table 15) with a very strong share of researchers (6.19 %) and teachers (4.31%) (Table 16).

Table 15. Greater Tokyo Sub-Areas Ranked by Super Creative Class (%) Top and Bottom 10 by Place of Residence: 2000-2010

	2000		2005		2010	
	Top Ten		**Top Ten**		**Top Ten**	
	Tsukuba-shi	21.40%	**Tsukuba-shi**	18.15%	**Kawasaki-shi Nakahara-ku**	19.45%
	Kawasaki-shi, Tama-ku	20.30%	**Musashino-shi**	17.74%	**Tsukuba-shi**	17.95%
	Kokubunji-shi	18.70%	**Kokubunji-shi**	17.55%	Kawasaki-shi Asao-ku	17.93%
	Musashino-shi	18.64%	Shibuya-Ku	17.29%	**Musashino-shi**	17.85%
	Kawasaki-shi, Nakahara-ku	18.58%	**Kawasaki-shi, Nakahara-ku**	17.23%	**Kawasaki-shi Tama-ku**	17.42%
	Kawasaki-shi, Asao-ku	18.37%	Kamakura-shi	16.76%	Yokohama-shi Kohoku-ku	17.30%
	Yokohama-shi, Aoba-ku	18.30%	**Kawasaki-shi, Tama-ku**	16.71%	**Yokohama-shi Aoba-ku**	16.64%
	Tama-shi	17.91%	**Yokohama-shi, Aoba-ku**	16.49%	**Kokubunji-shi**	16.60%
	Koganei-shi	17.84%	**Koganei-shi**	16.49%	Kamakura-shi	16.42%
	Yokohama-shi, Kohoku-ku	17.75%	**Suginami-Ku**	16.34%	**Koganei-shi**	16.22%
	Top Ten Average	18.78%	Top Ten Average	17.07%	Top Ten Average	17.38%
%	Overall Average (n=119)	12.71%	Overall Average (n=131)	11.70%	Overall Average (n=138)	11.70%
#	Overall (n=119)	1740440	Overall (n=131)	1698819	Overall (n=138)	1796366
	Bottom Ten		**Bottom Ten**		**Bottom Ten**	
	Saitama Koshigaya-shi	8.47%	Saitama Kumagaya-shi	7.57%	**Adachi-Ku**	7.56%
	Chiba Noda-shi	8.41%	Kawasaki-shi, Kawasaki-ku	7.46%	Chiba Kisarazu-shi	7.54%
	Taito-Ku	8.34%	Saitama Soka-shi	7.25%	**Saitama-shi Iwatsuki-ku**	6.90%
	Tochigi Oyama-shi	8.28%	**Saitama-shi, Iwatsuki-ku**	7.24%	Chiba Narita-shi	6.89%
	Arakawa-Ku	8.00%	**Adachi-Ku**	6.95%	**Chiba Noda-shi**	6.82%
	Sumida-Ku	7.86%	Chiba Narita-shi	6.86%	**Saitama Misato-shi**	6.81%
	Saitama Fukaya-shi	7.84%	Tochigi Oyama-shi	6.83%	Tochigi Tochigi-shi	6.62%
	Saitama Misato-shi	7.77%	**Saitama Fukaya-shi**	6.59%	Saitama Kazo-shi	6.29%
	Saitama Iwatsuki-shi	7.68%	**Saitama Misato-shi**	6.23%	Ibaraki Koga-shi	5.48%
	Adachi-Ku	7.49%	Ibaraki Koga-shi	5.33%	**Saitama Fukaya-shi**	4.99%
	Bottom Ten Average	8.01%	Bottom Ten Average	6.83%	Bottom Ten Average	6.59%

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note 3: Bold indicates that those sub-areas featured in all three years.

Asao-ku in Kawasaki-shi is ranked third for the percentage of the population employed in the super creative class by place of residence. Asao-ku is located on the northeastern edge of Kawasaki-shi. This subarea of Kawasaki-shi has excellent access

from other parts of Kawasaki-shi, and Yokohama-shi or the Tokyo Core by train along the Odakyu-line.

Table 16. Greater Tokyo Sub-Areas Ranked by Super Creative Class (%) and Occupational Sub-Components Top 10 by Place of Residence, 2010

Top Ten		Researchers	Rank	Engineering	Rank	Teacher	Rank	Other Specialist	Rank	Authors, journalists, editors	Rank	Artists, designers, photographers	Rank	Musician, dancers	Rank	Office appliance operators	Rank
Kawasaki-shi Nakahara-ku	19.45%	0.36%	46	12.91%	**1**	1.74%	105	1.94%	39	0.41%	45	1.24%	21	0.35%	35	0.50%	70
Tsukuba-shi	17.95%	6.19%	**1**	4.58%	97	4.31%	**1**	2.09%	30	0.13%	118	0.27%	126	0.04%	129	0.33%	125
Kawasaki-shi Asao-ku	17.93%	0.65%	8	8.18%	11	3.51%	**2**	2.51%	9	0.65%	22	1.16%	22	0.55%	18	0.71%	13
Musashino-shi	17.85%	0.45%	27	7.12%	26	3.10%	5	2.52%	8	1.39%	4	1.72%	9	0.95%	5	0.59%	35
Kawasaki-shi Tama-ku	17.42%	0.37%	43	9.71%	5	2.35%	39	2.20%	21	0.56%	28	1.10%	24	0.45%	25	0.68%	16
Yokohama-shi Kohoku-ku	17.30%	0.37%	42	10.10%	2	2.19%	59	2.10%	28	0.50%	36	0.84%	49	0.37%	30	0.82%	5
Yokohama-shi Aoba-ku	16.64%	0.51%	19	7.43%	20	2.42%	36	2.74%	**1**	0.83%	18	1.43%	15	0.61%	14	0.66%	19
Kokubunji-shi	16.60%	0.76%	4	6.89%	32	3.24%	**3**	2.55%	6	0.86%	15	1.31%	18	0.58%	17	0.36%	118
Kamakura-shi	16.42%	0.65%	9	7.13%	24	3.05%	8	2.68%	2	0.78%	20	1.54%	11	0.34%	37	0.26%	134
Koganei-shi	16.22%	0.52%	18	6.60%	38	3.00%	9	2.55%	7	0.98%	9	11.31%	19	0.63%	12	0.63%	26
Top Ten Average	17.38%	1.08%		8.07%		2.89%		2.39%		0.71%		2.19%		0.49%		0.55%	
Overall Average (n=138)	11.70%	0.36%		5.66%		2.10%		1.67%		0.39%		0.77%		0.26%		0.51%	

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities

The area around Shin-Yurigaoka Station is the center of the creative activity in Asao-ku. Many artistic and cultural events are conducted by local art-related facilities. Another strength of Asao-ku includes the availability of academic resources such as Den-en Chofu University and Wako University, the Japan Institute of the Moving Image and the Kurokawa Farm of Meiji University. Industrial resources including Microcomputer Kawasaki City with many R&D facilities are located in Asao-ku.

Musashino-shi, one of the Tokyo Suburbs shi-area, is ranked fourth based on place of residence for the super creative class (%), and is considered an edge community located immediately outside the Tokyo Core sub-area. Animation offices and Coamix has its headquarters in the Kichijyoji, a neighborhood of Musashino-shi. At one-time, Studio Ghibli (known as Disney in Japan) was located in Kichijyoji. Several other animation studios are located in Musashino. The electrical engineering and software company Yokogawa Electric has its headquarters in Nakacho, Musashino-shi.

Another sub-area of Kawasaki-shi, Tama-ku is ranked fifth for the super creative class by residence. Ikuta Ryokuchi Park and the Kawasaki Municipal Science Museum are located in Tama and these grounds provide local creative individuals with a popular recreational and learning environment. Three major universities, Senshu University, Meiji University and Japan Women's University, are also located in Tama-ku. Students of these universities are engaged in a variety of activities in collaboration with residents in Tama-ku. Over 70 percent of residents in Tama-ku are in the productive ages between 15 and 64. This is 5 percent higher than the overall average for the GTA where the median age of Tama-ku is 38.7 years, the third youngest in the central GTA.

Yokohama-shi, located south of Tokyo, is the largest city by population and the most populous municipality in Japan. Yokohama-shi is a major commercial hub in the GTA with eighteen sub-areas within a city limit. Kohoku-ku is one of sub-area of Yokohama and it has the largest population in the city. Kohoku-ku is ranked sixth for the percentage (17.3%) of the population employed in the super creative class by place of residence (Table 13). Kohoku-ku is largely a regional commercial center. It is also a

commuter bedroom community for central Yokohama, Kawasaki and Tokyo. Kohoku-ku also has an excellent transportation network include the JR Central Tokaido Shinkansen Shin-Yokohama station and the JR East Yokohama Line which is easily accessible to other CBDs in Tokyo (Koizumi and Wakabayashi 2014, 2015). Kohoku-ku is one of the wealthiest subareas in the GTA with very high in household incomes.

Aoba-ku is another subarea of Yokohama-shi where there is a strong presence of the super creative class. Aoba-ku is ranked seventh for the percentage of the super creative class by place of residence in 2010 (16.4%) (Table 15). This subarea is adjacent to Kohoku-ku to the north and adjoins Kawasaki-shi where three subareas have a strong presence of the super creative class. Just like Kohoku-ku, Aoba-ku is largely a regional commercial center and bedroom community for the central cities of Kawasaki and Yokohama, as well as the Tokyo Core. The major commercial centers are around the Aobadai and Tama Plaza train stations. Four major universities are located in Aoba-ku: Toin University of Yokohama, Nippon Sport Science University, Caritas Junior College and Yokohama College of Art and Design. Aoba-ku ranked first in the occupational subcomponent of the super creative class ranking, other specialists with a 2.74 percent share (Table 16). Aoba-ku has the fifth lowest unemployment rate (2.1%) in the GTA and is one of the wealthiest subareas in the GTA.

Kokubunji-shi, one of the Tokyo Suburbs shi-area, was ranked third for the percentage of the population employed in the super creative class by place of residence in the central GTA in 2000 and 2005. However, it dropped in the ranking to eighth in 2010 (Table 15). This city is located in the western portion of Tokyo, connected by JR Chuo

Main Line. Kokubunji-shi is a bedroom or commuter community where the super creative class disproportionally live and then depart from for work elsewhere. Kokubunji-shi is home to the Hitachi Central Research Laboratory and the Railway Technical Research Institute, the technical research company under the JR.

Kamakura-shi is ranked ninth for the presence of the super creative class by place of residence. This city is located in Kanagawa Prefecture, about 31 miles southwest of Tokyo. Koizumi and Wakabayashi (2015) argued that the distribution of white-collar worker is higher in the southwestern part of the GTA extending further south to Kamakura-shi due to the high concentrations of railroad lines (Kawabata 2003, 2006; Ueno and Suzuki 2014; Mori 2016) Kamakura is famous for being the capital city of Japan between 1192 and 1333 and it is one of the most popular tourist destinations in the country. Kamakura Women's University is the city's sole university. As of 2010, Kamakura was largely a tourist center and bedroom community for the central cities of the GTA.

Koganei-shi is ranked tenth for the presence of the super creative class by place of residence. Just like Musashino-shi and Kokubunji-shi, the location of this city is on the JR Chuo Main Line. Indeed, Koganei is another bedroom community. Huge animation industries such as Gainax and Studio Ghibli have their corporate headquarters in Koganei-shi. Koganei ranked fifth for the highest level of educational attainment (58.48%) (Table 12). Although there are no other major creative industries located in Koganei, several major universities such as Hosei University, Tokyo University of

Agriculture and Technology, Tokyo Gakugei University and International Christian University are all located in this city.

It seemed useful to better understand how the distribution of the super creative class looked when removing engineering-related occupations since approximately fifty percent of all the super creative class workers in the Greater Tokyo Area in 2010 were engineers. The average percent of the labor force employed in the super creative class by place of residence when excluding engineering-related occupations is about five percentage points lower than for the entire super creative class (i.e. 6% versus 11.7%) and the average for the top ten GTA sub-areas drops by nearly half from 17.4 % (with engineering) to just over 10% (without engineering) (Table 17). Overall, the percent of the super creative class without engineering varied from a high of 13.37 percent in Tsukuba Science City (Table 17) to a low of 1.78 percent for Fukaya-shi.

These two sub-areas are same as the super creative class by place of work excluding engineering-related occupations. None of the Tokyo-Core sub-areas appeared in the top ten ranking when including engineering-related occupation. However, when the engineering-related occupation was removed, five sub-areas of central Tokyo area ranked in the top ten list (i.e. Shibuya-Ku, Suginami-Ku, Bunkyo-Ku, Setagaya-Ku and Meguro-Ku). On the other hand, five GTA sub-areas were featured in both top ten rankings. These sub-areas included Tsukuba Science City, Musashino-shi, Kawasaki-shi Asao-ku, Kokubunji-shi and Koganei-shi. Furthermore, a subarea of Kawasaki, Nakahara-ku with the highest share of the super creative class, plummeted in the ranking when excluding engineering -related occupations (i.e. 6.5% versus 19.45%).

Table 17. Super Creative Class With and Without Engineers Top 10 by Place of Residence in the Greater Tokyo Area, 2010

A. SCC (including Engineers)		B. SCC (Without Engineers)	
Kawasaki-shi Nakahara-ku	19.45%	**Tsukuba-shi**	13.37%
Tsukuba-shi	17.95%	Shibuya-Ku	10.77%
Kawasaki-shi Asao-ku	17.93%	**Musashino-shi**	10.73%
Musashino-shi	17.85%	Suginami-Ku	10.57%
Kawasaki-shi Tama-ku	17.42%	Bunkyo-Ku	10.42%
Yokohama-shi Kohoku-ku	17.30%	**Kawasaki-shi, Asao-ku**	9.74%
Yokohama-shi Aoba-ku	16.64%	**Kokubunji-shi**	9.71%
Kokubunji-shi	16.60%	**Koganei-shi**	9.62%
Kamakura-shi	16.42%	Setagaya-Ku	9.59%
Koganei-shi	16.22%	Meguro-Ku	9.42%
Top Ten Average	17.38%	Top Ten Average	10.39%
Overall Average (n=138)	11.70%	Overall Average (n=138)	6.04%

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note 3: Bold indicates those sub-areas ranked only top ten with or without Engineers.

When removing engineering, a significant relative change in the geography of the super creative class in the central GTA is likely because nearly 50% of the super creative class are in engineering or related occupations in the GTA (i.e. 0.88 million of the 1.8 million super creative class workers in the central GTA).

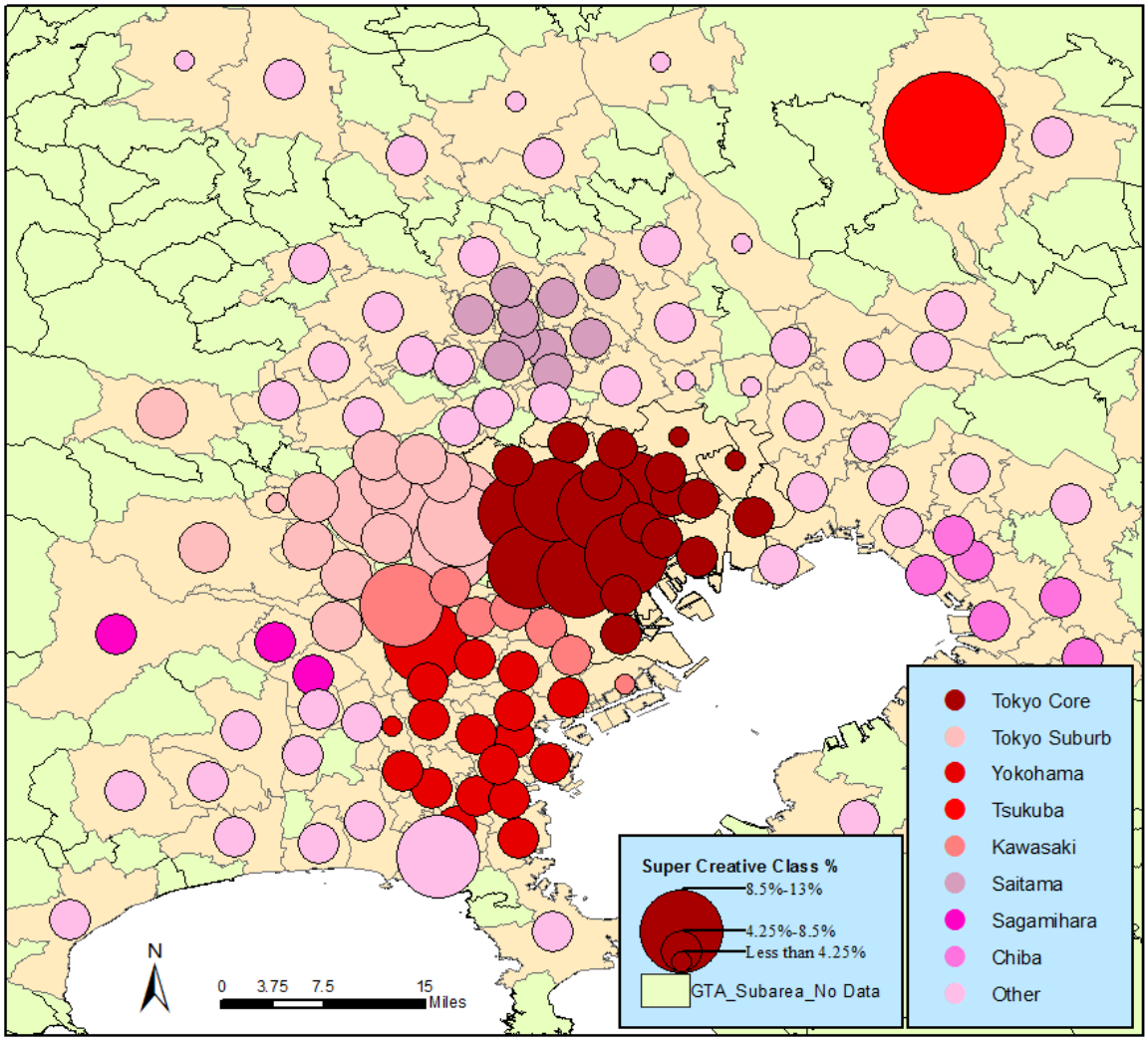
The GTAs' sub-area rankings of super creative class by place of residence becomes centrally clustered when excluding engineering and related occupations. The majority of the top ten sub-areas listed in Table 16 locate either in the Tokyo Core (5 Ku areas) or the Tokyo Suburbs (3 shi areas) (see Figure 14). By contrast, when including

engineering and related occupations, 3 shi areas from the Tokyo Suburbs were ranked in the top ten but none of Ku areas from the Tokyo Core were ranked in the top ten (see Table 17). This suggests that the distribution of the super creative class by place of residence when removing engineers is different from that of the super creative class by place of work.

Creative individuals seem to concentrate in the center part of GTA by place of residence, but by place of work those creative people are located in suburbs. By place of residence, it appeared that the most intense super creative class clusters may prefer to locate in more urban settings when excluding engineering and related occupations. Many of these super creative class clusters are located in the core area of Tokyo but there are also super creative class clusters immediately west of the core area of Tokyo and are located in the south in the Asao-ku, subarea of Kawasaki.

A closer examination of the geography of the super creative class without engineering by place of residence suggest an intense concentration in the Tokyo Core, Suburbs, and part of Kawasaki and Tsukuba (Figure 14). However, Table 18 suggests that these areas offer a diversity of different creative occupations with no clear trend. Five top ten areas each have their own unique super creative class identity and are ranked first in that niche. For example, the Tsukuba Science City has the highest share of creative class worker when excluding engineering (i.e. 13.37%) and is also ranked first in the GTA for its share of researchers (i.e. 6.2%) and teachers (i.e. 4.3%). Shibuya has two top rankings which with artists, designers and photographers (i.e. 3.1%), and musicians and dancers (i.e. 1.6%).

Figure 14. Spatial Distribution of Super Creative Class (%) by Place of Residence by GTA Sub-area, Without Engineers, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

Table 18. Greater Tokyo Sub-Areas Ranked by Super Creative Class (%) by Place of Residence and Its Sub-Components Top 10, 2010

	Top Ten Average		Researchers	Rank	Engineering	Rank	Teacher	Rank	Other Specialist	Rank	Authors, journalists, editors	Rank	Artists, designers, photographers	Rank	Musician, dancers	Rank	Office appliance operators	Rank
1	Tsukuba-shi	13.37%	6.19%	**1**	4.58%	97	4.31%	**1**	2.09%	30	0.13%	118	0.27%	126	0.04%	129	0.33%	125
2	Shibuya-Ku	10.77%	0.23%	89	4.46%	102	1.64%	110	2.56%	5	1.39%	3	3.10%	**1**	1.57%	**1**	0.29%	133
3	Musashino-shi	10.73%	0.45%	27	7.12%	26	3.10%	5	2.52%	8	1.39%	4	1.72%	9	0.95%	5	0.59%	35
4	Suginami-Ku	10.57%	0.25%	80	5.35%	72	2.34%	40	2.64%	**3**	1.49%	**1**	2.40%	**2**	0.87%	6	0.58%	39
5	Bunkyo-Ku	10.42%	0.88%	**2**	4.88%	85	3.06%	6	2.64%	4	1.44%	**2**	1.44%	14	0.46%	24	0.51%	69
6	Kawasaki-shi, Asao-ku	9.74%	0.65%	7	8.18%	11	3.51%	**2**	2.51%	9	0.65%	22	1.16%	22	0.55%	18	0.71%	13
7	Kokubunji-shi	9.71%	0.76%	4	6.89%	32	3.29%	3	2.55%	6	0.86%	15	1.31%	18	0.58%	17	0.36%	119
8	Koganei-shi	9.62%	0.52%	18	6.60%	38	3.00%	9	2.52%	7	0.98%	9	1.31%	19	0.63%	12	0.63%	26
9	Setagaya-Ku	9.59%	0.31%	64	4.93%	84	2.06%	70	2.38%	11	1.11%	5	2.13%	4	1.18%	**2**	0.43%	100
10	Meguro-Ku	9.42%	0.33%	53	4.22%	109	1.76%	102	2.22%	18	1.01%	8	2.38%	**3**	1.15%	4	0.56%	50
	Top Ten Average	10.39%	1.06%		5.72%		2.81%		2.46%		1.05%		1.72%		0.80%		0.50%	
	Overall Average (n=138)	6.04%	0.36%		5.66%		2.07%		1.67%		0.39%		0.77%		0.26%		0.44%	

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities

There is a strong tendency for the top ten sub-areas when engineers are removed from the super creative class ranking by place of work and place of residence. The major trend is that creative individuals seem to concentrate in two geographic units: 1) the Tokyo Core sub-areas (Shibuya-Ku, Suginami-Ku, Bunkyo-Ku, Setagaya-Ku and Meguro-Ku) and 2) the Tokyo Subarea (Musashino-shi, Kokubunji-shi and Koganei-shi). These sub-areas in the Tokyo Suburbs are the bedroom communities along the Chuo main train Line in the Tokyo metropolitan area (TMA). Also, Kawasaki-shi Asao-ku and Tsukuba Science City are highly ranked in the super creative class without engineering-related occupation by place of work and place of residence (Table 18).

The top ten super creative class by place of work when excluding engineering-related occupation had a significant change from the overall super creative class total rankings. Seven sub-areas by place of work moved up in the ranking (See Table 13). Those non-engineering super creative class residents prefer to locate in the outlying sub-areas of the Tokyo's CBD. On the other hand, the location of the top ten super creative class by place of residence after removing engineering-related occupation indicates a different scenario. Those super creative non-manufacturing engineers concentrate in the central part of GTA. None of the Tokyo Core sub-areas were ranked top ten when the engineering related occupation was included in the super creative ranking by place of residence. However, after removing this occupation, five Tokyo Ku areas moved into the top ten ranking (see Table 17). This suggests that more creative class are likely to cluster in the central part of GTA without engineers. For example, those sub-areas that moved down in the ranking had higher clusters of engineering, including Nakahara-ku Kawasaki-shi. Nakahara-ku is heavily relied on engineering workers. Nakahara-ku was top ranked manufacturing engineers by place of work and place of residence. None of Tokyo Core sub-areas or Tokyo Suburbs sub-areas were ranked top ten by place of work. And four Tokyo sub-areas appeared in top ten ranking by place of residence (see Table 19).

However, Table 18 suggests that these areas offer a diversity of different creative occupations with no clear trend. Five top ten areas each have their own unique super creative class identity and are ranked first in that niche. For example, the Tsukuba Science City has the highest share of creative class worker when excluding engineering

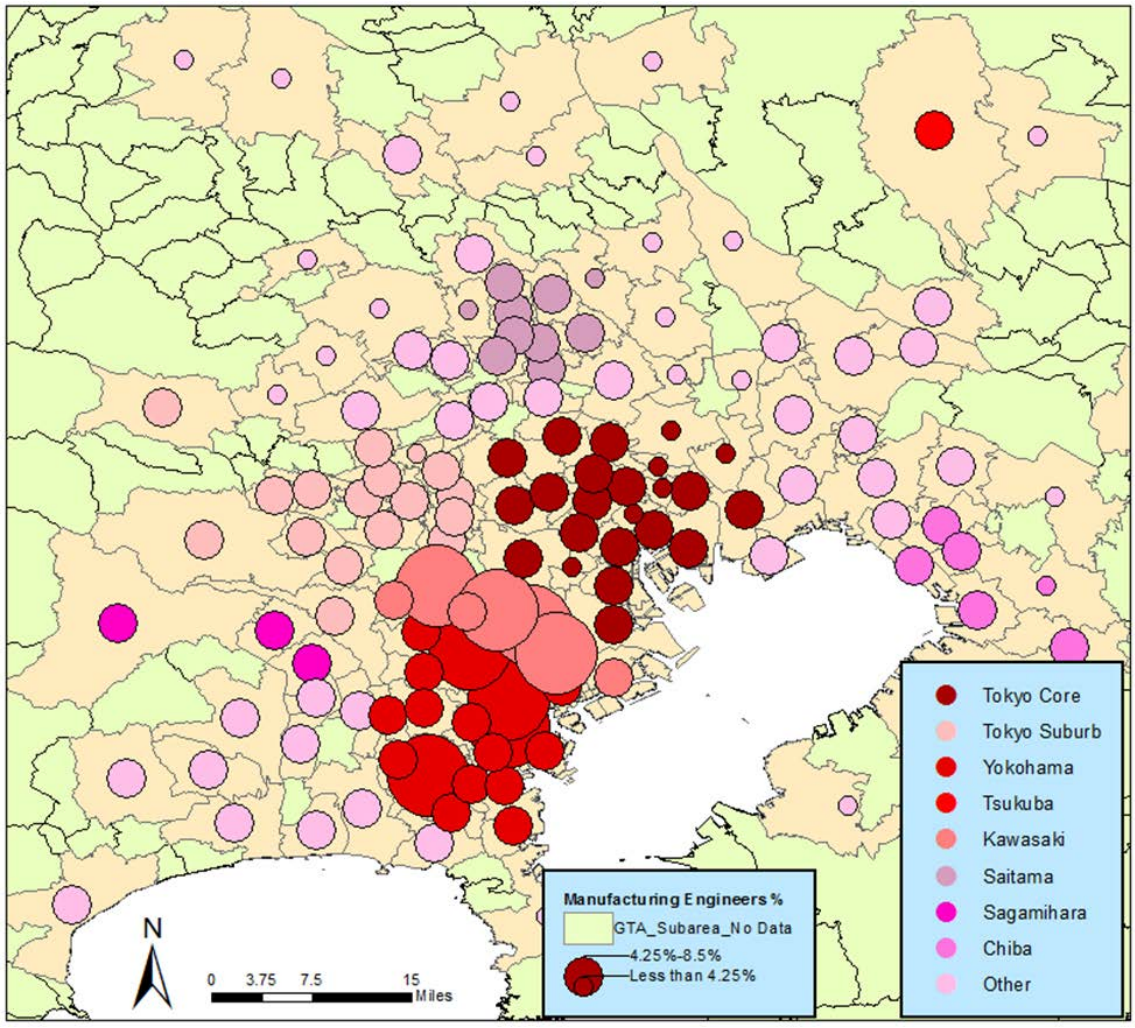
(i.e. 13.37%) and is also ranked first in the GTA for its share of researchers (i.e. 6.2%) and teachers (i.e. 4.3%). Shibuya has two top rankings which with artists, designers and photographers (i.e. 3.1%), and musicians and dancers (i.e. 1.6%).

Table 19. Engineering and Related Occupations (%) in the Greater Tokyo Area, 2010

	Place of Work			Place of Residence	
	Top Ten			**Top Ten**	
1	Kawasaki-shi, Nakahara-ku	12.91%	1	Kawasaki-shi, Nakahara-ku	19.24%
2	Yokohama-shi, Kohoku-ku	10.10%	2	Kawasaki-shi, Saiwai-ku	18.27%
3	Kawasaki-shi, Saiwai-ku	10.09%	3	Shinagawa-Ku	14.39%
4	Yokohama-shi, Totsuka-ku	9.78%	4	Minato-Ku	12.78%
5	Kawasaki-shi, Tama-ku	9.71%	5	Fuchu-shi	12.73%
6	Yokohama-shi, Nishi-ku	9.11%	6	Koto-Ku	12.25%
7	Yokohama-shi, Kanagawa-ku	8.82%	7	Astugi-shi	11.09%
8	Kawasaki-shi, Takatsu-ku	8.75%	8	Yokohama-shi, Totsuka-ku	9.60%
9	Yokohama-shi, Tsuzuki-ku	8.68%	9	Tama-shi	9.43%
10	Yokohama-shi, Tsurumi-ku	8.38%	10	Yokohama-shi, Kohoku-ku	9.27%
	Top Ten Average	9.63%		Top Ten Average	12.91%

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities

Figure 15. Spatial Distribution of Engineers (%) by Place of Residence by GTA Sub-area, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

The geography of manufacturing engineers by place of residence is concentrated in Kawasaki (i.e. Nakahara-ku, Saiwai-ku, Tama-ku, Takatsu-ku) and Yokohama (i.e. Kohoku-ku, Totsuka-ku, Nisi-ku, Kanagawa-ku). However, there are much less concentration of manufacturing engineers in Tokyo Core or Tokyo Suburb. This indicates that engineering-relation occupation by place of residence does not have diversity of distribution in the GTA.

Sub-areas of the Tokyo Core are continued to be well represented in the super creative class rankings. It continues to hold five of the top ten positions for the super creative class without engineering workers, albeit in different positions. Some of Tokyo's sub-areas have the high-engineering workers, but, these sub-areas in Tokyo also have the high concentration of other creative workers. Five sub-areas remain from the super creative class total ranking by place of residence (only three sub-areas remain in the same situation by place of work) from the super creative class total ranking when it removed engineering related occupations.

This section investigated how Florida's original definition of the super creative class was distributed in the GTA and analyzed the distribution of super creative class between place of work and place of residence. In this dissertation, four different categories of the super creative class were examined. These four super creative class were: 1) super creative class by place of work; 2) super creative class by place of work excluding engineering-related occupations; 3) super creative class by place of residence and 4) super creative class by place of residence excluding engineering-related occupations.

The special distribution of each super creative class varied. Some categories of super creative class were centrally concentrated but other clustered in more suburban locations. Those sub-areas moved up or down in the ranking depending on different occupations (i.e. engineering or non-engineering) and different locations (i.e. place of work or place of residence). For example, Nakahara-ku, Kawasaki-shi was top ranked in both place of work and place of residence when engineering-related occupations was included. When engineering-related occupations were removed, Nakahara-ku dropped its super creative class ranking. Among those four different super creative classification, Tsukuba Science city was the only sub-area that appeared in all four rankings. This may indicate that Tsukuba-shi is at the heart of the creative class in the GTA.

According to Florida (2002, 2012), the creative class has two major different components: the super creative class and the creative professional class. He argued that the super creative class is superior to the creative class in term of skills. Florida also asserted that the second tier of creative professional classes can play a significant role in regional growth and economic prosperity.

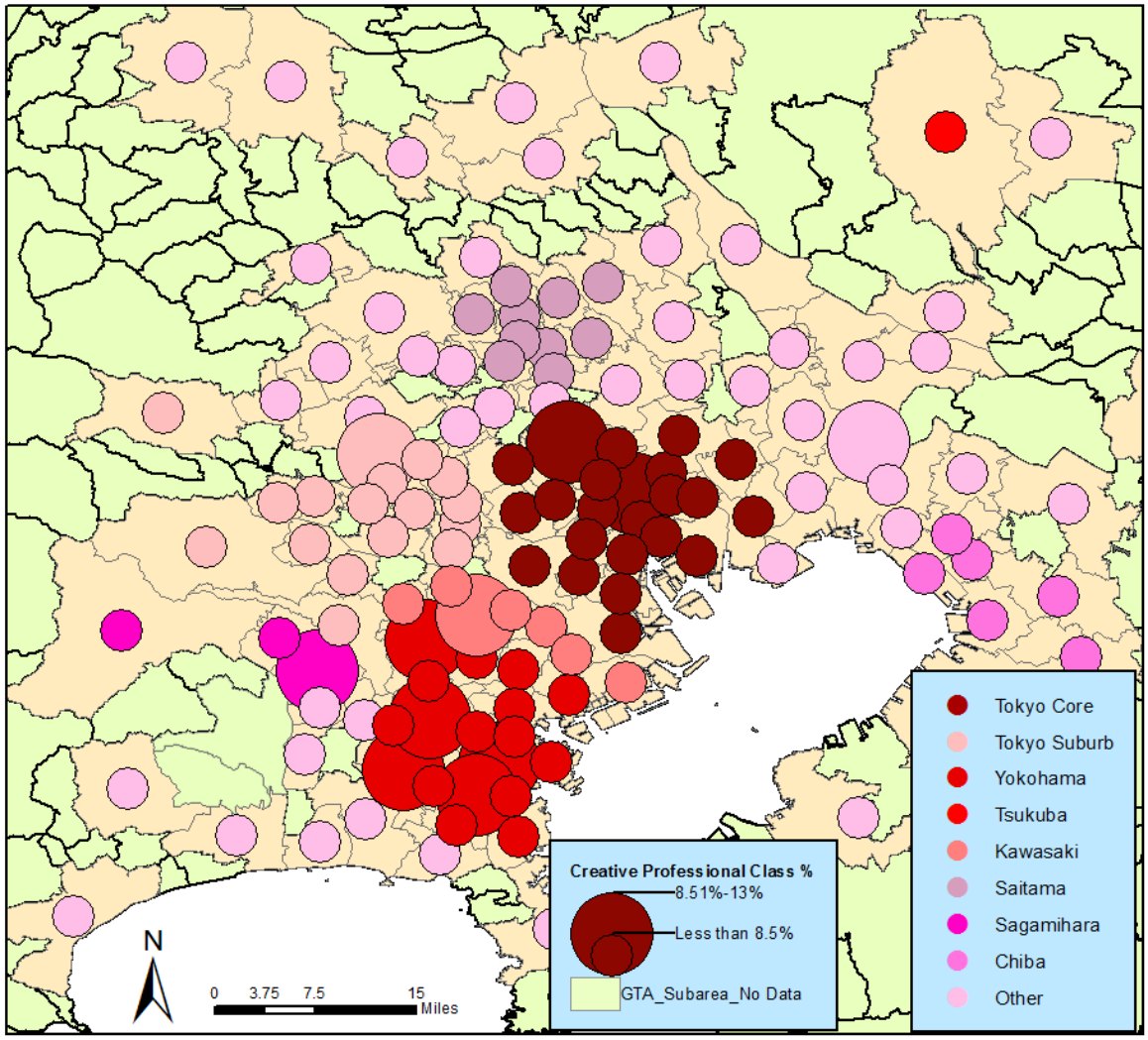
4.5 Spatial Distribution of the Creative Professional Class

The spatial distribution of the creative professional class in the central Greater Tokyo Area (GTA) is uneven and many subareas have disproportionate shares of the creative professional class by place of residence and place of work. A visual representation and spatial distribution of the creative professional class by work place (Figure 16) and residence (Figure 17) illustrate an intense yet differentiated geographic

distribution of the labor pool. The geography of the creative professional class by place or work is relatively evenly spread throughout GTA.

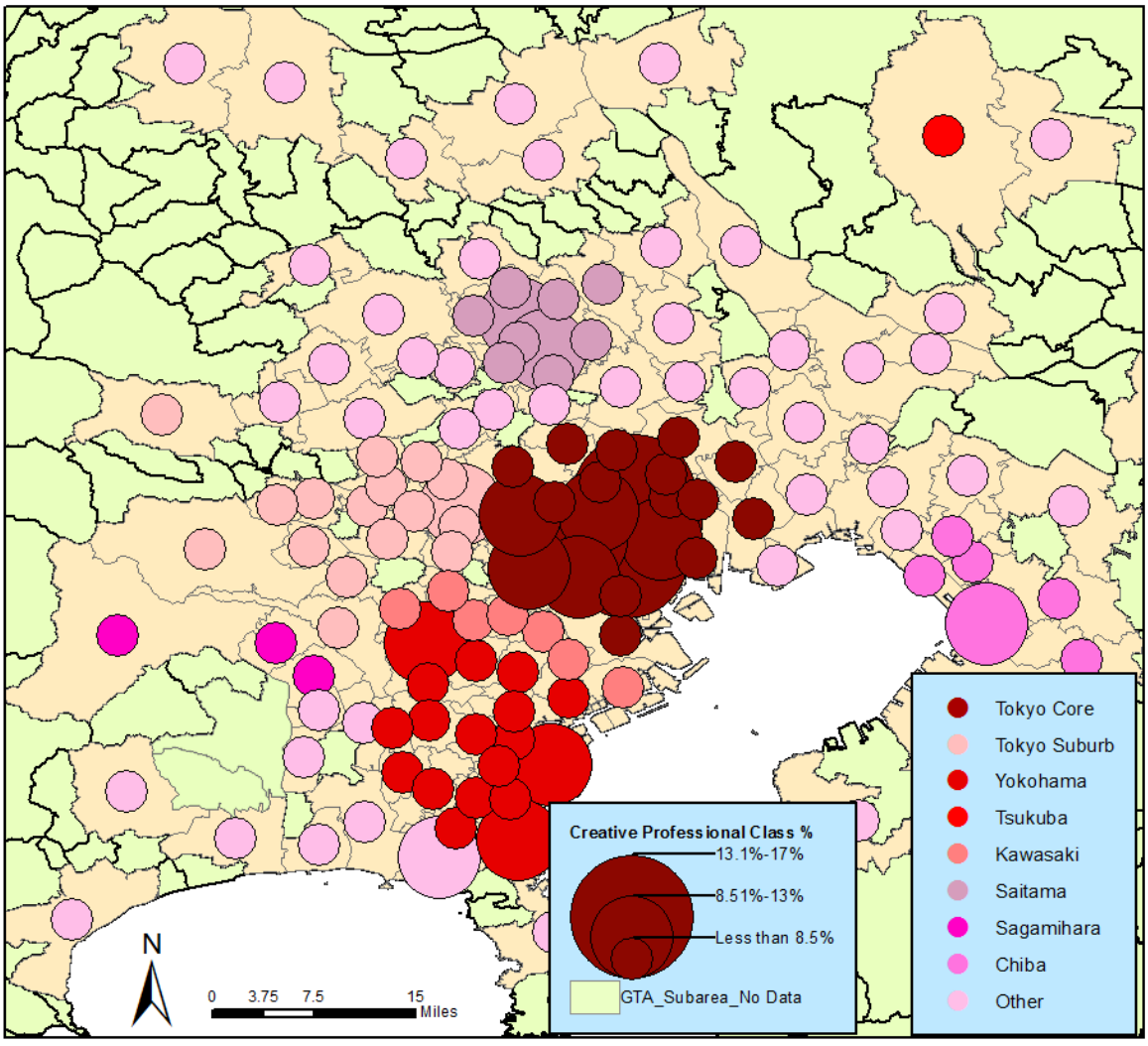
However, the creative professional class by place of residence is more spatially concentrated in the Tokyo Core, the Tokyo Suburbs, Kawasaki and Yokohama. Tsukuba, located in the northeastern part of the GTA, Ome-shi and Hachioji-shi, located in the western part of the GTA, are the peripheral areas in the GTA that have a high concentration of the creative professional class. Overall, the distribution of the creative professional class by place of residence has a higher concentration in the central part of the GTA. By contrast, the geography by place of work is more evenly distributed especially in the suburban northern and eastern sub-areas of the GTA. That said, a disproportional share of the creative professional class is located in the central part of the GTA both by place of work and place of residence.

Figure 16. Spatial Distribution of Creative Professional Class (%) by Place of Work by GTA Sub-area, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

Figure 17. Spatial Distribution of Creative Professional Class (%) by Place of Residence by GTA Sub-area, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

4.6. Creative Professional Class by Place of Work

Overall, 8.12 percent of the GTA labor force is employed in the creative professional class occupations in 2010 varying from a high of 12.8 percent in Yokohama-shi Minami-ku, to a low of 5.14 percent for Narita-shi (Table 18). An analysis of the spatial distribution of the creative professional class by place of work in the GTA indicates that Yokohama-shi (9.18%), Sagamihara-shi (9.08%) and Chiba-shi (8.42%) had the highest concentrations of the creative professional class due to high concentration of health care workers situated these sub-areas.

The highest average percent of the super creative class by GTA sub-area by place of work was in 2000. It gradually declined in 2005 and 2010, yet, the average percentage of the creative professional class by GTA sub-area by place of work was in 2005 (9.17%). It increased from 6.87 percent in 2000 but declined 6.74 percent in 2010 (Table 20). However, the absolute number of the creative professional class by place of work suggested different scenarios.

In absolute numbers, the total number of creative professional class increased from 1,059,650 in 2000 to 1,037,050 in 2010. The number of creative professionals started to decrease to 1,043,696 in 2005 and continued to lose population as a creative profession in 2010 (i.e. 1037050). The same trend can be traced in the case of the top ten average, which increased from 10.35 percent in 2000 to 11.59 percent in 2010 (Table 20).

Although, by looking at the Table 18, Bunkyo-Ku was the only sub-area that top ten ranked both super creative class and creative professional class. This suggests that these two creative class have totally different characteristics.

Despite the drastic shifts in the share of creative professional class workers both temporally and spatially in the central GTA, the list of top ten creative professional class sub-areas was relatively stable. Five Yokohama sub-areas were featured in both the 2000 and 2010 top ten listing. Furthermore, in 2005, three of the top ten sub-areas were in Yokohama while two of the bottom ten in 2000 and 2005 were also in Yokohama (Table 20).

The first detailed impression of the GTAs' sub-area rankings for the creative professional class by place of work is that each of the top ten sub-areas has an above average share of health care related occupations which accounts for over half of the creative professional class (60%) in the entire GTA (Table 21). Also, the top-ten rankings for the creative professional class by place of work have an above average share of each occupational sub-component except legal workers (Table 21). Another trend for the top ten sub-areas by place of work is the geographic proximity of three geographic cluster of the creative professional class including; 1) Yokohama-shi (Minami-ku, Aoba-ku, Izumi-ku, Asahi-ku and Konan-ku); 2) Sub-areas in Kanagawa prefecture (Sagamihara-shi, Minami-ku, Isehara-shi and Kawasaki-shi, Miyamae-ku) and 3) Higashimurayama-shi and Kamagaya-shi (Figure 17). Two sub-areas in the creative professional class top ten by place of work that were not located in Kanagawa Prefecture were Higashimurayama-shi and Kamagaya-shi which are still located in the central part of the GTA.

Table 20. Greater Tokyo Sub-Areas Ranked by Creative Professional Class (%) by Place of Work: 2000-2010

	2000		2005		2010	
	Top Ten		**Top Ten**		**Top Ten**	
	Yokohama-shi, Minami-ku	10.94%	**Yokohama-shi, Minami-ku**	10.21%	**Yokohama-shi, Minami-ku**	10.52%
	Bunkyo-Ku	10.30%	**Bunkyo-Ku**	10.00%	**Yokohama-shi, Aoba-ku**	10.26%
	Yokohama-shi, Kanazawa-ku	9.40%	**Yokohama-shi, Asahi-ku**	9.85%	Sagamihara-shi, Minami-ku	10.22%
	Itabashi-Ku	9.24%	Musashino-shi	9.13%	Isehara-Shi	10.12%
	Yokohama-shi, Asahi-ku	9.18%	Chiba-shi, Midori-ku	8.94%	**Bunkyo-Ku**	9.59%
	Yokohama-shi, Aoba-ku	9.16%	Mitaka-shi	8.81%	Kawasaki-shi, Miyamae-ku	9.38%
	Nagareyama-shi	8.87%	**Yokohama-shi, Aoba-ku**	8.74%	Kamagaya-shi	9.14%
	Kamagaya-shi	8.66%	Yokohama-shi, Konan-ku	8.73%	Yokohama-shi, Izumi-ku	9.02%
	Mitaka-shi	8.65%	Yokohama-shi, Izumi-ku	8.68%	Yokohama-shi, Konan-ku	8.91%
	Kodaira-shi	8.46%	Itabashi-Ku	8.64%	**Yokohama-shi, Asahi-ku**	8.88%
	Top Ten Average	9.29%	Top Ten Average	9.17%	Top Ten Average	9.60%
%	Overall Average (n=119)	6.87%	Overall Average (n=131)	6.90%	Overall Average (n=138)	6.74%
#	Overall (n=119)	1059650	Overall (n=131)	1043696	Overall (n=138)	1037050
	Bottom Ten		**Bottom Ten**		**Bottom Ten**	
	Iruma-shi	5.65%	Kawasaki-shi, Tama-ku	5.44%	Fukaya-shi	5.15%
	Kawasaki-shi, Saiwai-ku	5.53%	Asaka-shi	5.38%	Koto-Ku	5.07%
	Iwatsuki-shi	5.49%	Urayasu-shi	5.08%	Astugi-shi	5.04%
	Soka-shi	5.40%	**Soka-shi**	5.05%	Urayasu-shi	4.92%
	Koto-Ku	5.40%	Oyama-shi	4.94%	**Yokohama-shi, Nishi-ku**	4.87%
	Oyama-shi	5.18%	Astugi-shi	4.79%	**Soka-shi**	4.84%
	Astugi-shi	4.96%	Kawasaki-shi, Saiwai-ku	4.73%	Higashikurume-shi	4.83%
	Yokohama-shi, Nishi-ku	4.96%	**Yokohama-shi, Nishi-ku**	4.73%	Niiza-shi	4.62%
	Yokohama-shi, Tsuzuki-ku	4.96%	Yokohama-shi, Naka-ku	4.71%	Narita-shi	4.34%
	Hino-shi	4.83%	Narita-shi	4.59%	Kazo-shi	4.15%
	Bottom Ten Average	5.24%	Bottom Ten Average	4.94%	Bottom Ten Average	4.78%

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note 3: Bold indicates that those sub-areas features in all three years' rankings.

Table 21. Greater Tokyo Sub-Areas Ranked by Creative Professional Class (%) and its Occupational Sub-Components Top 10, 2010

Top 10		Management Government Officials	Rank	Officers of companies and	Rank	Other Administrative and	Rank	Health Care Workers	Rank	Legal Workers	Rank	Manegement, finance, and insurance	Rank
Yokohama-shi, Minami-ku	10.52%	0.0002%	103	2.91%	7	0.35%	78	6.72%	4	0.04%	109	0.48%	18
Yokohama-shi, Aoba-ku	10.26%	0.0004%	71	1.98%	42	0.24%	121	7.36%	3	0.12%	48	0.52%	12
Sagamihara-shi, Minami-ku	10.22%	0.0003%	92	1.84%	54	0.31%	100	7.83%	1	0.04%	108	0.17%	104
Isehara-Shi	10.12%	0.0008%	37	1.38%	113	0.33%	91	6.33%	7	0.05%	98	0.53%	11
Bunkyo-Ku	9.59%	0.0000%	N/A	14.39%	18	0.18%	135	5.97%	12	0.03%	123	0.36%	43
Kawasaki-shi, Miyamae-ku	9.38%	0.0017%	5	1.80%	59	0.34%	83	7.62%	2	0.02%	125	0.17%	103
Kamagaya-shi	9.14%	0.0000%	0	1.61%	80	0.53%	12	6.37%	5	0.12%	45	0.26%	72
Yokohama-shi, Izumi-ku	9.02%	0.0008%	34	1.90%	47	0.38%	61	6.29%	9	0.15%	28	0.34%	47
Yokohama-shi, Konan-ku	8.91%	0.0002%	109	2.03%	38	0.33%	92	5.95%	13	0.06%	81	0.54%	9
Yokohama-shi, Asahi-ku	8.88%	0.0000%	N/A	2.19%	28	0.45%	36	6.31%	8	0.12%	44	0.30%	54
Top Ten Average	9.60%	0.0004%		3.20%		0.34%		6.68%		0.08%		0.37%	
Overall Average (n=138)	6.74%	0.50%		1.82%		0.37%		4.08%		0.11%		0.30%	

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities

Yokohama-shi has the highest concentration of the creative professional class in the central GTA and is located south of Kawasaki-shi where the highest concentration of the super creative class is located. Yokohama-shi is the second largest city after Tokyo's 23 Wards. Yokohama-shi is one of the major sites of the Greater Tokyo Area and one of the major international trade seaports in the world. Among its industries are steel mills, oil refineries, chemical plants, and factories that produce transportation equipment, electrical apparatuses, automobiles, machinery, primary metals, ships, and textiles. Yokohama-shi includes eighteen smaller subareas or ku (wards) and has a large share of the labor force composed of the creative professional class due to the high concentration of creative

workers (Table 22). Not only Minami-ku and Aoba-ku, but the entire city of Yokohama generated a disproportionate share of the creative professional class.

Table 22. Creative Professional Class (%) by Place of Work in ku areas in Yokohama, 2010

Creative Professional Class Total	
Yokohama-shi Minami-ku	10.25%
Aoba-ku	10.26%
Izumi-ku	9.02%
Konan-ku	8.91%
Asahi-ku	8.88%
Kanazawa-ku	8.13%
Hodogaya-ku	7.95%
Naka-ku	7.64%
Sakae-ku	7.39%
Midori-ku	7.32%
Kohoku-ku	6.77%
Isogo-ku	6.75%
Seya-ku	6.66%
Kanagawa-ku	6.59%
Totsuka-ku	6.57%
Tsuzuki-ku	6.19%
Tsurumi-ku	5.93%
Nishi-ku	4.87%
Overall Average (n=18)	7.56%

The top ten average of the creative professional class by place of work is 11.2%. Five sub-areas of Yokohama-shi (i.e. Minami-ku, Aoba-ku, Izumi-ku, Asahi-ku and Konan-ku) have above 11% of creative professional class. Not only these five sub-areas, but the entire city of Yokohama generates a disproportionate share of the creative professional class. In Yokohama, 9.2% of the labor force belongs to the creative professional class. Sagamihara-shi (9.1%) is the only other core-area that has the average

percent of creative professional class above 9%. Those five ku-areas in Yokohama-shi are largely a regional commercial center and bedroom community for central Yokohama-shi or Tokyo due to its extensive commuter train infrastructure.

The creative professional class top ten sub-areas by place of work is significantly different from those top-ten sub-areas in the super creative class. Bunkyo-Ku, Tokyo, is the only sub-area of the Tokyo-Core that appeared in both top-ten in the super creative class and the creative professional class. However, as one of the six creative professional class sub-components, health care workers made up over 60 percent of the creative professional class, it is worth it to identify the geography of creative professional class without health care workers.

The creative professional class top ten sub-areas by place of work significantly differ from top-ten sub-areas in the super creative class. Bunkyo-Ku, Tokyo, is the only sub-area of the Tokyo-Core that appeared in both top-ten in the super creative class and the creative professional class. However, as one of the six creative professional class sub-components, health care workers made up over 60 percent of the creative professional class, it is worth it to identify the geography of creative professional class without health care workers.

The average percent of the labor force employed in the creative professional class by place of work when excluding health care workers is about 5.5 percent points lower than for the entire creative professional class (i.e. 2.66% versus 8.12%) (Table 23). Additionally, the average for the top ten GTA sub-areas drops by nearly half from 9.6 % (with health care) to just below 5% (without health care).

Table 23. Creative Professional Class (%) Top 10 With and Without Health Care Workers by Place of Work in the Greater Tokyo Area, 2010

(With Health Care Workers)			(Without Health Care Workers)	
Top 10			**Top 10**	
Yokohama-shi, Minami-ku	10.52%		Chiyoda-Ku	6.84%
Yokohama-shi, Aoba-ku	10.26%		Chuo-Ku	5.94%
Sagamihara-shi, Minami-ku	10.22%		Taito-Ku	5.19%
Isehara-Shi	10.12%		Minato-Ku	5.15%
Bunkyo-Ku	9.59%		Yokohama-shi, Naka-ku	4.74%
Kawasaki-shi, Miyamae-ku	9.38%		Shibuya-Ku	4.63%
Kamagaya-shi	9.14%		Shinjuku-Ku	4.24%
Yokohama-shi, Izumi-ku	9.02%		Sumida-Ku	4.00%
Yokohama-shi, Konan-ku	8.91%		**Bunkyo-Ku**	3.99%
Yokohama-shi, Asahi-ku	8.88%		Toshima-ku	3.97%
Top Ten Average	9.60%		Top Ten Average	4.87%
Overall Average (n=138)	8.12%		Overall Average (n=138)	2.66%

Note: Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note3: Bold indicates that those sub-areas ranked top ten when health care workers are included or excluded.

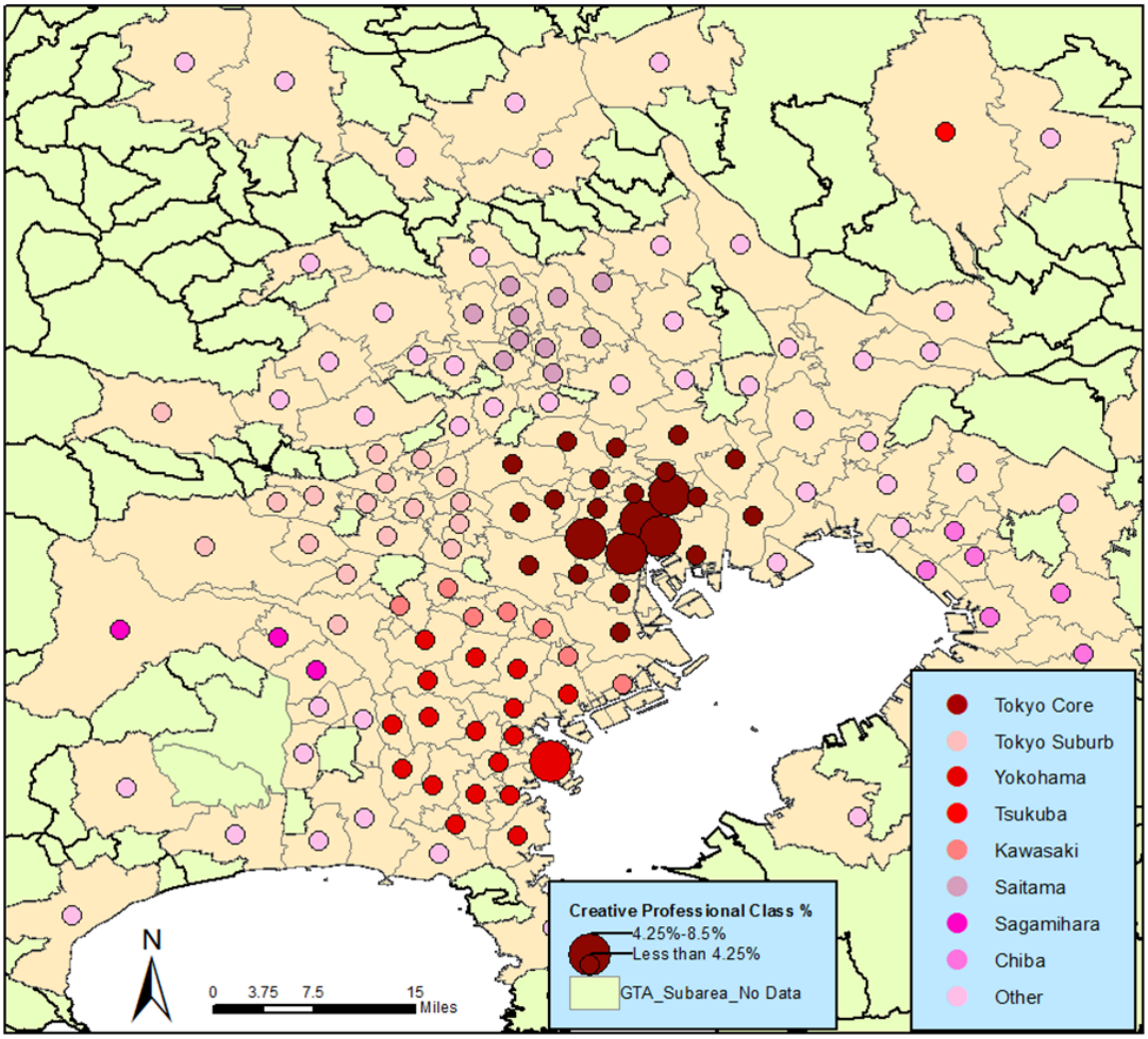
Overall, the percentage of the creative professional class without health care varied from a high of 6.84 percent in Tokyo Chiyoda-Ku to a low of 1.43 percent for Midori-ku Chiba-shi. Only one GTA sub-area was featured in both top ten, which is Bunkyo-Ku in central Tokyo. In contrast, the five sub-areas of the creative professional class including health care appeared in the top ten ranking of health care workers (i.e. Sagamihara-shi, Minami-ku, Isehara-shi, three ku-areas of Yokohama-shi; Aoba-ku, Minami-ku and Asahi-ku and Kamagaya-shi). This might suggest that Yokohama-shi is a center of health care workers rather than the creative professional class. Furthermore, one of the sub-area

of Chiba-shi, Midori-ku with the high share of health care workers (ranked 6th in health care workers) plummeted in the rankings when excluding health care-related occupations (i.e. from 7.79 % to 1.43%. Ranked 21st to 138th).

When removing health care workers, the significant relative change in the geography of the creative professional class in the central GTA is likely because nearly 60% of the creative professional class are in health care workers in the GTA (i.e. 540,000 of the 1 million creative professional workers in the central GTA). Other than health care, the creative professional class in the central GTA includes management governmental official, officers of companies and organizations, other administrative and management workers, legal workers and management, finance and insurance (Figure 18).

The first impression of the new sub-area rankings when excluding healthcare workers is that the nine of the top sub-areas listed in Table 21 are located in the Tokyo Core and only one sub-area is located in Yokohama-shi (Naka-ku). It is a significant shift from when including health care workers (Table 22). Only one Tokyo-Ku area was in the top ten rankings but five ku- areas were in the same ranking with health care workers. It appears that most intense creative professional class clusters may prefer to locate in urban settings when excluding health care occupations. Most of these creative professional class clusters are located in the CBD of Tokyo and Naka-ku, located in the CBD of Yokohama-shi.

Figure 18. Spatial Distribution of Creative Professional Class (%) by Place of Work by GTA Sub-area, Without Healthcare Workers, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

A closer examination of the geography of the creative professional class without health care workers suggest an intense concentration in the Tokyo Core and the core of Yokohama-shi. Two Ku areas of Tokyo's CBD, Chiyoda-Ku and Chuo-Ku, did not appear on the top ten super creative class ranking (i.e. Chiyoda-Ku was ranked 23rd and Chuo-Ku was 25th). However, these two Ku-areas appeared in the top ten ranking of majority of sub-components of the creative professional class.

For example, Chiyoda-Ku ranked 1st on legal workers (1.12%) and management, finance and insurance (1.87%). Chuo-Ku ranked 2nd on officers of companies and organizations (3.11%) and management, finance and insurance (1%) (see Table 19). Also, Chiyoda-Ku and Chuo-Ku have a high percentage of educational attainment and presence of scientific research, professional and technical services, telecommunication and FIRE employments (see Table 11). Chiyoda-Ku (107,130 / ranked 2nd) and Chuo-Ku (77,295 / ranked 4th) are high in the absolute number of creative workers. Kana-ku functions as the CBD of Yokohama-shi. It not only hosts the Yokohama city hall but also the headquarters of the Kanagawa prefectural government locates there.

The top ten creative professional class when excluding health care workers are different from the overall creative professional class total rankings. Sub-areas that moved up in the ranking had high concentrations of other creative professional occupations (i.e. managers, officers, lawyers and other professional workers). At the same time, those sub-areas that moved down in the rankings had higher clusters of health care workers. For example, Yokohama-shi is a good case of a relatively undiversified sub-area that heavily relied on health care workers. Five ku-areas of Yokohama-shi (i.e. Minami-ku, Aoba-ku,

Izumi-ku, Konan-ku and Asahi-ku) were ranked top ten among the central GTA for the creative professional class but dropped in the rankings for the creative professional model when health care workers were removed from the equation (i.e. Minami-ku=12th, Aoba-ku=34th, Izumi-ku=29th, Konan-ku=31st and Asahi-ku=64th). On the other hand, Toshima-Ku, one of the sub-areas in the Tokyo Core increased its creative professional ranking from 93rd, when it included health care workers, to 10th when health care workers were removed. Only 2.26 percent of all creative class are health care and related occupations in Toshima-Ku but it ranked 4th for other administrative and managerial workers (0.6%) and 6th for management, finance and insurance (0.6%) (see Table 21).

Five sub-areas of Yokohama-shi vanished from the creative professional ranking when it removed health care workers. Instead, nine sub-areas of the Tokyo Core dominate the top ten positions for the creative professional class without health care workers. However, only Bunkyo-Ku ranked in the top ten for both the creative professional class total ranking and when it removed health care related occupations. Also, Bunkyo-Ku was ranked in the top ten for both the super creative class total ranking and when it removed engineering related occupations. One of the major centers of the super creative class, Tsukuba Science City, did not appear on the top ten creative professional ranking (both with health care workers and without health care workers); it ranked 47th (6.97%) in the creative professional total ranking and 126th (1.9%) when health care workers were removed.

Overall, the distribution of health care worker by place of work has the least concentration in the central part of the GTA and does not have a major tendency in its

spatial distribution. A visual representation of the spatial distribution of the percent of health care workers by place of work (Figure 19) illustrates a wide spread geographic distribution of the health care labor pool.

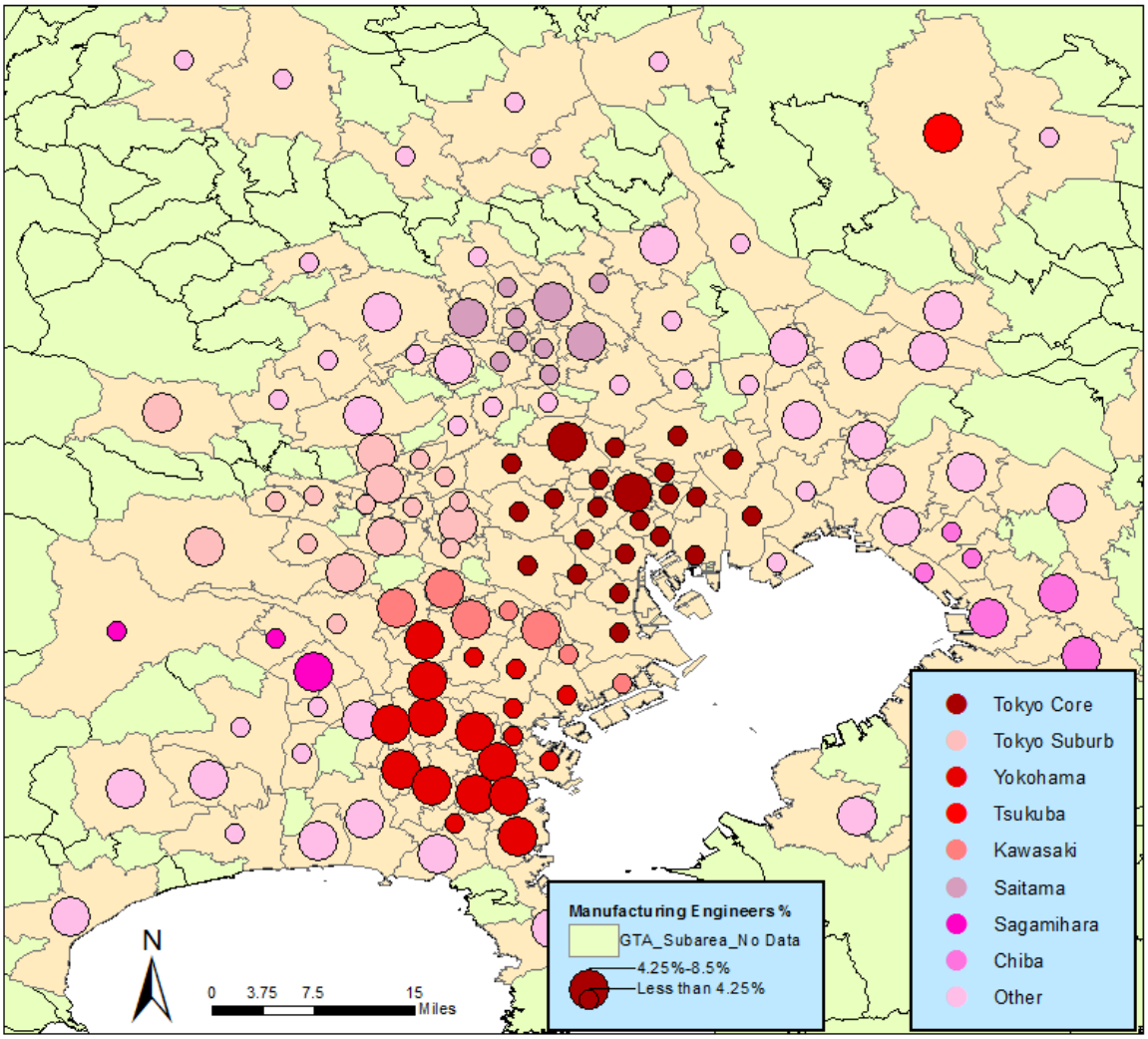
The geography of health care workers is spatially less concentrated in the Tokyo Core. Instead, health care workers are widely spread throughout GTA. Additionally, the sub-areas in the Tokyo Core dominated the bottom ten ranking for health care workers. Eight of the bottom ten are in the Tokyo Core (i.e. Chuo-Ku, Chiyoda-Ku, Minato-Ku, Taito-Ku, Shibuya-Ku, Koto-Ku, Toshima-Ku, Shinagawa-Ku).

4.7. Creative Professional Class by Place of Residence

The creative professional class by place of work were relatively evenly spread throughout GTA. On the other hand, the creative professional class by place of residence were more centrally clustered. An analysis of the spatial distribution of the creative professional class by place of residence in the central GTA suggests that the Tokyo-Core (8.9%), Yokohama-shi (7.3%) and Chiba-shi (7.3%) had the highest concentration of creative professional class.

Overall, in 2010, 6.9 percent of the GTA labor force (total number=1,013,450) was employed in the creative professional class occupations varying from a high of 17.4 percent in Chiyoda-Ku, Tokyo to a low of 4.6 percent for Kazo-shi Saitama-ken (Figure 18, Table 24).

Figure 19. Spatial Distribution of Health Care Workers (%) by Place of Work by GTA Sub-area, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

The average percentage of the creative professional class by GTA's sub-area by place of residence had declined from 7.29 in 2000 to 6.92 in 2010. Also, the absolute number of the creative professional class by place of residence provides the same scenarios. The total number of the creative professional class declined from 1,022,415 in 2000 to 1,016,570 in 2005, and the number of the creative professional class continued to decline to 1,013,450 in 2010. Additionally, the same trend can be traced in the case for the top ten average of creative professional class which increased from 12.45 percent in 2000 to 11.93 percent in 2010 (although the percent was in 2005 at 12.21 percent) (Table 24). This trend of the creative professional class by place of residence differs from the creative professional class by place of work (e.g. 2005 was highest in overall average and 2010 was the leader of top ten average).

The share of the professional class workers both temporally and spatially in the central GTA, the list of top ten creative professional class sub-areas by place of residence was very stable. Seven of the top ten sub-areas were in the Tokyo Core (Chiyoda-Ku, Minato-Ku, Bunkyo-Ku, Chuo-Ku, Shibuya-Ku, Shinjuku-Ku and Meguro-ku) and one sub-area was in the Tokyo Suburb in 2000, 2005 and 2010. Furthermore, in 2010, seven of the Tokyo Core sub-areas dominated the list of top ten creative professional class without health care workers. This suggests that the Tokyo Core is the center of the creative professional workers by place of residence (Table 24). The average GTA's sub-areas by place of residence has 11.70 percent of the labor force employed in the creative professional class occupations, varying from a high of 17.37 percent in Chiyoda-

Ku, Tokyo, to a low of 4.58 percent for Kazo-shi, Saitama-ken with 138 subareas exceeding the mean (Table 24).

A significant shift of the top ten ranking of the creative professional class between place of work and place of residence was found. Despite some concentration of the creative professional class by place of work that was observed in Yokohama, distribution of this occupational classification was spread throughout the GTA. On the other hand, the creative professional class was centrally clustered particularly in Tokyo during night time (place of residence).

The detailed explanation of the GTAs' sub-area top ten rankings for the creative professional class by place of residence is that each of the top ten sub-areas listed in Table 23 has an above average value in the creative professional class subcomponents. This suggests that the central GTA sub-areas are the major geographic nodes of the creative professional activities in the Greater Tokyo Area. However, the major difference from the creative professional analysis by place of work is that eight of the Tokyo Core sub-areas ranked top 10 by place of residence.

Another trend for the creative professional class top ten sub-areas by place of residence is the geographic proximity of three geographic units: 1) the Tokyo-Core (Chiyoda-Ku, Minato-Ku, Bunkyo-Ku, Chuo-Ku, Shibuya-Ku, Shinjuku-Ku and Meguro-Ku); 2) Yokohama-shi (Naka-ku); 3) the Tokyo Suburbs (Musashino-shi); 4) Kamakura-shi. The only sub-area in the creative professional class by place of residence top ten that is not located in the central part of GTA is Kamakura-shi, which is located in the southwestern part of the GTA (Figure 18).

Table 24. Greater Tokyo Sub-Areas Ranked by Creative Professional Class (%) by Place of Residence: 2000-2010

	2000		2005		2010	
	Top Ten		**Top Ten**		**Top Ten**	
	Chiyoda-Ku	18.78%	**Chiyoda-Ku**	17.10%	**Chiyoda-Ku**	17.37%
	Bunkyo-Ku	15.13%	**Minato-Ku**	14.62%	**Minato-Ku**	14.60%
	Minato-Ku	13.68%	**Bunkyo-Ku**	14.41%	**Bunkyo-Ku**	14.13%
	Chuo-Ku	13.11%	**Chuo-Ku**	13.22%	**Chuo-Ku**	12.55%
	Shibuya-Ku	12.43%	**Shibuya-Ku**	11.00%	**Shibuya-Ku**	11.45%
	Shinjuku-Ku	10.84%	**Shinjuku-Ku**	10.85%	**Shinjuku-Ku**	10.94%
	Meguro-Ku	10.50%	**Meguro-Ku**	10.82%	**Meguro-Ku**	9.74%
	Kamakura-shi	10.47%	Setagaya-Ku	10.56%	Yokohama-shi, Naka-ku	9.63%
	Setagaya-Ku	10.01%	Kamakura-shi	9.99%	**Musashino-shi**	9.60%
	Musashino-shi	9.56%	**Musashino-shi**	9.55%	Yokohama-shi, Aoba-ku	9.33%
	Top Ten Average	12.45%	Top Ten Average	12.21%	Top Ten Average	11.93%
%	Overall Average (n=119)	7.29%	Overall Average (n=131)	7.10%	Overall Average (n=138)	6.92%
#	Overall (n=119)	1022415	Overall (n=131)	1016570	Overall (n=138)	1013450
	Bottom Ten		**Bottom Ten**		**Bottom Ten**	
	Astugi-shi	5.60%	Saitama-shi, Iwatsuki-ku	5.35%	Koga-shi	5.19%
	Sayama-shi	5.55%	Koga-shi	5.33%	Yokohama-shi, Seya-ku	5.15%
	Edogawa-Ku	5.54%	Kawasaki-shi, Takatsu-ku	5.33%	Hiratsuka-shi	5.11%
	Soka-shi	5.50%	Asaka-shi	5.32%	**Misato-shi**	5.10%
	Kawasaki-shi, Kawasaki-ku	5.39%	Toride-shi	5.28%	**Soka-shi**	4.99%
	Kawasaki-shi, Saiwai-ku	5.28%	Kawasaki-shi, Tama-ku	5.20%	**Edogawa-ku**	4.98%
	Niiza-shi	5.12%	**Edogawa-Ku**	5.14%	Ichihara-shi	4.98%
	Toda-shi	5.05%	**Soka-shi**	4.99%	Adachi-Ku	4.97%
	Adachi-Ku	5.01%	Saitama-shi, Sakura-ku	4.95%	Niiza-shi	4.95%
	Misato-shi	4.80%	**Misato-shi**	4.75%	Kazo-shi	4.58%
	Bottom Ten Average	5.28%	Bottom Ten Average	5.16%	Bottom Ten Average	5.00%

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note 3: Bold indicates those sub-areas featured in all three year rankings.

The Tokyo Core 23 sub-areas display a very strong presence of the creative professional classes. Seven Ku areas of the Tokyo Core dominated in the top ten rankings. These sub-areas include Chiyoda-Ku (1st), Minato-Ku (2nd), Bunkyo-Ku (3rd), Chuo-Ku (4th), Shibuya-Ku (5th), Shinjuku-Ku (6th) and Meguro-Ku (9th). This

indicates that the Tokyo Core is the center of the creative professional activities (Table 23).

Chiyoda-Ku is ranked first for the creative professional class by place of residence in 2000, 2005 and 2010. A strong presence was noted of management and government officials (0.37 percent/ranked 1st), officers of companies and organizations (7.30%/1st), legal workers (1.39%/1st) and other administrative and managerial workers (0.61%/ 2nd). Also, unlike the creative professional class by place of work, there was a high concentration of health care workers (6.52%/2nd) located in Chiyoda-Ku. Chuo-Ku is the leader of management, finance and insurance in the GTA (Table 24 and Table 25).

The average percent of the labor force employed in the creative professional class by place of residence when excluding health care workers is about three and half percent points lower than for the entire creative professional class (i.e. 3.25% versus 6.92%). Additionally, the average top ten GTA sub-areas drop by five percent from 11.9% (with health care workers) to just over 7% (without health care workers). Overall, the percent of the creative professional class without health care workers varied from a high of 10.84% in Chiyoda-Ku Tokyo to a low of 1.72 % in Kazo-shi, Saitama-ken. The top ten rankings of the creative professional class by place of residence are very consistent. Only two GTA sub-areas drop from the top ten ranking when excluding health care workers and these are Musashino-shi (12th) and Kamakura-shi (13th). Furthermore, three sub-areas of the Tokyo Core have a high share of health care workers (i.e. Bunkyo-Ku, Chiyoda-Ku and Shinjuku-Ku), and that is very different from the ranking of health care workers by place of work (Table 26).

Table 25. Greater Tokyo Sub-Areas Ranked by Creative Professional Class (%) by Place of Residence and Its Sub-Components Top 10, 2010

Creative Professional Class		Management Government Officials	Rank	Officers of companies and organizations	Rank	Other Administrative and Managerial	Rank	Health Care Workers	Rank	Legal Workers	Rank	Manegement, finance, and insurance	Rank
Chiyoda-Ku	17.37%	0.37%	**1**	7.30%	**1**	0.61%	**2**	6.52%	**2**	1.39%	**1**	1.18%	**4**
Minato-Ku	14.60%	0.11%	8	7.10%	**2**	0.58%	7	4.35%	16	0.94%	**2**	1.51%	**3**
Bunkyo-Ku	14.13%	0.04%	78	4.30%	6	0.44%	56	7.02%	**1**	0.77%	**3**	1.55%	**2**
Chuo-Ku	12.55%	0.09%	22	5.04%	**4**	0.52%	21	4.54%	12	0.76%	**4**	1.60%	**1**
Shibuya-Ku	11.45%	0.04%	76	5.87%	**3**	0.44%	58	3.73%	51	0.44%	7	0.92%	6
Shinjuku-Ku	10.94%	0.06%	53	3.92%	8	0.60%	5	4.97%	8	0.45%	6	0.94%	5
Musashino-shi	9.74%	0.02%	118	3.43%	14	0.55%	13	4.36%	15	0.39%	12	0.86%	9
Kamakura-shi	9.63%	0.09%	18	3.65%	11	0.26%	136	4.15%	27	0.49%	5	0.26%	29
Meguro-Ku	9.60%	0.06%	52	3.85%	9	0.58%	8	4.03%	35	0.34%	13	0.89%	8
Yokohama-shi Naka-ku	9.33%	0.03%	97	4.03%	7	0.53%	17	4.25%	21	0.18%	53	0.61%	21
Top Ten Average	11.93%	0.09%		4.85%		0.51%		4.79%		0.62%		1.03%	
Overall Average (n=138)	6.92%	0.05%		2.17%		0.42%		3.67%		0.19%		0.43%	

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities.

Table 26. Health Care Workers (%) by Place of Work and Place of Residence in the GTA, 2010

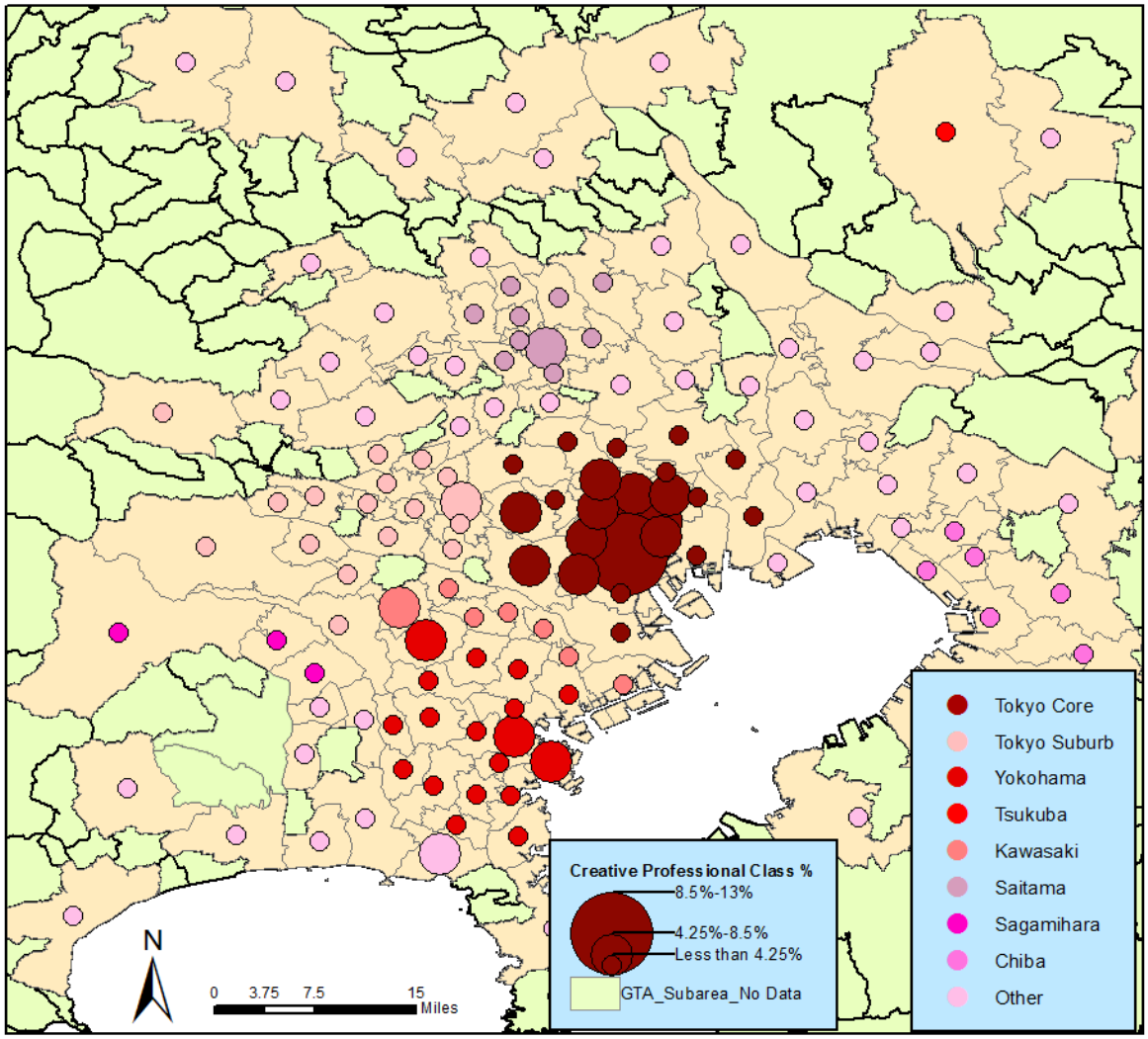
Place of Work			Place of Residence	
Health Care Workers			**Health Care Workers**	
Top 10			**Top 10**	
Sagamihara-shi, Minami-ku	7.83%		Bunkyo-Ku	7.02%
Isehara-Shi	7.62%		Chiyoda-Ku	6.52%
Yokohama-shi, Aoba-ku	7.36%		Tsukuba-shi	5.87%
Yokohama-shi, Minami-ku	6.72%		**Isehara-shi**	5.86%
Yokohama-shi, Asahi-ku	6.37%		Chiba-shi, Chuo-ku	5.73%
Chiba-shi, Midori-ku	6.36%		**Sagamihara-shi, Minami-ku**	5.42%
Higashimurayama-shi	6.33%		Chiba-shi, Midori-ku	5.17%
Kawasaki-shi, Miyamae-ku	6.31%		Shinjuku-Ku	4.97%
Kamagaya-shi	6.29%		Yokohama-shi, Sakae-ku	4.74%
Oume-shi	6.04%		Yokohama-shi, Kanazawa-ku	4.73%
Top Ten Average	6.72%		Top Ten Average	5.60%

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note 3: Bold indicates that those sub-areas ranked top 10 by place of work and place of residence

When removing health care workers, the significant related change in the geography of the creative professional class in the central GTA was observed when examining the place of residence (Figure 20). However, despite losing 60% (health care workers) of the creative professional class, the geography of the creative professional class remains very stable. This confirms that distribution and concentration of the creative professional class in the central GTA is centrally located and clustered in the Tokyo Core sub-areas.

A visual representation and spatial distribution of the percent of health care workers by place of residence (Figure 21) illustrates concentration of health care workers in the Tokyo Core (i.e. Bunkyo-Ku, Chiyoda-Ku, Shinjuku-Ku). The geography of health care workers is similar to the distribution of the creative professional class (Figure 17 and Table 27). Contrary to health care worker by place of work, sub-areas in the Tokyo Core ranked highly. For example, Chiyoda-Ku ranked 137th in health care workers by place of work but moved up to second by place of residence. Shinjuku-Ku ranked 115th by place of work but ranked 9th by place of residence. Health care workers by place of residence has more influence on the creative professional class ranking by place of residence than the same equation of place of work.

Figure 20. Spatial Distribution of Creative Professional Class (%) by Place of Residence by GTA Sub-area, Without Healthcare Workers, 2010



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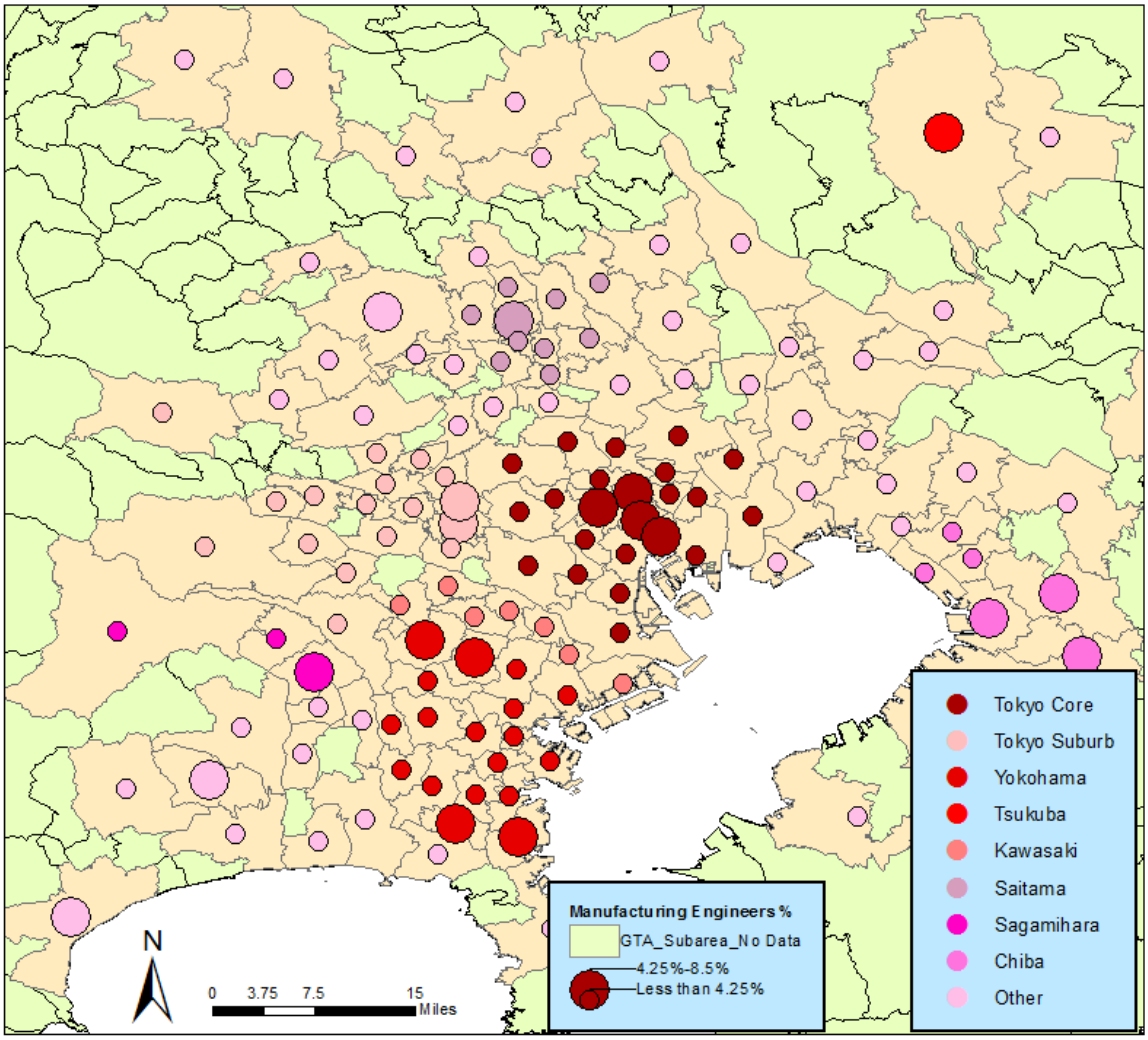
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

Figure 21. Spatial Distribution of Health Care Workers (%) by Place of Residence by GTA Sub-area, 2010



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3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

Table 27. Creative Professional Class (%) Top 10 Without Health Care Workers and Health Care Workers by Place of Residence in the Greater Tokyo Area, 2010

	Without Health Care Workers			Health Care Workers	
1	Chiyoda-Ku	10.84%		Bunkyo-Ku	7.02%
2	Minato-Ku	10.25%		Chiyoda-Ku	6.52%
3	Chuo-Ku	8.01%		Tsukuba-shi	5.87%
4	Shibuya-Ku	7.72%		Isehara-Shi	5.86%
5	Bunkyo-Ku	7.11%		Chiba-shi, Chuo-ku	5.73%
6	Shinjuku-Ku	5.97%		Sagamihara-shi, Minami-ku	5.42%
7	Meguro-Ku	5.71%		Chiba-shi, Midori-ku	5.17%
8	Setagaya-Ku	5.57%		Shinjuku-Ku	4.97%
9	Yokohama-shi, Naka-ku	5.38%		Yokohama-shi, Sakae-ku	4.74%
10	Suginami-Ku	5.35%		Yokohama-shi, Kanazawa-ku	4.73%
	Top Ten Average	7.19%		Top Ten Average	5.60%

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities

4.8. Summary of Creative Class Geography

Despite drastic shifts in the share of total percent of creative class workers both temporally and spatially in the central GTA, the list of top ten creative class in aggregate sub-areas was stable. Two sub-areas in Kawasaki-shi (i.e. Nakahara-ku and Saiwai-ku), three Tokyo Core areas (Bunkyo-Ku, Shibuya-Ku and Minato-Ku) and Tsukuba Science City dominate the top ten list in all three years of 2000, 2005 and 2010. At least one Tokyo Suburb sub-area appeared in each year. Mitaka-shi (2000 and 2005), Kokubunji-shi (2005), Fuchu-shi and Tama-shi (2010) were ranked in the top ten list (Table 28). Tokyo Suburb shi-areas also attracted creative individuals.

Table 28. Greater Tokyo Sub-Areas Ranked Creative Class in Aggregate (%) by Place of Work Top 10: 2000-2010

	2000		2005		2010	
	Top Ten		Top Ten		Top Ten	
1	**Kawasaki-shi, Saiwai-ku**	30.13%	**Kawasaki-shi, Nakahara-ku**	28.54%	**Kawasaki-shi, Nakahara-ku**	31.48%
2	**Bunkyo-Ku**	29.76%	**Bunkyo-Ku**	27.98%	**Bunkyo-Ku**	28.23%
3	**Kawasaki-shi, Nakahara-ku**	29.49%	**Kawasaki-shi, Saiwai-ku**	26.98%	**Kawasaki-shi, Saiwai-ku**	27.65%
4	**Shibuya-Ku**	27.32%	Meguro-Ku	25.72%	**Minato-Ku**	27.53%
5	**Tsukuba-shi**	27.29%	**Shibuya-Ku**	25.28%	**Shibuya-Ku**	26.71%
6	**Minato-Ku**	27.20%	**Minato-Ku**	25.13%	Shinagawa-Ku	25.39%
7	Meguro-Ku	26.48%	Mitaka-shi	24.90%	Fuchu-shi	24.61%
8	Tama-shi	26.17%	Musashino-shi	24.36%	**Tsukuba-shi**	24.35%
9	Abiko-shi	25.78%	Kokubunji-shi	24.29%	Tama-shi	23.82%
10	Mitaka-shi	25.23%	**Tsukuba-shi**	24.14%	Yokohama-shi, Aoba-ku	23.54%
	Top Ten Average	27.48%	Top Ten Average	25.73%	Top Ten Average	26.33%
%	Overall Average (n=119)	18.73%	Overall Average (n=131)	17.50%	Overall Average (n=138)	17.15%
#	Overall (n=119)	2818781	Overall (n=131)	2813497	Overall (n=138)	2848980

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note3: Bold indicates that those sub-areas featured in all three rankings.

The first detailed impression of the GTAs' sub-area rankings for the creative class in aggregate by place of work is that nine of the top ten sub-areas are identical to the top ten sub-areas of for the super creative class (Table 29). On the other hand, only one sub-area, Bunkyo-Ku, is included in the creative class in aggregate top ten and the creative professional class by place of work in 2010. Tsukuba is only sub-area in the creative class in aggregate top ten by place of work that is not located in the central part of the GTA. Furthermore, Bunkyo-Ku is the only sub-area that featured all three creative rankings.

However, excluding engineering–related occupations and health care workers from the equation reveals a different scenario. Overall, only 8.46% of the GTA labor force is employed in creative class occupations when excluding engineering–related

occupations and health care workers. This is a drastic reduction. Nearly half of the workforce (i.e. 8.45% versus 17.15%) are employed in engineering–related occupations and health care occupations. The top ten average and the bottom ten average also declined about fifty percent (i.e. 26.33% versus 13.93% and 10.67% versus 5.52%). Five top ten ranked sub-areas remained after removing engineering –related occupations and health care workers (see Table 30). Those sub-areas were: 1) the Tokyo Core (Shibuya-Ku, Bunkyo-Ku and Minato-Ku), 2) Yokohama-shi Aoba-ku and 3) Tsukuba Science City. This advocates that those five sub-areas are the superiors of the creative class in the GTA. This demonstrated that those five sub-areas are the creative nexus in central Tokyo since these five sub-areas have consistently been in the top-ten rankings.

Table 29. Greater Tokyo Sub-Areas Ranked Creative Class (%) by Place of Work: 2010

	Creative Class in Aggregate		Super Creative Class		Creative Professional Class	
	Top Ten		**Top Ten**		**Top Ten**	
1	*Kawasaki-shi, Nakahara-ku*	31.48%	*Kawasaki-shi Nakahara-ku*	24.42%	Yokohama-shi, Minami-ku	10.52%
2	**Bunkyo-Ku**	28.23%	*Kawasaki-shi, Saiwai-ku*	22.46%	Yokohama-shi, Aoba-ku	10.26%
3	*Kawasaki-shi, Saiwai-ku*	27.65%	*Minato-ku*	20.81%	Sagamihara-shi, Minami-ku	10.22%
4	*Minato-Ku*	27.53%	*Shibuya-Ku*	20.11%	Isehara-Shi	10.12%
5	*Shibuya-Ku*	26.71%	*Shinagawa-Ku*	19.53%	**Bunkyo-ku**	9.59%
6	*Shinagawa-Ku*	25.39%	**Bunkyo-Ku**	18.64%	Kawasaki-shi, Miyamae-ku	9.38%
7	*Fuchu-shi*	24.61%	*Fuchu-shi*	18.37%	Kamagaya-shi	9.14%
8	*Tsukuba-shi*	24.35%	*Tsukuba-shi*	17.37%	Yokohama-shi, Izumi-ku	9.02%
9	*Tama-shi*	23.82%	*Tama-shi*	17.37%	Yokohama-shi, Konan-ku	8.91%
10	Yokohama-shi, Aoba-ku	23.54%	Koto-Ku	17.01%	Yokohama-shi, Asahi-ku	8.88%
	Top Ten Average	26.33%	Top Ten Average	19.61%	Top Ten Average	9.60%
%	Overall Average (n=138)	17.15%	Overall Average (n=138)	10.40%	Overall Average (n=138)	6.74%
#	Overall (n=138)	2848980	Overall Average (n=138)	1811930	Overall (n=138)	1037050

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note3: Bold indicates that those sub-areas listed in all three rankings; Note 4: Italic indicates that those sub-areas listed in creative class in aggregate and super creative class.

The list of top ten creative class in aggregate by place of residence in the central GTA sub-areas remained steady throughout the ten-year period and included four sub-areas in the Tokyo Core (i.e. Bunkyo-Ku, Chiyoda-Ku, Minato-Ku and Shibuya-Ku), plus the Tokyo Suburb of Musashino-shi and Kamakura-shi. These six sub-areas appeared in the top ten list in all three years for 2000, 2005 and 2010. This suggests that those six sub-areas are at the heart of the creative class geography by place of residence in the central Greater Tokyo Area.

Table 30. Creative Class in Aggregate (%) and Creative Class in Aggregate without Health Care Workers and Engineers (%) by Place of Work in the Greater Tokyo Area, 2010

	Place of Work			**Place of Work No Health/Engi**	
	Top Ten			**Top Ten**	
1	Kawasaki-shi, Nakahara-ku	31.48%	1	**Shibuya-Ku**	16.58%
2	**Bunkyo-Ku**	28.23%	2	**Tsukuba-shi**	14.85%
3	Kawasaki-shi, Saiwai-ku	27.65%	3	**Bunkyo-ku**	14.68%
4	**Minato-Ku**	27.53%	4	Koganei-shi	14.49%
5	**Shibuya-Ku**	26.71%	5	Meguro-Ku	13.64%
6	Shinagawa-Ku	25.39%	6	Suginami-Ku	13.33%
7	Fuchu-shi	24.61%	7	**Minato-Ku**	13.17%
8	**Tsukuba-shi**	24.35%	8	Yokohama-shi, Aoba-ku	13.15%
9	Tama-shi	23.82%	9	Chiyoda-Ku	13.11%
10	Yokohama-shi, Aoba-ku	23.54%	10	Setagaya-Ku	12.30%
	Top Ten Average	26.33%		Top Ten Average	13.93%
%	Overall Average (n=138)	17.15%	%	Overall Average (n=138)	8.46%
#	Overall (n=138)	2848980	#	Overall (n=138)	1433370

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note3: Bold featured that those sub-areas listed in two rankings.

Six of those top ten ranked sub-areas for the creative class in aggregate are also listed in the top ten sub-areas of the creative professional by place of residence. By contrast, only two top-ten sub-areas were listed in the creative class in aggregate and also the super creative class by place of residence. This is drastically different from the same analysis by place of work (i.e. nine of the top ten sub-areas are identical to the top ten sub-areas of the super creative class). This indicates that the creative class in aggregate by place of residence is heavily impacted by the creative professional class instead of the super creative class (Table 32).

Table 31. Greater Tokyo Sub-Areas Ranked by Creative Class in Aggregate (%) by Place of Residence Top 10: 2000-2010

2000		2005		2010	
Top Ten		Top Ten		Top Ten	
Bunkyo-Ku	30.00%	**Bunkyo-Ku**	28.94%	**Bunkyo-Ku**	29.43%
Shibuya-ku	29.79%	**Shibuya-Ku**	28.30%	**Chiyoda-Ku**	28.21%
Musashino-shi	28.20%	**Minato-Ku**	27.65%	**Minato-Ku**	27.61%
Tsukuba-shi	27.86%	Musashino-shi	27.29%	Musashino-shi	27.45%
Kokubunji-shi	27.58%	**Chiyoda-Ku**	27.11%	**Shibuya-Ku**	26.68%
Chiyoda-Ku	27.54%	Kamakura-shi	26.74%	Kawasaki-shi, Asao-ku	26.17%
Kamakura-shi	27.45%	Setagaya-Ku	26.43%	Yokohama-shi, Aoba-ku	25.98%
Yokohama-shi, Aoba-ku	27.23%	Kokubunji-shi	26.05%	Tsukuba-shi	25.90%
Minato-Ku	27.20%	Meguro-Ku	25.88%	Kawasaki-shi, Nakahara-ku	25.83%
Kawasaki-shi, Asao-ku	27.14%	Suginami-Ku	25.27%	Kamakura-shi	25.61%
Top Ten Average	28.00%	Top Ten Average	26.97%	Top Ten Average	26.89%
Overall Average (n=119)	20.00%	Overall Average (n=131)	18.80%	Overall Average (n=138)	18.63%
Overall (n=119)	2818781	Overall (n=131)	2719249	Overall (n=138)	2753890

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note 3: Bold indicates those sub-areas featured in all three rankings.

Six of those top ten ranked sub-areas for the creative class in aggregate are also listed in the top ten sub-areas of the creative professional by place of residence. By contrast, only two top-ten sub-areas were listed in the creative class in aggregate and also the super creative class by place of residence. This is drastically different from the same analysis by place of work (i.e. nine of the top ten sub-areas are identical to the top ten sub-areas of the super creative class). This indicates that the creative class in aggregate by place of residence is heavily impacted by the creative professional class instead of the super creative class (Table 32).

Table 32. Greater Tokyo Sub-Areas Ranked Creative Class (%) by Place of Residence, 2010

	Creative Class in Aggrigate		Super Creative Class		Creative Professional Class	
	Top Ten		**Top Ten**		**Top Ten**	
1	*Bunkyo-Ku*	29.43%	*Kawasaki-shi Nakahara-ku*	19.45%	*Chiyoda-Ku*	17.37%
2	*Chiyoda-Ku*	28.21%	*Tsukuba-shi*	17.95%	*Minato-Ku*	14.60%
3	*Minato-Ku*	27.61%	*Kawasaki-shi Asao-ku*	17.93%	*Bunkyo-Ku*	14.13%
4	**Musashino-shi**	27.45%	**Musashino-shi**	17.85%	Chuo-Ku	12.55%
5	*Shibuya-Ku*	26.68%	Kawasaki-shi Tama-ku	17.42%	*Shibuya-Ku*	11.45%
6	*Kawasaki-shi, Asao-ku*	26.17%	Yokohama-shi Kohoku-ku	17.30%	Shinjuku-Ku	10.94%
7	**Yokohama-shi, Aoba-ku**	25.98%	**Yokohama-shi Aoba-ku**	16.64%	Meguro-Ku	9.74%
8	*Tsukuba-shi*	25.90%	Kokubunji-shi	16.60%	Yokohama-shi, Naka-ku	9.63%
9	*Kawasaki-shi, Nakahara-ku*	25.83%	*Kamakura-shi*	16.42%	**Musashino-shi**	9.60%
10	*Kamakura-shi*	25.61%	Koganei-shi	16.22%	**Yokohama-shi, Aoba-ku**	9.33%
	Top Ten Average	26.89%	Top Ten Average	17.38%	Top Ten Average	11.93%
%	Overall Average (n=138)	18.63%	Overall Average (n=138)	11.70%	Overall Average (n=138)	6.92%
#	Overall (n=138)	2753890	Overall (n=138)	1796366	Overall (n=138)	1013450

Note 1: Ku=Ward, Shi=City; Note 2: Ku (with large K) in Tokyo is quasi-independent. Ku (with small k) in other cities are sub-components of designated cities; Note3: Bold indicate that those sub-areas featured in all three rankings; Note 4: Italic indicates that those sub-areas ranked top ten.

A closer examination of the creative class in aggregate by place of residence in the GTA reveals a different scenario. Overall, only 9.29% of the GTA labor force is employed in creative class occupations when excluding engineering –related occupations and health care workers. This is the substantial reduction, nearly a half of workforce (i.e. 9.29% versus 18.63%). However, the top ten average declined only forty percent (i.e. 26.89% versus 16.52%). When excluding engineering –related occupations and health care workers, five top ten ranked sub-areas remained after removing these two occupational classification. Additionally, nine of top-ten ranked sub-areas are dominated by the Tokyo Core. Tsukuba-shi is once again the only sub-area that listed in the top-ten when excluding engineering health care workers. This should be a strong evidence that the Tokyo Core is a place where creative individuals prefer to live in the GTA (Table 29).

4.9. Regression Analysis

The purpose of this regression analysis is to specify and test the functional relationships that exist between the percent of the workforce that is classified as part of the creative class and various independent variables. Regression analysis will include ten separate regression models:

- Super Creative Class by Place of Work,
- Super Creative Class by Place of Work Excluding Engineering-related Occupations
- Super Creative Class by Place of Residence,
- Super Creative Class by Place of Residence Excluding Engineering-related Occupations

- Creative Professional Class by Place of Work
- Creative Professional Class by Place of Work Excluding Health Care Workers
- Creative Professional Class by Place of Residence
- Creative Professional Class by Place of Residence Excluding Health Care Workers
- Creative Class in Aggregate by Place of Work and,
- Creative Class in Aggregate by Place of Residence

Independent variables listed in Table 5 were largely obtained from the Statistics Bureau, Ministry on Internal Affairs and Communication.

A simple understanding of the relationship between the independent variables and the dependent variables are the first step of the regression analysis. One way to determine the relationship is by using covariance, or the average of two variables respective deviation from their mean (Rogerson 2011). A variable's covariance with another is standardized by dividing the result by the standard deviation to yield a unit-less correlation coefficient with a value from negative one to one (-1 to 1). The correlation coefficient between the two variables such as the super creative class or super creative class without manufacturing engineers. Each selected independent variable can be greater than zero indicating a positive relationship or the value can be negative indicating a negative or inverse relationship. Rogerson (2011) argued that the correlation coefficient is a measure of the strength of the linear association between variables. Closer the

correlation coefficient is to one or negative one (1 or -1) then the strength of the association is relatively stronger than correlation coefficients that approach zero.

A regression analysis has several assumptions that must be addressed and this is the second step of the regression analysis. The first assumption is the errors (i.e., residuals) have a mean of zero (0), and constant variance that knows as the assumption of homogeneity of variance or homoscedasticity. The second assumption is that the residuals are independent, meaning that values of one observation's error is not affected by the value of another observation's error: the assumption of independence. The third assumption is that for each independent variable (x), the errors have a normal distribution and are centered around the regression line: the assumption of normality. The last and final assumption is the independent variables have a low correlation: the assumption of no multicollinearity (Rogerson 2011).

The assumption of no multicollinearity indicated that two independent variables should not be used in the regression modeling. For example, education variables including completed university (4 years) and/or graduate school, completed junior college (2 years) or vocational school and completed high school (12^{th} grade) are highly correlated with each other. The completed university (4 years) and/or graduate school has a higher correlation with the creative classes dependent variables than the completed junior college (2 years) or vocational school and the completed high school (12^{th} grade). Therefore, completed university (4 years) and/or graduate school variable is retained and the other two education variables are removed from the modeling. As a result, 28

independent variables remain for the regression analysis. Any multicollinearity in the model is assessed using the variance inflation factor (VIF).

There are several different methods that can be used to determine a regression model. In this dissertation, the overall goal is to generate the most parsimonious model: a model with the fewest variables that explains a substantive portion of the variance in the dependent variable. A stepwise linear regression analysis was performed to assess quantitatively the relationships between three creative classes reported from the Statistics Bureau, Ministry on Internal Affairs and Communication and the selected socio-economic variables by sub-areas in the central GTA.

4.10. Super Creative Class Regression Analysis by Place of Work

It is important to understand the various statistical ranges and values for the 28 variables used in the regression analysis. The descriptive statistics for the sub-areas in the central GTA are reported in Table 5. The 138 sub-areas have different averages, standard deviations, minimum and maximums for the super creative class dependent variables by place of work and place of residence. The super creative class by place of work average is 10.4 percent and the super creative class by place of residence average is 11.7 percent. The minimum and maximum range of super creative class by place of work is larger than the place of residence (4.65%-24.41% versus 4.99%-19.45%). Also, the super creative class without manufacturing engineers by place of work and by place of residence have different averages (i.e. 5.90% versus 6.04%) and different ranges (3%-13% versus 1.78%-13.37%) (Table 33).

Based on a stepwise regression analysis (Table 34), the final regression model for the percent of the workforce in the super creative class by place of work explained 60 percent of the variation based on two predictor variables: science research industry employment and telecommunication industry employment (Model 2, Table 34).

Table 33. Descriptive Statistics for the Greater Tokyo Area: Dependent Variables, 2010

	Mean	sd	Min	Max
Dependent Variable (Place of Work)				
Super Creative Class	10.40%	3.98	4.65%	24.41%
Super Creative Class_NoEngi	5.90%	1.87	3.00%	13.00%
Creative Professional Class	6.73%	1.21	4.15%	10.52%
Creative Professional Class_NoMedi	2.66%	0.8	1.42%	6.84%
Creative Class Total	17.14%	4.21	8.98%	31.20%
Creative Class Total_NoEngi/no medi	8.52%	2.2	4.70%	16.58%
Dependent Variable (Place of Residence)				
Super Creative Class	11.70%	2.89	4.99%	19.45%
Super Creative Class_NoEngi	6.04%	1.82	1.78%	13.37%
Creative Professional Class	6.92%	1.85	4.58%	17.37%
Creative Professional Class_NoMedi	3.25%	1.4	1.72%	10.84%
Creative Class Total	18.63%	4	10.36%	29.43%
Creative Class Total_NoEngi/no medi	9.29%	2.85	3.61%	18.88%

Note1: The source for each variable is also from Japan's Population Census by the Japanese Ministry of Internal Affairs and Communications (MIC) in 2010. Note 2: However, household income is from housing and land survey in 2008.

It appears that the spatial variation in the Super Creative Class by place of work in Central Tokyo was explained by the share of the labor force in just two key industries rather than by more conventional and broadly based human capital or population variables such as the level of educational attainment, income level or population density.

These two industries included the science research, professional and technical services and information and communication sectors. The implication is that the geography of the super creative class in the central GTA is best explained by labor pools with professional and technical skills field and high levels of connectivity as measured by information and communication. By contrast, human capital variables like percent BA are a less major factor in shaping the geography of the creative class. However, individuals who work these industries normally need to have completed a course at a university or to have specialized knowledge at the same level or higher (the Statistics Bureau, Ministry on Internal Affairs and Communication).

Table 34. Regression Analysis of Super Creative Class (%) by Place of Work

Model	Variable	Model R2	b	SE b	β	p-value
1	Constant	0.506	0.031	0.007		0.00
	% Science Research, Professional and Technical Services		1.556	0.134	0.711	0.00
2	Constant	0.6	0.019	0.006		0.00
	% Science Research, Professional and Technical Services		1.074	0.149	0.491	0.00
	% Information and Communication Industry Employment		0.611	0.11	0.378	0.00
3	Constant	0.639	0.031	0.007		0.00
	% Science Research, Professional and Technical Services		1.26	0.15	0.576	0.00
	% Information and Communication Industry Employment		1.004	0.148	0.621	0.00
	% Finance, Insurance and Real Estate Industry Employment		-0.701	0.186	-0.36	0.00

Overall, the final model (Model 2) suggested that for every percentage point increase in the percent of science research, professional and technical service industry employment, the percentage of the super creative class by place of work will increase by 1.074 percent. On the other hand, every percentage point increase in the percent of

telecommunication industry employment, the percentage of the super creative class by place of work in the central GTA will increase by 0.611 percent.

The standardized estimate, also known as standard coefficient, Beta or β is used to determine which predictor variable was most dominance. The percent of science research, professional and technical service industry employment variable was the dominant variable with a standard estimate of 0.49 compared with the percent of information and communication industry employment predictor variable's standard estimate of 0.38. A one standard deviation (1.79 percent) increase in percent of science research, professional and technical service industry employment leads to a 0.49 standard deviation in predicted super creative class by place of work. And, a one standard deviation or 2.43 percent increase in percent of information and communication industry employment, in turn, leads to an increase of 0.38 standard deviation in the super creative class by place of work with the other variables in the model held constant.

The percent of FIRE industry employment variable was the third variable added by the stepwise procedure to the super creative class by place of work regression model (Model 3, Table 34). However, this model was not selected because the marginal R-Square increase was only 0.04 and the added complexity of the additional predictor variable was deemed not worth the negligible R-Square increase. Additionally, the standardized estimate of the FIRE industry employment variable was half the other two predictor variables; just 0.36 compared to 0.58 and 0.62 for science research and telecommunication industries employments predictor variables.

The spatial distribution of the science research, professional and technical service industry employment (%) was concentrated in the Tokyo Core (the Ku areas of the Tokyo Core plus Tsukuba-shi and Kamakura-shi). On the other hand, the special distribution of the percent information and communication industry employment was more diverse and located in the Tokyo Core (4 Ku areas), Kawasaki-shi (3 ku areas) and Yokohama-shi Tama-ku, Urayasu-shi and Musashino-shi (see Table 9, Table 10 and Figure 23).

The spatial variation in the Super Creative Class by place of work when excluding engineers was also largely explained by the share of the labor force in just two key industries These two industries included; 1) the science research, professional and technical service industry employment and 2) education and learning support instead of information and communication industry (Table 35). Overall, the final model (Model 2) suggested that for every percentage point increase in the percent of science research, professional and technical service industry employment, the percentage of the super creative class by place of work will increase by 0.53 percent. On the other hand, every percentage point increase in the percent of education and learning support industry employment, the percentage of the super creative class by place of work in the central GTA will increase by 0.87 percent (Table 35).

The percentage of science research, professional and technical service industry employment variable was the dominant variable with a standard estimate of 0.50 compared with the percentage of education and learning support industry employment predictor variable's standard estimate of 0.47. A one standard deviation (1.79 percent) increase in percent of science research, professional and technical service industry

employment leads to a 0.50 standard deviation in predicted super creative class by place of work. And, a one standard deviation or 1.02 percent increase in percent of education and leaning support industry employment, in terns, leads to an increase of 0.38 standard deviation in the super creative class by place of work without engineers with the other variables in the model held constant.

The percent of secondary economic sector employment variable was the third variable added by the stepwise procedure to the super creative class by place of work without manufacturing engineers' regression model for the central GTA sub-areas (Model 3, Table 35). However, this model was not selected because the marginal R-Square increase was only 0.04 and the added complexity of the additional predictor variable was deemed not worth the negligible R-Square increase. Additionally, the standardized estimate of the percent of secondary economic sector industry employment variable was a negative value of -0.23.

Table 35. Regression Analysis of Super Creative Class (%) by Place of Work (Without Engineers)

Model	Variable	Model R2	b	SE b	β	p-value
1	Constant	0.567	0.022	0.003		0.00
	% Science Research, Professional and Technical Services		0.787	0.06	0.753	0.00
2	Constant	0.731	-0.005	0.004		0.00
	% Science Research, Professional and Technical Services		0.53	0.055	0.508	0.00
	% Education and Learning Support Industry Employment		0.867	0.097	0.473	0.00
3	Constant	0.768	0.017	0.006		0.00
	% Science Research, Professional and Technical Services		0.428	0.056	0.41	0.00
	% Education and Learning Support Industry Employment		0.783	0.093	0.427	0.00
	% Secondary Economic Sector Employment		-0.001	0	-0.231	0.00

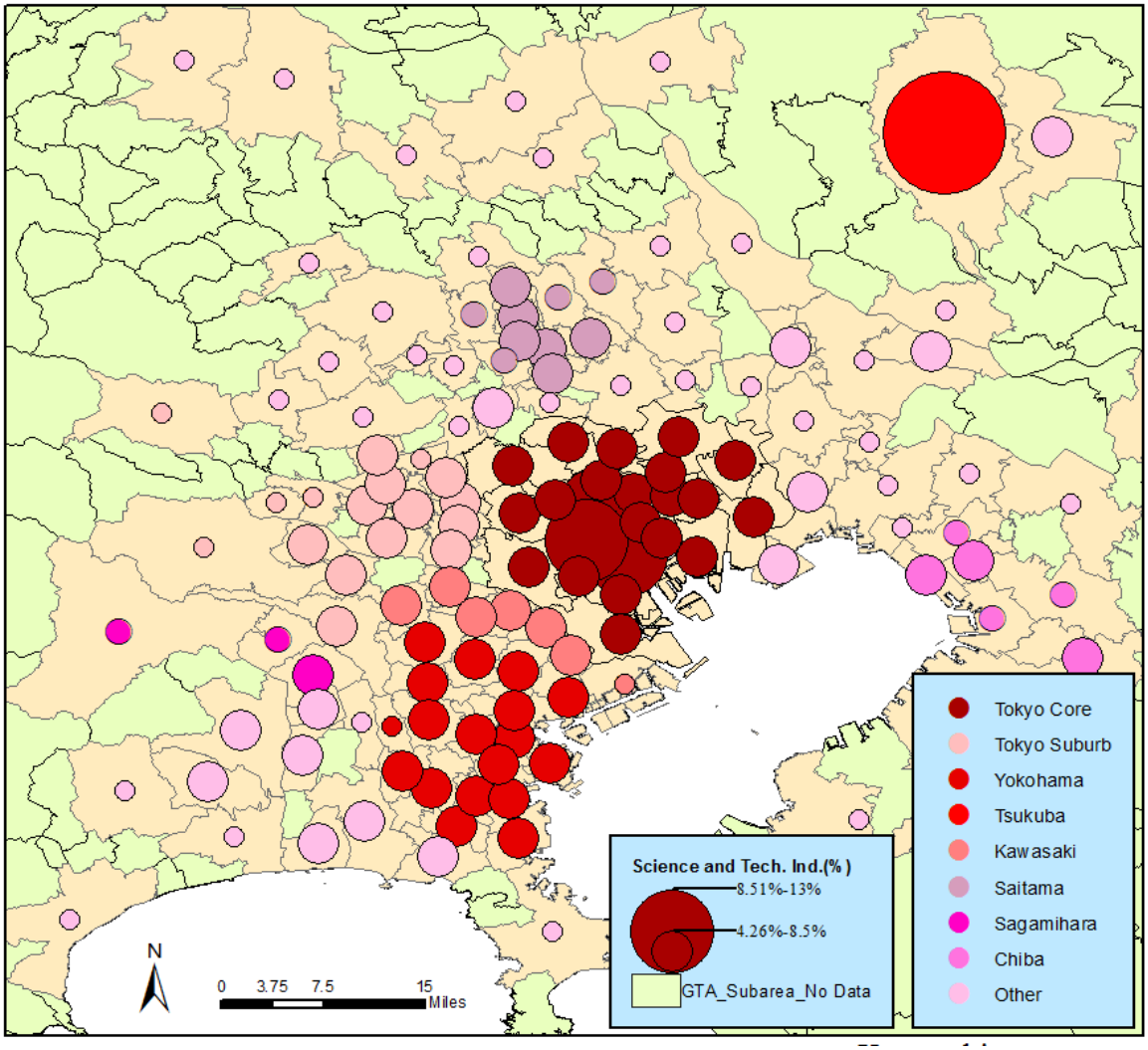
The distribution of the percent of education and learning support industry employment was concentrated in the central part of the GTA: 1) the Tokyo Suburb (four ku areas); 2) the Tokyo Core (2 Ku area); and 3) others (Tsukuba-shi, Kawasaki-shi Asao-ku, Kamakura-shi and Saitama-shi Urawa-ku) (Table 36, Figure 22).

Table 36. Education and Learning Support Industry Employment (%) in the GTA, 2010

Top Ten	
Tsukuba-shi	7.71%
Koganei-shi	7.15%
Kokubunji-shi	7.03%
Kawasaki-shi, Asao-ku	6.91%
Bunkyo-ku	6.74%
Kodaira-shi	6.61%
Kamakura-shi	6.59%
Shinjuku-ku	6.50%
Musashino-shi	6.31%
Saitama-shi, Urawa-ku	6.04%
Top Ten Average	6.76%

The spatial variation in the Super Creative Class by place of work both with engineers and without engineers in the central Tokyo was explained by the share of the labor force in percentage in three major industries science research, telecommunication and education and learning support instead of level of educational attainment or income level. Once again, however, these individuals working these industries need to obtain completed a course at a university or higher degree to have specialized knowledge in order to apply scientific and specialized knowledge. Additionally, individuals with higher degrees generally earn higher wagers than individuals with lower degree.

Figure 22. Spatial Distribution of Science Research, Professional and Technical Service Industry (%) by GTA Sub-area, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

Therefore, the result of the regression analysis for the super creative class by place of work could be seen as a reinforcing of key industries, level of educational attainment and income earning level.

4.11. Super Creative Class Regression Analysis by Place of Residence

Like the super creative class by place of work for both with manufacturing engineers and without manufacturing engineers, the goal for the super creative class by place of residence dependent variable is to generate the most parsimonious regression model. Not like the super creative class by place of work in the central GTA, the percentage of completed university (4 years) and/or graduate school independent variable had a very high R-Square: 0.76 (Table 37).

Table 37. Regression Analysis of Super Creative Class (%) by Place of Residence

Model	Variable	Model R2	b	SE b	β	p-value
1	Constant	0.758	0.024	0.005		0.00
	% Completed University (4 years) and/or Graduate School		0.239	0.012	0.871	0.00
2	Constant	0.811	-0.162	0.031		0.00
	% Completed University (4 years) and/or Graduate School		0.266	0.011	0.969	0.00
	Sex Ratio		0.002	0	0.251	0.00
3	Constant	0.841	-0.159	0.028		0.00
	% Completed University (4 years) and/or Graduate School		0.276	0.011	1.004	0.00
	Sex Ratio		0.002	0	0.247	0.00
	Ratio of daytime population and night time population		-3.47E-05	0	-0.178	0.00

The final regression model for the percent of the workforce in the super creative class occupations by place of residence explained 81.1 percent of the variation based on two predictor variables: the percentage of completed university (4 years) and/or graduate school and sex ratio (Model 2, Table 37).

Overall, the final model suggested that for every percent point increase in the percent of completed university and/or graduate degree, the percent of the super creative workforce by the place of residence will increase by 0.276 percent. By contrast, for every percent sex ratio (males per 100 females) increase in sub-areas in the GTA, the super creative class will increase by 0.002 percent. Model 2 is the best model to select for the regression model for the super creative class by place of residence since the third independent variable of ration of daytime population and night time population has decrease of 0.0035 percent.

The spatial distribution of the percentage of completed university (4 years) and/or graduate school, was concentrated in southwestern part of the central GTA (i.e. Kamakura-shi, Yokohama-shi, Aoba-ku and Kawasaki-shi, Asao-ku) (Table 12 and Figure 24). Koizumi and Wakabayashi (2014, 2015) argued that the number of white-collar (i.e. administrative and managerial workers, and professional and engineering workers) workers increased in the southwestern part from the central GTA, especially around train stations such as Kohoku New Town (Kohoku-ku, Yokohama-shi) and Wakabadai (Asao-ku, Kawasaki-shi). Kohoku-ku and Asao-ku is other leading sub-areas of creative activities where easily access from central Tokyo. On the other hand, the blue-collar ratio (i.e. transportation and machine operational workers and manufacturing process workers) significantly decreased around train stations where large scale redevelopment had process (Koizumi and Wakabayashi 2014, 2015). This indicates that those individuals who obtain higher degree live near central part of Tokyo where those individuals (including creative class) can commute to the central part of GTA.

GTA has one of the most transit-oriented region in the world. Chorus and Bertolini argued (2016) that each train station area consists of a node and a place value. According to them, the node value represents readily transport services in each station, and the place value consists the intensity and diversity of activities in a certain location. The major railway company in the GTA, “Tokyu” operates several railway lines to the southwest of the region (Chorus and Bertolini 2016; Kanno and Itoh 2017). Train stations, including Jiyugaoka in Meguro-Ku and Musashi Kosugi in Nakahara-ku, Kawasaki have huge impact on economic activity in GTA. These stations play important creative nodes for industries and residential. For example, Nakahara-ku is the leading creative activity for super creative class and creative class in aggregate by place of work and Meguro-Ku has been highly ranked in creative class ranking by place of residence. Mansury et al. (2011) suggested that relative centers appear to share a common feature of the key built environment for innovative creators, especially around efficient and heavily rail systems. They argued that creative individuals gravitate toward train stations where offering certain amenities of schools, shopping malls, parks or industrial facilities. These advocate that Kawasaki, Yokohama and the Tokyo Suburb’s sub-areas are leading creative areas by place of residence.

The result is a variable model (i.e., Model 2, Table 37) with an R-square of 0.81, meaning the two predictors explained over 91 percent of the variance in the super creative class by place of residence, higher than the R-Square of two predictor model for the super creative class by place of work. The larger R-Square for the super creative class by place of residence is likely explained by the narrower and more specific locational

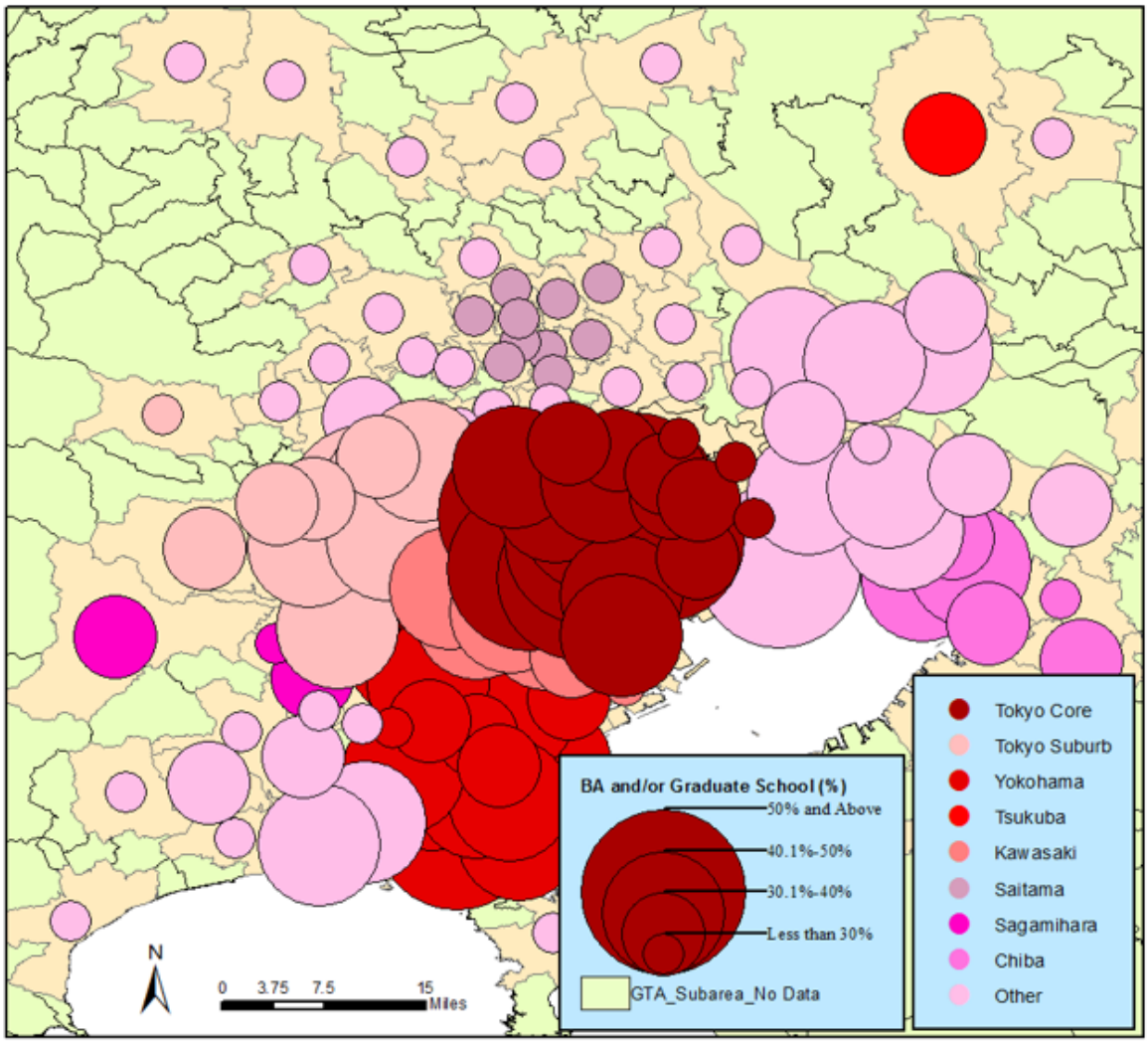
analysis of two super creative classes (by place of work and place of residence). Many creative people tend to work the central GTA but live in the suburb area of the central Tokyo.

The b coefficients for Model 2 (Table 37) indicate that a sub-area of the GTA would generate a 0.27 percent increase in the super creative class (%) for every one percent increase in the proportion of the completed university (4 years) and/or graduate school. The implication is that the distribution of the super creative class by place of residence in the central GTA is best explained by labor pools with a human capital of attainment of higher degree.

However, the spatial variation in the Super Creative Class without engineers by place of residence provided a different scenario. Like the two super creative classes models (with or without engineers) by place of work, the super creative class without engineers by place of residence in Central Tokyo was explained by the share of the labor force in just two key industries, science research, professional and technical service and education and learning support rather the level of educational attainment.

Overall, the final model (Model 2, Table 38) suggests that for every percentage point increase in the percent of science research industry employment, the percentage of the super creative class by place of work will increase by 0.66 percent. On the other hand, every percentage point increase in the percent of education and learning support industry employment, the percentage of the super creative class by place of residence in the central GTA will increase by 0.69 percent.

Figure 23. Spatial Distribution of Completed University (4 years) and/or Graduate School (%) by GTA Sub-area, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

Table 38. Regression Analysis of Super Creative Class (%) by Place of Residence (without Engineers)

Model	Variable	Model R2	b	SE b	β	p-value
1	Constant	0.719	0.02	0.002		0.00
	% Science Research, Professional and Technical Services		0.862	0.047	0.842	0.00
2	Constant	0.826	-0.001	0.003		0.00
	% Science Research, Professional and Technical Services		0.659	0.043	0.648	0.00
	% Education and Learning Support Industry Employment		0.685	0.076	0.384	0.00
3	Constant	0.871	-0.007	0.003		0.00
	% Science Research, Professional and Technical Services		0.478	0.046	0.47	0.00
	% Education and Learning Support Industry Employment		0.505	0.071	0.283	0.00
	% Completed University (4 years) and/or Graduate School		0.056	0.008	0.324	0.00

The standardized estimate, Beta or β, is used to determine which predictor variable has a relatively stronger effect for the two predictor variables in the model: percent of science research, professional and technical service and education and learning support industries' employment. The percentage of science research, professional and technical service industry employment variable was the dominant variable with a standard estimate of 0.43 compared with the percentage of education and learning support industry employment predictor variable's standard estimate of 0.76. A one standard deviation (1.79 percent) increase in percent of s science research, professional and technical service industry employment leads to a 0.65 standard deviation in predicted super creative class by place of residence. And, a one standard deviation or 1.02 percent increase in percent of information communication industry employment, in turn, leads to an increase of 0.38 standard deviation in the super creative class by place of residence with the other variables in the model held constant.

The percentage of science research, professional and technical services industry employment variable was the dominant variable with a standard estimate of 0.65 compared with the percentage of education and learning support industry employment predictor variable's standard estimate of 0.38. A one standard deviation (1.79 percent) increase in percent of science research industry employment leads to a 0.50 standard deviation in predicted super creative class by place of residence. And, a one standard deviation or 1.02 percent increase in percent of education and leaning support industry employment, in terns, leads to an increase of 0.47 standard deviation in the super creative class by place of residence without engineers with the other variables in the model held constant.

4.12. Creative Professional Class Regression Analysis by Place of Work

The descriptive statistics for the sub-areas in the central GTA are reported in Table 5. The 138 sub-areas have different averages, standard deviations, minimum and maximums for the creative professional class dependent variables by place of work and place of residence. The creative professional class by place of work average is 6.73 percent and the creative professional class by place of residence average is 6.92 percent. The minimum and maximum range of creative professional class by place work is larger than the place of residence (4.15%-10.52% versus 4.58%-17.37%). Also, the creative professional class without health care workers by place of work and by place of residence have different averages (i.e. 2.66% versus 3.25%) and different ranges (1.42%-6.84% versus 1.72%-10.84%) (Table 33). That said, there are higher concentration of the creative professional class at place of residence with health care workers and when it

excludes health care workers. Also, range between the minimum percentage and maximum percentage of the creative professional classes are much wider in place of residence.

Based on a stepwise regression analysis (Table 39), the final regression model for the percent of the workforce in creative professional class by place of work explained 30.5 percent of the variation based on two predictor variables: percent of medical, health care and welfare industry employment and percent of tertiary economic sector employment (Model 2, Table 39). This is significantly lower than the super creative class, where the final regression model's R-Square was 60 percent.

The standardized estimate is used to determine which predictor variable has a relatively stronger effect for the three predictor variables in the model: percent of medical, health care and welfare industry employment and percent of tertiary economic sector employment.

The percent of public and governmental affairs industry employment variable was the third variable added by the stepwise procedure to the creative professional class by place of work regression model for the central GTA sub-areas (Model 3, Table 39). However, this model was not selected. The marginal R-Square increased 0.063 and the added complexity of the additional predictor variable was indeed worth not to neglect R-Square increase. However, the standardized estimate of the percent of public and governmental affair industry employment variable was a negative value of -0.26.

The distribution of the percent of medical, health care and welfare industry employment is uneven and none of the major sub-areas is located in the Tokyo Core. On

the other hand, the distribution of the percent of tertiary economic sector employment is centrally clustered (i.e. 4 Tokyo Ku areas and 3 Tokyo Suburb shi areas) (Table 40). Overall, the geography of the creative professional class by place of work is evenly distributed throughout central GTA. It is difficult to find that concentration of creative professional class by place of work in the GTA.

Table 39. Regression Analysis of Creative Professional Class (%) by Place of Work

Model	Variable	Model R2	b	SE b	β	p-value
1	Constant	0.158	0.038	0.006		0.00
	% Medical, health care and welfare Industry Employment		0.341	0.069	0.398	0.00
2	Constant	0.306	-0.011	0.011		0.00
	% Medical, health care and welfare Industry Employment		0.383	0.063	0.447	0.00
	% Tertiary Economic Sector Employment		0.001	0	0.387	0.00
3	Constant	0.369	-0.012	0.01		0.00
	% Medical, health care and welfare Industry Employment		0.455	0.063	0.53	0.00
	% Tertiary Economic Sector Employment		0.001	0	0.419	0.00
	% Public and Governmental Affairs Industry Employment		-0.26	0.072	-0.266	0.00

The distribution of the percent of medical, health care and welfare industry employment is uneven and none of the major sub-areas is located in the Tokyo Core. On the other hand, the distribution of the percent of tertiary economic sector employment is centrally clustered (i.e. 4 Tokyo Ku areas and 3 Tokyo Suburb shi areas) (Table 40). Overall, the geography of the creative professional class by place of work is evenly distributed throughout central GTA. It is difficult to find that concentration of creative professional class by place of work in the GTA.

Table 40. Medical, Health Care and Welfare Industry Employment (%) and Tertiary Economic Sector Employment (%) in the GTA, 2010

	% Medical, health care and weifare Industry Employment		% Tertiary Economic Sector Employment	
	Top Ten		**Top Ten**	
	Ome-shi	13.16%	Urayasu-shi	91.3
	Shinjuku-ku	11.59%	Yokohama-shi, Naka-ku	90.5
	Isehara-shi	11.43%	Saitama-shi, Urawa-ku	89.8
	Higashimurayama-shi	11.27%	Shibuya-ku	89.68
	Chiba-shi, Midori-ku	11.25%	Tama-shi	88.25
	Yokohama-shi, Asahi-ku	11.08%	Musashino-shi	87.95
	Yokohama-shi, Sakae-ku	10.99%	Koganei-shi	87.79
	Yokohama-shi, Seya-ku	10.95%	Setagaya-ku	87.47
	Sagamihara-shi, Minami-ku	10.86%	Chiyoda-ku	87.23
	Yokosuka-shi	10.73%	Suginami-ku	87.23
	Top Ten Average	11.33%	Top Ten Average	88.72%

The spatial variation in the Creative Professional Class without health care workers in Central Tokyo was also explained by the share of the labor force in three key independent variables. These three variables included; 1) Ratio of daytime population and night time population, 2) percent of foreign population and 3) annual household income between $100,000 and above (Table 41).

Overall, the final model (Model 3, Table 41) suggests that for every percentage point increase in the ratio of daytime and night time population, the percentage of the creative professional class by place of work will increase by 0.0000309 percent.

The creative professional class without health care workers final model by place of work in the GTA features the different independent variable as the creative professional class with health care workers by place of work. Further, the final models of R-Square has larger difference (i.e. 0.37 versus 0.715). The larger R-Square for the

creative professional class without health care worker is likely explained by the narrower and more specific definition of creative professional class.

Table 41. Regression Analysis of Creative Professional Class (%) by Place of Work (without Health Care Workers)

Model	Variable	Model R2	b	SE b	β	p-value
1	Constant	0.373	0.023	0.001		0.00
	Ratio of daytime population and night time population		3.38E-05	0	0.611	0.00
2	Constant	0.594	0.018	0.001		0.00
	Ratio of daytime population and night time population		2.93E-05	0	0.528	0.00
	% Foreign Population		0.326	0.039	0.478	0.00
3	Constant	0.682	0.015	0.001		0.00
	Ratio of daytime population and night time population		3.09E-05	0	0.558	0.00
	% Foreign Population		0.228	0.038	0.335	0.00
	Annual Household Income Between 100,000 and Above		5.41E-07	0	0.328	0.00
4	Constant	0.715	0.011	0.001		0.00
	Ratio of daytime population and night time population		2.51E-05	0	0.453	0.00
	% Foreign Population		0.249	0.036	0.365	0.00
	Annual Household Income Between 100,000 and Above		4.63E-07	0	0.281	0.00
	Average Age		0.055	0.014	0.212	0.00

The ratio of daytime population and night time population variable is the leading variable with a standard estimate of 0.45 compared with the percentage of foreign population (standard estimate of 0.37), annual income between $100,000 and above (0.28) and average age (.02). A one standard deviation (147.99 percent) increase the ratio of daytime population and night time population leads to a 0.0000309 standard deviation in predicted super creative class by place of work. The third independence variable of the annual household income between $100,000 and above increased the R-Square to 0.309 or a marginal increase of 30.9 percent of explained variance of the creative professional class without health care workers. After the addition of the forth indent variable, the R-

Square increase was 0.03 threshold and therefore considered not substantial enough to justify a more complex model (Table 41).

The spatial variation in the Creative Professional Class by place of work both with health care workers and without health care workers in Central Tokyo was complex. Health care workers were simply explained by the share of the labor force in percentage in medical, health care and welfare industry and tertiary economic sector employments. On the other hand, when excluding health care workers, the population characteristics of ration of daytime population and night time population, the percent of foreign population and income level appeared. Not only changing to other type of independent variable, the level of R-Square change drastically (about 50 percent). Due to significantly lower level of R-Square, health care workers are less impact on the creative activities in the GTA.

4.13 Creative Professional Class Regression Analysis by Place of Residence

Like the creative professional class by place of work for both with health care workers and without health care workers, the goal for the creative professional class by place of residence dependent variable is to generate the most parsimonious regression model. Not like the creative professional class by place of work in the central GTA, the annual household income between $100,000 and $150,000 independent variable had a very high R-Square: 0.6 (Table 42) comparing to two independent variables (% of medical, health care and welfare and tertiary economic sector employments) of 0.31.

The final regression model for the percent of the workforce in the creative professional class occupations by place of residence explained 60 percent of the variation

based on one predictor variable: the annual household income between $100,000 and above (Model 1, Table 42).

The overall, the final model suggests that for every percent point increase in the percent of the annual household income between $100,000 and above, the percent of the creative professional workforce by the place of residence will increase by 0.445 percent. Model 1 is the only model to select for the regression model for the creative professional class by place of residence since the second independent variable of the percent of married individual 15 years or older has decrease of 0.153 percent (Table 42).

Table 42. Regression Analysis of Creative Professional Class (%) by Place of Residence

Model	Variable	Model R2	b	SE b	β	p-value
1	Constant	0.6	0.025	0.003		0.00
	Annual Household Income between 100,000 and Above		0.445	0.032	0.775	0.00
2	Constant	0.723	0.099	0.01		0.00
	Annual Household Income between 100,000 and Above		0.453	0.027	0.771	0.00
	% Married Individual 15 years or older		-0.153	0.02	-0.35	0.00
3	Constant	0.787	0.089	0.009		0.00
	Annual Household Income between 100,000 and Above		0.371	0.027	0.632	0.00
	% Married Individual 15 years or older		-0.124	0.018	-0.283	0.00
	Ratio of daytime population and night time population		3.70E-05	0	0.297	0.00

The spatial variation in the Creative Professional Class without health care workers by place of residence in Central GTA was also explained by the share of the labor force in two key independent variables. These three variables included; 1) percent of FIRE industry employment, 2) Ratio of daytime population and night time population, 2) percent of foreign population. The third independent variable of percent of

construction industry employment was excluded since standardized estimate of the percent of the construction industry employment had a negative value of 0.256.

The result is a variable model (i.e., Model 2, Table 43) with an R-square of 0.75, meaning the two predictors explained over 75 percent of the variance in the creative professional class without health care workers by place of residence without health care workers, higher than the R-Square of three predictor model for the creative professional class without health care workers by place of work (i.e. 0.752 versus 0.682) (Table 33).

Table 43. Regression Analysis of Creative Professional Class (%) by Place of Residence (without Health Care Workers)

Model	Variable	Model R2	b	SE b	β	p-value
1	Constant	0.599	-0.01	0.003		0.00
	% FIRE Industry Employment		0.54	0.038	0.774	0.00
2	Constant	0.752	0.002	0.002		0.00
	% FIRE Industry Employment		0.427	0.033	0.612	0.00
	Ratio of daytime population and night time population		4.01E-05	0	0.424	0.00
3	Constant	0.808	0.025	0.004		0.00
	% FIRE Industry Employment		0.325	0.034	0.465	0.00
	Ratio of daytime population and night time population		3.41E-05	0	0.361	0.00
	% Construction Industry Employment		-0.256	0.042	-0.296	0.00

The larger R-Square for the creative professional class by place of residence is likely explained by the narrower and more specific locational analysis of two super creative classes (by place of work and place of residence). Particularly those creative professional workers who belong to FIRE industry in the central GTA likely to live suburb of Tokyo and commute to the central part of GTA during daytime. Also, appearance of the ratio of daytime population and night time population independence variable by place of work

and place of residence may indicate that creative professional individuals are likely commute for work.

The b coefficients for Model 2 indicates that a sub-area of the GTA would generate a 0.43 percent increase in the creative professional class (%) for every one percent increase in the proportion of the percent of FIRE industry employment. The implication is that the distribution of the creative professional class by place of residence in the central GTA is best explained by labor pools in specific type of industry. On the other hand, the spatial variation in the creative professional class with health care workers by place of residence provided a different scenario. It was explained by income level rather the share of the labor force in key industry.

4.14 Creative Class in Aggregate Regression Analysis by Place of Work

It is important to understand the various statistical ranges and values for the 28 variables used in the regression analysis. The descriptive statistics for the sub-areas in the central GTA are reported in Table 5. The 138 sub-areas have different averages, standard deviations, minimum and maximums for the creative class total, combine both super creative class and creative professional class, dependent variables by place of work and place of residence. The creative class total by place of work average is 17.14 percent and the super creative class by place of residence average is 18.63 percent. The minimum and maximum range of super creative class by place work is larger than the place of residence (8.98%-31.20% versus 10.36%-29.43%).

Also, the creative class total without manufacturing engineers and without health care workers by place of work and by place of residence have different averages (i.e.

8.52% versus 9.29%) and different ranges (4.70%-16.58% versus 3.61%-18.88%) (Table 33).

Based on a stepwise regression analysis (Table 44), the final regression model for the percent of the workforce in creative class in aggregate by place of work explained 65 percent of the variation based on three predictor variables: science research professional and technical services industry employment and information and communication industry employment (Model 2, Table 44).

Table 44. Regression Analysis of Creative Class in Aggregate (%) by Place of Work

Model	Variable	Model R2	b	SE b	β	p-value
1	Constant	0.556	0.09	0.007		0.00
	% Science Research, Professional and Technical Services		1.735	0.135	0.746	0.00
2	Constant	0.649	0.077	0.006		0.00
	% Science Research, Professional and Technical Services		1.227	0.148	0.527	0.00
	% Information and Communication Industry Employment		0.644	0.11	0.375	0.00
3	Constant	0.689	0.02	0.015		0.00
	% Science Research, Professional and Technical Services		1.135	0.142	0.488	0.00
	% Information and Communication Industry Employment		0.77	0.108	0.448	0.00
	% Medical, health care and welfare Industry Employment		0.633	0.156	0.208	0.00

The spatial variation in the creative class in aggregate by place of work in the GTA was explained by the share of the labor force in just two key industries instead of obtaining of higher degree or income. The industry of science research is a same leading independent predictors as the creative class total without manufacturing engineers and health care workers model. However, there are some notable differences with how each independent variable affects the model. The difference is most noticeable when analyzing the standard estimate for each predictor variable in the model. A one standard (1.79 percent) increase in science research industry employment leads to 0.527 standard

deviation increase in predicted creative class in aggregate with all other variables held constant. And, a one standard deviation (2.43 percent) increase in information and communication industry employment, in turn, leads to an increase of 0.375 standard deviation in the creative class total, with the other variables in the model held constant. Standard estimate values for the creative class total indicated that the science research, professional and technical service industry employment independent variable explained much more of the variance than information and communication industry employment predictor variable. However, in the creative class total without manufacturing engineers and health care workers' mode for the central GTA, the standardized estimate was much higher of 0.807 (Table 44).

Overall, for the creative class in aggregate, the final model (Model 2, Table 44) suggests that for every percentage point increase in the percent of science research, professional and technical service industry employment, the percentage of the creative class in aggregate by place of work will increase by 1.227 percent. On the other hand, every percentage point increase in the percent of information and communication industry employment, the percentage of the super creative class by place of work in the central GTA will increase by 0.644 percent. On the other hand, when the dependent variable excludes manufacturing engineers and health care workers, the final model (Model 1, Table 4) suggests that for every percentage point increase in the percent of science industry employment, the percentage of creative class total will increase by 0.983 percent.

The percent of secondary economic sector employment variable was the second variable added by the stepwise procedure to the creative class total without manufacturing engineers and health care workers by place of work regression model for the central GTA sub-areas (Model 2, Table 44). However, despite increased of R-Square of 0.09, this model was not selected because the additional predictor variable was deemed not worth the negligible R-Square increase.

The creative class in aggregate with or without manufacturing engineers and health care workers for the sub-areas of central GTA have the same leading predictor variables, albeit at difference relative strengths in the models as indicated by the standard estimates. The sub-areas in the GTA used as the study area for the best regression models for the super creative class and creative professional class by place of work have similarity and contrast as well. The leading independent variable for the super creative class (with or without manufacturing engineers) by place of work was the same independent variable, the percentage of science research industry employment. On the other hand, the creative professional class, both health care workers and without health care workers have greater spreads of types of the independent variables. The percentage of medical, health care and welfare industry employment and the ratio of daytime population and night time population variables were selected. Additionally, the R-Square of independent variables for the creative professional class by place of work were lower than the super creative class and the creative class total. The different selected independent variables and the lower R-Square vales can cause modeling and model interpretation to be much more difficult.

4.15. Creative Class in Aggregate Regression Analysis by Place of Residence

Based on a stepwise regression analysis (Table 44), the final regression model for the percent of the workforce in creative class in aggregate by place of residence explained 92 percent of the variation based on two predictor variables: the percent completed university (4 years) and/or graduate school and the percent of science research, professional and technical service industry employment (Model 2, Table 45).

Table 45. Regression Analysis of Creative Class in Aggregate (%) by Place of Residence

Model	Variable	Model R2	b	SE b	β	p-value
1	Constant	0.853	0.049	0.005		0.00
	% Completed University (4 years) and/or Graduate School		0.353	0.013	0.923	0.00
2	Constant	0.917	0.049	0.004		0.00
	% Completed University (4 years) and/or Graduate School		0.255	0.014	0.667	0.00
	% Science Research, Professional and Technical Services		0.812	0.081	0.361	0.00
3	Constant	0.923	0.088	0.012		0.00
	% Completed University (4 years) and/or Graduate School		0.234	0.015	0.61	0.00
	% Science Research, Professional and Technical Services		0.757	0.079	0.336	0.00
	% Unemployment		-0.937	0.282	-0.111	0.00

The spatial variation in the Creative Class in aggregate by place of residence in the GTA was explained by the share of the key industry, science research, professional and technical service and the obtainment of the higher degree. The industry of science research, professional and service industry is a same leading independent predictor as the creative class total without manufacturing engineers and health care workers model. However, there are some notable differences with how each independent variable affects the model.

The difference is most noticeable when analyzing the standard estimate for each predictor variable in the model. A one standard (1.79 percent) increase in science research industry employment leads to 0.361 standard deviation increase in predicted creative class total with all other variables held constant. A one standard deviation increase in same industry employment, without manufacturing engineers and health care workers, leads to an increase of 0.518 standard deviation with the other variables in the model held constant. On the other hand, a one standard (10.57 percent) increase in the percent of completed university (4 years) and/or graduate school leads to 0.667 standard deviation increase in predicted creative class total with all other variables held constant. A one standard deviation increase in same industry employment, without manufacturing engineers and health care workers, leads to an increase of 0.476 standard deviation with the other variables in the model held constant (Table 45).

Standard estimate values for the creative class in aggregate indicated that the percent of completed university (4 years) and/or graduate school independent variable explained much more of the variance than the science research, professional and technical service industry employment predictor variable when included engineers and health care workers. However, in the creative class total without manufacturing engineers and health care worker mode for the central GTA, the science research industry employment predictor became the leading predictor and the percent of completed university (4 years) and/or graduate school independent variable became the second.

Overall, for the creative class in aggregate, the final model (Model 2, Table 44) suggests that for every percentage point increase in the percent of completed university (4

years) and/or graduate school, the percentage of the creative class total by place of work will increase by 0.225 percent. On the other hand, every percentage point increase in the percent of science research, professional and technical service industry employment, the percentage of the super creative class by place of work in the central GTA will increase by 0.812 percent. On the other hand, when the dependent variable excludes manufacturing engineers and health care workers, the final model (2nd model) suggests that for every percentage point increase in the percent of science research, professional and technical industry employment, the percentage of creative class in aggregate will increase by 0.825 percent. And, every percentage point increase in the percent of completed university (4 years) and/or graduate school, the percentage of the super creative class by place of work in the central GTA will increase by 0.129 percent.

The creative class in aggregate with or without manufacturing engineers and health care workers for the sub-areas of central GTA have the same leading predictor variables, albeit at difference relative strengths in the models as indicated by the standard estimates. The sub-areas in the GTA used as the study area for the best regression models for the super creative class and creative professional class by place of work have similarity and contrast as well. The leading independent variable for the super creative class was educational attainment but (without manufacturing engineers, the percent of science research employment became the leading independent variable. On the other hand, just like the creative analysis in the place of work, the creative professional class, both health care workers and without health care workers have greater spreads of types of the independent variables. Annual household income between $100,000 and above and

the percentage of FIRE industry employment and the ratio of daytime population and night time population variables were selected. Not as much as place of work, however, the R-Square of independent variables for the creative professional class by place of residence were lower than the super creative class and the creative class total. The different selected independent variables and the lower R-Square values suggest that modeling and model interpretation of the creative professional class is much more difficult.

CHAPTER VI

CONCLUSION

The purpose of this dissertation was fourfold: 1) How is Florida's original definition of the creative class that include super creative class, creative professional class and creative class in aggregate, distributed in the central GTA? 2) What socio-economic variables best explain this distribution? 3) To analyze the distribution of creative class between place or work and place of residence and which socio-economic variables best explain this distribution? And 4) Is Florida's theory applicable to Tokyo and what are the key western/non-western differences?

Descriptive findings suggest that the sub-areas in the central GTA with the highest percentages of each creative classes, super creative class, creative professional class and creative class in aggregate, were disparate. Additionally, each creative class by place of work and place of residence generated different concentrated sub-areas in the GTA. An analysis of the spatial distribution of the super creative class by place of work in the central GTA indicated that Kawasaki-shi (15.1%), the Tokyo-Core (12.4%) and Yokohama-shi (11.6%) had the highest concentrations of the super creative class. The highest concentration of the creative professional class by place of work was found in Yokohama-shi (7.56%), Tokyo-Core (6.98%) and Chiba-shi (6.97%). Furthermore, the Kawasaki-shi (22%), Tokyo-Core (19.4%) and Yokohama-shi (19.2%) were the three leading sub-areas of the creative class in aggregate in the GTA.

On the other hand, the distribution of super creative class by place of residence in the central GTA indicated that Kawasaki-shi (15.6%), the Tokyo-Suburbs (13.85) and Yokohama-shi (13.7%) had the highest share of the super creative class. Regarding the creative professional class by place of residence, the Tokyo-Core (8.9%) is the leading place followed by Yokohama-shi (7.33%) and Chiba-shi (7.29%). Lastly, Kawasaki-shi (22%), Yokohama-shi (21%) and the Tokyo-Core (20.7) dominated the top ranking of the creative class in aggregate activities by place of residence.

Another important finding was that roughly half of the super creative class in the GTA were engaged in engineering and related occupations and approximately sixty percent of the creative professional class in the GTA were dominated by health care workers. When excluding these two occupations, a drastically different distribution of creative class appeared. The Tokyo-Suburbs became the super creative node by place of work and place of residence. On the other hand, the Tokyo-Core was the center of creative professional activities by place of work and place of residence.

When removing engineering and related occupations and health care workers from the creative professional class, the most affected sub-areas included Kawasaki-shi, Yokohama-shi and Chiba-shi, where an undiversified creative workforce had a high disproportionate share of engineering or health care workers. As a result, the sub-areas with high percentages of engineers or health care workers dropped in the rankings. Conversely, sub-areas with low percentages of engineering or health care workers increased in the creative rankings. However, the geography of the three creative classes in the GTA is not just about central cities including the Tokyo-Core and Kawasaki-shi or

specific type of occupations. For example, Tsukuba Science City is also a distinctive geographic cluster of creative class workers even though it is located on the GTA periphery.

Using stepwise regression, significant associations were observed between the percent super creative class and creative class in aggregate by place of work and the percent of science industry employment in the central GTA. Likewise, the more narrowly defined super creative class and creative class that excludes engineering and related occupations had the same predictor variables. On the other hand, significant associations were observed between the percent super creative class and creative class in aggregate by place of residence and the percent of the workforce that had completed university (4 years) degrees and/or graduate school in the central GTA. Yet, the more narrowly defined super creative class and creative class that excluded engineering and related occupations had different predictor variables, which is the percent of science industry employment workforce.

By contrast, the geography of the creative professional class by place of work and place of residence in the central GTA was different. Instead of educational attainment or science industry workforce, the percent of medical, health care and welfare industry employment (place of work) and annual household income between $ 100,000 and above (place of residence) had a positive relationship although the percent of FIRE industry employment and the ratio of daytime population and nighttime population emerged as key predictor when excluding health care workers. This suggests that the creative

professional class has its own distinctive explanations separate from the super creative class or the creative class in aggregate.

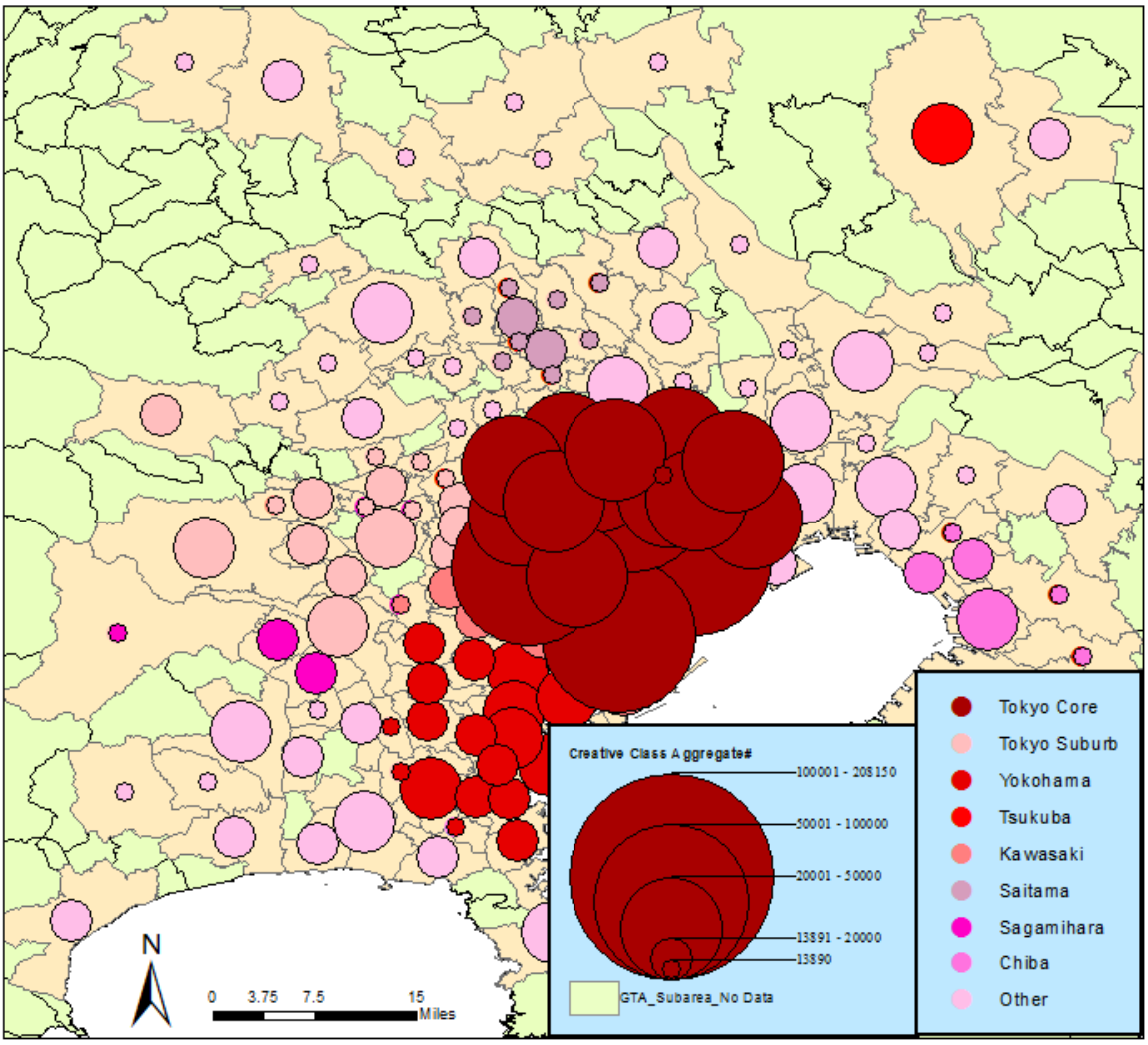
Tokyo is a different type of a World City, unlike Western World Cities such as New York where market-centered policies prevail. In Japan, the State (i.e. the Japanese central government or the TMG) control industrial policy, finance and development plans including, for example, the establishment of the Tsukuba Science City and the Waterfront City Project in Tokyo Bay. In some respects, because of the cultural differences, Florida's theories of creativity may be less applicable since the neo-liberal focus of many Western economies is less present in Tokyo. Much of Japan and Tokyo's economy represents a more directed or developmental state economy that lies somewhere between the West and China. Perhaps the best comparative is with the developmental state in South Korea and Seoul, which are a unique mix of public and private sectors where the national economy is part entrepreneurial and part directed economy. Additionally, unlike in the Western application of Florida's creative class the role of the gay community and foreign-born appears to be relatively mute in Tokyo, although additional research is warranted.

However, is the state oriented governmental structure the only reason that the creative class theory may not be as applicable in the GTA? Other reasons may include unique time-historic factors in Japan and Tokyo, the natural environment and geographic features in the area, and/or various other socio-cultural factors. Fujita and Hill (2016) argued that the team approach or group orientalism remain much stronger than individualism in Japan. These factors need to be considered in any further creative class analysis in the GTA.

During the completion of this dissertation research, a number of additional avenues of investigation were identified regarding the creative class and the various socio-economic predictor variables. For example, additional analysis of each creative class subcomponent (e.g., artists, musician, authors) would enable a better understanding of the creative class and its spatial distribution in the GTA. What predictor variables best explain the distribution of each detailed subcomponent of occupations and how are they different by place of work and place of residence? A separate regression model for each of the three creative class subcomponents could augment the creative class findings and enable a better overall understanding of the individual predictors.

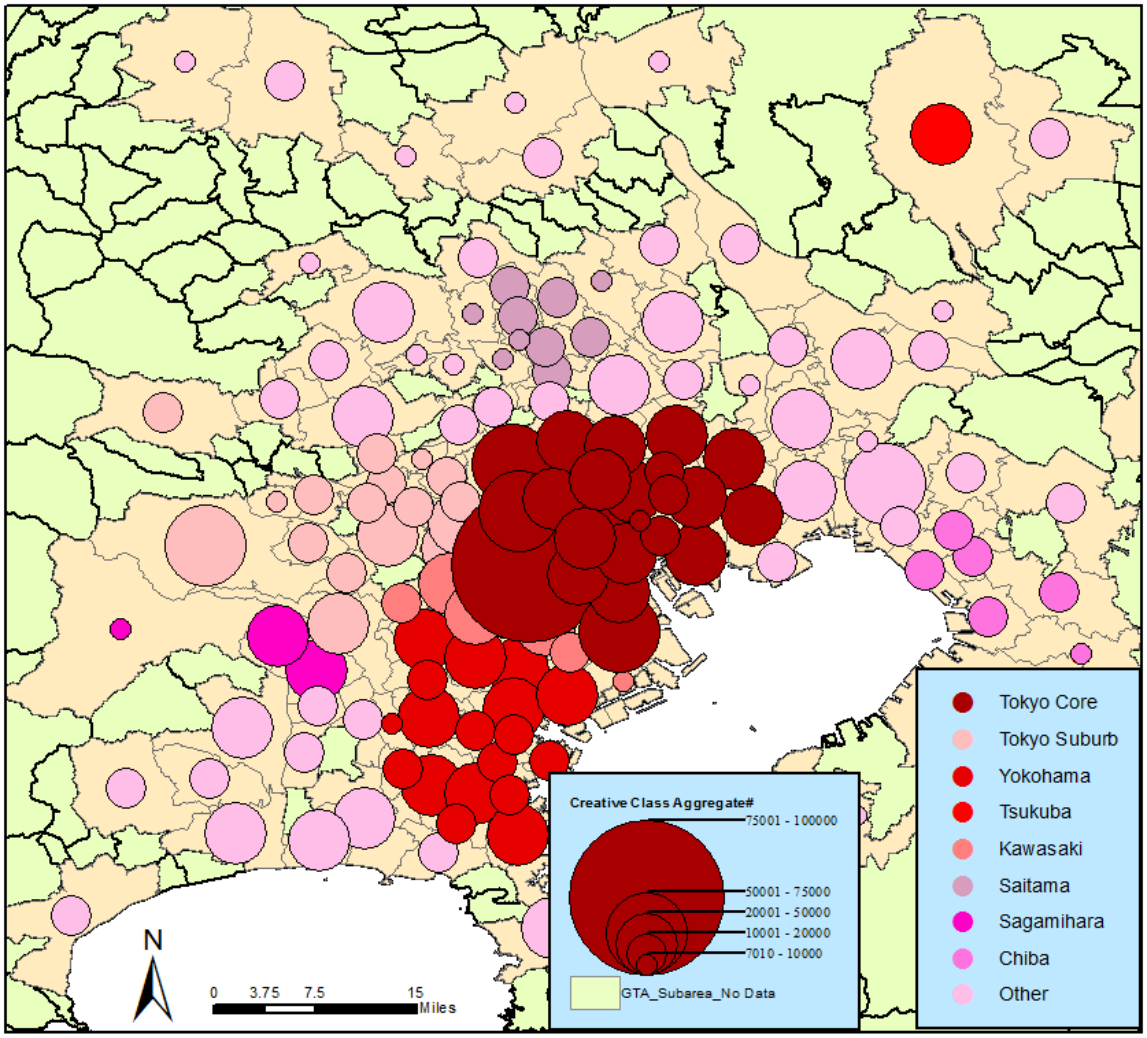
This dissertation investigated the geography of disproportionate shares (%) and the distribution of the creative class in the Greater Tokyo Area. Figure 24 and 25 illustrate the spatial distribution of the creative class in aggregate in the GTA instead of by percent share. Both Figure 25 and 26 remind us that while places like Kawasaki have a disproportionate share of the creative class, we should not forget the overwhelming significance of the Tokyo Core in aggregate. Of course, the aggregate geography of the creative class also varies dramatically by place of work and place of residence. All of this merits additional attention in future research because it remains unclear if the geography of the creative class in aggregate is most shaped by agglomeration economies, transit networks, affordable housing, cost-of-living, socio-economic status, employment mix, the availability of land and capital, or a host of other factors.

Figure 24. Spatial Distribution of Number Creative Class in Aggregate by Place of Work by GTA Sub-area, 2010



1.Standard Occupational Classification (SOC) data are only available for sub-areas of 100,000 or above in the GTA.
2.The Tokyo Core includes the 23 Special Municipal Wards of Tokyo formally known as the city of Tokyo
3.The Tokyo Suburbs include the Shi areas or cities within the Tokyo prefecture that are not a part of the Tokyo Core

Figure 25. Spatial Distribution of Number Creative Class in Aggregate by Place of Residence by GTA Sub-area, 2010



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Another avenue for further investigation in the creativity in the GTA will be contrast between number of creative individual and percent of creative workers. Will the distribution of the super creative class of the professional creative class remain similar or different? A separate measurement (number and percent) for each of the three creative class and examination will make this study even more powerful. Furthermore, focusing on other major cities in Japan including Osaka and Nagoya is necessary to see if the findings in the GTA hold up in other geographic contexts.

Perhaps the biggest finding of the dissertation is that the descriptive findings suggested that the three different types of creative classes in the Greater Tokyo are unevenly spread and some sub-areas have disproportionate shares including Kawasaki-shi, Tokyo-Core and Yokohama-shi. Based on a stepwise regression analysis, the key predictors of the creative classes are not always population characteristics or educational attainment levels but instead the type of employment composition or labor pool classification, particularly when analyzing the creative class by place of work.

REFERENCES

Adachi City. 2017. https://www.city.adachi.tokyo.jp/ (last accessed 21 June 2017)

Andersen, K., Hansen, H., Isaksen A., and Rauino, M. 2010. Nordic City Regions in the Creative Class Debate – Putting the Creative Class Thesis to a Test. *Industry and Innovation* 17(2): 215-240.

Andersson, D. E., Andersson, A. E., and Mellander, C. 2011. *Handbook of Creative Cities.* Cheltenham UK and Northampton MA USA: Edward Elgar Publishing. Inc.

Andersson, A. E., and Andersson, D.E. 2015. Creative Cities and the New Global Hierarchy. *Appl. Spatial Analysis* **8**: 181-198.

Aoyama, Y., Murphy, J. T., and Hanson, S. 2011. Key Concepts in Economic Geography. London: SAGE Publications Ltd.

Arai, Y., Nakamura, H., Sato, H., Nakazawa, T., Musha, T., and Sugizaki, K. 2004. Multimedia and Internet Business Clusters in Central Tokyo. *Urban Geography.* 25(5): 483-500.

Argent, N., Tonts, M., Jones, R., and Holmes, J. 2013. A Creativity-led Rural Renaissance? Amenity-led Migration, the Creative Turn and the Uneven Development of Rural Australia. *Applied Geography.* 44: 88-98.

Asada, Y. 2015. Distribution of Creative Industry and Creative Occupation in Japan. *Asian Growth Research Institute* 26(1): 15-24.

Barro, R. J., 1991. Economic Growth in a Cross Section of Countries. *The Quarterly Journal of Economics* 106: 407-443.

———. 1997. *Determinants of Economic Growth: A Cross-Country Empirical Study.* Cambridge MA USA: The MIT Press.

Becker, G. 1964. *Human Capital.* New York City: Columbia Univ. Press.

Bell, D. and Jayne, M. 2010. The Creative Countryside: Policy and Practice in the UK Rural Cultural Economy. *Journal of Rural Studies.* 26: 209-218.

Bereitschaft, B. and Cammack, R. 2015. Neighborhood Diversity and the Creative Class in Chicago. *Applied Geography.* 63: 166-183.

Boren, T. and Young, C. 2013. Getting Creative with the 'Creative City'? Towards New Perspectives on Creativity in Urban Policy. *International Journal of Urban and Regional Research* 37(5): 1799-1815

Boschma, R.A. and Fritch, M. 2009. Creative Class and Regional Growth: Empirical Evidence from Seven European Countries. *Economic Geography* 85(4): 391-423.

Bradford, N. 2004. *Creative Cities: Structural Policy Dialogue Backgrounder*. Canadian Policy Research Networks: Background Paper F/46.

Brennan-Horley, C. and Gibson, C. 2009. Where is Creativity in the City? Integrating Qualitative and GIS Methods. *Environment and Planning A* 41: 2595-2614.

Brown, L.A. 2014. The City in 2050: A Kaleidoscopic Perspective. *Applied Geography* **49**: 4-11.
Bunkyo City. 2017. http://www.city.bunkyo.lg.jp/ (last accessed 5 July 2017)
Burdett, R. and D. Sudjic. 2007. *The Endless City.* New York: Phaidon Press.
Chorus, P. and Bertolini, L. 2016. Developing Trans-Oriented Corridors: Insights from Tokyo. *International Journal of Sustainable Transportation* 10(2): 86-95.
City of Yokohama. 2017. http://www.city.yokohama.lg.jp/ (last accessed 13 June 2017)
Comunian, R. 2010. Rethinking the Creative City: The Role of Complexity, Networks And Interactions in the Urban Creative Economy. *Urban Studies* **47(1)**: 1-13.
Cresswell, T. 2013. *Geographic Thought: A Critical Introduction.* Chichester UK: Wiley -Blackwell.
Cushing, R. 2001. Creative Capital, Diversity, and Urban Growth. Unpublished Manuscript.
Cybriwsky, R. A. 1998. *Tokyo: The Shogun's City at the Twenty-First Century.* New York: John Wiley.
———. 2011. *Historical Dictionary of Tokyo Second Edition* United Kingdom: Scarecrow Press, Inc.
Dai, J., Zhou, S., Keane, M., and Huang, Q. 2012. Mobility of the Creative Class and City Attractiveness: A Case Study of Chinese Animation Workers. *Eurasian Geography and Economics.* 53 (5): 649-670.
DCMS (Department of Culture, Media, and Sport). 1998. *Creative Industries Mapping Document.* London, UK: HMSO.
Florea, C. A. 2015. Case Study: Creative and Innovative Cities – A New Perspective for Sustainable Development. *Network Intelligence Studies* **3(1)**: 49-53.
Florida, R. 2002. *The Rise of the Creative Class and How It's Transforming Work, Leisure, Community, and Everyday Life*. New York: Basic Books.
———. 2003. Cities and Creative Class. *City & Community* 2(1): 3-19.
———. 2005a. *Cities and the Creative Class*. New York, NY: Routledge.
———. 2005b. The Rise of the Creative Class. *Regional Science and Urban Economics* 35(5): 593–596.
———. 2008. *Who's Your City? How the Creative Economy is Making Where to Live the Most Important Decision of Your Life.* Basic Books, New York.
———. 2012. *The Rise of the Creative Class: Revisited.* New York, Basic Books.
———. 2014. The Creative Class and Economic Development. *Economic Development Quarterly* 28(3): 196–205.
Florida, R. and Gates, G. 2001. Technology and Tolerance: The Importance of Diversity to High-Technology Growth. Center on Urban & Metropolitan Policy. The Brookings Institution.
Florida, R., and Mellander, C. 2009. There Goes the Metro: How and Why Bohemians, Artists and Gays Affect Regional Housing Values. *Journal of Economic Geography*: 1-22.
Florida, R., Mellander, C., and Rentfrow, P. 2013. The Happiness of Cities. *Regional Studies* 47(4): 613-627.

Florida, R., Mellander, C., and Stolarick, K. 2008. Inside the Black Box of Regional Development. *Journal of Economic Geography* 8: 615-649.
———. 2010a. Should I Stay or Should I Go Now: The Effect of Community Satisfaction on the Decision to Stay or Move. *Martin Prosperity Research* March.
———. 2010b. Talent, technology and tolerance in Canadian Regional Development. *The Canadian Geographer* 54(3): 277-304.
———. 2011. Beautiful Places: the Role of Perceived Aesthetic Beauty in Community Satisfaction. *Regional Studies* 45(1): 33-48.
Florida, R., Mellander, C., Stolarick, K., and Ross, A. 2012. Cities, Skills and Wages. *Journal of Economic Geographer* 12: 355-377.
Friedmann, J. 1986. The World City Hypothesis. *Development and Change* 17: 69-83.
Fujita, K. 1991. A World City and Flexible Specialization: Restructuring of the Tokyo Metropolis. *International Journal of Urban and Regional Research* 15(2): 269-284.
———. 2003. Neo-Industrial Tokyo: Urban Development and Globalization in Japan's State-Centered Developmental Capitalism. *Urban Studies* 40(2): 249-281.
Fujita, K., and Hill, R.C. 2005. Innovative Tokyo. The World Bank Policy Research Paper No. 3507.
Fujita, K., and Hill, R.C. 2012. *Residential Income Inequality in Tokyo and Why it Does not Translate into Class-based Segregation*. Ashgate.
Fukaya City. 2017. http://www.city.fukaya.saitama.jp/ (last accessed 21 June 2017)
Fukushima, T., and Tachibana, A. 2014. Comparative Study on the Current Status and Characteristics of Creative Cities in Japan, from the viewpoints of Urban Policy and Creative Index. *School of Human Science and Environment, University Hyogo*16: 39-57.
Gabe, T., Florida, R., and Mellander, C. 2012. The Creative Class and the Crisis. *Cambridge Journal of Regions, Economy and Society*: 1-17.
Gibson, C. 2008. Youthful Creativity in Regional Australia: Panacea for Unemployment and Out-migration? *Geographical Research.* 46: 183-196.
Gibson, C. and Davidson, D. 2004. Tamworth, Australia's Country Music Capital': Place Marketing, Rurality, and Resident Reactions. *Journal of Rural Studies.* **20**: 387-404.
Gibson, C. and Connell, J. 2012. *Music Festivals and Regional Development in Australia.* Farnham: Ashgate.
Girard, L. F., Baycan, T., and Nijkamp, P. 2011. *Sustainable City and Creativity: Promoting Creative Urban Initiatives.* Farnham and Burlington: Ashgate.
Glaeser, E. 2005. Review of Richard Florida's The Rise of the Creative Class. *Regional Science and Urban Economics* 35: 593-596.
Grant, J. L. 2014. *Seeking Talent for Creative Cities: The Social Dynamics of Innovation. City and Creativity:* Toronto Canada: University of Toronto Press.
Grodach, C. 2012. Before and After the Creative City: The Politics of Urban Policy in Austin TX. *International Journal of Urban and Regional Research* 34(1): 81-97.
Hall, P. 1966. The World City First Edition (Second edition 1979). New York: McGraw -Hill.

———. 2002. Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century Third Edition. Oxford and New York: Blackwell.
Hamley, W. 1984. Tsukuba Science City, Japan. *Geography.* 69(4): 345-347.
Hartley, J., S. Potts, S. Cunningham, T. Flew, M. Keane, and J. Banks. 2012 *Key Concepts in the Creative Industries*. London, UK: Sage.
He, J-L. and Gebhardt, H. 2014. Space of Creative Industries: A Case Study of Spatial Characteristics of Creative Clusters in Shanghai. *European Planning Studies.* 22(11): 2351-2368.
Henderson, J. and Castells, M. 1987. *Global Restructuring and Territorial Development.* Newbury Park, CA: Sage.
Hensen, H. and Niedomysl, T. 2009. Migration of the Creative Class: Evidence from Sweden. *Journal of Economic Geography.* 9: 191-206.
Hill, R. C. and Fujita, K. 2003. The Nested City: Introduction. *Urban Studies* 40(2): 207-217.
Hill, R. C. and Kim, J., 2000. Global Cities and Developmental States: New York, Tokyo, and Seoul. Urban Studies 37, 2167–2195.
Hoyman, M., and Faricy, C. 2009. It Takes a Village: A Test of the Creative Class, Social Capital, and Human Capital Theories. *Urban Affairs Review* 44(3): 311-333.
Isozaki, Y. 1997. The Local Administration in Japan. Tokyo, Japan: Local Autonomy College.
Jacobs, A. J. 2003. Embedded Autonomy and Uneven Metropolitan Development: A Comparison of the Detroit and Nagoya Auto Regions, 1969-2000. *Urban Studies* 40 (2): 335-360.
———. 2004. Inter-local Relations and Divergent Growth: the Detroit and Tokai Auto Regions, 1969 to 1996. Journal of Urban Affairs 26(4), 479-504.
———. 2005. Has Central Tokyo Experienced Uneven Development? An Examination of Tokyo's 23 Ku Related to American's Largest Urban Centers. *Journal of Urban Affairs* 27(5): 521-555.
———. 2006. Embedded Localities: Employment decline, Inner City Population Growth, and Declining Place Stratification among Japan's Mid-Size and Large Cities. *City & Community* 5: 269-282.
———. 2008. Developmental State Planning, Sub-national Nestedness, and Reflexive Public Policymaking: Keys to Employment Growth in Saitama City, Japan. *Cities* 25: 1-20.
———. 2011. Japan's Evolving Nested Municipal Hierarchy: The Race for Local Power in the 2000s. *Urban Studies Research*, 1-14.
———. 2012. The Nested Global City-Region: Intermunicipal Income Stratification in the Tokyo Metropolitan Region, 1980-2007. *Urban Geography* 33(1), 120-146.
———. 2014. Industrial Restructuring and Expanding Income Stratification: The Case of Japan's Four Largest Major Metropolitan Areas, 1990-2007. *Journal of Urban Affairs* 36 (4), 760-782.
———. 2016. The City as the Nexus Model: Bridging the State, Market, Societal, and Geospatial Contexts. *Cities* 51: 84-95.

Jacobs, J. 1961 (1993) The Death and Life of Great American Cities. The Modern Library, New York.
Jiang, J., and Harayama, Y. 2006. University-Local Industry Linkages: The Case of Tohoku University in the Sendai-Area of Japan. The World Bank Policy Research Paper No. 3991.
Kato, M., Okamura, H., and Honjo, Y. 2015. Does Founders' Human Capital Matter for Innovation? Evidence from Japanese Start-ups. *Journal of Small Business Management* 53(1):114-128.
Kakiuchi, E. 2016. Culturally Creative Cities in Japan: Reality and Prospects. *City, Culture and Society* 7:101-108.
Kamakura City. 2017. https://www.city.kamakura.kanagawa.jp/ (last accessed 13 June 2017)
Kawabata, M. 2003. A GIS-Based Analysis of Jobs, Workers, and Job Access in Tokyo. Tokyo: CSIS (Center for Spatial Information Science) Discussion Paper No. 57.
———. 2006. Job Accessibility as an Indicator of Auto-Oriented Urban Structure: a Comparison of Boston and Los Angeles with Tokyo. *Environment and Planning B: Planning and Design* 33:115-130.
Kawasaki City. 2017. http://www.city.kawasaki.jp/ (last accessed 13 June 2017)
Kayama, M. 2010. Local Government in Japan. Council of Local Authorities for International Relations.
Kodama, F., and Suzuki, F. 2007. How Japanese Companies Brought New Sciences for Restricting Their Business: Characterizing Receiver-Active National System of Innovation. *World Development* 35 (6): 976-990.
Koga City. 2017. http://www.city.ibaraki-koga.lg.jp/ (last accessed 21 June 2017)
Koganei City. 2017. https://www.city.koganei.lg.jp/ (last accessed 13 June 2017)
Koizumi, R., and Wakabayashi, Y. 2014. Spatial Patterns of Population Change in the 23 Special Wards of Tokyo After the Period of the Bubble Economy. Journal of Geography (in Japanese) 123(2): 249-268.
———. 2015. *Changes in the Spatial Patterns of Occupational Structure in the Tokyo Metropolitan Area after the Bubble Economy*. Springer Japan.
Kokubunji City. 2017. http://www.city.kokubunji.tokyo.jp/ (last accessed 13 June 2017)
Konno, Y., and Itoh, Y. 2017. A Creative City Planning Framework by a Private Company: Case Study of the Development of Futako-Tamagawa by Tokyu. *Cogent Business & Management* 4: 1-13.
Landry, C. 2008. *The Creative City: A Toolkit for Urban Innovators.* London and Sterling, VA: Earthscan.
Lazzeretti, L., Innocenti, N., and Capone, F. 2015. Does Related Variety Matter for Creative Industries? A Paper Presented at the Evolutionary Economic Geography *Urban and Regional Research Centre Utrecht*.
Lefebvre, H. 1997. The Production of Space. In *Rethinking Architecture: A Reader in Cultural Theory,* ed. N. Leach, 138-146.Routledge.: London and New York.
Lee, S., Florida, R., and Acs, Z. 2004. Creativity and Entrepreneurship: A Regional Analysis of New Firm Formation. *Regional Studies* 38(8): 879-891.

Lee, J.H., and Kaga, A. 2013. Visual Analysis of Relation Between Concentrated Districts Of Knowledge-Based Industries and Third Places in Osaka City. *Open Systems: Proceedings of the 18th International Conference on Computer-Aided Architectural Design Research in Asia (CAADRIA): 581-589.*

Lucas, R. E., 1988. On the Mechanics of Economic Development. *Journal of Monetary Economics* 22: 3-42.

Mansury, Y. S, Tontisirin, N., and Anantsuksomsri, S. 2012. The Impact of the Built Environment on the Location Choices of the Creative Class: Evidence from Thailand. *Regional Science Policy and Practice.* **4 (3)**: 183-205.

Marcuse, P. 2003. Review of The rise of the creative class by Richard Florida. *Urban Land* 62, 40-41.

Marrocu, E., and Paci, R. 2012. Education or Creativity: What Matters Most for Economic Performance? Economic Geography 88(4): 369-401.

Markusen, A. 2006. Urban Development and the Politics of the Creative Class. *Environment and Planning* A 38: 1921- 1940.

Markusen, A., and Schrock, G. 2006a. The Artistic Dividend: Urban Artistic Specialization and Economic Development Implications. *Urban Studies* **43 (9)**: 1661-1686.

———. 2006b. The Distinctive City: Divergent Patterns in American Urban Growth, Hierarchy and Specialization. *Urban Studies* **43 (8)**: 1301-1323.

Marlet, G., and van Woerkens, C. 2004. Skills and Creativity in a Cross-section of Dutch Cities. *Utrecht School of Economics, Tjalling C. Koopmans Research Institute, Discussion Paper Series*.

Marrocu, E., and Paci, R. 2012. Education or Creativity: What Matters Most for Economic Performance? *Economic Geography* 88(4): 369-401.

Martin Prosperity Institute. 2015. The Global Creativity Index 2015. http://martinprosperity.org/media/Global-Creativity-Index-2015.pdf (last accessed 28 March 2017)

Mayer, M. 2013. First World Urban Activism: Beyond Austerity Urbanism and Creative City Policy. *City* **17:1**: 5-19.

McGranahan, D., and Wojan, T. 2007. Recasting the Creative Class to Examine Growth Processes in Rural and Urban Counties. Regional Studies, 41(2): 197-216.

McGranahan, D. A., T. R. Wojan, and D. M. Lambert. 2011. The Rural Growth Trifecta: Outdoor Amenities, Creative Class, and Entrepreneurial Context. *Journal of Economic Geography* 11:529-557.

Mellander, C., Florida, R., Asheim, B. T., and Gertler, M. 2013. *The Creative Class Goes Global.* New York, NY: Routledge.

Mellander, C., Florida, R. and Stolarick, K. 2011. Here to Stay: The Effects of Community Satisfaction on the Decision to Stay. *Spatial Economic Analysis* 6(1): 5-23.

Minato City. 2017. http://www.city.minato.tokyo.jp/index.html (last accessed 5 July 2017)

Mori, H. 2016. Clustering of Migrant Sending Suburban 60km Areas to Tokyo 23 Wards With Migration Preference Index. *Keizai Shirin (the Hosei University Economic Review)* 83 (4): 1-25.
Musashino City. 2017. http://www.city.musashino.lg.jp/ (last accessed 13 June 2017)
Narita City. 2017. https://www.city.narita.chiba.jp/ (last accessed 21 June 2017)
Nohara, T., Okamura, Y. and Kawahara, S. 2016. Research for a Comprehensive and Active Planning Method in an Industrial-Residential Mixed Area- Focused on Ota Creative Town Vision in Ota Ward, Tokyo *Journal of the Malaysian Institute of Planners* 5: 369-382.
Novy, J. and Colomb, C. 2013. Struggling for the Right to the (Creative) City in Berlin And Hamburg: New Urban Social Movements, New 'Spaces of Hope'? *International Journal of Urban and Regional Research* 37 (5): 1816-1838.
O'Connor, J. and Gu, X. 2014. Creative Industry Clusters in Shanghai: A Success Story? *International Journal of Cultural Policy* 20 (1): 1-20.
Ohsugi, S. 2011. The Large City System of Japan. Council of Local Authorities for International Relations.
Okano, H. and Samson, D. 2010. Cultural Urban Branding and Creative Cities: A Theoretical Framework for Promoting Creativity in the Public Space. *Cities* **27**: S10-S15.
Osada, S. 2003. The Japanese Urban System 1970-1990. *Planning* 59(3): 125-231.
Park, R., Burgess, E., and Mckenzie, R. 1925. *The City.* Chicago, IL. University of Chicago Press.
Peck, J. 2005. Struggling with the Creative Class. *International Journal of Urban and Regional Research* 29(4): 740-770.
Perry, M. 2011. Finding Space for the Creative Class: A Review of the Issues. *Urban Policy and Research* 29(4): 325-341.
Petrov, A. N. 2008/ Talent in the Cold? Creative Capital and the Economic Future of the Canadian North. *Arctic **61*** **(2)**: 162-176.
Ponzini, D. and Rossi, U. 2010. Becoming a Creative Cities: The Entrepreneurial Mayor, Network Policies and the Promise of an Urban Renaissance. *Urban Studies* 47 (5): 1037 -1057.
Pratt, A. C. 2008. Creative Cities: The Cultural Industries and the Creative Class. *Wiley: Swedish Society for Anthropology and Geography* 90 (2): 107-117.
———. 2011. The Cultural Contradictions of Creative City. *City, Culture and Society* 2: 123-130.
Putman, R. D. 1995. Turing in, Turing Out: The Strange Disappearance of Social Capital in America. *Political Science and Politics* 28(4): 664-683.
Rambaldi, G., and Callosa-Tarr J, 2000. *Manual on Participatory 3-DModeling for Natural Resource Management National Integrated Protected Areas Programme,* Quezon City, Philippines.
Reese, L., Faist, J., and Sands, G. 2010. Measuring the Creative Class: Do We Know It When We See It? *Journal of Urban Affairs* 32(3): 345-366.
Relph, E. C. 1976. *Place and Placelessness.* London: Pion.

Rogerson, P. 2011. Statistical Methods for Geography, 3rd edition. Sage Publications Ltd. Thousands Oaks, California.
Sasaki, M. 2010. Urban Regeneration through Cultural Creativity and Social Inclusion: Rethinking Creative City Theory through a Japanese Case Study. *Cities* 27: S3 -S9.
Scott, A. J. 2006. Creative Cities: Conceptual Issues and Policy Questions. *Journal of Urban Affairs* 28:1: 1-17.
———. 2014. Beyond Creative Cities: Cognitive-Cultural Capitalism and the New Urbanism. *Regional Studies* **48:4**: 565-578.
Sassen, S. 1991. *The Global City.* Princeton, New Jersey: Princeton University Press.
———. 2001. *The Global City: New York, London, Tokyo: Second Edition.* Princeton, New Jersey: Princeton University Press.
Shibuya City. 2017. https://www.city.shibuya.tokyo.jp/ (last accessed 5 July 2017)
Shinagawa City. 2017. http://www.city.shinagawa.tokyo.jp/ (last accessed 5 July 2017)
Simmie, J. 2001. *Innovative Cities*. London: Spon.
———. 2005. Innovation and Space: A Critical Review of the Literature. *Regional Studies* 39 (6): 789-804.
Somusho [Ministry of Internal Affairs and Communication] (MIA) http://www.stat.go.jp/data/kokusei/2010/users-g/word7.htm (last accessed 28 March 2017)
Somusho, glossary [Ministry of Internal Affairs and Communication] (MIA) http://www.soumu.go.jp/menu_seisaku/hakusyo/chihou/22data/yougo.html (last accessed 28 March 2017)
Sorenson, A. 2000. Land Readjustment and Metropolitan Growth: An Examination of Suburban Land Development and Urban Sprawl in the Tokyo Metropolitan Area. *Planning* 53: 217-330.
———. 2001. Subcentres and Satellite Cities: Tokyo's 20th Century Experience of Planning Polycentrism. *International Planning Studies* 6(1): 9-32.
Stolarick, K. and Florida, R. 2006. Creativity, Connections and Innovation: A Study of Linkages in Montreal Region. *Environment and Planning* 38(10): 1799-1817.
Storm, P. 2006. The Creative Class in Japan, 3T; Talent, Technology and Tolerance. Tokai University, Sapporo.
Tajima, K. 2014. Dissecting the Re-Urbanization Trend in the Tokyo Metropolitan Area in 2005-2010. *Global Urban Studies*. 7: 57–67.
Taylor, C. 2015. Between Culture, Policy and Industry: Modalities of Intermediation in the Creative Economy. *Regional Studies* **49:3**: 362-373.
Trip, J. J., and Romein, A. 2010. Creative City Policy: Bridging the Gap with Theory. A Paper Presented at the Eighth European Urban and Regional Studies Conference *Repositioning Europe in an Era of Global Transformation* for Vienna.
Tuan, Y-F., 1975. Images and mental maps. *Annals of the Association of American Geographers.* **65**: 205-213
Ueno, M. and Suzuki, N. 2014. A Study on Creative Industry Accumulation and Creative City in Yokohama. *Journal of the City Planning Institute of Japan*. 49 (1):11–18.

Vajjhala S, 2005, *Integrating GIS and participatory mapping in community development planning,* in Proceedings of the Twenty-Fifth annual ESRI User Conference, San Diego, CA.

Verdich, M. 2010. Creative Migration? The Attraction and Retention of the 'Creative Class' in Launceston, Tasmania. *Australian Geographer*, **41(1):**129–140.

Waitt, G. and Gibson C. 2009. Creative Small Cities: Rethinking the Creative Economy in Place. *Urban Studies* **46 (5&6)**: 1223-1246.

Wojan, T. R., Lambert, D. M., and McGranahan, D.A. 2007. Emoting with Their Feet: Bohemian Attraction to Creative Milieu. *Journal of Economic Geography*, **7 (6)**:711–736.

Waley, P. 2013. Penciling Tokyo into the Map of Neoliberal Urbanism. *Cities,* 32;43-50.

Watanabe, K. 2014. The Creative City as Governance Theory and its Realization Process: the Case Study of Kumamoto City. *Urban Studies in Japan,* 32;45-63.

Westlund, H. and Calidoni-Lundberg, F. 2007. The Creative Class and Social Capital: Civil Society, Regional Development and High-Tech Industry in Japan. *CESIS* 122: 1-29.

Wojan, T. R., Lambert, D. M., and McGranahan, D.A. 2007. Emoting with Their Feet: Bohemian Attraction to Creative Milieu. *Journal of Economic Geography*, 7 (6):711–736.

Yoshimoto, M. 2003. The status of the Creative Industries in Japan and Policy Recommendations for their promotion. NLI Research Institute Report: 1-9.

———. 2009. The status of the Creative Industries in Japan and Policy Recommendations for their promotion. NLI Research Institute Report: 40-47.

Yusuf, S. and Nabeshima, K. 2005. Creative Industries in East Asia. *Cities* 22 (2): 109-122.

———. 2006. *Postindustrial East Asian Cities: Innovation for Growth.* Washington DC United State: The World Bank.