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FIRMS’ DECISIONS TO ENTER A MARKET OF HIGHLY DIFFERENTIATED PRODUCTS: -APPAREL INDUSTRY AND NEW YORK FASHION WEEK-

by

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A dissertation submitted to the Graduate Faculty in Economics in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

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This manuscript has been read and accepted by the PhD Program in Economics in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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THE CITY UNIVERSITY OF NEW YORK
Abstract

FIRMS' DECISIONS TO ENTER A MARKET OF HIGHLY DIFFERENTIATED PRODUCTS: APPAREL INDUSTRY AND NEW YORK FASHION WEEK-

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Adviser: Professor Michael Grossman

This dissertation deals with economic aspects of the fashion industry. It begins with a discussion of the complex industrial organization aspects of the industry. A wealth of information in this area has been assembled and is presented for the first time. The focus is on the high-end fashion market: how it started, how it works, New York Fashion Week, and its significance for the industry. Then a comprehensive review of the economics literature as it pertains to the industry is presented, also for the first time. The empirical sections of the dissertation contain estimates of demand functions for apparel and determinants of the number of high-end fashion firms in the industry.
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Chapter 1

Introduction

A centerpiece of the New York high-end fashion industry today is "New York Fashion Week," NYFW, a bi-annual, week-long fashion show event. Started in 1943, it presents photographic opportunities and is an event in which high-end designer firms signal their continuous existence, entry into, or exit from the upcoming luxury fashion market by presenting their fashion collections. The successful entrants are able to sell their fashion product at a high price such as a woman’s jacket selling for somewhere between $500 to $5000, or even higher. They sell their products through department stores, independent boutiques and, if available, their own stores, including "flagship" stores.\(^1\) The lower priced fashion firms or mass producers pay attention to the shows, analyze upcoming possible trends and start to produce "inspired" designs. They sell in a lower price range and market throughout the country over time. The purpose of this study is to analyze designers’ entry and exit decisions to the high-end branding business symbolized during Fashion Week.

In order for a designer to "officially" participate in NYFW, a group of New York fashion industrial professionals decides in advance who should participate officially during the week (Kawamura 2005). Since 1993, an organization called the 7th on Sixth, which was later acquired by the International Management Group (IMG) in 2005, started to handle the main

\(^1\)It is part of the branding strategy where a designer cares and reflects his/her brand concept in every possible detail, including the store location, interior design, exterior design, and store employee attitude. A brand may have other designer stores elsewhere, but the flagship store is used as the brand symbol, and there is only one flagship store for a market region. When a brand is very active and operating on an international scale, it may open other flagship stores, such as a Paris flagship store for Europe and a Tokyo flagship store for Asia.
selection and setup for NYFW. Economy may not be large enough to sustain very large number of high-end designers. When the economy has too many designers, either designers may not face enough demand to run profit business, or high-end brands lose prestigious status as price decreases with an increase in competition. The purpose of this dissertation is to find economic conditions to induce one more design firm to enter or exit Fashion Week, tantamount to entering the New York high-end fashion industry. For each period, designers choose whether to enter or exit this industry. The cost of a show event is a large, irrevocable sum; some New York fashion shows cost upward of $150,000, (Karimzadeh 2008) a significant expense, especially for starting designers who have not yet made a profit. I propose using empirical models to find an "optimal," from the point of view of participants, number of presenting designers and the economic conditions, which tell how many designs should be presented during each season.; I use “optimal” in the sense that a designer can make the decision not to enter the market at the current economic conditions. For the current presentation setting, which I describe in detail in a later section, I propose how many numbers of firms should present each season by looking at the demand conditions since the pre-7th on Sixth presentation period. This model gives an answer to those designers, media and organizers of shows who complained that, "there are too many shows" (Wilson 2007). If the industry knows the "optimal" number of firms to present during Fashion Week and selects how many designers should showcase collections. New designers do not have to incur the expensive irrevocable entry cost if knowing that market cannot provide non-negative profit to the new entrants.

This analysis is an interesting economic study in that the event influences the nature
of differentiated product offerings in a large and growing segment of the economy. Other than clothing, the element of "fashion" is of rising importance in diverse industries such as automobiles, electric appliances, smartphones and computers, and housing (Bianchi 2002; Chai, Earl, and Potts 2007; Matt 2008).

Finally, several empirical papers since 1990 have analyzed competitive effects of entry in other industries. The measure of a market size required to support a given number of firms for a given time period, "threshold" demand condition, but these have only had a cross-sectional data set. These studies are Bresnahan and Reiss (1990, 1991b), Berry and Waldfogel (1999), Asplund and Sandin (1999), Manuszak (2002), Davis (2002), Mazzeo (2002a, 2002b), Griffith and Harmgart (2005), Abraham, Gaynor and Vogt (2007), Seim (2006), and Cohen and Mazzeo (2007). A survey of this research is in Chapter 2. All of these economically isolated locations were carefully picked in order to separate a demand at each location at a given time. However, as Bresnahan and Reiss point out, it would be preferable to have data from an industry where market demand has fluctuated enough to cause significant firm turnover over time. The nature of this study analyzes, a market that starts off with a population of one hundred people to support one firm to possibly operate at long run non-negative profit. Over time, for the second firm to enter, the question is, how much more demand, i.e. population, is needed to support the second firm for it to operate at non-negative profit. The increase in population matters because, while assuming that there is no fixed cost and one firm sells to one hundred people, assuming that each buyer purchase one unit of goods. It is also assumed that each firm faces the identical cost function. One hundred more people are needed to support the second firm to be able to sell
the additional one hundred quantity. This is a case of pure competition where each firm produces the minimum of the average variable cost in the long run. Each company makes a non-negative profit. However, considering the fixed cost, it is possible that later entrants may face higher variable or fixed costs (Bresnahan and Reiss 1991a), because of barriers to entry or less efficient technology. The higher the fixed cost is, the larger quantity a firm needs to sell in order to break-even in the long run. The second and later entrants need to sell to more than one hundred population to be break-even. The larger the fixed cost, the greater the population is needed for the additional firm to enter the market. Bresnahan and Reiss also consider the case when product is differentiated. Then, for the second firm to enter the market, they may not need an additional one hundred population and over demand to run in non-negative profit. My data are in time series and is consistent with the initial theory to find "threshold" demand condition that demand fluctuations occur and that firms enter and exit the market over time.

In the next chapter, I explain the fashion industry structures, including the development and function of NYFW. I devote this chapter to introduce the organization of the industry. The understanding of the function and the significance of NYFW within the fashion industry will give sufficient grounds for my empirical model in Chapter 4. This organization in the chapter will help future researchers understand the industry better. The following chapter reviews previous literature in economics in relation to the fashion industry. I find the economic theories of fashion scattered over many areas of economics literature. It is my contribution to put them together in this dissertation. I have a chapter on empirical economic analysis to identity the determinants of a firm’s entry to the high-end fashion business,
and estimation of demand for fashion products. The last chapter is my conclusion.
Chapter 2

The Fashion Industry

The fashion industry has evolved into a complex industry, and it is not an easy task to understand its organization and function. The complexity stems from a mixture of companies that coexist in the industry. Some establish their brands by differentiating from each other and selling their products at a high price while others offer standardized products at competitive affordable prices. Some fashion companies want to be known as innovative, not only for their apparel designs, but also for their technologically advanced textiles or quick application of newly available technologies. Firms use different ways to reach their consumers such as catalogues, retail, or online, some may engage in more active social networking to ensure high customer satisfaction. A company may start off its business as a manufacturing company taking orders from retail stores. From the start or down the road, it may put on elaborate fashion show presentations in New York Fashion Week (NYFW) to establish its position as a high-end fashion firm. Some firms run not only the manufacturing business but also the direct retail stores, a process known as vertical integration. Some start their business in horizontal integration by offering different categories of products. For example, they not only sell fashion apparel, but also bags and cosmetics. Some companies remain as private companies, while others go public. Some choose to spend 25% of their profits on advertising to raise consumer awareness of their brands. Many variation of business activities take place. As a result, the fashion industry it has become quite complex.

It became necessary to do research on the industry and describe it in detail for three
reasons. First, much of the academic fashion research in non-economics fields overlooks the economic theory of integration, which leaves the impression that the industry is extremely complex for researchers who want to explore it for the first time. Second, some of the fashion analysis in economics did not portray the fashion industry correctly. Third, by showing the organization of the industry, I hope that future researchers will understand the function, position, system and importance of NYFW within the industry.

When I say the fashion industry, my focus is on the fashion industry in New York, particularly NYFW, a bi-annual fashion show event where designers present the upcoming season’s designs and styles. In addition to being the most prestigious fashion show venue in the United States, it is considered a high-end fashion design apparel presentation event.

In this chapter, I describe the fashion industry in four different sections. In section 2.1, I dissect and describe the structure of the current fashion industry. Section 2.2, I describe the significance of the New York fashion industry by using available economic indicators. Section 2.3, I describe the three stages of NYFW’s historical development. Section 2.4, I describe the positioning of NYFW to the fashion industry in NY and the United States. This chapter helps explain how I use NYFW data in my empirical work.

2.1 The Structure of The Current Fashion Industry

By establishing the well-defined and clarified structure of the current fashion industry, one can understand the position of NYFW and how it relates to other parts of the apparel, apparel-related and fashion industries. Academic fashion research is complex for two reasons: the relatively long, historical development of the industry and the lack of clearly defined
differences between apparel and the fashion industry.

The New York fashion industry has become one of the most significant industries in New York City due to the necessity of uniforms for the Civil War and immigration to the area. It was mostly unskilled female laborers who filled the jobs in the industry. Today, the New York fashion industry is known as one of the fashion capitals of the world along with Paris, Milan and London. Over time many fashion and fashion-related businesses and organizations have emerged and evolved. After World War II, branding became the more prominent business strategy; that is to say that it became profitable to pursue a product/brand differentiation market strategy. Firms and individuals participated in the industry by creating and implementing different promotional and business ideas. Firms tried to make their products different from others, especially in the form of designer names. They evolved into different organizations; some became retail-only businesses while others integrated their operation by managing their manufacturer and retail businesses under the same company. Economists have applied different economic theories and models to examine the consumer aspect and the business aspect of fashion related behaviors. However, some of these papers lack an accurate portrayal of the fashion industry. Apparel and fashion industries are very closely related but not identical. As I will explore below, the fashion industry is not only creating tangible apparel goods, but also creating perceived fashion or branding images for consumers by producing intangible apparel images such as a logo and heavy advertisements. Tangible apparel goods are the physical products such as T-shirts and jeans. When intangible apparel images are added to the tangible apparel goods, companies can sell those products at a very high mark-up. For example, a brand logo on a bag such as
the LV logo on Louis Vuitton bags can create a very high value; a canvas material bag with leather trim can cost more than $2000. While knock-off costs $50. A consumer can find a simple T-shirt for $10 while the Marc Jacobs brand name on a T-shirt can be priced $100.

As can be seen in Figure 2.1, there are many different professionals and institutions involved in these industries. After clarifying terminology that I use in this paper, I will look at three different aspects of the fashion industry: the apparel and accessory segments, tangible and intangible creations of businesses, and, lastly, each profession and institutions’ role in the industry.

2.1.1 Fashion-related Terminologies

- Fashion:

  Fashion carries sociological concepts other than the usefulness of goods. It adds extra utility on top of the conventional utility in economics. A fashionable item is more variable when peers recognize it. This recognition gives additional satisfaction to its conventional utility. Cowan, Cowan, and Swann (2004) write that consumers interact with each other, and that these interactions affect utility directly. Known as social interactions theory, it explains how a consumer’s utility depends not only on one’s self-satisfaction from consuming a product, but also on one’s perception of how much the society recognizes a brand, quality or design.

  Fashion is any prevailing style at a given time that is changing constantly over time. Kawamura (2005) writes that in the etymology of fashion, "fashion conveys a number of different social meanings.” Dickerson (2002) notes that, "social acceptance
Figure 2.1: Fashion and Apparel Industry
is the very essence of fashion.” In economics, game theory proves that assuming an existence of two types of consumers, fashion leaders and followers, is enough to create the phenomenon of fashion (Pesendorfer 1995). New innovative designs attract fashion leaders. Fashion followers start to recognize and purchase the designs after carefully observing how noticeable fashion leaders wear them in different social scenes. Once the majority acquires the designs, fashion leaders start seeking new designs to distinguish themselves from a crowd. This selection system shows the emergence of demand for new designs. A particular design or style is in fashion when more and more people appear in garments with the new design. Some items become historical fashion images such as bell-bottom blue jeans in the 1970s or leggings in 2006 for about 8 years. Some items become in fashion for a small group for a relatively short time period such as jumpsuits in 2010-2011. Historically, fashion has changed over time and the speed of change is notably quicker after the Industrial Revolution in 18th century (Yurchisin and Johnson 2010).

- Clothing, Apparel, and Garments:

  Clothing, apparel, and garments are the generic materials that a person wears and refers to any or all articles worn by men, women and children. The term apparel is used in a more general context, while the term garment refers to a particular piece (Wolfe 2001). In Jones’ (2006) text of economics in fashion the terms fashion, apparel, clothing and garments are used synonymously. I treat apparel, clothing and garments synonymously in my text. I also use "fashion apparel," "fashion clothing" and "fashion garments" interchangeably when I refer to apparel that has fashion characteristics.
• Styles:

Style is a particular appearance of parts of a garment. It is also used to express an overall look of a prevalent standard. Additionally, personal style can relate to a standard of how a person regularly dresses in a particularly describable way.

Dickerson (2002) defines style as a type of product that has one or more specific features or characteristics that distinguish it from other products of the same type. An example is the sweater with a crew neck, which is a neckline style, while the turtleneck has another kind of neckline. Wolfe (2001) notes the difference between style and fashion is that "style" reflects fashion at a point of time and "fashion" is a continuing process of change in the styles of apparel that are accepted. Styles are names for shapes of a part or of a whole garment, which does not change over time. However, fashion, which at a given time comes with distinctive styles, can be popular or obsolete over time.

Certain styles, in some cases, receive names when people set a characteristic for an entire look such as classic, contemporary, casual, hip-hop, and athletic.

Style can be linked to an individual consumer. Some consumers develop their "own style" that people recognize with his or her particular way of dressing. Occasionally, fashion or costume museums feature an individual for his or her iconic style. For example, in 2005 the Metropolitan Museum of Art had an exhibition on Iris Apfel, a business woman in the fashion industry. Her signature style included a pair of round glasses and very colorful styling. The Fashion Institute of Technology had a Daphne Guinness Exhibition in 2012 for her personal styling. Guinness is a philanthropist and
is also active in cultural scenes. Her styling is dramatic, futuristic and edgy. Today, both of them are considered fashion icons for many designers.

- Trends:

"Trend" or "fashion trend" is the direction in which fashions are moving. For example, a fashion-leading group starts to dress differently from a recently popular style. Followers then pick up the new way of putting together garments. This shift is the trend. When the legging style in the late 2000s became the new norm, and by 2015 much of the population had worn them, a new trend occurred. Some people started to wear a skirt style in variations. This is a shift in trend from leggings style to the skirt style.

- Runway:

Runway is a narrow path that models walk on while a seated audience watches them. A runway show refers to a walking live model style presentation. It is also described as a runway, or a catwalk because the way that models walk on the runway is said to resemble the way cats walk. This is the main presentation of new designs in NYFW.

- Silhouettes:

A silhouette is an outline of a garment or style. Wolfe (2001) defines silhouette as "the shape of a clothing style." (p.21)

- Collection:
A collection is a set of garments that a brand styles and releases for an upcoming season. When a brand is relatively large, a collection differentiates between a designer’s own creations from creations designed by a team of behind-the-scene designers who work for the brand. Each collection may contain about thirty styles per designer brand at NYFW. Frings (2004) finds that the term collection is used for high-priced apparel in the US and Europe.

- Line:

A line is a set of designed garments for a season that reflects a designer’s vision of one theme for the season. It is often used for moderately priced fashion. In some contexts it is used synonymously with a collection, especially when a company is small and has no need to make a distinction between their lines for one season.

2.1.2 Fashion Industry and Apparel Industry (Stages)

For academic or analytical purposes, the terms fashion industry and apparel industry need to be defined. The apparel industry creates the physical garments. Its components are textile manufacturing, apparel manufacturing, and distribution (Jones 2006; Wolfe 2001). In the apparel industry, companies and individuals participate by creating physical products from raw material to wearable generic garments. Meanwhile, the fashion industry does the same process as the apparel industry; however, it has business activities to add additional social meaning and value to the physical products at different stages of the supply chain as shown in Figure 2.1. Stage one to stage four are the stages where raw material becomes actual products that are delivered into the hands of consumers. From designing to manufac-
turing the clothing, apparel industry delivers products to market. The majority of sewing factories producing generic apparel where the garments themselves do not have additional value beyond the products’ usefulness fits into purely competitive market structures. Many of the firms in the apparel industry do their business anonymously. Some firms and organizations participate exclusively in creating intangible images for the garments, such as the business of color forecasting and public relations. Some firms are vertically integrated and handle many different levels of supply chains within the same organization. When firms successfully add positive value to generic garments, consumers pay a higher price than garments that are delivered by the apparel industry. A detailed depiction of how exactly firms add extra value will be discussed in this section.

As I stated in the Chapter 1 introduction, a mixture of different types of firms coexist in the fashion industry, making the industry complex for researchers. A summary of the organization will help researchers to understand how a particular firm participates in the industry. I organize this industry into five different stages as shown in Figure 2.1. I placed all the other fashion-related firms and organizations under the Stage Five category. All five stages make up the fashion industry today.

The fashion industry also includes the apparel-related industry made up of products that go along with garments such as handbags, shoes, jewelry, gloves, millinery, and cosmetics. Wolfe (2001) and Jones (2001) say one way that apparel-related industry is different from the apparel industry is that the materials are not limited to textile, but may include items such as different kinds of leather, rubber, metal, plastic, and gems. The US Census shows this by collecting data on clothing production separately from other fashion-related products such
as handbags, shoes and jewelry. While taking the same stages One to Four, fashion-related manufacturing companies use different raw material for production.

While the main stages Stage one through Stage four are to create and deliver garments and apparel-related products to consumers, Stage Five plays an important role as well. Stage Five is not in the apparel industry per se; however, it includes other important activities that sustain and facilitate the fashion industry. For example, fashion magazines deliver up-to-date fashion images to consumers. Retailers and designer brands publish advertisements in the magazines to extend their exhibits. Finally, some museums specialize in fashion and present historical fashion expositions.

I will now explain each stage of my model. On the left side of Figure 2.1, I mark points where a firm decides on its business strategies to add intangible value to the apparel or apparel-related tangible products it sells. Information on the added value is shared within the fashion and apparel industries. When consumers find the added value attractive, it affects the consumers’ demand for the products. The fashion element of a commodity shifts the demand curve up. I state how garments gain extra value at each stage. Not all garments receive added value nor do they gain value at every single stage. I mark "stages" 1-5 on the right side of Figure 2.1. The number increases as the production supply moves from raw material to actual consumption products of the garments and related products. Stage one is the creation of raw material. Stage Two is the manufacturing process. Stage Three is the first part of distribution at a wholesale level, from manufacturers to retailers. Stage Four is the second part of distribution at a retail level, sales from retailers to consumers. Stage Five includes other related activities to facilitate and sustain the fashion industry. The following
Stage One: Material for Apparel and Apparel-Related Goods

The origin of a supply chain in the fashion industry starts from the textile industry and other material suppliers for apparel and apparel-related products. Raw material is made into other materials that are used in manufacturing in the second stage. According to a definition by the US Bureau of Labor Statistics and the US Census classifications, the textile industry turns natural or synthetic fiber like cotton, yarn like wool, and thread into fabric. The process includes dyeing, knitting, waving, pressing, printing images onto fabric and special finishes such as durable or stain-resistant coatings. Textile is used not only for garment manufacturing, but also for apparel-related and household manufacturing for sheets, furniture and curtains. Textile also includes fur and leather in a broader definition. A very high percentage of material used for garments is textile. As a result, the textile industry has a significant role in the apparel and fashion industries. Even though other apparel-related production uses materials other than textile such as metal and rubber to make items such as shoes and belts, the amount of the total material used for those products is relatively small compared to textile for garments. For example, rubber is used for making car tires. Even though it is also used for shoe soles, I do not include these kinds of apparel-related material producers in the fashion industry.

There are three distinctive sectors that add value to generic textile in Stage one: color forecasting services, textile trade shows, and use of organic material. Color forecasting
services suggest the upcoming season’s most popular colors. These companies, such as Color Association of the United States and Pantone among others, analyze color trends in textile, apparel, home furnishing and related fields. One way that color sensitive specialists predict the future color pallet is by collecting objects and colors they notice in life over a given period of time, bringing them together onto one table where they look for the colors that stand out the most. Then narrowing down a trend of colors from the gathered material. These color-forecasting companies publish color pallets twice or four times per year that they sell to textile producers and apparel companies. They also provide color consulting services for individual companies for an additional fee. The service analyzes each apparel company’s target consumers and creates the brand’s specific color pallet, which reflects the upcoming color trend. This service successfully differentiates colors by varying slightly from one apparel brand to another. This can create matching problems for consumers when they buy garments from different stores. Therefore, consumers are encouraged to purchase tops and bottoms from the same brand so that colors are perfectly matched.

There are many color organizations. The most prominent one is The Color Association of the United States, which was established in 1915. Until 1955 it was formerly known as Textile Color Card Association of the United States. It is a non-profit organization that systemized color standard and provides direction in color trends. These activities allow firms to lower the risk of producing non-demanded color textiles, so that textile manufacturers can focus on producing mainly upcoming-trend colored textile to generate more sales. The color-coding also allows apparel manufacturing firms to order the correct color dye and textile that the firms purchased previously from different textile companies worldwide and still obtain
the same color.

Industrial textile trade shows are also resources for the textile and apparel manufacturers and the color forecasting companies to narrow down the most popular textile patterns and colors. Attending these trade shows also creates added value. The most prominent bi-annual textile show Premiere Vision is held in Paris. The main textile presenters are textile producers from Europe, but are not limited to that region. Textile producers show their fabric and trims to designers and apparel manufacturers. Premiere Vision collectively selects a season’s trend from these presenters and summarizes what is new and trendy in the textile industry. The presentation of the Industrial textile trade shows calls for some artistic sense rather than a scientific academic approach. The entire atmosphere of the show, from the visual appeal, to the seasonal posters and promotional phrases, is intended to inspire the visitors with what is the most current trend. Many US-based designers and textile and apparel manufacturers regularly attend the event in Paris. New York hosts Premiere Vision New York, a relatively smaller venue. Paris visitors may come across some new innovative textile that leads to a new design or new product creation\textsuperscript{1} for upcoming seasons. This creates new demand in the market.

Growing concern of toxic chemicals in textile production shifted some producers to start organic cotton farming. It is called social responsibility that many branding business takes it in their business practice and market themselves as socially responsible firms to consumers. Growing numbers of socially conscious consumers find added value to the products when they know how and when their products have been delivered to them.

The color organizations, textile trade shows, and organic material create added value

\textsuperscript{1}Burns and Bryant (2008) have a section in detail on the color forecasting service business.
to garments. For producers, these reduce the risk of running a fashion business because they make them easier to present newness to their new season’s line, focusing more on the upcoming trend, of which consumers are willing to pay a higher price. For consumers, when a fashionable trend is clear to them, they identify that they don’t have those new items in their wardrobe, and a new demand emerges.

**Stage Two: Designing, cutting and sewing**

Stage Two consists of the construction of actual garments from designing to finishing. At first, when design firms are small, they often do all the designing, cutting and sewing of clothing themselves. As the business grows, they start to contract out the sample making and production to manufacturers and hire more seamstresses and designers. Designers, especially high-end brand designer firms in New York, have target customers’ profiles. While formalizing their ideas and designs, they consider the cost of production and price range of the garments.

Specialized factories have large cutting and sewing operations. High-tech cutting machines can drastically increase the productivity in the supply chain. Multiple layered textiles can be cut in the same shape at one time. However, many parts of the sewing job are still manually intensive. Some relatively smaller manufacturers in New York provide sample making for high quality designer companies. The close proximity of these sample makers is beneficial for design-focused firms, permitting more frequent meetings and shortened delivery times.

New York once had the largest labor participation in the apparel manufacturing sector
than other sectors in business; however, it has been overtaken by countries with cheaper labor. It is very difficult for large manufacturers to stay in the New York area because of labor costs. The government and some non-profit organizations struggle to persuade manufacturers to stay in New York. For example, existing zoning regulations try to encourage manufacturers to stay in the city. "Made in New York" campaigns appear every now and then, once in the 1940s, in 2005 and again in 2015. Firms use mixed tactics when deciding where to place garment productions to maximize their profits (Abernathy, Dunlop, Hammond, Weil, Bresnahan, and Pashigian 1995; Taplin 1996). The use of local or overseas manufacturers depends on the needs of design firms or wholesalers and retailers who place orders. Fashion-driven products are more time-sensitive. Retailers can charge higher markups and make more profit when they can sell new products that are still considered trendy. Retailers like to respond to changing consumer demand as quickly as possible. The close proximity of manufacturing factories can be beneficial so that they can deliver the products to consumers quickly. Even though the cost of production becomes higher, retailers can sell products at a high price because firms can deliver the newly trendy piece when consumers want it. See Figure 2.2. Meanwhile design firms and retailers that offer more basic items that are not time-sensitive can place orders overseas for a cheaper production cost. Their market model is more of a pure competitive market with basic designs, and their prices are near or at a pure competitive price. Bulk orders can reduce the average total cost because firms can benefit from economies of scale. They have more of an incentive to use contractors at a lower cost and manufacturers further away.

In the fashion diffusion path, the horizontal axis is time while the vertical axis shows

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2 This requires future research. I am only aware of the 1940s, in 2005 and in 2015.
how many people adapted at a given time (Figure 2.3). There are three curves drawn for different types of clothing. When classic products such as turtleneck sweaters and straight blue jeans become available, some people buy them right away and later, more and more people have them because they are functional and less influenced by trend. These kinds of products last for years and are adopted by many consumers. Once consumers own them, they can wear them until these clothes wear out and then purchase new ones. Fashion-basic items have the same functional elements, but vary in silhouettes, fabric color, finish, or trim. When they appear in the market, smaller numbers of consumers, relative to the standard shape, buy them. As other consumers see how these initial consumers wear them in the street or in advertisements in fashion magazines, the number of customers who adopt these in their wardrobe increases gradually. These products last in fashion for a limited number of years. Some examples are bell-bottom jeans in the 1970s, low rise waist jeans in the late
Figure 2.3: Diffusion Pattern for Different Time Sensitivity in Fashion Products

1990s, and skinny leg jeans in the early 2000s. A fad product is a product style that has an extremely short selling life, perhaps only one season, such as the see-through dress in 2015, and art-influenced pattern textile in 2014. These items may be adopted by a relatively small number of people compared to classic or fashion-basic products.

Fast fashion companies such as Zara, H&M and Forever 21 use the mixed strategy well and have been a growing segment of the fashion industry. They deliver fashionable trendy products to their stores frequently, 3 to 4 times a week. The conventional department stores receive products at the beginning of a season and do not have a chance to adjust inventory level frequently for the season. For example, Forever 21, headquarteried in Los Angeles, uses mixed production locations. It used to purchase products from their contracting manufacturers in the same Los Angeles area, but has currently expanded into overseas (Leeman,
Roberts, and Carracedo 2007). In Figure 2.2, the goal is to produce fashionable products at a low price, i.e. be in the upper right corner. The apparel was manufactured in local factories, with very fast deliveries to stores. It kept their labor cost relatively low because they were taking advantage of great numbers of immigrants from Central and South America in Los Angeles. Some of these workers were illegal and were paid less than the minimum wage. The company became well-known for fast fashion at very low price. This became a legal issue back in 2001. A film called "Made in L.A." Leeman et al. documents this case. Forever 21 company and the immigrants settled with an undisclosed agreement. Today, the company uses a mixture of local manufacturers and overseas manufacturers to maintain the low prices it offers to the consumers while manufacturing trendy styles.

Manufacturers add intangible value to their products at this Stage Two. Manufacturing companies can promote themselves as "unique" or "different" from other manufacturing companies by incorporating a creativity and innovation of new designs, applying new technologically innovative textile into their products, or appealing to their social responsible production process.

Stage Three: Wholesale Distribution

Distribution has two parts: wholesales and retail sales. The wholesale distribution is Stage Three. The most basic function of the wholesaler is to present garments to retail buyers, take orders from retailers and promise delivery of the orders by due date. In this stage, I describe four main strategies wholesalers use to expose products to retailers. I also explain how high-end brand firms start out in the manufacturing stage and as a natural
path, they go into the wholesale business, - this is considered vertical integration. Their wholesale activities are also described here. I also included some of the activities conducted by the especially high-end brand firms in Stage Three.

Wholesale firms can choose different modes of presentation to appeal to their retail buyers. There are four ways that they present their finished sample products to prospective buyers or apparel retail stores: fashion shows, trade shows, trunk shows, and showroom presentations.

Fashion shows are a form of presentation where live models wear the new samples and walk or move around while wholesalers invite buyers to examine pieces of the collection. Live models often present apparel better because consumers wear clothing in their lives with different activities. In contrast, mannequins may not show how comfortable a piece of apparel might be. They also prevent buyers from seeing how a texture or design fits on an active human body. The most prestigious fashion shows in the United States take place during the New York Fashion Week (NYFW). Retail wholesalers are invited to the bi-annual shows. The apparel is among the highest ready-to-wear or pret-a-porter clothing in the US. One NYFW is for the spring/summer collections and one is for the fall/winter collections. "Fashion Week" takes place around the world, starting in New York and going to London, Milan, Paris and Tokyo. Even though Tokyo has a relatively small venue, Women's Wear Daily covers the collections. In addition to the bi-annual fashion shows, designers may have fashion shows for resort collections. There is also another round of fashion shows for Haute Couture collections in Paris, which showcases the most prestigious and artisanal fashion designs of the season. The production job is artistic, and most of the garments are not for everyday wear.
The trade show is another method that manufacturers use to promote their clothing to prospective store buyers. Trade shows showcase new designs and identify trends for specific product categories, price points, and target audiences (Brannon 2000). Trade shows are held in many different places; those trade shows considered as national market shows are held in New York, while other regional markets around the country take place in Atlanta, Chicago, Dallas, Denver, Las Vegas, Los Angeles, Miami, San Francisco and other smaller regions. Usually, public relations companies organize a trade show by handling event space coordination and registrations of vendors and buyers. They rent out booth space to manufacturers from across the country and around the world (Brannon 2000; Frings 2004). Many of the trade shows are held in convention centers, hotels, or other large spaces. Each one has price points and characteristics of the manufacturers’ products so that sellers and buyers are matched well. Some of the high-end fashion clothing manufacturers that present during New York Fashion Week also arrange booth space to display their clothing. Here, buyers can finally have the opportunity to examine the samples closely. At this time the sellers take orders and make arrangements for delivery and payment. Some of the significant trade shows in women’s apparel in the United States are the bi-annual Coterie by Coterie; relatively small but creative items presented by Designers & Agent.

A third way that manufacturers present their finished sample products to prospective buyers or apparel retail stores is with trunk shows, a form of garment showing where manufacturers and wholesalers bring their garments into retail offices to present their garments

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3Formerly known as the Fashion Coterie. Pre-screening makes vendor’s quality selective. It is relatively difficult to have a show booth at the Coterie by Coteries for new entrants.

4D&A gives pre-screening for vendors. Five times a year. Some additional ones are: Moda Manhattan and Fashion Avenue Market Expo (FAME), WWDMAGIC in Las Vegas.
directly to consumers. The name came from when trunk shows first started, a manufacturer representative or a designer him/herself came to the store with a line of new designs in a trunk. During a trunk show consumers can place orders directly with the manufacturers. Retailers may not carry every piece from the collection at store during a season, so at the trunk show, whether the retailer carries a specific garment or not, customers can see what (s)he likes and place an order.

Wholesalers may have their own showrooms and bring their samples from manufactureres onsite. Retail business owners and buyers walk in to see and feel the garments, place orders, and make arrangements for payment and delivery. Some take the products on the spot. Many showrooms are located in the Garment District in New York City, between 34th and 40th Streets and 5th and 9th Avenues. Typically, stores are grouped into categories, which makes it easier to find the same kind of garment or accessory. Meanwhile, in many cases, design-focused manufacturers do the direct wholesaling themselves. Their showrooms are located at their designing offices and those are located in the upper floors in buildings, which are located within the Garment District. In other words, some design firms do their product sales as well by vertical integration. In New York, the Fashion Center Information Kiosk in the Garment District facilitates visitors to provide contact information of the wholesalers for different categories, miss, children, young adults, and so on, of garments. The Los Angeles area also has an designated area for fashion related businesses in the LA Fashion District. This will be my future research.

Besides selling garments to retail stores, the high-end manufacturing/wholesale firms may choose to participate in non-direct sales activities. A company may appeal to consumers
directly by presenting at the prestigious fashion shows in NYFW, fashion-related charity events, or film and TV major awards shows. Those activities do not make direct sales to retailers or consumers but, if successful, they can create intangible positive value to the brands. The events are often covered by media, where consumers can see the dramatic, beautiful images in luxurious settings.

Extravagant fashion shows such NYFW add intangible value to garments. A designer or a brand coordinates newly created garments with stylists, models, hair and make-up artists, public relations companies, interior designers, lighting and music technicians, and photographers. A NYFW designer creates garments such as blouses, jackets, skirts, pants and dresses, using high-quality textiles that may be specially made for the brand with sophisticated new designs. Stylists mix combinations of these items to find the best matches in which to present the designer’s image. The designer chooses models that can best present the styles. For example, if a designer wants to present a soft image, then (s)he hires the softer looking models. Hair and make-up also is carefully selected. A public relations company takes responsibility for the guest list, invitations, and seating. The designer may hire an interior designer and lighting and music technicians to decorate a show space that enhances the designer’s clothing presentation. The designer hires his/her own photographer to archive for future sales promotion. The designer coordinates different professionals to best represent his/her brand. Those who are invited are carefully selected. Celebrities who best fit with the designer’s image may be invited and asked to sit in front and wear the brand is garments. Fashion magazine and newspaper journalists are expected at the shows. Since around the mid-2000s, high-view-count fashion internet bloggers also sit in the
audience. This is a big stage for brands to increase the intangible value of their garments and transfer their ideas and images to their retailers and consumers.

Manufacturing, wholesale, and sometimes retail companies add value to their brand by participating in charity and other socially responsible events. Some events are intended to directly send a message to consumers, while some are only for the people in the industry. There are two main approaches: fashion-related fundraising and charity events, which can be one time event bases, and socially responsible activities, which are more continuous.

There are different forms of fundraising for social causes in the fashion industry: fashion shows to raise awareness of social concerns, designer item auctions, and cause-specific designer products that are made to raise money. During NYFW, a fundraising fashion show event has been held annually since 2002 called The Heart Truth’s Red Dress Collection. During this event, health awareness organizations such as the Foundation for the National Institutes of Health, National Heart, Lung, and Blood Institute, and the National Institutes of Health raise awareness of women’s heart disease by offering a special fashion collection. Top fashion designers and brands offer designs and products, celebrities walk the catwalk as models, and corporate sponsors promote a healthy lifestyle to prevent heart disease. The products are all red dresses. During NYFW journalists are in town to see as many shows as they can. They may also cover the special charity event as The Heart Truth’s Red Dress Collection. Whether these special charity events increase revenue directly is not clear and could be a subject for future research.

One time target fundraising takes place when a natural disaster occurs such as the tsunami and nuclear disaster in Japan in 2011. At the time some designers and retailers
created specific products to raise money. They also donated their products for an auction or sale. Another type of fundraising in the fashion industry is a cause-specific one. For example, since 2006, many firms have been participating in the "Red" campaign to fight the transmission of HIV from mothers to babies in Africa. Many brands participate by creating products in red and donating a percent of the profit to charity.\(^5\)

Another type of participation in social causes may add brand value for the designer or company. It is a business model where a portion of each sale contributes to a charitable cause. For example, TOMS Shoes is a retailer that distribute one pair of shoes to a child in need in developing countries when a customer purchase a pair of shoes in the US or other developed countries. They started by approaching college campuses to attract college students. They also provided some opportunities to those students to come to distribute shoes in needy countries. This created intangible value to the brand for consumers. The Warby Parker company has a similar business model with eyeglasses. For each pair of eye glasses sold, it donates the same number of eye glasses to poor countries.

More and more designer firms try to reach consumers directly by participating in many layers of value-added activities. Extra value is successfully added to a brand when consumers can distinguish it from other brands. This is the reason that the fashion industry is often referred to as a good example of a monopolistic competition market structure.

\(^5\)By 2015, the organization is aiming to reduce the HIV transmission rate to zero percent.
Stage Four: Distribution from retailers to consumers

Stage Four is the final supply chain stage where garments are sold to consumers. The retailers include department stores, specialty stores, catalogues, and e-commerce (Frings 2004; Wolfe 2001). A department store is defined as a store that carries many different types of merchandise such as women’s, men’s and children’s apparel and accessories, as well as household goods. Specialty stores such as The Gap and Foot Locker carry focused products targeting specific customer groups (Tamilia 2002; Wolfe 2001). Catalogue businesses and e-commerce are also discussed in this stage.

There are varieties of department stores that carry products in different price ranges. Each department store carries products within certain price points and levels of quality and designs that determines its selection of merchandise for their target consumers. Some examples of the upscale department stores are Neiman Marcus/Bergdorf Goodman, Barney’s New York, and Saks Fifth Avenue; some upper-middle to middle ranges are Bloomingdale’s, Macy’s and Dillard’s. There are also so-called discount department stores such as Wal-Mart, Kmart, Target, Burlington Coat Factory, and TJMaxx. The more upscale the department store, the more services are needed in order to maintain its reputation for quality and integrity. Such services include personal shopping assistance, gift-wrapping, and customer service desks. Within the upscale department stores, Neiman Marcus/Bergdorf Goodman and Saks Fifth Avenue offer a more conservative style of merchandise, while Barney’s New York carries products that are more young, fun, unique and eccentric. Many stores today develop their department store brands. In other words, retail originated businesses are vertically integrated and design clothing, work with contractors for cutting and sewing and
manage delivery of final products to stores as well.

Specialty stores carry focused products that are appropriate for their target consumer groups. Their merchandise may be a variety in clothing to accessories under one label or in one category of apparel such as T-shirts stores, shoe stores, maternity shops, bridal stores, children’s apparel stores and dress stores. Stores like The Gap are called single-brand or private-label. The Gap is known as one of the first firms to apply a vertically integrated business operation. It started in 1969 as a small brick and mortar jeans store in California. After successful sales of different brands of jeans, the company decided to go into vertically integrated operation. It started to design in-house jeans to deliver to consumers. Today, The Gap brand includes product variety from accessories to children’s wear. When single-brand stores like The Gap operate large and nationwide, they are sometimes referred to as mass merchants (Frings 2004). Gap Inc. operates The Gap brand. It also runs clothing stores under different names such as Banana Republic, Old Navy, Athleta, and Intermix. Athleta offers fashionable activewear garments. A company can form multi branding firms by developing a new brand name and concept store, or merger and acquisition. These firms have control over their own designs, manufacturers, retailing and overall brand image. Vertically operated firms can observe consumers’ demand and place orders quickly to maximize their profits. Another type of specialty store is the single-line specialty store, such as Foot Locker that carries in sport shoes of many different brands.

Some high-end brand companies may decide to operate their direct brand stores once they have enough assets, expanding their functions from design/manufacturing in Stage Two to distribution in Stage Four. This is often referred to as a flagship operation. By operating
their direct stores, a company has control over how to present their brand. They can make decisions on store locations, who to hire for architectural details, and interior design. For instance, the Calvin Klein flagship store on Madison Avenue was designed by architect John Pawson (Stewart 1998). Designer brands that operate flagship stores by themselves must hire more employees for security and better service. Moore, Fernie, and Burt (2000) convey, "Fashion design retailing is synonymous with brand image." Manufacturers, especially fashion forward designers, may open their direct stores in prestigious locations such as Madison Avenue in the Upper East Side of New York City. A flagship store is not necessarily the first company store in a selected market (Ogle, Hyllegard, and Dunbar 2004). It brings more value in brands (Kozinets, Sherry, DeBerry-Spence, Duhachek, Nuttavuthisit, and Storm 2002; Moore and Doherty 2007a). Moore and Doherty (2007b) note that opening a new store requires a significant capital investment. A flagship store can be very big and may only display a few items of clothing (Chong 1996). It incurs high operating costs associated with day-to-day operations. Full retail prices on the same apparel or accessories between flagships and department stores do not generally differ. By cutting one supply chain transaction from manufacture to retail, the flagship operation can bring more revenue per unit of clothing to the manufacturer, but it faces the disadvantage of higher operating costs due to hiring high-standard sales teams and security guards. Flagship stores are known to be loss-incurring showcases that fail to deliver profits to the manufacturer directly. However, their costly operation may help their branding business in other stores or operation that manufacturers expect indirect positive profits.\footnote{For one firm to start operating in another country, it may start up the flagship store first to attract consumer attention. See Moore and Doherty (2007) and Moore, Fernie, and Burt (2000).} Moore and Doherty (2007b) say the flagship store
serves "as physical manifestation of these intangible, yet vital brand characteristics through the provision of what may seem an excessive consumption space." For example, Abercrombie and Fitch, a young casual low-to-mid-priced firm, operates flagship stores in prestigious locations such as Fifth Avenue in Manhattan and Champs-Elysees in Paris. Square foot rent is more than ten times higher than that of mall store rental space. However, it has full control of how the store should look and visually conveys the brand. Security guards are dressed up in Abercrombie and Fitch’s brand jeans without wearing a shirt. The music in the store is usually very loud. The location also attracts tourists from around the world, which makes the brand presence strong in the national and international markets (as of 2016).

Catalogues are another medium to reach consumers. The idea of catalogue orders developed along with the railroad expansion in the US in the mid-1800s. Sears was one of the first retail stores providing catalogue listing of a variety of products including garments and accessories as one of the ways to reach more consumers. Some companies focused mainly on the catalogue-based business, such as Chadwick’s of Boston and Coldwater Creeks. They specifically offered women’s apparel. However, with the emergence of e-commerce, consumers shifted their purchasing to online. By not changing the business focus from catalogue to online, both companies filed bankruptcy: Chadwick in 2011 and Coldwater Creek in 2014. This does not mean the catalogue business is over. Some companies whose original venue was catalogue sales still offer products with catalogues alongside retail and online operations.

E-commerce is based on online sales to consumers. E-commerce has taken the place of catalogues. It is cheaper to deliver to consumers, and new merchandise can be updated more quickly. Ordering online is much easier for consumers than using catalogues. Flash
sale sites are web-only retail in which a limited quantity of high-fashion products become available for a limited amount of time. This sales strategy gained popularity around 2005. Sold out items remain visible saying Sold Out, which triggers some consumers to purchase right away when they see something they want. This is a historically new development that needs further research. Social networking is also a growing segment of the fashion industry today that needs to be explored.

**Stage Five: No Physical Garments Making to Selling Involved**

While the apparel and apparel-related industries create and sell garments and accessories to consumers, without institutions such as museums, schools, and magazine publishers, the fashion industry does not work as it is. There are two types here. One serves fashion industry insiders, and the other serves both insiders and consumers. In Stage Five, in Figure 2.1, there is no actual garment or commodity production taking place. Those business or organizations are unions, advertisement companies, magazine and other media reports, professional blogs and fashion-related organizations. I list some noticeable organizations and their function in the industry.

- **Unions**

  Unite Here! is a conglomerated union organization that includes textile, apparel manufacturing, hotel, and restaurant workers. Its purpose is to serve fashion industry insiders, engaging in labor union activities on behalf of workers in the Garment District. Unions provide education, training and seminars to workers. Their historical origins are found in the
creation of Textile Workers Union of American 1939 in the South. For garment manufacturing workers, two separate organizations were established separately and later became a part of Unite Here!: International Ladies’ Garment Workers’ Union which was established in 1900 and Amalgamated Clothing Workers of America for men’s clothing in 1914.\footnote{The unions merged over time and change names each time such as Amalgamated Clothing & Textile Workers Union (ACTWU), UNITE as result of the merger International Ladies’ Garment Workers’ Union, ILGWU and ACTWU. Later with Hotel Employees & Restaurant Employees International Union, it became Unite Here!.} The Triangle Shirtwaist Fire killed 145 garment workers, mostly female, due to unsafe factory condition in 1911 in NYC. This lead the union formation stronger in the city. In Bangladesh, the Rana Plaza garment factory building collapsed with a death toll of 1,129 people in 2013. This raised concerns of securing the safety of workers in overseas as the US imports 97% garments from overseas by 2013. The accord on Factory and Building Safety in Bangladesh was created in 2014.

- Advertisement

Some advertising companies specialize in helping fashion firms establish their brand. Since the North American Industry Classification System does not have sub-categories under the advertising business, we do not know what percent of the advertising industry is associated with the fashion industry. Subtle and consistent branding images over time help establish a firm’s appeal to its target consumers, which adds more value to the actual garments. It is known that a significant amount of budget is set aside for advertising, although exact figures are not revealed even in the financial reports of public companies. Fashion business insiders also check on what is covered and featured to appeal to consumers. Advertisements appear in magazines, billboards, and web and blog commercials where consumers
are the direct target. This strategy facilitates stronger demand for new products and can force the previous season’s garments to become obsolete.

- Media:

Media serves as an informational messenger among stakeholders in the fashion industry and from the industry to the consumer. Many outlets are available such as trade publications, fashion magazines, gossip magazines, newspapers and TV reports and programs. Each one is explained here.

In the United States there are specialized fashion trade publications available in the industry. This category is a business to business publication. The trends in garments, business practice, colors, and news about relevant laws are all shared within the industry. This is a must-read report within the industry. Today’s most prominent trade publication is Women’s Wear Daily that was started in July 1910 by The Fairchild Publication, Inc. Today, it publishes five business days a week. As of 2014, according to the Fairchild Publications’ press release, total circulation is 59,032 for an estimated audience of 235,332. This newspaper covers every stage of the fashion industry from not only the apparel, and apparel-related items but also fragrance and cosmetics, with domestic and international news coverage. Men’s wear are also covered in WWD. Another trade publication is The Tobe Report, a weekly retailing business report of reputation, which was first printed in 1927. It provides detailed analysis of the Tobe Team’s reports on the topic of fashion management and retailing. The Tobe Report covers men’s, women’s, and children’s clothing. Other publications specialize in different segments of the fashion industry; examples are Textile World, International Textiles for textile industry, Earnshaw’s and Children’s Business for children’s

There is a wide variety of fashion magazines available today, depending on the target consumer. Editors, writers, stylists, make-up artists, models and photographers are heavily involved in creating the magazines. Magazines serve for both business to business and also from the industry to consumers. It includes magazine specific content such as originally styled fashion scene photos, fashion stories and critics, and life style stories. The other content is most notoriously heavy advertisement campaign images by many brand companies. The more prestigious the magazine is in general, the heavier those advertisements are. This is known as network externality in economics. Apparently, editor-in-chiefs for prominent magazines have a very strong influence on the fashion industry. Further social science studies are needed in this area.

The most influential fashion magazines in the United States are Vogue, Harper’s Bazaar, and Elle. The first American fashion magazine was Harper’s Bazaar published in 1867 as a weekly magazine for the upper class. Vogue started in 1892 also as a weekly journal. Today most of the fashion magazines are monthly publications, and many of them have international versions, Vogue France, Vogue Japan, Vogue Russia and so on, available in different locations around the world. Each country’s version has its own editor-in-chief and may create its own content. Each magazine has a target reader segment, which attracts different types of advertisers. Advertisers are national and foreign fashion luxury brand manufacturers like
Ralph Lauren Collection, Chanel and Gucci; cosmetic companies; and different kinds of accessory companies for jewelry, bags, shoes and sunglasses. Other businesses such as car manufacturers and credit card companies may choose to advertise in these magazines as well. September issues are known to be very thick due to the volume of advertisements for the beginning of the fall season campaign. The look of magazine covers has shifted and needs to be explored in social science academic studies. For example, in the 1990s, supermodels were the faces of fashion magazines. In the new millennium, actresses or celebrities have taken their place.

Newspapers play three different functions in the fashion industry: providing fashion show reviews, trend or what’s-new information, and advertisement spaces. The readers are both people in the industries and consumers. Newspapers provide fashion show reviews and critiques, especially after each major international fashion week. Each newspaper has a renowned critic, for example, Cathy Horyn for The New York Times since 1998, and Suzy Menkes for The International Herald Tribune since 1988. Robin Givhan for The Washington Post won the 2006 Pulitzer Prize in the category of criticism. She is the first fashion critic who was nominated for the Pulitzer Prize, and she won the award because of “her witty, closely observed essays that transform fashion criticism into cultural criticism,” according to the Pulitzer Prize website. For The New York Times, the fashion critics have been Virginia Pope and Bernadine Morris. These fashion critics as well as the previously listed fashion magazine editors attend as many new fashion collections as possible during fashion weeks. Designers care about their critiques and watch them closely. Future research is needed to discover any correlation between the good or bad reviews and the profitability of a brand.
New designers want critics to attend their shows; however, the famous critics may not have enough time to attend them because they are too busy attending must-cover famous designer collections (Wilson 2007). They are the first to sense any coming trends and report them. Other writers also report on how consumers are wearing new designs. For instance, Bill Cunningham is a New York Times photographer who takes street and social photos and collectively presents a pattern of garments in a season. Brand firms advertise in newspapers as well. In fact, on pages two and three of The New York Times, most of the advertisers are fashion firms everyday.

- Fashion reports and TV programs

Television fashion reports and programs are aimed towards consumers. They often include entertainment, interviews, and fashion reports. Project Runway, started in 2004, is an American reality show about unknown fashion designers competing for an award. Over a dozen contestants kicked off the series. Every week, a garment design challenge is given and elimination takes place as a part of the competition. The last contestant standing is the winner for the season. It has been a popular show that is still running. As of 2016, the number of applications to fashion colleges has increased partly because of fashion-related TV programs. In the drama series, Sex and the City, (1994-2004), the main character was a fashionista who talked about fashion a lot. Another drama series, Ugly Betty, (2006-2010) was about a girl working for a fashion magazine. Most of the programs are entertaining and appealing for consumers.

- Fashion bloggers
Influential fashion bloggers have established themselves within the industry and serve both the industry and consumers. Their descriptions capture images of real people wearing garments of certain style. Fashion insiders collectively learn from the street fashion images as well. Consumers learn from those fashion images about how they want to dress. Many popular fashion bloggers are now invited to fashion week shows around the world. Mainly, two types of fashion blogs exist. One is the street snap based blogs. *The Sartorialist* is highly regarded in street snap shots from insiders and some fashion-driven consumers. The other type of fashion blog is a self-styling blog with style tips for fellow readers. Often, blog owners model the clothes themselves. Items that models wear have links to e-commerce sites. Revenue from these blogs usually comes from advertising space within the blogs for fashion retail stores. The latter type bloggers often receive garments from retailers, which can provide the retail store’s garment exposure to the readers.

- **Use of social network**

Increasing numbers of brands started to use social networking as a tool to convey their messages directly to consumers. Physically, a brand may have a flagship store to implement brand messages to consumers by letting them experience the entire mood which is created by the brand. Social networking is another tool to consumers to perceive brand messages. Balmain, a French high-end brand, has a young new designer, Olivier Rousteing, since 2011. He was 24 years then. His Instagram with the latest clothing with current top models made a large exposure of the brands. The social networking increases direct interaction with the brands to consumers, but also create interactions between consumers. A successful implementation can create a brand awareness.
• Fashion-related organizations

Other organizations involved in the fashion industry provide historical archival services, analytical services, professional seminars, and educational organizations including museums, special libraries and schools, and professional organizations.

Some museums specialize in fashion with exhibitions, historical collections and archives. In New York City, the Costume Institute at the Metropolitan Museum of Art and The Fashion Institute of Technology Museum focus on fashion exhibitions. The Costume Institute originated from the Museum of Costume Art started in 1937, which merged with the Metropolitan Museum of Art in 1946. Their exhibition changes seasonally and uniquely for custs different themes relating to clothing fashion. The museum provides some seminars and tours with curators. Each year it holds the Met Gala, a fundraising event for The Costume Institute. Prominent designers, celebrities, models and editors attend the event, and it is covered by the media. The Fashion Institute of Technology Museum is open to the public for free. It was founded in 1969. Outside of New York City, The National Museum of American History in Washington DC also has a costume division, as does the American Textile History Museum in Massachusetts, which opened in 1960. Other countries have specialized museums in fashion as well.

Libraries can help designers and researchers with historical images and documents. They may carry special archival documents and images. The Berg Fashion Library is a division within the New York City Library. The special archives of the Fashion Institute of Technology are another archival location. Both libraries inherited images from other fashion organizations.
For education, The Fashion Institute of Technology and Parsons School of Design, opened 1944 and 1896 respectively, both located in the Garment District, offer courses to educate students about market mechanisms and to provide necessary hands-on skills to those who want to make careers in the local and global fashion industry. There are other schools in the US that offer fashion-related courses and training. The Harvard Center for Textile and Apparel Research founded in 1990 publishes scholarly articles on textiles and apparel. The American Association of Textile Chemists & Colorists was founded in 1921 as a non-profit organization. It offers workshops for students and scholars on how to dye, process, and test fibers and textile. It offers seminars about innovative textile and coloring of textile and also offers scholarship programs to fashion students. The International Textile and Apparel Association was established in 1935 under the name of the United States Office of Education, offering scholars conference opportunities while also promoting excellence in research, theory development and education in the global textile and apparel field.

There are some organizations that were established especially for designers. The most prominent organization is Council of Fashion Designers of America, a non-profit organization founded in 1962. It supports activities to raise artistic recognition of fashion designs. For example, it provides annual fashion designer awards and fights on behalf of intellectual property rights of fashion designs, defining a code of ethical practices in manufacturing. Currently, in 2016, issue they are bringing to legislators is design piracy (Raustiala and Sprigman 2006). Another non-profit organization is Gen-Art, established in 1993 that gives

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8Parsons The New School for Design has moved its location from the Garment District to Greenwich Village in 2014
9The Fashion Institute of Design & Merchandising in Los Angeles, California; Moore College of Art & Design in Philadelphia, Pennsylvania; Pratt Institute in Brooklyn, New York.
support to emerging artists, including fashion designers. Gen Art provides time to selected emerging designers to present their collection in fashion shows, including NYFW.¹⁰

Other fashion-related organizations such as Fashion Group International, The Fashion Center Business Improvement District, IMG, and Infomat serve the industry with opportunities for education, business seminars and support for start-ups. Fashion Group International has served the industry since 1928 as a non-profit organization in New York. It encourages and supports career establishment in the fashion industry, offers public seminars related to fashion business, provides networking opportunities, and shares national and global activities that may affect fashion trends in the industry. The Fashion Center Business Improvement District was formed in 1993 as a non-profit organization to improve and encourage business activities in the Garment District in New York City. It provides security and sanitation services in the district, publishes economic data about the district, and offers business seminars on distinctive topics in fashion. It also provides the Fashion Center Information Kiosk located at the corner of Seventh Avenue and 39th Street where one can obtain business-to-business information on the fashion industry. For example, the Kiosk can provide an industry buyer with a list of manufacturers’ contact addresses. Infomat started in 1996 as an Internet information resource and serves all different kinds of sectors in the fashion industry. In 1984 the Garment Workers’ Union and the New York Skirt and Sportswear Association established the Garment Industry Development Corporation to promote and strengthen New York City’s apparel industry. It became a source for providing connection between New York factories with designers, manufacturers, and retailers. Today it provides

¹⁰ Zac Posen, Rebecca Taylor, Chaiken, Rodarte, Katy Rodriguez, Louis Verdad, Milly, Philip Lim (Development), Twinkle by Wenlan, Duckie Brown, Geren Ford, Hollywould, Sari Gueron & Shoshanna are examples.
training and technical assistance to firms to help them adopt modern technologies and obtain the most efficient production levels.

- Apparel-related industries

In the apparel-related industry, the following organizations offer their services: the Women’s Jewelry Association, the American Apparel & Footwear Association, and the Accessories Council. The Women’s Jewelry Association (WJA) was formed in 1983 as a non-profit organization. The main purpose of the WJA is to empower women in jewelry, watch and other accessory-related businesses by providing education, networking, scholarship opportunities, and design competitions. The American Apparel & Footwear Association (AAFA) was established in 2000 through a merger of two prominent organizations, American Apparel Manufacturers Association and Footwear Industries of America. AAFA promotes and enhances its members’ productivity, profitability and competitiveness in the global marketplace. The Accessories Council was formed in 1995 as a non-profit organization that promotes accessory awareness to consumers and creates demand for accessories.

In conclusion, I have shown how the fashion industry is organized and how the apparel and apparel-related industries play a role in the fashion industry. At each level, there are different ways to share and create trends and fashion information among the industries and customers. Some firms choose not to take any action to add value to their products while others may vertically integrate their business operation to take all the actions to try to maximize their added value. Different actions and their combinations certainly make the industry look extremely complex. However, by having focused on each level and function within the industry, it is easier to understand.
2.2 Scale of the New York Fashion Industry

New York City is the fashion design capital of the United States and one of the fashion capitals of the world. The fashion industry is a significantly large industry in the US and the design sector, which is a part of the manufacturing Stage two in Figure 2.1 is concentrated in NYC. Compared to other cities in the US, the number of firms and level of employment in those firms are increasing in the fashion design sector in NYC. NYC holds the bi-annual fashion show, New York Fashion Week (NYFW), which is considered as part of sequentially scheduled events in other internationally recognized fashion shows. NYFW is followed by fashion shows in London, Milan and Paris. On the other hand, apparel manufacturing employment is declining in NYC and the US as many firms order cutting and sewing jobs in relatively cheaper production countries such as China, India, Vietnam, and Mexico. Although the US production sector has been shrinking quickly for the past fifteen years, clothing retail sales show that it is a $152 billion dollar industry. Comparing four major fashion markets in the US shows that NYC is the fashion design capital of the US; however, it is no longer the largest manufacturing city for the actual cut and sewing sector of the industry.

2.2.1 Consumer Purchases:

Since 1992, an average American consumer has been purchasing more clothing per year but spending less on each piece of apparel. In 2010, an average American consumer spent $1,700 on apparel per year; that is 3.53% of the total average annual expenditure of $48,109 as shown in Table 2.1 and Figure 2.4.
Figure 2.4: Average Annual Expenditures in Different Goods and Services in 2010
Table 2.1: Average Annual Expenditures and Income of All Consumer Units and Percent Changes

The percent an average consumer spends on apparel and services has been declining from 6% in 1984 to 3.53% in 2010 as shown in 2.5. Housing, personal insurance and pensions, healthcare categories are rising in percent. Food and Transportation categories has been declining over time, shown in 2.6.

One of the reasons for apparel spending has been declining is due to the change in apparel price and the relative change in price across all items. The apparel price relative to the CPI declines over time since 1949 in Figure 2.7. The gap between the cumulative percent change in all consumption items has steadily grown and widened since 1973. Since 1994, the gap has only gotten wider at a quicker pace as the cumulative percent change for apparel has been declining Figure 2.8. With the decline in the relative price of apparel over CPI, the US apparel consumption is the highest in volume since 2000.\textsuperscript{11}

In 2000, the volume in garments consumed in the US has doubled from 10 billion to

\textsuperscript{11}The apparel consumption quantity data is only available from 1991 until 2008. Import and export reports for apparel, many categories have the measurement in square-meter equivalent. I only found quantity data for the selected years above.
Figure 2.5: Annual Percentage Average Spending on Apparel and Services Spending from 1984 to 2010

20 billion annually. In 2008 a US consumer purchased 64 garments annually, up from 40 garments annually in 1991, a 60% increase in volume consumption (Figure 2.9).

2.2.2 US Production and Import:

US production has been declining drastically. In 1994, the US produced 6.544 billion garments; however, in 2008, it was only 582 billion, less than one tenth of the production in thirteen years (Table 2.2 and Figure 2.10).

Since 1995, the Multifiber Arrangement, an import trade restriction on quotas and taxes, was passed by the US government, the US had relaxed the import restrictions gradually in four phases, in 1995, 1998, 2002 and 2004. US imports on apparel volume began to exceed US production volume in 1995 (Figure 2.10). In 1994, 6,537 millions of garments were imported. By 2008, the volume expanded to 18.9 billion, a 190% increase in the imported
Figure 2.6: Average Annual Expenditure of All the Categories in Percentage of Consumer Spending

Figure 2.7: Apparel Price Relative to the CPI since 1939

Figure 2.8: Cumulative Percentage Change for Expenditures on All Items and Apparel Since 1942
Table 2.2: US Production and US Import of Garments Volume
apparel volume. The ratio of the number of imported garments over total consumption of garments shows a steady increase over time, reaching a high of 97% in 2008 (Figure 2.11).

Despite the increase in US apparel imports, there is a need for domestic manufacturing. For the Garment District in the US, it is important to have local manufacturing businesses located at a close proximity to local design firms. When high-end designers need their samples made quickly, reliable local sewing businesses are necessary. When they place sample making of their designs with local seamstresses, they can benefit by visiting the seamstresses as often as they want to modify the designs and sewing. Some manufacturing still exists in the Garment District. In the Los Angeles area, the fast-fashion businesses succeeded by establishing a close relationship with local manufacturers. Forever 21, whose headquarters are based in Los Angeles, could place orders with local manufacturers and
deliver the most fashion-driven items to stores in a short time. In one instance this situation led to sewing employees at the local manufacturers taking action against Forever 21 for working conditions (Leeman, Roberts, and Carracedo 2007). American Apparel is another company that manufactures locally. The company’s concept is that their apparel is made in the US. Their manufacturing factories are located in Los Angeles. However, the business has been struggling, marking historical low stock prices in 2015 since its first public offering in 2006.

Several study by (Jin 2004; Guercini and Runfola 2004; Mattila, King, and Ojala 2002) examined the benefits of having local manufacturing business mixed with overseas production as I described at Stage Two. The products that are less fashion-driven tend to be made overseas, and the basic items can sit on shelves for longer without discounting the price.
However, for fashion-driven products, quickly selling at high price is key for making profit.

The United States Census Bureau issues the Annual Retail Trade Report, which details the large size and significance of the clothing industry in the US. Based on the report for 2013, at the retail level sales estimate, the clothing industry is a significantly large industry of $245 billion industry. For comparison, $738 billion in sales is spent in the new car industry is, $576 billion in the grocery industry, $552 billion in the gas station industry, and $234 billion in the restaurant industry. Clothing industry retail sales is higher than electronics and appliance retail sales of $104 billion and beer, wine and liquor retail sales of $46 billion. The clothing industry retail sales do not include clothing sales transactions in other large clothing retail spaces for department stores, discount department stores and warehouse clubs. Those sales are reported separately under General Merchandise Stores. Clothing store sales in addition to those of general merchandise stores add up to $898 billion. General merchandise stores carry not only clothing but also other products. Therefore, it is difficult to estimate the sales that refer only to clothing.

2.2.3 Employment in the US Apparel Industry, Four-city Comparison:

Employment in the US apparel industry has been declining as many manufacturers outsource their factories in search of cheaper labor and land. In 2006 overall employment in the US apparel manufacturing industry was 238,400 workers. However, apparel wholesale employment increased in 2006 to 150,000 workers (See Figure 2.12). Textile mill and textile product mill employment follows a continuous trend of declining, and is now a total
Figure 2.12: Four Cities Comparison - Amount of labor in different categories at the wholesale level

<table>
<thead>
<tr>
<th>Industry</th>
<th>U.S. TOTAL</th>
<th>Los Angeles-Long Beach-Santa Ana, CA MSA</th>
<th>New York-Northern New Jersey-Long Island, NY-NJ-PA MSA</th>
<th>Miami-Fort Lauderdale-Miami Beach, FL MSA</th>
<th>Dallas-Fort Worth-Arlington, TX MSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAICS 4243 Apparel and piece goods merchant wholesalers</td>
<td>152,459</td>
<td>22,539</td>
<td>44,742</td>
<td>4,320</td>
<td>2,994</td>
</tr>
<tr>
<td>NAICS 42432 Men’s and boys’ clothing merchant wholesalers</td>
<td>32,473</td>
<td>2,845</td>
<td>6,721</td>
<td>1,131</td>
<td>ND</td>
</tr>
<tr>
<td>NAICS 42433 Women’s and children’s clothing merch. whls.</td>
<td>67,228</td>
<td>11,554</td>
<td>28,469</td>
<td>1,938</td>
<td>944</td>
</tr>
<tr>
<td>NAICS 42434 Footwear merchant wholesalers</td>
<td>27,622</td>
<td>3,085</td>
<td>3,182</td>
<td>611</td>
<td>ND</td>
</tr>
</tbody>
</table>

Source: Bureau of Labor Statistics, Database from State and Metro Area Employment, Hours & Earnings. Data is the number of jobs in the private sector in 2007.
of 356,700 workers. The US footwear manufacturing employment also continued to fall in 2006 to 174,000 workers. Hourly earnings were $18.67 for apparel wholesale trade, $12.55 for textile mills, $11.94 for textile product mills, $11.45 for footwear manufacturing, and $10.61 for apparel manufacturing. Weekly hours were high in textile mills and textile product mills, 40.6 and 40 hours respectively, and 37.7 hours in footwear manufacturing, 37 hours in apparel wholesale trade, and 36.5 hours in apparel manufacturing (American Apparel & Footwear Association 2007).

New York City is the fashion designing capital of the US and one of the fashion capitals of the world. The New York fashion industry has long been putting their efforts to become and maintain to be the center of the US fashion/apparel industry and one of the fashion capitals of the world. Today, people often site New York City as the fashion capital in newspapers, TV broadcasting and fashion business textbooks. I looked into some economic numbers to examine its claim.

Although New York City has the largest apparel design service sector, Los Angeles has the largest manufacturing center in the US. I compare the four cities based on Stone’s (2006) textbook arguing that New York, Los Angeles, Dallas, and Miami are the market centers in the US (p.251).

Figure 2.13 shows the annual average employment level in four different manufacturing sectors (Textile Mills, Textile Product Mills and Apparel Manufacturing and Other Specialized Design Services) in the textile and apparel industry in 2007, and compares the four metropolitan cities. Other Specialized Design Services include fashion-related design services in clothing, fashion, and jewelry. For all four sectors, Los Angeles and New York City
Figure 2.13: Annual Average Employment Level Comparison of Four Major Metropolitan Areas - Apparel Manufacturing Sector 2007
Figure 2.14: Four Cities Comparison: Annual Average Employment Level for Apparel Retail

have a higher level of employment compared to Miami and Dallas, in particular, Los Angeles has higher employment than New York City in Textile Mills and Textile Product Mills and Apparel Manufacturing and more than twice the amount in Apparel Manufacturing. On the other hand, in other specialized design services, New York City’s employment level is twice the size of Los Angeles’ level. For employment level for clothing stores and department stores, New York City has the largest employment level and Los Angeles is the next highest (Figure 2.14). In summary, since 2007 New York City and Los Angeles have had the highest fashion-related industry employment levels in the country.
2.2.4 Comparison: New York City and Los Angeles

New York City is more concentrated in design creating services whereas Los Angeles has a larger garment-making process sector. I compared the New York City and Los Angeles from 1990 up to the current available data 2007. Figure 2.15 and 2.17 the apparel manufacturing established units are always higher in Los Angeles than that of New York. From 1990 until 1999, the number of units in Los Angeles increased until 2000 when it started declining steadily. The number of units in New York City has declined by a third of what it was in 1990.

The level of employment in apparel manufacturing in Los Angeles county has always been higher than that of New York City. The figure, Employment Ratio Los Angeles over NYC, shows that Los Angeles’s employment used to be 1.5 times as much as that of NYC in 1990. This ratio has an increasing trend to 3.8 times more in Los Angeles than NYC in 2007. For the average weekly wage in apparel manufacturing, the workers in NYC have always been paid more than that of Los Angeles. The average weekly wage ratio of Los Angeles/NYC indicates that the gap is widening. Los Angeles workers used to be paid 30% less than workers in New York City in 1990, but in 2007, the weekly wage was 50% less in Los Angeles than in NYC. Los Angeles’s apparel manufacturing has higher employment level per unit establishment business, and both Los Angeles and NYC indicate the average unit has smaller numbers of workers in 2007 than in 1990. Contrary to apparel manufacturing, New York City has two to three times more design firms than Los Angeles. Both levels of apparel firm units and employment have been growing over time for New York City and Los

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12Industry coding system has changed from SIC to NAICS. The time comparable data was only available back to 1990 at the Bureau of Labor Statistics.
Figure 2.15: Labor Aspects Comparison on Apparel Manufacturing Sector: NY and LA
Angeles. The average weekly wage is also higher in New York City than in Los Angeles, but in 2007 the gap became very small. The size of design firms is very similar to both in Los Angeles and NYC.

As government’s industrial classification was modified from SIC to NAICS in 2003, the comparable data for apparel manufacturing and design services were available from 1990. In SIC coding, partial data on the employment level for Women’s And Misses’ Outerwear of New York City and Los Angeles was available.

I examine the apparel manufacturing industry’s geographical shift from New York City to Los Angeles and plotted employment levels and trade agreement events (Figure 2.16). None of the data has continuous measure from 1958 until today. I selected data from four employment levels from the US Department of Labor database. The first, New York City’s annual employment level for the women’s and misses’ outerwear, has the longest data points from 1958 until 2001. The same data exists for Los Angeles but it was limited availability from 1970 until 1985. The third, New York City’s annual employment level for apparel manufacturing, was available from 1988 until 2005. Lastly, the annual employment level for manufacturing for Los Angeles County which was available since 1989 until 2006. Any two combinations alone could not show the geographical shift of the manufacturing business from NYC to Los Angeles. The NYC outerwear employment level and NYC annual employment level data from 1987 until 2000 demonstrate a similar pattern. New York City’s level of employment has had a declining trend since 1958. When I assume Los Angeles’s outerwear and Los Angeles County’s apparel employment level would also shift at the same pattern to each other, I can say that the annual employment in Los Angeles keeps increasing until 1995
Figure 2.16: Historical International Trade Law and Employment Comparison New York and Los Angeles Area
and declines thereafter. In Appendix A, there is a brief summary of the trade agreements relating the fashion industry.

Despite the spike in the manufacturing employment level in the Los Angeles area, the level of employment has been declining. It corresponded to the ATC’s quotas 10-year phase out period, which started in 1995. There have been increasing imports from developing countries over time. For 10 years the quotas on textile and apparel products were gradually eliminated in four stages. By the end of the period in 2005, the quotas were finally eliminated, except for China. The George Bush administration repositioned a bilateral agreement with China for quotas after the end of the ATC, which started on January 1, 2006 for three years. Elimination of quotas forced the US apparel manufacturing to face the world competition under free trade. (See Appendix A.)

In summary, New York City was once the capital of apparel manufacturing in the US, but it was taken over by Los Angeles in 1987. Overall, the US textile and apparel industries’ employment level has been declining. To some degree, productivity and technical improvements in textile and apparel production maintain some levels of output in the US; however, the automation requires fewer workers. The textile production is "very capital intensive and up-to-date technology is essential" (NAFTA 2005). High quality textile requires technical skills to produce. That area of manufacturing stays in the US, with fewer employees. Relatively cheaper labor countries, such as China and India, took over non-luxury textile manufacturing.

\[13\] Meanwhile, in 2000, Caribbean Basin Trade Partnership Act (CBTPA) started and it encouraged Caribbean basin countries to construct apparel with import fibers from the US. These products were tariff free product to US. Further research is needed to conclude any impacts from the CBTPA on LA employment level.
On the other hand, the fashion-related design services still remain very active in New York City with an increasing trend in the number of firms and level of employment (Figure 2.17). New York City shifted its function from actual garment making to design service over time. The average weekly wage is higher in New York City than Los Angeles, as New York City has more design firms and sample garment sewing services. The design firms request sample orders in small numbers for each design. More technical sewing labor is requested, and workers are paid higher according to their ability. Further research is required for labor union activities and its economic impacts apparel manufacturing and design sector in New York.

Data Source: US Department of Labor, Database from State and Metro Area Employment, Hours & Earnings. Data for the private sector in 2007
York City and Los Angeles. I left out the economic measurement comparison of fashion-related wholesale, advertisement and magazine industries between the two cities because of limited data availability. These industries are large and many of them are in NYC. It would further support the argument that New York City is the fashion capital of the world, but I leave this for future research.

Some of the technical difficulties I encountered were the category variations in the US database. Governmental industry classifications do not systematically categorize the fashion industry the way I include in Figure 2.1. There are two major governmental classification systems; North American Industrial Classification System, NAICS, and Standard Industrial Classification, SIC. Under NAICS, Textile Manufacturing is NAICS 313 and 314, Apparel Manufacturing is NAICS 315, Footwear Manufacturing is NAICS 5162, Leather accessories goods manufacturing such as bags and belts are NIAICS 5169, Apparel Wholesaling is NAICS 4243, and Clothing and Clothing Accessories Stores is NAICS 448. One will need to pull the relevant categories to see the entire fashion industry picture. Some firms may specialize in fashion advertisements, but it may not be possible to separate their specialized area of expertise among advertisement industry.

Apart from the above economic measurements, there are two more aspects to claim that New York is the center of the US apparel industry. First, semi-annually since 1943, New York City hosts fashion shows and are reported as a part of international fashion markets, in parallel to Paris, London and Milan.\textsuperscript{14} The events reported in television, newspapers and industrial journals. Secondly, the city is home to the top ten fashion magazines in

\textsuperscript{14}For the Spring/Summer 2008 collection, New York Fashion Week scheduled from September 5 until 12, 2007, London Fashion Week is from September 15 until 20, Milan Fashion Week is from September 22 until 30, and Paris Fashion Week is from September 30 until October 8.
the country. I suggest the scale of the fashion magazine industry to be a future research topic. Despite the decreasing employment level for apparel manufacturing business, New York City’s fashion industry is still the center of the national apparel industry and one of the fashion capitals of the world due to the concentration of high-end brand firms and the presence of New York Fashion Week.

2.3 History of New York Fashion Week - Three Different Eras-

There are three distinguishable periods of the New York Fashion Week’s historical development since 1943. The first period is the emergence and inauguration period of organized fashion shows in New York City. The second is the period of rising designer labels starting in 1952. This is the 35-year period during which the largest number of new designer labels appeared. Some designers stayed in business and some could not. The last and current period in New York Fashion Week’s historical development is organized fashion shows starting in 1988. Each period developed to serve a unique purpose in the fashion industry. Mell (2011) mentions the beginning of NYFW and how it started, but skips the middle development and explains the more recent formation since 1993. The following paragraphs explain the details of each period.

It goes back to 1943 when the origin of the current New York Fashion Week started in New York City.\footnote{The earlier time, organized fashion shows exist in New York City. In 1932, Fashion Originators’ Guild of America was created by textile and apparel manufacturers in the city. It started to have fashion shows since 1932. Attendees were buyers. Local reporters were invited as New York Times reporting their events, but I}
the United States. It was called Press Week or National Press Week During World War II, when Paris was occupied by the Germans, the Paris fashion shows could not go on as many European designer brands closed their stores and apparel businesses operated with limited resources. American fashion buyers and designers lost a destination to visit to follow the fashion trend. Meanwhile, manufacturers in New York saw the situation as an opportunity to promote New York-based designers and creations to the rest of the US. The International Ladies’ Garment Workers’ Union (a.k.a. Unite Here! as of 2012), The Joint Board of The Dressmakers Union and the New York City government founded The New York Dress Institute (NYDI) and ran a "New York Creation" campaign. Eleanor Lambert, a public relations agent, was appointed and formed a division called "New York Couture Group" within the NYDI that ran New York fashion shows for out-of-town newspaper editors. It was called the Press Week. The first Press Week took place in July 1943. Fifty-six out-of-town major newspaper editors were invited to attend the fashion shows, parties and visiting tours of manufacturers in New York City. No buyers were invited. The editors then wrote articles about these great American designs under fabric-saving restrictions imposed by the Government as a war economy effort. For the Press Weeks, only member designers to the NYDI could present at the show The second period from 1952 until 1988 was when other fashion shows in New York City started to gain more attention and Press Week became less of its center. Fashion Originators’ Guild of America started to get more attention as an organizer of fashion shows. Meanwhile, many individual designers and manufacturers had their fashion shows around the time when other organized fashion shows took place. As a could not confirm if out-of-town reporters were also invited or not. However a future research needs to be done. Some other organization such as The Sportswear Guild and The Dress Creators’ League of America, Inc. also collaborated their shows with FOGA.
result, shows could last for an extended period of time, leaving attendees exhausted. As many designers had their shows at different locations, attendees often had to move across the city to attend them. Not only editors, but also buyers were attending these shows. During this period, the number of designer brands expanded.

The third period starting in 1988 was the movement toward the centralized fashion shows in the city. The scattered locations and lengthy fashion shows were inefficient. Often shows started late. In October of 1988, the first New York Fashion Week took place. Many designers operated their shows at different locations. However, in 1992 safety concerns were raised after a falling ceiling incident occurred in Michael Kor’s fashion show. In response, the non-profit organization Council of Fashion Designers of America, CFDA, was founded in 1993 by Lambert, the public relations agent. A special division of the CFDA called “7th on Sixth” was created to organize the bi-annual fashion shows. From 1993 to 2010 7th on Sixth set up three large tents in Bryant Park for the fashion shows, and most of the high-end luxury brand were displayed there. In 2010, the centralized bi-annual one week length fashion shows moved to Lincoln Center for the Performing Arts and became what is known today as New York Fashion Week.

\[16\] Once it moved to Chelsea Piers in 1997.
2.4 Impact of New York Fashion Week to the NY and US fashion industries

New York Fashion Week has a significant role in the New York City and US fashion industries. New York City hosts many of the US fashion brands’ headquarters, especially top ready-to-wear designers or designer brands. The city is also one of the world’s fashion capitals and hosts NYFW. Its activities generate economic transactions throughout the city. The world recognizes New York City as the fashion city and many tourists come and shop in the city. For the overall the US, fashion trend diffusion model generates economic activities over time to different price points consumers. The top of the trend diffusion model finds NYFW designers, then a new trend diffuses to the rest of the US fashion industry.

The design sector of the US is concentrated in New York City and includes high-end ready-to-wear designer brands. Most of NYFW designers have their headquarters in the city. New York designer brands are often named after a designer who starts the brand; Ralph Lauren and Diane von Furstenberg, are good examples. The designers bi-annually prepare a new collection of approximately twenty to thirty head-to-toe complete styles for NYFW. This type of brand is known as a "signature brand" (Frings 2004). Even when designers retire, the brand names sometimes remain with the business and are run by other designers for signature brands. For example, after the designer Larry Aldrich retired, his brand name remained while Marie McCarthy was designing for the brand. Other brands have unique business names; for example, TIBI and Abaete, were founded/designed by Amy Smilovic and Laura Poretzky, respectively. Each season, designers come up with their brand themes to translate a concept or what they see in the world into garments. Some designers
use a motif from a particular country or culture, or images from a famous artwork or movie. Some reflect current events such as economic performance and interpret those into clothing. Often, cultural stimulations such as music or art events that emerge in the city can be a source for designers’ inspiration.

New York City provides designers great resources to run their business. Despite much of the US apparel production moving overseas, the city still retains apparel-manufacturing companies. The city and the industry provide incentives for old and new apparel manufacturers to stay in the city\textsuperscript{17} by offering funding and zoning that protects manufacturing buildings. These manufacturers are relatively small, but have highly skilled dressmakers. Designers can easily coordinate with them to make high-designer samples in a short time.

Fashion designers present during NYFW when they want name recognition under the high-end ready-to-wear brand category. It has become a great marketing tool today. The bi-annual New York Fashion Weeks attract approximately 232,000 attendees to more than 500 shows, including large and small-scale fashion shows. The event generates a total of $887 million per year for the city, including an estimated $532 million in direct visitor spending. NYFW’s economic impact surpasses other NYC major events such as New York City Marathon ($340 million), the 2014 Super Bowl in New Jersey ($550 million), and the U.S. Open ($800 million) (Maloney 2015). Many professionals take part in NYFW such as show producers, photographers, stylists, models, model coordinators, hair and make-up artists, stage managers, and public relations agents. Some are hired directly by fashion brands and others are hired by a fashion show organization for NYFW.

\textsuperscript{17}New York City Mayor de Blasio announced tripling the city budget for the industry from $5 to $15 million. Trying to promote "Made in NY" initiative.
A talented designer is only part of the high-end fashion business. In New York City, the fashion industry employs approximately 200,000 people, half of them in retail and pays $11 billion in wages. The city generates $2 billion in tax revenue each year. New York City also has a great number of advertising, marketing, and public relations companies that work with fashion brands throughout the year.

NYFW designer brands offer products to customers at the top of a trickle-down fashion diffusion path in fashion theory, which leads to increased fashion business throughout the US. Fashion trend apparel is at first very expensive and exclusive with a limited quantity. Only consumers with high disposable income can purchase them. High-end designers can easily charge $1000 or more for a jacket, allowing them to use much better fabric and workmanship than mass-produced counterparts. The designer goods give consumers’ higher status. Consumers with lower disposable income like to imitate those with higher income. The lower price range retailers start to offer the most wanted designs, and more people are able to buy them cheaper than the original ones.\(^{18}\) The following researchers took this trickle-down fashion diffusion path approach: Simmel (1904), Leibenstein (1950), Sproles (1981), Matsuyama (1993), Coelho and McClure (1993), Pesendorfer (1995), Corneo and Jeanne (1997). They found that once the market is saturated with a trend, a new trend is in demand so the industry can lure consumers, especially those consumers characterized as snobs who want to be different from the majority of the population. As a trend diffuses, many layers of the industry make money.

NYFW creates new consumer demands for new products. Through professional eyes,
designs and trends are formed through processing visual information. The large number of attendees sees many collections within a short period of time and pick up noticeable, new trends that are translated into blog posts, magazine editorials, media round-ups of NYFW reports, advertisements, stores’ show-window displays, and celebrity appearances. The industry induces new consumer demand all over the US and it can sometimes criticized as planned obsolescence. Planned obsolescence is that the cycle of creation of trend makes consumers purchase new garments before their garments have worn out. Each firm and consumer behaves rationally, which means that they try to maximize profits for firms and utility for consumers. As a result, the industry makes the past garments obsolete and consumers purchase new goods. It is criticized for wasting our social resources. Through those many filters in the society, copies or inspired designs were made and becomes available to all the price level apparel clothing. This business structure provides NYFW designer brands the opportunity to have a great influence on the NYC and US fashion industry.

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19 On the other hand, there are increasing numbers of firms take social responsibility in their business actions such as “Worn Wear” business model by Patagonia.
Chapter 3

Previous Research on Economics of the Fashion Industry

Economists have applied different economic theories to understand the fashion market behavior such as the product cycle (Doeringer and Crean 2006; Pesendorfer 1995), monopolistic competition (Gregory 1948), location models (Donohue 2000), international trade (Bhavani and Tendulkar 2001) and conspicuous consumption aspects (Bagwell and Bernheim 1996; Basmann, Molina, and Slottje 1988; Hopkins and Kornienko 2004; Leibenstein 1950). Other academic disciplines have studies on fashion and apparel industries; one can find examples in business research, consumer behavioral studies in psychology, cultural and gender dress codes in sociology, history and literature. Economics arrived relatively more recently in fashion studies than other fields. Because traditional economics approach had its own limitation to apply for fashion in a society. The more recent behavioral economics approach allowed to understand the fashion market behavior better.

I found that traditional economics explains some aspects of fashion market behaviors. Pure competition and its long-running analysis can support explanations of a fashion diffusion path model (Figure 3.1), which has long been accepted by fashion studies. The fashion industry is known as a textbook example of a monopolistic competitive market as many brands differentiate products within a very competitive market environment. Vertical integration theory is widely used in fast fashion businesses and private label brands. Innovative
designs and material are attractive to consumers. However, unlike the pharmaceutical and technology industries where intellectual property law protects new innovations, only a small part of fashion innovations can meaningfully obtain patent protection, such as logos and brand names. Fashion diffusion occurs much quicker than a government can process filed design innovations. Most new designs have no chance of obtaining intellectual property protection. There are no barriers to entering a market of a special style. It is a paradox that new ideas should be patented; however, designers make money when more people want to buy from them. To be at the top of a trend, a designer wants copycats to follow him and be inspired by his new design. The designer benefits by staying on top of the diffusion model. This is called piracy paradox; an explanation will be in this chapter.

A supply and demand analysis with pure competition in the long-run helps us understand
a fashion emergence and its diffusion model or fashion cycle model (Figure 3.1) in fashion studies. It has always been introduced and recognized in fashion studies without an economic mechanism behind the model. The diffusion model explains that when a new trend starts, it appears and is accepted by a very small group; as time passes, the fashion-following population starts to wear the new trend. As even more time passes, it becomes cheaper. Fashion industry experts know this information by observing the market and their experiences. How does the traditional supply and demand analysis jump into this? I connect them by using Figures 3.1 and 3.2. When a new design is released for a show, it may catch fashion leaders’ attention, become available in a small quantity, and sell at a very high price (equilibrium: $E_0$). Fashion firms that successfully deliver these new trends in the market early make significant profits with relatively few quantity sales. Fashion-followers start to notice the new emergence of the trend and demand product increases (from $D_0$ to $D_1$). As
other competitors see the profits of incumbent firms, they also enter the market, and the supply increases \((S_0 \text{ to } S_1)\). Gradually, the firms charge less \((P_1)\) for the products. Therefore, each firm makes less profits. More fashion followers are able to buy the design/style at an affordable price. This mechanism keeps occurring when one design or style market reaches its long-run equilibrium \((E_2)\) where all the firms make a normal profit and the price of the product breaks even. That assumes all firms have the same cost curves. Once the trend spreads in society, fashion leaders want to be different from the majority. The leggings trend in the 2000s is a perfect example. Basic leggings are a standardized product. When it first became available, it was only in luxury department stores for $100 each. By 2012, each pair cost about $8, and we could find them everywhere. This is a traditional long-run pure competitive analysis of supply and demand mechanism. Once the market is saturated with a certain product, the fashion industry needs to create a new trend; otherwise, all the firms only break even. This same long-running equilibrium mechanism continues to repeat. The consumer’s trendy garment may still be functionally usable, but because it becomes obsolete in fashion, consumers replace it with a new design. This is known as planned obsolescence. Fashion forward manufacturers and retailers keep providing new designs in order to make a profit. This approach, without introducing game theory, supports the fashion cycle model in fashion theory well.

Designers who present at NYFW have a significant function in the industry. They offer the initial designs to the market, and through a complex collective selection system, some designs or styles turn into trends. Fashion writers and buyers attend as many shows as possible and notice the designs or styles that keep coming up in the season. Fashion-forward
consumers are the first to try the new styles. High designer brands offer them new designs at a high price. Lower price range fashion companies are "inspired" by the new trend and deliver the new styles in their stores. Fashion followers can acquire the style at an affordable price at later time. This diffusion model is known as trickle-down theory.

There are three major trend diffusion models: trickle-down, trickle-across, and trickle-up (Kawamura 2005). I would like to suggest one additional one. In the trickle-down diffusion model, a new trend emerges at the top of the social pyramid and then diffuses to the lower levels. Trickle-across diffusion happens when a new trend comes and spreads out horizontally to homogenous groups. The assumption is that each group has its own fashion leaders. Socio-economic or age groups are not important elements for a trickle-across diffusion model. Trickle-up is when a trend starts from the lower social class and imitation happens in the upper class. While we can observe all these diffusion models today, the trickle-down theory best explains the positioning and function of NYFW. The trickle-down theory was the only diffusion model to explain fashion consumption more than one hundred years ago (Simmel 1904). What is different from that time and today is that the fashion diffusion path is no longer dependent on social class stratum diffusion. Fashion leaders today appear in expensive designer brands and styles, but they are not necessarily from the very top economic classes. I suggest adding to the fashion studies a forth category of diffusion model called trickle-jump-up-then-down. For example, a street fashion is picked up by designers and re-invented in high-quality style ways at NYFW so then trickle-down diffusion happens. In fact, I see this more and more with the wide availability of street images on the Internet.
The paradox in the intellectual property and innovation that the fashion industry faces is called piracy paradox. In general, the main idea for intellectual property is to protect new innovations which provide firms the chance to make good profits. The system encourages more innovations in the economy by showing that new ideas will be protected. However, in the fashion industry, without strong intellectual property rights, firms constantly innovate new designs and styles. Firms bring trademark infringements to those firms that copy the originals in order to protect identifiable brand trademarks; however, design copying is often ignored. Fashion designs remain mostly unprotected (Chaudhry and Walsh 1996; Raustiala and Sprigman 2009; Hemphill and Suk 2009). In other industries, the intellectual property rights succeed in protecting and promoting firms’ innovations such as pharmaceutical medicines, technologies, movies and music. The major difference between those industries and the fashion industry is that in other industries, one innovation serves the economic range of consumers. For example, when a pharmaceutical medicine is innovated, it is temporarily protected by a patent, meanwhile the company has a monopoly on all the customers in need of this medicine. Once the patent is over, generic products enter the market. The same is the case for the movie and music industries where the original products are protected by the law. A style of movie and music can be copied. New products are not exactly the same, but the "feel" is still similar. Copying the original is not permitted in these industries. On the other hand, because each firm in the fashion industry tries to differentiate from other competitors, one major strategy they use is branding. When the leaders of a firm build a brand, they identify their target consumers by socio-economic criteria. This can be seen as industry-wide price discrimination. Consumers reveal their willingness to pay for clothing
based on their brand preferences. Because each brand serves a specific socio-economic group, the advertising, materials, and presentation of their final products are chosen according to their target consumers. A luxury brand might offer its bridge line, a less expensive brand line, such as when Donna Karan offers Donna Karan’s DKNY. This practice expanded in markets during the late 1980s. It is a firm’s own knock-off line or price discrimination. They do this because each brand targets only a certain range of socio-economic consumers. Each position in the fashion-branding spectrum has different means to make money in the industry. High-end brands create few pieces at a high price. Their costs may be high, but the very high price of the product can make them profit. Low-end fast fashion offers many garments at a low price. Because of the economies of scale they face, they make smaller profits per garment, but sell large quantities to make money. Many fashion studies fail to mention this industry-wide price discrimination system.

The more recent behavior analysis approach has been applied to the economic studies of fashion. There are two major approaches to analyze the fashion behavior and industry in economics: consumer-side and producer-side analysis. Some of the fashion research needs both sides. Consumer-side analysis topics are some range of positional goods and social interactions such as a consumption pattern that one consumer’s demand is stimulated by observing other consumers’ demands. Some more topics such as Veblen theory of conspicuous consumption, signaling, snob effect and externalities will be covered in this chapter. Producer-side topics are design differentiation, fashion cycle game theory, and scarcity. Counterfeit products have the mixed of both sides. My empirical analysis in Chapter 4 contributes to find determinants of the number of high-end fashion firms in the
industry.

In this chapter, I summarize the economic literature that analyzes fashion industry, fashion-related behavior for consumers and firms. I separate consumer-side and producer-side behavior.

### 3.1 Consumer-Side Behavior with Fashion-Related Goods

Traditional price theory focuses on individual consumption choices, but that cannot fully explain consumer behavior on fashion goods. The conventional approach is that an individual makes a combination of consumption choices that maximize his/her own utility within his/her budget. The individual maximizes his/her utility without any consideration of consumption choices made by their social environment. However, with fashion-related goods, people make purchasing decisions for other reasons than maximizing his/her own satisfaction by consuming products as well. First, the consumer chooses certain things because of how they signal certain characteristics such as status, lifestyle, taste or personality. Second, the consumer purchases certain fashion goods because his/her peers have them. Becker (1974) discusses this as social interaction in economics. An example would be Nike shoes for males in a group who want to have the same limited version of Nike sneakers. This is known as the Bandwagon Effect. Third, when too many consumers buy the same item or style, he/she needs something new to differentiate from the others. This phenomenon is known as the Snob Effect (Leibenstein 1950). Besides a few economics papers in the 1980s, purchasing decisions related to interpersonal utilities or observance of other people’s purchasing decisions have not been discussed in economics, in part because the topic was considered to
be more in the sociological research field. Also game theory evolved and gave a path to incorporate the interpersonal effect on consumer’s demand in economics through the 1970s and 1980s (Manski 2000). When examining economic applications to describe consumer behavior on fashion goods, one must consider the theory of interpersonal consumption.

Terms that are used in the interpersonal consumption theory are not uniform. It depends on the emphasis of the researcher’s approach. Following the lead of Leibenstein (1950), Akerlof (1997) called it "social interaction theory" (p.1007). It explains the interpersonal effect on consumer’s demand in that some types of consumption goods bring extra positive or negative utility from other people’s evaluation of the goods. The goods that consumers can evaluate for their quality and value are called "status goods." Status goods bring extra positive utility from other peers’ attention, envious looks, admiration or acknowledgement. These goods can signal the wealth of the consumers. Kircher and Postlewaite (2008) use the term "information spillover" (p.662). Kirman (1997) uses the concept of information spillover and puts together a wide range of social networking surveys in economics mainly from the concept of game theory. Agents’ positions interact with each other to form a market. Kircher and Postlewaite explain that consumer leaders have more information about certain goods’ quality and can convey that to other types of consumers (Nelson 1970).

Hirsch (1976), Frank (1985), Basu (1987) and Scitovszky (1945) emphasize the characteristics of goods that allow consumers to compare their relative consumption among peers. The study area of "peer influences" and "neighborhood effects" comes from sociology (Manski 2000). There are two types in goods: "positional goods" and "non-positional goods." Positional goods is the valuation of those goods that depends on the comparison to other
goods owned by peers. Non-positional goods do not depend on comparisons. Other researchers emphasize the notion of externalities.

In contrast to externalities distinguished by the physical externalities of physical mediums, such as pollution, apple and honey farms for example, these are "social externalities," "consumption externalities," or "network externalities." Pastine and Pastine (2002) show the role of advertisements in social externalities when the consumer pays a higher price for heavily advertised brands. Akerlof (1997) suggests the political implications of social externalities in education in poor neighborhoods. For example, when the government created a policy to change the social expectations of children in poor areas by providing college scholarships to all the students, it changed the children’s educational performance for the better. When the social expectations for all of them changed, all the kids had better outcomes. Fershtman and Weiss (1993) argue that in status-seeking behavior, an individual's wage is used as an indicator, creating a wider wage gap and lower aggregate output in the economy. Becker (1974) analyzes the utility functions of a person when he cares about a group he belongs to such as his family or community. It suggests policy implications for community services. These social interaction approaches have long been studied in the sociology or psychology fields.

Economists have started to apply the bandwagon effect or conformity actions in the society to many different economic behaviors as well. Here I would like to review the literature, starting with some that give an overview of the relationship between economics and social interaction. Then I will show the theoretical and methodological approach and applications for consumption, firms and markets.
3.1.1 Bandwagon, Snob and Veblen Goods

I review the Leibenstein’s (1950) interpersonal demanded goods: bandwagon, snob and Veblen goods. Bandwagon and snob effects focus on the demand changes depending on the estimated quantity that peers possess. Leibenstein defines bandwagon that demand for a commodity is increased as there are more consumers consuming the same thing. As for the snob effect, when a consumer observes too many people possess the same product, he/she wants to deviate from the coherent group and avoids purchasing the product. Leibenstein examines the slopes of a demand function with these effects. The demand curve with bandwagon effect is more elastic, while the snob effect is less elastic than the curves without these effects. Let $x_i$ be consumption of the $i$th consumer, let $p$ be the relative price of $x_i$. Let $x$ be per capita market consumption. The individual demand function for a bandwagon good is

$$x_i = \alpha - \beta p + \gamma x.$$ 

Aggregate to the market level and divide by the number of consumers:

$$x = \alpha - \beta p + \gamma x.$$ 

Rewrite this equation and solve for $x$,

$$x = \frac{\alpha}{(1-\gamma)} - \frac{\beta}{(1-\gamma)} p.$$ 

Assuming that $\beta > 0$, represents Bandwagon and Snob consumer behavior, the slope of the demand curves is negative. That is to say that $(1 - \gamma) > 0$, which is $\gamma < 1$. The conventional demand curve has $\gamma = 0$. It means that individual demand does not reflect other consumers’ purchasing behavior. Bandwagon has a property of $1 > \gamma > 0$, that explains how the individual demand curve increases as more of the population purchases
the product. It also explains that the slope of the demand curve for Bandwagon products is more elastic than when $\gamma = 0$. Let $D_i$ be a hypothetical market demand curve when consumers up to $i$th consumer purchases the goods. When price reduces from $P_1$ to $P_2$, then quantity demanded increases from $a$ to $x$ (Figure 3.3). Assuming that $a < b < c$, when more people are believed to have purchased the product, then consumer demand increases to the quantity level on $D_c$ at $P_2$. As price goes down to $P_2$, the quantity demanded increases up to $c$. The increase of $xc$ is the effect from the bandwagon. $E_i$ to be the estimated market demand with $i$ consumers have purchased the product. This line $DB$ represents the market

Figure 3.3: Bangwagon Demand Curve
demand curve after allowing feedback of the bandwagon effect. The slope of the demand curve is flatter than the conventional counterpart, and $1 > \gamma > 0$.

The price elasticity of demand turns out to be independent from $\gamma$. 

$$\frac{dx}{dp} = -\frac{\beta}{1-\gamma}$$

and the price elasticity of demand is, 

$$\varepsilon d = \frac{dx}{dp} \cdot \frac{p}{x}$$

$$= -\frac{\beta}{1-\gamma} \cdot \frac{\frac{\alpha}{\beta}}{(1-\gamma)} \cdot \frac{p}{\frac{\beta}{(1-\gamma)} \cdot p}$$

simplify this 

$$= 1 - \frac{\alpha}{\beta} \cdot p.$$

Price elasticity of demand for bandwagon or snob is independent of $\gamma$. It is unit-elastic when $p = \frac{2\beta}{\alpha}$, elastic when $p < \frac{2\beta}{\alpha}$, and inelastic as $p > \frac{2\beta}{\alpha}$.

For snob goods, $\gamma < 0$: as more people have the product, demand for the product decreases. In this case, the market demand for snob goods has a steeper demand curve than that of conventional products. To see this, let’s assume $Dn$ is a hypothetical market demand curve when "$n" number of people are believed to have purchased the product. When the price reduces from $P1$ to $P2$, then quantity demand increases from $a$ to $x$ in the conventional demand theory (Figure 3.4). Assuming that $a < b < c$, when more people are believed to have purchased the product, then consumer demand for the product decreases to the quantity level on $Dc$ at $P2$. As the price goes down to $P2$, the quantity demanded increases to $c$ and not as much to $x$. The quantity in demand decreases by the amount of $cx$, which is the effect from the snob. $Ei$ is the estimated market demand with $i$ consumers who have purchased the product. This line DS represents the market demand curve after allowing
Figure 3.4: Snob Demand Curve

feedback of the snob effect. The slope of the demand curve is steeper than the conventional counterpart, and $\gamma < 0$. As shown above, the price elasticity of demand is independent whether or not the product is bandwagon or snob.

The Veblen effect, with $\gamma > 1$, makes the demand curve upward sloping (Figure 3.5). As the price increases, more people want to buy the goods. As the price goes down from $P_1$ to $P_2$, in the conventional demand curve, the quantity demanded should increase from $a$ to $x$. 

Figure 3.5: Veblen Effect and Demand Curve with the Effect
Leibenstein calls this the price effect. However, with the price reduction, the commodity loses its attractiveness so the consumer demand drops and the quantity demanded drops to \( b \), causing the Veblen effect. As long as the Veblen effect is larger than the price effect, then this market demand curve is upward sloping. However, if the Veblen effect is not as large as the price effect, the demand curve still has a negative slope.

Depending on the price range, the slope of demand for a conspicuous good can be positive and negative. Let’s say there is a price point where nobody can afford to buy, \( P_H \). As the price goes down while the Veblen effect is not as great as the price effect, some people can afford to buy the product. However, once the price becomes lower, then the commodity loses its symbolism of the consumer’s wealth so that some people stop buying the product. Thus, the Veblen effect is now greater than the price effect, and the demand curve is upward sloping. Therefore, the curves can be somewhere among those graphs in Figure 3.6.

Figure 3.6: Possible Veblen Demand Curves
The Veblen market happens in a monopoly or monopolistic competition. While firms can control the price of the product, the market can sustain where the Veblen effect is larger than the price effect, therefore, charging higher price can increase the quantity demanded. Veblen behavior is also known as conspicuous consumption at a high price. The conspicuous price is the price that the consumer thinks other people think he paid for the commodity. It is a positional good. Veblen pricing may occur done for fashion-related items if the firm is an established luxury brand. One may observe such behavior in luxury brand jewelry, perfume, watch or bag markets. As for a firm, once it establishes the brand, then it may perform pricing as Veblen. The more branding power it creates, the more of a price increase may be possible. However, if the price level becomes so high that not as many people can afford the product, then the quantity demanded starts to decrease until it reaches a price that nobody can afford.

There are three possible Veblen demand shapes to be considered (Leibenstein 1950). Under these conditions, the possible demand for luxury fashion-related goods can be limited. Kort, Caulkins, Hartl, and Feichtinger (2006) applied the Veblen consumer behavior on how fashion designer brands market their brand images in the short-term and long-term. If the price is modestly marked up, then the brand derives its value from consumers in the short-term, but when the brand becomes fully diluted, then the brand should retire. However, if the markups are substantial, then an existing brand should keep running. In that case, the brand might incur some temporary loss. The Veblen effect can be observed in the Rolls Royce case. Rolls Royce was the established and luxury car brand in the 1970s and 1980s. Swann (2001) observed that "excessive" growth in sales of some Rolls Royce models during
that time had the effect of slightly debasing the brand. Driving an old Rolls Royce was good, but new ones were perceived as brash. Amaldoss and Jain (2005b) studied the Ferrari brand and concluded that Ferrari promised to produce a limited number of 4300 vehicles when there was a two-year waitlist in order to exploit the Veblen consumer behavior. In apparel, Hermes offers Birkin bags, which can price at $70,000 and the purchase is on a waitlist. This type of market becomes pure competition, which I cannot think any markets with Veblen goods, a market supply curve is must be more elastic than the demand curve. When supply increases, the price decreases and so does quantity when the Veblen effect is stronger. However, once market price becomes low enough, then the market acts as pure competition.

The two types of consumers in the fashion market are sufficient to establish the fashion cycle. Consumers who behave as "snobs" in their fashion-goods purchasing behavior desire to be different from other people. Granovetter and Soong (1986) explain the snob-effect: "[s]tatus-seeking may require avoidance of an overly popular product " (p.84). In this case, status should not only be referred to as the social status hierarchy, but also one that shows one’s good sense of taste. This group’s status-seeking behavior allows the fashion to cycle. This self-reinforcing behavior is observed when a good is overly populated causing some consumers to avoid purchasing it. Snob consumers need new styles, which is a status-seeking behavior. Designers come up with new styles to respond to this demand. The bandwagon consumers follow the lead as more people possess the item. Then a new design is in demand.
3.1.2 Fashion Cycles

A fashion cycle is a phenomenon that a style follows the fashion diffusion path. Once a style becomes obsolete, a new style follows the diffusion path. The same style may come back to a mainstream trend again after a couple of decades. I described earlier about leggings style popularity in the 2000s that followed the fashion diffusion path. New styles emerged after the leggings. It was also a revival of the style from the 1980s. Some economists looked into this fashion cycle.

Pesendorfer (1995) used a game theory approach. Pesendorfer assumed that consumer types needed to be separated into snob and bandwagons and introduced two varieties of fashion. This setting made consumers to wanted to have new fashion. Granovetter (1978) examined the balance between bandwagon and snob effects using the case of riots. As a riot grows, causing a bandwagon situation, it is less costly for each participant. Granovetter models the threshold timing to join a riot as depending on preference. Some snob population who has low threshold and join the riot even when only small population is on the riot. Gravenotter mentions that innovation diffusion is also similar to mixed bandwagon and snob behavior, which one can find in fashion industry.

Amaldoss and Jain (2005b, 2005a) mix up the snob and Veblen behaviors. They mentioned that their analysis is based on “the presence of a stable and unique upward-sloping demand curve for the snobs” (p.10). They state that, "The desire for uniqueness can increase demand among some consumers as the price of a product increases" (p.1). Veblen behavior explains when price increases, consumer demand increases. The uniqueness should be the result of the Veblen behavior of consumers, not the other way around.
To sum up, the majority of fashion-following behavior can be explained as Bandwagon, but the fashion-consumption behavior of only a handful of consumers who possess certain styles and designs is explained by Snob and Veblen consumption. However, the motivations behind consumer behavior and which market fits with which model are different. Snob is the main force for new designers to create new styles and designs because some individuals want to dress differently from the crowd. New designs that designers introduce bi-annually are more likely to be sold in the high price range, but can be in the lower price range as well. On the other hand, when the Veblen effect plays in fashion goods, the brand has to already be established so that quantity demand increases as price increases. By the time this behavior starts to appear in the market, the price range tends to be very high. Under both circumstances, only a handful of individuals purchase these fashion-related goods.

3.1.3 Interpersonal Consumption Theory

Using the interpersonal consumption theory, Nelson (1970) raised a point that a firm’s monopoly power is not only from market-size variables and cost function, but also from information about consumers. Nelson separated goods into two categories: search goods and experience goods. Search goods are goods that a consumer can judge in quality before making a purchasing decision such as clothing and cameras. Experience goods are the goods that consumers have to purchase to find out its quality such as liquor, tires and batteries. The latter case is pricier for consumers. Nelson empirically examined data from consumer reports and governmental organizations and found that there is more monopoly power in markets for experience goods, especially durable goods. Also, consumer recommendations
are used more for experience goods and durable goods. Stores that sell search goods such as apparel must have more retail advertising and a higher inventory/sales ratio than stores that sell experience goods.

Frank (1985) examined the difference in demand for non-positional and positional goods under cooperative or non-cooperative behavior in somewhat broader aspects. Frank uses Hirsch’s (1976) term "positional goods" as goods whose value depends strongly on the perceived value by others. "Non-positional goods" do not have value dependent on perceived value by others. He notes that on the personal level, people make their consumption, job and saving-level choices relative to their peers. Frank explains how the demand for positional goods is the same as the Prisoner’s Dilemma situation. When consumers determine their consumption cooperatively, they spend less on the positional goods compared to the situation when consumption is based on a non-cooperative way.

Kircher and Postlewaite (2008) used a game theoretic approach and found evidence of the information spillover that market leaders’ consumption choices influence other consumers’ consumption decisions. Kircher and Postlewaite examined the significance of firms’ extra services to goods they sell to an exclusive group of consumers, which generates more sales as followers buy the products. For normal goods, wealthy consumers become the leaders. Some examples one observes are that celebrities and athletes receive free goods and services. The assumption is that these people are exposed to so many goods that they can find high-quality goods easily. Poorer consumer groups can save time searching by learning from leaders’ consumption behavior which products are high-quality.

Gui and Sugden (2005) explore some connections between economics and social interac-
Some industries lost social interactions within industries, such as financial market, and textile industry before and after the Industrial Revolution. Other industries faced technology adoptions and consumption choices increased over time such as in fashion industry. First, a change in fashion trend to be seen as incompatible to the current society, a resistance to adopt the new and very different trend. Over time, this negative perception dissipates with experience within the society and the change eventually be accepted. Banerjee (1992), Ellison and Fudenberg (1993) and Bala and Goyal (1998), Horst and Scheinkman (2006) applied game theory and showed how neighbors choose the same actions in the long run. Banerjee found consumer behavior in sequential decision making setting, a consumer can settle down a decision that may not have been his first choice. Bikhchandani, Hirshleifer, and Welch (1992) saw their theory applications to fashion that the leader has the least cost to start a trend and later decision-making consumers in fashion would follow the leaders. Ellison and Fudenberg looked into technology adaptation in consumers. Eventually, consumers have tendency to use more popular technologies in a long run. Cooper and John (1988) uses the two different interaction levels to their analysis in their game and looked at employment issues.

Manski (2000: pp.23-24) distinguishes this empirical research into three different hypotheses.

1) endogenous interactions, where in the propensity of an agent to behave in the same way varies with the behavior of the group;
2) contextual interactions, wherein the propensity of an agent to behave in some way varies with exogenous characteristics of the group members;
3) correlated effects, wherein agents in the same group tend to behave similarly because they have similar individual characteristics of face similar institutional environments.
The theoretical approach in Glaeser and Scheinkman (2003), and Horse and Scheinkman (2006) define equilibrium models that explain the contextual interactions where individuals choose actions in the random interaction structure. When social interactions exist and everyone in the peer group is influenced simultaneously, the impact to an agent becomes very high. Morris (2000) wrote another theoretical paper using the game theory to find a change in local interaction and how it spreads to the entire population. Morris uses binary action games. There are large volumes of empirical studies on conformist behavior. These theoretical papers are applied to empirical studies not only to individual consumer behavior but also firms’ behavior. Gale and Rosenthal (1999) examine a mechanism when there are two types of agents, experimenters and imitators, in the economy. If an experimenter keeps trying new strategies, then, even if an equilibrium were reached, the experimenter would keep testing. This would jolt the imitators’ behavior away from equilibrium. Empirical studies looked at different areas of the economy. Glaeser, Sacerdote and Scheinkman (1996), Durlauf (1996) and Brok and Durlauf (2001) find social interaction explains the high variation in cross-city crime and wedlock birth rates. Relating to the crime issue, Ludwig, Duncan and Hirschfield (2001) looked at the effects of relocating families from high- to low-poverty neighborhoods on juvenile crime. They found that relocation to lower-poverty neighborhoods reduce violent criminal behavior by teens. Hanushek, et al. (2003) studied the effects of peer on student achievement. Neighborhood effects are not only on the labor, crime and education. Bertrend, Luttmer, Mullainathan (2000) researched the network effect, measured by the different mother language groups in an area, on how much welfare the group received with the help of the shared information in that language group.
Schelling (1971) studied how discriminatory race segregation develops in the interaction of the residential property purchases. Foeller, Horst, and Kirman (2005) modeled a financial market where there are leading "gurus" and followers use them as one of the predictors to forecast future prices of an asset. Lux (1998) and Horst (2005) also modeled the financial market assuming that a large number of traders interact with each other. Goldin and Katz (2000) has empirical study on higher birth control pill usage on a more educated female group. Goldin and Katz did research on delaying marriage on women. Glaeser and Scheinkman uses "social multiplier," where the larger the value, the more social decision impacts on an individual agent's action. Ellison and Fudenberg (1993) found social learning takes place when two new technologies are introduced and neighboring agents' choices have great influence on the adoption of the more popular technology. Jones (1984) finds the interpersonal processes though preferences, opportunities and social environment. Jones looked at labor market where firms use the conformist characteristics to train labor force to attain higher quality labor therefore maintaining the high quality of products. Zax and Rees (1998), Durlauf (1995), Benabou (1993) and Case and Katz (1991) found that peer household characteristics has effects on the future earnings. Topa (2001) also looked at the spillover impacts on the labor market. The more information exchanged with a peer group on job opportunity, the more hiring occurs through informational channels. Audretsch and Feldman (1996) looked at the producer-side and found the effects of interaction behavior on industry R&D and skilled labor. Rauch (1993) examined reasons of the tendency of firms within an industry to cluster together. Bardsley (2005) examined how social interaction affects on the donation to public goods such as cancer research. Some sum of initial seed
money will significantly impact how other followers donate to an institution.

3.1.4 In Conclusion of Consumer-Side Behavior

The consumer purchases fashion goods not with the traditional economic behavior as to maximize own utility within the budget, but it is inter-depending on what his/her peer or upper socioeconomic group purchase. Both the Bandwagon and Snob behaviors drive the fashion goods industry to create new styles, which in turn starts a new cycle. Bianchi (2002) comments that the fashion is the result of both conformism and social rivalry. Later adopters of fashion are better to imitate the leaders rather than following independent purchase choice. This increases the probability of making the "correct" choice, assuming that the early adopters started to signal the right purchase choice. This type of behavior happens in a car industry, which is in Swann (2001) paper where he compares Rolls Royce with Ferrari. Veblen theory describes the Rolls Royce purchase behavior, but for Ferrari case, it is the mixture of the bandwagon and snob behavioral product. Snobs want to acquire different and latest style as increasing number of people buy older year Ferrari for a cheaper price. This is the same behavior one observes in the fashion industry.

Since the current Internet technology era, more images and information are transferring across many different socioeconomic groups in no time. The presence of Internet and social networking, the fashion turn over may be quicker. Research is required on how fast or shortened the fashion cycle becomes.
3.2 Producer-side of Fashion-Related Goods

Different economists have applied their specialized fields of study to the fashion industry, but there is no material that covers the overall fashion production side of the fashion industry. I surveyed previous literature and discovered four major topics for the production side: design differentiation, design cycle, inventory control and scarcity.

3.2.1 Design Differentiation

The fashion industry is one of the classic examples of the theory of monopolistic competition, where firms in an industry produce goods that are not perfect substitutes for the products of other firms. Each firm differentiates its products so that the firm gains some monopoly power in the competitive market. There are two different kinds of product differentiation, and the fashion change occurs due to both kinds of differentiation (Gregory 1947a; Gregory 1948). The first one is when, at any given time, firms differentiate their goods from their rivals. This case has three models: Chamberline’s monopolistic competition, spatial, and attribute. The other one is product differentiation over time. The latter creates a product’s "newness" and makes previous designs obsolete. It is a theory of temporal differentiation.

Fashion major colleague students’ responses capture the product differentiation. I asked these students why there were many new designers who would like to present at the New York Fashion Week and how they could enter the market. Their answers were that the designers wanted to be successful and make money. In order to do that, they had to enter the market by creating niche brands. Many firms in the fashion industry do not produce
standardized goods; they try to differentiate from other companies. Each one tries to shift their demand curve outward. Each seller perceives his brand to face a downward-sloping demand curve as the result of product differentiation. (Caves and Williamson 1985)

Firms try to maximize profits by differentiating products from competitors. A firm's products are not perfect substitutes for those of other firms in the industry. In order for companies to establish, maintain or improve their brand images, they do a combination of the following strategies. Firms carefully manage their branding image by placing their business with the right quality, design, durability and pricing. They establish clear designer brand images such as "dark, edgy and cool sportswear," or "playful with many colored prints." Some firms operate flagship stores to totally control the brand images. Some set aside a big budget for advertisements. Caves and Williamson (1985) examined the impact of importing goods into a local economy using industry classification index for different markets. Schroeter, Smith, and Cox (1987) examined the quality attribute of private practice law firms. Caves and Greene (1996) used data from Consumer Reports to measure product quality attributes, price and its relation to advertisement. For convenience goods, high price may induce the maintenance of high quality. For unimportant and frequent purchasing goods, price is an indication of quality of products. Advertising does not provide a high quality signal.

The Chamberline model was developed in the 1930s. A large number of firms produce close but imperfect, substitutes for one another. Each firm faces a downward sloping demand curve, and each firm decides on its own price and quantity and has no effect on the behavior of other firms in the industry. But their products are close substitutes. They face a highly
elastic demand. A consumer who has high loyalty to a particular brand is willing to pay a higher price than for other brand products. However, if the brand increases its price too high, a consumer may decide to switch to a substituting brand.

The spatial models have major approaches called Hotelling’s location model and Salop’s circular model Frank; ?. Both treat distance as an indicator of the lack of complete substitutability. The distance can be interpreted as the difference in brand, tastes or preferences. Hotelling’s location model was first introduced in 1929. The setup is that on a particular length of street, two vendors are selling identical products. However, it is consumers’ preference to make a purchase at the nearest store. For the consumers’ convenience, each vendor should locate at 1/4th lengths from both ends. The average trip of the consumers to a vendor becomes 1/8th length. However, from the vendors’ point of view, both would like to locate at the center of the street. A vendor will have more consumers if he/she comes closer to the center to steal the other vendor’s consumers. Vice versa is true, and this will lead both vendors to settle at the center. The other model is the circular city model from 1979 by Salop. The setup is that firms in an industry locate themselves in a circle. Consumers are equally distributed on its edge of the circle and make trips to the closest store. The cost for consumers is the trip to the stores. The cost for the stores is the fixed cost and variable cost such as labor and material. The optimal number of stores can be found with an equilibrium condition.

\[
N^* = \sqrt{\frac{t + L}{2F}}
\]

where \(N\) is the number of stores, \(t\) is transportation cost, \(F\) is fixed cost, and \(L\) is population density (Frank 2009). As transportation becomes expensive, there needs to be more stores to offset the costs. As number of stores increases, the average traveling distances
decrease. That is more beneficial for consumers. As fixed cost increases, fewer firms operate. This distant model can be applied to the product variety in a market. Fashion designer brands locate their images to niche branding. More brands exist, consumers may find some brand that is "close" to their taste and firms make profits.

Lastly, another concept for product differentiation at any given time is the product attributes. Product differentiation is a market where there are many products that are not perfect substitutes. Researchers try to infer market structure by separating the product into specific elements, or observable attributes, of products and buyers select which attributes they desire. When firms can provide many differentiated products to a market, this market produces at constant long-run average costs and offered at competitive prices with many attribute bundles. Each consumer enjoys a customized attributes which makes goods in variety. However, only selected sets of attributes bundles would be provided to a market where firms have large fixed costs or economies of scale (Caves and Williamson 1985). Berry, Levinsohn and Pakes (1995, 2004) treated automobiles as heterogeneous goods and data range for twenty years. The data contained product characteristics such as the number of cylinders, number of doors, and weight. When final products have separatable characteristics, each component can be considered in research.

The only research that implemented the idea of attributes on the topic of fashion clothing was research done by an anthropology professor Kroeber (1919). Although this research does not have any price measurements and is not an economic analysis, the idea of trying to consider each part of evening dresses to figure out style elements was the element of the attribute. The reason for choosing the evening dress among other clothing was that it does
not change by season and by day-and-night. Thus, it is possible to separate the style or fashion elements from dress. Kroeber’s samples are randomly taken from 1844 until 1919 for 76 years from fashion journals. Kroeber separated the dress components into different attributes, from proportion of a skirt from a whole body style, the width of skirts and the length of skirts. Those separable characteristics are considered as attributes in fashion.

The other type of product differentiation that is relevant to the fashion industry occurs when firms differentiate their products from their previous season models. This is product differentiated over time, or temporal differentiation (Gregory 1947b; Gregory 1948; Connor 2001). The fashion apparel is an ever-changing business and firms change fashion frequently. New fashion seldom changes the product itself. But this incessant emphasis on "newness" makes people dissatisfied with their existing clothing, making existing clothing prematurely obsolete. Sometimes fashion trend changes drastically (Gregory 1947b).

Companies do not change their style from the previous seasons in a drastic way. Usually the brand has its signature characteristics and implements its interpretation of the current tastes and habits on top. Some examples of the base characteristics are the following: Calvin Klein is known for minimal clean lines, and the Ralph Lauren brand reflects an upper class American lifestyle. Consumers change their style by reflecting the most current ambience of the economy and society. This newness makes people want to keep purchasing new fashion. As companies repeats fashion changes each season, they have tendency for collusion to keep long-run positive profits for brands. Frequent changes make companies renegotiate the collusion tactics mor often (Ivaldi, Jullien, Rey, Seabright, and Tirole 2003).

However, other researchers use the temporal differentiation in a different way. The
temporal differentiation was classified by Stackelberg in 1951 and "implies that the price of a product may be different according to the time of delivery within which it may be obtained" (Philips 1962). Philips points out that there is a time lag for consumers to learn about new products such as quality and price. The new entrant has to use this time to settle down and establish its position in the new market. Philips’ paper examined a geographical market integration, which finds more competition that offers lower price of products to consumers in European coal and steel market. Gregory’s definition of temporal differentiation does not apply to any of Stackelberg’s imperfect market conditions. Gregory’s definition is more suitable for the fashion industry. However, this area is not developed. Chamberlin initially included the concept of temporal differentiation as a type of differentiation in his thesis in 1927, but omitted it in a published book in 1933 (Chamberlin 1961).

As I surveyed here, there are two kinds of product differentiations in the fashion industry: one where firms make their brand differ from other competitors and the other where firms to differentiate their products from their previous seasons.

3.2.2 Fashion Cycle

This section of Fashion Cycle, I covered it previously in consumer side behavior, in this section, I focused on producer side analysis of the fashion cycle and adoption process studies. This survey has the following categories: descriptive analyses, innovation, game theory, and counterfeit as related topics in this section.

**Descriptive Analysis** In descriptive analysis papers before the early 1980s, many researchers documented the cycle in a rather descriptive way and took simple measures
to find the existence of a fashion cycle in women’s evening dresses over time. That is a long-run analysis. Women’s dress length goes maximum length to short length over time and then come down to long length again. A style goes away and then comes back again. Furthermore, each style goes through an "innovation" and its diffusion model in a short-run. For example: Let’s say that at one time, the majority of women wears long maximum length because that is the style of that period. However, some women who are fashion-forward or are snob consumers need something different. Also, from a producer point of view, as more and more retailers join to sell at the monopolistically differentiated market, they start to lose their profits as product price goes down. Innovative companies need to produce something different so that they can start enjoying relatively large profits. So, a new style is invented by fashion-forward companies and adopted by fashion-forward consumers. All the research papers I found show that the style does not change dramatically. For example, maximum length skirt would be replaced by a skirt length that is relatively shorter than maximum, but it is not extremely short. A new trend diffusion starts, and more and more consumers acquire that shorter length skirt. When the market becomes saturated with that length skirt, it is ready for the next "innovative" skirt length. First, I will look at the long-run view of this cycle. Then, I will look at this short run diffusion or fashion-adopted process.

Robinson (1961) describes the beginning of cyclical movements, which comes from consumers who are not always passive in consumption. Some consumers are style leaders or "entrepreneurs of taste" (p.397). Robinson claims that they convert "the world of fashion to new wants [that] have exercised potent and immediate influence on the course of economic development." As one can tell in past fashion in apparel, building, furniture, and automobiles
their different eras, because when items are newly introduced, they reflect their freshness of the era and are followed by many adopters of the designs or styles. Entrepreneurs of taste start accepting new innovated designs and then more consumers follow.

Chai, Earl and Potts (2007) wrote another descriptive paper that looks at the fashion cycle with the connection of historical income growth and the consumer behavior on acceptance of new products. As income rises, consumers’ discretionary spending increases. Producers create something different or new to create a new demand so that this money can be spent. Purchasing something new, consumers take risk, but as consumers with more discretionary money, they are willing to try out these items first. This captures the essence of the trickle-down theory. The rich has the first opportunity to access the new design, the masses may follow, and this consumer behavior in a society as a whole creates the trend.

However, I do not agree with Chai, Earl and Potts’ (2007) application of technological innovation to the fashion cycle. "The crucial driving force of innovation are the rich pickings that await those who place their bets on the winning standard and work out how to make it win by solving technological problems" (Chai, Earl & Potts 2007, p.202). When new technologies are invented, producers wait to find out which technology dominates the industry. Once the industry recognizes major changes, then competition starts. One example is the combustion engine based motorcar innovation, rather than steam or electric power. Once the majority accepted the engine, those cars with the engine became the industry trend. Furthermore, the uncertainty of future standards improves productivity growth. In fashion, it is not only one style that becomes a winner among other suggested styles as it is depicted in the technological innovation. Fashion style for pants and tops can start to appear at
different times. The fashion industry does not wait for the rich to pick out styles, but it contains an industrial system to sort out what will look most fashionable. Therefore, I do not agree with the direct application of technical innovation to fashion cycles.

As Sproles (1981) mentions that "fashion designers and the fashion industry as initiators and propagators of new fashions" (p.118). Producers are proactive to navigate what will become fashionable by showing the new styles to journalists. As a result, these journalists deliver what designs or styles they see as fresh and new that season. Magazine editors put together different designers’ items and reveal how these styles capture the common representation of upcoming styles. Retail store buyers order the garments that consumers will find fresh, new, but not radically different from their current wardrobe so that they can update their closets for the season without having to change everything. Designers present many samples for future products, but they do not necessarily produce the entire line available to consumers. In the fashion industry, new style innovation does not necessarily improve the productivity of making apparel or consumers’ quality of life. I agree with Chai, Earl, and Potts (2007, p.203) their observation that "the end of one fashion cycle is not the beginning of a clearly defined new fashion."

In the field of marketing, Sproles (1981) separated fashion cycles into long and short-run aspects. A long-run time frame reflected cycle of 30 to 50 years or more. There are "long run trends in silhouettes and garment dimensions" (Sproles, p.117) in fashion trends. Any radical change in the short time receives social rejection that the change does not become a trend. Short-run cycle is a style change within a couple of years up to 10 years. Sproles argues that the start of the new cycle originates from propaganda of industry and consumer
behavior that creates the new fashion. Media and branding business makes industry to succeed the propagating new trend. There is no study found about how quickly trends turn over with the new technology era. The Internet causes fashion images to transfer all over the world during powerful fashion designers' shows. Fashion turnover must be quicker than ever. Future research will be needed in that field. Sproles lists four different consumer fashion trend-propagating behaviors such as trickle-down, trickle across, subcultural leadership and collective selection. Detailed explanations are in chapter 2.

Blumer (1969) determines three conditions that can shift tastes and change directions of collective choice. The first is "the impact of outside events." It could refer to a social movement such as women's liberation, or international war tensions. The second is "the introduction of new participants" (Blumer 1969, p.287). In the 1990s, there were a lot of "fashionable" young men wearing their pants so low that people could see the top of their underwear. This trend started among gang members in jail where belts were not permitted. Once they came out from the jail, hip-hop music culture picked that up. This style became a street style, which started in early 1970s in South Bronx. Their fashion style became visibly popular in late 1980s to early 1990s. In early 1970s, it was more local music gathering of gangsters and youth. In 1980s, some documentaries and movies made the hip-hop culture known worldwide. (Baxter and Marina 2008; Sinopole 2008). This is a good example of introduction of new participants in fashion. The third condition that can shift taste and change directions of collective choice in fashion is changes in inner social interaction. Since Blumer presented no specific example, I am not sure what he meant by inner social interaction. It could be a personal environmental change that shifts a person's taste for
cloth, which in turn can change other people’s taste. For example, while I start to commute to a big city once a day, other stay-at-home mothers do not. I update my wardrobe by seeking other fashions in the city. When I bring that taste to my circle of stay-at-home mothers, their tastes gradually shift. If this is a case for environmental change for majority such as the emergence of accessible Internet and blog posts can change the way consumers change their taste for apparel clothing. There are many blogs specialized in fashion, such as The Sartorialist. Among a social group, this becomes a popular site that people start following. Then, it can change the taste of fashion. Furthermore, Blumer clearly states that, "[p]eople in the area will be found to be converging their choices on models and shifting this convergence over time" (p.287). The start of fashion emergence opportunities and the convergence of fashion through collective choices among people are explained in Blumer’s paper.

Hands-on empirical works on fashion cycle can be found in Nystrom (1928), Lowe and Lowe (1984, 1990), Weeden (1977), Robinson (1976) among other studies in history and archeology. Like many other authors, Nystrom describes fashion cycles. He analyzes the fluctuation of skirt lengths of evening dresses in his book called Economics of Fashion. Weeden extended Kroeber’s (1919) research data and showed fluctuations in women’s skirt length and width and waist length. Weeden found that the cycle of appearance of short and long skirt length was getting shorter over time by counting how many peak of short and long length appears in the research periods. Lowe and Lowe extend their analysis and test whether the fluctuation of waist width or skirt length accelerates over time in women’s dress from 1789 until 1980. They ran a time series analysis in log on the differences of the
measurements. They did not find any acceleration, but found that fashion change was not consistent. Robinson looked at fashions in shaving and trimming of the beard for the period of 1842-1972. He put the data together with his previous research with Kroeber about a trend and fluctuation of skirt width. In short periods, there are fashion cycles or fluctuations in the data period, but in the long run there was one big trend and it was not cycle. For example, in the skirt width, which is measured as ratios of height of women's figures, in 1823, the width started around 40% of height. It was becoming wider and wider until early 1960s when width was as wide as 105% of the height. Then there was a declining trend down, and it became the narrowest to 20% of the height in mid-1940. Lowe and Lowe (1984) analyzed time series models on women's formal dresses to examine whether they could predict style change, extending their original data from their paper in 1982. The data was originally contained from 1789 to 1936, and the extension was up to 1980, a total of 192 years. They discovered that the use of a larger time period improved accuracy of prediction, but only slightly. These researchers succeeded in showing the existence of cycles in fashion. There were no direct economic measurements involved in these analyses.

Innovation

Up to this point, I surveyed literature that explains a cycle of styles that appear at one period and later disappear, then come back at a different time period. At one point, a new idea or innovation has to come up and follow its diffusion pattern that the majority of the population accepts. This new innovation can disappear after the market is saturated and some fashion forward population wants to wear something else such as another newly
invented style or recurring old style. In apparel markets, as the number of sellers increases, many sellers provide then-standardized items. The firms that are good at creating new innovative styles need to provide them constantly. In the marketing field, Abernathy and Clark (1985) used a term called "niche creation," a kind of innovation that uses the existing technology but changes a product’s design in order to open up new market opportunities. This type of innovation refines goods in the existing market and creates the new demand. It brings profits to the innovative companies while the style is recognized as exclusive to the firms. For fashion, it changes apparel in "ornamentation, color, configuration, fabrics and finishes" (Abernathy and Clark, p.10). I did a survey on the issues of the innovation. Crane (1999) defines innovations in fashion," as styles (as of sartorial details that contribute to overall appearance) and as fads that are very specific changes in the components of dress" (p.16). In the case of trickle-up fashion diffusion, the innovation from popular culture has to be discovered and promoted. In the case of trickle-down fashion diffusion, designers are the innovators, and they are free to create their innovation today. However, it is unstable and unpredictable which styles become fashionable and diffused in the future. The resource of innovation could be recycled themes from previously fashionable styles. Some designers are inspired by the subcultures. Crane claims that the current luxury fashion companies make profits in brand images; therefore, their collections are not subtly different from previous seasons and more shocking changes are observed.

On the topic of industrial organization, many researchers have focused on the relationship between innovation and firm size. Economists were interested in finding out the optimal economic production level based on the market organizations. Questions about the cost of
making a new product or process, the return to the innovation, and the optimal performance level for firms would be interesting to answer. Schumpeter (1939) states that the large firms are more engaged in the innovation. Mansfield (1981) found that R&D expense increases less than proportionally with firm size. As the size of the firm increases, manufacturing process increases relative to product R&D. Large firms have a greater or a higher share of R&D toward process innovation (Link 1982). Cohen and Klepper (1996) found that product innovation does not depend on ex ante firm size because they can earn their return by licensing new product innovation. For process innovation, ex ante firm size is a key factor for innovation that they face more scale economies. They used patent data to distinguish process and product innovation over 36 manufacturing industries with 587 business units for a three-year length. Acs and Audretsch (1987, 1988) looked at innovative activity and firm size in different manufacturing industries. They found that the large firms were more innovative in industries which were capital-intensive, concentrated, highly unionized and produced differentiated goods. In contrast, the small firms had an innovation advantage in industries that were highly innovative and utilized a large component of skilled labor. The fashion industry is known as a typical monopolistic competition market. When applying Acs and Audretsch’s finding to the fashion industry, the hypothesis would be that large firms are more innovative.

There are some deficits in measuring innovative activities. Some measurements can be an input into innovation process such as R&D, or a proxy measure of innovation output in patented inventions. Acs and Audretsch (1987) looked at a number of innovations in each four digit Standard Industrial Classification, SIC, industry record in 1982. The fashion
industry usually prefers to say that some new designs are innovated each year. But there is a problem with measuring innovation. Innovation in textile mill manufacturing industry might be clearer to what is innovation. There were major innovations in synthetic fibers or machineries for knitting, dying, and sewing. Innovation for designing part of the fashion industry, it is much more difficult to quantify. Large fashion designing firms may have more financial budget to invest in research for upcoming trend in color, style, images in advertisements and even consumers’ lifestyle to have best forecast for the future trend. Some large firms are publicly traded firms, but they do not have separate spending categories that show how much they have spent toward design innovations. In the fashion industry, it is not practical to submit patents for designs. Patents are granted for products that are functionally unique to its products and services. Receiving an approval of a patent takes a longer time than it takes to copy a new design. Non-functional product attributes can be protected in its originality by intellectual property law, in which a product’s trade dress and copyright can protect designers’ new design and textile patterns. The degree of copying is always debated in courts, whether designs are identical or only "inspired" designs. Also, how much the original design can be recognized by the consumer can be debated in infringement lawsuits. These are no record of how many of what products are exact copies or only inspired designs. For fashion industry, counting patents is not realistic to consider for counting as product innovation, and counting lawsuits also faces two pitfalls. First, not all the copied designs are filed for court actions. Second, there is no clear cut off whether a piece of design was exactly copied or what degree it was "inspired." There are also cases that are settled out of court and detailed information is not disclosed.
Some researchers in non-economic fields have tried to find out the relationship between the design innovation and firm size. For a possible comparison, I surveyed the change that empirical studies of technological progress made in industrial organization. Schumpeter in 1942 argued that one can expect a long-run output expansion in a very concentrated market condition. Empirical studies found that innovations have drawn mixed conclusions in the relationship between firm size and innovation in industrial organization. R&D is more productive in large firms since there are economies of scale in marketing and financial planning. However, some large firms may encounter some bureaucratization issues that might prevent R&D developments. In the mid-1960s, some research found that R&D intensity against the firm size increased weakly, while other research found no significant evidence of such relationship. Other research found that up to a threshold firm size, R&D activities increases proportionally the firm size, but beyond the threshold, it had a weak negative or no relationship. The extensive results on R&D research can be found in Cohen and Levin (1989). Including research in the 1980s, Cohen and Levin could say that these research results were inconclusive. Again, it is not technological innovation, but in the fashion industry, Crane (1997) looked at French haute couture industry and measured the level of innovation against firm size. Crane looked at eighteen-year-long lists of French fashion shows experts’ reviews and its published ranking with a descriptive analysis. She concluded that while costs of entry to luxury fashion market were less competitive, new small firms could be perceived as innovators. While the cost of entry rises as the market expands to overseas, and there are large established firms already in the market, the chances that small firms will be perceived as innovators decreases. Medium to large size foreign firms and well-financed firms are more
successful than new and small French firms.

Antonelli, Petit, and Tahar (1990) did a case study on diffusion of process innovation in the textile industry using international data from 1976 to 1984. They hypothesized that the new synthetic fiber acceptance by consumers had changed the adaptation of new spinning and weaving machines in the economy. They looked at data of different countries for seven years. They found that the firms with wider production of synthetic fibers adopted more intensive use of shuttle, less looms, and not the diffusion of open-end spinning rotors.

Innovations in the fashion industry are the area of study that has not been done by economists. In part, it is due to the lack of a system to quantify the innovation in design itself. The industry is made so that design turnover is quicker than waiting for the issues of patents. Many non-designer brands create "inspired" designs by higher luxury brands. Number of confiscated counterfeit goods is also available from some authorities, but it can depend on how strict the social policies are. For example, the Council of Fashion Designers of America started a more aggressive campaign against piracy activities under the current executive director Diane von Furstenberg since 2006. This area needs more research in the future.

The Game Theory

Economists started to apply the game theoretic approach to the fashion industry in 1990. It is applied to the production side of the fashion industry to explain the fashion cycle. Another application to fashion industry is the effect of merger in high quality manufacturing firms and prestigious brand companies when new companies create new products.
Fashion or style cycles when there are two groups of consumers. The necessary assumption is the existence of two consumer types: fashion leaders who are nonconformist and try to find something different from the majority and fashion followers who are conformist and try to wear what the majority chooses to wear. This approach that separates consumers into two groups suits the trickle-down theory of class status signaling. In this case researchers refer two consumer groups as high and low types. Product set that consumers choose was expressed in color matching actions (Karni and Schmeidler 1990; Matsuyama 1993). Using the matching game approach, Pesendorfer (1995) and Temzelides (2009) incorporated a dynamic price declining mechanism that explains how initially expensive apparel goes on sale later. A casual observation shows that production side offers newly innovated apparel, and the product is sold at a high price. However, as time passes, the price decreases and more and more consumers purchase the design. Some interesting debate over Pesendorfer’s paper can be found in numerous discussion academic articles between Pesendorfer and Coelho (2005, 2005, 2004, 2004). Leaving out the consumer purchasing behavior and its matching game, Caulkins, Hartl, Kort and Feichtiger (2007) looked at only the producer-side. They modeled a mechanism that depicts fashion innovators and their imitators in product space, which in turn explains the fashion cycles. Pricey designer label fashion houses innovate new products and low cost imitator companies offer the similar products. The cost of new designing innovation is low enough imitation happen easier. When design innovation cost is too high, then no innovation is the optimal outcome for the industry.

A different approach explains the fashion market structure as a result of merging a high-quality manufacturing firm with a prestigious brand company (Araujo and Minetti
Pesendofer’s (1995) model explains that many brands’ new innovations start to be acquired by more and more of the population; in return, it becomes less fashionable and loses popularity over time. When design diffuses to many levels of consumers, I would like to make a remark that each fashion retailer has its target consumers and focuses marketing on them. In other words, each firm serves only a portion of the industry’s demand curve. When a brand presents a new innovative design for the upcoming seasons, some customers who are fashion-forward and able to afford the high price can acquire the product. As time passes, the imitator produces a less expensive, similar style to the market. But the high brand does not have to lose its popularity. Some companies offer different brand lines to serve different targeted consumers. For Ralph Lauren company, there are many brand names such as Polo by Ralph Lauren, Ralph Lauren Purple Label, Ralph Lauren Collection, Black Label, Blue Label, Lauren by Ralph Lauren, RRL, RLX, Rugby, Chaps and Club Monaco. Pesendorfer acknowledged this type of fashion branding business, but he often confused the term brand with styles. It is not necessarily that the brand itself loses its popularity, but it can only be the style that loses the popularity. Araujo and Minetti (2007) treat this scenario with economic models using game theory. They construct models that match consumers with high and low quality and prestige options. For example, firms have an incentive to merge if a firm is a low quality fashionable firm and has the opportunity to merge with a high-quality unfashionable firm. It hopes to produce high-quality fashionable production. They showed that the popularity of brands that was initially fashionable remained constant over time. It is correct to say that style is innovated and diffuses to more consumers at lower price through different brands.
Counterfeit as A Related Topic

The issues of counterfeit or "knock-off" are related topics to the fashion cycles. Often times, researchers use counterfeit and knock-off interchangeably, but these concepts are different. A counterfeit product is defined as one that a perpetrator copies, marks, and sells without authorization of original companies. It can include distinctive color combinations and patterns, packaging, trademarks and labeling. Counterfeit products can be made with relatively lower quality material than an original one, or it can be obviously low quality. If consumers purchase counterfeit products thinking that they are buying the authentic one, then the product is deceptive. In other cases, when they know they are buying the counterfeit product, it is non-deceptive. Knock-off products are imitation of the originals and sold at lower price and more often lower quality under different brand names (Kunz and Garner 2011; Yurchisin and Johnson 2010). Both of the forms include different degree of imitation of the original products.

The system of the fashion industry today requires a certain degree of imitations. As a new style spreads out through the consumer clusters, high to low income and fashion forward to less fashion sensitive population, consumers need to recognize the "new"-ness and start buying these new styles that they did not have before. Imitation of the original with a lower price range helps spread out what is becoming, or simply is, trendy. The market of that style saturates once most of the population acquires it. Knock-off items help penetrate markets’ turnover and are more profitable for the industry.

However, producers do not welcome counterfeit products. Brands lobby for governments to impose some control over counterfeit goods. The governments try to enforce laws against
counterfeit goods, but it cannot cover the entire, worldwide economy. There are three reasons why counterfeit products are popular. First, usually the counterfeit copies are from well-recognized brands. Second, lower quality products are offered at the affordable price range. Third, high brands spend a large amount of money on advertisements to persuade consumers. Counterfeiters get a free ride of this effort.

The fashion industry created organizations that dictate exact copies in the market to prevent counterfeit. For the US, Fashion Originators’ Guild Association functioned from 1932 to 1941. It controlled the market so that large retailers had to have exclusive sales agreements to sell only guild-certified original designs. The US Supreme Court in 1941 determined that this practice was against antitrust law. For France, Chambre Syndicale de la Couture Parisienne has existed since 1868. The Chamber used to have 106 designer labels in 1946, but the number is declining, and there were only 11 firms in 2012 (Barnett, Grolleau, and El Harbi 2010; Marcketti and Parsons 2006). Two of these articles did not have information but I have gathered some in Women’s Wear Daily that revealed that there was some movement of controlling of image distribution of New York Fashion Week in late 1940s and 1950s to deter the timing of imitation of the US designer fashion. For example, on October 27, 1959, The New York Times introduced an opening of Spring Summer 1960 collection, but reporters of The New York Times were barred from attending some shows. It is not clear when this restriction was imposed on New York Times. Further research is needed.

The fashion industry today welcomes some level of imitation, but is strict about exact copies or infringements on logos and brand names. This mixed approach is known as Piracy
Paradox of the fashion industry. For more details of law setting for fashion goods, see Raustiala and Sprigman (2006) and Barnett (2005) Marcketti and Parsons (2006). Barnett, Grolleau and Harbi (2010) applied game theory to explain that some level of imitation is welcome in the fashion industry under some investment risks that each designer house has to bear. Designer houses pay an investment price to bet on the next seasons’ trends. Some level of imitation is allowed so that even if a designer fails to be accepted as the in-style, he or she can still produce some level of imitated products to recoup the failure. Barnett, Grolleau and Harbi found that under this risky trend forecasting system, some levels of imitation should be allowed.

3.2.3 Integration

Some firms in the apparel industry adopt vertical integration and horizontal integration in their operations. Vertical integration eliminates transaction costs of products and allows firms to have more control over designs and quality. Different sectors of the fashion industry integrate horizontally to eliminate management costs or to diversify risks associated with which trend stays in style. In this section, I survey economic analysis of the vertical and horizontal integration in the fashion industry.

Due to the competitive nature of the fashion industry, vertical integration became increasingly popular starting in the 1980s. The turnover of popular styles and trends are shorter today. The fashion industry adapted a quick response system to deal with uncertainty or variance in trend (Hines and McGowan 2005; Christopher, Lowson, and Peck 2004; Barney 1999). For example, a retailer that sells goods that it purchases from wholesale
distributors of different brands can eventually operate by being vertically integrated. The retailer startes to create their own designs and manufactures, either at its own factories or with subcontractors. One of the very first successful examples of it in the fashion industry is The Gap company. The Gap originally was a firm opened in 1969, carrying brands from other manufacturers. It used to be the largest distributor for Levi’s jeans at one point. But in the 1970s it integrated vertically and started manufacturing its own apparel and created its own brand to directly sell to consumers. Today, in 2016, many specialty stores practice this vertical integration. Another example is department stores. They started to coordinate with their suppliers to produce their own store brand clothing. The price range for department store brand is relatively lower than other brands that they carry in the stores.

The organizational structure depends on firms in the fashion industry. Smaller firms tend to stay not integrated, but as firms expand or large firms integrate their operation at different stages of production. The Forever 21 company is known today as vertically integrated. Its supply shipments come to stores every week. They offer consumers new style with limited numbers. Once a firm observes a line is selling, it starts to expand this new trendy goods production and respond to the new consumer demand quickly. This is only possible with the vertically integrated business model. A Spanish fast fashion apparel brand, Zara, is known as a highly vertically integrated firm (Lopez and Fan 2009) as well. According to the study, in 2006, it operates 852 stores in 59 countries. In 2015, it expanded to over 2,000 stores in 88 countries. It owns production facilities and controls production chain, from designing to delivering to consumers. Forever 21 operates differently. The company has its own buyer teams to select the items that sell more. Most of their apparel
is coming from subcontracting manufacturers. Forever 21 also has its own design team and places orders at its own factories or subcontractors. The very fast turnover of their products is the key to the success in the growing business. It has the ability to observe the current trend in design and style. They work very closely with their factories and subcontractors. It is not strictly the vertical integration form of a business, but is similar in that it manages its design team and partially runs its own factories. A similar scenario is observed with fastfashion business of H&M, a Swedish fast fashion apparel firm that has been growing rapidly.

Richardson (1996) examines three different types of apparel organizations and finds that only integrated firms are able to make full use of the production and distribution in the competitive industry. Distant production’s lead-time is remarkably shorter in an integrated firm, which is four weeks on average when non-integrated firms take three months on average. Richardson also notes that there are some trade-offs due to the integration. Fully vertically integrated firms commit to capital resources, making them vulnerable to major technical or economic changes. It can also raise significant management issues at different production stages.

Gertner and Stillman (2001) look at Internet use for integrated and non-integrated firms in apparel industry. Integrated firms can put their production line in their own catalogues more than non-integrated firms.

Christopher, Lawson and Peck (2004) simulate different possible business structural situations to find out the benefits of quick response under integrated firms as opposed to a business structure of using offshore contract suppliers or non-integrated firms. The authors
find that a quick response system has higher gross margin return on investment than an offshore contract supplier strategy.

Hines and McGowan (2005) do qualitative research on the fashion industry in United Kingdom. They research the degree of integration between suppliers and retailers. The strongest form of the relationship is the vertical integration, but this research includes weaker vertical integration as well. Weaker vertical integration is when a retailer and a supplier have a long-term relationship that they both rely on. They act as if they are vertically integrated, but technically, they are not in one firm. Hines and McGowan find that more powerful retailers can impose their power on suppliers to lower the price of products without incurring investment in production itself. The retailer has an upper hand because it can always change its supplier contract to offshore developing economies. Hines and McGowan identify that retailers want control over their supply chains to ensure profits by satisfying consumer demands while suppliers want to guarantee cash flows and long-term profitability with retail relationship.

Hanson (1995) looks at the vertical integration within the apparel-manufacturing sector in Mexico. Within the manufacturing sector of the fashion industry, there are degrees of integration in the process of manufacturing a style of garments. His empirical results suggest that when style is fashion-driven due to sudden change in consumer tastes, the manufacturing company decentralizes and subcontracting manufacturing firms jointly construct a style of garments. In case of taste change, each firm’s commitment is low. The system succeeds to lower risk to demand change. When garments are standardized style, a manufacturing company tends to be vertically integrated within the sector to avert holdup risk from sub-
contractors. Holdup is a problem between manufacturing firm and its subcontractor. If the large firm subcontracts a part of the manufacturing process to a smaller subcontracting firm, the large firm has to tell the small firm to deliver more of the product. The subcontractor can hold up against the large firm, refusing to cooperate without charging higher price. Therefore, when a product is more standardized product, the less holdup issues arise. Gereffi (1999) investigates how apparel manufacturing and retail companies are using or not using outsourcing subcontractors in Asia. Companies use a mixture of their own and subcontractor manufacturing. Gereffi displays a sourcing network for the top ten US retail buyer offices in Taiwan that shows the proportion of Taiwan office orders actually produced in Taiwan and offshore subcontractors such as the Philippines, Vietnam and China. Gereffi finds that some companies such as Coach and Levi Strauss & Co. changed from more intense vertical integrated operation to less integration. They shifted to using more offshore subcontractors to face less risk with their own manufacturing assets. Berra, Piatti, and Vitali (1995) focused on development of Italian small to medium-size firms in the fashion industry using data from 1987 to 1991. They found that small to medium-size firms decentralize their production within the country to adapt flexibility to market change and save money.

In the fashion industry, shorter turnover brings firms business opportunities. More frequent changes in trends attract new demand for these products. In recent years, fast fashion has been the growing business in the industry, even when the economy was in recession starting in 2008. The fast fashion firms' success is due to the effective application of vertical integration. On the other hand, the trade-off is that the integration in industry makes firms more vulnerable to sudden major fashion change. Rosenbloom (1963) gives a case study of
how a firm in textile industry, Textron, in mid-1947 failed when it had vertically integrated to produce not only the textile but also consumer products by themselves. Textron weaved textile from the basic fibers and also produces finished consumer apparel goods. Its inflexibility to adapt to a change in the economic environment caused the vertical integration to fail. I found that there was a gap in Richardson’s 1963 study and what we observed in the fast fashion industry today. It is understood that frequent replenishments of the shelf with new products or updated products were gaining success in fast fashion business.

The above is about the cases of integration in the fashion industry. I found needs of research on Quick Response business practice. How it helps the process in the success of vertical integrated firms in the fashion industry. I did not find any articles discussed about the horizontal integration of fashion firms. This area needs to be further investigated.

3.2.4 Created or Maintained Scarcity

Economists have hardly looked at created and maintained scarcity of products; even in other fields, little research has been done on this topic. Women’s Wear Daily in 2007 reports that consumers are looking for rarity, and more and more brands are offering limited editions (Murphy 2007). Fashion firms intentionally create and maintain scarcity of their product availability. Marketing and psychology researchers study this area more closely (Gutierrez 2004; Koski 2004). I describe some examples at luxury, fast fashion and online business sectors to illustrate how created and maintained scarcity benefits firms’ profit in the long run. I also review four research articles that looked at this in this subsection. I observe that there are three different parts of the fashion industry practice that create and maintain
scarcity to make profit: luxury sector, fast-fashion sector and flash sale e-commerce.

From the economists’ point of view, luxury firms understand and apply the Veblen behavior of the consumers to make a profit. Very high prices only attract wealthy consumers. When consumers can believe that other consumers would recognize the "rarity," then it is worth for them to pay a high price. The higher the price, the more it signals a consumer’s wealth and more people are attracted to the products. For example, a French luxury fashion brand, Hermes, produces one specific style of bag, called the Barkin bag. It sells for up to $200,000 per piece, but there is a waiting list to obtain it. Consumers wait for a couple of years to be able to purchase this product. Another example is when luxury brands produce limited edition products when they open flagship stores or mark anniversaries. In 2007, Prada, an Italian brand, collaborated on a design with an architect, Rem Koolhaas, offering limited edition white T-shirts for $160 and selling them at only twenty-two Prada stores worldwide among nearly 200 stores. The sneaker industry also uses this practice. Some consumers consider those luxury brand limited editions as investment. Typically, those limited edition pieces are treated like art with a resale value that is maintained or even rising over time.

A fast-fashion business applies this kind of intentional scarcity in a slightly different way: firms manipulate consumers’ price elasticity of demand. Examples from Zara was studied by Ghemawat and Nueno (2003). Zara, a Spanish fast fashion, that operates over 2000 stores in 88 countries as of 2015. Its retail stores receive new merchandize every week and stores have new garments all the time. Zara is a mass producer, but they distribute a small portion of each style of garments to different stores. When each store displays one style of
clothing, the store puts out a limited number of pieces for each size on a rack. Consumers walk into the store, see that what the store has changes all the time and only find one or a few of the size a consumer want. This gives the impression that if a consumer does not buy it, then what he or she wants will be gone at his or her next visit. This perception that the item is scarce can change consumers’ price elasticity of demand compared to a situation where consumers can always come back to find what they want in their size. When there is no time for consumers to wonder if they should buy it or not, price elasticity of demand tends to be inelastic. When consumers have enough time to consider it, price elasticity of demand is relatively more elastic. Consumers walk into a store, and they find something they want, then there are more chances that they walk out from the store with the products. Many fast-fashion businesses use this type of practice of created scarcity to make a profit.

Around the time of the financial crisis in 2008, flash sale e-commerce sites became an emerging business model for fashion retailing. The flash sale sites such as Gilt.com and Haute Look, offered limited quantity of products at a limited time. Each sale lasted for a day to three days. This had a similar effect as the case of fast fashion. When a consumer sees that there is limited quantity and if one passes the chance of buying, one may not purchase the item any more. Either somebody else bought it or the offer was over. The site keeps Sold Out signed items on the sale site along with other on-going sales items. This also gives impression that if a consumer finds something he or her wants, he or she should buy it now. This distorts the consumer’s price elasticity of demand, and consumer responds more inelastically compared to when there is no time limitation. This consumer behavior is referred to as impulse purchases. In marketing, Koski (2004) studies appliance purchase
Yao and Li (2005) use demand and marginal revenue functions to demonstrate that limited quantity products can be priced very high at the beginning of fashion, and the targeted buyers are only high income population. They can signal the status with the limited products. As technology improves and marginal cost declines over time, more quantity becomes available at lower price. Signaling power disappears as time passes by. This is true to explain the beginning of the trend to the wide acceptance of the trend in the majority of population. Yao and Li’s example of cellular phone use fits perfectly. One company offers with the new technology. Others enter the market while the original company stays in the industry. For fashion industry, only when one sees the industry as a whole, the argument is true. The example of leggings market as a whole, the model explains well. Leggings were sold at $100, initially, but as time passes by price went down as low as $7 in the industry over time. However, I would like to point out that different firms participate at different price points in the market. The first leggings were offered in the market, those were only offered at a high priced brand. Then imitation happened in the industry that many other firms started to offer them to the market at a lower price point. Meanwhile, the high priced brand does not offer them anymore.

Aviv and Pzgal (2008) examined the optimal pricing of seasonal products in fashion industry using game theory. When a producer limits product quantity, it expects consumers to be concerned about future product availability and to act similar way to impatient customers. From impatient consumers, a seller sets at high price at first and collects large revenues. At the end of the season, a small number of unsold units remain, but those can
be sold easily at lower price. However, this does not work when their target consumers are strategic or patient consumers. In this case, more moderate prices attract consumers to purchase immediately and this is more profitable for the firm. The firms’ strategy should be depend on characteristics of the consumers.

In fashion business practices, the information knowledge of scarcity stimulates consumer purchases and consumers’ behavior changes with new information. This area needs further development in economics.

3.3 In Conclusion

Those are the economic analysis on the topic of fashion industry, fashion good purchasing behavior and fashion related producers’ strategies. This chapter covered the areas that where found economics applications in the fashion industry. With the full explanation of the fashion industry in Chapter 2, I hope that future researchers can find areas of studies they can contribute to understand more about the link between fashion and economics.
Chapter 4

Empirical Analysis of the Fashion Industry

In this chapter, I use historical data to identify determinants of the number of high-end fashion firms in the industry since 1943 and to calculate price elasticity of demand for apparel in the period of 1991 to 2008. I use an autoregressive model with the 2nd and the 4th lagged value of the number of designers along with real per capita disposable income. The price elasticity of demand was not identified for that period of my study. A detailed description of these two findings are in this chapter.

4.1 Identifying the Determinants of the Number of High-end Women’s Fashion Firms

"Help, We’re Drowning in a Sea of Shows" (Wilson 2007), was the title of an article in The New York Times that came out in 2007. Fashion show attendees were complaining that a growing number of high-end fashion shows were getting to be "too many" for a one-week fashion event. Assuming that each attending company, media company and department store sends a fixed number of attendees to cover the growing number of shows, each attendee starts to feel overwhelmed. However, is it really true that there are too many high-end fashion brands show at a "minimum support condition?" This economic condition I will hereafter call the "minimum support condition" that reflects a minimum market condition that enable the fashion industry to have some number of designers to operate at a non-
negative profit.

I assume that showing at the New York Fashion Week is a way for a company to claim that it is one of the high-end brands. In other words, this is the way for firms to identify themselves as belonging to the high-end brand differentiated market. I collected historical numbers for the fashion firms who presented at each Fashion Week since its inauguration in 1943. I identify the determinants of the number of high-end fashion firms in the industry to see if that are too many or too few fashion shows at the minimum support condition.

4.1.1 Data

The dependent variable is the number of fashion brands that present in a given year at each bi-annual fashion show event, New York Fashion Week (NYFW) since 1943. For independent variables, I use real per capita disposable income, dummy variables, and a trend variable.

I collected the number of designers from various sources. There was no simple consistent list available for all Fashion Weeks. The sources are from Women’s Wear Daily (WWD) articles, The New York Times (NYT) articles, the Fashion Calendar, documents at the Manuscripts and Archives Division at the New York Public Library (NYPL), and Special Collections at the library of the Fashion Institute of Technology (FIT).

First, I identify the periods of NYFW from NYT, and from Fashion Calendar and archives at NYPL and FIT. Second, I identify brands that are considered high-end when one of the following criteria is satisfied; (i) a show was reviewed in NYT. (ii) the resources reported

\footnote{NYPL’s archive has some rare pictures from original NYFW designers for their promotional photos for the fashion week.}
reviews, advertisements and direct schedule lists of NYFW during those periods in *WWD*. The Science, Industry and Business Library of New York City Library has *WWD* available in a microfilm digital archive. *WWD* supplemental special issues called “The Best of New York” had features of the New York designers during NYFW in the 1960s until the 1980s. Some periods are publicized as an insertion to regular *WWD*. For other periods, it seemed to be a part of the regular *WWD*, since I could not find some issues; the cause of the problem was not clear whether it was due to the scanning and archival problems. In other words, either somebody forgot to scan the insertions, or the publisher simply did not issue them at all for some years. For some historical microfilm reels, unfortunately, prints on the following are not properly developed on the films: April 1987, April 1989, October and November 1976; thus, I was unable to collect information for those periods. FIT had documents for 1946 until 1965, except 1947, 1952 and 1964, including some letter exchanges and pictures about NYFW. In the more recent years, the responsible organizations for NYFW offer scheduling lists online, and I take those as the lists of designers for a season. I excluded men’s wear, college presentation, mass-market business and charitable fashion shows.

I use per capita disposable income to be the explanatory variable. Bresnahan and Reiss (1991b) used population variables and demographic variables to test if those can explain the demand for a good. In their case, the per capita income became insignificant in explaining the demand. I tested both population and per capita disposable income to see if these are good indicators. The larger the per capita disposable income, the more brands should be able to operate at non-negative profits in the high-end fashion luxury market.

I collected quarterly real per capita disposable income data from the United States Census
Bureau. It is chained to 2005 dollars. Since fashion is more intense in an urban social environment (Currid 2007), the ideal data was per capita disposable income in New York City and other big US cities since the 1940s. Presumably, living in an isolated area, people care less about fashion, especially high-end status-inducing fashion products. The city level data do go back to the 1940s.

One limitation of the data is the lack of import-export data. Some of the successful US high-end fashion brands have their retail clients not only in the US, but also in the international market. The international market in the history of NYFW has increased gradually since the 1980s. US imports from European brands were established much earlier than the US brands going overseas. The more imports the US faces, the competition increases in the domestic market. For example, Christian Dior, a French brand, first opened its retail store in the US in 1949. Yet, I could not collect the exclusive data for the luxury brands from overseas. From the 1980s the US high-end brands are aiming toward selling overseas as well as in domestic market. However, it was impossible to collect data to reflect the level of high-end fashion brands’ imports and exports.

Due to data unavailability of city level data, I use national level disposable income. Since the dependent variable is bi-annual, I took the 1st and 3rd quarterly national disposable income for the bi-annual per capita disposable income of the first and the second bi-annual show period, respectively.

Some irregularity in the events occurred in the history of NYFW. There were three fashion shows in a year of 1959, January for spring/summer 1959 Collection, July for fall/winter 1959 Collection and October for spring/summer 1960 Collection. The industry tried to ad-
just the production planning for more efficiency with extra lead time for production. Since there were three fashion shows that took place in one year in 1959, \(^2\) I used per capita disposable income three times for the bi-annual fashion week, 1st quarter for the first show, 3rd quarter for the second and the third show. There was another schedule shift in 1998, when New York decided to open a collection week before their European counterparts. Pre-1998, New York was showing after European markets. Because this scheduling shift to before Europe was only by one month, I assumed it was not important enough to change the reference economic condition.

I used dummy variables to reflect the three phases of the historical NYFW. One period of emergence of NYFW from 1943 until 1951, period two is from 1952 until 1987 when NYFW dismantled organized fashion shows, and period three is from 1988 until 2014 when NYFW became organized again. A description of each period is in Chapter 2.3.

\subsection{4.1.2 Some Descriptive Results}

As I described in Chapter 2, there were three distinct periods in the history of the New York Fashion Week. It started as very organized and controlled from 1943 until 1951. From 1952 the organizers’ power diminished, and many designers started to signal themselves as high-end brands. Rather than over one-week period, designers presented once during a month-long fashion show period. A significant large number of firms varied during this time. The number of high-end fashion firms in New York changed drastically in 1988 as shown in Figure 4.1, where the show length changed back to a one-week event. In 1993,

\(^2\)Around this time, Press Week asked The New York Times not to attend and report the fashion shows in the paper. NYT collected the news indirectly from other resources. The reasoning is for further research.
the “7th on Sixth” organization was created, which centralized the fashion show in tents at Bryant Park. This led to a slump in the number of designers in 1993, but quickly picked up at the following show.

**Filling missing data**

*Number of designers*

Two data points in the dependent variable were missing - April 1987 and April 1989. I have imputed values for these data in the following way. Initially, I estimated the following regression.

\[ Y_t = \alpha_1 + \alpha_2 X_t + \alpha_3 D_t + \alpha_4 X_t D_t + \epsilon_{t1}, \]  

(4.1)

where \( Y_t \) is the number of high-end fashion firms, \( X_t \) is the per capita disposable income, \( D_t \) is a dummy variable, \( t \) denotes time, and \( \epsilon_{t1} \) are independently and normally distributed distribution with mean zero and common variance \( \sigma^2 \). For 1987 and earlier, I define \( D_t = 0 \), and \( D_t = 1 \) denote years later than 1988. I expect \( \alpha_2 \) to be positive. The estimates of \( \alpha_3 \)
and $\alpha_4$ in equation (4.1) are insignificant. Therefore, I modify equation (4.1) by omitting the interaction term:

$$Y_t = \alpha_1 + \alpha_2 X_t + \alpha_3 D_t + \epsilon_{t2},$$

where $\epsilon_{t2}$ are independently and normally distributed residuals with mean zero and common variance $\sigma^2$. All the estimated coefficients came out significant at the 5% level and $\alpha_2$ had the expected positive sign.

$$\hat{Y}_t = 91.798 + 0.001751 \times X_t - 74.039 \times D_t.$$  \hspace{1cm} (4.3)  

P value are in parenthesis. Adjusted R-squared = 0.4389, and F-statistic probability = 0.000. I estimated the missing two value for April 1987 and 1989 based on equation (4.3).

**Per capita disposable income**

Per capita disposable income data were missing as well before 1946. Regressing per capita disposable income on year turned out to be statistically significant, and I used the following equation to estimate the missing data;

$$\hat{Disposable} = -789710.72 + 408.77 \times Year,$$  \hspace{1cm} (4.4)  

p-value are in parenthesis. Adjusted R-squared = 0.9851 and F-statistic’s probability is 0.0000. The years before 1947 include the time of the World War II. My estimation did not treat years up to 1945 as the war time, years with different characteristics, simply treating them as any other years.
Figure 4.2: Population and Per Capita Disposable Income

<table>
<thead>
<tr>
<th></th>
<th>Population</th>
<th>Per Capita Disposable Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>1</td>
<td>0.9941</td>
</tr>
<tr>
<td>Per Capita Disposable Income</td>
<td>0.9941</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 4.1: Correlation Coefficients

Population data and per capita disposable income are highly correlated. The plots in Figure 4.2 show similar patterns.

As Table 4.1 shows, the population and the per capita disposable income are highly correlated at 0.9941.
4.1.3 Time Series Autoregressive Model

As the previous analysis indicated the autocorrelation in the error terms, I extended my analysis into time series autoregressive models.

I use per capita disposable income as the main independent variable for the following two reasons. One is that the per capita disposable income and population are very highly correlated at 0.994. Secondly, for the high-end fashion industry, disposable income ought to matter more than the population.

Before I eliminate the population as an independent variable, I examined a linear regression model.

\[ \text{Number \_of \_Designers} = C_0 + C_1 \times \text{Population} + C_2 \times \text{PCDI} + \epsilon, \quad (4.5) \]

where PCDI is per capita disposable income, and where the errors are independently and normally distributed with mean zero and common variance \( \sigma^2 \). I examined variations that include, without constant term, distributed lag model for PCDI with or without population, polynomial in PCDI, semi-log and log-log models. The outcomes are in Appendix B. When the estimated population coefficient is positive, the estimated coefficients for per capita disposable income came out to be negative, which is not the right sign. The adjusted R-squared came out low, somewhere between 0.069 and 0.107. This model does not explain the number of designers well. When I calculate Q-statistics with 36 lags, I found the regression suffers from serially correlated errors, possibly as a result of omitted variables.

I also treat the three separable formations of fashion show events with dummy variables. The first period where fashion shows were well organized since 1943 to 1951, which I set as the base. The second period of no organization and show lasts for a month from 1952 until
1987. The last period, which the industry decided to organize it again from 1988 until 2014.

I examined to see if a trend variable and a seasonal dummy variable would improve the model. The fashion show event is held twice in a year, the spring/summer season and the fall/winter season. The seasonal dummy variable equals zero for the spring/summer season and one for the fall/winter season.

The autoregressive model I estimate is the following:

\[ Y_t = \beta_0 + \beta_1 \times \log(PCDI)_t + \beta_2 \times Dummy(1952 \leq year \leq 1981)_t \]

\[ + \beta_3 \times Dummy(year \geq 1988)_t + \beta_4 \times Trend + \beta_5 \times Season Dummy_t \]

\[ + \beta_6 \times Y_{t-1} + ... + \beta_p \times Y_{t-p} + \epsilon_t + \gamma_1 \times \epsilon_{t-1} + \gamma_2 \times \epsilon_{t-2}, \]

where \( Y \) is the number of designers and \( \epsilon_t \) is a white noise error term.

The best fit of the autoregressive moving average model was an autoregressive with the 2nd and 4th order lagged endogenous variables regression without dummy for years between 1952 and 1981, trend, and season dummy and without any moving average term for the disturbance. All the estimated models’ outcome are in Appendix C. p-values are reported in the parentheses.

\[ Y_t = -333.108 + 46.766 \times \log(PCDI)_t - 82.4979 \times Dummy(year \geq 1988)_t \]

\[ + 0.3057 \times Y_{t-2} + 0.2730 \times Y_{t-4}. \]

The adjusted R-squared is 0.5557, the Durbin-Watson Statistic is 1.741, and the Breusch-
Godfrey serial correlation Lagrange multiplier test statistic is 0.839 using up to 6 residuals, which has a p-value of 0.511. Thus, at the 5%, I fail to reject the null hypothesis that there is no serial correlation in the residuals. The Durbin-Watson Statistic indicates it is indecisive whether the error follows serial correlation or not at the 5%; however, at 1% there is no serial correlation. The Durbin-Watson statistic may be biased when the regression equation contains lagged dependent variables. Therefore the Breusch-Godfrey test statistic is more reliable.\footnote{When there is no serial correlation, the Durbin-Watson statistic is expected to be about 2. Referring a d-statistical table of Savin and White, with the sample size of 141 observations, therefore I refer d=150, with 4 regressors, dL=1.679 and dU=1.788 at 5% significant level. The d=1.7412 falls into the dL and dU; therefore, I conclude that it is indecisive. At 1% significant level, dL=1.571 and dU=1.679. Therefore, we cannot reject the null hypothesis that there is no serial correlation.}

All the coefficients have the expected signs and are statistically significantly different from zero. For every 1% increase of the per capita disposable income, the number of designers increase by 0.46 firms. In other words, for one more firm to enter the market, the per capita disposable income needs to increase by 2.395%. The long run effect that when per capita disposable income increases by 1%, the number of designers increases by 1.11.\footnote{\((=0.46766/(1-0.3057-0.2730))\)} The mean of the real per capita disposable income, chained to 2005, between 1940 to 2013 was $18181.68. The 1% of it is $181.81. When there is an increase in the real per capita disposable income by $181.81, ceteris paribus, the number of designers increase by 0.46 firms in the short run. In the long run, the number of designers increases by 1.11. The coefficient of dummy variable for years between 1952 and 1987 came out insignificant across models. The dummy variable for year 1988 and above has -82.498 coefficient and is statistically significant. That means that after 1988, there have been 82.5 on average fewer firms present
Figure 4.3: 2nd and 4th Lagged Autoregressive Model with Number of Designers as Dependent Variable during New York Fashion Week. This number coincides with the time that the industry made NYFW again an organized event. It reflects the fact that the show period became one week from four week lengths. The trend variable was not significant at the 5% level. Comparing models with and without the trend model, the adjusted R-squared and Durbin-Watson d values are remarkably similar across models; this regression does not appear to be spurious. For the season dummy that represents the spring/summer and fall/winter presentation, the coefficient was insignificant across most of the models. However, the 2nd and the 4th lagged dependent variable’s coefficients were statistically significantly different from zero. This picked up the seasonality in the regression; therefore I eliminated the season dummy variable from the regression. The 6th lagged dependent variable came out insignificant. The actual number of designers, estimated number of designers and residual graph is in Figure 4.3. The Schwartz Criterion is 9.466, and it was the smallest among
other models I tested. Akaike Criterion was the third smallest next to two AR models with 2nd and 4th order lagged dependent variable with trend term in it. In those two models, the AR models with 2nd and the 4th lagged variables with or without seasonal dummy, the coefficient of the trend term was statistically significant at the 10%; however, it was not at the 5%.

The estimated coefficients of the autocorrelation function and partial correlation function are shown in Figure 4.4. This correlogram indicates that the model is stationary. Statistics indicate that I fail to reject the null hypothesis that the disturbance is white noise, up to the 19th lag. Breusch-Godfrey’s Lagrange multiplier test with 6 lagged residuals is 0.839, with a p-value of 0.511 showing that the disturbances are not serially correlated. Therefore, the parameter estimations are consistent. The sum of the coefficients of the lagged dependent variables are 0.5787 (=0.3057 + 0.2730), which is less than 1. The dynamic pattern of Y is stable rather than explosive.

I also run time series models using the number of designers per 1 million people as the dependent variable in Figure 4.4. This takes previously ignored population into analysis. The lagged by 2nd and 4th order autoregressive model is once again the preferred model among other autoregressive moving average models I have examined. The regression outcomes are in Appendix D.
Table 4.2: Correlogram of Residuals of the Model with 2nd and Augoregressive Terms.
$Y_{\text{Designer Per 1 Million}(t)} = -511.637 + 0.652 \times \log(PCDI)_t$

$(0.0003) \quad (0.0000)$

$-0.213 \times \text{Dummy(year } \geq 1988)_t - 0.888 \times \text{Trend}$

$(0.0007) \quad (0.00000)$

$+0.327 \times Y_{dp1m(t-2)} + 0.3246 \times Y_{dp1m(t-4)}.$

$(0.0001) \quad (0.0000)$

P-values are in the parenthesis. Adjusted R-squared is 0.70689 and Durbin-Watson Statistic is 1.82256. The Breusch-Godfrey serial correlation LM test’s chi-square is 0.515 with 6 lagged residuals. It indicates that this model does not have serial correlation. The Durbin-Watson Statistics also supports a condition of no serial correlation at the 5% level of significance with 150 number of observation and 5 explanatory variables, dL =1.665 and
dU=1.802. The Durbin-Watson Statistics of 1.8226 fails to reject the null hypothesis that there is no serial correlation. For the above model, the Akaike Information Criterion and Schwartz Criterion were both the lowest among 17 models I tested. (See Appendix D.)

The sign of log of per capita disposable income is correct and positive. In the short run, ceteris paribus, when per capita disposable income increases by 1%, the number of designers per one million people increases by 0.0065. In other words, when income increases by 153.84%, one more designer firm per one million people is established. The long run effect is larger that the coefficient is 1.8714. The number of designers per one million people decreased by 0.213 on average after 1988. The trend slope indicates that, ceteris paribus, the number of designers per one million diminishes by 0.89.

The actual, fitted data and the residual are in Figure 4.5. The residuals indicate that there is no serial autocorrelation for the error terms. The estimated results are consistant.

\[ 5 = \frac{0.652}{(1-0.327-0.3246)} \]
According to those relationships I examined, the current number of designers or number of designers per million people depends on the previous season’s level by 30.57% to 32.70% and two previous seasons’ levels by 27.99% to 32.46%. Some brands have been presenting at NYFW since they entered the market and have not been exited from the market. This strong effect, past numbers of designers may reflect this.

To answer whether there were "too many shows" by the time the Wilson (2007) of NYT article came out, note that the estimated number of designers in 2007 Spring/summer season was 72.75 firms according to the regression estimate with a minimum support condition. The actual number of firms presenting at that time was 78. There were 5.25 more designers that decided to present than the minimum support condition. However, the standard error of the regression is 25.23; therefore this 5.25 is within an expected error range. The tables for the actual and fitted value for the number of designers for 1943 until 2013 are in Appendix E. It is true that "too many shows" were presented at that time relative to the estimated number of designers, but with the given standard error, the number of designers shows was not out of the estimated range. By using the number of designers per one million people, I realize a good fit in the model.

Estimates derived from data from 1947 to 2013

I examined the same models by using a different data set - using only data from 1947 to 2013, instead of from 1943 to 2013. The per capita disposable income data in Figure 4.2 has a upward bump in 1947. The data for 1946 and before are imputed on the basic of estimate using equation 4.5 and may therefore be subject to imputation error. I run seven additional
autoregressive equations using the data from 1947; the results are in Appendix F. The results indicate that the coefficient of per capita disposable income is no longer statistically significant at the 10% level for six models. The last model, using the 2nd and 4th order lags of the dependent variable, without trend, while using number of designer per one million population as dependent variable, proved to be statistically significant at the 10%, but not significant at the 5% level. In addition, the sign was wrong (negative). The coefficients for the autoregressive model with 2nd and 4th order laged variables indicate robustness across models, with or without data on or before 1946. The numbers of designers from the two immediate-past same-season fashion shows determine the current number of designers, and the results indicate coefficients are statistically significant at the 5%. The coefficients for 2nd and 4th order lags had a range between 0.277 to 0.347. This results were consistent with models I used with the data from 1943.

I conclude that the coefficients for per capita disposable income became insignificant because of the two reasons. First: my method of estimating the missing data to extrapolate the bi-annual per capita disposable income before 1946 was not the best way. Second: now I am not using the eight data points for the number of designers at the beginning of the New York Fashion Week. At the beginning of NYFW, the number of fashion designers was under control of an organizer of NYFW, and I took that into account with the dummy variables in my original autoregressive models. In my future research, I will reconsider other ways of extrapolating the missing bi-annual per capita disposable data and re-examine the models I should be using to make interpretations. The exogeneity of the event of 1988 should be further considered. It might be that the NYFW has reorganized by an institution, the
number of designers may have been under cartel.

4.2 Estimation of Demand Functions for Apparel

In this section, I estimate demand functions for apparel. I tested different linear models to explain the quantity and price relationship. I find the price elasticity of demand for apparel is unit elastic when I do not use per capita income in the exogenous variables. When I include per capita income, I could not obtain robust estimates of the price elasticity of demand. It can be the results of some omitted variable or the small sample size - only 18 observations. At the end, I estimated the price elasticity of demand and income elasticity of demand by using the consumer spending for apparel in percentage data, which had 26 observations.

Ordinary Least Square Estimation

The baseline regression is a log-linear model:

\[
\log(Q) = \alpha_1 + \alpha_2 \times \log(P) + \alpha_3 \times \log(Y) + \epsilon,
\]  

(4.9)

where Q is per capita quantity consumption of apparel, P is real price, and Y is real per capita disposable income. \( \epsilon \) represents independently and normally distributed disturbances with mean zero and common variance \( \sigma^2 \).

Quantity is a sum of all the apparel production in the US and imported quantity minus exported quantity, which I described in Chapter 2. Q equals to quantity divided by the US population. Exported quantity data was limited and a few data points were missing;
therefore, an estimated value is used for substitution. P is price of apparel divided by the consumer price index, which is chained to 1984 as 100. $\alpha_2$ is expected to be negative. Y is per capita disposable income, which is chained to 2005 equals 100. I use a time trend variable in some of the estimated equations. See Table 4.3 on page 150 for the outcomes.

The available data with quantity import and export consists of annual data from 1991 to 2008. Quantity of apparel information is difficult rare to find for the national fashion industry. The industry did not report imports and exports data in quantity before 1990 and after 2008. Available data for imports and exports are typically measured in variations such as in square meter equivalent (SME) and also in quantity of garments. For example, bulky coats fit less quantity in one SME volume while thin T-shirts fit more numbers for the same one SME. Therefore, for the same value of SME, the quantity varies depending on products and material. I could not find a consistent quantity of imports and exports.

I tested variations of the Equation (4.9). For model type 1, I used the log-log linear model without using the export data, for which values are imputed for a few years as in Chapter 2. For type 2, I did the log-log linear model including the export information. For type 3, a simple OLS regression without log. Lastly, I used an instrumental variable consisting of real wage as a proxy for apparel price.

The regression results are in Table 4.3. When the demand function is specified with only price as the independent variable, then the sign of the coefficients for price elasticity of demand come out plausibly, negative and statistically significant. In model (1), the price elasticity of demand is -0.76 and statistically significant. The model indicates relatively weak statistical outcomes as adjusted R-squared is 0.62. I test the null hypothesis that
Table 4.3: Demand Estimation

price elasticity of unit elastic. \( t = (-0.760 + 1)/0.142 = 1.690 \) with a p-value of 0.109. At the 10% statistical significance, it fails to reject a null hypothesis. I cannot reject unit price elasticity in demand.

When export data are included in the quantity, in regression (6) in Figure 4.3, the price elasticity coefficient is -1.031 and statistically significant. The adjusted R-squared is 0.923 and high. F statistics of the model are also high. I test the null hypothesis of coefficient on Log(P) to be -1: \( t = (-1.031 + 1)/0.0721 = 0.416 \). Again, I cannot reject the null hypothesis that price elasticity of demand is unit elastic. The regression model (10), the coefficient for the real price was -70.189 and it is statistically significant at the 5%. I calculate the price elasticity of demand by using the average price and average quantity. The price elasticity of demand turned out to be \(-70.189 \times ($0.76/50.61) = -1.054\).

The rest of the regression models above (models 2, 3, 4, 5, 7, 8, 9, and 11) have wrong
signs, showing a positive price elasticity of demand, when the per capita income measure is included. Per capita income has positive sign across the models and is statistically significant at the 5%, except models 4, 8 and 9, which are significant at the 10%. I conclude that the income elasticity of demand is positive, and apparel goods are normal goods.

4.2.1 Instrumental Variable Estimation

I estimated the price elasticity of demand by using an instrumental variable of the real wage of apparel workers as a proxy for the real price. I could only find either wrong signs of coefficients or insignificance in statistical results of the model, I suspected that there were error terms were correlated with independent variables. Many of the models had the wrong sign of the price elasticity of demand in OLS. I suspect that the price may be endogenous and correlating with the error terms. When using real wage, the price elasticity of demand for the apparel products from 1991 to 2008 was unit elastic when I exclude income variable from the exogenous variables. I also tried the nominal wage as the instrumental variable and report the results in this section.

Using the Real Wage

I obtained the average weekly earnings of production and nonsupervisory apparel employees in the US, seasonally adjusted from the United States Department of Labor (Series ID CES3231500030). I took the average of 12 months data as an annual data and used both nominal and real weekly apparel workers’ wages. The real wage is calculated by the nominal wage divided by the consumer price index. Using the two stage least squares estimation
Table 4.4: Price Elasticity of Demand Estimation, Using Instrumental Variable

method, I estimated the following model with the use of an instrument variable:

\[
\begin{align*}
\log(Q) &= \beta_1 + \beta_2 \times \log(P) + \beta_3 \times \log(Y) + \varepsilon_1 \\
\log(P) &= \gamma_1 + \gamma_2 \times \log(W) + \varepsilon_2,
\end{align*}
\]  

where \( W \) is the weekly wage for apparel workers in the US. The wage variable is assumed to be uncorrelated with the error \( \varepsilon_1 \). The results of the two stage least square estimations are in Table 4.4.

The reported p-values for the two stage least square estimations are based on the white heteroscedascity-consistent standard errors. Models 12 to 14 are without log of per capita disposable income. Model 15 to 17 include it.

For models 12, 13, and 14, the coefficient of log of price has the right sign and is statis-
tically significant at the 5% level. Once I have log of per capita income in the equations, either the sign comes out wrong or statistically insignificant for the log of price coefficient in all other models such as in the models 15, 16, and 17.

I found that the real wage instrumental variable and per capita disposable income are negatively, highly correlated with the value of -0.944. Because of the extent of co-linearity in the data, I could not obtain robust estimates of the price elasticity.

I checked the validity of the instrument by using a weak instrument test. The F-statistic for the coefficient of the Log(W) in the first stage regression indicates that when the models have the right signs and are statistically significant coefficient for Log(P), the instrument is significant in the first stage, in models 12, 13 and 14. Otherwise, it is statistically insignificant, and I conclude that the instrument is weak in models 15, 16, 17, 18, and 19. The F statistics are less than 10. Therefore, the two stage least square estimators are biased and the statistical inferences can be misleading.

Next, I tried the Hausman Test for price variable is correlated with error term. The Hausman test is useful for large sample sizes, and unfortunately my data size is only 18 observed points. In model 12, the coefficient on residual is -0.064 and p-value is 0.893. At the 5% or the 10% level of significance, the coefficient of the first stage error term is not statistically significantly different from zero; therefore, I include the log of real apparel price is exogenous, and there is no need to use instrumental variable. The OLS estimation should be unbiased. For model 12, the weak instrument test shows the validity of the instrument; however, in the Hausman Test, it shows no need of instrument. For model 13, the Hausman test rejected the null hypothesis that the error term in the IV equation is uncorrelated with
the error term in the original regression. It indicates that this was not a good instrument, and I can properly interpret the results. The elasticity of demand is -1.02. Model 19’s Hausman test shows that real price is endogenous in 13, 14, 15, and 18. However, in the weak instrumental test, we failed to reject that the instrumental variable is a good estimator. Trend term’s coefficients turned out insignificant.

I conclude that the price elasticity of demand for apparel in the US for the period of 1991 to 2008 is unit elastic when per capita disposable income is excluded from the exogenous variables. Once I include the income variable, I cannot obtain robust estimates. The quantity in model 12 does not include the information for the export apparel volume. When quantity of which specific export is considered, both the weak instrument test and Hausman Test indicate the real wage of apparel worker in the US is a good instrumental variable, in model 13 and 14.

Some annual numbers of export data were missing and estimated value has been used for those missing ones. In the Hausman test for models 13 and 14, the coefficient of the residual becomes significantly different from zero at the 5\% level, which means quantity and price have an endogeneity problem. Given that, real wage is related to the price of the apparel but not the quantity consumed in the US. Running the instrumental variable regression with two stage least square in models 13 and 14, I can say that price elasticity of demand is -1.022 from model 13 and -1.047 from model 14.\textsuperscript{6} When I test the null hypothesis that price elasticity of demand is 1, I fail to reject the null hypothesis for model 13. Therefore, I conclude that price elasticity of demand for apparel in the US for the period from 1991 to 2008 is unit elastic when I exclude the per capita disposable income and use real wage.

\textsuperscript{6}Coefficient * (average price/ average quantity) = -68.676*(0.76/50.61)
I also run the same models using the nominal wage in place of the real wage for the instrumental variable. With both nominal and real wage, the outcomes were very similar. The regression outcome is in Table 4.5.

My conclusions did not change from the models where I used the real wage. The only change is that in Model 21, the Hausman test rejected the null hypothesis of the correlation of the error term in the instrumental variable and the original model. Again, the sample is very small, only 18.

4.2.2 Using Consumer Expenditure for Apparel

I also examined the price elasticity of demand using consumer expenditure for apparel. In the Chapter 2, I have collected the percentage consumer expenditure that is spent on
apparel and services. Apparel and services include apparel for men, women and children, accessories and footwear, and other services include laundry, dry cleaning, alteration, and clothing rentals. The annual percentage average spending on apparel and services spending is $K$. The share is expressed as

$$K = P \times Q / Y,$$  \hspace{1cm} (4.11)

where $P$ is real price for apparel and $Q$ is apparel quantity purchased. $Y$ is real per capita disposable income. The share, $K$, data is available in the Consumer Expenditure Survey at Bureau of Labor Statistics. The data range was from 1984 until 2010 for 26 annual data.

A regression I examined was

$$\ln K = a_1 + a_2 \ln P + a_3 \ln Y.$$  \hspace{1cm} (4.12)

I inserted the equation 4.11 into the equation 4.12 and obtained

$$\ln P + \ln Q - \ln Y = a_1 + a_2 \ln P + a_3 \ln Y.$$  \hspace{1cm} (4.13)

I can rewrite this as the form of price elasticity of demand;

$$\ln Q = a_1 + (a_2 - 1) \ln P + (a_3 + 1) \ln Y,$$  \hspace{1cm} (4.13)

where $(a_2 - 1)$ is price elasticity of demand and $(a_3 + 1)$ is income elasticity of demand.

I run the Ordinary Least Square regression for the equation 4.12 and the result was
\[
\ln K = 7.962 + 0.3021 \ln P - 1.2213 \ln Y, \tag{4.14}
\]

\begin{align*}
(0.0000) & \quad (0.0063) & \quad (0.0000)
\end{align*}

where P-value is in parentheses. Adjusted R Square is 0.955. All the coefficients are statistically significantly different from zero. I applied those estimated number into the equation 4.13 and obtained

\[
\ln Q = 7.962 - 0.6979 \ln P - 0.2213 \ln Y. \tag{4.15}
\]

I can say that using the data between years 1984 to 2010, the price elasticity of apparel is 0.698 and it is inelastic. The income elasticity of demand is -0.221 and according to this number, the apparel and services are inferior goods. I hypothesised that the apparel and services were normal goods. The outcome indicated the opposite of my hypothesis.

The price elasticity of demand is unit elastic when I exclude the per capita disposable income. Once I have per capita disposable income, the elasticity becomes positive and has a wrong sign. I used apparel worker’s wages as instrumental variable for the proxy of price. It appeared that the instrumental variable was highly correlated with the income variable. There have a limitations in the data so tha I could not obtain a robust outcome of the price elasticity. When I examined the price elasticity of demand by using the percentage of consumer spending for apparel, I could say that the consumers were inelastic toward apparel goods and services and income elasticity of demand indicated apparel goods and services are inferior goods.
Chapter 5

Conclusion

The New York fashion industry has a rich history of being a prominent industry in the city. When I first started to look into it, the complexity was overwhelming with a mixture of public, private, vertically and/or horizontally integrated, large, small, old and new firms coexisting in the industry. Chapter 2 simplifies this complexity by explaining each of the supply chain in stages. Firms add value to simple and purely functional garments at each stage to maximize profit opportunities by differentiating brands and products. For the fashion industry to be complete, one should not forget the effects of activities in Stage five. Some firms participate in a part of this process, while some firms take parts in many stages of the industry by integration. It is my contribution to the economics of fashion that when future economic researchers study it, the industry map in Figure 2.1 will help identify and clarify the position and function of a firm or section in the industry.

This is the first paper that actually counts the number of designers for each season since the very beginning of the New York Fashion Week, 1943. As I gathered the data, I learned the historical developments of the high fashion designer market, which I have presented in this dissertation. This is the first research paper to look into all the bi-annual New York Fashion Weeks since 1943. This is also my contribution to the future economics of fashion and the more recently developed field of fashion studies.

I did not find any economists whose focus is exclusively fashion in the US. However there have been economists who have applied their fields of specialty to understand certain
aspects of fashion-related economic activities. When the game theory approach was applied to the fashion industry, irrational behaviors of fashion consumption as well as trend cycles started to be explored more. I found there were some disparities between the economic theories and actual fashion business models, and hope that I started a bridge between those two fields. Many microeconomic theories help us to understand what has already been understood in the fashion business. For example, the industry refers to a fashion diffusion path (Figure 3.1) which describes the relationship between a timeline of trend adaptation and price. Previously, price information was not considered in the diffusion model in fashion theory. With my addition of the economic aspects to the diffusion model, we now have more complete and useful model.

Frustrated fashion show attendees started to complain that there were "too many" designers presenting during New York Fashion Week. Based on the historical data, the number of designers increased by 0.46 for each 1% increase in consumers’ real per capita disposable income. In other words, on average, an additional new firm enters New York Fashion Week when per capita disposable income increases by 2.17%. When the industry looks for a new fashion show venue in the city, I might suggest taking this fact into consideration. The high-end branding fashion business is a textbook example of monopolistic competition. If "too many" firms enter the market, then competition increases; each firm’s share gets smaller, and the market structure becomes close to pure competition. To keep firms recognized as high-end, or highly differentiated business, the entry fee to this market in a form of presenting at New York Fashion Week is very high, especially for new entrants. Understanding of the entry and exit mechanism will improve the understanding of the industry; if one can
collect actual brand names of new entries and exits in New York Fashion Week, as well as show how many long-standing big brand companies there are.¹

The price elasticity of the demand for apparel is unit elastic when I exclude per capita disposable income. When I included the per capita disposable income, the economic outcomes were not robust. One has to keep in mind that this is an aggregate apparel product, including necessities such as basic underwear, and T-shirts, and luxury fashion goods as well. Price elasticities of consumer purchasing behavior should be different for different types of apparel products. Future research needs to be done on the demand for different types of apparel products, especially after the emergence of fast fashion apparel since 2000.

¹I did not collect the names of designers who presented at each show. It would be take a very long time to do this research, so must will be left for a future time.
Appendix A

Trade Agreements

Impact of international trade agreements on apparel industry:

Growing developing countries’ exports in textile and apparel goods became a threat to the US domestic industries in the early 20th century. Relatively cheaper labor resources were available in the aspiring countries, and cheaper textile and apparel started to arrive in the US\textsuperscript{1}. The US responded by playing an important role to develop international trade treaties on textile and apparel industries to protect the US manufacturing business. Some key multilateral agreements for textile and apparel are: the Short-Term Arrangement Regarding International Trade in Cotton Textiles (STA) in 1961-1962; The Long-Term Arrangement (LTA) in 1962; and The Multifiber Arrangement I, II, III, and IV (MFA) since 1974. The 1994 North American Free Trade Agreement reduced tariffs and quotas within North America. At the Uruguay Round of General Agreement on Tariffs and Trade (GATT) meeting, nations signed a deregulation of the trade tension agreement, known as Agreement on Textiles and Clothing (ATC) replacing the MFA in 1995. GATT was also replaced by the World Trade Organization (WTO). In 2000, the US implemented Caribbean Basin Trade Partnership Act to reduce tariff and quotas on goods, including textile and clothing imports to and exports from some Caribbean Basin and sub-Saharan Africa countries.\textsuperscript{2}

\textsuperscript{1}Detail on Japan-US apparel related trade is on pp.425-429 in Sumiya (2000)
\textsuperscript{2}You can find detailed overview of the import regulations are in Chapter 10 of Textile and Apparel in the Global Economy, 3rd edition, by Dickerson. Also The Global Textile and Clothing Industry post the Agreement on Textiles and Clothing 2004 working paper by Nordas.
general, other industries’ trade restrictions were eased when the General Agreement on Tariffs and Trade (GATT) accord took effect in 1947 and liberalized the trade over time. However, the same liberalization did not happen to the textile trade between developed countries and aspiring countries. For example, Japan was an aspiring country for textile when it joined the GATT in 1955. The US manufacturers had to protect Japan’s liberalization on trade. Japan’s export on cotton fabrics increased 2.9 times since the previous year, 4.6 times more for cotton goods, and as much as 20 times more for cotton blouses (Sumiya 2001). The US government persuaded Japan to sign the first post-WWII textile-specific restriction, a "voluntary" export restraint (VER) to limit some cotton textile products. In late 1950s, growing imports from the weak US alliance countries such as Hong Kong and other developing countries became new threats to the US, but the US failed to sign any agreements. This led to the establishment of the series of textile and apparel trade agreements, STA, LTA and MFA. STA and LTA imposed quotas on cotton textiles for 1 year and 5 years, respectively during 1960s. LTA was renewed over time and was effective until 1973. New technologies developed other fibers and those imports became another threat to the US. The MFA started in 1974 and extended to manufactured fibers and wool in the form of quotas. MFA represented bilateral agreements between the US and other textile exporting countries. MFA was repeatedly renewed until The Uruguay Round in 1994.

At the Uruguay Round, an accord, Agreement on Textiles and Clothing (ATC), was made to remove the quotas on multifiber textile and apparel with a 10-year phase out of the MFA. By the January 1, 2005, these quotas were eliminated. Meanwhile, The World Trade Organization (WTO) was established and the successor to the GATT. North American Free
Trade Agreement (NAFTA) was reached among the US, Canada and Mexico in 1994 for freeing trade. These developments had impacts on the textile and apparel manufacturing in the US. Those readers who need to follow closely to the history, background and agreements, Dickerson (1999) is a good source.
Appendix B

Linear Regression Models

Table B.1: Linear Regression Models

<table>
<thead>
<tr>
<th></th>
<th>Number of Designers as Y</th>
<th>Log(Y)</th>
<th>log(Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>-3.95809 (0.9193)</td>
<td>3.6960 (0.0001)</td>
<td>3.6960 (0.0001)</td>
</tr>
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<td>2.31E-05 (0.0001)</td>
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<td>3.08E-15 (0.0001)</td>
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P values are reported in parentheses.
Appendix C

Time Series Results Using "Number of Designers" as $Y_t$

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Adjusted R squared: 0.674886
Durbin-Watson Statistic: 2.12343
Akaike Info Criterion: 5.3265
Schwarz Criterion: 6.57495
LM Test Probability F Statistic: (0.0000)
Probability Chi-square 4 Lags: (0.0000)
Augmented Dickey-Fuller Test for Residuals: -3.59022
(P-Value): (0.0076)

Table C.1: Autoregressive Models Outcomes with Number of Designers as Dependent Variable
Table C.2: Autoregressive Models Outcomes (continued) with Number of Designers as Dependent Variable, No Trend Variable
<table>
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<tr>
<th>Independent Variables</th>
<th>AR(1)</th>
<th>AR(2)</th>
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Table C.3: Autoregressive Models Outcomes (continued) with Number of Designers as Dependent Variable
Appendix D

Time Series Results Using "Number of Designers per 1 million population" as $Y_t$

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Table D.1: Autoregressive Model Outcomes with Per Capita Number of Designers as Dependent Variable
<table>
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<th>Independent Variables</th>
<th>ARMA(4,2)</th>
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<tr>
<td>C</td>
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<tr>
<td></td>
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<td>0.0025</td>
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<tr>
<td>Log(PCI)</td>
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<tr>
<td></td>
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<td>0.0005</td>
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<tr>
<td>Dummy Year&gt;1987</td>
<td>-0.197119</td>
<td>-0.209741</td>
</tr>
<tr>
<td></td>
<td>0.0014</td>
<td>0.0007</td>
</tr>
<tr>
<td>Trend</td>
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<td>-0.008848</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
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<td>Dummy Season</td>
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<td>0.2414</td>
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<td>MA(2)</td>
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<td></td>
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<tr>
<td>Adjusted R squared</td>
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<td>Durbin-Watson Statistic</td>
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<td>Akaike Info Criterion</td>
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<td>Schwarz Criterion</td>
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<td>(0.5012)</td>
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<tr>
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<td>(0.2294)</td>
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Table D.2: Autoregressive Model Outcomes (Continued) with Per Capita Number of Designers as Dependent Variable
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<tr>
<td>Dummy Year&gt;1987</td>
</tr>
<tr>
<td>Trend</td>
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<td>Dummy Season</td>
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<tr>
<td>AR(1)</td>
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<td>AR(2)</td>
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<td>AR(3)</td>
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<td>Schwarz Criterion</td>
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<td>6 Lags</td>
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<td>4 Lags</td>
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<td>6 Lags</td>
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<td>Augmented Dickey-Fuller Test for Residuals</td>
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Table D.3: Autoregressive Model Outcomes (Continued) with Per Capita Number of Designers as Dependent Variable, No Season Dummy
Table D.4: Autoregressive Model Outcomes (Continued) with Per Capita Number of Designers as Dependent Variable, No Season Dummy

<table>
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<th>Independent Variables</th>
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<td>0.001</td>
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Dummy Season

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<th>AR(3)</th>
<th>AR(4)</th>
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<td>0.121315</td>
<td>0.327003</td>
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<td>0.0001</td>
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<td>MA(1)</td>
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<td>MA(2)</td>
<td>0.225697</td>
<td>0.2745</td>
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<td>0</td>
</tr>
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</table>

Adjusted R squared | 0.703978 | 0.703797 | 0.706886 | 0.67948 |
Durbin-Watson Statistic | 1.997053 | 1.96156 | 1.822557 | 1.718852 |
LM Test Probability F statistic | (0.5619) | (0.5010) | (0.7217) | (0.6296) |
5 Lags | (0.2054) | (0.4905) | (0.6691) | (0.5908) |
Probability Chi-square 4 Lags | (0.5213) | (0.4551) | (0.6982) | (0.6062) |
9 Lags | (0.1707) | (0.4331) | (0.6352) | (0.5596) |
Augmented Dickey-Fuller Test for Residuals | -11.73477 | -11.728 | -10.75042 | -10.22464 |
(P-Value) | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
Appendix E

Actual and Fitted Dependent Variable: Number of Designers
<table>
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<tr>
<th>Year</th>
<th>obs</th>
<th>Actual</th>
<th>Fitted</th>
<th>Residual</th>
<th>Residual Plot</th>
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<td>1944S1</td>
<td>35</td>
<td>60.81856</td>
<td>-25.8186</td>
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<td>45</td>
<td>62.72804</td>
<td>-17.728</td>
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<tr>
<td>1946S1</td>
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<td>61.98614</td>
<td>-0.98614</td>
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<tr>
<td>1947S1</td>
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<td>77.82702</td>
<td>-22.827</td>
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<td>-6.90494</td>
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<td>146</td>
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<td>32.7043</td>
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<td>86</td>
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<td>-0.88327</td>
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<td>4.408746</td>
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<td>108</td>
<td>126.4571</td>
<td>-18.4571</td>
<td>*</td>
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<tr>
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<td>89</td>
<td>94.82692</td>
<td>-5.82692</td>
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<tr>
<td>1954S1</td>
<td>96</td>
<td>94.34277</td>
<td>1.657226</td>
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<td>1955S2</td>
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<td>62.24068</td>
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<td>1956S2</td>
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<td>129.5417</td>
<td>17.45828</td>
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<td>1957S1</td>
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<td>98.88886</td>
<td>-18.8889</td>
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Table E.1: Actual and Fitted Number of Designers 1943-1959
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<th>Residual</th>
<th>Residual Plot</th>
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<td>1961S1</td>
<td>85</td>
<td>100.8366</td>
<td>-15.8366</td>
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<td>1967S1</td>
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Table E.2: Actual and Fitted Number of Designers 1960-1979
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Table E.4: Actual and Fitted Number of Designers 2000-2013
Appendix F

The Autoregressive Models, Using Data from 1947 to 2013
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<th>MA(1)</th>
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<th>AR(4)</th>
<th>AR(2)</th>
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Table F.1: Autoregressive Model Outcomes, Using Data from 1947 to 2013
Bibliography


American Apparel & Footwear Association (2007). Trends: an annual compilation of statistical information on the u.s. apparel & footwear industries. Available at


Barnett, J. M. (2005). Shopping for gucci on canal street: reflections on status con-


Handbook of industrial organization 2, 1059–1107.


Hall.


Goldin, C. and L. Katz (2000). The power of the pill: oral contraceptives and women’s career and marriage decisions. NBER.


NAFTA (2005). Report from the trilateral working group on textiles and apparel to the nafta free trade commission.


