Analysis

of the Competitiveness

of the Ningbo Garment Industry

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Acknowledgement

With this dissertation, we are completing our studies here at Kristianstad University. Some theories in the international business course stimulate us to get together to write this theme.

We experienced this process as challenging, however, very instructive. We have learned that hard work and good cooperation are key factors for a good result. We have also got the opportunity to test our knowledge gained during our programme. Furthermore, we have established good relationships each other through this dissertation.

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Abstract

This dissertation focuses on the topic of competitiveness of the Ningbo garment industry. The purpose is to find out the strengths and weaknesses of the Ningbo garment industry by applying different theories assessing its competitiveness. The theoretical framework discussion is based on a literature review about competitiveness and its assessment theories and relevant garment theories. We analyzed the case in a qualitative and quantitative way. The Porter's "diamond" model and the Tim Padmorre & Hervey Gibson's GEM model were our theoretical frameworks. In the process of quantification, the authors of this dissertation conducted questionnaires addressed to 22 specialists and 173 garment company's managers in Ningbo. We come to the conclusion that the Ningbo garment industry has competitiveness on a national level. Since the documentary data is based on past material and the process of scoring is subjective, the results of this study are valid to some extent and may not entirely reflect its status quo. The paper concludes with the criticism of methodology and authors' reflections of dissertation.

Key words: analysis, competitiveness, garment industry, Porter's diamond model and GEM model.

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Chapter 1: Introduction

The first chapter introduces the background of the dissertation. The research problems and the purpose are presented. Further, the limitations and research questions are defined. Finally, the outline is presented.

1.1 Background

Economic competitiveness has drawn the attention of decision-makers around the world. While competitiveness has always been the core concern of business firms, during the past 2-3 decades the term has been increasingly used in combination with the economic performance of whole industries or nations. In order to obtain comparative competition at different levels, analysts and policy makers have attached great importance of this issue to ensure the competitiveness of firms, industries, or countries.

The term competitiveness is now also a high-frequency word used in China. With China's entrance into the WTO and further global economic integration, competition between different regions and different industries has become fiercer and fiercer. To gain a further sustainable development of their economies, the central government, local governments, public organizations and enterprises are enthusiastically trying to analyze and assess competitiveness to find out their weaknesses and strengths. The idea behind our topic, competitiveness, has already interested us since we took in public economic work.

After having finished the course of International Business at Kristianstad University in Sweden, we learned that Michael. E. Porter's " Diamond" model is a good one to use to interpret the competitiveness of a nation, a region or an industry, which inspires

us to study competitiveness. After discussions, we found that the Ningbo garment industry, which is one of the most important mainstay industries in our hometown, is an appropriate research subject aiming at investigating the level of the competitiveness, strengths and weaknesses by analyzing factors affecting the development of the Ningbo garment industry.

Our idea, to analyze the competitiveness of the Ningbo garment industry by using an existing model in a qualitative method, and to evaluate the competitiveness by means of scoring the factors we have put forward and tested in a quantitative way, is novel and interesting. While studying the literature of the research area, we realized there are a lot of research articles and research papers about competitiveness and the garment industry, which will be beneficial to our dissertation.

1.2 Problem

The competitiveness concept from the firm to the industry and to the country differs, but their borders are ambiguous since the measure used to appraise competitiveness is, to some extent, subjective. Although there are many models that can express the competitiveness at different levels, the outcome depends on the method used. However, when it comes to the garment cluster in a region, there are no specific models aimed at finding out its competitiveness even if many researchers and policy makers have found many explanatory factors that the cluster have when a cluster has been regarded as one of policy-oriented tools in China. Therefore, the problem is whether we can find the main factors influencing the competitiveness of the garment industry from existing theories and materials, and whether we can find or establish an exact model suitable for use to evaluate the field of the Ningbo garment industry. Will the model develop in this dissertation have practical implications on the whole garment industry, or theoretical implications for the other parallel industry by referring to our proved model of assessing garment industry's competitiveness?

1.3 Purpose

The purpose with our dissertation is to discover which kind of theories could appraise an industry in a region. Further, the purpose is to find what the factors affecting the competitiveness of the garment industry are by applying the appropriate existing theories to analyzing its competitiveness. Therefore, after analyzing all the factors, we will find the level of the competitiveness of the Ningbo garment industry. We will find out what factors are its strengths and what ones are its weaknesses in status quo. Meanwhile, we will operationalize the model applicable to assess the garment industry for us to better understand and accumulate the knowledge of how to use these theories to assess the competitiveness at the industrial level. In the end we will put forward some implications about how to maintain strengths and improve the weakness in order that the Ningbo garment industry will develop fast and healthily in the future.

1.4 Limitations

We have studied many researchers within the field of how to assess the competitiveness at the different levels. However, the time constraint limited us to only concentrate on the most familiar and supported theories. Concerning the case we selected, as we are studying at Kristianstad University in Sweden, some data we collected will risk the threats of the reliability with the help of our domestic relations to finish. In addition the library of Kristianstad University is relatively limited, although the library help us to borrow some related materials from the outside, it is still insufficient for us. To some extent, it will influence the validity of the dissertation.

1.5 Research Questions

The dissertation is based on the following research questions:

- What does the term competitiveness refer to?

- What factors affect the competitiveness of the garment industry?

- How to analyze the competitiveness of the Ningbo garment industry?

- What are the main strengths and weaknesses of the Ningbo garment industry?

- How to improve the competitiveness of the Ningbo garment industry in the future?

1.6 Outline

The dissertation has the following outline.

Chapter 1: The background of the dissertation is described. Research problem, research objective, research questions and limitations are presented.

Chapter 2: The methodological strategy, research design and scientific approach are presented.

Chapter 3: The theoretical framework is presented. First, the notion of competitiveness and its theories used in the dissertation are introduced. Second, the related theories that can assess the competitiveness in the field of the garment industry are explored. Finally, we select two theories and modify them in accordance with the characteristics of the garment industry in Ningbo.

Chapter 4: The Ningbo garment industry is analyzed by using the Porter's "Diamond" model in a qualitative method. We start by briefly introducing the profile of Ningbo. Then we describe the status quo of the Ningbo garment industry. Next we formulate six factors one by one in a descriptive way. In this part, some successful factors determining the garment industry in developed regions are compared to Ningbo's. Finally, the chapter summary is presented.

Chapter 5: The GEM model is used to analyze the competitiveness of the Ningbo garment industry in a quantitative way, focusing on the process of the quantification of factors influencing the Ningbo garment industry. First, sub-factors determining the garment industry's competitiveness are put forward. Second, we conduct questionnaire to testify the degree of the importance of determinants in the garment industry in Ningbo. Third, another questionnaire is introduced to score the given factors reflecting the current state. At last after calculation according to the procedure of the model, we will evaluate the competitiveness.

Chapter 6: The conclusions are presented. First, we summarize the dissertation. Further, the practical implications of the research findings are discussed. Finally, the theoretical implications of the dissertation are also given.

Chapter 2: Methodology

In this chapter the procedures throughout this dissertation are illustrated. Our choice of methodology, theory and the applicable models are presented. This section will end with a summary of the method.

2.1 Mode of Procedure

Generally speaking, there are two procedures in our methodology. One step is to find the related theories. In order to reach the goal of our dissertation, we studied previous researches in competitiveness theories to find suitable existing models that could explain the competitiveness of an industry in a region. At the same time, we searched for some related theories concerning the field of the garment industry. Then, on the basis of these theories we put forward some factors and apply them to appraise the competitiveness of the Ningbo garment industry using both quantitative and qualitative methods.

To be able to conduct our research in a proper academic way, we started by studying a number of published articles that deal with our topic of interest. Searching the databases (ELIN and Libris) we read a number of useful articles about the definition of competitiveness put forward by different economists or politicians in different times. Some articles also discussed how existing models were applied to analyze practical cases. By examining available materials and referring to other dissertations, we gained a better understanding of how to compose a research paper in a more professional way.

Based on the literature review, we gained a deeper insight into the subject and our research was taken another step forward. A telephone survey aimed at relevant

garment industrial departments was done and questionnaires were delivered, asking them to answer questions relevant to our work. As we now study in Sweden, we rely on our colleagues and friends in China to finish the principal part of this work.

2.2 Research Philosophy

There are *three alternatives* that could be used to determine the research philosophy, the *positivistic research philosophy*, the *interpretivistic research philosophy* and *the realistic research philosophy*.

In the *positivistic research philosophy*, the most vital assumption is that there only exists one reality. This reality can be discovered and studied by reducing and separating it in different parts. The connection between these parts, and the logical, structural principles that control this connection can also be discovered and known through collection and analysis of data. This in turn leads to the possibility to predict the phenomenon with the starting point of what was already known (DePoy & Gitlin, 1998).

In the *interpretivistic research philosophy,* the strongest argument is the necessity to discover the details of the situation to understand the reality or perhaps a reality working behind them. An interpretivist sees business situations as very complex and also unique. Furthermore they are a function of a particular set of circumstances and individuals. In this sense, people not only interact with their environment, they also seek to make sense of it through their interpretation of events and meanings that they draw from these. In turn their own actions may be seen as being meaningful in the context of these socially constructed interpretations and meanings. It is therefore the role of interpretivist to seek to understand the subjective reality of those that they study in order to be able to make sense of and understand their motives, actions and intentions in a way that is meaningful for these research participants (Saunders, Lewis

& Thornhill, 2000).

Realism is based on the belief that a reality exists, which is independent of human thoughts and beliefs. There are large-scale social forces and processes that affect people without them necessarily being aware of the existence of such influences on their interpretations and behaviors. Realism shares some philosophical aspects with positivism but it also recognizes that people themselves are not objects to be studied in the style of natural science. In this way, realism recognizes the importance of understanding people's socially constructed interpretations, broader social forces and structures of processes that influence the nature of people's views and behaviors (Saunders, Lewis & Thornhill, 2000).

In the light of above-mentioned philosophies, our philosophy is a realistic one. Because after studying existing literature we have gained knowledge about competitiveness, different models of assessing competitiveness and successful factors affecting the garment industry. As competitiveness is objective *realism* for a certain industry over a period of time and it will not be changed by people's thoughts and beliefs. By using this knowledge it is possible to analyze the competitiveness of the Ningbo garment industry to find out which are its strengths and which are its weaknesses.

2.3 Research Approach

There are two fundamental perspectives described by Saunders, Lewis and Thornhill in *Research Methods for Business Students* (2003, p85), namely empiricism and rationalism. The empirical way of thinking is an inductive method, which is suitable to use when no theory exists within the research area. The rationalistic way of thinking is a deductive method, which means the researcher starts from an existing theory. The theory creates a ground for a hypothesis that thereafter is testified through

empirical studies.

According to our thoughts, we want to apply existing theories to analyze the competitiveness of a specific industry. The purpose of our research was not to produce a theory that can assess the competitiveness in the field of garment industry. Our goal was that we just carry out a case study research by applying the existing theories to analyze the specific industry rather than to prove existing theories. When we conducted our questionnaires, we put forward some factors that have an impact on the Ningbo garment industry. These factors are similar to the hypothesis often used in the inductive way. So by making a comparison to the concept of the above research approach, our approach tends to be an inductive case study.

A case study is a research on one or several reality situations, which can be examined from many perspectives. The case study can also generate answers to the questions: "Why?, "What?" and "How?". The collection of data may include questionnaires, interviews, observations and documentary analysis. This is a good strategy for exploring and challenging existing theories and factors. This strategy could also provide a source of new hypotheses (Saunders et al, 2003, p93). We conducted our case study by collecting the relevant data through the reality in its context and carrying out interviews with department of the Ningbo garment industry. The type of case study that suits our aim is both descriptive and explanatory.

2.4 Data Collection

The literature and other references have a varied grade of reliability and validity. It is important for the final result of the dissertation that the literature chosen is of high validity. Both primary and secondary data are used in the research.

2.4.1 Primary Data

Our primary data is mainly composed of information gained through our questionnaires given to experts, specialists, government officials and entrepreneurs etc. The questionnaires are done by using the Internet or filled in manually with the help of our domestic colleagues and friends. Some data we collected through interviews to get general information about the subject and also to get knowledge about the newest reports. Other data we applied are from some unpublished documents provided by related departments.

2.4.2 Secondary Data

Secondary data used, are mostly information obtained from books, as well as written documents (Saunders, Lewis, Thornhill, 2003) such as journals, magazines, articles and yearbooks issued by the local government. The Kristianstad university library is our literature resource center. Since our research topic is limited to a rather small field, we found it difficult to search for relevant information directly through books. To some extent, the Internet presented us with more up-to-date references and theories. However, we still felt that literatures were not enough for us to collect. Therefore, documentations gained from China are the main sources of secondary data in this dissertation.

It should be mentioned that there are many other means of data collection, which are not used in this paper, for example archival records, direct/indirect observations, and participant observations. They are not selected in this dissertation for various reasons. Some of those methods are time consuming, for instance direct and participant observation.

2.5 Reliability and Validity

When deciding how the research should be conducted in order to get the answers needed and to minimize the threats to the credibility of the research findings, two important aspects have to be coped with: *reliability* and *validity*.

Reliability is about how well the research method yields the same results on other occasions and if other researchers could reach similar results. Reliability is also concerned with whether the conclusions are presented in a way which makes it possible to understand how sense was made from the raw data (Saunders et al., 2003). To this aspect, the determinants of assessing the competitiveness are relatively fixed for an industry in a given period of time. And we will evaluate them under the same benchmarking. This can guarantee stability, equivalence and internal consistency to results of the investigation for each respondent. So there seems no problem with aspect to the reliability.

Validity is defined as to what degree the findings really measure what they are aimed at measuring and if the findings are what they appear to be about (Saunders et al., 2003). There are different kinds of validity, e.g. face validity and content validity. As for the validity, we faced some challenges. The first reason is that the process of score is subjective when we collect data. If the participants do not know the background very well or their backgrounds are different, the answers to these kinds of questions in our questionnaires might not be correct. Some sub-factors we put forward are difficult to be quantified because they are involved in many minor factors, so this will lead to the issue of clarity of instructions in the questionnaires. What is more, most of our questionnaires will be dependent on our domestic colleagues and friends to finish rather than ourselves.

As stated above, high validity and reliability in a research is crucial for the credibility of the whole work. It is essential to be aware of the threats to validity and reliability

and what steps could be taken to reduce these threats. As for us, some data, including the result of questionnaires, we gleaned from our domestic country by our colleagues and friends may have more threats. We are worrying about the outcome of the quantitative analysis whether it will be consistent with that of the qualitative one.

2.6 Summary

In order to finish our dissertation in an academic way, we make sure the whole procedure of methodology is described, including how to collect literatures and data. Different research philosophies are presented and the dissertation is based on the *realistic research philosophy*. The research approach chosen is called the inductive case study. Furthermore, relying on colleagues to finish some face-to-face interviews or surveys together with literature and articles has been necessary.

Chapter 3: Theoretical Framework

The theoretical framework is presented. First, the notion of competitiveness and its theories used in the dissertation are introduced. Second, the related theories that can assess the competitiveness in the field of the garment industry are explored. Finally, we select two theories and modify them in accordance with the characteristics of the garment industry in Ningbo.

3.1 Introduction

Since this research analyzes the competitiveness of regional garment industry, the issue of competitiveness is of great importance. Over the past decades, the term competitiveness has been widely used. The essence of the concept of competitiveness has been applied by policy makers and economic theorists to address their thoughts to better understand the issues that are central to improving economic well-being and the distribution of wealth. Before delving into the competitiveness of the garment industry in Ningbo, it is important to introduce various theories in the field of competitiveness, which are necessary for us to seek a more proper understanding of the term competitiveness and to gain insight into the driving factors behind it. It is also important to introduce some theories about the development of regional garment industry. The research problem in this dissertation focuses on the determinants or factors used to evaluate the competitiveness of garment industry in Ningbo, China.

3.2 The Definition of Competitiveness

Competitiveness is one of the most powerful concepts in modern economic thinking. It can be defined at the level of nations, industries or individual companies. Scholars

and institutions have been very prolific in proposing their own definition of competitiveness. To a larger extent, different definitions about competitiveness particularly exist at the level of nations. Therefore, a clear concept of competitiveness is very necessary for us before we conduct our research.

With respect to the macro-economy, competitiveness is identified with a steady upward trend measured by GDP growth, productivity of resources and factors of production growing in macro-terms, and economic expansion onto the international market (enlargement of the existing markets as well as entry into new markets), that is, with the capability of offering new, better and cheaper goods and services in a competitive environment (M. E., Porter, 1990).

According to The National Competitiveness Council (NCC):

"Competitiveness is the ability to achieve success in markets leading to better standards of living for all. It stems from a number of factors, notably firm level competitiveness and a supportive business environment that encourages innovation and investment, which combined lead to strong productivity growth, real income gains and sustainable development".

According to the OECD's definition, competitiveness denotes the ability of firms, industries, regions, nations or transnational groups to confront international competition and to secure the sustainability of a relatively high rate of return on the factors of production, and of a relatively high level of employment. In the long term, improved competitiveness yields a growth in total productivity. Higher productivity is particularly important for more successful competitiveness on markets open to international competition, as it brings about a long-term improvement in the quality of life and in the creation of jobs. Finally, higher productivity offers a better use of competitive advantages, which are thus no longer limited to the availability of natural resources in the economy and global competition *(Industrial Structure Statistics, OECD, 1994)*.

A further OECD definition stresses that competitiveness is the ability to generate sustainable and relatively higher revenues from the factors of production and high employment as a result of exposure to international competition *(Globalisation and Competitiveness,* OECD, 1996*)*.

Others argue that the level of international competitiveness of an industrial sector or a given firm depends on several forces on the micro and macro level. Only the collective consideration of these variables will lead to an understanding of the dynamics underlying international competitiveness.

At the level of individual firms, competitiveness is the ability of a firm to survive and prosper, given the competition of other firms for the same profits. The competitiveness of a firm is the result of a competitive advantage relative to other firms. Porter defines competitive advantage as the ability of a company to make products that provide more value to the customer than rival products, leading to higher sales and higher profits for that company. (Porter 1985, p.2; Porter 1996, p.62)

According to above definition of the competitiveness, from the macro-economic perspective the concept of competitiveness is much more poorly defined and more strongly contested than the micro-economic one. Despite the fact that improving a nation's or region's competitiveness is frequently regarded as a central goal of economic policy, it should be based on concrete contents which exists a reasonably clear and straightforward the capacity of firms to compete, to grow, and to be profitable.

In a regional industry, the term competitiveness should be taken into consideration both in a macro and a micro level. It seems that the concept of competitiveness is 'stuck in the middle'. Therefore, the competitiveness depends on the performance and the synergy of companies and players related along the value chain by means of suppliers-client mechanisms that occur in local or regional contexts.

3.3 The Analytical Level

The concept of competitiveness mentioned above can be analyzed from three aggregation levels (Industry Canada, 1995): that is the firm, the industry or one sector of it, and the nation. There are different measures or indicators of competitiveness for each aggregation level.

According to Porter, the competitiveness of a national economy does not depend only on the macroeconomic, political, legal and social circumstances that prop it up, but not sufficient to generate opportunities for the creation of wealth, since wealth is created at a microeconomic level, on the foundations of the sophistication of firms' operational strategies and practices and the quality of the business environment in which they are competing. So the best way to understand competitiveness is on the firm level, a firm is competitive if it is profitable. At this level, profitability, costs, productivity and market share are indicators of competitiveness (Industry Canada 1995). The OECD(1992) and Grossi(1990) also conclude that the factors influencing competitiveness at firm level include knowledge and skills of a managerial, financial, technological and market nature.

In the case of industry or sector level, the analysis of competitiveness seeks to respond to classic questions on the economy: What determines investment? How is the success of firms determined? And, what are the best public policies for the sector? (Pitts and Lagnevik, 1998). Porter's diamond (Porter, 1990) is a model that has won great international acceptance for sector competitiveness studies. It is based on the analysis of industrial clusters in which the competitiveness of an enterprise depends on the performance of other companies and players related along the value chain by means of supplier-client mechanisms that occur in local or regional contexts. It is no doubt that we will put emphasis on this level because the purpose of our dissertation is to analyze the competitiveness of the current state of the Ningbo garment industry. In addition, both nation and firm level are helpful for us to analyze the

competitiveness

3.4 Related Theories of Garment Industry

3.4.1 Introduction of the Textile and Apparel Pipeline

The garment industry, as Briscoe (1971) said, developed later than the primary textile industry which was one of the earliest large scale economic activities that led the industrialization process centuries ago. The activity of the garment industry like other ones can be subdivided into various stages, which Briscoe called apparel pipeline (see Figure 3.1). A highly simplified version of the progression through the pipeline would consist of Level 1 (the manufacture of fibre) which becomes the input into Level 2, within which fibre is manufactured then sold to companies manufacturing industrial textiles, household textiles or apparel (Level 3). The completed product then has to be distributed to the final consumer in a variety of ways: in the case of the apparel manufacturing industry this process is usually achieved via some from of retailer or distributor in Level 4. A more modern view would stress the importance of all levels in the pipeline working together to achieve competitive advantage in world markets (Richard, M., Jones *The Apparel Industry* 2002, P2-3).

3.4.2 Factors Affecting the Garment Industry

According to this pipeline, the most important single element in the cost structure of the garment production process is fabric, which is normally held to account for around 40% of the total cost (Jones, 2002, p57). A second important feature of cost structures in the apparel sector is the very high degree of labor intensity which still characterizes production especially at the assembly stage (Jones, 2002, p56, 95-102) . The roles of
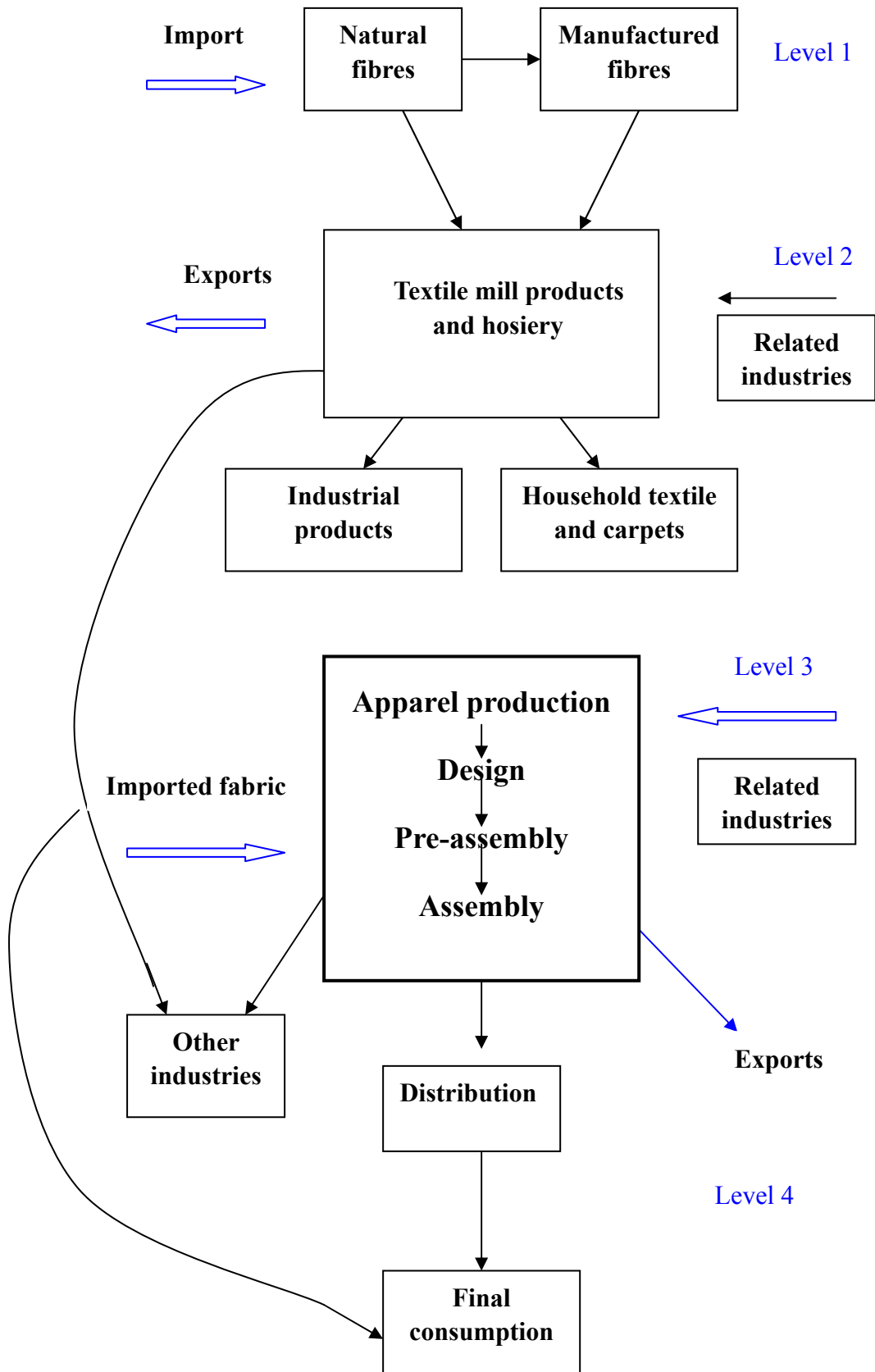
Figure 3.1 The textile-apparel pipeline

marketing and brands are also very important, especially in the environment of globalization, as Douglas (1987, p.19) pointed out:

> *"Globalization has become a key theme in every discussion of international marketing strategy. Proponents of the philosophy of "global" products ... argue that in a world of growing internationalization, the key to success is the development of global products and brands... a focus on the marketing of standardized products and brands world-wide."*

Moreover, Hunter (1990,p.1) argued that the industry could improve its competitive ability simply by making changes in management style which reflected the fact "that textile manufacture, garment making and retailing are not separate businesses, but must operate as parts of an integrated consumer responsive supply system". The essential elements of a quick response (QR) strategy were then identified as the integration of all parts of the supply chain, which means management is an important factor affecting the efficiency. Technological changes do have a role to play in the implementation of QR strategy. The introduction of CAD and Computer Controlled Cutting are examples of technological changes at the apparel manufacturing stage. Besides the enterprise strategies, the national ones, which can impact on performance, are also highlighted. Belussi (1997) argues that the competitive power of the Italian industry rests on "mature product specialization".

As Singleton (1997, p.4) argues, in apparel production the competitive advantage created at the home base. Singleton (1997, p.125) and Dickerson (1995) demonstrate, the majority of the world's top textile and clothing companies are American, European or Japanese. The location of assembly production within the value chain is not, in itself, an indicator that a specific country is likely to be the home base for the most successful companies. So a high degree of systematic integration of geographic, historic, cultural and some other factors also contribute to the competitiveness of a garment industry.

3.5 Choosing Suitable Model for Our Dissertation

3.5.1 Different Theories to Assess Competitiveness

Many models elaborated by economists, with different views from Schumpeter and the neo-Schumpeterian to the neoclassical approach and new theories of growth, have dominated the economic scenario. After researching we found a lot of theories that can assess the competitiveness at different levels. Such as J.A.Schumpter put forward the concept of economic innovation in his book of *Theory of Economic Development* in 1934. He believed that the innovation which refers entrepreneur to implement a new combination of productive factors. The world Competitiveness Year Book (WCY) produced by the International Institute for Management Development (IMD), analyses the ability of nations to create and maintain an environment that sustains the competitiveness of enterprises. The concept systemic competitiveness put forward by three German authors (Tilman Altenburg, Wolfgang Hillebrand,Jörg Meyer-Stamer, 1998) seeks to capture both the political and the economic determinants of successful industrial development. According to them, systemic competitiveness is a pattern in which state and social actors create the conditions needed to develop systemic competitiveness. The two others are the Porter's diamond model and the GEM model that can appraise the competitiveness of an industry in a region.

3.5.2 The Reasons of Our Choosing Models

There are still many other economic theories that can describe the competitiveness at different levels. The main reasons why we selected the Porter's diamond model and the GEM model as our theories that are more appropriate to be used in the later case study are:

After studying of different theories and arguments concerning the issue of

competitiveness, we can find that the earlier classic theories just provide us with a cut-in point about how to explore competitiveness. For example, classic economists mainly weighed or compared the competitiveness at the national level on the basis of the quantity of the country's possessing the resources. Their approaches lack a micro-foundation. They cannot interpret the entire issue of competitiveness. To some extent, the later scholars contribute to the enlargement of our vision of research. Through the Porter's diamond model and the GEM model, the phenomenon of economic growth can be fully understood on a microeconomic level and on the level of firms and industries. However, up till now, there are still no systematic, mature theories that could guide us to a really deep insight into the issue of competitiveness from an economic perspective.

The Porter's diamond model has been widely used as a tool of competitiveness analysis in the world. In our opinion, Porter's "*Competitive Advantage of Nations*" has made two contributions. The first is a consistent model that can explain why, for example, the environment in Italy supported a successful fashion industry, and how a completely different national setting like Germany provided a basis for successful car and machine manufacturers. Moreover, Richard M. Jones successfully interprets the competitiveness of the U.K. apparel industry. The second is that, based on the results of his analysis, Porter can give directly applicable recommendations on what to change in order to improve the competitiveness of an industry, and what to do to improve the attributes of a region or a sector.

In comparison with the IMD model mainly focuses on a macro national environment. It means that the WCY focuses on the outcome of the interaction of four competitiveness factors, including economic performance, government efficiency, business efficiency and infrastructure. What is more, there are more than 320 criteria, which makes it hard for us to adopt it to a specific industry. Therefore, the Porter's diamond is a more suitable tool for us to analyze our case.

As far as the GEM mode is concerned, the model was developed on the basis of the Porter's diamond theory. The model was first developed to explore the importance of new technologies, specifically the contribution of advanced materials in traditional industries, and has since been used in a wide range of national and international cluster analysis and benchmarking exercises. It can describe and assess the strengths and weaknesses of clusters from a regional perspective. The Ningbo garment industry has formed a cluster in our region. Therefore, from this point of view, we will gain a clearer picture of the competitiveness of the Ningbo garment industry and can explain both the dynamics and future potential of regional development. The other reason is that the factors included in the model will be quantified. The GEM determinants are organized in a way that facilitates subjective scoring and allows a mapping onto a more conventional production-system structure. So that we can sensibly and intuitively appraise the economic impact from projects aimed at improving the cluster foundations such as resources, infrastructure, firm structure, strategy and rivalry, characteristics of local markets and access to global markets. It will be easy for us to operationalize, although, the process of quantification is subjective, and that may influence the accuracy of the result.

All in all, we assume that the Porter's diamond model and the GEM model are relatively rational and will be applied to our case study research in both qualitative and quantitative ways. In the following sector, we will specifically introduce the two models.

3.6 Introduction of the Two Models

3.6.1 The Porter's Diamond Model

Michael E. Porter introduced a model that allows us to analyze why some nations are more competitive than others, and why some industries within nations are more

competitive than others (Porter, 1998). This model of determining factors of national advantage has become known as Porter's Diamond displayed in the Figure 3.2. He distinguishes four determinants:
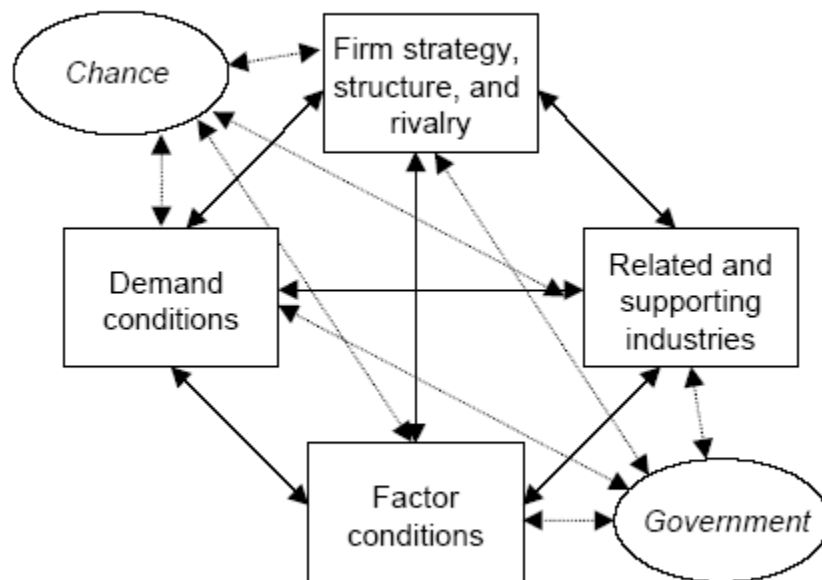
Figure 3.2 The Porter's diamond model

➢ Factor Conditions

The factor conditions are related to the situation in a country regarding production factors, like skilled labor, infrastructure, etc., which are relevant for competition in particular industries. These factors can be grouped into human resources (qualification level, cost of labor, commitment etc.), material resources (natural resources, vegetation, space etc.), knowledge resources, capital resources, and infrastructure. They also include factors like quality of research on universities, deregulation of labor markets. These national factors often provide initial advantages, which are subsequently built upon. Each country has its own particular set of factor conditions. Porter points out that these factors are not necessarily nature-made or inherited. They may develop and change.

> Demand Conditions

Demand conditions influence the shaping of particular factor conditions. They have impact on the pace and direction of innovation and product development. According to Porter, demand is determined by three major characteristics: their mixture (the mix of customers needs and wants), their scope and growth rate, and the mechanisms that transmit domestic preferences to foreign markets. Porter states that a country can achieve national advantages in an industry or market segment, if home demand provides clearer and earlier signals of demand trends to domestic suppliers than to foreign competitors.

> Related and Supporting Industries

Another determinant of a nation's advantage in an industry is the presence in the nation of related and supporting industries that are internationally competitive. Related and supporting industries can supply important inputs and services for the innovation and commercialization of firms in the sector. They can also use and coordinate particular activities in the value chain together, or that are concerned with complementary products (e.g. hardware and software). The competitive advantages partly arise from close working relationships between world-class suppliers and the industry. Through this close relationship, firms gain a quick access to information, new ideas and new technology.

> Firm Strategy, Structure and Rivalry

Entrepreneurial strategy, structure and rivalry, a factor that recognizes that the way in which firms are created and establish their objectives and type of administration will be very important for their success, together with the presence of intense rivalry from competitors, which will create pressures to innovate in order to improve competitiveness. Typical corporate objectives in relation to patterns of commitment among workforce are of special importance. They are heavily influenced by structures of ownership and control. Family-business based industries that are dominated by owner-managers will behave differently than publicly quoted companies. Porter

argues that domestic rivalry and the search for competitive advantage within a nation can help provide organizations with bases for achieving such advantage on a more global scale.

> Government

The government may affect the four aspects mentioned above by affecting conditions for the supply of key production factors, demand conditions and competition patterns among enterprises, its interventions can also have an influence at local, national and supranational levels. On national level, governments can (and should) consider the policies that they should follow to establish national advantages, which enable industries in their country to develop a strong competitive position globally. According to Porter, governments can foster such advantages by ensuring high expectations of product performance, safety or environmental standards, or encouraging vertical co-operation between suppliers and buyers on a domestic level etc.

> Chance

Chance means things that have little to do with particular circumstances in a nation and lies beyond the power of the firm. Fortuitous events, such as inventions, political decisions by foreign governments or wars, which are beyond the firms' control but that can generate discontinuities that will influence gaining or losing a competitive position.

The four determinants of national advantage, influenced by government and chance, shape the environment for competition, upgrading, and gaining and loosing competitive advantage of industries in a nation. A favorable diamond of national advantage tends to create an environment that promotes the development of clusters of competitive industries – geographic concentrations of interconnected companies and institutions, with vertical and horizontal linkages between suppliers, producers and customers. These clusters ideally become a mutually supporting system as firms

have access to the best suppliers and most demanding customers, and benefit from a shared pool of knowledge coming from dedicated research institutions or experienced workers.

(*source:http://www.themanager.org/models/diamond.htm*)

3.6.2 Groundings—Enterprises—Markets (GEM) Model

In 1998, two Canadian scholars Tim Padmore and Hervey Gibson improved the Porter's diamond model by summarizing the experience based on long years of research on industrial clusters. Then they created a new model which can describe and assess the competitiveness of clusters from a regional perspective. The GEM model established the six categories of determinants affecting the competitiveness of industrial cluster, which include: "resources", "infrastructures", "suppliers and related industries", "enterprise structure, strategy and rivalry", "local market", and " external market". The six categories compose three parts: Groundings—"resource" and "infrastructure" is called factor pair I , Enterprises—"suppliers and related industries" and "enterprise's structure, strategy and rivalry" is called factor pair II , Markets--"local market" and " external market", is called factor pair III. The chart below (Figure 3.3) illustrates the relations between them.

Factor pair I , consists of the supply determinants to which the productive processes of enterprises in a cluster are input.

*Resources***:** Resources are natural, inherited or developed endowments available within the region. These include natural resources like forests, mineral deposits as well as land, a labour supply that is skilled, flexible and reasonably priced, strategic geographical location, financial capital and, not least, technology and patent.
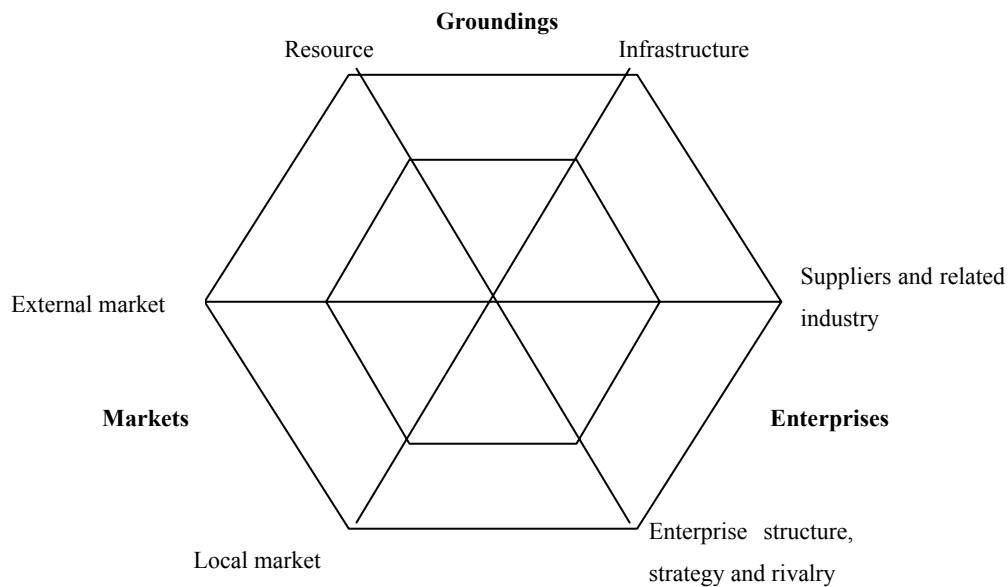
Figure 3.3 The GEM Model

*Infrastructure***:**   Infrastructure consists of physical structures and institutional arrangements that facilitate access to resources and support other business functions. It includes physical infrastructure like roads, ports, pipelines and communications as well as intangible infrastructure like business associations, research laboratories, training systems, tax and regulatory regime, national monetary policy, financial markets, business and labour climate, quality of life (housing, crime, etc.).

Factor pair Ⅱ, refers to the structural factors of enterprise clusters which determine the productivity of a cluster. Their explanation is similar with that of two factors, "related supporting and industries" and "firm structure, strategy and rivalry," as mentioned in the diamond model.

Supplier and related industries: The cluster uses the goods and services of other enterprises within the region, i.e. suppliers.   Success factors include diversity, quality, cost and proficiency, as well as the quality of the buyer-supplier relationships. The other issue is related firms that use similar technology, transferable human resources,

similar specialized infrastructure, or that serve common markets. Success factors include the number and quality of these related firms, and the existence of formal and informal linkages between them and the cluster firms.

Firm structure, strategy and rivalry: These refer to the number and scale of enterprises in a cluster, the arrangement manner of goods production between firms, the management form of enterprises and the structure type of firm property right. They influence the strategy direction and the competition tactic of the whole cluster. The reasonable size of firm and the effective arrangement manner of production will make the value-chain in the cluster secure and nimble, thus assuring production process to realize not only the convergence effect of cluster but also scale effect of production. Meanwhile, the overall management level and the property right structure of enterprises in the cluster will impact on whether the firms get successes with an advantage of cost or differentiation, then determine the growth and competitive strategies of the cluster in markets.

Factor pair Ⅲ, means the demand conditions, including the end market demands, medium demands and the demands of enterprises in a cluster.

Local market: It refers to a regional market. The notion of "local" can be defined as a province, a region, or a nation. Our preference has been to restrict the notion of "local market" to the domestic market itself. This is largely because of the small size compared to the whole nation and the essential difference between the domestic market and the international market. Important are the size of the market, market share, growth and prospects, extent of local sourcing by purchasers, standards and quality expected, distinctiveness of local demand, and willingness of buyers to work with the local cluster.

External markets: In principle, regions face a more or less common set of external markets except the local market. What differentiates between regions, therefore, is

the accessibility of external markets, including issues such as closeness of markets, their size and growth rates, global market share for the cluster, characteristics of end users, existing market relationships, barriers to entry, trade and export barriers.

The GEM model is a tool studying competitiveness of industrial cluster based on the Porter's diamond model. Compared with the diamond model, it puts more emphasis on the role of the government in the cluster development and it also considers the different determinants with mutual supplementary and interrelations. Furthermore, the GEM model can quantify the level of competitiveness mathematically, which makes it more direct and convenient than others models analyzing competitiveness.

3.7 Summary

In this chapter we firstly present the concept of competitiveness at national, regional and firm level, then we introduce some models that can assess the competitiveness for a nation, a region or a firm. Next, as the Ningbo garment industry is our case study, we quote some determinants affecting the garment industry. In the end, to realize our purpose of analyzing the competitiveness, we give the reasons why we choose two models as our tools to assess the competitiveness.

Chapter 4: Qualitative Analysis—Application of the Porter's Diamond Model

The Ningbo garment industry is analyzed by using the Porter's diamond model in a qualitative method. We start by briefly introducing the profile of Ningbo. Then we describe the status quo of the Ningbo garment industry. Next we formulate six factors one by one in a descriptive way. Finally, the chapter summary is presented.

4.1 Overview of the Ningbo Garment Industry

Ningbo is located on the east coast of China, in the south of the Yangtze Delta. It is an important industrial base in the Zhejiang Province and has become one of the largest port cities in China. The garment sector is an important part of Ningbo's manufacturing industry, giving employment to more than 200,000 people. Its importance for social and economic cohesion has increased because it is dominated by a great number of enterprises. More than 2,000 firms are engaged in this industry, of which 439 are medium-sized and large-sized enterprises with a total 117,000 employees. In 2003, all Ningbo's garment industry produced over 1.4 billion suits, accounting for 12% of the country's total production capacity, and had a 22.8 billion RMB (approximately $ 2.76 billion) turnover.

As the oldest sector in the history of Ningbo industrial development, the garment industry has undergone remarkable expansion and modernization efforts through its privatization and marketization during the last 1990s. It has increased productivity through the cluster and production chain, re-oriented production from low-quality to high-quality products and made abundant established brands. Now in Ningbo, 11

firms are of China's 100 best garment enterprises. The Ningbo garment industry has nurtured a number of famous brands in men's and children's wear such as Firs（杉杉）, Youngor（雅戈尔）, Romon（罗蒙）,Yixiu（一休） and so on, of which 12 are national brands. They enjoy significant market shares in their respective market segments on the Chinese mainland. Table 4.1 shows the national ranking of annual sales and profits for three Ningbo enterprises in 2003. Firs, Youngor and Romon are very famous in China. Meanwhile, their presence has accelerated the development of the whole Ningbo garment industry.

Table 4.1 The ranks of the three Ningbo garment enterprises in China in 2003

	Youngor	Firs	Romon
The ranking in sales	1	4	10
The ranking in profits	1	9	7

Source from: *The Yearbook of Chinese Garment Industry (2003)*

Ningbo is also known as a foreign trading port with a long history. Ningbo created the glory of "the silk road on sea" in ancient times and it was the birthplace of the garment industry in modern China. Ningbo tailors made the first Chinese tunic suit and the first Western-style suit, managed the first Western-style suit store, and wrote the first book on making Western suits in China. What is more, Ningbonese in China founded the first garment school. The above five "first" in China fully prove the place and function of the city in the history of clothing development of China.

Since 1978 Ningbo has boasted rapid development of export trade, especially the garment industry. The degree of openness of the Ningbo garment industry is very high. The proportion of export volume to total sale is high, 64.9% in 2000 and 70% in 2003. The top destinations are Japan, the US, the EU and Korean. Ningbo has been an important exporter of garment in China and also has been an important producer of

men's clothing in the world. Ningbo garment enterprises have introduced the most advanced production equipments to improve productivity and quality.

It is great that the garment industry contribution to the GDP of Ningbo, and 4% of the population are involved in this labor-intensive industry. The profit of the Ningbo garment industry mounted to 1,224 million RMB (about $148.4 million). Compared with Shanghai, Hangzhou and other neighbor cities, the production value, sale, profit and profit margin of the Ningbo garment industry are the highest. (See Table 4.2)

Table 4.2 Comparison of some indicators between Ningbo and neighbor cities

Unit: billion *RMB(equals to 0.121 $)*

City	Number of firm	Number of worker(thousand)	Turnover	Sales	Profit	Average number of worker per firm	Profit margin （%）
Shanghai	886	184.4	25.145	27.741	1.255	208.1	4.52%
Hangzhou	272	54.2	7.653	7.463	.377	199.3	5.05%
Ningbo	431	117.1	16.494	15.769	1.224	271.7	7.76%
Shaoxin	260	55.6	9.005	8.764	.531	213.8	6.06%
Wenzhou	312	63.9	8.428	8.135	.528	204.8	6.49%

Source from: Shanghai Garment Industry Association, *the Yearbook of Apparel Industry in Shanghai and Yangtze Delta Region in 2004,* published by DongHua University.

The Ningbo Textile and garment is one of six major industries in the area, not only directly promote the development of Ningbo economy and society, but also boost the fashion atmosphere and globalization. However, with the transformation of the international garment industry and trade situation, with increasing degrees of garment

trade liberalization on the international market, the Ningbo garment industry is faced with a number of challenges. How can the industry keep the predominant position in Chinese mainland and share more of the opening market abroad. Therefore, in the future, Ningbo must improve the competitiveness of the garment industry, adapt to new competitive regulations and changing business environment, and gain the advantages in both domestic and international competition.

4.2 Analysis of The Ningbo Garment Industry With Diamond Model

The four determinants put forward by Michael E. Porter, which influence an industry are: factors condition; demand condition, related and supporting industries and firm strategy, structure, and rivalry, They affect each other and the weakness of every determinant will impede industrial upgrading and the potential of innovation. Meanwhile, Porter also put emphasis on the functions of government and chance. He argued that the government should avoid intervening in the market to the utmost extent. Chance events, which are fortuitous, can alter the original conditions and create discontinuities that allow shifts in competitive position. Furthermore, they can impact and change key determinants in the diamond system. In the following parts, we will analyze and assess the six determinants in details one by one on the basis of the present situation of the Ningbo garment industry（Porter, 1990, p71-73, p124-128).

4.2.1 Factor Conditions

The factors conditions are composed of the two parts: basic factors and advanced factors. The basic factors include geographic conditions and natural resources, infrastructure and energy supply, basic labor force resources and local financial market. Meanwhile, the advanced factors consist of technical equipments, talents,

education, innovation activities, capital operation and the like.

A. Basic Factors

➢ Geographic Condition and Natural Resources

Ningbo city is located in the eastern part of the Zhejiang province along the East China Sea, with the Zhoushan Archipelago as its natural shelter in the east, bordering on the Hangzhou Bay in the north, neighboring on the city of Shaoxing in the west, facing Sanmen Bay in the south, and adjacent to the country of Taizhou. The Yaojian River and the Fenghuajian River converge downtown and flow into the East China Sea through the Yongjian River.

Ningbo Port ranks as the second among the continent ports in China and is one of the largest ports with an annual cargo throughput of more than one hundred million tons. The shallowest section of the entry channel is more than 18.2 meters deep, enough for vessels of less than 250,000 tonnages to entry freely. Huge ships of 250,000 to 30,000 tonnages can also navigate at tide. It is well situated at the middle of the coastline of Mainland China, just at the T-shaped joining point of north-south shipping line and the golden waterway of the Yangtze River. Its service area covers the whole East China and the high-developed economic drainage areas of the Yangtze River. It is also convenient to navigate to the Southeast Asian and the whole Asian Pacific regions. Thanks to the port, Ningbo has a long history of foreign trade.

Ningbo is located in the fast developing economic zone of the Yangtze River Delta. The complementarities and interaction between Jianshu province, Zhejiang province and Shanghai and the prosperity of Shanghai Metropolis will significantly stimulate the development of Ningbo's economy.

➢ Infrastructure and Energy Supply

    a) *Transportation system*. There is a high-developed transportation network of highway, railway, aviation and waterway. With the completion of cross-sea

and cross-gulf bridges, Ningbo will be soon integrated into the "two-hour" economic circle of Shanghai.

b) *The Construction of Informationalization.* Ningbo has established the Internet Exchange Center and Ningbo Branch of Digital Certification (CA). The scale of network, the level of technology and the ability of service keep ahead in the nation. The local network has a comprehensive ability to provide with fixed and mobile audio communication services, datum services, computer multi-media services and image communication services.

c) *Electricity Supply.* The severe shortage of electricity supply, which results in the halt of operation, is a short-term problem that will be solved by the completion of massive electricity projects.

➢ Basic Labor Force Resources

Ningbo is abundant in high-quality basic labor force resources and job seekers coming from other poverty-striken regions. So it is very easy for the local garment firms to employ high quality but cheap labor force resources. Compared with some eastern European countries, the labor cost in Ningbo is kept lower. Nevertheless, with the rise of living costs of the inhabitants, the firms will be confronted with an increase of labor force costs. Furthermore, they are facing more and more pressure from some developing countries such as Pakistan and India etc. The average hourly pay rate in some developing countries are as follows: 1.77$ in Tunisia, 1.89$ in Morocco, $1.01 in Albania, 2.9$ in Poland and 2.13$ in Turkey, while lower levels can be found in Asian countries (Indonesia 0.7$, China 0.6$, Vietnam 0.6$, Thailand 0.5$, India 0.2 $, Pakistan 0.2$). Compared to $19192 annual wage in Los Angeles (Los Angeles Fashion Industry 2003), Ningbo has an average annual wage of $1653(0.62 $/h, close to the China's average level), which is higher than in western China and southern Asia (See Figure 4.1). These figures illustrate that the Ningbo garment industry will face

challenges not only from the inner land of China, but also from some developing countries where their wages maintain a low level.
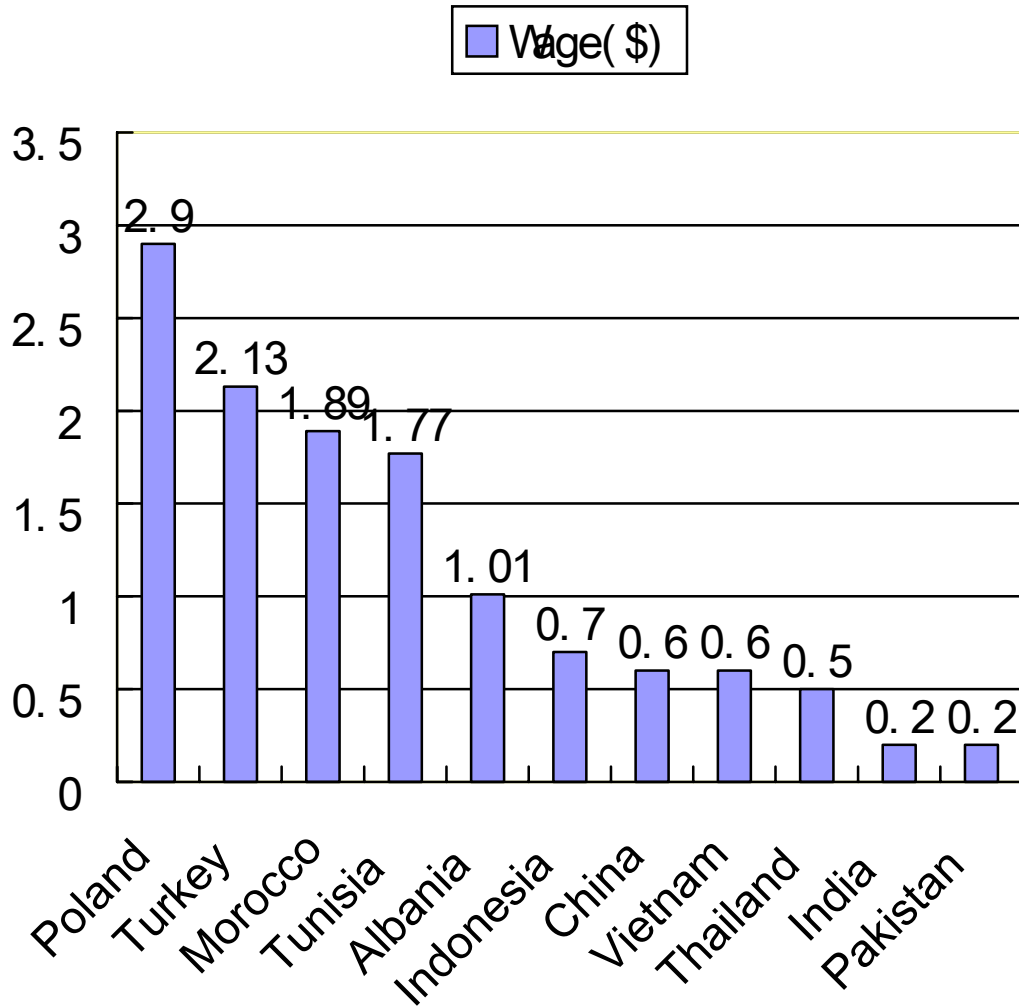
Figure 4.1 Comparison of some countries' wage level ($/hour/capita)

Meanwhile, the high volatility of the labor force will also raise the costs of firms. According to an investigation done by the Ningbo labor bureau, the average wage of garment industry employees varies from 800 to 1500 Yuan per month, and this figure did not reach the level for which employees will loyally work in one place forever. The lower the wage is, the higher the volatility of the labor force will be. Nowadays it has become a common phenomenon, and some firms suffer from a shortage of workers while many laborers are looking for job opportunities. This dilemma the

industry has to face. All these factors will gradually spur the garment firms in Ningbo to transform their strategies from cost-oriented to value-oriented.

➢ Financial Market

Ningbo is near Shanghai, the financial center of China, and provides investors with a good environment of investing and financing. Moreover, the local culture of emphasizing business lays a solid foundation of sufficient original capital accumulation. However, private-owed companies and small-medium enterprises (SMEs) cannot obtain enough loans from commercial banks. Meanwhile, high social risks, less flexibility of capital and narrowness of finance channel, to some extent, hinder the development of economy. In sum, the financial market in Ningbo is on a less developed stage.

B. Advanced Factors

➢ Technological Equipments

A group of the key garment companies have introduced first-class equipments assembly line in the world, providing with automatic design, automatic material arrangement and spread-out, automatic sewing, 3D ironing and automatic packing. Furthermore, the firms are commencing constructing informationalization, such as the application of knowledge about Enterprise Resource Planning (ERP), Customer Relationship Arrangement (CRM) and Supply Chain Management (SCM) and gain benefits from it (see Table 4.3).

They improved manufacturing productivity of the equipments by using soft technology, such as CAD, CAM and UPS. The core technological equipments of more than 85% key firms in Ningbo reached advanced level in the world. However, some problems about standardization and share of information remain unsettled. The development of information system and the popularization of hi-tech are far from

perfect. Compared with more than 50% of CAD/CAM application in US, 70% in EU and 80% in Japan, Ningbo only amounts to 31.6%.

Table 4.3 The imformationalization construction of Ningbo garment industry

Items	Intra/inter-net	E-business stage	Retail POS system	CRM	SCM	ERP	None of them
Proportion of firm	60.3%	28.2%	4.6%	20.7%	10.3%	10.3%	26.4%

➢ Talents and Education

With regards to talents and education, Ningbo has been investing huge amounts in preparing for construction of the Ningbo Vocational College of Textile Technology, the Ningbo Vocational College of Apparel Technology and the Ningbo Garment School. By now, the courses related to the textile and clothing industry are taught at more than 30 colleges and schools in the city. In the past five years, Ningbo has nurtured more than 6,000 students (see the following Table 4.4 and Figure 4.2). However, the undergraduates only accounts for 1.5% of them. Those colleges and schools lack ability to foster the higher-level talents.

At the same time, the profound cultural tradition and atmosphere of the garment industry in Ningbo have cultivated a large group of excellently skilled-workers in the garment industry. Now the government pays much attention to inheriting and developing the excellent cultural tradition of clothing.

However, compared with the neighbor cities, such as Shanghai, Hangzhou and Shuzhou, Ningbo has some comparative disadvantages, to some extent, especially in the aspect of fame. This gives rise to a flow-out of local talents and excellent talents from other regions are unwilling to work in Ningbo. The majority of the numerous

SMEs in Ningbo, which are private-owned and operated in a family manner, lack instruments attracting and retaining talents. Up to now, Ningbo only has 40 garment senior technicians, which accounts for 0.8% of all the tailors. The phenomenon of lacking senior talents, such as designers and senior managers in the garment industry, impedes the Ningbo garment industry further development.

Table 4.4 The number of recruited students majoring in garment industry over past five years in Ningbo

Name of school	Education level	The number of recruited students					In sum	
		2000	2001	2002	2003	2004		
Ningbo University	Level 1	24	17	19	22	12	94	
Ningbo Advanced Technological Academy	Level 2		80	80			160	5486
Zhejiang Vocational College of textile Technology	Level 2	96	279	455	297	209	1336	
Ningbo Vocational college of garment technology	Level 2	310	717	772	1097	1094	3990	
All kinds of vocational high school and technical secondary schools in Ningbo	Level 3	1050	1120	1056	1516	1500	6242	

Source from: *Ningbo Recruit Office of Advanced Education* and *Ningbo Education Bureau*

➢ Innovation Activities

Relatively speaking, the firms which are pursuing the brand strategy, mainly tatting clothing firms, put heavier weight on innovation investment, as opposed to those which are engaged in processing trade for export, mainly the knitting clothing firms with a weak ability of R&D. The garment firms in Ningbo are prone to borrowing

"heads" from outside clusters in the processes of self-development and design, which means the innovation system of knowledge in the cluster is well developed and the cluster development cannot meet the most advanced firms' demands. For example:
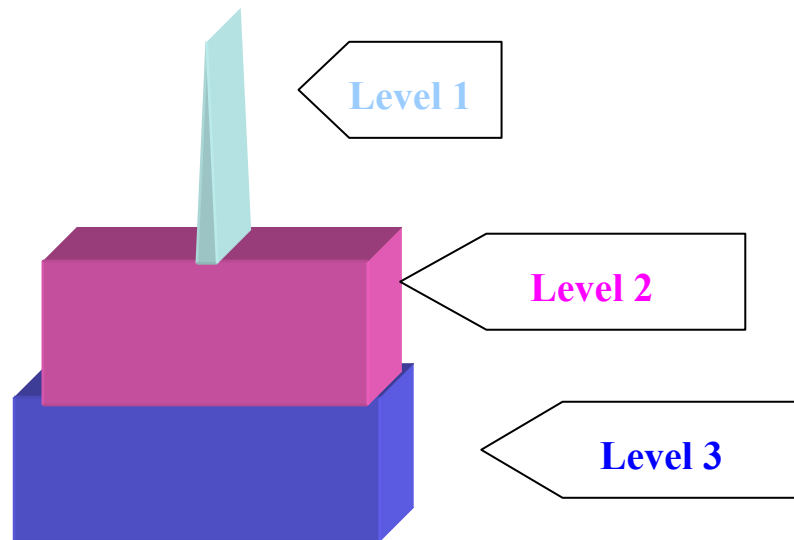
Level 1—undergraduate;

Level 2—high vocational education and junior college;

Level.3--vocational high school and technical secondary school

Figure 4.2 The distribution of students majoring in the garment industry in the past five years in Ningbo

◆ *The Apparel Design Headquarter of Firs Ltd. Co.*: owning a large group of domestic well-known designers and foreign designers:

◆ *The Design Center of Youngor Ltd. Co.*: being led by the deputy dean from the Garment College of Shanghai Donghua University;

◆ *The Design Center of Romon Ltd. Co.*: cooperating with famous companies in South Korea, owning over 300 professional designers:

◆ *The Vocational Clothing Design Center of China*: being founded with the cooperation between Peiluochen Group and ManQi Co. from the US.

➢ Capital Operation

The majority of the garment firms in Ningbo are private-operated and almost all the

original state-owned enterprises experienced reconstruction and reform. They now enjoy a flexible mechanism of management. The forms of company organization have been transforming gradually from private-owned, household system to the ones of joint venture, cooperation and joint stock operation. A great deal of high-organized private-operated firms under the cooperation system established their presence. Meanwhile, the manners of management are also changing gradually from household type to more modern and human character. The firms lay much emphasis on employing senior talents of management. And a group of professional managers consisting of engineers, production managers, financiers, and sales managers are emerging.

A part of the firms entered the capital market by being listed in the stock market and broadened their financing channels. Some key companies strengthen themselves by means of capital management, such as shareholding controlling and merging. Thus, the resources are converging the superior companies. In contrast, the phenomenon that a relatively great amount of firms still have an old-fashion management style and lack perfect instruments of employing and retaining talents, along with the imperfect social credit system, the single mean of financing and insufficient utilization of civic capital, hamper Ningbo's garment firms from further developing.

4.2.2 Demand Conditions

➢ Domestic Demands

The continuing increase of the national economy and resident income will strongly and directly improve the domestic demands for clothing.

In 2003 the GDP per capita of China was $1090 and that of some advanced cities reached $ 3000. The GDP of Ningbo in 2004 was 215.8 billion Yuan RMB

(approximately $26.22 billion) and its per capita GDP in 2004 reached 38,858 Yuan RMB (approximately $4721). Figure 4.3 illustrates the GDP of Ningbo from 1998 to 2004. From the chart, we can find the annual average growth rate of GDP in Ningbo was over 20%. It means that the economic and social development will enter a new, rapidly developing period. Meanwhile, the consumption structure will be further upgraded and the consumption demand will speed up.
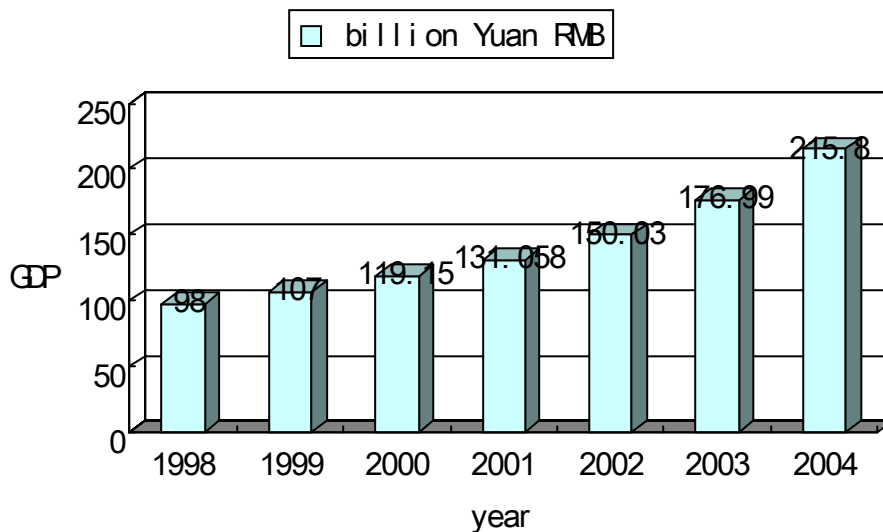
Source from: Ningbo Statistical Bureau

Figure 4.3 The GDP of Ningbo over the years (1998-2004)

As far as apparel and accessories are concerned, the consciousness of brand consuming of home consumers will be stronger and stronger. A middle class with a strong purchasing power will come into being. Nevertheless, the domestic garment consumption market is still not mature and lacks an elite consumption group.

The annual average disposable income per capita of the Ningbo dwellers stands at leading position in China. It   reached 15,882 Yuan RMB (approximately＄1930) in 2004.   Figure 4.4 shows the disposal income per capita of urban residents in Ningbo from 1999 to 2004, with an annual average growth rate of 13.46%. The powerful comprehensive economic strength of Ningbo supports the traditional high demands

for clothing in Ningbo. The continuing decline of the *Angel coefficient*, the proportion of food spending in overall expenditure, displays that a part of the consumption group has the ability to upgrade and Ningbo enters a period of high consumption where consumers pursue fashions and individualized demands.

Figure 4.4 Disposal income per capita of urban residents in Ningbo over years

➢ International Demand

According to the outcome of Ningbo Statistics Bureau's investigation of 187 samples of the Ningzhou district (the most important district in Ningbo, possessing Firs' and Youngor's famous enterprises), the top destinations of export are Europe, America and Japan (see Table 4.5). The Middle East countries have strong purchasing power too. Despite turbulence situation, it is still a bridgehead for a Ningbo garment merchants to exploit foreign market. After having adopted a flexible export strategy, the Ningbo garment industry keeps a predominant position in China.

In 2005, the world economy will keep a slight revival tendency. The economies of main export nations and regions, such as the US, Japan and the Euro Zone, to which the Ningbo garments export, will continue to increase. The economic growth of

developed country will facilitate the increase of the Chinese garment export.

The clothing products of China share a certain position and reputation in the supply and value chain of big international purchaser. However, the garment firms are confronted with cost pressures at the same time as the amount of orders increase.

Table 4.5 The distribution of the export destinations of the 173 investigated enterprises

Destination	Number of enterprise	Percent
Europe	107	61.8%
America	84	48.6%
Japan	94	54.3%
The Southeast Asia	30	17.3%
South Korea	36	20.8%
Hong Kong	40	23.1%
The Middle East and Africa	51	29.5%
Others	13	7.5%

Source from: the Ningbo Statistics Bureau in 2003

As an important port city and outstanding place of textile-apparel export, the volume of Ningbo's clothing export dramatically rises each year. According to the Ningbo Customs statistics, the total export value of clothing and accessories in 2003 went up to $2.29 billion, accounting for 3.7% that of the export of whole nation, with an increase by 51.7% opposed to the last year. The export volume in the first quarter in 2005 surged up wildly after the expiration of the MFA (The Multi-Fabric Arrangement, 1974--2004).

However, there are still some disadvantages in the demands conditions of the Ningbo garment industry. With the expiration of the MFA, the main import nations, such as

the US, the EU, Canada, Japan and South Korea have been committing themselves to setting up laws to restrict the textile-apparel import. In addition, with the speed-up of client order frequency, the production cycle from price inquiring, ordering, pattern making and recognition to formal production becomes shorter than ever before. This demands flexibility and quick response for the garment enterprises.

4.2.3 The Industry Strategy, Structure and Rivalry

➢ Structure

Ningbo garment industry has formed a cluster. The "corridor" of the L-shape clothing industry and Xiangshan knitting manufacturers are recognized as remarkable features of cluster. Nevertheless, the level of clustering is still low and it exists homogeneous phenomenon. The degree of integration between the firms is not strong.

The private-operated firms develop fast. They have the characteristics of flexible management mechanism. After several years' fierce competition in the market, some of them have grown into key firms with strong competitiveness in the industry. However, a great number of private-operated enterprises still have an old-fashion household management style and their further development is restricted.

The Ningbo garment industry has a dual structure. That is a co-existence of large enterprises and SMEs. Along with a large number of the family factories, the majority of enterprises are SMEs. This structure is adaptable to the characteristics of the garment industry. The SMEs that have flexible mechanism and distinguishing specialty can make quick response to the changes of the external environment. Meanwhile, the SMEs can attain external scale economy by developing with all kinds of social relationships, divisions and cooperations.

➢ Strategy

With the development of the Ningbo garment industry, a group of firms have grown up into "key" firms, which has an advantage of internal scale economy and play leading roles in the industry. The understanding of "large enterprise" concept is gradually changing from simple expansion, diversified economy to industry cooperation. The large enterprises ought to integrate with a great number of SMEs in the industry horizontally and vertically and then turn them into the large enterprises' supplementary and processing factories by means of developing the ability of core strategy, along with the scalization and standardization of production. There are numbers of domestically well-known brands in the Ningbo garment industry, such as Firs, Youngor, Romon, Yixiu, Peace Bird, Peilouchen, Giant Eagle, Bulijie, Weishen, Aiyimei, Tong-lion and so forth. Some of them have built their presences in the international market. This shows Ningbo advantage in brand marketing .So that Ningbo garment industry will own the whole brand advantage driven by the firms' brands.

It is very obvious in Ningbo that around a large garment enterprise, as a center of the area, there are numerous small factories depending on and serving the large one. For instance, by drawing a circle with a center of the Dongfang Clothing Factory and radius of 5km, there are 30 embroidery mills, 20 printing and dyeing plants and supplementary material producers and 10 water-washing mills in this circle. These small plants, which attach themselves to and provide the garment factory with extended services, can assist the garment factory in meeting the clients' accessory demands better and to improve its competitiveness. This evidently demonstrates that an interaction industry cluster has basically been shaped in Ningbo. Nevertheless, there is a phenomenon of homogeneity in the Ningbo garment industry. The main variety of the Ningbo garment is men's clothes, especially western-style suits and shirts. And the differences between the firms' strategies are not apparent, which gives rise to low-price competitions.

➤ Rivalry

The Ningbo garment industry is confronted with two fierce competitions in the domestic and international markets.

In the domestic market, there are many strong domestic rivalries for the Ningbo garment industry, such as Wenzhou's men's wear, Dongguan's women' s wear, Foshan's knitting products and so on. Taking Wenzhou garment industry as an example, there are over 2000 clothing enterprises and 120,000 employees work in the industry. Meanwhile, there are more than 200 firms that produce 50,000 western-style suits annually and 10 key firms whose sales reach over 100 million RMB (about $ 12.12 million). And in Wenzhou, there are many domestic original brands building their presence in the market, such as Xiameng, Judger (Zhuangji), Baoxiniao (means pied magpie) and the like. With a plenty of equipments and advanced technics, the Wenzhou garment industry has primarily formed a sale network in the domestic market and has succeeded in virtual operation, such as Metersbonwe Group, Semir Co. and so on. The Wenzhou government has set a goal of " Building a well-known garment city-wearing in Wenzhou" and has embarked on the construction of "the Chinese Famous Garment Industry Garden"

The majority of Ningbo garment enterprises are engaged in process trades and their main export products are low and medium grade. So Ningbo garment industry will face fierce low-cost competitions from developing countries, such as Pakistan, India, Indonesia, Vietnam and so on. Besides, the drop of the tax drawback of export, to some extent, also impacts the cost competitiveness of the export firms. Meanwhile, the dramatic fluctuation of the cotton prices cost (see Table 4.6) exposes the export firms to the high risks of operation.

Table 4.6 List of the world cotton price (in cents per pound) from 1999 to 2004

Year	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004
Price (yearly average)	52.88	57.34	41.82	55.89	69.88

Source from: Cotlook, Ltd. United Kingdom

4.2.4 Related and Supporting Industries

In Singleton's opinion (1997, p.73) the most important related and supporting industries to the garment industry are the production of machinery, materials, the fashion sector and relevant services and facilities. Clustering is present in these industries for the Ningbo garment industry. Cooperation among these industries is an important factor to support garment industry and to enhance the competitiveness.

➢ Cloth and Auxiliary Material Supply

The cloth and accessories material are mainly imported from neighbor areas around Ningbo city. But much top grade cloth must be collected from the Guangdong province, even some firms with famous brands import cloth from foreign countries directly. In order to overcome this constraint, some enterprises start to expand toward upstream of industry chain by means of cooperation with overseas companies. For example, Youngor has collaborated with Japanese enterprises such as ITOCHU CORP(伊藤忠), NISSINBO (日清纺), OKAYAMA(晃立), spending more than $100 million to construct cloth and auxiliary material center and involving in top grade cloth development and production. The programs about textile printing and dyeing, knitting trimming and bleaching have also started up.

As to auxiliary material, they are produced by many local companies which plunge into badly vicious competition. Only a few firms such as Yike, have gradually gone out the vicious circle of low-price competition and have become the leading in this industry through cooperating with universities.

➤ Garment Machinery Suppliers

In the Zhejiang Province, the garment machinery industry has been developed and clustered, which matches the Ningbo garment industry chains. For instance, the world biggest sartorius factory is located in Taizhou city near Ningbo. Moreover, the machinery-manufacturing sector in Ningbo is also one of the strongest industries. Many exhibitions and investment conferences are related to the garment machinery, such as Ningbo International Machinery Industry Fair, Zhejiang Textile Machinery Investment Conference and Ningbo International Apparel Machinery Fair.

It was reported that Chinese biggest textile machinery specialized market engaging in sewing, knitting and textile machinery would be built in Shanghai in near future, which can boost the garment machinery market to service for garment sector around Shanghai, including Ningbo city.

➤ Specialized Market

Ningbo textile market center is a garment specialized market whose annual turnover amounts to 5 billion RMB, of which 15% is ex-im trade (almost is the knitting export). So the specialized market can not play the role on linking up the downstream such as trade, marketing and logistics. The relationships with production bases are also loose. Compared with other developed markets, Ningbo garment wholesale market lags behind in terms of scale, quality and the related equipments. The state of wholesale market is determined by the features of the Ningbo garment industry, which the large-sized enterprises intend to establish distribution channels by themselves, while the SMEs mainly belonging to processing export pattern do not need wholesale market. According to the features of the Ningbo garment industry, Ningbo should establish higher-level specialized trade market such as Market Center, Fashion Mart.

➤ Fair Industry

In order to enhance communicating with international garment industry, Ningbo held the first International Garment Festival in 1997, which provided enterprises an arena

to present their strengths. From then on, Ningbo International Garment Festival has been held every year and gradually toward specialization and internationalization. In 2003, the 6th Ningbo International Garment Exposition was first held in Ningbo International Fair Center where it can contain 2,200 exposition units, which avoid the bottleneck astricting the scale and level because of not having ideal field before. Now, the scale of exposition is the second largest in China. It is next only to Beijing exposition. The success of garment festival owes to not only the well-equipped facilities but also marketization operation by which it can foster personnel, extend customers and gain much exposition experience.

➢ Association/Agency

With promoting the development of the Ningbo garment industry as its service principle, Ningbo garment association provides garment-related service for government, industry and society. Ningbo business association is committed to breeding, fostering and publicizing original apparel brands and spares no efforts in promoting the internationalization of brands and outbound exchanges. It also attaches great importance to the communication between upstream and downstream industries, government and enterprises while advocating self-governing of the industry and safeguarding the interests of both the industry and enterprises. It not only boosts the improvement and linking up of the textile and garment industry chain, but also strives to build up the highly efficient, active and practical image of the Ningbo garment industry.

➢ Culture and Fashion

It is regretful that the development of garment culture could not catch up with the development of the industry. Nowadays, Ningbo has neither a fashion magazine nor a fashion TV channel, even no specialized edition related to these industries exists, which can not increase the channels of acquiring information, lower the costs of acquiring the information, enhance the communication among enterprises or guide the consumption trends.

4.2.5 Government

In the process of the development of the Ningbo Garment Industry, the municipal government has made great contributions which are mainly embodied in the following:

First, having laid and implemented the mid-term and long-term plan of the development of the Ningbo Garment Industry. Second, through integrating the function of the government that clarifying task and accountability of investment environment. Meanwhile it promoted the transformation of the function of the government and upgraded the service quality of the government by adopting the social evaluation. In addition, that through amending the system of approval improved the efficiency of government. Third, its having established special e-business platform for regional textile and clothing industry and set up an exhibition center on the net via network mirror in the developed countries and regions makes the platform become a network integrating of the production, supplier, marketing and research. Fourth, it has nourished garment culture and has propelled the construction of the famous city of garment forward. Last but not least, it organized the service institution and set up special development fund. The government organized and established the testing center for the textile and clothing, the foreign trade development fund for overseas marketing center, the fund for the loan warranty of SMEs and the garment industry development fund sponsored by the government, the enterprise and the society.

4.2.6 Chance

From this year, the trade quota of the textile and clothing industry had been thoroughly removed, which will give both opportunities and challenges to the Ningbo garment industry. As the Ningbo garment industry has its own characteristic in the development process, the influence arising from the environment change of the Ningbo garment industry is different. As for the export-oriented producing firms, the

expiration of quota system means that they will have a bigger overseas market, while they must face other trade barriers such as barrier of employment-labor condition security, technological barrier, environmental barrier etc. If those firms can successfully deal with these new stricter changes of international demand, the Ningbo garment industry may be upgraded and its competitiveness will be strengthened.

In the case of the entry of foreign brands after China' s accession to the WTO, some influential Ningbo brands mostly concentrate on men's clothing such as the suit and the shirt, these products are not like the women's clothing, which is more personalized, changeable and fashionable. Therefore, men's fashion will be less impacted. What's more, in the domestic market, the basic factor determining the men's fashion consumption is the purchasing power. The China's purchasing power has not reached the degree to which famous foreign brands will immediately dominate the market share when they enter the China's market. Therefore, the well-developed men's garment enterprises still have local competitive advantage and have ability to face the pressure from foreign brands.

4.3 Conclusion

4.3.1 The Structured Summary

According to the above discussion of the six different factors in the Ningbo garment industry, a brief summary of the factor analyzed is presented in table 4.7 below. After listing the main description of the six different factors of the Porter's diamond model in the Ningbo garment industry, we can shed light on the characteristics of its competitiveness. For example, in the demand conditions, we listed four strengths (•)and two weaknesses (*) that have been discussed in the above process of describing and analyzing.

4.3.2 The "Diamond" System

The "diamond" system of Ningbo should be an open system. The "diamond" system includes two levels: one is integration, namely, internal integration of four conditions and two factors. The other is the "diamond chain" formed between Ningbo's "diamond" and the peripheral city's "diamond"(Such as Wenzhou. Huangzhou and Shanghai etc).

Ningbo is located in the core joint point of the Chinese garment industry. If we regard Shanghai, Wenzhou and Huangzhou as a joint point of a "diamond", Ningbo is one of the pillar "diamonds" of the whole "diamond chain". Only when Ningbo is connected with the peripheral city's "diamond", its garment industry will be upgraded overall. For example, Shanghai's fashion, retailer market and trade market are in reality also the demand conditions of the Ningbo garment industry. Both Taizhou's garment machinery industry and Wenzhou's zip and button industries are vital raw material sources for the Ningbo garment industry. The "diamonds" of these regions will be the supplementary factors of the Ningbo "diamond". Therefore, the garment industry in Ningbo should strength the interaction with neighboring regions, cooperating with each other in the competition and competing with each other in the cooperation in order to obtain upgrading together.

As far as the factors are concerned, the existence and availability of adequate and cheap skilled labors lay the foundation of the cost advantage of the Ningbo garment industry. Advanced technology and technics provide a basis with high quality products. From the analysis of enterprise's structure, strategy and rivalry, the presence of the SMEs gives rise to the competition between prices and costs, which compels enterprises to lower the cost. At the same time, enterprises having strength force put more efforts to construct their brands and transfer to high-grade market. Because of the existence of powerful competitors outside the region, the Ningbo garment industry constantly have to reduce costs, improve quality and strengthen the marketing

Table 4.7 A structured summary of six factors of the Ningbo garment industry

Condition/ Factor	Determinant	Brief Description
Factor conditions	Geographic condition and natural resource	• a good geographic condition • with the Ningbo port, the second continent port in china. • the Ningbo port is the second largest continent port in China with a cargo throughput of over 100 million tons • located in the fast developing economic zone of the Yangtze River Delta
	Infrastructure and Energy Supply	• high-developed transportation network • a perfect information system * a short-term electricity supply
	Basic Labour Force Resources	• a high-quality and cheap skilled or semi-skilled labour force * the cost of labour is increasing as the wages increase.
	Financial Market	• near Shanghai, the financial centre of China • finished the process of original capital accumulation * SMEs cannot obtain enough loans and face a high risk, less flexibility and narrow finance channel.
	Technological Equipments	• first-class equipments exists * begin to construct informationalization, the CAD/CAM application remain low.
	Talents and Education	* lack of senior management and design talents * the structure of the talent is irrational.
	Innovation Activities	• innovation investments keep relatively low • prone to borrow "brain" and cooperate with outside clusters * some small firms have weak ability of innovation
	Capital Operation	• large enterprises enter the capital market by being listed in the stock market and the like * many SMEs still operate in household manner through civic capital

Demand Conditions	Domestic Demands	• have a large potential domestic market • the home purchasing power is rising * the fashion market is not well developed
	International Demand	• the age of post quota is coming * lack of international trade mark * high valued-added products are little
The Industry Strategy, Structure and Rivalry	Structure	• has formed an industry cluster • the private-operated firms developed fast • a dual structure
	Strategy	• transform from a multi-operation to industrial cooperation • the influence of the core firms is evident * cost competition is also a main strategy objective * the phenomenon of homogeneity between enterprises
	Rivalry	* facing a fierce competition in the domestic and international market
Related and Supporting Industries	Cloth and Auxiliary Material Supply	• advanced cloth mainly imported from neighbor areas and has become a constraint * Auxiliary material supply has existed vicious competitions
	Garment Machinery Suppliers	• has a strong competitive strength on the national level • get benefits from the machine cluster
	Specialized market	• the Ningbo Textile Market Centre * lag behind neighbouring cities
	Fair Industry	• has successfully sponsored eight international garment festival from 1997
	Association/Agency	• has a Ningbo garment association • has a Ningbo business association * their roles are not sufficiently used
	Culture and Fashion	* no well-developed garment culture * fashion is not formed
Government		• lays down and implements the plan • promotes the work efficiency • established a special e-business platform • constructed the Testing Centre for the Textile and Clothing
Chance		• have a bigger overseas market due to the expiration of the MFA(quota system) • own brand will be famous in the home market * confront the challenge from the other trade barriers

network in order to improve the market share. In addition, entrepreneurs are gradually aware of the importance of the value-added chain (design, specifications, production processes, and implementation of quality and information systems) increasingly regarded as the pivot of the whole chain because the core competitiveness is generated from it.

In the case of domestic demand, there are a lot of demand for low-grade textile at home, form abroad, including the Middle East and Africa. The demand is also huge. Even in North America and the EU, Ningbo occupies a certain market share. As long as the product has the market, many Ningbo SMEs will continue to invest in these products. With the improvement of people's living standard, the clothing consumption will gradually transfer to brand apparel, which will stimulate the enterprises to enhance brand marketing and upgrade its connotation and value-added.

The "diamond chain", formed between Ningbo's "diamond" and the peripheral city "diamond"(such as Wenzhou, Tanzhou, Huangzhou and Shanghai etc) has an important role in developing the Ningbo garment industry. Industries such as Wenzhou's cloth, Tanzhou's garment machinery, Huangzhou and Shanghai's specialized markets and fashion, have formed a garment cluster industry of moderate competition and full cooperation, which help the Ningbo garment industry to develop further.

4.3.3 The Strengths and the Weaknesses

The competitiveness of the Ningbo garment industry mainly embodies two aspects: one is that there is a batch of enterprises with nationally original brands. These enterprises have large scales and specialize in brand marketing. They have comparative advantages in these high-grade products and upgrade the famous degree of Ningbo regional brand. The other is that lots of SMEs promote the output of

Ningbo garment and continuous increase in export. They possess a strong competitiveness in the low-grade products. The above competitiveness is the result of the interaction of the "diamond" system.

The "diamond" system of the Ningbo garment industry is roughly formed, and, there are still some weaknesses. First, the original cloth and auxiliaries upstream is not be fit for the development of garment industry. Second, the specialized market in the industry chain could not play the role in linking up the downstream such as trade, marketing and logistics. Third, the lack of senior designers and low-level fashion restrict the further development of the Ningbo garment industry. The development of the supply chain and creation of high value added designs/trademarks accompanied by increasing marketing capabilities must accelerate. In addition, the competition in the Ningbo garment industry tends to be of a homogenous structure, enterprises having influential brand concentrate on men's fashion and children's clothing and among brands lack unique personalized orientation. This kind of competition especially takes place in the process enterprise, which impedes mutual cooperation and cannot exert the clustering effect. To some extent, this leads to resource waste and repetitive construction.

4.4 Summary

In this chapter we described the Ningbo garment industry using the Porter's diamond model. First of all, we introduced an overview of the Ningbo garment industry. After that we formulated the four conditions and two factor of the Ningbo garment industry one by one in the light of the Porter's diamond model. At last we drew a conclusion of the competitiveness of the Ningbo garment industry including its strengths and its weaknesses.

Chapter 5: Quantitative Analysis –Application of the GEM Model

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In this chapter the GEM model is used to analyze the Ningbo garment industry. First, sub-factors determining the garment industry's competitiveness are put forward. Second, we introduce the process of the quantification of the GEM model. Next, two questionnaires to get the score of determinants are conducted. At last after calculation according to the procedure of the model, we will evaluate the competitiveness of the Ningbo garment industry.

5.1 Introduction

In the preceding chapter, we made a descriptive analysis of the competitiveness of the Ningbo garment industry by using the Porter's diamond model. The data we collected were relatively centralized and the material belonged to second hand one. For the purpose of getting a clearer picture of the overall competitiveness of the Ningbo garment industry and finding out whether the results of analysis we will get in different ways are the same. In this chapter we will assess and analyze the Ningbo garment industry (as a cluster) quantitatively through developing a competitiveness evaluation model of the Ningbo garment industry on the basis of the GEM model, which has been applied in the UK, principally in a consulting context (Inverness & Nairn Enterprise, 1994), and in Canada (Western Economic Diversification, 1996). We will evaluate the competitiveness of the Ningbo garment industry by using the primary data we collect from the questionnaires.

The GEM model, which was developed by Tim Padmorre & Hervey Gibson with a purpose of competitiveness appraisement and analysis of an industrial cluster, is a symmetrical framework combining dimensions of the Porter's diamond with an equal

explicit accounting of infrastructure and markets. Factor categories are organized under headings of groundings, enterprises and markets, which gives the model its name: GEM. Each factor categories is comprised of a factor pair, i.e. groundings---resources and infrastructure; enterprises---suppliers and relating industries; firm structure, strategy and rivalries; markets--- local markets and external markets (see Figure 3.3). Comparing with the diamond model, the GEM model put more emphasis on the local government functions in a cluster development. It believes in the substitution /complementary effect between two factors in the "factor pair" and interrelationship between all factors. Furthermore, the GEM model can quantify the competitiveness by using of mathematical methods, and thus makes itself much more straightforward and convenient than others.

5.2 The Process of Quantification of the GEM model

The GEM assessment is meant to be exhaustive, a more or less complete inventory of the determinants of cluster competitiveness, adaptable to clusters of all kinds: traditional resource industries, manufacturing and service industries, high tech and low tech industries, industries located either in the private or the public sector. According to the GEM model, there are a lot of factors impacting the competitiveness. Because of the time limitation, it is impossible for us to find out the overall possible existing sub-factors. Considering the characteristics of the Ningbo garment industry, we try to establish a competitiveness-appraising model of the Ningbo garment industry (Figure 5.1) on the basis of the GEM model. We call it as the process of quantification. The model is composed of three hierarchies. The first one is the overall competitiveness of the industry and determined by the next one. The second consists of six determinants arranged in the hexagon of the GEM model. And the third includes groups of detail sub-factors we put forward that, we suppose, might represent the six factors (the second level) well and be measured easily.
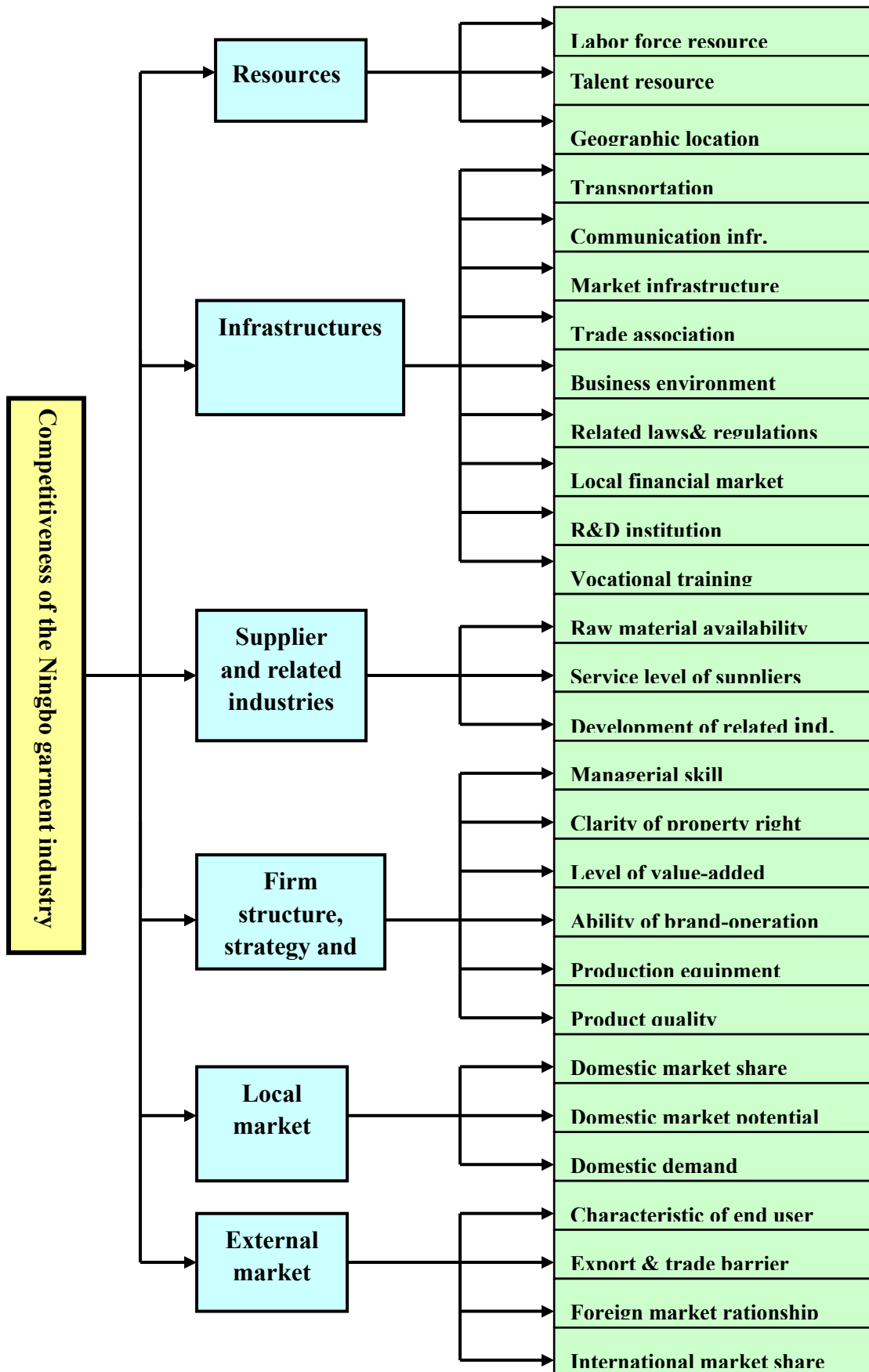
Figure 5.1 The appraising model with three hierarchies

In order to shed light on the competitiveness of the garment industry in Ningbo as a cluster, we try to quantify the six factors impacting on the competitiveness of the Ningbo garment industry. Through quantification we will know better about the competitiveness of a single cluster. At the same time, it will more convenient for us to make a comparison between similar clusters. The specific process of quantification is divided into three steps.

The first step is to give scores to the sub-factors influencing on the competitiveness of the cluster. According to the GEM model, each factor is scored within a range of 1 to 10. The meaning of each score is listed in the following.

- ➢ **10**---extremely excellent, having competitiveness at the international level, and ranking the first or second worldwide.

- ➢ **9**---excellent, possessing competitiveness at the international level, and ranking within top five worldwide.

- ➢ **8**----very good, having an exclusive advantage across the nation.

- ➢ **7**--- good, owning a competitive advantage in the nation.

- ➢ **6**----not bad, having no competitiveness, but excelling the average level in the nation.

- ➢ **5**----at mean level, having the national average strength.

- ➢ **4**----at limited level, possessing slightly below the national average strength.

- ➢ **3**----very limited level, having a certain gap comparing with the national average strength, and the gap might influence the development of the whole cluster.

- ➢ **2**----poor, having a remarkable gap comparing with the national average level, and the gap has obvious impacts on the Ningbo garment industry (as a cluster).

> ➤ **1**----very poor, existing a huge gap comparing with the national average level, and the difference has impeded severely the cluster development.

Meanwhile we should determine the weights of all sub-factors to their corresponding factors. In this part each factor is scored within a range of 1 to 7, the number means the degree of importance sub-factors to its factors.

The second step is the process of calculating and transforming the factor pair. The concreted formulas is illustrated below:

$D_{ij}=\Sigma$ (Final score) $_{ik}=\Sigma$ (Score)$_{ik}\times$(Weight)$_{ik}$ (i=1~3, j=1~2, k=1~n and n is the number of the subsets),

(PAIR SCORE) $_i$=($D_{2i-1}+D_{2i}$)/2,

(PAIR SCORE) $_i$---- means the score of each "factor pair",

D_{2i-1}, D_{2i}---- represents the scores of factors.

The "factor pair" represented by (D_{2i-1}, D_{2i}) consists of two factors which can (or by and large) substitute for each other. According to GEM model, the two factors in a "factor pair" can substitute for each other. For an example, complete "infrastructures" can make up for the shortage of "resources" in a cluster. The external market with great potential can compensate the scarcity of the demand of the local market.

The third step is to calculate the "linear cluster score" and to get the final sore of competitiveness of the Ningbo garment industry in terms of the two transformation formulas below:

1. (LINEAR CLUSTER SCORE)$=\amalg_{i=1,3}$(PAIR SCORE)$_i$

2. **GEM**$=2.5$ ($\amalg_{i=1,3}$ ($D_{2i-1}+D_{2i}$))$^{2/3}$

The first transformation is that the "linear cluster score" transforms into the multiple of the three factor pair. This transformation means that each factor pair influences each other. Namely, as long as the score of one or two factor pair is low, it will maybe lead to the low final score of the cluster competitiveness. As the cluster competitiveness is the multiple of the every factor pair. In reality, for instance, a

cluster with a competitive advantage in the past, due to the factor pair Ⅱ that supplier and related industry and enterprise structure, strategy and rivalry had some problems, it leads to the lack of the innovation of the cluster. Although this cluster had very strong competitive advantage in the market, resource and infrastructure, it will lose the leading position in the end.

The second one is the transformation of score ratio. It aims at getting the end score. If scores of six factors are all 5 marks (at an average level), the GEM score of a cluster will be 250, which means the cluster's competitiveness has reached to an average level in its nation. In the same way, if scores of six factors all get around 8 marks (with an exclusively competitive advantage across the nation), the GEM score of a cluster will be about 640, which shows that the cluster owns a absolutely strong competitiveness in the nation. And if all scores of factors are near 10 marks, the cluster will get a full mark (1000), indicating the cluster's competitiveness ranks first-class in the world.

5.3 The Evaluation of the Ningbo Garment Industry

According to the idea of our above quantification, we will glean data from conducing the questionnaires to make out the competitiveness of the Ningbo garment industry. to get our purpose of the dissertation, the following are our procedures of evaluation of the Ningbo garment industry.

5.3.1 Questionnaires design

The most important thing is to devise a set of rule of scoring. Scoring is a process of subjective evaluation, which demands an evaluator a full understanding of the benchmarking so that the validity of questionnaires can be guaranteed. The information of the benchmarking can be collected through all kinds of channels, such

as government sectors, consultative agents and trade associations.

To obtain the score a survey was conducted by using questionnaires. A questionnaire is preferable to use when there is a large amount of respondents, when you have limited time and when the questions are of standardized character (Saunders et al., 2003). In order to clarify the content of the questionnaires we designed, a pilot test was conducted. During the pilot test we had some indications of unclear questions, which we corrected before we sent out the final version of the questionnaire. Doing this we not only enhanced the chances of the respondents to answer the questionnaire, we also increased the validity of the survey (Lekvall & Wahlbin, 1993). The questionnaires had to be written in Chinese (see Appendix 3, 4) since the respondents to our survey were Chinese companies. The reason for this was to make it easier for the respondent to reply and also to avoid misunderstandings, and thereby hopefully receiving a higher response rate.

On the basis of the appraising model, we design questionnaires with two parts. The first one is aiming at collecting the information of present situation of all determinants. According to the GEM model, each factor is scored within a range of 1 to 10, so we plan our Questionnaire 1 named "The evaluation of factors determining the competitiveness of the Ningbo garment industry" with a similar scoring method (See Appendix 1). The second one, which is called "The evaluation of importance of sub-factors to their factors"(see Appendix 2), is attempting to determine the weights of all sub-factors to their determinants.

5.3.2 Questionnaires collection and data statistics

The first part of statistical data mainly came from the enterprises of the Ningbo garment industry. We totally sent 173 *Questionnaire 1* to the Ningbo garment enterprises with different sizes. Up to now, we received 107 valid respondences with

an average receipt rate 61.8%, of which 22 from the large-sized enterprises with an annual sales more than 50 million RMB, 68 from the medium-sized enterprises with an annual sales between 10 to 51 million RMB and 17 from the small-sized enterprises whose annual sales are less than 10 million RMB.

The second part of the statistical data mainly came from experts and scholars who devote themselves to studying the Ningbo garment industry. Thanks to the help of our friends, we totally sent 25 *Questionnaire 2* and actually received 19 with a respond rate 76%. According to the statistics and calculations, we got average scores of 28 decisive sub-factors and their average importance scores and weights (see Table 5.1).

5.3.3 The Outcomes of the Calculations

Firstly, according to data of Table 5.1, we can get the scores of six determinants (D_{ij}) of the Ningbo garment industry with the formula: $D_{ij} = \Sigma$ (Score)$_{ik} \times$ (Weight)$_{ik}$ (herein i=1-3, j=1-2, k=1-n and n is the number of the subsets):

D_{11}=7.874 D_{12}=7.438

D_{21}=7.801 D_{22}=7.145

D_{31}=7.664 D_{32}=7.323

Average D_{ij}=7.541

Then, we can calculate the scores of factor pairs in the light of the following transformation rule: (PAIR SCORE) $_i$=(D_{2i-1}+D_{2i})/2

(PAIR SCORE) $_1$=7.656

(PAIR SCORE) $_2$=7.473

(PAIR SCORE) $_3$=7.494

Lastly, we can calculate the "linear cluster score" and get the final score of competitiveness of the Ningbo garment industry in terms of the two transformation

Table 5.1 The results of statistics and calculation

Factor	No.	Sub-factor	*Score	Importance *Score / Weight	#Final Score
Resources (D11)	1-1	Labor force resources availability	8.451	6.316 / 0.414	3.497
	1-2	Talent resources availability	7.010	5.053 / 0.331	2.321
	1-3	Geographic location	8.057	3.895 / 0.255	2.056
Infrastructure (D12)	2-1	Transportation infrastructure	7.928	6.421 / 0.256	2.032
	2-2	Communication infrastructure	7.967	3.526 / 0.141	1.121
	2-3	Market infrastructure	7.822	2.526 / 0.100	0.789
	2-4	Trade association	5.664	2.474 / 0.099	0.559
	2-5	Business environment	7.509	3.211 / 0.128	0.962
	2-6	Perfection of related laws/rules	7.748	2.473 / 0.099	0.765
	2-7	Local financial market	7.470	1.474 / 0.059	0.439
	2-8	R&D institution	6.439	1.737 / 0.069	0.446
	2-9	Vocational training	6.687	1.211 / 0.048	0.323
Supplier and related industry (D21)	3-1	Raw material availability	7.813	6.368 / 0.576	4.502
	3-2	The service level of suppliers	7.867	2.842 / 0.257	2.023
	3-3	The development level of related industries	7.659	1.842 / 0.167	1.276
Firm structure, strategy and rivalry (D22)	4-1	Managerial level	7.206	6.579 / 0.313	2.252
	4-2	The clarity of property right	7.341	2.842 / 0.135	0.991
	4-3	The level of value-added	6.864	3.105 / 0.148	1.012
	4-4	The ability of brand-operation	6.220	4.421 / 0.210	1.306
	4-5	Production equipments	7.808	1.737 / 0.083	0.644
	4-6	Product quality	8.352	2.368 / 0.113	0.940
Local market (D31)	5-1	Domestic market share	7.837	6.211 / 0.502	3.935
	5-2	Domestic market potential	7.790	4.526 / 0.366	2.851
	5-3	Domestic demand distinctiveness	6.653	1.632 / 0.132	0.878
External market (D32)	6-1	Characteristics of foreign end user	6.598	5.105 / 0.320	2.112
	6-2	Export &trade barriers	7.897	5.421 / 0.340	2.685
	6-3	Foreign market relationship	8.196	3.053 / 0.191	1.569
	6-4	International market share	6.449	2.368 / 0.149	0.958

* Score stands for average score

Final Score= Score × Weight

formulas below:

(LINEAR CLUSTER SCORE)=$\prod_{i=1,3}$(PAIR SCORE)$_i$

GEM=2.5 ($\prod_{i=1,3}$ ($D_{2i-1}+D_{2i}$))$^{2/3}$

After calculating, we can get the GEM score of competitiveness of the Ningbo garment industry is about 568. And it can be shown in the GEM model (Figure 5.2).

Resources (D_{11}=7.874) Groundings Infrastructure (D_{12}=7.438)

Supplier and related industry (D_{21}=**7.801**)

External market (D_{32}=7.323)

Markets

Enterprises

Firm structure, strategy and rivalry (D_{22}=**7.145**)

Local market (D_{31}=7.664)
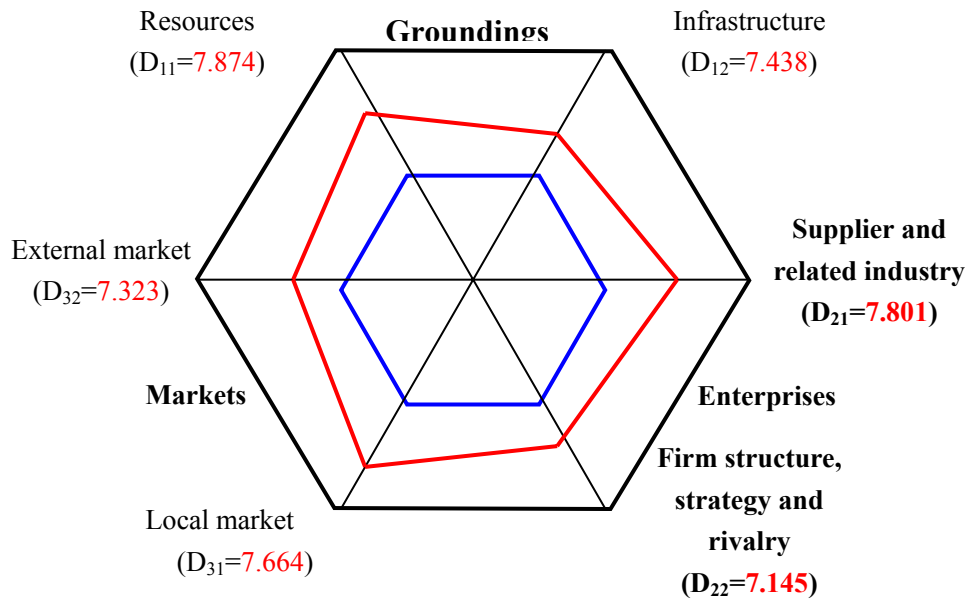
Figure 5.2: The score of competitiveness of the Ningbo garment industry in GEM model

5.3.4 The Result Analysis and Implications

The overall GEM score of the Ningbo garment industry is about 568, between 250 and 640, which means that the present competitiveness of the Ningbo garment industry is above the national average level and possesses a nationwide competitive advantage. However, it still has a long way to go to become a world-class center of garment industry.

The average factor score of the Ningbo garment industry is 7.541 and the three factor

pairs get almost a similar score. It means that the developments of the three aspects ("grounding", "enterprise" and "market") of the Ningbo garment industry are at the same level on the one hand. It also reflects the complementarity of the factors in the GEM model, which conceal the difference of score for each sub-factor due to the combination of them on the other hand. Moreover, it implicates that some weak factors can be made up by the strong factors. In contrast, some weaknesses may spoil the roles some strength would play sufficiently, thus influence the overall competitiveness of the industry. After re-sorting the score according to the average score we calculate from the primary data, from the Table 5.2, we can find that sub-sector "Labor force resources availability" got the highest score (8.451) among the all sub-factors. On the contrary, the "Trade association" obtained the lowest score (5.664).

From the Table 5.1, we can find that in the category of "Resources" determinant, the subsets, such as the "Labour force resources availability" and the "Geographic location", get much high scores. On the contrary, the" Talent resources availability" gets a relative low mark, which gives rise to weak ability of innovation and product research and development in the Ningbo garment industry. According to the statistics, the enterprises of the Ningbo garment industry lack high and middle level managers and senior designers. This is partially explained by the geographic proximity with Shanghai and Hangzhou, weak attractiveness of talents, high cost of introducing talents and the like. In this case, the Ningbo garment enterprises can adopt tactics of network-shaped firm layout which locate the sectors with high talent demands for design and marketing in Shanghai and Hangzhou, meanwhile, enhance the production and quality management in the local sectors.

In the category of the "Infrastructure" determinant, the results of the analysis show that the "hard" or visible infrastructures in Ningbo get relatively high marks. This reflects that there are pretty good basic foundation of garment industry in Ningbo. At the same time, the "soft" or intangible infrastructures, such as the subsets of "Trade

Table 5.2 The average (importance) score and standard deviation

No.	Sub-factor	Average Score	Std. Deviation	Average Importance Score	Std. Deviation
1-1	Labor force resources availability	8.451	0.701	6.316	0.671
4-6	Product quality	8.352	0.642	2.368	0.895
6-3	Foreign market relationship	8.196	0.791	3.053	1.026
1-3	Geographic location	8.057	0.595	3.895	1.100
2-2	Communication infrastructure	7.967	0.588	3.526	0.905
2-1	Transportation infrastructure	7.928	0.668	6.421	0.692
6-2	Export &trade barriers	7.897	0.696	5.421	1.387
3-2	The service level of suppliers	7.867	0.631	2.842	0.765
5-1	Domestic market share	7.837	0.838	6.211	0.855
2-3	Market infrastructure	7.822	0.698	2.526	0.697
3-1	Raw material availability	7.813	0.643	6.368	0.761
4-5	Production equipments	7.808	0.601	1.737	0.733
5-2	Domestic market potential	7.790	0.714	4.526	1.020
2-6	Perfection of related laws/rules	7.748	0.649	2.473	0.905
3-3	The development level of related industries	7.659	0.613	1.842	0.688
2-5	Business environment	7.509	0.673	3.211	1.084
2-7	Local financial market	7.470	0.635	1.474	0.697
4-2	The clarity of property right	7.341	0.664	2.842	0.958
4-1	Managerial level	7.206	0.583	6.579	0.607
1-2	Talent resources availability	7.010	0.723	5.053	0.970
4-3	The level of value-added	6.864	0.628	3.105	1.049
2-9	Vocational training	6.687	0.668	1.211	0.419
5-3	Domestic demand distinctiveness	6.653	0.575	1.632	0.684
6-1	Characteristics of foreign end user	6.598	0.664	5.105	1.150
6-4	International market share	6.449	0.710	2.368	1.065
2-8	R&D institution	6.439	0.689	1.737	0.733
4-4	The ability of brand-operation	6.220	0.670	4.421	0.961
2-4	Trade association	5.664	0.794	2.474	0.964

association", "R&D institution", "Vocational training "and so on, get much low marks. In order to overcome the weakness of the "soft" infrastructures, the local government should transform its duties, make full use of market functions and provide firms with a fair and reasonable competitive environment, a good financial and business environment and high-quality services. Meanwhile, the government also should reinforce the macro-control and direction of the market and regulate the market activities by establishing the related laws and regulations. In addition, the government should facilitate the healthy grow-up of business associations by all kinds of means, so that the business association will become real channels connecting between firms or firms and markets, and upgrade the business association of the Ningbo garment industry. This will not only help solve some problems, such as unreasonable internal competitions and homogeneity of product structure, but also smooth the progress of information communication, cooperation of product development between firms and market expansion. Furthermore, the government should lay down favorable policies to encourage and direct the enterprises to lay much weight on the innovation, R&D and the vocational training.

Regarding to the category of the " Supplier and related industry", all the sub-factors get high scores. It shows that the Ningbo garment industry has strong upstream and down stream industry. It has distinct character of the industrial cluster.

As to the category of the" Firm structure, strategy and rivalry", several sub-factors, such as "The level of value-added", "The ability of brand-operation" and "managerial level", get relatively lower marks. It demonstrates that the majority of the Ningbo garment enterprises are engaging in producing the low value-added products, lack the ability and awareness of the brand-operation, and the low cost competition is their main strategy. Although low cost is the main comparative advantage for the Ningbo garment firms in the domestic and international competition nowadays, as time goes by, this advantage will disappear due to the increase of costs of the labor forces. Therefore, the enterprises, especially the medium and large ones, should shift their

strategy gradually from low value-added products to high value-added ones by means of innovation, R&D of new products and brand-operation. Meanwhile the style of production should transfer from OEM (Original Equipment Manufacturer) to ODM(Original Design Manufacturer) and OBM(Original Brand Manufacturer). At the same time, the style of firm management should be further improved so as to get higher efficiency and adapt to the fierce competitions and changing business environment.

Regarding the category of "Local market" and "External market", the subsets of "Domestic demand distinctiveness", "Characteristics of foreign end user" and "International market share" get lower scores. The low score of the" Domestic demand distinctiveness" may be caused by the economic globalization, social informationalization and fast improvement of the living standard of the local citizens due to the steady development of domestic economy. It also implicates that the domestic consumption demand has been entering into a brand-new period and the Ningbo garment firms will face fiercer competition than ever before. The low mark of "Characteristics of foreign end user" maybe results from the diversity of foreign end users. The Ningbo garment firms should pay more attention to the different characteristics of the foreign end users, and apply different strategies to deal with different end users. As to the "International market share", the Ningbo garment enterprises should seize the opportunity of the expiration of the MFA and expand the international market further. Meanwhile they should develop their good reputation and the famousness of products by means of improvement of their product quality and brand marketing, thus increasing their international market share.

In sum, the Ningbo garment industry has the strengths in the respect of the labor force resources, geographic location, product quality and foreign market relationship etc. However, the sub-factors such as the trade association, the ability of brand-operation, R&D institution and international market share are its weaknesses.

5.4 Summary

In this chapter the analysis of the competitiveness of the Ningbo garment industry by applying the GEM model is presented. First of all, we briefly interpret the purpose of using this model. Then we put forward the 28 sub-factors that impact on the competitiveness of the Ningbo garment industry. After that the process of the quantification of our model is introduced. In order to get the primary data, the questionnaires are conducted with the help of our friends in Ningbo. At last, through calculations and analyses, we draw the conclusion that the overall GEM score of the Ningbo garment industry is about 568, showing that the present competitiveness of the Ningbo garment industry is above the national average level and possessing a nationwide competitive advantage. The competitiveness of the Ningbo garment industry is the strongest in the labor force resources respect and the weakest in the trade association aspect.

Chapter 6: Conclusion

This chapter presents the conclusions of this dissertation. The outcomes of the analysis of the Ningbo garment industry by applying the two models will be given. The methodology will be discussed. The chapter ends with suggestions of further studies. Practical and theoretical implication will also be described in this chapter.

6.1 Summary of the Dissertation

The garment industry is a very diverse and heterogeneous industry, with its products being used by virtually everybody. Its activities range from the production of raw materials to the manufacture of a wide variety of semi-finished and finished products and culminating in the delivery of a product into the hands of the consumer. As a labor-intensive industry, the garment sector contributes to a city or a region greatly. It is very important to social and economic cohesion if the garment sector is the mainstay industry in the city or the region. Moreover, it also can boost up fashion atmosphere and cultural connotation.

Like many other sectors, the garment industry has been greatly affected by the phenomenon of globalization. It could be argued, therefore, that global economic integration will increasingly play a part in the consideration of strategic options and the development of sustainable competitiveness. In the increasingly competitive world marketplace for garment, all companies will have to recognize what the basis of their competitive advantage is to be. There will be a long list of these from lowest cost to highest quality. In order to obtain comparative competition, the term competitiveness has been hot topic in world.

The Ningbo garment industry is one of the six major industries in our hometown.

With the development of the economic integration and globalization, making out the presence of its competitiveness has become more and more crucial for its further development in order to keep a competitive advantage in both domestic market and international market. Many researchers study the competitiveness from three aggregation levels, the national, the industry and the firm. The aim of this dissertation is to analyze the competitiveness of the Ningbo garment industry, so we mainly focus on the analysis of the industry level. It is based on the analysis of industrial cluster in a region.

Among the existing theories, the earlier classic theories only provide the macro-factors, such as infrastructure, management, organization, while the Porter's diamond model can interpret entire issue of competitiveness. The porter's diamond model can fully illuminate the phenomenon of economy growth at the microeconomic level, at the level of industries and firms. Moreover, this model successfully interpreted the fashion industry in Italy and apparel industry in the UK. The GEM model was developed on the basis of the Porter's diamond theory. The model was first developed to explore the importance of new technologies, specifically the contribution of advanced materials in traditional industries, and has since been used in a wide range of national and international cluster analysis and benchmarking exercises. It can describe and assess strengths and weaknesses of clusters from a regional perspective.

The method we used is inductive case study. Our purpose of the dissertation was to analyze the case not to apply the case to testing some theories and hypotheses. First and foremost, it is a case study that the Ningbo garment industry is a research subject. We analyzed it by using the Porter's diamond model and the GEM model. Then it is an inductive approach. In the process of analyzing the case by using the GEM model we put forward some determinants that should be tested by conducting questionnaires, we learned the case and developed the operationalized approach to evaluate the competitiveness of the garment industry.

The authors started with a review of the literature of the competitiveness and chose two theoretical models, which contain the Porter's diamond model and the GEM model. The main part of our dissertation had been analyzed the case. The Porter's diamond model was applied in analyzing the competitiveness of the Ningbo garment industry in a qualitative way. Meanwhile, a quantitative way was introduced. We put forward 28 sub-factors on the basis of related theories of the garment industry and the GEM model. Therefore, in order to get data, the authors sent out questionnaires to managers in apparel enterprises and specialists from related departments in Ningbo asking them for scoring the sub-sectors that influence the Ningbo garment indsutry competitiveness.

In our qualitative analysis we concluded that the Ningbo garment industry had the following strengths and weaknesses. Our method was based on the analysis of current state of the Ningbo garment industry through comparing with many benchmarkings including domestic and overseas regions. We found out the competitiveness of the Ningbo garment industry mainly embodies into two aspects: one is that there are batchs of enterprises with nationally original brands. These enterprises have large scales and specialize in brand marketing. The other is that lots of SMEs promote the output of the Ningbo garment industry and continuously increase export. They possess the competitiveness in the low-grade products.

Meanwhile, it also has some weaknesses. First, the original cloth and auxiliaries in upstream could not be fit for the development of garment industry. Second, the specialized market in the industry chain could not play the role in linking up the downstream such as trade, marketing and logistics. Third, the lack of senior designers and low-level fashion restrict the further developing of the Ningbo garment industry. In addition, the competition in the Ningbo garment industry tends to be homogenous structure, enterprises having influential brand only concentrate on men's fashion and children's clothing and among brands lack unique personalized orientation.

In our quantitative analysis we argue that the success of conducting the questionnaires is the guarantee of analyzing the Ningbo garment industry. Under the help of our friends who work in the related garment departments in Ningbo, we got a relatively high response rate. Through calculations and analyses, we got the conclusion that The GEM score of the Ningbo garment industry is about 568, between 250 and 640, which means that the present competitiveness of the Ningbo garment industry is above the national average level and possesses a nationwide competitive advantage. However, it still has a long way to go to become a world-class center of garment industry.

When it comes to the specific factors. The average factor score of the Ningbo garment industry is 7.541 and the three factor pairs get almost a similar score, which implicates developments of the three aspects ("grounding", "enterprise" and "market") of the Ningbo garment industry are at the same level. From the score of the single sub-factor, we can find that sub-sector "Labor force resources availability" got the highest score (8.451) among the all sub-factors. On the contrary, the "Trade association" obtained the lowest score (5.664).

After making a comparison between the two results of different ways, we found that the results of analysis getting from the Porter's diamond model are basically same as those from the GEM model. Both outcomes illustrated that the Ningbo garment industry had competitive advantage on the national level. However, the analysis results of some sub-factors are, to some extent, different, such as "The development level of related industries". This factor was a restrictive one in the conclusion of the Porter's diamond model. While this sub-factor got a relatively high score in the GEM model. The reason we think is that we drew conclusions from the analysis of the secondary and centralized data in the Porter's diamond model at a marco level. However, in the GEM model we got the results from the primary and distributive data by means of conducting questionnaires. When the respondents answered the questionnaires, they were dependent on much subjective judgments and their own experiences at a micro level. Therefore, it gave rise to the different result.

6.2 Methodological Discussion and Criticism

Our study is carried out under the context of the existing documentary and the subjective score given by some sample respondents. As the competitiveness itself is a vague concept, one disadvantage was that the risk from the questions of the questionnaires was misled or they were wrongly formulated, which could have affected the validity of the result. Another disadvantage with our sample group was that all of the participants come from Ningbo. For these reasons a wider research on the subject needs to be conducted. When we did the questionnaires, we'd better to invite other neighbor cities' exports and specialists to take part in the process of the score from their points of views. To minimize the risk for misinterpretation of the questions although we had piloted the questionnaires among our classmates before handing them out, a risk still exists when we translate the English into the Chinese in our questionnaires. The time constraint at hand made it impossible to spend more time on getting more respondents. If the investigation had been given longer time, it might have been possible to get more ideal answers.

6.3 Further studies

In our dissertation we have reasons to assume that Porter's diamond model and the GEM model would be applicable in assessing the competitiveness, therefore, the two models are worth further examination. In order to determine the applicability of the two models, a hypothesis must be established and carefully tested.

In our research, we focused on the almost factors affecting the garment industry. So another interesting area of research would be to study the relationship between one or several factors and the competitiveness of the garment industry. For example, the wage cost and the competitiveness, the cluster and the competitiveness, can become monograph.

A major restructuring of apparel production has happened since the beginning of 2005 when garment and textile export quotas under the Multi-Fabric Arrangement (MFA) is phased out for all 144 member-countries of the World Trade Organization (WTO), which will impact the garment industry in some countries. With the phasing out of the MFA, the competitiveness of the garment industry in different regions will change immediately. This phenomenon is also worth researching.

A final suggestion for further studies could be to investigate if our model could be applied and valid in other business areas and also to investigate the possibility of finding other determinants impacting the competitiveness of an industry on a cluster level.

6.4 Theoretical Implications

The models we selected as our theoretical base are Porter's diamond model and the GEM model. These models analyze competitiveness from three aggregation levels (Industry Canada, 1995): that is the firm, the industry or one sector of it, and the nation. There are different measures or indicators of competitiveness for each aggregation level. They can be developed to explore the importance of new technologies, specifically the contribution of advanced materials in traditional industries. The GEM model has been used in a wide range of national and international cluster analysis and benchmarking exercises.

We developed a new model comprised of 28 Sub-factors which originated from the GEM model and theories related to the garment industry. The intention is to develop a concrete model suitable for analyzing the competitiveness of the garment industry. So the new model is able to analyze the competitiveness of the garment industry in any region, because of almost all important factors being included in the model.

6.5 Practical Implications

Our research has most important practical implications for different regional governments, garment industry associations and garment enterprises assessing the competitiveness of the garment industry. By using this model, the enterprises or the organizations can get indications on which factors are their strengths and which factors are their weaknesses. For instance, after doing this research, we understood that Ningbo must spare no effort to establish a strategy to increase value-added through investments in the value-added chain (design, trademarks, organizational and management improvements, faster delivery, etc.), which will be beneficial for regional governments and enterprises leaders setting unambiguous goals to strive for. The following are our suggestions of how to improve and upgrade the competitiveness of the Ningbo garment industry.

Porter argues that under the context of new economy competition enterprise, government and different institutions should play a new role. Therefore, in order to upgrade the competitiveness of the Ningbo garment industry, they should take active measures.

As to enterprises, two things are very important in the enterprise's strategies. The first one is to enlarge the coordination among enterprises. The second one is to set up a mechanism of skilled labor. Through horizontal and vertical coordination between enterprises we can materialize clear and voluntary cooperation encompassing enterprises connection between forward, horizon and backward, between producing and supplementary enterprise, between infrastructure and service, even between cluster and other institutions. We can also realize specialized and flexible production and optimal segment of the value chain. In the end the industry will finish upgrade from multi-integration to quality improvement, transformation from isolated price competition to a cooperation one. Modern garment industry is an overall industry with cultural and artistic connotation. Special designers and senior managers are playing

important roles in upgrading brands image and increasing value- added. Garment enterprises should build up their own suitable and special mechanism of employment and dismission on the basis of their demand conditions. They should shake off the empirical and domestic enterprise management culture.

What should the government do? Prof. Kilduff in his book "*beyond quick response: In the digital age*" argues that the government is not suitable to rule out industrial development strategies, the enterprise should do by themselves. He thinks government is an efficient organization accelerating the industry development and adjustment of industry structure by subsidizing R&D, promoting common share of new knowledge and facilitating cooperation of enterprises network.

The textile and clothing industry intervention from the government can be classified into three categories: trade policy, labor policy and industry policy. According to the market rule and signal, it should provide information services and coordinate enterprise behavior by wise guidance, negotiation and cooperation, which can meet the need of the goal of the industry policy. Therefore, the main function of the local government is to create a good regional economic environment. Namely, regional innovative context, providing a benign development space for the industry, induce the formation and promotion of the industry cluster. A good regional context includes not only a good "hard" environment, such as modernized infrastructure, convenient transportation and telecommunication and matched production service facilities, but also a "soft" one, for example, stability relations based on long-term cooperation among enterprises, science institutes and government. This soft setting with clustering function can facilitate mutual contact, communication and cooperation between enterprises. It will give rise to interaction effects and synergy effects.

According to the results of analysis, the trade association got the lowest score in all the 28 sub-factors and the score of the vocational education is low too. This shows we should strengthen these two aspects. High education should be better combined with

enterprises and add some related courses according to practical needs of enterprises in order to improve advantage to construct advanced factors of the Ningbo garment industry. To some extent, the Ningbo garment association sponsoring different exhibits and garment festivals have played a role in promoting garment cultural communication between regions. However, the function of association should be improved in order to promote further cooperation and communication among enterprises, universities, government institutions and special technological departments. The trade association will become important consultant institution of information and scheme of the garment industry.

Therefore, it is a must for enterprises, the government and the trade association to collaborate with each other to create a good business environment which will improve the competitiveness of the Ningbo garment industry.

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Questionnaire 1

The Evaluation of factors determining the competitiveness of Ningbo garment industry

Please give an evaluation (to mark a score between 1 to10) individually to each item regarding with the Ningbo's garment industry (as a cluster) after reading the following rule carefully.

➢ **10**---extremely excellent, having competitiveness at the international level, and ranking the first or second worldwide.

➢ **9**---excellent, possessing competitiveness at the international level, and ranking within top five worldwide.

➢ **8**----very good, having an exclusive advantage across the nation.

➢ **7**--- good, owning a competitive advantage in the nation.

➢ **6**----not bad, having no competitiveness, but excelling the average level in the nation.

➢ **5**----at mean level, having the national average strength.

➢ **4**----at limited level, possessing slightly below the national average strength.

➢ **3**----very limited level, having a certain gap comparing with the national average strength, and the gap might influence the development of the whole cluster.

➢ **2**----poor, having a remarkable gap comparing with the national average level, and the gap has obvious impacts on the Ningbo garment r industry (as a cluster).

➢ **1**----very poor, existing a huge gap comparing with the national average level, and the difference has impeded severely the cluster development.

1. GROUNDINGS

1.1 Resources (D_{11})   Score

- ➢ Labor force resources availability--(   )

- ➢ Talent resources availability --(   )

- ➢ Geographic location--(   )

1.2 Infrastructures (D_{12})

- ➢ Transportation infrastructure---(   )

- ➢ Communication infrastructure--(   )

- ➢ Market infrastructure---(   )

- ➢ Trade association--(   )

- ➢ Business environment---(   )

- ➢ Perfection of related laws/ rules--(   )

- ➢ Local financial market--(   )

- ➢ R&D institution--(   )

- ➢ Vocational training---(   )

2.   ENTERPRISES

2.1 Suppliers and Related and Supporting Industries (D_{21})

- ➢ Raw material availability--(   )

- ➢ The service level of suppliers---(   )

- ➢ The development level of related industries---------------------------------(   )

2.2 Enterprise Structure, Strategy and Rivalry (D_{22})

- ➢ Managerial skill--(   )

- ➢ The clarity of property right ---(   )

- ➢ The level of value-added--(   )

- ➢ The ability of brand name --(   )

- ➢ Production equipments ---(   )

- ➢ Product quality--(   )

3. MARKETS

3.1 Local Market (D$_{31}$)

➤ Domestic market share--(   )

➤ Domestic market potential---(   )

➤ Domestic demand distinctiveness--(   )

3.2 External Market (D$_{32}$)

➤ Characteristics of foreign end user--(   )

➤ Export &trade barriers---(   )

➤ Foreign market relationship---(   )

➤ International market share---(   )

Please make your choice a tick(√) for the question:

The annual sales of your company belongs to:

➤ Less than (including) 10 million RMB----------------------------(   )

➤ Between 10 million RMB and 50 million RMB------------------(   )

➤ More than(including) 50 million RMB---------------------------(   )

Questionnaire 2

The evaluation of importance of sub-factors to their factors

Please think over carefully each sub-factor and compare with each other that belong to a certain factor category (Dij), and then give each sub-factor a score (1—7) according to the degree of importance of each sub-factor to its factor. Please pay attention to that all sub-factors are related to the whole Ningbo garment industry (as a cluster), not to a certain enterprise! 1=not important at all; 4=medium-important; 7=extremely important.

1. GROUNDINGS

1.1 Resources (D_{11})　　　　　　　　**1**　**2**　**3**　**4**　**5**　**6**　**7**

➢ Labor force resource availability-------□　□　□　□　□　□　□

➢ Talent resource availability--------------□　□　□　□　□　□　□

➢ Geographic location----------------------□　□　□　□　□　□　□

1.2 Infrastructures (D_{12})

➢ Transportation infrastructure-------------□　□　□　□　□　□　□

➢ Communication infrastructure-----------□　□　□　□　□　□　□

➢ Market infrastructure---------------------□　□　□　□　□　□　□

➢ Trade association-------------------------□　□　□　□　□　□　□

➢ Business environment--------------------□　□　□　□　□　□　□

➢ Perfection of related laws/rules----------□　□　□　□　□　□　□

➢ Local financial market-------------------□　□　□　□　□　□　□

➢ R&D institution--------------------------□　□　□　□　□　□　□

➢ Vocational training-----------------------□　□　□　□　□　□　□

2. ENTERPRISES

2.1 Suppliers and Related and supporting Industries (D_{21})

➢ Raw material availability----------------□　□　□　□　□　□　□

- ➢ The service level of suppliers-----------☐   ☐   ☐   ☐   ☐   ☐   ☐
- ➢ The development of related industries-☐   ☐   ☐   ☐   ☐   ☐   ☐

2.2 Enterprise Structure, Strategy and Rivalry (D$_{22}$)

- ➢ Managerial skill-------------------------☐   ☐   ☐   ☐   ☐   ☐   ☐
- ➢ The clarity of property right------------☐   ☐   ☐   ☐   ☐   ☐   ☐
- ➢ The level of value-added----------------☐   ☐   ☐   ☐   ☐   ☐   ☐
- ➢ The ability of brand name--------------☐   ☐   ☐   ☐   ☐   ☐   ☐
- ➢ Production equipment--------------------☐   ☐   ☐   ☐   ☐   ☐   ☐
- ➢ Product quality---------------------------☐   ☐   ☐   ☐   ☐   ☐   ☐

3. MARKETS

3.1 Local Market (D$_{31}$)

- ➢ Domestic market share------------ ---☐   ☐   ☐   ☐   ☐   ☐   ☐
- ➢ Domestic market potential------------☐   ☐   ☐   ☐   ☐   ☐   ☐
- ➢ Domestic demand distinctiveness----☐   ☐   ☐   ☐   ☐   ☐   ☐

3.2 External Market (D$_{32}$)

- ➢ Characteristics of foreign end-user--☐   ☐   ☐   ☐   ☐   ☐   ☐
- ➢ Export & trader barrier----------------☐   ☐   ☐   ☐   ☐   ☐   ☐
- ➢ Foreign market relationship-----------☐   ☐   ☐   ☐   ☐   ☐   ☐
- ➢ International market share-------------☐   ☐   ☐   ☐   ☐   ☐   ☐

调查问卷一

影响宁波服装业竞争力因素的评价

请仔细阅读下面的评分标准，然后，对照评分标准独立完成对影响整个宁波服装产业(作为一个产业积聚)竞争力的各个因素进行评分(1---10分)。数值允许内插， 精确到0.5分。

评分标准：

➤ 10分——非常优秀，具有世界级的竞争力，在全世界范围来说数一数二；

➤ 9分——优秀，具有世界级的竞争力，在全世界范围内排在前五名；

➤ 8分——良好，具有本国范围内独一无二的优势；

➤ 7分——不错，具有本国范围内的竞争优势；

➤ 6分——及格，具有超过全国平均水平的实力，但没有竞争优势；

➤ 5分——适当及格，具有与全国平均水平相当的实力；

➤ 4分——水平有限，具有略低于全国平均水平的实力；

➤ 3分——水平很有限，与全国平均水平有一定的差距，这种差距可能影响到整个集群的发展；

➤ 2分——水平较差，离全国平均水平较大距离，这种差距对集群造成的影响已经显现；

➤ 1分——很差，离全国平均水平较大距离，这种差距已经严重阻碍着集群的发展。

评分表

1. 基础因素

1.1 资源条件 (D$_{11}$)   得分

- 劳动力资源---(   )

- 人才资源 --(   )

- 地理位置--(   )

1.3 **基础设施 (D$_{12}$)**

- 交通设施--(   )

- 通讯设施--(   )

- 市场设施--(   )

- 行业协会--(   )

- 商业环境--(   )

- 相关法律和法规的完善程度--(   )

- 本地金融市场状况--(   )

- 研发机构水平--(   )

- 职业培训状况--(   )

2. 企业因素

2.1 供应商及相关产业 (D$_{21}$)

- 原材料供应状况--(   )

- 供应商服务水平--(   )

- 相关产业的发展水平--(   )

2.2 企业结构、战略及竞争 (D$_{22}$)

- 企业管理水平--(   )

- 企业产权清晰度 --(   )

- 创造附加值能力--(   )

- 品牌运作能力 --(   )

- ➤ 生产设备档次---(   )
- ➤ 产品质量---(   )

3. 市场因素

3.1 国内市场(D_{31})

- ➤ 国内市场份额---(   )
- ➤ 国内市场发展潜力---(   )
- ➤ 国内需求的独特性---(   )

3.2 国际市场 (D_{32})

- ➤ 最终国外用户的特性---(   )
- ➤ 进出口容易度---(   )
- ➤ 国外市场关系---(   )
- ➤ 国际市场份额---(   )

你的企业年销售额在（请选择打"√"）：

- ➤ ￥1000 万元及以下---(   )
- ➤ ￥1000 万元—￥5000 万元---(   )
- ➤ ￥5000 万元及以上---(   )

调查问卷二

各分因素对其所对应的相关因素重要性程度的评分

请认真仔细考虑以下的各个分因素并作相互比较，然后对各个分因素就其对应的相关影响因素(Dij)的重要性程度进行评分(1---7分)。并请注意：各个分因素是指影响整个宁波服装产业(作为一个产业集聚)竞争力的各因素，并非只指一个特定的企业！(1 分=不重要； 4 分=中等重要；7 分=非常重要)

1.基础因素

1.1 资源条件(D$_{11}$)

		1	2	3	4	5	6	7
➤	劳动力资源------------------------------	☐	☐	☐	☐	☐	☐	☐
➤	人才资源- ------------------------------	☐	☐	☐	☐	☐	☐	☐
➤	地理位置------------------------------	☐	☐	☐	☐	☐	☐	☐

1.2 基础设施 (D$_{12}$)

➤	交通设施------------------------------	☐	☐	☐	☐	☐	☐	☐
➤	通信设施------------------------------	☐	☐	☐	☐	☐	☐	☐
➤	市场设施------------------------------	☐	☐	☐	☐	☐	☐	☐
➤	行业协会------------------------------	☐	☐	☐	☐	☐	☐	☐
➤	商业环境------------------------------	☐	☐	☐	☐	☐	☐	☐
➤	相关法律和法规的完善程度-----------	☐	☐	☐	☐	☐	☐	☐
➤	本地金融市场状况----------------------	☐	☐	☐	☐	☐	☐	☐
➤	研发机构水平-------------------------	☐	☐	☐	☐	☐	☐	☐
➤	职业培训状况--------------------------	☐	☐	☐	☐	☐	☐	☐

2. 企业因素

2.1 供应商及相关产业(D$_{21}$)

> 原材料供应状况------------------□　□　□　□　□　□　□

> 供应商服务水平------------------□　□　□　□　□　□　□

> 相关产业的发展水平--------------□　□　□　□　□　□　□

2.2 企业结构、战略及竞争 (D$_{22}$)

> 企业管理水平------------------□　□　□　□　□　□　□

> 企业产权清晰度----------------□　□　□　□　□　□　□

> 创造附加值能力----------------□　□　□　□　□　□　□

> 品牌运作能力------------------□　□　□　□　□　□　□

> 生产设备档次------------------□　□　□　□　□　□　□

> 产品质量----------------------□　□　□　□　□　□　□

3. 市场因素

3.1 国内市场 (D$_{31}$)

> 国内市场份额-------------------□　□　□　□　□　□　□

> 国内市场潜力------------------□　□　□　□　□　□　□

> 国内需求的独特性---------------□　□　□　□　□　□　□

3.2 国际市场(D$_{32}$)

> 最终国外用户特性---------------□　□　□　□　□　□　□

> 进出口容易程度----------------□　□　□　□　□　□　□

> 国外市场关系------------------□　□　□　□　□　□　□

> 国际市场份额------------------□　□　□　□　□　□　□