The Effects of China’s WTO Accession on the Production Structure of the European Union

Heljä Nieminen
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Department of Economics
University of Tampere
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The aim of this paper is to examine how China’s accession to the World Trade Organization (WTO) in late 2001 affects the production structure of the European Union (EU). In addition, strategies for adjustment are discussed in some detail.

The research problem is addressed by examining key determinants of production structure derived from traditional international trade theories (Ricardian model, Heckscher-Ohlin model and Krugman’s (1980) model of economic geography) as well as from Porter’s (1990) theory of competitive advantage. Moreover, the model of Aghion, Alesina & Trebi (2007) on the effects of political regimes on the growth of advanced industries is introduced as it helps to determine whether China is likely to succeed in moving up the value chain and thus challenge the EU in the production of high-tech goods.

While the theories examined in this study provide valuable insight into the research question, they all have flaws. Consequently, none of them is able to predict the production structure of a country or a region with complete accuracy. As the underlying theories are unable to produce exact and indisputable results, no econometric testing is conducted. Instead, this paper considers aspects from several theories with a discursive approach.

It is evident that China’s WTO accession has different effects in different European industries and countries. China’s distinctive advantage in the production of labour-intensive goods will contract these industries throughout the EU. The European textile and clothing industry, for example, is unable to compete with China once trade barriers are lifted. In contrast, high-tech industries are predicted to succeed in the EU due to the relatively skilled labour force and highly democratic political regimes of all EU countries. However, attention needs to be turned from protecting globally inefficient industries to fostering innovation in the EU. The need for adjustment is greatest in the new member states in Central and Eastern Europe as they lag behind the rest of the EU in innovation performance and their current production structure is similar to that of China’s.
1. INTRODUCTION

Over the last three decades, China has taken firm steps in reintegrating into the global economy. The efforts to open the Chinese economy culminated in the accession to the World Trade Organization (WTO) in late 2001, which is considered a milestone in China’s trade relations with the rest of the world.

China’s commitments are substantial and extend from cutting tariff rates and reducing non-tariff barriers (NTB) to increasing the transparency of its trade and investment regimes. In return, China gained market access and was granted a permanent most-favoured-nation (MFN) status by several WTO members. This multilateral trade liberation will undoubtedly have consequences on the patterns of international trade and production.

The European Union (EU) was among those granting China MFN status upon accession. Therefore, China’s WTO membership and integration to the trading world are likely to affect production in the EU. In general, economic integration has multiple effects on production. It affects both the level and structure of production and possibly the speed of growth. This paper concentrates in analysing the effects of China’s WTO membership on the structure of production in the EU.

A number of recent studies have addressed China’s WTO membership. However, the viewpoint of most studies has been the welfare implications of trade liberation. Also, previous studies have mainly examined welfare changes on a global level. This paper deviates from previous studies as the focus is on the changes in the production structure of a particular region. This somewhat narrower research problem allows a more detailed analysis.

The theoretical framework of this study is two-fold. The starting point is international trade theories that provide basic insight into how production structure is determined globally. In addition to economic models (Ricardian model, Heckscher-Ohlin model and Krugman’s model of economic geography), Porter’s theory of competitive advantage is discussed as it adds depth and dynamism to the analysis. Next, the effect of
political regimes on the growth of advanced industries is examined in order to determine whether China will succeed in moving up the value chain and thus challenge the EU in the production of high-tech goods. Aghion, Alesina and Trebi (2007) provide a model on the effects of political regimes on the growth of advanced industries.

Based on international trade theories and the model of Aghion et al. (2007), this study aims to identify the determinants of production structure and utilise them in examining the effects the multilateral trade liberation between China and the rest of the WTO has on the production structure of the EU. No econometric testing, however, is conducted. Instead, this paper applies the theory in practice by assessing and comparing a set of variables in the EU and in China. In addition to analysing how the production structure of the EU adjusts to China’s WTO membership, the adjustment process is discussed.

The remainder of the paper is organised as follows. Chapter 2 reviews international trade theories, while Chapter 3 examines the effects of political regimes. Chapter 4 focuses on China’s integration into the trading world and its accession to the WTO. Chapter 5 provides a short comparison of the economies of the EU and China and presents broad trends in the bilateral trade of these two large economies. Chapter 6 aims to estimate the changes in the production structure of the EU as predicted by international trade theories. Based on the findings of earlier chapters, Chapter 7 evaluates the competitive capabilities of the EU and introduces strategies for adjustment, whereas Chapter 8 concludes.
2. INTERNATIONAL TRADE THEORIES AND THE LOCATION OF PRODUCTION

The question of which country produces which goods and services has traditionally been addressed indirectly by examining trade flows between countries instead of production. This is, of course, quite a natural way to deal with an issue in the field of international economics.

Therefore, in order to examine and predict the changes that will happen in the production structure of the EU following China’s full WTO membership, a number of the most influential theories on international trade will be discussed in some detail. Their ability to predict existing trade flows and the division of production across countries will also be examined in the light of their empirical performance.

This chapter is by no means an all-embracing review of trade theories as several models of international trade are excluded due to their similarity to the models discussed or lack of determinacy. Gravity-based models, for example, are not discussed as they tend to predict only the volume of trade as opposed to the pattern of trade. The aim of this chapter is to give an overview of the factors that affect the pattern of trade and production. In subsequent chapters, the impact of these factors in trade flows between China and EU will be assessed.

2.1 The Ricardian model

The Ricardian model, first expressed by David Ricardo in the early 19th century, has kept its place among the most prominent trade theories. The core of the model is the concept of comparative advantage, which states that a country has a comparative advantage in producing a good if the opportunity cost of producing the good in terms of other goods is lower than in other countries. (Krugman & Obstfeld 2005, 44.)
Ricardo (1817, Chapter 7) demonstrated how two countries can both gain from trade even if one country has an absolute advantage in producing both goods. This discovery was the basis for much of international trade theory for over a century.

The original model encompasses two goods, two countries and one factor of production, labour. Countries differ from each other only in the productivity of labour in different industries. The Ricardian model states that a country exports a good which it produces relatively efficiently. In other words, a country specialises in the production of the good in which it has a comparative advantage. Except for some exceptions, the Ricardian model predicts specialisation to be complete.

The simple idea expressed by David Ricardo has been further developed by several economists and has been extended to a multi-good, multi-country model that can be expressed in a mathematical form. Despite much research, some defects still remain evident.

Firstly, the model is a very simplified one as there is only one factor of production. It does not allow for differences in resources. Secondly, it assumes no economies of scale and therefore fails to explain the presence of intraindustry trade, which is often substantial, especially between industrialised countries. Thirdly, transport costs are not incorporated into the basic version of the Ricardian model. In real economies, transport costs can cause countries to be self-sufficient in certain sectors. Fourthly, countries can choose not to specialise according to comparative advantage and follow other criteria when choosing what to produce. This can be done by restricting trade and protecting certain industries, which has been very common throughout history. However, many countries are presently undergoing a process of liberalising the economy. Therefore the relevance of this last argument against the Ricardian model might diminish in time.

Despite the shortcomings mentioned above, the basic prediction of the Ricardian model seems to hold surprisingly well: according to many empirical studies, countries tend to export products in which their relative productivity is high. The degree of specialisation, however, is not as extreme as the model predicts.
Several studies used data comparing British and American productivity and trade in the early post-World War II era. MacDougall (1951) found that most goods were indeed produced as the law of comparative advantage dictates. Balassa (1963) also investigated the validity of the Ricardian model, using slightly different approach and newer data. The results do not support the theory of comparative advantage as strongly as MacDougall’s results. Still, the study confirmed the connection between productivity and export shares: nearly two thirds of the variance in export shares could be explained by differences in productivity.

The Ricardian model assumes perfect markets and homogenous products. In the absence of transport costs, two countries would both export the same good only if the productivity ratio equalled the wage ratio. In all other cases, even small differences in comparative advantage would cause only one country to capture the whole export market. In reality, however, the assumptions made by the Ricardian model are too strict. Markets are generally characterised by several restrictions, differentiated products and transport costs. MacDougall’s study (1951, 708) revealed that each country tended to get larger share of the market in which it had a comparative advantage as opposed to the whole market. Also, there was a tendency for each country get a larger and larger share of the market the greater its comparative advantage was. Balassa’s (1963, 235) calculations confirmed this notion by revealing that one percent change in productivity ratios between the United States and Britain led to an approximately 1,6 per cent change in the ratio of export values.

Despite the seemingly good correlation between the relative productivity of labour and pattern of trade, many believe that the link between them is weaker than estimated. In fact, McGilvray and Simpson (1973) found very little evidence from trade patterns between Britain and Ireland to support the idea that the driving force in specialisation is differences in the productivity of labour. On the theoretical side, Leamer and Levinsohn (1994, 5), for example, argue that the Ricardian model is too simple to be anything but a mathematical toy. However, the majority of studies seem to be unable to deny the tendency of countries to be exporters of products in which they have a comparative advantage, at least in the case where there are no barriers to trade such as tariffs, which may alter the pattern of trade.
Unfortunately, most research has moved on to examine more recent trade theories, leaving the testing of the Ricardian model in the background. Still, the basic idea presented in the Ricardian model often reappears as part of other models.

2.2 The Heckscher-Ohlin model

The Heckscher-Ohlin model, first expressed in 1933 by Bertil Ohlin, explains international trade patterns and the location of production with differences in the relative quantities of resources. The framework of two goods, two countries and two factors of production (capital and labour, for example) makes the model slightly more complicated than the simple Ricardian model based on differences in the productivity of labour. (Ford 1963, 460.)

The cause of trade is the same in the Ricardian model and in the Heckscher-Ohlin model: inequalities in the pre-trade relative commodity price ratio cause countries to trade. According to Ohlin, however, the reason for the difference is in factor-propositions, not in the productivity of labour.

Ohlin (1933,30) arrives at a natural conclusion that a factor will be relatively cheap where it is relatively abundant. Initial differences in factor prices will cause differences in the pre-trade prices of commodities. When international trade is introduced, a commodity will be produced where the relative price of that commodity is lower. In short, each country will tend to specialise in the production of the commodity using much of its abundant factor. It can be gathered from this reasoning that the underlying explanation for specialisation lies in differences in factor-endowments. (Ford 1963, 459; Samuelson 1948, 165.)

Classical trade theory states that free mobility of factors of production leads to an equalisation of factor prices. Ohlin’s ground-breaking idea was that free mobility of commodities in international trade can serve as a partial substitute for factor mobility, leading to a partial equalisation of factor prices. This idea has been extensively formalised by Samuelson in several studies. Ohlin (1933) wrote that factor prices will
not cause complete equalisation of factor prices, but was unable to explicitly explain why equalisation happens only partially. Samuelson (1948), however, takes the theory one step further by claiming that the equalisation of factor prices is both possible and probable and in certain cases, it is inevitable. He states that factor prices will necessarily be equalised when only partial specialisation happens and when initial factor endowments are not too unequal. (Samuelson 1948, 163-170.)

As always, there are some complications associated with the model, many of which are the same as in the Ricardian model discussed in the last chapter: the model assumes perfect competition, no transport costs or barriers to trade, homogenous products and constant returns to scale. As noted earlier, these assumptions turn out not be very realistic. In addition, Ohlin (1933) assumes that each good is produced using the same technology everywhere in the world. In other words, the model does not take differences in productivity into account at all.

Also, while the Heckscher-Ohlin model is undeniably a more complete model than the simple Ricardian model, empirical evidence on the accuracy of the model in predicting trade flows is less clear-cut than in the case of the Ricardian model. As a highly debated theory, the Heckscher-Ohlin model has been the subject of numerous empirical studies.

Bernstein and Weinstein (1998, 33-34), for example, estimated the average prediction error for an international model deriving production estimates from regressions of outputs on factor endowment to be high. They state that if there are more goods than factors of production it’s impossible to predict output solely on the basis of factor endowments. Bowen, Leamer and Svekauskas (1987, 796-797) confirmed that the relationship between industry input requirements, country resource supplies and international trade in commodities is often weak. In contrast, Davis and Weinstein (1996, 33) found that in OECD manufacturing, production patterns correlated highly with factor endowments. After modifying the model to account for interindustry differences in factor prices, Brechen and Choudhri (1993) also discovered some support for the model. In sum, the evidence for the model is inconsistent.

One proof against the Heckscher-Ohlin can be obtained by examining factor prices: if trade and production are determined by relative factor endowments, factor prices should
converge in different countries. It does not take much of research to conclude that this
not the case. Samuelson (1948, 178-179) offers several explanations for this, such as the
fact that commodities are never perfectly mobile and that extreme differences in factor
endowments can lead to complete specialisation. In these situations, factor prices can
differ. More serious inadequacies and limitations of the model, as Samuelson (1948,
181) points out, is assuming that production functions are the same in different
countries and that factors of production are homogenous and commensurable in
different parts of the world. If the Heckscher-Ohlin theorem is presented in a weaker
form, i.e. that countries will on average be net exporters of their abundant factors and
net importers of their scarce factors, factor-price equalization needs not to be true
(Leamer & Levinsohn 1994, 17-18; Deardorff 1982, 689).

Much of the empirical work on testing the model has had to make considerable
adjustments to the original model. When more factors, such as technological
differences, home bias and diversification, are added to the model, relative factor
abundance can better predict the commodity composition of trade, especially if factor
content of trade rather than its commodity content is examined. The Heckscher-Ohlin
model predicts only partial specialisation. In this aspect, the model is closer to reality
than the Ricardian model predicting complete specialisation. (Leamer & Levinsohn
1994, 34; Deardorff 1982, 683.)

Finally, the success of the model in predicting North-South trade in manufactures is
worth noting. Most studies confirm that the Heckscher-Ohlin model works better when
applied to North-South trade than overall international trade. This finding suggests that
factor endowments might play a considerable role in determining trade patterns between
China and the EU as trade between them can be classified as North-South trade. (See,
for example, Krugman & Obstfeld 2005, 115-116.)

2.3 Economic geography

Traditional trade theories, such as the Ricardian model and the Heckscher-Ohlin model,
assume no economies of scale, no product differentiation and perfect competition. In
addition, transaction costs are often discarded. Therefore traditional models are often unable to explain the extensive trade among industrial countries, which in many cases is intraindustry trade in differentiated products. Models based on economic geography aim to incorporate the missing elements into trade theory and thus better describe trade and production.

Paul Krugman was among the first to try to formulate an economic model on how increasing returns and product differentiation affect the pattern of trade. The influential model developed by Krugman in 1980 was derived from the works of Dixit and Stiglitz. Equilibrium takes the form of Chamberlanian monopolistic competition, where firms have some monopoly power but entry to the market is free, making monopoly profits zero. An important aspect the model is its micro-based approach: at the centre of attention is not a country, but a firm trying to minimise its costs. (Krugman 1980, 950.)

The model encompasses a large number of differentiated goods, but only one factor of production, labour. Krugman (1980, 950-951) finds that in the presence of scale economies each differentiated product will be produced by one country and the greater diversity of goods in the world markets creates gains from trade by widening consumer choice. This shows that trade is profitable even if the economies have identical tastes, technology and factor endowments, which is something traditional trade theory is unable to explain.

Krugman (1980, 955-957) extends his analysis to include transport costs and discovers what is referred to as the “home market effect”. In the presence increasing returns and transport costs, it is profitable for a firm to concentrate production near its largest market. Producing in the largest market area enables a firm to realise scale economies while minimising transport costs. Krugman (1980, 957) shows that when consumer tastes are sufficiently dissimilar, each country specialises in the industry for which it has a relatively larger home market. He states that each country will be a net exporter of the class of goods in which it specialises. Thus the pattern of exports is determined by the home market.

The model focused on economies of scale internal to firms. Later, external economies have become a topic of discussion as well. Krugman (2005, 179-183), for example,
stresses the importance of external economies, which can give rise to economies of scale at the national level. External economies are usually generated by specialised suppliers, labour market pooling and knowledge spillovers. In the presence of external economies, a country that has a large production in some industry tends to have low costs of producing that good. In other words, strong external economies confirm existing patterns of trade: countries that start out as large producers in certain industries often to stay as large producers. The reasoning above hints that historical accident might have a strong role in determining the pattern of trade and that established patterns of specialisation can persist even when they run counter to comparative advantage dictated by productivity and factor-endowments.

Formulating a model based on both geographic and economic considerations is not simple and considerable concessions in one way or another are inevitable. In addition, models of economic geography often describe a highly abstract world due to the complexity of the problems covered. This approach yields clear theoretical insights, but makes an analytic solution difficult. Also, identifying empirical features that distinguish models of economic geography from those based on comparative advantage and factor-endowments has proven challenging. (Davis & Weinstein 1996, 1,11.)

Empirical evidence on the importance of economic geography on the pattern of trade and production is, so far, inconclusive. Hummels and Levinsohn (1995) present very mixed results on the subject. Davis and Weinstein (1996, 38-41) formally reject a model of economic geography that is based on Krugman’s (1980) study and conclude that economic geography does not seem to have an impact on production patterns. In a later study, however, Davis and Weinstein (1998, 29-33) arrive at a different conclusion and discover a considerable home market effect in the manufacturing production of the OECD. In a more recent study, Antweiler and Trefler (2002) confirm that allowing for the presence of increasing returns to scale significantly increases the ability of trade models to predict actual trade flows.
2.4 Competitive advantage

Michael E. Porter (1990) analysed the impact of national environment to international competitive performance. Strictly speaking, his book “The Competitive Advantage of Nations” is not economics: much of the concepts and theories stem from strategic management. However, despite the framework of strategic management, Porter’s work serves to extend the theories of international trade as its main aim is to explain why a nation is a desirable home base for competing in an industry.

The major actor in Porter’s work is not a nation, but a firm competing in the global marketplace. As a home base, the nation influences the performance of firms and industries through a set of variables.

The nature of competition and the sources of competitive advantage differ widely among different industries. Therefore, instead of relying on a single determinant such as comparative advantage or factor endowments, different sources of competitive advantage in different industries must be allowed for. Following this notion, Porter specifies four sets of determinants, which together define the national competitive advantage. (Porter 1990, 69-71.)

The first determinant, factor conditions, encompasses both factor endowments and the technology used in exploiting them. Unlike in traditional trade theory, factors of production are disaggregated to a fine level and their characteristics are analysed in detail. Factors are divided into hierarchies. Basic factors include natural resources, climate, location and demographics. These factors are becoming increasingly unimportant due to their diminished necessity or their widening availability and the instability of the advantage they provide. Advanced factors, such as communications infrastructure, sophisticated skills and research facilities, in contrast, are now the most significant ones in creating and sustaining competitive advantage as they are necessary for creating higher-order competitive advantage. The most enduring basis for competitive advantage tends to be specialised advanced factors. (Porter 1990, 73-80.)
The second determinant, demand conditions, affects competitive advantage in an industry through home demand composition, demand size and internationalisation of domestic demand. Unlike economic geography, which mainly focuses on the static effects caused by scale economies, Porter concentrates in analysing the dynamic influences of demand conditions. Demanding local buyers and saturated markets create pressure and compel firms to improve their products and services in order to succeed in domestic markets, while buyer needs that anticipate those of other nations stimulate the upgrading of products and the ability to compete in emerging sectors. Thus, home demand can provide initial and ongoing impetus for innovation, improvement and upgrading competitive advantage. (Porter 1990, 86-99.)

The presence of related and supporting industries is the third determinant of competitive advantage. The proximity of internationally competitive supplier industries creates advantages by providing efficient access to inputs, linkages in the value chain and, most importantly, it creates close connections between suppliers and the industry. Successful related industry, in turn, provides opportunities for information flow and technical interchange. (Porter 1990, 100-107.)

The last determinant, firm strategy, structure and rivalry, is the context in which firms are created, organised and managed as well as the nature of domestic rivalry. These variables are strongly influenced by social and religious history, education system and family structure and thus vary widely among nations. Competitive advantage is achieved when choices made in managing and organising a firm match the sources of competitive advantage in the industry. In addition, Porter emphasizes the importance of domestic rivalry in creating and maintaining competitive advantage in an industry as a competitive domestic environment creates pressures for firms to improve, innovate and sell abroad in order to realise economies of scale. (Porter 1990, 109-124.)

Furthermore, chance can shape competitive advantage. Pure inventions, abrupt changes in input costs and wars, for example, create discontinuities that allow shifts in competitive position. Also, the government can, albeit only partially, shape the competitive environment by influencing the four major determinants with different policies, such as those directed towards capital markets, education and trade. (Porter 1990, 124-128.)
The four determinants of competitive advantage form an interactive system in which the parts influence each other. The interaction of the determinants is manifested in clusters, which are usually formed by the most successful industries in the country and are often a vehicle for maintaining and upgrading competitive advantage. Domestic rivalry, strong supporting and related industries and demanding buyers often act together in creating a cluster. A cluster, in turn, magnifies and accelerates the process of factor creation. Competitive advantage in simple or resource-based industries can be a result of advantage in only one determinant, factor conditions. However, competitive advantage in more sophisticated industries usually requires unique advantages in several determinants. (Porter 1990, 144-154.)

Unlike international trade theories in economics proper, Porter’s theory is dynamic: competitive advantage can shift, the most important factors are created rather than inherited and the variables in the model interact with each other. In that respect, Porter’s model corresponds to real economies better than many economic models. Also, the determinants of competitive advantage are very good at describing and explaining why certain industries prosper in certain countries. However, the variables embodied in the four determinants are numerous and overlapping, which makes predicting industry location and trade patterns cumbersome. In short, the theory seems to be empirically relevant, but lacks determinacy and specificity.

2.5 Assessing international trade theories

International trade theories discussed in the preceding sub-chapters gave insight into how trade patterns and production structure are determined between trading countries. Despite the research of nearly two centuries, none of the models presented is a perfect tool for predicting the production structure of a country: some are robust in theoretical foundations, and others are backed up by sound empirical evidence. Simple models, such as the Ricardian model, are easier to test, while more complicated theories like Porter’s theory of competitive advantage are practically impossible to test empirically. The main characteristics of international trade theories can be summarised as:
Table 1. Comparison of international trade theories.

<table>
<thead>
<tr>
<th>Model</th>
<th>Key determinant(s)</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ricardian Model</td>
<td>Productivity of labour</td>
<td>Sound theoretical foundations, easy to test, broadly supported by empirical evidence</td>
<td>Unrealistic assumptions, intraindustry trade not explained, static</td>
</tr>
<tr>
<td>Heckscher-Ohlin model</td>
<td>Factor-endowments</td>
<td>Sound theoretical foundations, reasonably easy to test</td>
<td>Unrealistic assumptions, intraindustry trade not explained, empirical testing inconclusive, static</td>
</tr>
<tr>
<td>Models based on economic geography</td>
<td>Increasing returns</td>
<td>Explains intraindustry trade, more realistic assumptions</td>
<td>Empirical testing inconclusive, abstract, somewhat difficult to test</td>
</tr>
<tr>
<td>Competitive advantage</td>
<td>Factor conditions, demand conditions, related and supporting industries, firm strategy, structure and rivalry</td>
<td>Explains intraindustry trade and trade in services, dynamic, broad in scope</td>
<td>Lack of precision and determinacy, complexity, difficult to test</td>
</tr>
</tbody>
</table>

It’s easy to see from Table 1 that all of the trade theories have some major drawbacks either in theoretical foundations or in empirical relevance. The Ricardian model and the Heckscher-Ohlin are relatively easy to formulate, but both models have made some substantial simplifying assumptions: perfect competition, constant returns to scale and zero transport costs. Economic geography, instead, is more realistic in its assumptions: transport costs are acknowledged, the assumption of perfectly competitive markets is abandoned in favour of monopolistic competition and the existence of economies of scale is accepted. Porter’s theory of competitive advantage, albeit being complicated and impossible to formulate explicitly, adds more nuances to the ideas presented in earlier trade theories.

By now it should be clear that several factors jointly determine trade flows and production structure. The productivity of labour affects trade between two countries, as does factor-endowments. Economies of scale certainly help to explain trade patterns.
Also, the numerous determinants presented by Porter add more depth and dynamism into the analysis. In today’s highly competitive markets, the business environment of a nation is an important factor when firms choose their location. Ultimately, as noted by economic geography and emphasised by Porter’s theory of competitive advantage, it’s the firm that chooses the country in which to operate, not vice versa. Therefore the point of view of a single firm operating in a competitive environment is perhaps more appropriate than the traditional viewpoint of two countries maximising their gains from trade.

In short, the ability of a single trade theory to predict the impact of trade liberation in China and in the EU is dubious at the very least. Therefore aspects from several theories need to be considered. It would be possible to formulate a mathematical model comprising several factors that jointly determine production patterns and then estimate the model using econometrics. Yet no such model will be used for a variety reasons. Firstly, a model including an extensive variety of variables would be extremely complicated. Secondly, the validity of the model would first have to be tested extensively and that is out of the scope of this paper. Thirdly, the apparent inability of leading economists to create a feasible, all-embracing model that explains and predicts international trade patterns and division of production suggests that such a model is, as of yet, unobtainable. Lastly, gathering accurate figures on some of the variables is next to impossible. Statistics available for China are especially unreliable and thus any estimation would automatically contain errors and lack accuracy.

Therefore the economies of China and the EU will be evaluated from the perspective of the key determinants of international trade theories without resorting to econometric testing. The determinants used in assessing the effects of China’s WTO membership on the production structure of the EU include productivity of labour, factor endowments, increasing returns and selected aspects from the four determinants of competitive advantage.
3. INNOVATION AND TECHNOLOGY

Throughout the era of opening-up, China has mainly been a base for low-cost manufacturing. Increasingly, China has shown signs of a strong will to move on into more advanced products further up in the value chain. For decades, much of the technology in China has been acquired through technology transfers from FIEs. Although foreign investment is still seen as a path to upgrade technology, China is now attempting to decrease its reliance on imported technology gradually. Consequently, initial innovation has become a high priority in China. If China succeeds in moving up the value chain, it could pose a greater threat to the economic performance of the EU than in its current position as the workshop of the world.

The previous chapter introduced international trade theories that are often used in determining the pattern of specialisation. This is, of course, a natural starting point. Traditional trade theories, however, are static in nature and do not predict changes in the underlying variables. Instead, they assume that the determinants of production structure remain the same throughout time. Therefore, they are unable to provide an answer on whether or not China could be a suitable home base for high technology manufacturing.

Porter’s theory of competitive advantage is a dynamic theory as it recognises that competitive advantage can change over time. This chapter takes a slightly different view on the subject, stressing the importance of the political regime in determining technology and growth. It assesses the probability of China to succeed in its attempts to move into advanced products by focusing on the impact of political systems on the growth of industries involving high technology. But first, the idea of creative destrucution is introduced as it helps to explain the process of transformation.

3.1 Innovation through creative destruction

The introduction of the concept of creative destruction has been attributed to Joseph Schumpeter who first described the process of creative destruction in 1942. Although a well-known and widely used concept, it has only played a minor role in growth theory.
It is discussed here as much of the research presented in the next subchapter can be considered as an extension to the original idea presented by Schumpeter.

Creative destruction refers to a process in which innovations destroy obsolete technologies in an infinite process. Schumpeter states that this process is pushed forward by factors such as new markets or goods, new methods of production or transportation and organisational development. The outcome of the process is the change in the economic structure from within. (Schumpeter 1942, 83-85.)

Aghion and Howitt (1992) have presented a formal model of economic growth based on the ideas presented by Schumpeter. Each innovation consists of a new intermediate good that can be used to produce the final product more efficiently than before. Research firms are motivated by the prospect of monopoly rents that can be captured when a new innovation is created. These rents will, however, be destroyed by the next innovation as the old innovation becomes obsolete. Competition among research firms that generate innovations leads to technological progress. This, in turn, generates economic growth.

Schumpeter handles creative destruction as an essentially capitalistic phenomenon, while Aghion and Hewitt (1992) do not mention societal structures and their role in fostering innovation. In a later study, however, Aghion among others analyses the role of political systems on growth and technology. This aspect on growth theory is discussed in the next subchapter.

3.2 The effect of political regimes on growth and technology

The question of whether or not democracy enhances economic growth and development has been addressed by several recent studies, Aghion, Alesina & Trebi (2007) being one of them. This study is particularly relevant in the framework of this paper as it examines the link between democracy and growth in the more advanced sectors of the economy. Therefore, the results of the study help to determine the role of innovation-driven industries in the EU and China.
Most studies have not been able to find a link between political regime and economic growth. However, they have focused on the overall growth of an economy, not the growth of specific industries. At the moment, Aghion is the most dominant author focusing on the specified question of whether a certain type of political regime supports growth in certain sectors. Aghion has approached the question in several recent studies, first focusing on firm entry (see Aghion & al. 2006) and then extending the theory to political regimes.

Aghion & al. (2007) discover a link between democracy and growth in different sectors of the economy. The model, presented in mathematical form, provides insight into why democracy may have different effects on different sectors of the economy. The main idea of their paper is that the effects of democracy on economic growth are two-fold: extensive political rights are conducive to growth in the more advanced sectors of the economy, while they do not matter or even have slightly negative effects on growth in the less advanced sectors.

Political rights are associated with freedom of entry into markets. Consequently, democracy increases the probability of entry as politicians in democratic political systems are less likely to subdue to bribes paid by firms trying to make policy makers raise barriers to entry. (Aghion & al. 2007, 8.)

The focus of the model is intermediate firms, which can be divided into two categories: advanced firms with leading-edge technology and high productivity and backward firms with lower productivity. It is assumed that advanced firms can use a first-mover advantage to block entry in order retain monopoly. If an advanced firm does not innovate, it risks being eliminated by new entry and earning zero profits. Increase in entry threat encourages an advanced firm to innovate as innovating enables it to remain in the technological frontier and retain its position. In sum, a firm close to the technological frontier responds to increased entry threat by innovating more in order to escape the threat. (Aghion & al. 2007, 5-7.)

In contrast, backward firms are assumed to remain behind the frontier even if they manage to innovate as the frontier also advances. Thus, a backward firm is not able to reap monopoly power and the profit of a backward firm is zero regardless of whether it
innovates or not as the firm cannot catch up with the frontier. Also, an increase in entry threat discourages a backward firm from innovating because the firm is unable to prevent a new entrant from destroying the value of the innovation. Therefore, innovation incentives depend negatively on innovation in the case of firms that are far behind the technological frontier. (Aghion & al. 2007, 6-7.)

The main result of the study is achieved when the idea that democracy increases the probability of entry and the notion that increased entry threat encourages innovation by advanced firms are combined. This results in a prediction that an increase in democracy will stipulate innovation by advanced firms but not by backward firms. Thus, democracy is likely to have a higher impact on productivity growth in sectors that are closer to the world technological frontier. Naturally, the result only applies when democracy results in policies that allow more competition and more freedom of entry. (Aghion & al. 2007, 10.)

This core finding of the study was tested empirically by examining distance to the technological frontier and democracy. The former was measured by value added by worker in relation to the maximum of the same variable across all countries each year, while the latter was measured using established measures of political economics, such as aggregate indicators from the Polity IV Database (2005) and Freedom House measures of civil liberties and political rights. These two independent variables were used to estimate growth rate of output in different industrial sectors. (Aghion & al. 2007, 11-12.)

Judging from the results, it seems that democracy has no effect or even slightly negative effect on growth rates for manufacturing at the country level, which supports the findings of earlier studies. At an industry level, however, an interaction term between democracy and distance to the technological frontier becomes statistically significant with a negative coefficient. This result indicates that the effect of democracy on growth is positive close to the technological frontier. In contrast, democracy may diminish growth far away from the technological frontier. Overall, the results of the empirical part seem to support the hypothesis of the study. (Aghion & al. 2007, 14-15.)
Having established a model that explains the differentiated effect of democracy on growth, Aghion et al. aim to improve the model further. As mentioned earlier, they assume that freedom of entry and political freedom are correlated. This is a reasonable assumption as several studies have proved that democracies have lower barriers and cost of entry. (Aghion & al. 2007, 16-17.)

Freedom of entry, however, can be measured in several ways. One is to use the number of procedures needed to start up a business in a country. Perhaps surprisingly, this approach does not improve the predictability of the model as the coefficients on democracy and its interaction with distance were unaffected by the introduction of this proxy. Another option is to use the effective entry, measured by growth rates in the number of establishments. This approach yields statistically significant coefficients on the interaction between entry and distance for both sectoral output and value added. Overall, the results suggest that freedom of entry may explain why democracy supports growth in sectors close to the frontier rather than in the less advanced sectors. (Aghion & al. 2007, 17-18.)

Relying on theoretical and empirical findings, Aghion & al. (2007, 19) propose that democracy fosters entry, innovation and competition. These factors are relatively more important for growth in sectors close to the technological frontier than in sectors that are far behind the frontier.

While the model is useful in assessing which countries will most likely be able to generate growth in the advanced industries, it should be pointed out that the empirical evidence supporting the model is still somewhat insufficient. Further research into the subject is still needed. Despite the lack of determinate empirical evidence, the EU and China will later be evaluated in the light of the main findings of Aghion & al. (2007) as the model is both rational and relevant.
4. CHINA AND THE WTO

After decades of inward-looking economic policy, China re-emerged as a player in the global economy during the 1980s and 1990s. Its trade grew faster than world trade and simultaneously it attracted substantial amounts of foreign direct investment.

As a part of its opening-up policy, China first expressed interest in joining the General Agreement on Trade and Tariffs (GATT) as early as in 1984 and formally requested membership in 1986. However, China’s terms of accession remained under negotiation for more than a decade and China finally became a member of the WTO, the follower of the GATT, in late 2001. The following sub-chapters will introduce the reforms that were made before the WTO membership and China’s terms of accession. In addition, some of the major problems between old WTO members and China will be discussed.

The focus of this chapter is the obligations undertaken by China. However, the purpose of this paper is to assess the changes the will occur in the production structure in the EU following China’s accession. Therefore it should be stressed that, other than for some specific provisions applying to China only, the EU will equally have to obey the rules set by the WTO when trading with China. On accession, China was granted a permanent most-favoured-nation (MFN) status by other WTO members, including the EU. Consequently, China’s market access in the EU improves. The changes in the production structure in the EU will occur as a consequence of the mutual, albeit not complete, trade liberation.

4.1 Trade reforms pre-WTO membership

It is important to note that many reforms in the Chinese economy took effect before China’s official accession into the WTO. Before the late 1970s, China’s commodity trade was determined almost purely by economic planning. A handful of foreign trade companies, owned and controlled by the Ministry of Foreign Trade, carried out the trade plan, which was specified in physical terms. Complicated pricing mechanisms
determined the prices of both imports and exports, which led to substantial distortions in the commodity structure of foreign trade. (Lardy 2002, 29-32.)

The death of Mao Zedong and the collapse of the gang of four in 1976 brought on a climate of change which extended to the economy. Led by Deng Xiaoping, China began the transition from a centrally-planned socialist economy into a socialist market economy in the late 1970s. During the process, the trading system underwent a thorough reform. Physical planning was gradually dismantled in the 1980s and the whole system of foreign trade was largely transformed by the end of the 1990s.

The import regime remained complex throughout the reform era. As the scope of import planning decreased in the early 1980s, high tariffs were introduced for many products. In 1982, the average statutory tariff rate was 55.6 per cent. Over time, however, tariffs were adjusted. A series of tariff reductions began in 1992. By 2001, the average statutory tariff rate had fallen to 15 per cent, which is similar to that of Mexico and Brazil and about half of that prevailing in India. (Lardy 2002, 33.)

Also worth noting is the extensive tariff exemption scheme. Raw materials and intermediate goods used in producing export goods and capital goods used in joint venture and wholly foreign-owned companies were de facto duty free for most of the reform era. Later, an even broader range of imported goods was exempted from import duties. As a result, the share of imports subjected to any import duty was less than 40 per cent in 2000, while tariff revenue was only 4 per cent of the value of imports. (Lardy 2002, 34-36.)

With the diminishing tariff level and tariff exemptions, non-tariff barriers (NTBs) became effective in restricting the flow of imports. The most important were licences, quotas and limits on trading rights. However, at the end of the 1990s, the liberation of quantitative restrictions proceeded rapidly. Despite the small number of tariff lines under quotas and licensing requirements on the eve of China’s WTO membership, their restrictive effect on few commodities, such as cigarette and vehicle imports, was extreme. (Lardy 2002, 39-40.)
Quality and safety standards have often acted as de-facto NTB. In fact, just before China’s accession to the WTO, statutory inspection requirements were imposed on 144 different product lines, covering about 10 per cent of all import tariff lines. (Lardy 2002, 43-45.)

The issuing of trading rights has been one of the most important NTB maintained by the Chinese government since the system of economic planning. At the beginning of the reform, only twelve foreign trade companies controlled by the Ministry of Foreign Trade were allowed to engage in the international commodity trade. Over time, reforms led to substantial increase in the number of trading companies. By the end of 2001, 35000 domestic firms held the legal right to engage in international trade. (Lardy 2002, 40-43.)

The export regime was similarly transformed. Physical planning was gradually replaced by de-centralised transactions. Export licensing and quotas, last used in the early 1950s, were reintroduced in the early 1980s with the aim to allow the export markets to develop sufficiently before competing fully in the global markets. They were dismantled as market-determined prices began to dominate commodity trade. By 1999, only 50 products remained under export controls. (Lardy 2002, 46-48.)

An important element of the transformation of the export regime was the foreign exchange reform, which began in the early 1980s. However, this reform was completed by mid-1990s and therefore is of little relevance in this context.

Extensive reforms extended to state-owned enterprises (SOE), which had dominated China’s economy before the reform era. In 1979, SOEs accounted for 79 per cent of industry output. Since then, the SOE share of industry output has declined more or less continuously. At the outset of China’s WTO membership, this share had declined to 18,7 per cent. Since then, it has shrunk even further. (Chiu & Lewis 2006, 5-7.)

Institutional reforms were also undertaken, including changes in the legal system. For example, China has participated in international conventions and signed agreements regarding intellectual property rights. Despite this, China remained infamous for violating against intellectual property rights as there were problems in implementing the
revised laws and regulations. In addition, certain provisions of the copyright and trademark laws did not provide national treatment for foreign companies. (WTO 2001a, 48-53.)

More effort was put into curtailing antidumping as it was clearly in China’s own interest to do so. Antidumping regulations broadly consistent with WTO principles were promulgated in 1997, ahead of most transitional economies in Eastern Europe. Also, new laws and regulations were formed to guide public bidding and government procurement. Lardy states that these laws diverge from WTO regulations on some points and clearly fail to provide for national treatment and most favoured nation treatment. However, promises have been made that the Chinese government purchase market will be opened up gradually on a reciprocal basis following China’s WTO membership. (Lardy 2002, 57-61; WTO 2001a, 29-31.)

All in all, China has liberated trade considerably prior to its WTO accession and adapted a more market-oriented approach in its economy. Although China’s entry into the WTO is by no means an insignificant event, it should be acknowledged that many of the changes actually took place well before the accession. China has chosen a gradual path for reform and, unlike many transition economies in Eastern Europe, avoided abrupt changes.

It’s evident that some of the changes were made in preparation for the WTO membership, because without the reform China’s WTO membership would have been either impossible or demanded a sudden, drastic change in the trade regime and overall economy, which the Chinese government wanted to avoid. However, it is difficult to estimate which changes can directly be attributed to the WTO accession as the liberation of the Chinese economy and the accession process overlapped.
4.2 The terms of accession

Despite substantial reforms in the trading system prior to the WTO membership, China’s trading regime retained a number of features dating from the pre-reform era. It was complex and lacked transparency in many areas. At the dawn of the 21st century, trade and foreign direct investment were governed by several overlapping regulations, which hindered the operation of foreign firms both in and outside of China and disrupted patterns of trade. Foreign access to some areas of the economy, such as much of the services sector, was particularly tightly controlled. It is clear that China needed external pressure in order to further reform its economy.

The growing Chinese markets represented an untapped potential for companies in the EU. On the other hand, many governments saw the inflow of Chinese goods as a threat to their domestic producers, especially in specific industries that had long been protected against competition from low-wage countries such as China. Therefore, the goal of the Western world was to integrate China into the global trading system on commercially viable terms. This was, to a great extent, achieved. The agreement promised Western companies greater access to the Chinese markets as China agreed to reduce tariffs and NTBs significantly and to provide non-discriminatory treatment to all WTO members. The final accession protocol is broad in scope, covering several aspects in the trade of goods and services.

Tariffs levels are often seen as a benchmark for trade liberation. Thus, reductions in the tariff rates will be discussed first. In commodity trade, tariff rates will be reduced in both the agricultural sector and the industrial sector. After implementing all the commitments made, China’s average bound tariff rate will go down to 15 per cent for agricultural products, ranging from 0 to 65 per cent with the highest rate applied to cereals. In addition, China made other market access commitments, such as limiting subsidies to 8,5 per cent of the value of farm output. An average bound tariff rate of 8,9 per cent will be applied for industrial products with the range of 0 to 47 per cent, highest rates being applied to photographic film and automobile related products. (WTO 2001c, 2.)
Changes in tariff rates were not China’s only commitments in liberalising its commodity markets to foreign competition. In fact, reductions in tariff rates can be seen as a continuation of a longstanding trend rather than a substantial achievement caused by the WTO membership. Several other important provisions were needed in order to improve the entry of foreign goods into Chinese markets.

For example, transparency will be increased following accession as China has committed to measures improving the transparency of its laws and regulations. Also, China promised non-discriminatory treatment to foreign individuals and enterprises. Moreover, the right to participate in international trade will be progressively liberalised. After three years of accession, all enterprises in China will have the right to trade in all goods throughout China, except for certain goods. Non-tariff measures will be gradually dismantled and the process of import and export licensing will be facilitated. Another significant change is the elimination of price controls and multi-tier pricing practices. Technical barriers to trade (TBT) have also acted as a major disincentive to trade. China’s accession protocol states that all technical regulations and standards will be brought into conformity with the TBT Agreement, meaning that discriminating regulations will be diminished and information in latest standards will be readily available. (WTO 2001a, 3-8.)

Not undervaluing the depth and scope of the changes in the commodity market, the services market is possibly even more affected by China’s WTO membership than the commodity market as China agreed to open up sectors that had remained relatively closed to international competition. Important steps were taken in the key industries of telecommunications, banking and insurance as well as in several other industries.

In this context, the opening of the telecommunications industry is often emphasised. Prior to China’s accession, foreign firms were established as important providers of equipment but had been denied access to providing services. Following the accession, foreign firms will be able to establish joint ventures providing telecommunications services with no geographical limitations within five years of accession. In banking, foreign financial institutions will be able to provide all services to all Chinese clients without geographical limitations and with improved access to domestic funds within five years of accession. In the insurance industry, foreign non-life insures will be
permitted to operate as a wholly foreign-owned subsidiary within two years of accession. However, ownership restrictions on life insurers are not fully lifted as life insurers are permitted only a 50 per cent foreign ownership upon accession. For large scale commercial risks, wholly foreign-owned subsidiaries are permitted within five years of accession. (WTO 2001c, 2.)

Advances will be made in other service industries as well. For example, China agreed to lift geographic, ownership and other restrictions over a three-year period in the distribution industry. The ability of foreign firms to provide professional services in China is also improved by the terms of accession. Following bilateral negotiations with the EU, China promised to allow the operation of wholly foreign-owned construction companies after three years of membership in the WTO. (European Commission 2001.)

Besides lowering trade barriers for agricultural and industrial goods and loosening restrictions in the service industries, China agreed to comply with most of the rules set by the WTO, such as the Agreement on Trade-related Aspects on Intellectual Property Rights (TRIPS). Consequently, China will have to modify its existing laws, and enact new legislation so that abuses on intellectual property rights are better avoided and that foreign companies will be provided national and MFN treatment. In particular, China has promised to attend to the problems regarding the implementation of its laws on intellectual property rights. If China’s commitment to make efforts to meet the requirements of the TRIPS Agreement becomes materialised, the position of foreign companies operating in the Chinese markets is improved. (WTO 2001a, 53-61.)

In some important areas, China undertook obligations that exceed normal WTO standards. These provisions, often referred to as WTO-plus commitments, encompass several unusual mechanisms that China’s trading partners can use to reduce the flow of Chinese goods into their markets.

China’s accession protocol dictates that other members of the WTO can use transitional, product-specific safeguards. The special provision makes curbing imports from China by imposing safeguards much easier than under the normal WTO rules and restricts China’s ability to retaliate. This transitional safeguard mechanism remains in effect over a 12-year period following China’s accession. (WTO 2001b, 46-48.)
In addition, special arrangements were made in the textile and clothing industry. The transitional Agreement on Textiles and Clothing (ATC), which allowed certain WTO countries to impose quotas on textile and clothing imports, expired at the end of 2004. In the case of China, however, a special textile safeguard will be in use until the end of 2008. It allows WTO members to consult with China in case Chinese textile imports created or threatened to create a market disruption and to limit the growth of Chinese textile and apparel imports to 7.5 per cent per year. (WTO 2001b, 45-46.)

Another important field where China made unusual commitments is dumping. The United States in particular does not consider China as a market economy and China’s accession documents reflect this view. In determining prices for the purpose of antidumping investigations, Chinese prices and costs will only be used if it can be shown that markets conditions prevail in the industry in question. Otherwise, price comparisons will be made using methods identifying and measuring the subsidy benefit. This non-market economy methodology makes raising an antidumping case against China easier as the method allows much discretion in determining the normal prices of Chinese goods. Consequently, goods produced in China can become subjected to antidumping duties despite sold at normal prices determined by production costs and market situation. (WTO 2001b, 79-80.)

4.2 Assessing China’s commitments

A good way of examining the depth and scope of China’s commitments is through the main principles of the WTO. Getler (2004, 25) identifies five basic principles from the WTO agreements:

- Non-discrimination
- Market opening
- Transparency and predictability
- Undistorted trade
- Preferential treatment for developing countries
The principle non-discrimination can be divided into two concepts. The MFN principle ensures that all foreign producers are treated equally in the Chinese markets. The national treatment principle, in turn, guarantees that foreign producers receive the same treatment as local Chinese producers. China has promised to respect these principles by accepting the terms of accession. Also, China has made commitments which ease the introduction of the new practices, such as phasing out dual pricing practices and improving the ability of foreign companies to conduct trade. (Getler 2004, 25.)

Market opening refers to the liberation of foreign trade in the member countries. As discussed earlier, China has made considerable steps in lowering tariff levels in both agricultural and industrial goods, as well as committed to open up its service sectors. (Getler 2004, 25.)

Getler (2004, 25) emphasizes transparency and predictability as one of the key principles of the multilateral trading system as it facilitates the making of long-term business decisions by lowering uncertainty. In this context, transparency refers to publishing all trade-related laws and regulations promptly and systematically as well as providing an independent juridical review, while predictability means that tariffs are favoured over non-tariff barriers. In addition, the WTO encourages the binding of established commitments. In this area, China had taken some major steps even prior to its WTO membership by simplifying its trade regime. Also, China has bound all tariff rates in the goods area. However, difficulties may exist with respect to variations in treatments in different parts of China’s customs territory and with the perceived lack of independence of the judiciary.

The WTO also aims to provide markets in which trade is undisturbed. It has hoped to achieve this by introducing disciplines on subsidies and dumping. China has agreed to follow the guidelines set by the WTO. In fact, as mentioned earlier, China implemented antidumping laws ahead of many other transition economies. Government procurement laws still remain inconsistent with the WTO agreements, but promises have been made to open this relatively closed sector of trade to international competition. (Getler 2004, 26.)
Preferential treatment to developing countries has guided the accession process of the least developed countries and transition economies. This principle would have provided China additional flexibility in implementing various agreements. After much dispute, China was not granted a developing country status. As a compromise, however, China was allowed to make transitional arrangements in some areas, such as in the phasing out of quotas and import licences. (Getler 2004, 26.)

Whether judging China’s commitments on their own or in relation to the basic principles of the WTO, it is clear that China has committed to make considerable changes in its trading regime. Most of China’s commitments are in line with the WTO principles. In contrast, some of the special provisions imposed on China clearly violate the general principles and place China at a disadvantaged position vis-à-vis other WTO members.

4.3 Problems and sensitive issues

China has been a member of the WTO for over five years, meaning that most of the measures related to China’s accession should have come into effect by now. When assessing the liberalisation followed by the WTO membership, it is necessary to examine whether China’s actions are in line with its commitments.

It is undeniable that China has made efforts to improve market access by reducing tariff barriers. When comparing tariff rates presented in Table 2 to commitments made by China prior to accession, it can be noted that China has progressively fulfilled its promises to reduce tariff levels. Tariff rates for both agricultural and industrial products fall in the range specified in China’s accession protocol.
Table 2. Simple average tariff rates in China, 2001-2005.

<table>
<thead>
<tr>
<th></th>
<th>All products</th>
<th>Primary products</th>
<th>Manufactures</th>
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<tbody>
<tr>
<td></td>
<td>Bound</td>
<td>Applied</td>
<td>Bound</td>
</tr>
<tr>
<td>2001</td>
<td>n/a</td>
<td>15,6</td>
<td>n/a</td>
</tr>
<tr>
<td>2002</td>
<td>12,4</td>
<td>12,2</td>
<td>17,9</td>
</tr>
<tr>
<td>2003</td>
<td>11,3</td>
<td>11,1</td>
<td>16,4</td>
</tr>
<tr>
<td>2004</td>
<td>10,4</td>
<td>10,2</td>
<td>15,0</td>
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<tr>
<td>2005</td>
<td>10,0</td>
<td>9,7</td>
<td>14,7</td>
</tr>
</tbody>
</table>


Another field where China has completely carried out its commitments is the abolishment of the system of trading rights. According to Chinese authorities, restrictions on trading rights were phased out six months ahead of schedule. Nevertheless, state trading in the selected products agreed upon accession continued to be active in 2003. (WTO 2006, 81-82.)

Import quotas were abolished in 2004. The rest of the import licensing system, consisting of import licences, automatic import licences and tariff rate quotas, remained intricate and opaque despite several changes in the regime since accession. Tariff lines subjected to import licensing have decreased, while those subjected to automatic licensing have slightly risen. Generally, imports are still monitored and controlled by several restrictions. (WTO 2006, 77-80.)

China’s use of technical barriers to trade as well as sanitary and phytosanitary measures have raised a number of questions in the WTO. In addition, government procurement is not fully liberalised as legislation still favours domestic producers. China has been an observer to the Agreement on Government Procurement since 2002, which shows a sign of willingness to adapt WTO rules in the future. (WTO 2006b, 88-98.)

All in all, NTBs still constitute a major barrier to trade. According to a study commissioned by the European Commission, European exporters of traded goods lost an estimated total of 12,4 billion euros in lost export revenues as a direct result of NTBs. Lost opportunities in the services sectors covered in the study amounted to an estimated 8,9 billion euros. (European Commission 2007f, 11.)
When examining the reforms at a sectoral level, it can be noted that reforms have been more profound in the manufacturing sector than in the agriculture and services sectors. Although government intervention in the agriculture sector has decreased, several of the measures listed above are still used to control both exports and imports. Also, while China has not made any notifications to the WTO regarding the support given to the agriculture sector, it seems that producer support has increased in the last few years. (WTO 2006.)

The services sector is an area of persistent problems, although China has liberalised its services broadly in line with its GATS schedule. The sector remains dominated by greater state ownership and limited competition, especially in the key areas of telecommunications, financial and transport services. The European Commission reports that EU companies are still blocked from the Chinese services markets by discriminatory licensing systems, ownership restrictions and regulations. Consequently foreign presence, despite showing signs of gradual growth, remains minor. (European Commission 2007f, 41-50; WTO 2006b, 207-246.)

The relative openness of the manufacturing sector can be explained with the high priority given to attracting foreign direct investment (FDI), which is considered as a means of encouraging export-oriented capital-intensive manufacturing. As a result, most of the growth industries are dominated by foreign invested enterprises (FIE). The sector has also benefited from extensive government assistance. Despite decreased tariff levels, a range of measures remain in place in order to secure domestic supplies for key industries and to manage the growth of industries. (WTO 2006b, 161-162.)

It can be noted that China still maintains a number of industrial policies that are not in the spirit of its WTO commitments. However, there is little evidence that the central government promotes and protects the interests of indigenous industry as a whole. Internal factors in China increase the role of local and state-level involvement. Firstly, the size of the country dictates a high level of decentralisation, which often makes the enforcement of central-level directives problematic. Secondly, the fragmented nature of industry promotes local protectionism, which is manifested in small-scale industrial policy activism by local officials down to the village level. (European Commission 2007f, 14-15.)
Despite the seemingly diminishing importance of SOEs, many commentators underline SOEs as the key problem of China’s entire economic reform. There are several reasons for this view. The size of the state sector has not decreased in absolute terms and it remains important to the economy in terms of employment and technology. Also, data showing the dramatic decrease in SOEs does not account for changes in both the economic shape of SOEs and statistical practices. Furthermore, state-owned banks (SOB) provide short-term loans for SOEs. These loans constitute a serious problem to the financial system and overall economy as they are the source of most non-performing loans of the SOBs. Also, they are an implicit subsidy for inefficient SOEs. (Chiu & Lewis 2006, 7-11.)

Although the presence of SOEs poses a bigger challenge to China itself, it is obvious that SOEs also cause problems for foreign companies operating in China. China rarely reports the exact level of subsidies given to SOEs. However, it is clear that subsidies are disbursed through various forms. They create soft budget constraints for SOEs and distort competition. Also, the close links between Chinese regulators, SOEs and their respective local governments leads to issues of transparency and unfair treatment. (European Commission 2007f, 4-5.)

Judging from the preceding dialogue, there still exist a number of problems in the Chinese trading regime. The biggest problems, however, arise mostly from trade-related matters, the key issues being overall transparency and enforcement of intellectual property rights. Chinese business environment lacks transparency in several aspects cutting across all sectors of the economy.

As for intellectual property rights, China has continued its path of participating in major international conventions. For example, in 2003 China and the EU signed an agreement to establish bilateral dialogue on intellectual property rights. Also, it seems that the focus has shifted to law enforcement now that the legal framework has been established. While efforts have been made to improve the enforcement of intellectual property rights, infringements on intellectual property rights remain widespread. Enforcement seems to be paralyzed by to the large number of responsible authorities and inadequate deterrents provided by the prosecution system. (WTO 2006b, 145-157.)
The European Commission identifies the protection of intellectual property rights as a key issue for European businesses. European manufacturers have estimated that infringements of intellectual property rights in China cost European manufacturers operating there around 20 per cent of their revenue. While this figure might be exaggerated, it reveals that the poor enforcement of intellectual property rights constitutes an ongoing problem. Also, the lax enforcement of intellectual property rights affects the revenues of companies operating outside of China as China was the origin of 80 per cent of all counterfeit goods intercepted at EU borders in 2006. (European Commission 2007f, 4.)

Setting aside China’s problems in implementing its WTO commitments, we now turn attention to measures directed at China by other WTO members. Antidumping and safeguard issues continue to pose problems in the relationship between China and its trading partners. China is still the main target of antidumping investigations: 17,6 per cent of all antidumping initiations and 19,3 per cent of all final measures between 1995 and 2006 were directed at China. Its WTO membership has been a poor remedy to the problem, as can be observed from Figure 1. (WTO 2007a.)

This observation is nothing but surprising. Antidumping can be used as a mechanism to control imports from China. Bown (2007, 12) points out that now that China is a member of the WTO, discriminating against China in order to curb its growing exports must be done with WTO-consistent policies instead of raising tariffs and imposing quotas on Chinese products. Also, the special provisions in China’s terms of accession partly encourage raising an antidumping case against China.

Chemical and bare metal products lead the charts of industries most often subjected to antidumping investigations, together amounting to almost half of all antidumping cases. In contrast, the much discussed Chinese textile and clothing industry represents a rather small fraction. It has been targeted mainly by other measures discussed later in this sub-chapter. (WTO 2007a.)
Fitting well with the overall trend, China has been the main target of antidumping investigations and measures initiated by the EU both before and after China’s accession to the WTO. Antidumping cases against China represented 28 per cent of the EU’s total antidumping caseload in 2002-2006 (up from 14 per cent in 1995-2001). However, the number of both investigations and measures against China has declined during China’s WTO membership. At the same time, imports from China have grown. Therefore it is difficult to assess whether China’s position has improved in the EU. (Bown 2007, 52.)

In response to antidumping cases aimed at Chinese products, China itself has increasingly resorted to antidumping investigations in recent years. Between 1995 and 2001, only 1 per cent of all initiations came for China. In contrast, in the period 2002-2006 China’s share of all cases had soared to 10 per cent. Most of the cases are focused on industrial chemicals, hinting that antidumping measures are used as a trade barrier. (Bown 2007, 51; Bown 2007, 27-31.)

Resorting to antidumping investigations is not the only way to curtail the growing imports from China. Other WTO members have reserved the right to use transitional, product specific safeguards until 2014. However, these China-specific safeguards have

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**Figure 1. Antidumping initiations against China, 1995-2006.**

Source: WTO 2007a.
been used very little and the EU has not reported any use of safeguard measures against China. (Bown 2007, 58.)

What sounds like a surprising finding is explained by the exclusion of the textile and clothing industry from the statistics. The special textile and clothing safeguard allows a less transparent use of measures and actions against Chinese textile and clothing products are often not reported to the WTO.

A common resolution to concerns from the US and the EU has been for China to voluntarily restrain its exports. China has, for example, agreed to limit the growth of its exports of certain textile and clothing products to the EU. These include 10 out of the 35 categories of textiles and clothing that were liberalised in at the beginning of 2005 following the termination of the ATC. (European Commission 2005.)

Despite several issues impairing the relations of China and developed country members, China has not actively taken part in the WTO dispute settlement mechanism. It seems that many matters regarding China are still handled outside the formal WTO mechanism. So far, China has not responded to the large number of antidumping actions taken against Chinese products in part due to the high legal costs of such actions. However, this might be changing as China has recently become more active as an interested third party. It could possibly start defending its rights more vigorously after observing the operation of the dispute settlement mechanism. (WTO 2007b.)

In light of the preceding discussion it can be concluded that the while the overall trend of trade liberation has been good, some issues are left unresolved. China’s use of opaque trade barriers and the enforcement of intellectual property rights remain as issues. It is unlikely that these issues will be resolved in the near future as many of the problems stem from the fragmented actions on the part of insubordinate local governments. On the other hand, the EU still subjects China to measures that might be considered as unfair competition. Therefore, when assessing the impact of China’s WTO membership on the production structure of the EU, it is necessary to keep in mind that even the best of trade theories cannot completely predict the pattern of specialisation between China and the EU as barriers to trade clearly exist. At best, they can explain and predict broad trends in trade and production.
5. THE EU AND CHINA

After a somewhat long discussion focusing mainly on China and its WTO membership, attention is now turned into the economies EU and China and the linkages between them. First, the economies of the EU and China will be compared with each other in order to outline a generalised picture of the differences in the performance and structure of the two large economies. Next, attention is paid to the extensive trade between the EU and China.

Although this chapter mainly discusses the EU as a unity as this practice allows a generalised treatment of issues that is not too detailed, it should be remembered that the EU is a union of independent states, each with their own economic characteristics. This notion, underlined on several occasions, should be kept in mind throughout this chapter.

5.1 Comparing the economies of the EU and China

The basic indicators presented in Table 3 disclose some of the most apparent differences between the economies of China and the EU. Gross domestic product (GDP) is the most commonly used single measure of a country’s overall economic activity. Comparing the GDPs of China and EU reveals that the EU can still be considered more economically active than China.

While the per capita GDP of China is still much lower than that of the EU, it has been growing at a rapid pace for over two decades. In the period 1995-2005 China’s economy grew at an average pace of 9 per cent a year. For 2007, the IMF has estimated a growth rate of 11,5 per cent, followed by 10 per cent growth in 2008. In contrast, the mature economies of the EU grow rather slowly. Worth noting is the dispersion of growth rates in the EU. The highest growth rates are in the Baltic states, including Latvia (10,5 per cent), Estonia and Lithuania (8 per cent) and Poland (6,6 per cent). The lowest growth rates were reported on Portugal, Italy, France and Denmark. Each of these economies showed a growth rate of less than 2 per cent in 2007. For these countries, equally slow growth rates are projected for 2008. (IMF 2007a.)
China, with its 1.3 billion consumers and growing income levels will most likely to continue to increase both its relative and absolute importance as a market area. As a consequence, the relative importance of the mature economies of the EU is likely to decline.

The growth rate of the economy and the unemployment rate are closely linked in China. The unemployment rate seems, thus far, moderate. However, achieving low unemployment rates in the future is one of the key medium-term challenges faced by China. The restructuring of the economy and a growing labour force generate a need to create an estimated 100 million jobs in the next decade. This challenge is only met if the growth of the economy remains high. (WTO 2006b, 29.)

In the EU, unemployment has been considered one of the main macroeconomic problems. However, the unemployment rate of the EU has fallen recently. The unemployment rate in the EU was 6.9 per cent in June 2007, down from 7.9 per cent in June 2006. However, unemployment rates vary greatly between member countries. Rates of 4 per cent or less were reported in the Netherlands, Denmark, Cyprus and

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1 EU-25 refers to: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland Portugal, Slovakia, Slovenia, Spain, Sweden and United Kingdom.
Ireland. In contrast, unemployment rates in Poland and Slovakia exceeded 10 per cent. Unemployment rates above the EU average were also recorded in Bulgaria, Belgium, Romania, Hungary, Portugal, Spain, Greece and France. (Eurostat 2007.)

As for inflation, it should be noted that the figures vary depending on the source. The figures presented in Table 3 are according to the IMF. In the ten-year period of 1997-2006, inflation rates in China have varied in the range of 3.9 per cent and -1.4 per cent. Inflation rates in China should be treated with caution as the price of some commodities has been controlled by the Chinese government. In the EU, a record inflation of 9.5 per cent was experienced in 1997. Otherwise, inflation rates have varied in the range of 2.2 and 4.7 per cent. In recent years, inflation rates have fluctuated in the narrow range of 2.2 and 2.5 per cent. (IMF 2007b.)

Figures 2 and 3 illustrate the distribution of GDP in broad sectors in the EU as well as in China. It is apparent that the structures of the economies differ widely. In the EU, the services sector constitutes much of total GDP and industrial production is moderate, while the share of agriculture is minimal. In contrast, industrial production and services represent roughly equal shares of China’s GDP, leaving a share of 13 per cent for agriculture. Even though a relatively high proportion of GDP is created by agriculture, the GDP share of agriculture has decreased considerably in the last two decades due to the rapid growth of the industrial sector. However, agriculture still accounts for 45 per cent of employment despite agricultural reforms and rationalisation of production (WTO 2006b, 161; WTO 2007d, 1).
Figure 2. GDP by sector in the EU, 2004.
Source: WTO 2007d, 1.

Figure 3. GDP by sector in China, 2004.
Source: WTO 2006b, 10.

5.2 Trade between the EU and China

China’s re-emergence as a key player in the global economy can be clearly observed in the trade between China and the EU. According to World Trade Organisation (2007c), China was the EU’s fourth biggest export market and second biggest source of imports in 2005. In 2006, China became the first supplier of the EU.

The timing of the trade expansion between the EU and China can be assessed in the framework of China’s WTO membership. The growth rates of the imports and exports
of EU-15\(^2\) in the ten-year period 1990-99 averaged 16 and 13 per cent respectively. The growth rates began to surge in the last year of the decade. In 1999, the growth of merchandise exports to China reached 21 per cent. This can be considered as a simple proof that the liberation of the Chinese trading regime in preparation for the WTO membership has most likely had a great impact on the quantity of exports of the EU as the removal of trade barriers usually tends to increase trade between countries. (WTO 2006a.)

![Figure 4. EU-25 Merchandise trade with China, 2000-2006 (millions of euros).](image)

Source: European Commission 2007b

The growing trend in trade between the EU and China in the first years of the 21\(^{st}\) century can be observed Figure 4. Both imports to China and exports from China have doubled in the first half of the ongoing decade. Of particular interest is the EU’s trade deficit with China, which has been rising especially after 2002. In 2006, the deficit amounted to approximately 128 billion euros. (European Commission 2007b.)

The large deficit poses problems in the trade relations between China and the EU. While the EU recognises the shift in production from other Asian markets to China and China’s competitiveness in certain sectors, it commonly holds the view that at least a

\(^2\) EU-15 refers to: Austria, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the United Kingdom.
part of the deficit is explained by barriers to trade that hamper exports from the EU. (European Commission 2007c.)

Turning to the commodity composition of trade between the EU and China, the first observation is that the share of manufactures is substantial in both the exports and imports of the EU. In 2005, manufactures accounted for 95.8 per cent of all merchandise imports from China and 91.2 per cent of exports to China. As the share of other sectors is insignificant, the focus here will be on broad trends in the trade of manufactures and trade in other sectors is introduced only briefly. (WTO 2006a.)

In 1990, agricultural products was one of the biggest individual commodity groups imported by the EU from China with a share of nearly 13 per cent. In 2005, however, the share of agriculture had declined to 2.3 per cent of all imports. Similar trend can be observed in the exports of the European Union, albeit not as strongly. Also, the trade flows have reversed: the EU now exports more agricultural products to China than it imports from China. Still, the overall significance of agricultural trade with China is small for the EU. (WTO 2006a.)

During the period 2000-2004 manufacturing exports of EU-25 to China grew at an average pace of 22 per cent per year. This is considerably more than the growth rate of 12 per cent per year reported by EU-15 in the ten-year period from 1990 to 1999. The fastest growing export commodity groups include transport equipment, other machinery, chemicals and other manufactures. The clothing sector experienced unusually high growth rates, but the growth is of little significance as the sector represents only a small fraction of total exports. (WTO 2006a.)

In 2005, exports to China were dominated by machinery and transport equipment, which accounted for nearly 60 per cent of all merchandise exports. Transport equipment, other machinery and chemicals were the biggest individual commodity groups exported by the EU. The broad structure of exports has changed relatively little since 1990. Some changes can be observed, most notably the diminishing role of telecommunications equipment in recent years and the growing significance of transport equipment. Most of the growth in the exports of automotive products and other
transport equipment can be attributed to the partial trade liberation in these sectors following China’s WTO membership. (WTO 2006a.)

As for imports, rapid growth was experienced even before China’s WTO membership. The pace of growth, however, accelerated after accession. During 2000-2005 manufacturing imports from China grew at an impressive pace of 24 per cent per year, while in 1990-99 the growth rate was 17 per cent per year. A record growth rate of 41 per cent was reached in 2003. The fastest growing commodity group was office and telecommunications equipment, especially integrated circuits. Imports of clothing have also increased. Following the termination of WTO Agreement on Textiles and Clothing (ATC) that hindered imports from China, import volumes grew sharply and a growth rate of 43 per cent was recorded in 2005. However, growth rates are likely to be slower in 2006 and 2007 as China imposed voluntary export restraints in June 2005 on several categories of clothing and textiles following negotiations with the EU. (WTO 2000; WTO 2006a.)

There has been some shift in the composition of imports. In 1990, the textile and clothing sector was the biggest group of import goods with a share of 30 per cent of all imports, while the rest of the imports were more evenly distributed between different classes of goods, mainly in the categories of other consumer goods (such as toys and travel goods) and agricultural goods. In 2005, office and telecommunications equipment represented nearly one third of all imports from China, as did the textile and clothing sector. (WTO 2000; WTO 2006a.)

Figure 5 summarises EU-25 trade with China in 2006 applying the categorisation used by the EU in several reports. It distinctively reveals the sectors that contribute most to the EU’s large trade deficit with China. The office and telecommunications sector accounts for 45 per cent of the deficit, while the textiles and clothing sector explains some 19 per cent of it. Somewhat minor deficits existed in other sectors with negative balances.
In contrast, the EU reported a trade surplus with China in only three sectors: Power and non-electrical machinery, transport equipment and non-agricultural raw materials. The surpluses, however, are far too small to compensate for the deficits in the office and telecommunication as well as in the clothing and textile sectors.

In China, trade in services has grown more slowly than merchandise trade. However, both exports and imports of services nearly tripled in the period 1998-2004. In 2004, services comprised 9.5 per cent of China’s total exports and 11.9 per cent of its imports. Travel, business and transportation were the main services traded. It is likely that trade in services will continue to grow as a result of the concessions China made when accessing the WTO. (WTO 2006b, 25.)
6. THE PRODUCTION STRUCTURE OF THE EU

This chapter applies the key ideas of the most prominent international trade theories in assessing the changes that the trade liberation following China’s WTO accession will cause to the production structure of EU countries. Also, the implications of political regimes will be discussed in the context of China’s attempt to move on from relatively low-cost manufacturing to advanced industries.

Throughout this chapter, the structure of exports will be used as a proxy for production structure. While the structure of exports might not fully reflect the underlying production structure, it reflects the basic approach of international trade theories and is a common method of describing the pattern of specialisation.

Naturally, the effects of China’s WTO membership on the production structure of the EU do not only stem from the trade liberation between China and the EU. The accession will also affect the EU’s trade with other WTO members as WTO agreements are multilateral, guaranteeing MFN treatment to all WTO members. Consequently, this has an impact on China’s ability to compete with the EU in third markets.

It should be emphasized that treating the EU as a unity can give a somewhat misleading picture of the situation as the economies in the EU can differ vastly. Exports of textiles, for example, represent only a small fraction of total exports of the EU. However, the sector is still important for countries such as Italy, Portugal and Greece and numerous low-income member countries in Central and Eastern Europe. Similar disparities exist in several other industries. This issue is addressed to on several occasions and some level of disaggregation is made in the analysis of the subsequent chapters.

Usually, changes in production structure happen gradually with a considerable lag due to inelasticities in the economy. It is difficult to assess the timing of change in the production structure following trade liberation and this paper makes no attempt to do so. Also, the magnitude of change is not sized up as the aim of this paper is to simply examine the direction of change in the production structure of the EU as predicted by international trade theories and consider how the EU should adjust to the new situation.
6.1 Implications of international trade theories

The determinants of production structure were discussed in detail in Chapter 2. This chapter aims to apply the theory in practice in the framework of this study, i.e. examine the changes in the production structure of the EU in light of international trade theories. The approach of this subchapter is rather generalised. More detailed analysis is made in sub-chapter 6.3 which deals with specific industries. Also, this sub-chapter focuses on the production and trade of manufactures. Service industries are discussed in detail in sub-chapter 6.3.

The Ricardian model of comparative advantage explains specialisation patterns with differences in labour productivity across sectors and industries. According to the Heckscher-Ohlin model, a country specialises in the production goods whose production uses much of its abundant factor. The predictions of these traditional trade theories are derived from relative price determination, i.e. differences in pre-trade relative prices across countries, underlined by supply and demand factors.

Models based on differences in the productivity of labour and those based on factor endowments are often discussed together. The basis of specialisation is referred to as comparative advantage, regardless of the source. For simplicity, this paper applies the same approach. Following this approach might, to some extend, emphasize the Heckscher-Ohlin model instead of the Ricardian model. As mentioned earlier, the approach of the Heckscher-Ohlin model might be suitable in determining trade patterns between the EU and China as the model has traditionally been able to predict North-South trade fairly accurately. Therefore, this approach can not be considered to overemphasize the role of factor-proportions.

While the theory is relatively simple, measuring comparative advantage is not since relative prices under autarky are not observed. Balassa (1965) proposes that it may not be necessary to include all constituents affecting a country’s comparative advantage. Instead, he suggests that comparative advantage can be inferred from observed trade patterns. Revealed comparative advantage (RCA) is a widely accepted approach and has been utilised fairly extensively in recent papers examining specialisation patterns. The basic logic behind RCA is to evaluate comparative advantage on the basis of a country’s
specialisation in net exports relative to a reference group. This is the approach chosen by Mika Widgrén (2005) in evaluating the specialisation patterns of the EU and selected countries from Asia and the Americas.

The Balassa index (BI) is used as a measure for revealed comparative advantage. It is calculated as the ratio of the share of a given product in a country’s exports to another country or region to the share of the same product in that country or region’s total exports. The BI can be expressed as

$$BI(EX) = \frac{x_{ij}^k / X_{ij}}{x^k / X}$$

where $x_{ij}^k$ denotes exports from country i to country/region j, $X_{ij}$ is total exports from country j to the reference group, $x^k$ is the reference group’s exports of good k and $X$ is the reference group’s total exports. EX refers to exports shares used in computing the index. If the index for a product is greater than one, the country is considered to have comparative advantage in exporting that good. (Widgrén 2005, 2.)

Analysing trends in the composition of foreign trade in manufacturing and making sectoral comparisons among countries requires a classification of products and industries. Widgrén (2005, 2-3) uses the methodology and classification proposed by Neven (1995), which categorises goods according to capital intensity (high / intermediate / low) and according to the skill-intensity of labour (skilled / unskilled). Manufacturing industries are divided into five categories with different characteristics illustrated in Table 4. Human capital is measured as the share of white-collar workers in the industry’s total labour force, labour as the average wage rate in the industry and the ratio of labour costs to industry value added and physical capital as the ratio of fixed investment to value added in the industry.
Table 4. Properties of the industry classification categories.

<table>
<thead>
<tr>
<th>Intensity Category</th>
<th>Human Capital</th>
<th>Labour</th>
<th>Physical Capital</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very High</td>
<td>High</td>
<td>Intermediate</td>
<td>Pharmaceuticals, aerospace equipment and other high tech industries</td>
</tr>
<tr>
<td>2</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Electrical machinery, medical equipment</td>
</tr>
<tr>
<td>3</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>Textile, footwear and clothing industries</td>
</tr>
<tr>
<td>4</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>Motor vehicles, iron and steel industries</td>
</tr>
<tr>
<td>5</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Paper industry</td>
</tr>
</tbody>
</table>


Widgrén (2005) has calculated the RCA in different categories. A distinction is made between the EU-15 and the new member countries in Central and Eastern Europe (referred to as the CEE-10). The results are presented in Table 5. Balassa indexes exceeding one are highlighted. It can be observed from Table 5 that the RCA of the EU-15 is in categories 1 and 2. This means that the EU-15 is specialised in high-technology industries where human capital is used intensively, average wages are very high and physical capital is used little or moderately.

Most CEE-10 countries differ from the EU-15 in their RCA as their BI exceeds one mostly in categories 3 and 4. This means that their specialisation pattern is skewed towards the production of labour-intensive goods with low level of capital and industries that are intensive in both labour and capital. This is especially true for countries such as Bulgaria, Latvia, Lithuania, Romania and Slovakia. None of these countries had BI greater than one in categories 1 and 2. Hungary is an interesting exception as its BI exceeds one in all categories from 1 to 4 and shows similar levels of RCA in categories 1 and 2 as EU-15. Also, Estonia’s BI in category one is greater than one. However, the BI of most other CEE-10 economies is low both in categories 1 and 2. In several countries, the BI in the skill-intensive categories 1 and 2 is even below that of China.
Table 5. RCA index in different categories in EU-15, CEE-10 and China.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU-15</td>
<td>1.07</td>
<td>1.08</td>
<td>0.75</td>
<td>0.98</td>
<td>0.84</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0.19</td>
<td>0.44</td>
<td>6.68</td>
<td>1.15</td>
<td>1.10</td>
</tr>
<tr>
<td>Czech Rep.</td>
<td>0.53</td>
<td>1.46</td>
<td>1.39</td>
<td>1.56</td>
<td>0.32</td>
</tr>
<tr>
<td>Estonia</td>
<td>1.22</td>
<td>0.75</td>
<td>3.16</td>
<td>1.37</td>
<td>0.76</td>
</tr>
<tr>
<td>Hungary</td>
<td>1.06</td>
<td>1.09</td>
<td>1.46</td>
<td>1.34</td>
<td>0.20</td>
</tr>
<tr>
<td>Latvia</td>
<td>0.12</td>
<td>0.21</td>
<td>4.25</td>
<td>2.84</td>
<td>0.33</td>
</tr>
<tr>
<td>Lithuania</td>
<td>0.62</td>
<td>0.62</td>
<td>6.46</td>
<td>1.11</td>
<td>1.43</td>
</tr>
<tr>
<td>Poland</td>
<td>0.20</td>
<td>0.90</td>
<td>3.18</td>
<td>1.70</td>
<td>1.11</td>
</tr>
<tr>
<td>Romania</td>
<td>0.06</td>
<td>0.62</td>
<td>8.37</td>
<td>0.53</td>
<td>0.23</td>
</tr>
<tr>
<td>Slovakia</td>
<td>0.29</td>
<td>0.79</td>
<td>2.18</td>
<td>1.73</td>
<td>0.45</td>
</tr>
<tr>
<td>Slovenia</td>
<td>0.15</td>
<td>1.54</td>
<td>1.92</td>
<td>1.65</td>
<td>0.05</td>
</tr>
<tr>
<td>China</td>
<td>0.81</td>
<td>0.70</td>
<td>2.73</td>
<td>0.99</td>
<td>0.13</td>
</tr>
</tbody>
</table>


Turning on to China, it can first be noted that China’s RCA seems to lie in category 3. Production in this category is characterised by extensive use of unskilled labour with low wages and relatively little capital. This observation gives cause to suspect that the comparative advantage of the EU-15 differs vastly from the comparative advantage of China. In contrast, the specialisation patterns of many of the CEE-10 countries resemble that of China’s with the strongest areas being categories 3 and 4.

These results imply that the EU-15 is relatively well-endowed with skilled labour and China with low-skilled labour. The results for the CEE-10 are somewhat mixed. Also, RCA hints that there exists a large asymmetry between the comparative advantage of EU-15 and CEE-10.

The problem with the concept of RCA is that it is a poor measure of revealing the origins of comparative advantage. Also, observed trade patterns might not reveal the underlying comparative advantage when barriers to trade exist. Therefore, factor-endowments are next discussed at a general level.

Wang (2003, 13) estimated that Western Europe accounts for 5.6 per cent of arable land, 6.5 per cent of labour and 30.4 per cent of world capital stock. China possesses 9 per cent of land, 26.2 per cent of global labour force and only 2.6 per cent of capital
stock. These figures should be treated with caution. Particularly, measuring the capital stock of an economy is not easy and most studies, including Wang (2003), make several concessions when calculating the capital stock of a country.

In 2006, China’s total workforce was estimated to be 795 million people, while the EU’s total labour force was an estimated 221 million people (CIA 2007). More interesting than the total labour force is the relative size of the skilled labour force. The number of people enrolled in tertiary education is often used as a proxy for highly-skilled labour force. Usually, the number of university graduates is compared. The World Bank, however, includes a wide range of post-secondary school institutions into this category, such as technical and vocational education, colleges and universities. This approach is suitable here as vocational education also contributes to the acquisition of specified skills needed in the production of goods further up the value-chain. The enrolment levels presented in Table 6 contain errors and the figures could well be inflated. However, as the interest is the differences in the levels of tertiary education between the EU and China, this is unlikely to create a problem. (World Bank 2007b, 81.)

In the EU, the enrolment ratio to tertiary education ranged from 36 per cent (Romania) to 90 per cent in Finland. Most EU countries fell within the range of 50 per cent to 75 per cent. In sharp contrast, the corresponding figure for China was 19 per cent. This implies that the European population and thus, labour force, is relatively well endowed with skilled labour when compared to that of China. (World Bank 2007b, 78-80.)

The comparisons made above confirm that the EU’s comparative advantage is in the production of goods requiring high levels of human capital. Meanwhile, China’s comparative advantage lies in the production of labour-intensive products.
Table 6. Participation in tertiary education (% of relevant age group), 2005.

<table>
<thead>
<tr>
<th>Country</th>
<th>Enrolment ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>50</td>
</tr>
<tr>
<td>Belgium</td>
<td>63</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>41</td>
</tr>
<tr>
<td>Croatia</td>
<td>42</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>43</td>
</tr>
<tr>
<td>Denmark</td>
<td>74</td>
</tr>
<tr>
<td>Estonia</td>
<td>65</td>
</tr>
<tr>
<td>Finland</td>
<td>90</td>
</tr>
<tr>
<td>France</td>
<td>56</td>
</tr>
<tr>
<td>Germany</td>
<td>n/a</td>
</tr>
<tr>
<td>Greece</td>
<td>79</td>
</tr>
<tr>
<td>Hungary</td>
<td>60</td>
</tr>
<tr>
<td>Ireland</td>
<td>59</td>
</tr>
<tr>
<td>Italy</td>
<td>63</td>
</tr>
<tr>
<td>Hungary</td>
<td>60</td>
</tr>
<tr>
<td>Ireland</td>
<td>59</td>
</tr>
<tr>
<td>Latvia</td>
<td>74</td>
</tr>
<tr>
<td>Lithuania</td>
<td>73</td>
</tr>
<tr>
<td>Netherlands</td>
<td>59</td>
</tr>
<tr>
<td>Poland</td>
<td>61</td>
</tr>
<tr>
<td>Portugal</td>
<td>57</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>40</td>
</tr>
<tr>
<td>Romania</td>
<td>36</td>
</tr>
<tr>
<td>Slovenia</td>
<td>74</td>
</tr>
<tr>
<td>Sweden</td>
<td>84</td>
</tr>
<tr>
<td>Spain</td>
<td>66</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>60</td>
</tr>
<tr>
<td>China</td>
<td>19</td>
</tr>
</tbody>
</table>


Looking at the relative factor endowments of China and the EU, agricultural products should be produced in the EU as opposed to China. However, as the trading world does not consist of China and the EU only, it should be pointed out that neither China nor the EU is an optimal place of production for agricultural products. The United States, for example, has more arable land both in absolute and in relative terms. (World Bank 2007b, 126-129.)

Traditional trade theories predict extreme specialisation according to comparative advantage. Even if trade between the EU and China experienced complete liberation, specialisation would not be as extreme as predicted by traditional theory. One reason for
this is historical accident that often favours established industries. Another reason is transport costs.

Models based on economic geography explain the pattern of specialisation with the relative size of the home market. Although empirical evidence supporting models based on economic geography is inconclusive, simple observation confirms that many firms are increasingly inclined to choose their location of production close to large markets for their goods. The role played by geographic considerations, however, might differ across industries. Its role is possibly greatest in scale-intensive industries, such as motor vehicles and steel. In contrast, it can be expected to play a smaller role in the production of differentiated goods that are tailored to highly varied demand characteristics.

It is often emphasized that China is a huge market with over 1.3 billion consumers. According to the latest estimations by the European Commission, the total population of the EU is nearly 500 million. Measured with the number of consumers, the overall market size of the EU does not even amount to half of that of China. This implies that China is a more favourable location for firms than the EU. However, this method of defining market size highly exaggerates the importance of China as a market area. The per capita income of China, despite continuously rising, is still low compared to the EU countries. EU countries with the lowest per capita income are well above China. In addition, the highly unequal income distribution in China means that a substantial share of the Chinese can not be considered as consumers for a large number of goods.

Krugman (1983, 344) stresses that the broad industrial structure will be determined by a country’s factor endowments. Increasing returns occur at a product level and each country will produce only a limited number of goods within an industry. Going into product level, however, would expand this paper too much. Aspects from economic geography are included in the industry analysis of Chapter 6.3.

Similarly, Porter’s theory of competitive advantage is very broad in scope and the sources of competitive advantage vary between different industries. Therefore, the aspects from competitive advantage will be discussed in chapter 6.3 in the context of particular industries.
Based on the previous dialogue, it can be predicted that the production structure of the EU-15 will move further into the direction of advanced manufactures whose production requires highly skilled labour. In this division of labour, China will continue producing manufactures at low or intermediate level. The case for many of the newer EU members is more complicated as their RCA is mostly in production requiring relatively little skilled labour. At the moment, they enjoy a favourable position as they are part of the internal market, meaning that there exist no barriers to trade between them and the rest of the EU. Also, their location close to the main EU markets ensures that they will have a long-lasting advantage in sectors that can be considered to be China’s growth sectors. If trade liberation between the EU and China continues, the countries in Central and Eastern Europe might lose this advantage. In the long-run, this is not an unlikely scenario unless major unexpected changes happen in the world economy or politics.

6.2 Implications of political regimes

Chapter 3 introduced a model that explains the effect of market entry and democracy on different industries. The focus can now be turned into the implications the findings have on the likelihood of China to reach its goal of moving up the value chain and competing successfully with the EU in the more advanced industrial sectors.

It would be easy to state that China is an autocracy and the countries of the EU are democracies. However, this assumption will be verified before drawing any conclusions on China’s ability to compete in the innovation-driven industries. First, the problem will be addressed using the market entry channel. It will then be discussed using the established methods of political economy that assess the level of democracy.

The annual Doing Business Report, published annually by the World Bank, provides useful information on business regulations and their enforcement across the world. It ranks economies according to their ease of doing business, with the first place being the best. A high ranking on the ease of doing business index means that the regulatory environment is conductive to the operation of business. The ease of doing business index consists of 10 topics, each made up of a variety of indicators. The topics used in evaluating the overall regulatory environment include starting a business, dealing with
licences, enforcing contracts and trading across borders among others. (World Bank 2007a.)

Table 7 presents the economy rankings of China and individual member countries of the EU. China is in place 83 in the overall ranking, well ahead of economies like Russia, India and Brazil. The ranking can be explained by good performance in the fields of registering property, trading across borders and enforcing contracts. In the latter, China was ranked 20th among the 178 economies covered in the report. High rankings in these topics improve China’s overall ranking considerably as each topic carries the same weight in the final rank. (World Bank 2007a.)

Table 7. Economy rankings of the EU and China, 2008.

<table>
<thead>
<tr>
<th>Economy</th>
<th>Ease of Doing Business Rank</th>
<th>Starting a Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Ireland</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Finland</td>
<td>13</td>
<td>16</td>
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<tr>
<td>Sweden</td>
<td>14</td>
<td>22</td>
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<tr>
<td>Estonia</td>
<td>17</td>
<td>20</td>
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<tr>
<td>Belgium</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Germany</td>
<td>20</td>
<td>71</td>
</tr>
<tr>
<td>Netherlands</td>
<td>21</td>
<td>41</td>
</tr>
<tr>
<td>Latvia</td>
<td>22</td>
<td>30</td>
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<tr>
<td>Austria</td>
<td>25</td>
<td>83</td>
</tr>
<tr>
<td>Lithuania</td>
<td>26</td>
<td>57</td>
</tr>
<tr>
<td>France</td>
<td>31</td>
<td>12</td>
</tr>
<tr>
<td>Slovakia</td>
<td>32</td>
<td>72</td>
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<tr>
<td>Portugal</td>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>Spain</td>
<td>38</td>
<td>118</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>42</td>
<td>41</td>
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<tr>
<td>Hungary</td>
<td>45</td>
<td>67</td>
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<tr>
<td>Bulgaria</td>
<td>46</td>
<td>100</td>
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<tr>
<td>Romania</td>
<td>48</td>
<td>26</td>
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<tr>
<td>Italy</td>
<td>53</td>
<td>65</td>
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<tr>
<td>Slovenia</td>
<td>55</td>
<td>120</td>
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<tr>
<td>Czech Republic</td>
<td>56</td>
<td>91</td>
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<tr>
<td>Poland</td>
<td>74</td>
<td>129</td>
</tr>
<tr>
<td>China</td>
<td>83</td>
<td>135</td>
</tr>
</tbody>
</table>

Source: World Bank 2007a
In contrast, China does especially poorly in the categories of starting a business, dealing licences and paying taxes. The most interesting ranking in the framework of this chapter is that of starting a business, in which China was ranked 135th. China’s rank in this topic has dropped 9 positions from the previous year. The low ranking is due to the high number of procedures needed to start up a business, the rather long duration of the start-up process and the high level of minimum capital required. (World Bank 2007a.)

Denmark, United Kingdom and Ireland were ranked among the 10 countries where doing business is considered to be the easiest. All EU countries, with the exception of Poland, were ranked in the 33 percentile and nearly half were placed in the 15 percentile range. Rankings in the category of starting a business, however, are more scattered than in the overall ranking. While in most EU countries starting a business is moderately easy, some countries were placed at very low ranks. Poland, Slovenia, Spain and Bulgaria did not even make it to the top 100 countries in which starting a business is considered to be the easiest. This implies that there exist considerable challenges in setting up a new business in those countries. (Word Bank 2007a.)

If starting a new business is relatively easy, then it can be expected that new firms enter the market and create competition. According to the formalised concept of creative destruction presented by Aghion and Hewitt (1992), competition among firms generates innovations. This suggests that business environments that foster innovation are found in countries that rank high in the starting a business category of the ease of doing business index. In the EU, these countries include Ireland, United Kingdom, France, Finland, Belgium, Estonia and Sweden, for example. China, in contrast, ranks very low in this category and therefore the business environment in China is not considered to foster innovation.

While ease of market entry can be seen as one characteristic of democratic societies, there exist better proxies for democracy. Aghion & al. (2007, 11-16) used aggregate indicators from Polity IV Database and Freedom House measures of civil liberties and political rights. As discussed earlier, these proxies seemed to work particularly well in explaining the effect of democracy on growth in different industrial sectors. Aghion & al. (2007, 18) suggest that these variables might capture something more general than
the number of procedures regarding the possibility of entry. Therefore, the economies of
the EU and China are next assessed using these established measures of democracy.

Most governments in the world have self-identified as democratic. However, this does
not mean that all regimes are de facto democracies. There are several ways to measure
whether or not a country is a democracy. The Polity IV index is a commonly used
indicator of democracy. It combines separate measures of democratic and autocratic
authorities into a single measure of regime type, ranging from -10 to +10. A score of -10
in the Polity IV scale indicates a strongly autocratic state, while a score of +10
indicates a highly democratic state. (Polity IV Database.)

Generally, a country scoring 8 points or more on Polity IV scale is seen as a strongly
democratic state. Nearly all the countries of the EU score 10 points on the Polity IV
index, meaning that they can be considered as real democracies. Estonia’s rather low
score (6) is due to the fact that the sizeable Slavic minority living in Estonia does not
effectively participate in the political process due to citizenship and language
requirements.

Although the Chinese government officially identifies itself as a democratic authority,
China’s score of -7 on the Polity IV index implies that the Chinese political regime is
highly autocratic. The 58-million member Chinese Communist Party (CCP) continues
to dominate the political realm in China and restrict all challenges to its 50-year rule. In
addition to the dominant role of the CCP in the Chinese government and society, the
attacks on ethnic national groups within its borders and strict surveillance of pro-
democracy reformers and organisations that operate outside of the boundaries of direct
party control further lower China’s score. (Polity IV Database.)

Another widely used measure of democracy is the Freedom in the World Survey
published by Freedom House. The measures of the survey are highly correlated with the
measures of the Polity IV Database. However, these two measures are not completely
interchangeable.

Freedom in the World Survey measures freedom according to two broad categories:
political rights and civil liberties. Ratings in both categories range from 1 (most amount
of freedom) to 7 (least amount of freedom). The findings of the Freedom House survey are broadly in line with the Polity IV Database. Some differences exist between the two measures of democracy, but the overall results correlate well with the Polity IV Database. Despite some minor difficulties in some EU member countries, all of the countries in the EU are classified as free and most members score 1 in both categories. This gives further evidence that the EU is a union consisting of democratic countries. (Freedom House 2007.)

Scoring low on both political rights (7) and civil liberties (6), China is assigned an overall status of “not free”. This confirms that China is not a democracy. Freedom House identifies several serious problems in the Chinese society and political regime. These include the lack of political rights and civil liberties, inadequate rule of law and weak organisational rights. (Freedom House 2007.)

Freedom of speech, or rather, the lack of it is a topic China is infamous for. Freedom of speech does not apply to issues deemed politically sensitive by the CCP. The media is tightly controlled and several journalists have been imprisoned for presenting their views. Another example of the restrictive policies in China is the strict control on the use of internet. No other regime in the world limits the use of internet as much the Chinese government. The strict control on the use of an important international channel of information undoubtedly has an effect on innovation in China. (Freedom House 2007.)

It can be gathered from the previous discussion that China is not a democracy while all of the countries of the EU are. This notion is very clear as neither of the established methods of political economy describe China as a democracy. In contrast, all of the member countries of the EU are considered highly democratic by both measures.

When these findings are combined with the main prediction of Aghion & al. (2007), it can be concluded that it is unlikely that China will be able to reach its goal of becoming a supplier of high-technology manufactures as the Chinese political regime does not support growth and innovation that occurs close to the world technological border. The highly autocratic regime might support growth in sectors far away from the
technological border. These include many sectors in which China has already grown rapidly and gained market shares.

In contrast, the model of Aghion & al. (2007) suggests that the EU can be considered as an economy that supports growth in sectors close to the technological border as all of the member countries of the union have highly democratic political regimes. This translates into a prediction that the production structure of the EU should further move into the direction of advanced manufactures close to the technological border.

Some empirical observations, however, do not confirm these implications. Rodnik (2006), for example, argues that China’s export basket is significantly more sophisticated than would normally be expected for a country at its income level. Setting aside the viewpoint of comparative advantage and that of rich versus poor country, the results of the study are useful in the context of this chapter.

Rodnik (2006, 6-10) demonstrates that China’s export profile is skewed towards high productivity goods. Also, China has experienced the most rapid rate of growth in the sophistication of its exports since 1992. This contradicts the basic prediction of Aghion & al. (2007). However, Rodnik (2006, 16) points out that the quality of China’s exportables has been increasing, but not nearly as rapidly as the overall income. This implies that the productivity level of exports might converge to the per capita GDP, possibly leading to a standstill in the process of moving up the value chain.

Another question is whether or not the composition of China’s current export basket actually reveals much about China’s ability to generate growth in the advanced industries. A substantial share of China’s manufacturing exports can be attributed to FIEs that use China as a manufacturing platform, especially in electronic and communications equipment and automotive products. Domestically-owned enterprises appear to lag behind in technology and development. If a high proportion of the export basket is produced in foreign-invested enterprises using imported technology, then it is rather questionable to use the export basket as a measure of China’s future ability to succeed in the innovation-driven sectors. Rather, the composition of the export basket can simply be due to the fact that China has actively attracted FDI. Therefore, China’s relatively sophisticated exports cannot be held as a proof that the Chinese production
and export structure runs counter to what is predicted by Aghion & al. (2007). (WTO 2006b, 189.)

This notion leads to an important question of whether the high level of sophistication of the Chinese export basket is simply driven by foreign firms in China or whether Chinese firms are also gaining greater sophistication. Bloningen & Ma (2007) have compared the performance of Chinese firms relative to foreign firms in China. They (2007, 31) discovered that foreign firm’s share of exports by product category and that foreign unit values relative to Chinese unit values were increasing over the time period examined in the study (1997-2005). This finding is exactly counter to what would be expected if Chinese firms were catching up.

In 2004, the EU was the leading exporter and importer of high-technology in the world. Still, high-technology trade in the EU does not seem to go in the direction predicted by Aghion & al. (2007) as the EU reports a deficit in the trade of high-technology products. However, this deficit has recently begun to narrow. In 1999, EU-25’s deficit in high-technology trade totalled 43 billion euros, while in 2004 this figure had decreased to 38 billion. Germany, France, the Netherlands, Ireland, Sweden, Finland, Denmark and Malta reported a positive trade balance in high-technology products, while the United Kingdom, Italy and Spain recorded a negative balance in high-technology products. This was also the case for all the new member states with the exception of Malta. (Eurostat 2006b.)

In sum, the effects of a political regime supportive of growth in advanced industries are not completely observable in statistics examining high-technology trade in the EU. Some economies of the EU are still falling behind in both importing and exporting high-technology products and the EU as a whole seems not to have realised its full potential.

Still, these empirical observations only report historical data and have very little to say on the future of European industries in the advanced sectors of the economy. More important are the underlying variables, such as the potential to innovate. If democracy does foster innovation close to the technological border, it is probable that the EU will be able to increase its high-technology exports, provided that attention is turned from protecting established industries to promoting growth in the innovation-driven sectors.
China’s WTO membership and the resulting trade liberation, among other things, will most likely to act as a stimulus for this. This issue will be addressed in Chapter 7 which deals with adjustment strategies.

6.3 Effects of China’s WTO membership on selected industries

The previous sub-chapters have examined the changes in the production structure of the EU in a rather broad manner. Ultimately, the production structure of a country or a region is shaped by the international competitiveness of its industries. The aim of this sub-chapter is to deepen the analysis by discussing the production structure from an industry perspective, with the most weight placed on industries that are considered important in the EU and on industries China’s WTO membership is likely to affect the most. Also, opportunities for European companies in the Chinese markets are introduced.

6.3.1 The automotive industry

The production of automotives is generally characterised by low levels of human capital, low labour costs and high levels of physical capital. According to Table 5, the comparative advantage of the EU-15 is not in the production of goods of this type. Neither is China’s. In contrast, the RCA of most CEE-10 countries is in this category.

China is not an established manufacturer of automotives, while the EU is. It was discussed in Chapter 2 that historical accident can be an important determinant of production structure as strong external economies of scale can confirm existing patterns of trade. Therefore, the automotive industry, for example, might remain large in certain countries of the EU-15 as it is a well-established industry.

As discussed earlier, Porter (1990, 149-152) emphasizes the role of clusters. The reasons for clustering grow directly out of the determinants of competitive advantage. One competitive industry helps to create another in a mutually reinforcing process. Strong clusters guarantee efficient supply chains, free information flow and factor creation. There are several automotive industry clusters in Europe, such as those in
Germany, France and the UK. With strong clusters, the EU’s position as a large automotive manufacturer is not likely to be threatened by China’s WTO entry.

This prediction is also supported by the relative size of the automotive market in the EU. According to Eurostat (2006a), there were 487 cars per 1000 individuals in the EU in 2004. According to most sources, the corresponding number in China is less than 10 cars per 1000 individuals. While China’s car pool is rapidly expanding, the China Daily (2004) reports that it is eventually expected to reach 150 cars per 1000 inhabitants. This is still considerably less than the current car pool of the EU.

However, the location of automotive production within the EU may change. RCA suggests that the comparative advantage of several Central and Eastern member countries supports the automotive industry. This implies that automotive manufacturing might shift from Western Europe to Central and Eastern Europe. This shift is already observable. RCA strongly supports the location of automotive manufacturing in the CEE-10 countries, while strong clusters imply that some production might still remain in the established car manufacturing countries in Western Europe. At the moment, the trend in the European automotive industry seems to be outsourcing the production of components and retaining final assembly and branding.

The lowering of trade barriers in China might provide export opportunities for European automotive manufacturers mainly in the luxury segment. In other sectors, the focus of competition is likely to remain between foreign-invested projects that are manufactured in China. European car manufacturers are present in the Chinese markets mainly as joint ventures. One of the main strengths of European companies over competitors is environmentally friendly technology. China is introducing legislation to improve fuel quality and the economic use of fuel, thus creating opportunities for European manufacturers. Foreign component companies are also projected to increase their competitive advantage as suppliers of high quality components for the Chinese markets. (European Commission 2007f, 30.)

In third markets, Chinese manufacturers are likely to outperform EU manufacturers in markets where safety, environmentally friendly technology and overall quality play a smaller role compared to price. This segment consists of developing countries. China’s
automotive exports have soared considerably recently. However, China mainly exports cars at low prices to developing countries in Asia, Africa and Latin America. In other markets, China is unlikely to become a major competitor for European companies. (The People’s Daily 2005).

Judging by the preceding ideas, the importance of the automotive industry in the production structure is likely to remain largely unaffected by China’s WTO membership. Provided that trade barriers are further lifted and their implementation becomes clearer, established European car manufacturers can be expected to be successful in producing motor vehicles inside China if compared to purely Chinese manufacturers. The Chinese market, however, suffers from overcapacity and further consolidation is needed in order for European companies to be profitable. (European Commission 2007f, 30-31.)

6.3.2 High-tech industries

International trade theories support the idea of European high-tech industries succeeding in international competition. According to RCA, the EU-15 has comparative advantage in high-tech industries requiring intensive use of highly skilled labour, while China’s comparative advantage lies in extensive use of low skilled labour.

The political regime of the EU also supports growth in advanced industries, while that of China does not. This applies to both the EU-15 and the CEE-10 and translates into a prediction that the production structure of the whole EU should further move in the direction of advanced manufactures close to the technological border. This phenomenon is, to some extent, already observable in many countries in Northern and Western Europe, which are generally no longer specialised in bulk manufactures. The production of many low-technology commodities has, either voluntarily or reluctantly, been outsourced to other countries. As China is expected to continue its dominance in low-technology manufactures, this trend could extend into member countries in Central and Eastern Europe. This strategy, unlike specialising in low-technology manufactures, is supported by their political regime.

Several determinants of Porter’s competitive advantage are also favourable for European high tech industries. The EU has a workforce with sophisticated skills, while
China has a workforce with low skills. Also, demand conditions in the EU ensure that enough pressure is put on producers. This improves the ability of European firms to compete in emerging sectors, which is especially important in high-tech industries.

Porter (1990, 117) mentions the association between rigorous domestic rivalry and the creation and persistence of competitive advantage in an industry. Domestic rivalry depends on new business formation to create new competitors.

In China, entrepreneurs face many obstacles including political and legal uncertainty and poor access to funding and other resources. Also, private business is attributed a low social status. Despite recent climate changes and the particular encouragement of entrepreneurship in high-tech industries, these problems still exist. The weak social security network also discourages entrepreneurship as does the administrative complexity of starting a business. In contrast, entrepreneurship in the EU is encouraged by the relatively good social security network and positive attitude of government agencies towards private entrepreneurship. (Liao & Sohmen 2001, 27-29)

The pharmaceuticals industry is one of Europe’s best performing high-tech industries. The industry is characterised by significant investment in R&D, the EU share representing around one fifth of global pharmaceutical R&D expenditure. China’s domestic production, in contrast, is dominated by generic products and traditional Chinese medicines. (European Commission 2007f, 33.)

The Chinese pharmaceuticals industry will grow at a rate of 10 per cent per year over the next few years. These markets represent opportunities for established European companies with R&D capacities. The pharmaceuticals industry can gain from China’s WTO membership, especially if the number of NTBs is reduced and the legislation to protect intellectual property rights is further improved. (European Commission 2007f, 33-35.)

Biotechnology is another promising field. It is an important part of a chain of research, development and innovation activities which create new products or production processes in many industrial sectors. Advances in biotechnology also benefit other
European industries, such as the pharmaceuticals, chemical, plastic, pulp and paper and textile industries. (European Commission 2007a, 4.)

All in all, the production of high-tech products complies with the strengths of the EU and opportunities for increasing high-technology exports to China exist in several high-tech sectors. However, the EU seems not to have reached its full potential in the production of high-tech products and further innovation in the field is needed. This matter is returned to in Chapter 7 which discusses the upgrading of the innovative environment of the EU.

6.3.3 The textile and clothing industry

RCA suggests that the comparative advantage of China is in the production of goods that require low levels of human and physical capital and much unskilled labour. The textile and clothing industry is a good example of such an industry. The RCA of most CEE-10 countries is also in the textile and clothing industry, while the EU-15 does not have a comparative advantage in this industry.

In 2005, the EU reported a positive balance of 3172 million euros in textiles. However, the positive balance seems to be narrowing as imports have risen and exports decreased from 2001. The EU’s trade balance in the clothing industry was strictly negative at 38 814 million euros in 2005 and this deficit shows a widening trend. Especially, imports of both textiles and clothing from China have soared since 2002. At the same time, the EU has increased its textile exports to China and in 2005, China was the 10th biggest market for European textiles. However, the textile exports of the EU represent small figures when compared to the imports from China. (European Commission 2008.)

As discussed in Chapter 4, the textiles and clothing industry is still partly controlled by the special textile and clothing safeguard, at least until the end of 2008. The surge of Chinese textiles and clothing products onto the EU markets has been limited and it will take some time before the effects of China’s WTO membership become fully observable.
Theories based on comparative advantage suggest that once the transitional trade barriers are lifted, China will be able to further increase its textile and clothing exports to the EU and other WTO members. The effects of the upcoming removal of trade barriers between the EU and China are likely to be greatest in the clothing industry, which is more labour and less capital intensive than the textile industry and corresponds best with China’s comparative advantage as opposed to the comparative advantage of the EU.

While the importance of the textile and clothing industry is likely to decline, it is unlikely that the industry will completely die out, even in the EU-15. The EU still has opportunities in certain sub-sectors, such as high-quality clothing and technical textiles. Innovation in new materials, processes and products is an important feature of technical textiles, making them a suitable product for European manufacturers. (Stengg 2001, 36.)

In clothing, emphasis should be placed on the design, marketing, sales and flexible production of high-quality clothing as the EU is not cost competitive with China. The small and medium sized companies in the EU-15 are well equipped to adjust to fast-changing trends in the industry. The CEE-10 countries (especially Romania and Bulgaria) are also a suitable location for production in this sector as they provide lower production costs than the EU-15 while retaining proximity to the markets. However, it should be kept in mind that the EU has an advantage in niche sectors only once trade barriers in textiles and clothing have been completely lifted. Therefore, the share of textiles and clothing in the European manufacturing industry will decline as a result of China’s WTO accession. (Stengg 2001.)

6.3.4 Service industries

So far, only specialisation patterns in manufactures have been discussed. Porter’s theory of competitive advantage becomes especially useful in determining the pattern of trade in services. Several determinants of competitive advantage suggest that the EU is likely to succeed in service industries.

The role of factor conditions varies across service industries. In services where the buyer is attracted to a nation, such as tourism, factor conditions are usually critical for
success. Geographic location can also have a significant role in some service industries. Unskilled and semi-skilled labour is not usually a source of competitive advantage in service industries. In contrast, a nation’s stock of specialised, skilled professionals is frequently vital in international service competition. This is particularly true for business services. The EU, with a highly educated workforce compared to the Chinese workforce, can therefore be expected to prosper in international competition. (Porter 1990, 256.)

The regulatory environment in the EU has supported the establishment of new service firms, which has created competition. High level of domestic rivalry supports the success of the EU service industries abroad as it forces European firms to improve and innovate. In contrast, the Chinese services sector is generally characterized by state involvement through SOEs and restrictions on private-sector involvement, leading to a lack of competition.

Demand conditions also support the growth of innovative service industries in the EU. This is especially true for the EU-15, which has highly saturated markets in most service industries as well as highly demanding domestic customers.

Applying the role of historical accident to service industries, it can be concluded that the EU has a considerable advantage in service industries as these industries play a key role in most economies of the EU and there exists a large pool of established firms. In China, the service sector is roughly the same size as the manufacturing sector, while in the EU the services sector is by far the largest sector of the economy. The modern history of China has done little to support service industries. The sector has been neglected as attention has been mainly on supporting the growth of manufacturing.

For reasons listed above, China is unlikely to pose a challenge for European companies in third markets. Meanwhile, China represents an opportunity for European companies as the service sector in China is experiencing rapid growth. The growth in many service industries exceeds that of manufacturing. The European Commission (2007f, 3-4) reports that the growth in service sectors in which the EU is likely to have the most significant comparative advantage outpaces that of other sectors in the Chinese economy.
Financial services in China, for example, are growing at a fast pace and investors look to increase volumes. Foreign companies have introduced new banking products and better financial services than those offered by the underdeveloped Chinese financial institutions. However, once the Chinese banks have accomplished their reforms and acquired better banking expertise on a broader scope, their competitive position might become much stronger. This could be responded by competing with a niche approach and continuously developing innovative and differentiated financial products. (European Commission 2007f, 40-43.)

The outlook for European retailers is strongly positive. Prior to China’s WTO membership, foreign retailers could only operate in China as joint-ventures with a maximum of 65 per cent share of any operation. Following China’s WTO accession, European retailers are allowed to set up fully-owned stores. Competitiveness in retail is gained by focusing on lean operations, supply chain management, integrated procurement, effective quality controls and management flexibility as well as the ability to identify with consumer preferences. The weaknesses of Chinese competitors in these areas suggest that the foreign-owned market share could double by 2010. This implies substantial future possibilities for European firms that often outperform Chinese competitors in the key success factors listed above. European chains such as Carrefour, Metro and Tesco have already proven successful in the growing Chinese retail markets. (European Commission 2007f, 44.)

China, an emerging market and investment-driven economy, also offers growth potential in the construction industry. Most Chinese construction companies operate in the less sophisticated segments of construction. They are generally low-cost and relatively efficient, but lack the expertise and management skills to handle large projects. Therefore, EU companies can continue to retain their competitive advantage in the high-value segment of project design and management as well as areas of niche specialisation. Also, offering integrated services throughout the entire life-cycle of a building fits well the competitive advantage of EU enterprises with good managerial skills. However, the Chinese construction industry remains highly regulated and further liberalisation is required in order for the EU to fully exploit its potential. (European Commission 2007f, 46-48.)
The European telecommunications market is the largest in the world, accounting for almost half of global turnover. This means that European operators are highly experienced in the business and used to serving different market segments. The strengths of European companies in offering comprehensive services include high quality of customer relations as well as management and marketing skills. At their current stage of development, the Chinese companies have little experience in dealing with multinational companies and have insufficient products to offer. Therefore, the growing Chinese market could offer possibilities to EU firms. However, despite China’s WTO membership, there are high barriers to the Chinese telecommunications market. This makes it unlikely that any high levels of competition or cooperation occurs between Chinese and European service providers. (European Commission 2007f, 49.)

In sum, providing high-quality services can be considered as one of the key success sectors of the EU. China, in contrast, seems to lag behind in services. Therefore, the EU is likely to increase its service exports to China, provided that obstacles for trade and investment in the service industries are further lifted. China’s WTO membership has little effect on the service exports of the EU to third countries. As exports have been treated as a proxy for production structure, this finding implies that more services will be produced by the EU in the future and the proportion of services in the production structure of the EU will further increase. (European Commission 2007f, 3-4.)
7. ADJUSTMENT IN THE EU

Both international trade theories and the model by Aghion (2007) on the implications of political regimes on growth in different industries strongly hint that the EU is likely to succeed in the production of high-technology products and services with high level of human capital, while China’s advantage lies in low-technology manufacturing requiring unskilled labour. The basic prediction of this study is that the production structure in the EU should move in the direction of advanced products. Following trade liberation, it is unable to compete with China in sectors that China has advantage in.

This prediction, albeit informative, is not enough when determining production structure. It is a statement on how the production structure should adjust following trade liberation. Throughout history, countries have chosen their pattern of specialisation partly in counter to what would be expected simply by looking at the variables that determine production structure.

It becomes evident that the adjustment does not happen automatically unless attention is paid to facilitating the adjustment process. Therefore, it is also important to assess how the EU should adjust its production structure in order to foster economic growth. Clearly, adjustments have to be made. Otherwise economic development in the EU is threatened by China’s rise as a trading nation. This chapter introduces strategies to cope with the external pressure created by trade liberation between the EU and China. Also, adjustment in selected countries are discussed.

7.1 Strategies for adjustment

Trade can be a major trigger in the adjustment process. China’s rise in world trade has raised numerous concerns among industrialised nations, including the EU. China’s membership to the WTO and the trade liberation that followed has done little to dissipate the fears of jobs and welfare moving to China. However, one of the key lessons from models based on comparative advantage is that trade and specialisation increases welfare in all countries participating in the international distribution of work. This statement is also true for China. Although China is a large economy, it is
ultimately not in China’s interests to produce everything itself. According to international trade theory, its welfare is maximized when it specialises in the production of goods which it has comparative advantage either in the form of labour productivity, factor endowments or other factors presented in chapters 2 and 3.

This approach leaves room for the EU to prosper as well, provided that it follows the right strategies during the period of readjustment. Therefore, the effect of China’s WTO membership on the production structure of the EU depends on how well the strategies chosen by the EU member countries correspond with their political regime, comparative advantage, factor endowments, home markets and competitive advantage.

The analysis in Chapter 6 revealed that following China’s WTO membership, the production structure of the EU should move further in the direction of advanced industries. These are sectors in which the EU has advantage over China. Investing in education and knowledge should therefore be a priority in the readjustment process. Education and knowledge can, in turn, be used in research and development activities that foster innovation in the advanced industries.

Setting aside the aspect of high-technology for a while, it can be remarked that a common characteristic for internationally competitive industries is the capacity and will of firms to improve and innovate. According to Porter (1990, 173), improvement and innovation require investment in R&D, learning, modern facilities and sophisticated training. Innovation and knowledge, then, are required not only in high-technology industries but in all industries striving to be successful in the international market.

As can be observed from Table 6, most EU members are well ahead of China in terms of tertiary education. However, participation in tertiary education is at a relatively low level in some CEE-10 countries such as Bulgaria, Croatia, Czech Republic, Slovak Republic and Romania. In order to succeed in international competition, these countries need to improve enrolment to tertiary education.

Entrepreneurship can also be seen as a factor that fosters innovation as it increases domestic rivalry by increasing the number of firms. It was noted earlier that the relatively good social security network in the EU might encourage entrepreneurship.
Perhaps surprisingly, then, the fear of bankruptcy and uncertainty of income followed by the lack of finance and complex administrative procedures are the major obstacles for entrepreneurship in the EU. However, the share of young people in Europe willing to start their own business is increasing, inclining that attitudes towards entrepreneurship and risk are changing. Entrepreneurship should further be encouraged in order to create new firms with innovative capacities. This applies especially to countries that rank low in the starting a business category of the Doing Business Report, such as Poland, Slovenia, Spain and Romania. (European Commission 2007e.)

The Global Innovation Scoreboard compares the innovation performance of EU-25 to that of other R&D performing countries in the world, including China. It comprises 12 indicators such as tertiary education, R&D expenditures in public and business sectors, exports of high-technology products and formation of intellectual property. A list of categories indicators used in the study is available in Table A1 in the Appendix. (Arundel & Hollanders 2006, 5-8.)

The global innovation performance is measured by a composite index, the Global Summary Innovation Index (GSII). High GSII score implies successful innovative capabilities. The GSII scores of all countries reviewed in the study are presented in Figure A1 in the Appendix. (Arundel & Hollanders 2006, 9.)

Finland and Sweden received the highest GSII scores and are considered as innovation leaders both globally and in the EU. The EU as a whole, however, was placed well below Japan and the US. Although China’s innovation performance is not ranked high, it is ahead of some EU economies. These include Slovakia, Portugal, Bulgaria, Latvia, Poland, Cyprus and Romania. In addition, the innovation performance of Lithuania and Greece was reviewed to be only slightly higher than that of China. (Arundel & Hollanders 2006, 12.)

The low GSII scores of several EU members imply that more attention needs to be directed to fostering innovation in these economies. Specific problem areas need to be identified. Figure A1 in the Appendix reveals that most EU members with poor innovation performance received low marks in all categories. Many of these countries performed particularly poorly in the category of intellectual property. This is especially
true for Romania, Poland and Bulgaria. Chapter 7.2 discusses the issue of uplifting innovative capabilities in selected economies. (Arunder & Hollanders 2006, 12.)

Another aspect of adjustment strategy is choosing industries in which to compete in. Focusing on industries in which the EU is likely to succeed in instead of hanging onto outdated industrial structures that do not correspond to the strengths and competences of the EU is crucial in the adjustment process. Protecting inefficient industries wastes recourses and affects the ability of competitive European companies to compete in China. For example, China has no major stake in Europe in most service sectors. Therefore, further concessions in the Chinese service sector are most likely achieved by discussing the issue together with the opening of other sectors (European Commission 2007f, 43).

7.2 Adjustment in selected economies

Throughout this paper it has been pointed out that the EU is a union of heterogeneous countries as opposed to a homogenous entity. Therefore, adjustment strategies in different parts of the EU differ together with economic structures. This last section introduces adjustment processes in selected economies of the EU and gives deeper insight into the adjustment process. Each of the economies was chosen as a representative of a broader region with similar economic structures. Much of the focus is, again, on industries further up the value chain as these are industries supported by democratic political regimes. Also, they are industries that differ most from China’s comparative advantage.

The European Innovation Scoreboard (EIS) is used in evaluating the innovative performance of selected EU members. EIS is similar to GIS, but it analyses the innovative strengths of EU members in more detail. It covers five dimensions linked to innovation by measuring structural conditions required for innovation potential, investment in R&D activities, efforts towards innovation at firm level, performance of innovative sectors and formation of intellectual property. Each dimension embodies several indicators. In this paper, EIS is used in evaluating a country’s need for profound
adjustment following China’s WTO membership and identifying issues that need the most attention in the adjustment process. (European Commission 2007d, 6.)

Also, the current competitiveness of these economies is evaluated by using the Global Competitiveness Report published by World Economic Forum. It assesses and ranks policies, institutions and factors driving productivity in 131 economies. The report covers many of the aspects from Porter’s theory of competitive advantage. Again, an attempt is made to recognise areas that most need improvement in each of the economies examined. For reference, China was ranked at 34th place in overall competitiveness. (World Economic Forum 2007.)

7.2.1 Finland

Already considered as an innovation leader, Finland is in less need of adjusting its economy than many other EU countries. This is also true for the other two Nordic EU members, Sweden and Denmark. They also received high GSII scores.

According to EIS, Finland’s highest strengths are in the formation of intellectual property and participation in lifelong learning. The trend in Finland generally follows the general trend in EU-25. However, the number of science and engineering graduates, population with tertiary education and new community trademarks are growing less quickly than the EU average. The first two indicators are at a high level already and the less than average growth rate is therefore unlikely to create problems. (European Commission 2007d, 22-23.)

The Global Competitiveness Report ranks Finland at 6th place in overall competitiveness. Finland’s institutions, health and primary education as well as higher education and training received the highest marks in the report. Labour market efficiency, in contrast, received lower scores and was ranked at 29th place. The report identifies tax rates, restrictive labour regulations and tax regulations as the most problematic factors for doing business. (World Economic Forum 2007.)

Although Finland seems to be one of the innovation leaders in the EU, there are some persistent problems that are not revealed in the study prepared by the European
Commission. The number of patents granted, for example, does not reveal everything about the formation of intellectual property. Commercialisation is an issue that has long been discussed in Finland since a relatively high proportion of patents is not put into commercial use. The findings of the Global Competitiveness Report suggest that the Finnish labour market and taxation should also be addressed to further improve competitiveness.

7.2.2 Portugal

The importance of the textile and clothing industry as an employer is substantial. It is evident that if the quantitative trade barriers in the textile and clothing sector are lifted as agreed, Portugal’s textile and clothing exports will surge as Portugal is unable to compete with price. As a consequence, Portugal faces a dilemma of creating new jobs for those lost in the process of liberating the textile and clothing industry in the EU. Therefore the need for adjustment following China’s WTO accession is great.

Contemplating the possibility of compensating the likely fall of textile and clothing exports, it can first be noted that Portugal’s democratic regime is supportive of high-technology industries. Portugal’s innovation performance, however, is below EU average, the weakest areas being intellectual property, lifelong learning and business R&D. However, there have been several positive developments from 1998 to 2005. Youth education, ICT and early stage venture capital have increased significantly. Still, business R&D and knowledge creation overall has not experienced much progress and indicators for intellectual property also remained stagnant. (European Commission 2007d, 46-48.)

The Global Competitiveness Report ranks Portugal at 40th place out of 131 economies examined. Portugal’s best performance is in infrastructure and institutions, which were placed at ranks 25 and 27 respectively. Labour market efficiency and macroeconomic stability were areas where Portugal was ranked well below the global average. The most problematic factors included inefficient government bureaucracy, restrictive government regulations and inadequately educated labour force. These factors also deserve attention in the adjustment process. (World Economic Forum 2007.)
This discussion hints that Portugal has not yet fully responded to the challenge posed by trade liberation between the EU and China. Tertiary education, lifelong learning and R&D expenditures all need further boost in order for Portugal’s exports to rise. Despite a positive trend over a short period of time in Portugal’s high-technology exports, they are still at a low level compared to EU average. Similar problems exist in other countries in the Mediterranean region of the EU. Innovation performance in Spain, Italy and Greece is below EU average. (European Commission 2007d, 46-48.)

7.2.3 Poland

Referring back to Table 5, Poland’s RCA was similar to that of China with the highest BI in industries requiring low levels of both human and physical capital and high levels of unskilled labour. This pattern can possibly create a substantial problem for the Polish economy that is currently showing relatively high growth rates.

It can be expected that the internal market in the EU will remain more liberated than trade between the EU and China. This means that Poland can, at least to some extent, continue prospering in the production of low value added goods for the internal market. However, if the cost level in Poland increases sufficiently relative to that of China, then it is likely that China’s WTO accession will substantially affect Poland’s exports to the rest of the EU. Therefore, Poland should consider further investments in changing its industrial structure closer to that of the EU-15. This strategy creates more sustainable advantages than relying on the supply of cheap labour.

Poland’s democratic regime implies that it does have potential in industries further up the value chain. Also, participation in tertiary education (refer back to Table 6) is on a par with most advanced EU nations. Poland is also geographically located close to large EU markets.

At the moment, Poland’s innovation performance is well blow the EU average. Business R&D expenditure is low compared to the EU-25. The weakest area in Poland is intellectual property. For example, remarkably few patents are registered in Poland. Indicators measuring entrepreneurship are also at a low level except for ICT expenditure. (European Community 2007d, 45-46).
There has been some positive trend during the period 1998-2005, especially in the areas of youth education, ICT expenditures and innovative SMEs. In more recent years, business R&D and population with tertiary education have shown signs of improvement. However, other important indicators are stagnant at low level. These include public R&D expenditures and new community trademarks. (European Community 2007d, 45-46.)

The Global Competitiveness Report ranks Poland at 51\textsuperscript{st} place in overall competitiveness. Market size received the highest rating, being ranked at 22\textsuperscript{nd} place. Problem areas seem to be institutions and infrastructure, which were ranked in 80\textsuperscript{th} and 82\textsuperscript{nd} place respectively. In addition to the inadequate supply of infrastructure, inefficient government bureaucracy, corruption and political instability are identified as the most problematic factors for doing business. (World Economic Forum 2007.)

Poland has managed to upgrade its economy recently. However, much remains to be implemented. Judging from the previous dialogue, focus should be turned to facilitating entrepreneurship and spurring R&D investments in both public and private sectors. Institutions and government bureaucracy also need attention in the adjustment process.
8. CONCLUSIONS

The purpose of this paper was to discuss the effects of China’s WTO accession on the production structure of the EU. Several determinants of production structure were covered in order to formulate a view on how the production structure of the EU will adjust following trade liberation between the WTO and China. Moreover, adjustment strategies were formulated with the aim of finding a competitive strategy coherent with the capabilities of the EU.

Determining production structure is not an easy task as it is a complex matter affected by several determinants. A certain level of contradiction exists as different theories predict different location of production for a certain good. Therefore, the results of this study are only tentative and should be considered with caution. However, several conclusions can be articulated.

One of the most distinct findings of this paper is that China’s WTO accession has different consequences in different countries and industries in the EU. The EU-15 is in general better equipped to handle external pressure caused by China’s WTO membership than the CEE-10 countries. This is due to the dissimilarity of the export structure and comparative advantage of the EU-15 and China. Most CEE-10 countries, in contrast, have very similar production structures to that of China.

As for industries, China’s WTO membership will reduce labour-intensive industries in the EU, such as the textile and clothing industry. Their proportion of the total production of the EU will shrink as a result of trade liberation. In labour-intensive industries, the EU is likely to succeed in niche sectors only if trade is completely liberated.

An important exception is the service industry. Porter’s theory of competitive advantage supports the location of service industries in the EU. European service providers have several competitive strengths vis-à-vis their Chinese competitors. Provided that trade in services is further liberated, the EU will have considerable opportunities to increase its
service exports to China. All in all, the role of services in the production of the EU is likely to grow as a consequence of trade liberation.

The model of Aghion & al. (2007) implies that the highly autocratic political regime in China does not support growth in advanced industries. In contrast, the democratic political regimes of the EU contribute to the growth of advanced industries. This implies that the production structure of the EU should move further in the direction of high-tech goods. The EU as a whole, however, has not reached its full potential in high-tech industries. Countries such as Finland and Sweden possess high innovative capabilities, whereas some EU countries lag behind in innovation performance. This is especially true for CEE-10 countries and Mediterranean Europe. Therefore, focus in the adjustment process should be in the uplifting of innovative capabilities. This strategy is consistent with the political regimes of EU countries and provides more sustainable advantages than relying on the supply of unskilled labour.

While the results of this paper are interesting and provide useful information on the production structure of the EU, some level of imprecision is evident. More research is needed in order to for a more detailed picture of the research problem. One solution to making the results more precise would be to narrow the problem further to country or industry level.
REFERENCES


### APPENDIX

**Table A1. GIS indicators by category.**

<table>
<thead>
<tr>
<th>Category</th>
<th>Indicators</th>
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<tbody>
<tr>
<td><strong>Innovation drivers</strong></td>
<td>New Science and Engineering graduates</td>
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<tr>
<td></td>
<td>Labour force with completed tertiary education</td>
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<tr>
<td></td>
<td>Researchers per million population</td>
</tr>
<tr>
<td><strong>Knowledge creation</strong></td>
<td>Public R&amp;D expenditures</td>
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<tr>
<td></td>
<td>Business R&amp;D expenditures</td>
</tr>
<tr>
<td></td>
<td>Scientific articles per million population</td>
</tr>
<tr>
<td><strong>Diffusion</strong></td>
<td>ICT expenditures</td>
</tr>
<tr>
<td><strong>Applications</strong></td>
<td>Exports of high-tech products</td>
</tr>
<tr>
<td></td>
<td>Share of medium-high/high-tech activities in manufacturing value-added</td>
</tr>
<tr>
<td><strong>Intellectual property</strong></td>
<td>EPO patents per million population</td>
</tr>
<tr>
<td></td>
<td>USPTO patents per million population</td>
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<td></td>
<td>Triad patents per million population</td>
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</table>

Source: Arundel & Hollanders 2006, 5.
Figure A1. Global innovation performance.

Source: Arundel & Hollanders 2006, 12.