SPECIALIZATION AND ECONOMIC INTEGRATION POLICIES IN EUROPE

ON THE EFFECT OF THE SINGLE EUROPEAN MARKET AND THE EURO ON SPECIALIZATION PATTERNS IN EUROPEAN COUNTRIES

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MASTER THESIS INTERNATIONAL ECONOMICS

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AUGUST 29TH 2014

ABSTRACT

This thesis studies the effect of economic integration policies on specialization patterns in EU countries during the period from 1985 to 2012. We focus on the effect of access to the European Economic Area, and the use of the euro as a currency, two major, recent milestones of European integration. The effect of these integration events on GDP distributions, and in particular the shares for the overall manufacturing sector, the information & communication sector and the financial & insurance sector is studied by use of Gini coefficient analysis and panel data regression analysis. We make some interesting findings. First, graphical representations of the Gini coefficients do not show clearly that around the time the integration events take place there is a change in specialization patterns. This means that the shocks are not that severe and the changes are more subtle. Second, the panel data regression analyses show some interesting results. We find significant results of the effects of both integration events on sector shares for some countries. These are mainly the countries that have recently joined the EU – where a deeper adjustment and integration path applies. We mainly find that Eastern European countries increase their manufacturing sector share and Western European countries increase their financial sector share. These findings are in line with the general economic development trend in the countries, because they show a decrease in agricultural sectors, a de- or increase in manufacturing sectors, depending on the level of development, and an increase in service sector shares.

Contents

INTRODUCTION

The connection between trade and development has been widely discussed. Many theories and models exist that explain the benefits from trade, how trade affects national income, and how economic development affects trade (Bowen, Hollander, & Viaene, 2012). This thesis focuses on the theories of trade that describe the causal channels between trade and development. When a country opens up to international trade, it exposes its economy to both larger demand and supply markets. This leads to more competition and selection of the most productive firms. It can cause countries to specialize in certain industries or products. The access to larger markets provides opportunities of scale economies, and increases the choices of consumers. Firms can benefit from having access to foreign resources and from learning by exporting. Instead of studying the effect of trade on development, this study aims to identify the effect of trade on specialization, looking at the impact of trade policies of the European Union on specialization in European countries.

Trade policies have received more attention since the benefits have become more evident. A good example of this is Europe; what started as interdependency between European countries to prevent wars, has evolved in an integration act aiming for more economic power. Especially in the last two decades of the 20th century, major steps were taken towards economic integration such as the implementation of the single market and the formation of a monetary union. These actions make the economies within the EU excellent subjects to test specialization theories on. When we consider the trade policies to be shocks to the economic system, the effect of integration can be studied by comparing the situations before and after the shocks. This is done analyzing the distribution of economic activities using Gini coefficients, and estimating the effect of trade policies on specialization measures using regression analysis.

The main question we want to answer in this thesis is:

What is the effect of economic integration on specialization patterns within the EU?

We will analyze this research question for manufacturing overall, and for two service sectors: information & communication services and financial & insurance services. The research question is divided into the following sub questions:

- *What are the main trade theories connecting trade and specialization?*
- *What economic integration policies have been implemented in Europe?*
- *How has the distribution of economic activities in European countries changed between 1985 and 2012?*
- *How have economic integration policies affected the distribution of economic activities in European countries between 1985 and 2012?*

Part 1 will give a short history and description of trade theories accompanied by evidence from previous research. Part 2 describes the process of economic integration in Europe, with an overview of earlier found evidence. In part 3 the data and methodology are discussed. Part 4 and 5 follow with the results from Gini analysis and regression estimations. Part 6 concludes.

PART 1: TRADE THEORIES

MERCANTILIST VIEW

The earliest trade theory to mention is the mercantilist view of the zero sum game. Though the mercantilists participated in international trade, they did not believe that every nation could benefit at the same time. You either gained or lost from trade and a positive trade balance was the most important goal for nations. This resulted in policies to stimulate export but to restrict import. One of the key ideas behind the mercantilist theory was that the value of the world's production was fixed. The value of production was determined by the amount of capital used in production, and the only way to increase the value of production was by increasing the amount of capital, thus the export value had to be higher than the import value. The mercantilist view lasted approximately two centuries, until Adam Smith attacked the theory in 1776 (Grant & Brue, 2006).

CLASSICAL THEORY

Smith extended the trade theory by emphasizing the importance of opportunities. Trade does not only benefit nations through the accumulation of capital, but benefits the people because they can choose from a larger set of products. Smith bases his theory on the principle of absolute advantage, arguing that countries should specialize in their production according to their factor endowments. This means that countries should produce the good that uses the nation's abundant factor most intensively in the production process (Van Marrewijk, 2007).

NEOCLASSICAL THEORY

Smith changed the way people thought about trade, but did not formulate a model that justified this idea. Moreover, it did not describe how two countries with an absolute advantage in the same factor, could still benefit from trade. The neoclassical economy brought new insights, starting with the comparative advantage theory from David Ricardo (1877). Ricardo noted that not only capital and labor were important in production, technology was important as well. The productivity of labor and capital are determined by the state of the technology used. Having better or more advanced technology means that a nation can produce more efficiently and thereby cheaper. This increases the competitive position towards other countries, and

could increase export of that product. Using this theory, Ricardo shows that a country that does not have an absolute advantage in any production sector can still have a comparative advantage and participate in international trade. Comparative advantage simply indicates that for any country it is more beneficial to produce the good in which labor is most effective. When this product is exported, all other goods can be purchased with the revenue of export. Ricardo argues that in this situation, free trade is more profitable than producing in autarky (Van Marrewijk, 2007).

The comparative advantage theory of Ricardo was based on advantage in technology. In the years after Ricardo, another comparative advantage theory was formulated by Eli Heckscher and Bertil Ohlin. The Heckscher-Ohlin theory of comparative advantage (1930s) is based on differences in factor endowments. Countries that relatively have more capital than labor should specialize in capital-intensive goods and import the labor intensive goods. This theory combines the factor abundance theory with comparative advantage theory. The comparative advantage theory took a hit in the 1950s when Wassily W. Leontief studied the theory empirically and found that the United States, as a capital abundant country, exported labor intensive goods and also imported capital intensive goods. Since this was completely inconsistent with the H-O theory, there had to be another explanation for this so called intra-industry trade (Bowen, Hollander, & Viaene, 2012).

NEW TRADE THEORY

The new trade theories try to explain the difference in production structures between countries and intra-industry trade. In 1980 Krugman proves with a simple model that even countries with the same factor endowments will trade. The main elements of the model are the possibility of scale economies, transportation costs and access to large markets. Scale economies encourage production to take place in one location. Trade costs encourage firms to locate near the largest market. Combining the two driving forces predicts that production will locate in places with the largest domestic demand for the product. This is called the home market effect; countries will produce and export goods that are preferred by the domestic market. Intra-industry trade occurs when products are differentiated, creating a more diverse supply for consumers (Krugman, 1980).

This new trade theory was found to have limits as well as all the previous theories. The critic was based on the failure to explain production structures in the absence of differences between countries. While new trade theory assumed no differences in factor endowments or technologies, it does assume differences in market sizes between countries. This means, that countries with similar market sizes should develop similar production structures, which, in practice, does not seem to be the case (Brülhart, 1998).

NEW ECONOMIC GEOGRAPHY THEORY

The new economic geography theory studies why countries that seem similar still develop different production structures. To explain these developments this theory does not only focus on the pattern of trade, but also on the pattern of production. The new economy geography theory combines previous known trade theories with location theories. The most important principle in this theory is that market size is endogenous. Due to the mobility of labor and firms, integration changes the size of markets between regions. The first model assumes that labor is mobile. People create demand. Higher demand attracts firms to locate in highly populated areas. Higher labor demand, higher wages and a more varied range of consumer products in agglomerations in turn attract workers (Krugman, 1991b). The second model looks at input-output linkages. Here, demand is represented by downstream firms that use intermediate goods. In case of trade costs, upstream firms benefit from locating near downstream firms (Venables, 1996).

The theory however also predicts that there might be boundaries to the concentration forces. This creates a U-shaped relationship between integration and concentration. In case of the first model, there could be a point when trade costs are low that firms decide to relocate to regions with lower wages (Puga & Venables, 1996).

In short, the new economic theory predicts that more integration will lead to more concentration because firms can benefit at several levels from being located near each other. This clustering has consequences for the regional economy compared to other regions. Further integration results in some firms relocating to different regions for cost reasons or to be closer

to firms with related activities. Staying in an area with firms with unrelated activities means unnecessary competition for immobile factors (Ottaviano & Puga, 1998).

PREVIOUS EVIDENCE

Every different theory of trade has been given attention in research papers. The next section gives an overview of the overwhelming amount of evidence that has been found in favor or against trade theories, focusing on these theories in combination with specialization and production patterns.

Davis, Weinstein, Bradford and Shimpo (1997) study the factor abundance theory using international and regional data. The Heckscher-Ohlin model has not successfully been proven empirically, due to the many restrictions of the model. When the restriction of factor price equalization is relaxed, the model works well as a theory of production location in regions with FPE. Davis and Weinstein (1996) find that most of the manufacturing production structure in OECD countries can be explained by differences in factor endowments. Only a small part can be explained by home market effects. This supports the neoclassical theories, but not the new trade theories.

Brülhart (1998) studies industrial specialization in the European Union. He finds significantly high amounts of intra-industry trade in the manufacturing sector, indicating that similar goods are exchanged among countries contradicting the neoclassical theory. Brülhart (1998) also looks at the effect of increasing returns on intra-industry trade. He finds that more opportunity for scale economies in an industry lowers the level of intra-industry trade. Brülhart (1998) further finds that resource-intensive industries have the lowest intra-industry trade, and labor-intensive industries the highest. When Brülhart looks at the location of the clustered industries, he finds that these are mainly located in the central EU countries. This could be due to their good market access. The labor-intensive industries are relatively dispersed in the EU, and can mainly be found in the peripheral areas. Finally, Brülhart notes that industries that use high-technologies are also concentrated in the EU, but not in a centre-peripheral way.

Amiti (1997) tests trade theories empirically. She finds evidence of the importance of scale economies for concentration, as well as the importance of input-output linkages. Amiti (1998) concludes that industries are geographically concentrated in countries that have access to large markets. These are the central European countries. She also finds evidence of the home market effect and the fact that countries export goods for which there is a 'home bias'.

Brülhart and Torstensson (1998) use a model with three countries and different market sizes to theoretically and empirically test trade theories. They find a U-shaped relationship between integration and concentration of industries with increasing returns to scale. Their result is the opposite from the prediction by Puga and Venables (1997); integration first decreases concentration, then after a certain point concentration starts to increase. The second finding of Brülhart and Torstensson is that industries that are subject to scale economies locate near large markets, that is, the central countries. When they test the model with constant trade costs, but varying scale economies they find that scale-intensive industries tend to be more concentrated, again in the centre of the area. The empirical evidence confirms the finding of positive correlation between concentration and scale economies. Brülhart and Torstensson also find a positive correlation between scale economies and centre locations. These findings indicate that industries with increasing returns to close both cluster and locate in central EU countries.

PART 2: INTEGRATION POLICIES IN EUROPE

The road to integration between European countries is a long one (European Union, 1995-2014). Even before countries joined forces in 1951, there was talk about more cooperation. This idea came from Gustav Stresemann, former Foreign Minister of the Weimar Republic, during the economic crisis of the 1920s. Stresemann argued that countries had held on too long to their national monetary policies instead of cooperating, which had prolonged the economic crisis.

Only after the Second World War, the Western European countries came into action, although the motives for integration were different. There was a need for interdependence in coal and steel between the countries, in order to prevent one country from mobilizing its armed forces without the others knowing. This resulted in the **European Coal and Steel Community (ECSC)**, this **Treaty of Paris** was signed by six countries in **1951**; Belgium, Germany, France, Italy, Luxembourg and the Netherlands. The treaty reduced the mistrust between the countries and eased tensions after WWII (European Union, 1995-2014).

In the years after WWII it also started to dawn on Europe that the economic power of the United States of America was large. So large even, that the European countries realized that none of them could ever compete with the USA on their own. This originated the next steps towards European integration. In **1957**, the **Treaty of Rome** was signed, establishing the **European Atomic Energy Community (EURATOM)** and the **European Economic Community (EEC)**. With these communities the European integration came closer to general economic cooperation. The treaty also describes the cornerstones – the four freedoms - of European integration; free movement of goods, services, people and capital. Therefore, signing the treaty directly affirmed the intention of the countries to work towards common policies for these common markets (European Union, 1995-2014).

The first market that became regulated at European level was the agriculture. Plans for a **Common Agricultural Policy (CAP)** were already made in 1950, but the groundwork was not

laid out until 1958. The CAP was a partnership between agriculture and society. The main objectives of the plan were to ensure a stable food supply in Europe and a decent living for European farmers. This was achieved by removing trade barriers between countries, setting production quotas and maintaining the prices of goods. The CAP came into force in **1962** (European Commission, 2012).

Belgium, Luxembourg and the Netherlands signed a treaty establishing their own economic union in **1958; the Benelux**. The goal of the Benelux was to create an area of free movement of persons, goods and services. The Benelux countries had been working on abolishing borders and trade barriers to achieve this since the ending of WWII (Rijksmuseum, 2013).

Several European countries opted out of joining the EEC in 1957. As an alternative they decided to establish **the European Free Trade Agreement (EFTA) in 1960**. This was a union between the United Kingdom, Denmark, Norway, Austria, Portugal, Sweden and Switzerland. During the 1970s and 1980s several other countries join the EFTA, but join the EU in the late 80s or early 90s. Today, the EFTA consists of Liechtenstein, Norway and Switzerland (European Union, 1995-2014).

Integration continued in **1965 with the signing of the Treaty of Brussels; the Merger Treaty**. This treaty created a European Commission and a European Council to coordinate and streamline the already existing European bodies (European Union, 1995-2014).

The next breakthrough was in **1968** when a **customs union** was implemented. The customs union was the foundation of integration and eliminated all customs rights and tariffs between the participating countries. Since 1968 it is forbidden to exercise any import or export taxes within the EEC. Finally, a common outside tariff was set up for trades with non-EEC countries (European Union, 1995-2014).

During the 1970s, a number of events lead to further steps towards economic and monetary union. European Commissioner Raymond Barre presents a new plan for better coordination of economic and monetary policies in 1969. Following this plan, it is decided that European integration should lead to an **Economic and Monetary Union (EMU)**. In **1971**, the six

countries agree to a three-phase-plan to implement the EMU. Denmark, Ireland and the United Kingdom join the EEC in 1973. With the exception of the UK, the members of the EEC established the **European Monetary System (EMS)** in **1979** for more monetary stability. The EMS fixed the national currencies to a **European Currency Union (ECU)** instead of to the US Dollar (European Union, 1995-2014).

In the 1980s the EEC expands again. In 1981 Greece joins the community, and Spain and Portugal joined in 1986. The main reason for the acceptance of these countries was to make sure their new democratic regimes were to succeed (European Union, 1995-2014).

Because of the economic crisis in the 1970s, many countries reinstated protectionist measures which were a minor setback for the integration plans. The Commission for European Communities presented a **White Paper on completing the internal market** to the European Council in **1985**. This white paper consisted of a list of tasks that needed to be done to complete the European internal market, plus a timetable. The tasks included the abolition of all physical, technical and fiscal borders between the EEC countries. **The Single European Act Treaty** is signed in **1986**, a commitment by all countries to complete the internal market by 1993 (European Union, 1995-2014).

The internal market program

The internal market program was meant to ensure the free movement of goods, services, capital and people. Between 1986 and 1993 many steps were taken towards this goal. In the end, only the market for goods was complete by 1993(Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

Free movement of goods

First of all, the paperwork and border controls cost a lot of time and money. So the existing fiscal borders between the member states had to be removed. Furthermore, all goods from the EEC had to be treated equally, imported and exported. What was left were the technical borders; product laws, technical rules and regulations, all the difficulties of bringing goods onto other national markets. For simple goods, all EEC goods had to be allowed on all national

markets. For more complex or higher risky goods, the regulations were replaced with EEC wide regulations; harmonization (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

Transport, energy and telecommunication are the lifelines of the internal market program. Therefore, free movement of goods and people is not possible without regulating transport at the European level. The plans of a European transport network took shape in the late 1980s, and in 1992 the **Trans-European Networks (TENs)** were established. In 1994, a list of projects to develop and improve the TENs was made. Unfortunately, the completion of these projects took its time and by 2003 a new list was created. The development of these networks was essential for the internal market, but they also led to increased economic and social cohesion between different European regions (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

Free movement of people, workers and entrepreneurs

Free movement of people for work related reasons is different from free movement of people for studies, pleasure or living. The latter is part of European Citizenship Rights and therefore not part of the internal market program. All workers should be treated equally. Other goals of the EEC were better labor conditions, and equal chances (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

Free movement of services

Just like goods, services were supposed to be easily traded between EEC states. Restrictions on non-domestic services are prohibited. But the implementation of the internal market has been more difficult than the internal market for goods (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

Free movement of capital

Special attention was paid to financial services in the completion of the internal market. Before 1990, only 1% of EEC-trade was trade in financial services[1]. To increase this percentage a single permit was introduced that enabled financial institutions to provide their services in all

[1] Bank services, insurance and securities

EEC countries. Unfortunately, the single permit did not increase trade in financial services as much as was desired. A new plan was made to improve cross border financial trade from 2005 to 2010. One of the initiatives of the plan was a **Single European Payments Area (SEPA)** (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

In 1989, the President of the European Commission, Jacques Delors, presents a plan to implement the European common currency in three stages. The first stage started in 1990 and consisted of the liberalization of capital markets (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

As a part of completing the internal market, the **European Economic Area (EEA)** was created. This connected the countries of the EFTA[2] and the EEC with each other in a free trading area. The EFTA countries joined in the free movement of goods, people and services but did not adopt the common outside tariff that the EEC countries had. The EEA came into force in 1994. Three of the EFTA countries[3] formally joined the EU altogether in 1995 (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

In 1992, the Maastricht Treaty is signed; another very important treaty in the history of European integration. With this treaty the EEC is repealed, and the **European Union (EU)** is established as successor. One of the topics of the treaty was the EMU. The Delors-report and its three-stage-plan were approved. Furthermore, the Maastricht Treaty is famous for its steps towards financial stability; limits were set on inflation, budget deficit, government debt, the long term interest rate and exchange rates (European Union, 1995-2014).

The second stage of the EMU started in **1994** with the creation of the **European Monetary Institution (EMI)**. The EMI's task was the coordination of monetary policy. At the same time all the existing restrictions on capital and bank transfers between EU and non-EU states were abolished (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

[2] With the exception of Switzerland
[3] Austria, Finland and Sweden

In **1995**, the European Council gathered on the **Madrid Summit** where the name of the common currency changed from **ECU to euro** and the start date of the EMU was set on 1999. The Council also made a plan for the transition from national currencies to the euro. Later, in 1998, the EMI was replaced by the **European Central Bank (ECB)**. In 1999, the third stage of the implementation of the EMU started with the launch of the euro in 11 countries. The European Council fixed the value of the euro as an accountancy currency (European Union, 1995-2014).

In 1997 the Treaty of Amsterdam was signed. The main changes made in this Treaty were the reforms of EU institutions to be prepared for further expansion. In March **2000 at the Lisbon summit**, the EU agreed to become the most competitive and dynamic knowledge economy in the world by 2010. The goal was to accomplish durable economic growth with more and better jobs (European Union, 1995-2014).

The internal market for air transport was complete in 1997. Since 1993, the physical borders on the ground were gone, but they persisted in the sky. **In 2004, the Single European Sky (SES)** was introduced, removing all borders in the sky. The first liberalization guidelines for the market for railroad transport were formed in 1991. In 2007, the European market for international goods transport opened up. Plans were made to open up the market for transport of people in 2010. Liberalization of the waterways was complete in the mid 90s. Every EU citizen could work everywhere, though every ship, worker and company had to be registered and approved in one of the EU countries (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

In **2001**, Greece joins the list of countries that are allowed to adopt the euro in 2002 and the **Treaty of Nice** is signed (European Union, 1995-2014).

The euro is officially entered in 12 countries in 2002. With the adoption of the euro, the participating countries transferred their sovereignty – with regard to monetary policies – to the ECB. When developments in the euro regions are not symmetrical, the ECB has the power to influence the effects with monetary policy (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

In 2004, ten countries joined the EU; Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia and Czech. Five of these countries also joined the euro zone between 2007 and 2011[4]. These countries however did not receive total access to the internal market right away. To prevent large inflows of people looking for work in the elder EU countries, limitations were set on free labor mobility until 2011. These limitations were also put in place for Bulgaria and Romania, who joined the EU in 2007. Though for the two the restrictions were stronger (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

In **2004**, a proposal for **regulations of the internal markets for services** was made by the European Commission. The goal of this proposal was to have these in place by 2010. Special measures were taken for government ruled markets. The energy market was liberalized in 2007 and postal services in 2009 (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

The Treaty of Lisbon was signed in **2007** and consisted of changes to make the EU more democratic, more efficient and better able to address global problems with one voice. Furthermore, the Treaty established some boundaries as to what could be decided by national governments, the EU or both (European Union, 1995-2014).

The internal market in the EU faces future challenges. For one, the EU wishes to increase cross border research to integrate the national knowledge economies. There is still work to be done in the market for services and financial services. Plans are made to further encourage innovation and entrepreneurship. Lastly, the EU is working on the role of the internet in economic growth (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007).

[4] Slovenia in 2007, Cyprus and Malta in 2008, Slovakia in 2009 and Estonia in 2011.

PREVIOUS EVIDENCE

Not only economic integration changed the economies within the EU, general development also accounts for a large part of the structural changes. As an economy grows and income per capita increases, the structure of the economy tends to change. In developing countries, agriculture is the most important sector. When income per capita increases, the country first turns into an industrial economy and later into a service economy. These industrialization and post industrialization waves occur in any country when economies develop and are therefore present in the European countries. Most of the EU countries are in the post industrialization phase; a low level of agriculture, decreasing levels of industry and an increasing service sector. (Soubbotina & Sheram, 2000)

In 2003, The European Commission published a report on the Internal Market and impact on the European economy since 1993. The report set out economic benefits, and benefits for citizens, consumers and businesses (The European Commission, 2003).

In short, due to the internal market GDP has increased, jobs have been created, competitiveness has improved and as a result export has increased, and the inflow of foreign direct investments has doubled. Citizens have a wider choice of goods and services for a lower price, can easily move to live and work anywhere and have the same consumer rights everywhere in the EU. Free labor mobility has resulted in a better allocation of labor. For businesses trade within the EU has become easier, delivery times and costs have been reduced, rules and regulations have been harmonized, and electricity costs have lowered.

The economic benefits have spread unevenly across the EU. Because cohesion policies were taken at the same time, the poorest regions of the EU have not been left out. These regions have benefitted more than richer regions, which has narrowed the gap between rich and poor in the EU. The implementation of a single currency has eliminated the exchange rate risk, resulting in increased trade and cross-border investments between member states.

Overall the increased competition in the internal market has led to some interesting developments. Due to the strong competition many firms have decided to start working

together, resulting in an increased number of cross-border mergers and acquisitions. The larger firms in the market have succeeded in being more productive and cost efficient.

The European Commission conducted a survey under businesses about their experiences in the Internal Market. Most of the responses were positive and indicated that around half of all businesses sell their goods in other member states.

Although the economies of the EEC countries were mainly service economies, only 25% of trade between states is trade in services. The problem lies in the difference in rules and regulations for services between countries. Non-nationals cannot understand these rules, and the national governments haven't done enough to make it easier for outsiders to enter the national market. For some services, additional conditions have to be met by non-nationals, making trade in services even harder (Sterckx, Ryckbost, Vermeersch, & Van Bossuyt, 2007). The benefits in the service sector have not been as great as in the goods sector. Due to government regulations trading across borders is not as easy in this field. This has been a major challenge. One of the opportunities for this market is e-commerce.

Government spending has also benefitted from the internal market. Before opening up the market, most governments favored national businesses for their projects. Now governments are encouraged to seek for suppliers or contractors across borders, competition in this field has increased. This has again led to price reductions, and large savings in government spending.

The liberalization of the transport, energy and telecommunications markets have made them more efficient and lowered costs for consumers and businesses. This has made the European industry more competitive in the world. At first people feared that opening up these markets would harm the quality of the services provide or decrease the level of employment, in reality the opposite happened. The networks were largely controlled by national monopolies with high prices and low quality; competition increased choice for consumers and increased innovation. Job losses at the former monopolies were more than compensated by job gains at new firms.

The first policies that were adopted in the financial service sector have increased cross-border competition and thereby lowered prices. The effect however was not as strong as hoped or overshadowed by other events that changed the sector such as the introduction of the euro, e-commerce and innovation. These events led to increased price transparency and new possibilities. Overall the developments in the financial sector are promising, but there is still room for more integration which can lead to a stronger sector and higher growth. (The European Commission, 2003)

Many researchers have studied trade and production patterns in Europe during the last three decades of the 20th century. These studies made use of Gini indices, Herfindahl indices, and measures of intra-industry trade. This section gives an overview of the findings.

Brülhart (1998) studies industrial specialization in EU countries during the 1980s using Gini indices. He finds that Gini indices have risen during this time period, indicating increased specialization. Brülhart and Torstensson (1998) confirm this finding by an analysis of trade data. Amiti (1997) also found a significant increase in specialization in some EU countries between 1968 and 1990. She also finds no change or even a decrease in some other countries.

Amiti (1997) also studies the location of industries, finding that some industries were more concentrated in 1990 compared to 1968. Brülhart and Torstensson (1998) also find that industries became more concentrated during the 1980s, but not in favor of the central EU countries. They say that the degree of concentration in industries subject to high scale economies in these countries has not increased.

Brülhart (1998) finds that intra-industry trade growth slowed down during the 1980s, but not at the same time in all industries. The reduction in intra-industry trade growth happened earlier in industries that experience increasing returns. Frias, Iglesias and Neira (2000) study trade patterns in 1990s using intra-industry trade measures. They find that most North-Western EU countries exhibit higher intra-industry trade than the Southern countries, indicating that production structures in the North-Western countries are more alike. During their time period the trade patterns did not change much. They also find that Finland and Ireland increased their inter-industry trade levels, due to comparative advantages. Portugal,

Spain, Italy and Greece show advantages in labor-intensive industries, due to lower labor wages. But Frias, Iglesias and Neira find that Spain does not have a larger share in these industries. Sweden and Finland, more than other countries, have an advantage in capital-intensive industries, meaning that they are net exporters of this group of industries. Ireland, Germany, The Netherlands en France are net exporters of human capital-intensive industries. Frias, Iglesias and Neira do find that the before mentioned advantages in labor-intensive industries are not always exploited and even countries with a clear disadvantage have a high share in these industries.

Sapir (1996) focuses especially on changes due to the formation of the single market. He finds no significant increase in specialization in the four biggest European countries5 but he does find that the data are significantly higher in 1986 compared to the average between 1977 and 1985. Sapir looks closely at changes caused by trade costs, mainly non-tariff barriers (NTBs), because the reduction of these was essential for the Internal Market Program (IMP). The active NTBs however did not only restrict trade between EU countries, but also between EU and non-EU countries. Not surprisingly, Sapir finds that during the period 1986 to 1992 the share of domestic production has declined in favor of imports from both EU and non-EU countries. Depending on the type and degree of non-tariff barriers, they have had different trade creating effects. Sapir's regression analysis further indicates that the EU was less fragmented in 1992 and transport costs and tariffs favor EU imports of non-EU imports. One area that has not been affected by the IMP was agriculture; this sector experienced rather trade diversion than creation.

[5] Germany, UK, France and Italy

PART 3: DATA AND METHODOLOGY

In this chapter, we cover the data we intend to use and methodological approaches in order to answer the research question.

DATA

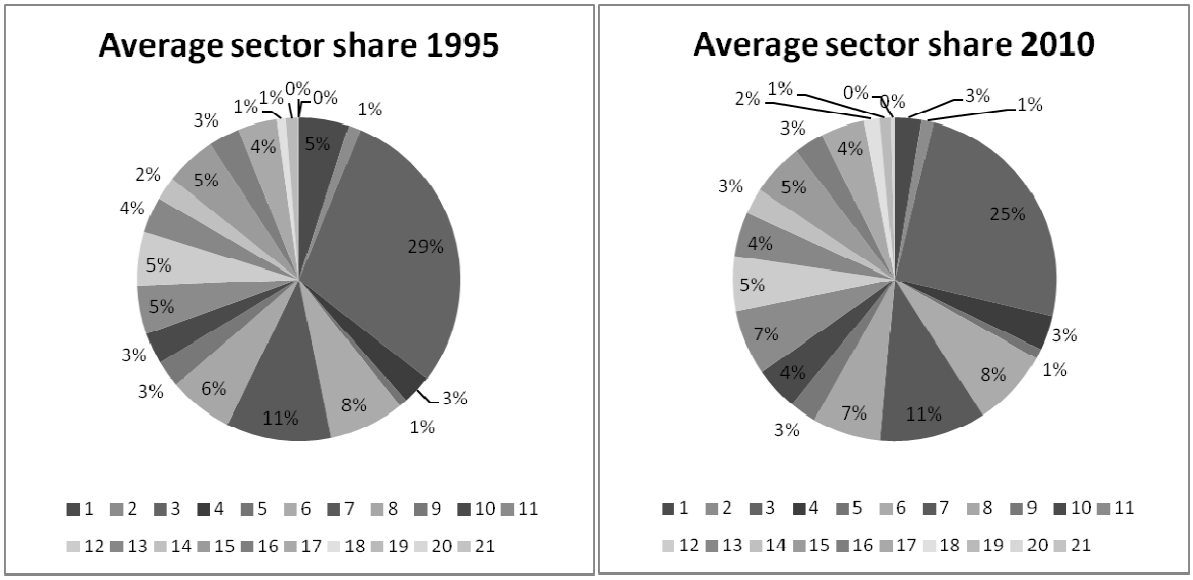
For this study, data is collected on specialization patterns, economic development and economic integration for 32 European countries for the period 1985 to 2012. This period is chosen to include the economic integration events that are subject to this study; the start of the completion of the internal market (1986), the completion of the internal market for goods (1993), the introduction of the euro (1999), the adoption of the euro (2002) and the EU expansion in 2004.

As a measure of specialization the share of GDP produced per sector is used. These "sector shares" indicate what kind of economy the European countries have, and how these economies have developed over the years. The data is collected from the Eurostat database and separates GDP into 21 sectors[6] [7]. Generally the biggest sector is manufacturing, averaging 25% of GDP alone. In graphs 1a and b the average distribution for all countries in 1995 and 2010 is shown. Overall the distribution has not changed much, but some sectors have experienced a change. The way GDP is distributed over different sectors in a country depends partly on economic development. Developing countries with low GDP per capita tend to have a larger share of agricultural activities. When the economy starts to develop, the share of the industry sector grows, increasing GDP. In the last decades a new shift is present in highly developed economies, where the service sector gains share and the industry sector loses share. These changes are present in the European economies. The share of the agricultural sector (sector 1) has decreased, as well as the share of the manufacturing sector (sector 3). There is an increase

[6] See table A1 in the appendix
[7] This dataset uses the old definition of the manufacturing sector, meaning that manufacturing services are accounted to the service sectors.

visible in the service sectors, such as information & communication (sector 10) and financial & insurance services (sector 11).

Graph 1a and b: Average GDP distribution in European countries



Because not every sector benefits the same from opening up borders, this study will focus on three sectors; manufacturing, information & communication services and financial & insurance services. The manufacturing industry is chosen because of the decrease in this sector and the opportunities for scale economies that could have added to this decrease. The service sectors are chosen to study if and how economic integration has influenced the increase in these sectors. Not every service will benefit directly from free trade; the service has to be tradable across borders. Information, communication, financial and insurance services provide this characteristic more than local entertainers or health services.

Graphs A1 a to g in the Appendix show the development of these sector shares in per group of countries. The countries have been divided in groups according to their connection to the EU and access to the internal market. Group one consists of the earliest members of the EU; the EU-15, which had access to the internal market from the beginning or very soon after that.

Group two consists of members from the EFTA that have not joined the EU. These countries do have access to the internal market, be it later than 1993 or due to individual arrangements. Group three consists of countries that joined in 2004 or later, mostly Eastern European countries. The data on the manufacturing sector shows a decline in time for all three groups. The decline however is steeper for the EU15 countries than for the EU2004 countries. On average the share in the EFTA countries is lower than in the others. The data on the two service sectors show an increase in their share. In all three groups, the data on communication and information services show a similar pattern; first an increase until the year 2002, then a decrease. The share is the lowest in the EU2004 countries and the highest in the EU15 countries. The economy of Luxembourg is mainly driven by their financial sector, which is much higher than in the other countries. For this reason the Luxembourg data is shown on the right axis of the graph. This also shows that the increase in the share of this sector is higher in Luxembourg than in the other EU15 countries. The EFTA and EU2004 countries have an outlier as well, these are Switzerland and Cyprus.

The collection of data on European countries for the studied period is far for complete. Eurostat has a great database on a comprehensive range of topics, but for a lot of the data it is dependent on national collections. Especially for data prior to 1995 and on the newest EU members, the data is incomplete and inconsistent. A matrix on the data availability for GDP distributions is shown in table A2 in the Appendix. What this shows is that prior to 1995 a lot of the data is missing and data for Malta, Ireland and Liechtenstein are missing altogether.

Because the matter of development of an economy is an important influence on GDP distribution, GDP per capita and GDP growth are added to this study. These variables act as economic indicators and are collected from the OECD database. Another influential factor on GDP distribution is competitiveness. Competitiveness includes many factors that could give a country an advantage that leads to a larger share of a particular industry or sector; favorable labor costs, easy access to capital, a large demand market, etcetera. Given the advantage and the development in this sector, it is expected that this sector will expand its production when new markets can be accessed. For this reason the Balassa index for comparative advantage in Europe for the goods and services is calculated and used in this study. The Balassa index is

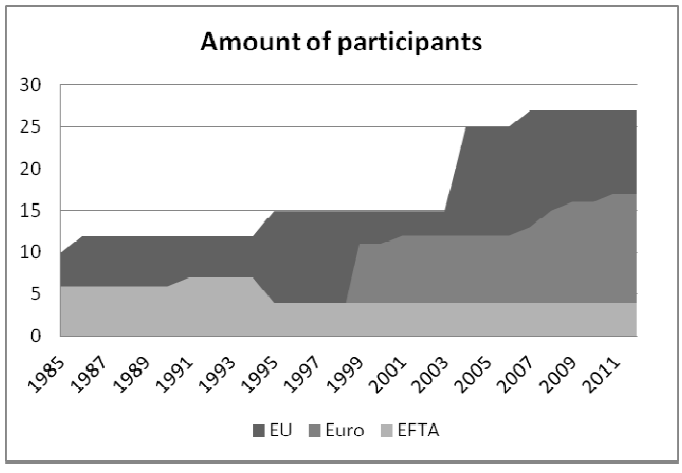
defined as:

$$BI_{ij} = \frac{\frac{Export_{ij}}{Total\ export_i}}{\frac{Export_{aj}}{Total\ export_a}}$$

Where i stands for the country, j for the sector and a for the reference group. Because data on European level is not completely available for the time period the reference group is a group of 5 countries that together resemble the average European economy; France, Spain, the Netherlands, Finland and The UK.

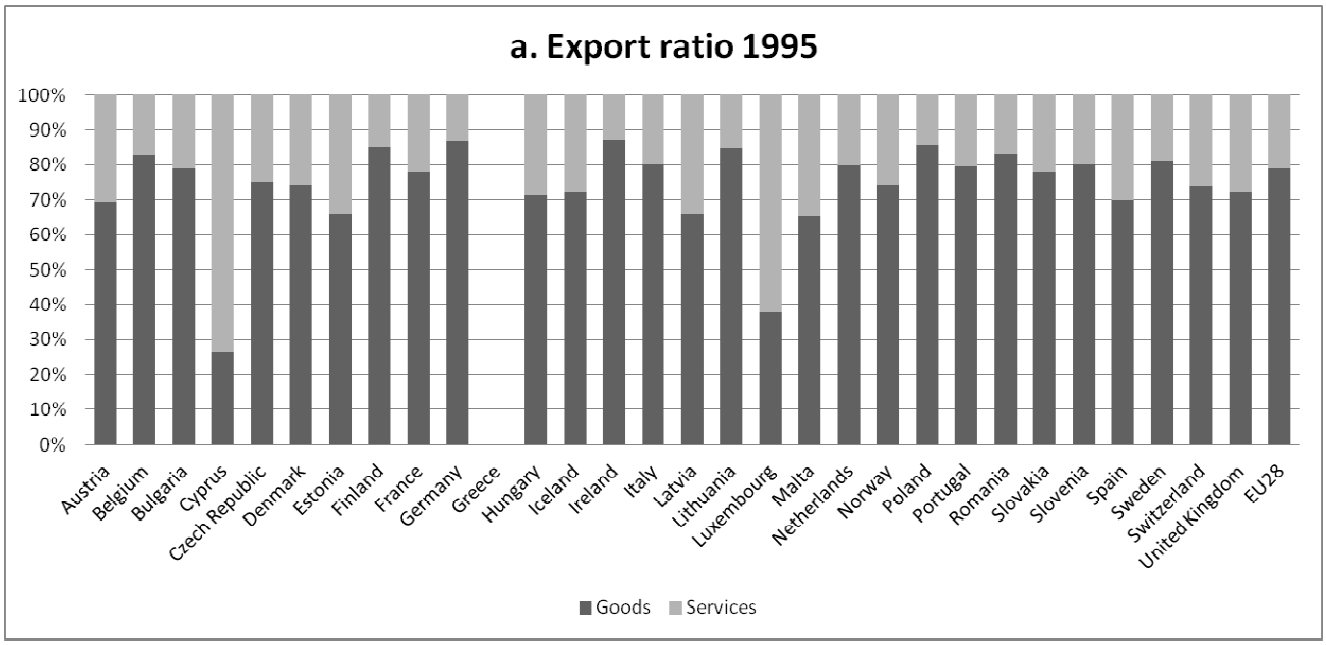
Data on export in goods and services is collected from Eurostat. The ratio between goods and services exports for years 1995 and 2010 is shows in graphs 3a and b. The last column gives the ratio for the EU28 countries; in 1995 approximately 80% of export is goods, in 2010 this has decreased to 75%. Luxembourg and Cyprus have a very low share in goods exports, which is even lower in 2010. Countries that have a high share of goods exports are Germany and Eastern European countries.

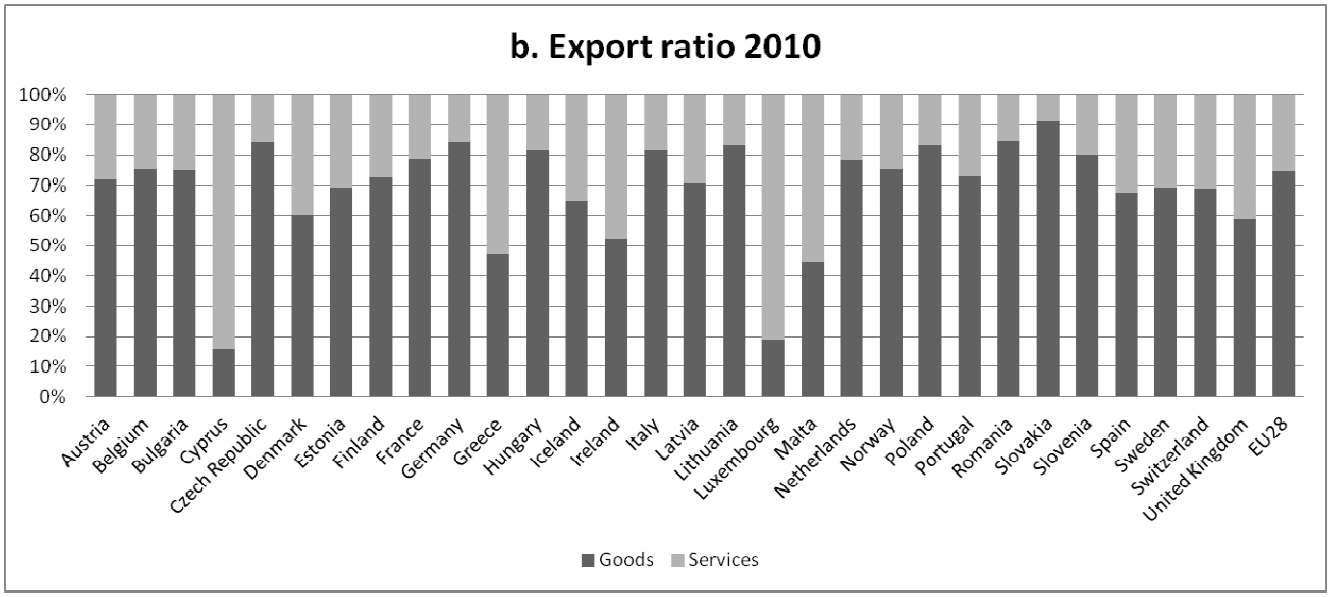
To see how much influence economic integration in the EU has had dummies are added to the study. The first dummy is an indicator of EU membership in a particular year; this will measure the effect of access to the internal market (effective after 1993 when the goods market was completed). The second dummy indicates euro zone membership; this will measure the effect of easier access to the market. Facts and figures considering joining dates and important milestones for the economic integration events are collected from the EU website. A graph on the number of members in European integration unions is shown below.



Graph 2: Amount of participants

Graph 3a and b: Export ratio in 1995 and 2010





METHODOLOGY

The GDP distributions carry a lot of information on their own, though they are not easy to interpret. To capture the distributions per country per year in one number, the Gini coefficient is calculated. The Gini coefficient is defined as a measure of equality and can therefore show how even or uneven GDP in a country is produced. Part 4 of this study will start with an assessment of these Gini coefficients.

The effect of economic integration on sector specialization is estimated using regression analysis with interaction effects. First the effect of the integration events on sector competitiveness is estimated. In this regression the Balassa index for the goods sector is used as dependent variable. Second the effect of integration events on sector shares is estimated. In these regressions the dependent variable is the production share of a sector. The explanatory variables are economic indicators, integration event dummies, time period fixed effects and country fixed effects. The event dummies are interacted with country dummies to isolate the integration effect for different countries.

The country fixed effects account for any pre-existing differences between countries. The period fixed effects account for the general time trend in the data that is country invariant. By doing this, any variation in the data caused by time or specific countries is eliminated. During the time period 1985 until 2012 there are two integration shocks. Firstly the implementation of the European Single Market in 1993, and second the adoption of the common currency in 2002. The ESM was created with trade in mind, reducing trade costs and barriers between countries. The euro also makes trade easier, and eliminates exchange rate risk which makes trade less costly than before. For these two events dummies are used.

PART 4: DISTRIBUTION ANALYSIS

The distributions of GDP in European countries have changed between 1985 and 2012, as can be seen in graphs 1a and b. This section takes a closer look at the GDP distributions and studies the changes in more detail. It will look at the effects of the before mentioned economic integration events on specialization, starting with some expectation.

Timing and effects of integration events on European market

The completion of the internal market did not happen overnight. The process started in 1986 and only the market for goods was completed in 1993. Any year between 1986 and 1993 could have been crucial in opening up the trade market. Looking at specialization and trade, the most important factor is the costs of trade and the ease of trading. For this reason, the crucial moment in time would be the when the physical borders were abolished and transport of goods became easier and cheaper.

The union between the EFTA and EU countries did have a specific start date; when the EEA was established in 1994. From that moment on, the physical borders were removed, and these countries could all benefit from the enlargement of the market. Some of the EFTA countries joined the EU a year later, which might have had an effect as well.

The euro made trade easier and cheaper again. Using the same currency made exchange rate risk insurance abundant and thereby trade less costly. The physical euro was available in 2002, but it was possible to trade in euros from 1999. This means there are two dates that are important for this event.

The expansion of 2004 again had a clear start date. It should be noted that similar to the completion of the internal market companies were preparing for this event in advance. The effect of this event therefore could have started a couple years before 2004, and lasted for some years after. In the years following 2004, several countries adopted the euro. This could also have had an effect on their economies.

Effect for different European countries

Every event had two effects; the lowering of trade costs and the enlargement of the market. It depends on the participation of a country whether and when it received the benefits of the events. The founding fathers of the EU join in every step of the way, and should feel the effect of all events. But for instance the UK, who opted out of some of the events, should feel a lesser effect. The adoption of the euro has a start date of 2002 for twelve countries, but the euro zone expanded thereby extending the effect to later years.

For the distribution analysis data from all countries will be compared to see whether the events have had the same effect in different countries. It is wise to keep in mind that integration is not the only force at work here. During the period from 1985 and 2012 there is general economic development to account for. Some countries are transitioning from industry economies to service economies, but it is also possible that some countries – like the Eastern European countries – might still be transitioning to an industry economy. Another event to account for is the dotcom bubble (1997-2000, and aftermath), and the economic crisis (2007-2012), these will have an effect too. Lastly, it is possible that countries experienced unique shocks.

GINI COEFFICIENT ANALYSIS

When a country is specializing in a specific sector it will increase this share and decrease the share of other sectors. The degree of specialization will be captured by a Gini coefficient. A Gini coefficient can take any number between 0 and 1; 0 indicates that the distribution is fairly equal, 1 indicates that the distribution of GDP in a country is completely skewed. The higher the specialization index is, the further the actual distribution from an even distribution. This indicates that more of GDP is produced by a low percentage of sectors. All of the economies are unevenly distributed because in most countries the main share of GDP is produced by one or two sectors. The Gini coefficient is calculated for every country for every year. The table below shows the average coefficient per country for the period 2000 to 2010 (these years have data for every country), divided in a high, medium and low category. Countries with a * have a high

deviation from the mean, indicating a strong trend or heavy fluctuations. Countries with ** have a low deviation from the mean, indicating slow trend or steady Gini coefficients.

Table 1: Gini coefficients

High coefficient	Medium coefficient	Low coefficient
Luxembourg 0.68*	Belgium 0.54	Austria 0.49**
Slovakia 0.60	Romania 0.54	Portugal 0.48*
Czech 0.57**	Poland 0.53	Norway 0.47
Lithuania 0.56	Estonia 0.53*	Denmark 0.46
Switzerland 0.56**	Bulgaria 0.53	France 0.46
Hungary 0.56	Italy 0.53	Greece 0.46*
Finland 0.56*	Germany 0.53	The Netherlands 0.45**
Slovenia 0.55	Sweden 0.52	Iceland 0.45**
	Latvia 0.51	Cyprus 0.45
	Spain 0.51*	The UK 0.42

On average the Gini coefficient lies around 0.5, coefficients above 0.55 are considered more specialized, and below 0.5 are considered more diverse. Not surprisingly Luxembourg has the highest Gini coefficient; most of GDP in Luxembourg is produced in the financial sector. Also in the high category are most of the Eastern European countries. These countries' economies are still mainly driven by the manufacturing sector, resulting in high Gini coefficients. The average share of the largest sector in these countries is 34%. The countries with low Gini coefficients comprise of small economies and countries in an advanced stage of transition to a service economy. The latter economies show a lowering share in the manufacturing sector and an increase in sectors like information & communication, financial services and education. The average share of the largest sector in these countries is 21%. In the middle category this is 28%. The stable (**) and volatile (*) countries are divided over the three categories. The high category has both, the medium category only volatile countries, and the low category more stable than volatile countries.

Just knowing which countries are more specialized than others is not really enough to say something about the trend over the years. Therefore, the coefficients of every country are separately studied to see if there is a general trend visible in the data. This gives the next table.

Table 2: Gini coefficient trends

Specialization trend	**Steady or fluctuating trend**		**Diversification trend**	
Luxembourg	Lithuania	Estonia	Romania	Denmark
Slovakia	Switzerland	Germany	Belgium	France
Czech	Hungary	Sweden	Italy	Greece
Slovenia	Finland	Spain	Bulgaria	Netherlands
	Poland		Latvia	Iceland
			Austria	Cyprus
			Portugal	UK
			Norway	

Most of the countries show a trend towards diversification. That means their GDP is produced more evenly across sectors. This is not really an indicator of specialization, but rather a "we all specialize out of manufacturing" trend that comes with the transition from industry to service economy. There are also a lot of countries that lack a clear trend. These are either very steady over the years, or show both upward and downward movements which makes it hard to classify them properly.

Combining table 1 and 2 gives a general idea of the development in Gini coefficients over the years.

Table 3: Gini coefficient overview

Coefficient/Trend	Specializing	Trendless/Fluctuating	Diversifying
High	Luxembourg 0.68* Slovakia 0.60 Czech 0.57** Slovenia 0.55	Lithuania 0.56 Switzerland 0.56** Hungary 0.56 Finland 0.55*	
Medium		Poland 0.53 Estonia 0.53* Germany 0.53 Sweden 0.52 Spain 0.51*	Belgium 0.54 Romania 0.54 Bulgaria 0.53 Italy 0.53 Latvia 0.51
Low			Austria 0.49** Portugal 0.48* Norway 0.47 Denmark 0.46 France 0.46 Greece 0.46* Netherlands 0.45** Iceland 0.45** Cyprus 0.45 UK 0.42

Findings

All of the countries that show a specialization trend have high Gini coefficients. In this box, there is one stable and one volatile country. None of the steady or fluctuating countries have a low Gini coefficient. In this box, there is one stable and three volatile countries. None of the diversifying countries have a high Gini coefficient. In this box, there are two volatile and three stable countries. None of the countries with a high Gini coefficient show a diversifying trend. In this box, there are two stable and two volatile countries. None of the countries with a medium Gini coefficient show a specialization trend. In this box, there are two volatile countries. All of the countries with a low Gini coefficient show a diversifying trend. In this box, there are two volatile and three stables countries.

These findings indicate that specialized countries keep specializing. If a country has an average or more even GDP distribution they are less likely to start specializing. They are more likely to diversify more. The findings also suggest that the diversifying low Gini countries are generally more stable than the other countries.

Effects of economic integration events

The Gini coefficients allow for further investigation of the effect of integration polices. The results are shown in graphs A3 a to d in the appendix. The first effect that is tested is the effect of the internal market on the elder countries. The countries with the most data are France (from 1985), The Netherlands (from 1989) and Germany (from 1990). The time period to study is 1985 to 1998; this includes all years in the period of completing the internal market and five years after the completion to allow for delayed effects.

These three countries show a similar pattern; diversification. The Gini coefficient decreases for all countries. The Gini coefficient of France and Germany does show a dip in 1993, after which the coefficient remains quite steady. After 1993, all three countries follow the same pattern. It is not clear that the completion of the internal market changed the composition of GDP in these countries much.

The effect of the internal market is also studied with the data from countries that did not experience the build up from 1986. The countries of the EFTA joined soon after the completion, but their event was more of a shock because of the obvious lack of transition period. There are two events to consider; the creation of the EEA and the transition from EFTA to EU by some countries.

The graphs of Finland and Sweden are similar. Both show a specialization trend with a peak in 1995. This could be due to the EEA in 1994 or their joining of the EU in 1995. Sweden goes steady after 1995, Finland specializes more. Austria shows diversification until 1993, after which it stays steady; there is no evidence of a shock from the integration events. Norway is

different in a way; its graph is very steady until 1997, with a slight dip in 1995 (or a peak in 1996).

The effect of the creation and adoption of the euro will be studied during the period 1997 – 2005. This includes the creation, the implementation in 1999, the adoption in 2002 and the aftermath. The selected countries are again; France, Germany and the Netherlands. The effect of the entrance of the euro in 1999 is hard to assess, because the internet bubble crisis occurred around the same time.

Looking at the graph, a couple things stand out. For one, a unique effect of the euro is not visible. The year 1999 seems only different in Germany. The year 2000 does show a difference, but this could be due to the dotcom bubble too. Again only Germany is affected in the year 2002. The effect could have been delayed in France and The Netherlands, since they experience a drop in 2003.

Finally, the effect for late entrants. This will be interesting from 2000 on, to include transition, adoption and adjustment period. There might be a difference in the effect for countries that will later (but before 2010) adopt the euro or not.

There are three countries included in this graph, two joined the EU in 2004 and also adopted the euro later on. Bulgaria joined the EU in 2008. The time period in this graph also includes the economic crisis; this effect is clearly visible in 2009. Bulgaria and Slovenia recover, but Cyprus does not. There is no effect visible in 2004 or 2008 for the EU event. Slovenia adopts the euro in 2007; the coefficient is less straight around this period. You could say that Cyprus also shows a little bump before 2008, the year they adopted the euro, but it is very small.

PART 5: REGRESSION ANALYSIS

As mentioned before the estimation will include economic indicators, event indicators and fixed effects. The analysis of the GDP distributions has shown that economic development is important for sector shares, for this reason GDP per capita is included in the estimation. The Balassa index for comparative advantage in goods or services export is also included. When trade barriers are lowered it is expected that exports rise, in particular for the sectors that had a comparative advantage to begin with. This idea is supported by the Gini analysis that showed that specialized countries have a tendency to specialize further. This is also important for the event dummies effect. If only the event dummies were included it would limit the events to have the same effect for every country. To account for different effects an interaction effect is added. This makes the estimations as follows:

$$\ln(BI_{j,t,c}) = c + \alpha \ln(GDP_{c,t}) + \gamma_c[\text{country} * EEA_{t,c}] + \delta_c[\text{country} * Euro_{t,c}] + \varphi_c CFE + \tau_t PFE + \varepsilon$$

$$\ln(sector\ share_{i,t,c}) = c + \alpha \ln(GDP_{c,t}) + \beta \ln(BI_{j,t,c}) + \gamma_c[\text{country} * EEA_{t,c}] + \delta_c[\text{country} * Euro_{t,c}] + \varphi_c CFE + \tau_t PFE + \varepsilon$$

with *i* for the sector, *t* for the year, *c* for the country and *j* for export sector, CFE for country fixed effects, PFE for period fixed effects and ε for the error term. The event dummies stand for either access to the European Economic Area (EEA) or whether a country uses the Euro (Euro). To account for autocorrelation the residuals have been included in the estimations.

Table 4: Estimation results

Dependent variable:		*Balassi index for goods*		*Manufacturing sector*		*Communication and information sector*		*Financial and insurance sector*	
Variable		***Coefficient***	***P-Value***	***Coefficient***	***P-Value***	***Coefficient***	***P-Value***	***Coefficient***	***P-Value***
Constant		0,102	0,556	4,109	0,000	0,442	0,120	1,104	0,013
ln GDP per capita		-0,015	0,457	-0,068	0,008	0,097	0,001	0,034	0,455
Balassi index				0,468	0,000	0,082	0,009	0,006	0,899
Interaction effects									
*EEA **	*AUT*	0,073	0,088	-0,069	0,187	0,002	0,970	-0,059	0,532
	BEL								
	BGR	0,061	0,104	0,138	0,000	0,248	0,000	0,306	0,000
	CYP	-0,215	0,000	-0,077	0,041	0,057	0,178	0,081	0,217
	CZE	0,154	0,000	0,112	0,000	0,091	0,012	0,024	0,674
	DNK	-0,015	0,655	-0,038	0,513	-0,078	0,245	-0,027	0,800
	EST	0,097	0,011	0,023	0,498	-0,023	0,557	0,143	0,020
	FIN	0,033	0,440	0,135	0,010	-0,073	0,227	-0,046	0,629
	FRA	0,049	0,238	-0,024	0,641	-0,103	0,090	-0,199	0,036
	GER	0,021	0,724	-0,093	0,151	-0,054	0,476	0,032	0,786
	GRE								
	HUN	0,145	0,000	0,108	0,000	-0,001	0,988	0,091	0,099
	ICE								
	ITA	0,045	0,399	0,008	0,917	-0,049	0,589	-0,031	0,829
	LAT	0,144	0,000	-0,087	0,009	-0,172	0,000	-0,041	0,495
	LIT	0,077	0,035	0,208	0,000	-0,151	0,000	0,176	0,003
	LUX								
	NLD	-0,401	0,000	-0,033	0,556	-0,016	0,802	0,072	0,473
	NOR	0,009	0,827	-0,105	0,028	-0,125	0,024	-0,255	0,003
	POL	0,145	0,000	0,158	0,000	0,020	0,565	0,111	0,041
	POR	0,107	0,002						
	ROM	0,038	0,337	-0,004	0,904	0,016	0,705	-0,091	0,155
	SPA	0,066	0,281						
	SVK	0,150	0,000	0,165	0,000	0,027	0,525	0,105	0,119
	SVN	0,052	0,267	0,043	0,280	0,114	0,014	0,012	0,863
	SWE	0,025	0,462	0,177	0,007	-0,007	0,931	-0,301	0,011
	SWS	0,054	0,109						
	UKD	-0,039	0,251						
*EURO **	*AUT*	0,088	0,022	0,060	0,068	0,013	0,725	-0,107	0,074
	BEL	0,009	0,827	0,015	0,677	0,064	0,114	0,020	0,748
	CYP	0,043	0,371	-0,101	0,012	0,111	0,017	0,176	0,015
	EST	0,073	0,205	0,020	0,672	-0,024	0,671	-0,140	0,108
	FIN	-0,029	0,444	0,061	0,057	-0,002	0,961	-0,196	0,001
	FRA	0,069	0,059	-0,053	0,089	-0,068	0,061	-0,072	0,202
	GER	0,045	0,222	0,119	0,000	-0,064	0,083	0,089	0,122
	GRE	0,106	0,155	-0,084	0,175	0,195	0,007	-0,202	0,073
	ITA	0,080	0,027	-0,012	0,700	-0,062	0,083	0,145	0,010
	LUX	-0,427	0,000	-0,237	0,000	-0,266	0,000	0,273	0,000
	NLD	0,058	0,107	-0,021	0,488	0,044	0,214	0,149	0,007
	POR	0,001	0,981	-0,069	0,047	-0,142	0,001	0,215	0,001
	SPA	0,030	0,400			-0,032	0,421	-0,101	0,104
	SVK	0,057	0,242	0,007	0,853	0,089	0,065	0,004	0,960
	SVN	0,010	0,844	-0,041	0,324	0,088	0,072	-0,002	0,980
R-squared		0,955		0,968		0,921		0,972	
Durbin-Watson stat		1,697		1,924		1,479		1,586	
Observations:		687		543		548		548	
Method:		Panel least squares		Panel least squares		Panel least squares		Panel least squares	
Sample:		1985 - 2012		1985 - 2012		1985 - 2012		1985 - 2012	
Periods included:		28		28		28		28	
Cross-sections included:		30		28		28		28	

Results

When discussing the results the sectors will be abbreviated to communication (instead of information & communication) and financial (instead of financial & insurance) sector for convenience.

The estimation results are shown in table 4. The first column represents the results for the Balassa index for goods estimations. The coefficient for GDP per capita is not significant for competitiveness in the goods sector, indicating that both developing and developed countries can have an advantage in this field. More interesting are the interaction effects below. These show that most countries experienced a positive effect on their comparative advantage after joining the EEA. A significant effect is visible for most Eastern European countries plus Austria. Graphs 1a and b showing the export ratio confirm that these countries also increased their goods exports. Countries with a larger share in the service sector show a negative effect from EEA; Cyprus and the Netherlands, indicating that the EEA has stimulated these countries to pursue services instead of goods. Adopting the euro has lead to a significantly positive effect for Austria, France and Italy and a negative effect for financial country Luxembourg. These results indicate that besides general time and country trends, the integration events have had an effect on exports in some European countries.

The next three columns show the estimations for the three studied sectors. As expected higher GDP lowers manufacturing share and increases communication share significantly. This follows the general economic trend that when countries become richer, their economies convert from industry- to service economies. The Balassa index for respectively goods and services shows a positive effect for manufacturing and communication as well. This is expected too; a higher comparative advantage increases production in a certain sector. These variables are not significant in the estimation for the financial sector. The next sections will discuss the interaction effects.

Bulgarian shares are all significantly positive, indicating that EEA access did not stimulate specialization in one of these sectors but increased production in all of them. The same is true for Czech Republic. Closer looks at the GDP distributions reveal that in these cases the shift is at

the cost of the agricultural sector. Hungary, Lithuania and Poland also show a significantly positive effect for the manufacturing and financial sector after EEA access. The effect for the communication sector is not significant in these cases. Latvia is the only Eastern European country that shows a negative effect for all three sectors, indicating that the Latvian economy is dominated by other sectors than these three. Estonia, Slovakia and Slovenia did not only become EU members, they also adopted the euro during the studied period. Estonia shows only a significantly positive effect for the financial sector after EEA access, leaving it unclear what effect integration events truly have had on the Estonian economy. Slovakia presents a positive effect after EEA access for the manufacturing sector, and for the communication sector after euro adoption. Slovenia shows a significantly positive effect for the communication sector after both EEA access and euro adoption. As for Estonia, the other coefficients are not significant making it hard to draw definite conclusions for these countries.

The estimations indicate that after Greece adopted the euro its communication share significantly increased, but their financial share decreased. Cyprus is one of the countries that show the general shift from manufacturing to service sectors. For both EEA and euro events the signs indicate that Cyprus is decreasing manufacturing production in favor of communication and financial services.

The coefficients for Austria are not significant for EEA access, but show a positive sign for manufacturing share and a negative sign for financial share for the euro dummy. Austria seems to follow the opposite of the general economic trend; a shift into manufacturing and out of services. Finland and Sweden show a similar shift into the manufacturing sector and out of the financial sector. Finland has a positive coefficient for both EEA access and euro adoption for manufacturing and a negative effect for the financial sector after the euro introduction. Sweden shows the same effect after EEA access. Of all Scandinavian countries Norway is the only country that shows significantly negative effects for all three sectors after EEA access. Like Latvia, it is likely that Norway has another important sector.

Most of the Western European countries show negative signs for manufacturing and communication share but positive signs for financial share. EEA access only gives significant

effects for France, these are the same as for Norway; a negative effect in all sectors (though not significant in the manufacturing estimation). The introduction of the euro does give significant effects. Contradictory to the other Western European countries, the German economy shows a significantly positive effect of euro adoption on manufacturing share. The negative effect is present for France, Luxembourg and Portugal. The communication share is significantly decreasing for France, Germany, Italy, Luxembourg and Portugal. After the euro adoption the financial sector is growing, with a significantly positive effect in Italy, Luxembourg, The Netherlands and Portugal.

Interpretation

The first issue about the estimation results that stands out is the low amount of significant coefficients for the effect of access to EEA for the oldest members. There are two possible reasons for this matter. The first is that the time period that is studied might be too short to really capture the change in sector shares. It is already mentioned that the process of completing the internal market began in 1986, but the EEA dummies are set to 1 from 1993 on. The results indicate that compared to the data before 1993, there is no significant change in sector shares; no significant effect from abolishing the physical borders. The other reason is the amount of available data. There are observations for multiple countries before 1993, but the dataset is nowhere near complete. The countries that do have data[8] are in fact the countries that have a significant coefficient, though not for every sector.

This issue is not a problem for the great EU expansion of 2004. For almost every country there is data available from 1995 on the effect of access to EEA is clearly visible. Looking at the trends that were visible in the Gini coefficients analysis, it can be said that access to EEA has been a factor in these developments. Czech Republic and Slovakia for instance had a high Gini coefficient, and showed a specialization trend. This trend is visible in the effects after receiving access to the EEA. EEA access has a significantly positive effect on manufacturing share. On the other hand, Latvia and Cyprus are present in the list of diversifying countries. This is also reflected in the estimation results. After receiving access to the EEA, these countries reduced

[8] Finland, France, Norway

their manufacturing share significantly; diversifying into other (not necessarily communication or financial) sectors. The last country that stands out is Bulgaria. Bulgaria joined the EU in 2007, and showed a diversifying trend in the Gini analysis. The difference between Bulgaria and most of the other countries is that Bulgaria is still transitioning from an agricultural economy to a manufacturing economy. The estimation results show that access to EEA has had a positive effect on this transition, even increasing the manufacturing and service sectors at the same time.

The coefficients for interaction effects with the euro dummies give some insight in the changes in GDP distributions after the year 2000. The negative effects for communication share might be linked to the dotcom crash and give indication that after this event the production in the communication sector decreased. This decrease in the Western European countries has been picked up by Greece and the countries that adopted the euro later than 2002. After the euro adoption the financial sector grows in Western European countries. The 00s were the decade for the financial sector all over the world, and it shows that the euro has increased this trend in several European countries.

PART 6: CONCLUSIONS

There are several trade theories that connect trade and specialization. These theories say that countries will specialize because of a number of reasons. The most recent theories are the new trade theory and the new economic geography theory. The new trade theory focuses on scale economies, transportation costs and access to large markets. It states that when scale economies are possible, production clusters in one location. Transportation costs on the other hand encourage production to locate near the largest markets. According to this theory countries will specialize in the goods with the largest domestic demand. The new economic geography theory explains trade and specialization according to concentration and agglomeration forces. Firms benefit from being located near each other, thereby changing the regional economy. When the regional economies change too much, the firms relocate to reduce competition for immobile factors.

The major – more recent – economic integration policies that have been implemented in Europe are the completion of the internal market in 1993 and the introduction of the single European currency in 2002. The internal market program was implemented to strengthen the European economy. The single market was meant to make trade between European Union countries easier. By 1993, the EU had 12 members that participated in the internal market. In 1994 the European Economic Area was created, which connected the EU economies with the EFTA economies. The EU has expanded to 25 members in 2004, to 27 in 2007, and to 28 in 2013. The single currency, the euro, was the next step towards a stronger European economy. The euro was formally introduced in 1999, and officially in 2002 in 12 EU countries. By 2012 the euro was the official currency in 17 EU countries (now 19 countries).

The average European distribution of GDP has not changed much between 1995 and 2010. The biggest changes are the decrease in the share of the manufacturing sector, and the increase in information & communication and financial & insurance sectors. This can be described as general economic development. This is the trend countries follow when their economies develop; it is the transition from agricultural economy to manufacturing economy to service

economy. The individual country distributions are captured in a Gini coefficient to examine them more closely. This analysis shows that countries with a high Gini coefficient tend to display the trend to specialize over the years. Many countries in the EU however show a diversifying trend in GDP distributions, these countries tend to have a low Gini coefficient. The diversifying trend also follows the general economic development. In most countries manufacturing is the largest sector, which is now losing share in favor of service sectors.

The economic integration policies have had a positive effect on the Balassa index. The BI indicates the degree of comparative advantage in the goods sector. By joining the EU and/or adopting the euro, the comparative advantage in goods has increased for most European countries. This is true for countries that relatively export more goods than services. Countries that relatively export more services than goods show a negative effect for the BI for goods. We believe this is because of preexisting comparative advantages that are strengthened by the integration events.

Countries that experienced an increase in their comparative advantage for goods also show an increase in their manufacturing share. This effect is expected because these countries benefit from their increased comparative advantage and therefore increase the production in this sector. There are two countries that do not show a positive effect for manufacturing, these are Latvia and France. We believe this is because the goods sector consists of more than manufactured goods, and these two countries clearly have an advantage in another good sector.

The general idea is that due to increased economic integration countries specialize in different sectors. To account for these differences an interaction effect is added to the regression analyses. This way the regression results show country specific integration effects. The effects for EEA are mostly significant for the Eastern European countries. We believe this is due to two reasons. Firstly, the data on the Eastern European countries is more complete, giving a more comprehensive view on the shares before and after EU membership. Secondly, the EU membership effect has posed as more of a shock to the system to these countries than it was to the oldest EU members. The oldest EU members were already integrated before the completion

of the internal market. These countries also had time to prepare for the introduction of the euro; however the effect of this event on the sector shares does show significant results.

The access to EEA has a positive effect on the share of manufacturing in most of the Eastern European countries. This indicates that these countries increase their manufacturing share at the cost of another sector. Some of these countries show a decrease in communication share, but this is not the most important sector that loses share. The Eastern European countries are transitioning into a manufacturing economy out of agriculture. Some also show an increase in the financial sector, indicating that they are also increasing production in services.

Other countries with significant results for EEA access are Cyprus, Finland, France, Norway and Sweden. These countries show mostly negative effects in the shares of these sectors as a result of EEA access. We believe that this is due to increases in other sectors than the studied ones.

The euro introduction has mostly a negative effect on manufacturing share, indicating that the euro zone countries are specializing in other sectors than manufacturing. The communication shares a decreasing as well in the Western European countries. Greece, Cyprus, Slovakia and Slovenia do show a significant increase in this sector. The Western European countries do increase their share in the financial sector after the adoption of the euro. Luxembourg in particular significantly increases in the financial sector and decreases in the other two sectors after the euro introduction. This is a clear sign of specialization. Austria, Finland and Greece reduce production in the financial sector, but Austria shows an increase in manufacturing share for both EEA and euro effect. This indicates that Austria is specializing more in the manufacturing sector after EU membership and euro adoption.

To summarize, there are specialization patterns visible in the regression estimations. The Eastern European countries specialize into the manufacturing sector and some into service sectors after EU membership. The EU membership is increasing economic development in these countries. The Western European countries show specialization patterns following the euro introduction. Most of the countries specialize out of manufacturing into other sectors, such as the financial sector. The communication sector is not a sector the Western European countries specialize in.

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APPENDIX

Table A5: List of sectors

Number	Sector
1	Agriculture, forestry and fishing
2	Mining and quarrying
3	Manufacturing
4	Electricity, gas, steam and air conditioning supply
5	Water supply; sewerage, waste management and remediation activities
6	Construction
7	Wholesale and retail trade; repair of motor vehicles and motorcycles
8	Transportation and storage
9	Accommodation and food service activities
10	Information and communication
11	Financial and insurance activities
12	Real estate activities
13	Professional, scientific and technical activities
14	Administrative and support service activities
15	Public administration and defence; compulsory social security
16	Education
17	Human health and social work activities
18	Arts, entertainment and recreation
19	Other service activities
20	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
21	Activities of extraterritorial organisations and bodies

Graph A1: Observations divided by sector and country group

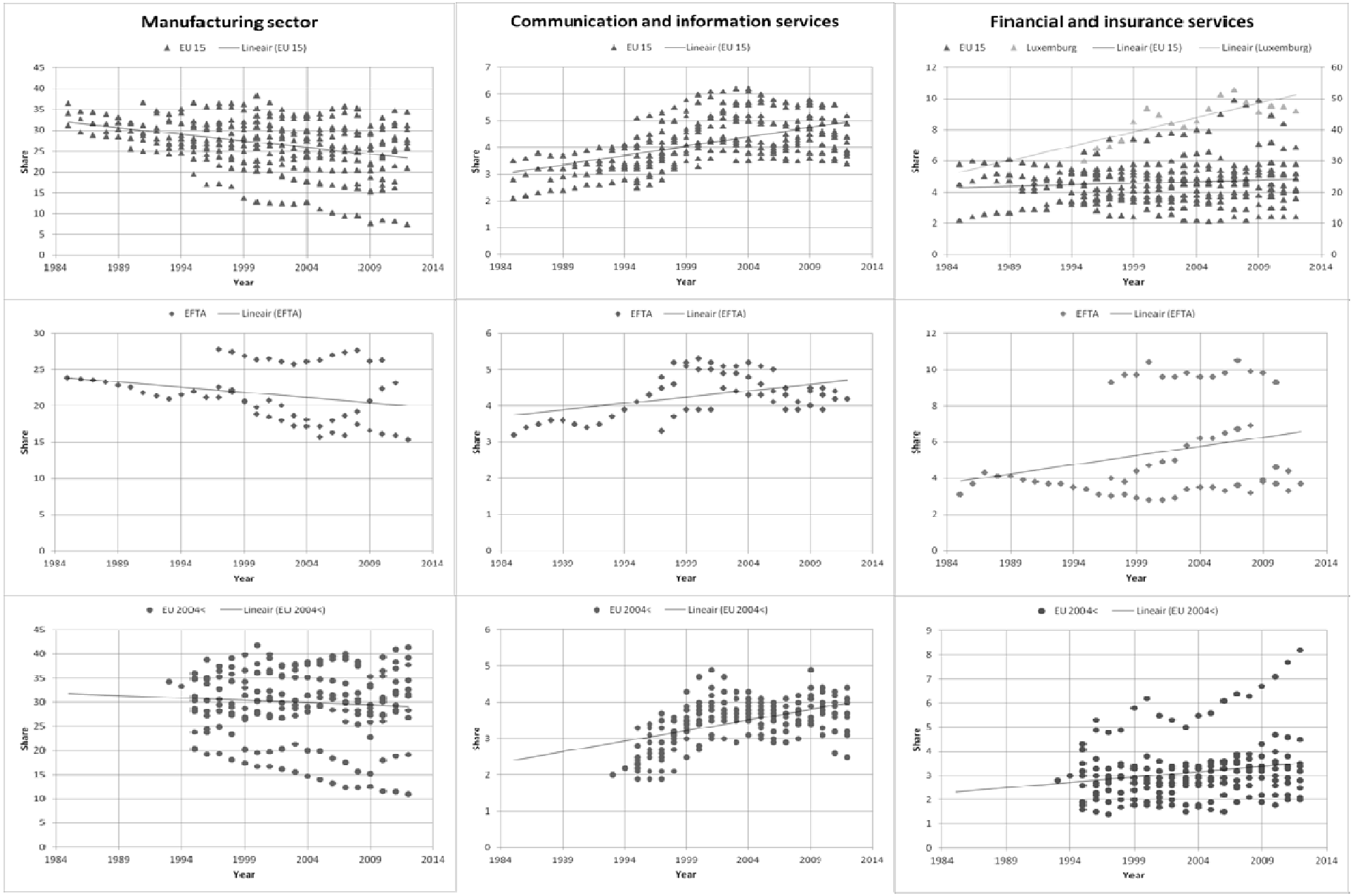

Table A2: Observation matrix

Country/year		*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	**Total**
EU15	*Austria*	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**28**
	Belgium											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
	Denmark						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			**21**
	Finland	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**28**
	France	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**28**
	Germany							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**22**
	Greece											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		**17**
	Ireland																													**0**
	Italy								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**21**
	Luxembourg											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
	Netherlands				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**25**
	Portugal											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		**17**
	*Spain**											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
	Sweden									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		**19**
	United Kingdom											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		**17**
EFTA	*Iceland*													X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		**15**
	Liechtenstein																													**0**
	Norway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**28**
	Switzerland													X	X	X	X	X	X	X	X	X	X	X	X	X	X			**14**
EU27	*Bulgaria*											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
	Cyprus											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
	Czech Republic									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**20**
	Estonia											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
	Hungary											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
	Latvia											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
	Lithuania											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
	Malta																													**0**
	Poland											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
	Romania												X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**17**
	Slovakia											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
	Slovenia											X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	**18**
TOTAL		**4**	**4**	**4**	**5**	**5**	**6**	**7**	**8**	**10**	**10**	**25**	**26**	**28**	**28**	**28**	**28**	**28**	**28**	**28**	**28**	**28**	**28**	**28**	**28**	**28**	**28**	**26**	**21**	**553**

* For Spain the manufacturing share data is not available before 2000. This means the amount of observations for Spain is 13, and total is 548.

Table A3: Gini coefficients

Country/Year	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*
Austria	0,54	0,53	0,52	0,53	0,53	0,52	0,52	0,51	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,49	0,49	0,49	0,49	0,50	0,50	0,48	0,48	0,49	0,49
Belgium											0,56	0,55	0,55	0,55	0,55	0,56	0,55	0,54	0,54	0,54	0,55	0,55	0,55	0,54	0,51	0,52	0,53	0,52
Denmark						0,50	0,49	0,49	0,49	0,49	0,49	0,49	0,48	0,48	0,47	0,48	0,47	0,47	0,46	0,46	0,46	0,46	0,47	0,46	0,44	0,44		
Finland	0,58	0,57	0,56	0,56	0,56	0,55	0,53	0,53	0,53	0,55	0,56	0,56	0,57	0,57	0,57	0,58	0,57	0,56	0,55	0,55	0,56	0,56	0,56	0,56	0,52	0,52	0,52	0,52
France	0,51	0,50	0,50	0,50	0,50	0,50	0,49	0,49	0,48	0,48	0,48	0,47	0,48	0,48	0,47	0,48	0,47	0,47	0,46	0,46	0,46	0,46	0,46	0,46	0,44	0,44	0,44	0,44
Greece											0,53	0,53	0,52	0,51	0,50	0,48	0,48	0,47	0,47	0,47	0,45	0,45	0,46	0,46	0,42	0,43	0,43	
Germany							0,55	0,54	0,52	0,52	0,53	0,52	0,52	0,52	0,52	0,53	0,53	0,52	0,52	0,52	0,53	0,54	0,54	0,54	0,50	0,51	0,53	0,52
Italy								0,54	0,54	0,55	0,56	0,55	0,55	0,55	0,54	0,54	0,54	0,54	0,53	0,53	0,53	0,53	0,54	0,53	0,50	0,51	0,51	0,51
Luxembourg											0,61	0,63	0,63	0,64	0,67	0,69	0,67	0,65	0,65	0,66	0,68	0,70	0,71	0,69	0,66	0,68	0,68	0,67
Portugal											0,52	0,52	0,53	0,52	0,51	0,51	0,51	0,50	0,50	0,49	0,48	0,48	0,48	0,47	0,45	0,46	0,46	
Spain																0,52	0,52	0,53	0,53	0,52	0,53	0,53	0,52	0,50	0,47	0,46	0,46	0,46
Sweden									0,50	0,52	0,53	0,52	0,52	0,52	0,52	0,53	0,53	0,52	0,52	0,52	0,52	0,52	0,52	0,52	0,50	0,50	0,50	
The Netherlands				0,50	0,50	0,50	0,48	0,48	0,47	0,47	0,47	0,47	0,47	0,47	0,47	0,47	0,46	0,45	0,45	0,45	0,46	0,45	0,46	0,45	0,44	0,45	0,46	0,46
United Kingdom											0,46	0,45	0,46	0,45	0,45	0,44	0,44	0,43	0,42	0,42	0,42	0,42	0,42	0,41	0,41	0,41	0,41	
Iceland													0,49	0,48	0,46	0,46	0,46	0,45	0,44	0,45	0,44	0,45	0,45	0,45	0,44	0,44	0,45	
Norway	0,51	0,49	0,48	0,48	0,48	0,48	0,48	0,47	0,47	0,47	0,47	0,48	0,48	0,47	0,46	0,48	0,48	0,46	0,46	0,47	0,48	0,49	0,49	0,50	0,46	0,46	0,47	0,47
Switzerland													0,56	0,56	0,56	0,56	0,56	0,55	0,55	0,55	0,56	0,56	0,57	0,57	0,55	0,55		
Bulgaria											0,55	0,55	0,61	0,55	0,55	0,54	0,55	0,53	0,53	0,54	0,54	0,55	0,55	0,54	0,50	0,50	0,52	0,52
Cyprus											0,50	0,49	0,49	0,48	0,47	0,46	0,46	0,46	0,45	0,45	0,45	0,45	0,45	0,45	0,43	0,41	0,40	0,39
Czech									0,54	0,53	0,54	0,54	0,55	0,55	0,55	0,56	0,57	0,56	0,56	0,57	0,57	0,58	0,58	0,57	0,54	0,56	0,56	0,57
Estonia											0,55	0,53	0,55	0,55	0,53	0,56	0,56	0,55	0,54	0,55	0,55	0,54	0,53	0,51	0,48	0,50	0,52	0,52
Hungary											0,53	0,54	0,56	0,56	0,57	0,58	0,57	0,55	0,55	0,55	0,55	0,56	0,56	0,55	0,53	0,55	0,57	0,57
Latvia											0,53	0,53	0,55	0,54	0,52	0,51	0,52	0,52	0,53	0,52	0,52	0,52	0,52	0,49	0,49	0,50	0,51	0,52
Lithuania											0,59	0,59	0,57	0,56	0,54	0,56	0,56	0,55	0,55	0,57	0,57	0,57	0,56	0,57	0,54	0,57	0,59	0,60
Poland											0,57	0,56	0,56	0,55	0,54	0,53	0,52	0,52	0,53	0,54	0,54	0,55	0,55	0,54	0,53	0,53	0,55	0,54
Romania												0,64	0,62	0,59	0,56	0,55	0,55	0,55	0,54	0,55	0,53	0,53	0,52	0,53	0,51	0,53	0,52	0,53
Slovakia											0,59	0,57	0,57	0,58	0,57	0,59	0,60	0,59	0,60	0,60	0,60	0,61	0,62	0,61	0,58	0,60	0,61	0,61
Slovenia											0,55	0,54	0,55	0,55	0,54	0,55	0,55	0,55	0,55	0,55	0,55	0,56	0,56	0,56	0,53	0,53	0,53	0,53

Graph A2: Development of Gini coefficients