Offshoring
Theory and employment effects for the Northern Netherlands

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Offshoring:
Theory and employment effects for the Northern Netherlands

Masterthesis

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Preface

During my study Human Geography and Planning and especially during my masters year Economic Geography I became intrigued by the process of offshoring; the relocation of firms to Eastern European or developing countries. International firm relocations is still a relatively unexplored research terrain within economic geography, although the media paid a lot of attention to this subject. I decided to look for myself what is true about the job losses that are predicted in the newspapers.

The purpose of this research is to look at the facts of offshoring, and specifically by paying attention to the employment effects in the Northern Netherlands. Apart from describing the current situation and its consequences, some policy recommendations have been formulated.

I would like to thank my supervisor, Prof Folmer, for his critical comments and advices, and the fact that he always found time to read my concept chapters. I would like to thank my family members for their comments and patience. I'm also thankful to my friends, most of them were also working on their thesis the same time as I did, their comments were valuable and it was useful to exchange ideas and experiences.

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It is well known that the Dutch economy has become increasingly integrated into the world economy in the last decades. This influence is for instance visible in the import and export of products and services, labor migration, firm migration and the international division of labor. Especially the last topic contains the core of this thesis. All changes in the places of production and services activities have an impact on the economy in the Netherlands. In this thesis, the impact of these relocation of activities in developed countries, especially in the Northern Netherlands will be examined. The relocation of activities from developed countries to developing countries is also called offshoring. The questions that come up when considering this phenomenon include; what is offshoring? What are the reasons for companies to offshore production or services? What role does offshoring play related to job growth in developed countries, especially the Netherlands? What role does offshoring play in the Northern Netherlands? These questions are the reason for this thesis.

Offshoring includes both foreign direct investment and offshore outsourcing. The difference between the two is the type of ownership; in-house (foreign direct investment) or outsourcing (offshore outsourcing). Offshoring can be defined as a relocation of activities towards low income countries. Differences in wages between developed and developing countries is an important cause of offshoring. However, market opportunities and qualified personnel also play important roles.

The research questions can be clarified by the use of neoclassical theories. Trade theories and the New Economic Geography are most suitable for this subject. According to the trade theory of comparative advantage by Ricardo does international trade produce an increase in welfare because it allows each country to specialize in producing the good in which it has an comparative advantage. The Heckscher-Ohlin (H-O) model builds on the theory of comparative advantage. It states that the difference between two countries involved in trade is the relative abundances of capital and labor. The model has variable factor proportions between the two countries, one is relatively labor intensive and the other is relatively capital intensive. In each sector, producers won't face fixed inputs requirements, as in de Ricardian model, but trade-offs. Ultimately, it predicts a convergence in wages between developed countries and developing countries. The H-O model also assumes perfect factor mobility and full employment. Offshoring has thus only advantages following this model. However, Sachs and Shatz (1994) and Krugman (1995) come to the conclusion that the offshoring of activities will go together with an increase in unemployment in developed countries. Within the context of the H-O model, the offshoring of activities that intensively use unskilled labor can be expected, while high skilled labor remains in the developed countries. Grossman and Rossi-Hansberg (2006) propose to think in terms of tasks instead of in goods, which is the case in the H-O model. They state that reductions in the costs of trading tasks can generate shared gains for all domestic factors.
The New Economic Geography is a collection of theories in which transport costs are crucial (Knaap, 2007). The tensions between centripetal and centrifugal forces is central to the theory. It predicts that differences in wages will continue to exist because of agglomeration advantages and transportation costs. Low income countries will exist next to highly developed and high income countries and there is no convergence of prices, according to the model of

Fujita et al. (2005). There is still discussion about the strength of these centripetal and centrifugal forces when applying this theory to the consequences of offshoring. Gorter et al. (2002) state that agglomeration forces in highly agglomerated regions are still stronger than dispersion forces and that core-periphery patterns are relatively stable. Robert-Nicoud (2006) comes to a different conclusion: low trade costs foster the relocation of some segments of the value chain to developing countries to take advantage of the low wages and this threatens the industrial base of the developed countries.

However, the foregoing are all theoretical models that make assumptions when trying to model the offshoring activities in the world. Most theories predict an employment loss of low skilled jobs. It is important to look at the patterns that are actually observed in reality. Unfortunately, there are no data available in any country about the number of companies that have relocated activities abroad, which makes it hard to analyze the employment effects of these relocations. Consequently, there is much ambiguity about the precise consequences of offshoring on the development on wages and labor demand for the developed countries. Even the impact of offshoring on the demand for low skilled workers is still disputable, as different studies show contradictory results. Falk and Koebel (2002) do not find any evidence of the substitution of low skilled labor for imported materials, while Hijzen et al. (2005) state that offshoring has a strong negative impact on the demand for unskilled labor.
The existing studies do not pay much attention to quantifying the consequences of offshoring. Research by international management consultants as Forrester Research, Mc Kinsey Global Institute and Deloitte, using surveys and interviews, made their own estimates, primarily focusing on the United States. In the Netherlands, the results of various reports show that it is still very difficult to predict exactly how much labor will be moved offshore. The studies focus on different sectors and the numbers show that more manufacturing jobs relocate than services. Two Dutch research agencies, CPB Netherlands Bureau for Economic Policy Analysis and Berenschot, made predictions about the number of jobs lost in the manufacturing industry. CPB estimates that annually, 21.000 are lost in the industry. Although this number is quite large compared to the other studies, it is small compared to the yearly destruction of jobs at a number of 856.000 annually in the period 1991-1997. One can conclude that most studies show that offshoring has only a limited effect on wages and labor in developed countries, but the predictions by consultancy bureaus show that offshoring will steadily increase, as the search for highly educated employees becomes more global in nature. It should be kept in mind that the use of surveys has disadvantages, for instance samples often include only large firms or a specific sector, which means that the validity and representativeness is limited. As the differences in wages between developed countries and developing countries are one of the most important reasons to offshore part of production or services, one wants to know what the exact differences in wages and labor productivity is. The statistics on foreign direct investment show that most of Dutch FDI is directed towards other European countries, and only a small part of the Dutch FDI is invested in Asian countries. The charts on hourly compensation of costs and labor productivity make clear that, although the wages are substantially lower in developing countries and Eastern European countries, so is the productivity in these countries. This means that it is very important to keep productivity in the Netherlands high.

What does this mean for the Northern Netherlands? It appears that in general, the North is still lagging behind compared to the Dutch average in education, employment and innovativeness, but the differences have decreased. All taken together, it is expected that the North is less attractive for high skilled companies compared to other parts of the Netherlands, but a catching up process is visible. Public policy concerning offshoring should therefore target the improvement of the competitiveness and entrepreneurial climate in the Northern Netherlands. Considering both keeping existing firms in the region and attracting new companies, policy needs to focus on embeddedness, innovation and education. Embeddedness gives companies an extra reason to stay in the North; it is thus a challenge to make the networks between different actors (firm, supplier, public institutions) as strong as possible. Increasing the R&D expenses, jobs and number of innovations and is crucial for creating a competitive environment in the North.

An analysis of articles in newspapers shows that offshoring and consequently the loss of employment does take place in the North of the Netherlands. Although the amount of offshoring is still not entirely clear, it is easy to underestimate it. By scanning the newspapers published in the Northern Netherlands, quite a few examples of firms that have relocated activities in the North were found. The largest part of offshoring consists of the offshoring of low skilled industry jobs, and the losses are greatly influenced by the relocation of several large companies. Also, half of the companies that are engaging in offshoring are foreign. Based on existing predictions about employment losses in the Netherlands, the number of employment losses in the manufacturing industry in the North due to offshoring, compared to the total number of job losses in the industry is roughly estimated. Using the prediction of Berenschot and the CPB, two different views arise. Following the CPB, the estimate job loss in the industry due to offshoring is very large (91.7%). Following Berenschot, a more realistic view arises: it predicts that 27.5% of the job losses in the industry are due to offshoring.

The contribution of this study to the existing literature is that the employment effects of offshoring have been studied, which usually only gets a limited amount of attention in existing research. The process of offshoring has been applied to the situation of a region, in this case the Northern Netherlands, instead of to a country, as it is possible that there are large differences between regions within a country. The Northern Netherlands is an interesting case as it is usually seen as an backward region in the Netherlands. However, further research is necessary, as only rough estimations of job losses have been given here. A problem is the lack of useful data to estimate the employment effects of offshoring. An advice is thus the improvement of the data provision of firms moving activities abroad and consequently the loss of jobs in the Netherlands due to offshoring.

Chapter 1: Introduction

Offshoring and outsourcing have been studied by many economists (see for example Antras et al (2005), Grossman and Rossi-Hansberg (2006) and Deardorff (2005), among others). In (economic) geography however, there hasn't been done much research about offshoring and outsourcing yet. Although in the field of firm demography, which can be thought of as a segment of economic geography, many studies have been published about the birth, death and migration of firms, this is mainly focused on the firms within a country. An important reason for this is of course that firm migrations abroad account only for a small part of all the firm relocations. In the Netherlands, 90% of all firm migrations are within the provincial borders (Pellenbarg et al., 2005). Furthermore, firm demography is mostly concerned with the relocation of complete firms, not the relocation of certain activities, as is the case with offshoring. However, the number of firms moving activities abroad is increasing. In the Dutch report of the Ministry of Economic Affairs, 'Visie op Verplaatsing' (Vision on Relocations) (2005), results of the study show that about 10% of the firms in the sample have relocated activities abroad in the last decade. It also shows that the yearly percentage of firms that relocated activities has increased over the studied period.
All changes in the locations of companies and corresponding changes in the places of production and services activities have an impact on the economy in the Netherlands. In this thesis, these relocations of activities will be examined. The main focus will be on the consequences for job growth in developed countries, especially in the Netherlands.

Although scientific research shows that offshoring and outsourcing have been steadily increasing, it is still low, as the results of the research of the Ministry of Economic Affairs (2005) show. However, the recent media and political attention on production and service offshoring from developed to developing and Eastern European countries gives the impression that outsourcing and offshoring are exploding (see for example the articles 'Nederland koploper in offshoring' (The Netherlands leader in the field of offshoring) in Het Financieele Dagblad 1 November 2006, and 'Verplaatsing is voordelig' (Relocations are lucrative) in the Leeuwarder Courant 1 February 2005). As a result, workers in industrial countries are anxious about job losses (Amiti and Wei, 2004).
One of the first questions that comes up when studying these relocations is; what is exactly the difference between outsourcing and offshoring? So far, these two concepts have been used interchangeable. However, there is a difference. Outsourcing and offshoring are related to the 'make or buy' decision. A firm can decide to subcontract part of the production capacity or services to another company, which is called outsourcing. If a firms decides to relocate part of their activities abroad, this is called offshoring. Offshore outsourcing is subcontracting a part of the activities of a firm to a foreign country. Offshoring without outsourcing means that the firm will take over an existing firm or set up a new firm abroad (Poort et al., 2004 and Ministry of Economic Affairs, 2005). In chapter two, this subtle difference will be clarified more explicitly.
Outsourcing and offshoring can be seen as part of international trade. Instead of producing a product in a developed country, it is now imported from developing countries where labor is cheap and abundant. However, the renewed attention for offshoring is caused by the fact that the relocation of production is no longer confined to the situation where only low skilled

production was transferred to low wage and labor abundant countries, as would be expected by examining the neoclassical trade theories. Increasingly, high skilled jobs, (for example IT-services) previously thought to be safe from competition from low wage countries are also shipped abroad. In 1985, investments related to industry made up 65 percent of total Dutch foreign direct investments (FDI) abroad and services 34 percent. Twenty years later, the situation is reversed: services accounts for 58 percent of total FDI and industry 42 percent (See chapter 3). Following the relocation of production, services are thus also being moved abroad. This development has created concerns among many workers in the industrialized countries that there may be no limits to the amount or type of jobs moving abroad. This has led to anxiety about what this will mean for employment in the home countries (Biermans and van Leeuwen, 2006).

In contrast to this pessimistic view, outsourcing and offshoring can contribute to the maintenance and development of employment in the developed countries. Because of savings, improvement of the competitive position and perspectives for new investments, new high skilled jobs can be created. According to Deloitte (2006), the process of offshoring in the Netherlands is already on its return. In the research 'Made in Holland V' they come to the conclusion that companies still relocate part of their production or research & development division to Eastern Europe, but with a decreasing speed. They state that some point of saturation is reached because of the recovery of the Dutch economy, the regaining of confidence and disappointing experiences of some firms in a foreign country. Most profit is to be gained in the optimization of the production process and the improvement in the chain management (Deloitte, 2006). This means that the separate locations will have to be integrated into one production network with planning on a broader scale. Relocations consequently only make sense if it happens in combination with a thorough thought and centrally led production chain.

That offshoring and outsourcing are still very low can also be shown from the fact that in many industrial countries 'insourcing' is greater than outsourcing (Amiti and Wei, 2004). Insourcing can be described as the opposite of outsourcing and offshoring (investments from foreign located firms to domestic firms). Amiti and Wei (2004) used the exports of business and computing services from the IMF Balance of Payment Statistics Yearbook 2002 as a proxy for insourcing. In dollar terms, the top five recipients in 2002 are the United States (US$59 billion), the United Kingdom (US$37 billion), Germany (US$28 billion), France (US$21 billion) and the Netherlands (US$20 billion). India is ranked at the sixth place (US$ 18.6 billion) and China at the 14th place. This means that the top five countries are rich, industrialized counties. However, scaling the export value by the size of the GDP, smaller economies tend to be more insource-intensive than the larger ones. The top three now consists of Vanuatu, Singapore and Hong Kong (Amiti and Wei, 2004). It is arguable whether business and computing services is a good proxy to measure insourcing.

Although studying the effects of outsourcing and offshoring on recipient countries goes beyond the scope of this thesis, it is an important aspect of firm relocations. According to Folmer (Volkskrant 13 april 2004), offshoring and outsourcing are new ways of development aid because developing countries become an interesting firm location. Furthermore, there is a shortage of labor in developed countries in sectors like the IT and care, and personnel in developing countries can help to reduce the scarcity. As a result, migration from developing to developed countries will decline.

1.1 Aim and outline of the thesis

In this thesis, I will give an overview of the existing theories and empirical studies in which I will focus on the implications of offshoring for the developed countries, starting with the developed world and then focusing on the Netherlands and the Northern Netherlands in particular. I would like to get a deeper understanding of the development of offshoring in the three northern provinces in the Netherlands; Groningen, Friesland and Drenthe, and the effects this will have on the labor market and income development. I will focus on the issue of whether offshoring is negatively related to job growth and wages, especially within the industry sector. I will do this analysis using desk research and data analysis. An extrapolation of national data on offshoring will be conducted to investigate the impact of offshoring on the income and job growth in the Northern Netherlands. The main research question can be formulated as:

What are the consequences of offshoring for the developed countries in general and what are the effects on the development of the economy in the northern part of the Netherlands in particular?

This leads to the following secondary research questions:

- What is offshoring?
- What are the reasons for companies to offshore production or services?
- What role does offshoring play related to job growth and income in developed countries?
- How will offshoring develop in the future?
- What role does offshoring play in the Northern Netherlands?
- What are the consequences of offshoring for the northern part of the Netherlands?
- How can governmental policy influence offshoring?

This thesis will continue with a more specific discussion on the difference between outsourcing and offshoring in chapter two. The concepts of offshoring and outsourcing will be defined and the reasons for companies to engage in offshoring will be discussed. Moreover, the neoclassical trade theories that describe the reason for the existence of offshoring will be discussed in chapter two. The trade theories of Ricardo and Heckscher-Ohlin are relevant here and will be applied to the topic of offshoring. The Ricardian model and the Heckscher-Ohlin model have been used frequently in order to explain offshoring trends. The role of new economic geography models in offshoring processes will also be analyzed. After this broad description, I shall investigate the existing empirical literature and research on the topic of offshoring in chapter three. It starts with the problem of how to measure offshoring, as there are no exact data available. An overview of research results of the employment effects of offshoring will be given, starting with a macro view of the world and then concentrating on the predicted outcome of offshoring for the Dutch labor market. In chapter four, I will look at the developments influencing offshoring in the Northern Netherlands. Policy that could influence the decision of companies in the North whether or not to engage in offshoring will

be discussed. The effects of offshoring for the Northern Netherlands will be analyzed, especially focusing on employment growth. In chapter five, the main conclusions will be summed up and recommendations for policy concerning offshoring in the Northern Netherlands will be given.

Chapter 2 Theoretical considerations

In this chapter, outsourcing and offshoring will be defined. In the literature, different definitions are used. I will try to give a comprehensive definition, which will be used consequently throughout this whole thesis. Furthermore, I will build a theoretical framework of the different forms of outsourcing and offshoring, based on different studies. The reasons for companies to engage in offshoring and backshoring will be discussed as well.
In the second part of the chapter, the most important and relevant theories and the changes made to these models to make them suitable for explaining outsourcing and offshoring will be examined. First, the neoclassical trade theories by Ricardo and Heckscher-Ohlin will be discussed. These theories will be adjusted to the situation of outsourcing and offshoring in the next part of the chapter. This is done by for example Deardorff (2005) and Grossman and Rossi-Hansberg (2006). Next, the theory of the new economic geography (NEG) will be investigated. In the new economic geography, offshoring has received new attention. The NEG-models designed to explain offshoring will be analyzed. While discussing these various models, I will focus on the effects on wages for the source countries. But to start with, outsourcing and offshoring will be defined.

2.1 Defining outsourcing and offshoring

First of all, the distinction between outsourcing and offshoring has to be clarified. This distinction is not clear-cut and the two concept are often used interchangeable. According to Biermans and van Leeuwen (2006), the meaning of the term outsourcing has changed the last couple of years, but the original definition is still in use:

Outsourcing describes the act of obtaining services and/ or goods from an external firm (Biermans and van Leeuwen, 2006).

The definition of offshoring most frequently used in the literature is very broad. Biermans and Van Leeuwen (2006) describe it as 'the relocation of production abroad' (p. 9). Ter Beek et al. (2005) defines it as 'the relocation of labor to low income countries' (p.4). The definitions of Poort et al. (2004) and Berenschot (2004) are similar: 'offshoring is the relocation of activities to low income counties'.

The most important aspects of offshoring are:

- *relocation*
- *activities*
- *low income countries*

Outsourcing can be seen as a part of the offshoring process, however, outsourcing does not have to include offshoring and it is also possible to offshore without outsourcing. This can be clarified by making the distinction between the location of the activities (national or abroad; onshore or offshore) and the type of ownership (the make or buy decision; in-house or outsourcing). Table 2.1 will make this clear:

Table 2.1: Different forms of business relocations		
	Onshore	**Offshore**
In-house	National investment	Foreign Direct Investment/ in-house offshoring
Outsourcing	National outsourcing	Offshore outsourcing/ international outsourcing

Source: Biermans and van Leeuwen (2006) and Gorter et al. (2005)

The focus in this thesis will be on offshore outsourcing, and foreign direct investments (FDI) will play a role as well. National investment and national outsourcing are beyond the scope of this thesis. When the word 'offshoring' is used, both foreign direct investments and offshore outsourcing are referred to, unless otherwise specified. In international context, research has focused more often on the aspect of FDI than on offshore outsourcing because it is easier to measure. Consequently, there is more data available on FDI than on offshore outsourcing (see chapter 3.1).

Looking at table 2.1, it seems that offshoring and outsourcing are unambiguous concepts. However, there are some more considerations concerning offshore outsourcing and foreign direct investments that have be kept in mind.

1. These foregoing definitions do not take into account the *distance to place of the relocation*. European companies can make a choice between the closer, more expensive and more developed Eastern European countries, and countries that are more distant, less developed and cheaper, like India and Vietnam. In the case of the U.S., Mexico is a close alternative (this is called nearshoring). It is not only the geographical distance that counts; the cultural distance is also important (differences in culture, language). It is possible that activities belonging to one firm are being relocated to several countries: multishoring (Ter Beek et al., 2005).

2. Another consideration is the *type of activities* that will be moved abroad: production (e.g. the production of electronics in China) or services (e.g. the call centers in India). Offshoring services, in particular IT-services, can be done in three ways: captive service provisioning, native service provisioning and foreign service provisioning (Beulen, 2005). Captive (or in-house) service provisioning means setting up an own service center in a low income country. The firms has to make considerable investments (FDI) in this country. In the case of native service provisioning, a company outsources the work to a local IT-supplier, and this local IT supplier gets the work done offshore. In the case of foreign service provisioning, the company outsources the work directly to an offshore IT-supplier. Both native service provisioning and foreign service provisioning come under the heading of offshore outsourcing. A familiar example is an IT-company in India that develops software for a company in the Netherlands. If this Dutch company is a non IT-company, it is called foreign service provisioning, and if in case of an IT-company, it is called native service provisioning.

Low skilled service and production jobs where personal contact is necessary won't be offshored, which means that demand for hairdressers, cleaners and plumbers in developed countries will continue to exist.
One relatively recent aspect of service offshoring is that people in developed countries go to developing countries for a medical operation or cosmetic surgery. This market has especially been booming in countries like Turkey, Thailand and Brazil. This is also a part of the offshoring process, as it does fit into the broad definition of offshoring as an relocation of labor to low income countries. One of the reasons of this is of course the differences in prices for these operations.

3. Third, an essential question is which *markets are being served* by this new location. A distinction can be made between horizontal FDI and vertical FDI. Horizontal FDI serves foreign markets, new markets will be opened up to sell the products. This has not necessarily negative effects on employment in the home country. Vertical FDI combines serving the home country and opening up new markets with the (partly) replacement of production or services in the home country. The effects of an expansion of vertical FDI on the home country are ambiguous (Biermans and van Leeuwen, 2006).

4. As said before, offshoring does not necessarily lead to (total) outsourcing. It is possible to open an own company or set up operations with other firms. Deloitte, cited in Ter Beek et al. (2005), distinguishes five ways to offshore activities:
   - outsourcing: total subcontracting to a third party
   - joint venture: setting up a new operation together with a third party
   - wholly owned: set up a new firm as a subsidiary company
   - turnkey: asking for the help of thirds, but keeping the full control over the operation
   - indirect: collaboration with a third party who uses offshoring

The different aspects of offshoring are summarized in table 2.2. It shows that the definition of offshoring (the relocation of activities abroad) is useful for general purposes, but in reality more aspects play a role, and more distinctions can be made.

Table 2.2: Facets of offshoring

Place of relocation	Nearshoring – Offshoring – Multishoring
Type of activities	Production - Services (captive, native and foreign service provisioning)
Served Market	Horizontal FDI - Vertical FDI
Way of offshoring	Outsourcing – Joint Venture – Wholly Owned – Turnkey – Indirect

Reasons for offshoring
Companies have different reasons to engage in offshoring. Differences is wages between employees in developed and developing countries is one of the most important reasons. However, there are more reasons for offshoring:

1. Improvement of the competitive position (lower wages and production costs)
2. Following the market
3. New market areas
4. Availability qualified personnel
5. Entrepreneurial opportunities
6. Legislation
7. Availability of raw material
8. Transport costs

This shows that wages are not the only factor of importance. Several IT-companies claim that they are moving to India because of the availability of qualified employees and not because of low labor costs (Poort et al., 2004).

Backshoring
Not every offshoring activity is a success. Although offshoring is still rising and the relocations to developing countries are still increasing, there are some examples of companies that are moving labor back to the source country. This is called 'backshoring'. The reasons for this are multiple: not enough costs reductions, loss of productivity, communication problems, differences in culture and a lack of expertise. Especially for small companies, site visits and new infrastructure are a huge cost (NRC Handelsblad, July 7th, 2007). Accurate counts of backshoring are absent and backshoring reports are anecdotal. Opinions diverge on the size of the backshoring problem, as some experts states that one dollar's worth of work gets backshored for every $10 offshored, while others say that the numbers could be much higher (Financial Week, 2008).

2.2 Trade Theories

Now that offshoring and its various aspects and reasons have been examined, it is time to discuss different theoretical models explaining offshoring. Neoclassical trade theories play a large role in this. According to the neoclassical theory economical output is the outcome of rational behavior of individuals. It assumes perfect competition and concludes that trade generally improves welfare by improving the allocation of factors of production. This approach has received a lot of criticism because of the assumptions that underlie these models. The factor labor is reduced to just one of the production factors, and labor is to a large extend substitutable for capital. The neoclassical economic geographer or economist does not pay attention to other factors that might play a role in the finding the optimal output or location. However, the neoclassical trade theories are still important in explaining trade patterns and offshoring, which is why Ricardo's theory of comparative advantage and the Heckscher-Ohlin model will be discussed here. The relevance of these theories and the adjustments made to them in order to explain outsourcing and offshoring processes nowadays will be examined after the general introduction of the theories of Ricardo and Heckscher-Ohlin.

Ricardo

The Ricardian model of comparative advantage is well known. Ricardo first described his theory in his book '*On the principles of political economy and taxation*' in 1817. According to Ricardo produces international trade an increase in welfare because it allows each country to specialize in producing the good in which it has an comparative advantage. A country has a comparative advantage in producing a good if the opportunity cost of producing that good in terms of other goods is lower in that country than it is in other countries. Suppose there are

Table 2.3: Unit labor requirements

	Food	**Cloth**
Country A	3	1
Country B	2	4

two countries, A and B. Each of these countries has one factor of production (labor) and can produce two goods: food and cloth. The unit labor requirement is the number of hours of labor needed to produce one unit of food or cloth. For example, as shown in table 2.3, it requires 3 units of labor to produce one unit of food in country A, and 2 units of labor to produce the same unit of food in country B. The relative price of food is thus higher in country A than in country B. For cloth, it requires 1 unit of labor to produce one unit cloth in country A, and 4 units of labor to produce the same unit of cloth in country B. Therefore, it will be profitable to ship food from B to A and to ship cloths from A to B (not taking into account the transportation costs). It is for both countries advantageous to specialize in the production of the good in which the country is relatively cheap. The prices of the goods will then no longer be determined purely by domestic considerations.

Table 2.4: Comparative advantage of food and cloth in country A and country B

	1 unit of food costs	**1 unit of cloth costs**
Country A	3 units of cloth	⅓ unit of food
Country B	½ unit of cloth	2 units of food

Examining table 2.4, it becomes clear that country A is relatively cheap in producing cloth because it costs only ⅓ unit of food. Country B is on the other hand relatively cheap in the production of food; it costs ½ unit of clothing. For country A, it is profitable to specialize in clothing and for country B in food. If country A produces an extra unit of cloth, it can be exported to country B. In country B, this unit of cloth can be traded for a maximum of two units of food. This specialization and trade means a trade advantage of a maximum of 2 - ⅓ = 1⅔. For country B this is the opposite: it is profitable to specialize in food production. The trade advantage has a maximum of 3 - ½ = 2½. In the end, the consumers in the two countries reach a higher indifference curve. The exact amount of the trade depends on the shape of the indifference curve (Eijgelshoven et al, 2004 and Krugman and Obstfeld, 2003).

Heckscher-Ohlin

The Heckscher-Ohlin (H-O) model, developed by Eli Heckscher and Bertil Ohlin, builds on the Ricardian model. It is frequently used and adjusted by economists in order to explain

offshoring and outsourcing in a more detailed way (see for example Robert-Nicoud (2006) and Deardorff (2005)). Here, the basic model will be explained.
The Ricardian model assumes that labor is the only factor of production. A more realistic view also includes other factors of production, such as land, capital and mineral resources. The Heckscher-Ohlin model shows that comparative advantage is influenced by the interaction between nations' resources (the relative abundance of factors of production) and the technology of production, which influences the relative intensity with which different factors of production are used in the production of different goods. The only difference between the two countries involved is the relative abundances of capital and labor. The model has variable factor proportions between the two countries, one is relatively labor intensive and the other is relatively capital intensive. In each sector, producers won't face fixed inputs requirements, as in de Ricardian model, but trade-offs. What input choices the producer will make depends on the relative costs of land and labor.
A country that has a large supply of one resource relative to its supply of other resources is abundant in that resource. Countries tend to export goods whose production is intensive in factors with which they are abundantly endowed. The result is the basic Heckscher-Ohlin theory of trade: countries tend to export goods that are intensive in the factors with which they are abundantly supplied. The general income distribution effect of international trade is that the owners of a country's abundant factors gain from trade, but owners of a country's scarce factors lose. Trade produces a convergence of relative prices of goods, which causes a convergence of the relative prices of land and labor. There is thus a tendency towards equalization of factor prices. However, in reality, world factor prices are not equalized. Empirical evidence on the H-O model is mixed, but most researchers do not believe that differences in resources alone can explain the pattern of world trade (Krugman and Obstfeld, 2003).

Adjustments in order to explain offshoring
What are the implications of these standard neoclassical models for offshoring and outsourcing processes, focusing on labor market and income development in the source countries? Contributions that study the price, wage, production and trade effects of offshoring in explicit mathematical models based on the trade models of Ricardo and Heckscher-Ohlin include Deardorff (2005), Robert-Nicoud (2006) and Grossman and Rossi-Hansberg (2006). Four changes to the standard Ricardian and H-O model will be discussed.
First of all, how can offshoring be cost-saving, if according to the H-O model, there is a tendency towards equalization of factor prices? This means that in the end, it does not matter where to produce the goods because the wages will be equal all over the world. To be able to answer the question of how offshoring can be cost-saving, papers usually work in models marked by non-factor price equalization, by which they leave the principle of factor price equalization of the H-O model. Since these models are quite complex, most authors assume that offshoring occurs in only one sector and only in one direction (Baldwin and Robert-Nicoud, 2007). These models are thus a simplification of reality, as in the real world offshoring occurs in more than one sector and one direction. The usefulness of these models can thus be questioned. An example of these one sector, one direction models is the model of Antras et al., (2005).
These authors make the distinction between high skilled workers and low skilled workers. Routine tasks are offshored, while more complex tasks are done domestically. The traditional

vertical division of labor, whereby some low skill workers undertake routine tasks and some high skill managers specialize in knowledge intensive tasks, can now take place across countries. In this model, the skill heterogeneity of the workers and managers is at the center of the analysis. Offshoring leads to the creation of production jobs in the South, and the creation of knowledge intensive jobs, and a decrease in the production in the North. As Southern workers employed in multinational firms receive on average higher wages than workers employed in domestic firms, within-worker wage inequality in the South increases. The effects for the North are more complicated. On the one hand, low skilled workers in the North face increased competition from Southern workers which tends to reduce their marginal return to skill. On the other hand, when more low skilled workers are available, the time of high skilled managers becomes relatively more scarce. Workers who are able to economize on this time become relatively more valuable. As a result, the value of more skilled workers relative to less skilled ones increases.

Secondly, the Heckscher-Ohlin model assumes full employment and perfect factor mobility between sectors within a country. This means that trade can lead to sectoral employment changes as one sector shrinks and another expands, but not to net job losses. Only in the short run, there may be rigidities that prevent perfect factor mobility and hence give rise to net employment effects.
Sachs and Shatz (1994) argue that any of the following factors could give rise to net employment losses in manufacturing: '(1) the low wage workers have a positively sloped supply curve, so that a decline in their wage leads to a decline in labor force participation; (2) low wage workers are unionized, and unions maintain wages above full-employment; or (3) low wage workers have alternative employment opportunities in non-manufacturing (such as services) so that they leave the manufacturing entirely when international competition puts downward pressure on wages.' Krugman (1995) presents a H-O model with rigid factor prices to show how trade can give rise to big employment effects. If one were to also introduce frictions in inter-sectoral labor mobility then these effects would be even larger (Amiti and Wei, 2004).

Thirdly, within the context of the Heckscher–Ohlin model, the offshoring of activities in developed countries mainly affects unskilled labor, while high skilled labor will stay in these countries. The reason is that, in the absence of factor price equalization, scarce unskilled labor is expected to have a higher wage in the developed countries than in developing countries. Deardorff (2005) comes to the conclusion that if countries continue to diversify, this causes the wages of unskilled labor in developed countries to fall below that of wages of unskilled labor in developing countries. The reason for this is that the developed countries (North) possess superior technology compared to the developing countries (South). Because of this, both skilled and unskilled labor earn more in the North than in the South. To take advantage of the low wages in the South, it is profitable to move both unskilled-labor-intensive and skilled-labor-intensive activities, to take advantage of the cheap labor in the South.
It became only recently possible for the owners in the North to apply the technology in the South because of innovations in information technology. In the end, this might lead to the catching up of the South to the North. Ultimately, the wage effect between the developed and developing countries would be removed, as the productivity in the developing countries rises. The scarce factor in the initially high-wage country even falls below the counterpart in the

low-wage country (Deardorff, 2005). However, if factor endowments differ enough to lead to specialization, then it becomes possible for both factors in developed countries to gain from offshoring.

Fourthly, the H-O model is based on the assumption of trade in goods. However, Grossman and Rossi-Hansberg (2006) propose to think in a new division: in terms of tasks instead of in products. The term 'task trade' is introduced to describe the international division of labor that entails different countries adding up to global supply chains and to distinguish it from goods trade that historically has involved an exchange of complete goods. This same division is sometimes called the difference between vertical specialization and horizontal specialization. Vertical specialization takes place when countries acquire expertise in particular stages of the production process. This includes importing goods from another country, then use it for the production of its own good and then export it to the next country. Horizontal specialization means completing all stages of the production process takes place in one country (Grant, 2003).
Advances in transportation and communications technology have weakened the link between specialization and geographic concentration, making it increasingly viable to separate tasks in space. Instructions can be delivered instantaneously, components and unfinished goods can be moved quickly and cheaply and services (e.g. administration) can be conveyed electronically. In this way, firms can take advantage of factor cost disparities in different countries without sacrificing the gains from specialization. The result has been a boom in offshoring of both manufacturing tasks and other business functions. In the end, Grossman and Rossi-Hansberg identify a productivity effect of task trade that benefits the factor whose tasks are more easily offshored. This is the result of improvements in the technology for trading tasks. In the light of this effect, reductions in the cost of trading tasks can generate shared gains for all domestic factors, in contrast to the conflict of interest that typically results from reductions in the cost of trading goods.

2.3 New economic geography

Apart from trade theories, the new economic geography is often used to explain the process of offshoring. These models are quite new compared to the trade theories. The new economic geography (NEG) was firstly published by Paul Krugman in 1991. It is a collection of theories in which transport costs are crucial (Knaap, 2007). The tensions between centripetal and centrifugal forces is central to the theory.
Instead of convergence in productivity and prices (as in the Heckscher-Ohlin model), the outcome of the NEG-models is agglomeration and continuous inequality between and within countries. The spatial organization of production largely depends on the trade-off between transport costs (which cause dispersion) and economies of scale (which cause agglomeration). Agglomerations are the result of interactions between the companies and between companies and consumers. These interactions can be self-reinforcing and small initial differences between regions can have large consequences. In this way, path dependency can come into existence. This is known as cumulative causation and was first published by Myrdal (1957).
The simplest NEG-models describe two regions, two factors of production and two sectors. One of these factors of production is mobile between these two regions. Although the NEG-models differ, there are always two criteria. The first is the existence of pecuniary

externalities. A positive pecuniary externality is for example the effect a firm has on the availability of intermediate resources in the region. Secondly, there are always several externalities that oppose each other. Positive externalities make a region more attractive as a location as more companies locate in the area. Negative externalities work in the opposite direction. For example, a positive externality is the presence of more consumers of goods. A negative externality is the increase in congestion. Depending on the strength of different externalities, the model tends to favor agglomeration or dispersal. Traditionally, differences in transport costs are variable in the model. If transport costs move from high to low, the model predicts dispersion, then concentration and again dispersion (known as the inverse-U relation). In this light, globalization is a logical effect of decreasing positive agglomeration-externalities. How relevant and useful is the theory of the NEG in reality? The exact usefulness of this theory is still subject of debate. Redding and Venables (2004) claim that seventy percent of the world income inequality can be explained by the NEG. However, physical characteristics of a region (harbors, climate, surface), are also of major importance in the economy, but these don't play a role within the NEG (based on Knaap, 2007).

Adjustments in order to explain offshoring

After this introduction on the NEG, the relevancy of the NEG-models on offshoring will be discussed. Are the agglomeration advantages reduced and are the negative externalities stronger than the positive externalities when companies decide to relocate activities to low income countries? The studies come to different conclusions when trying to predict the changes in wages of labor in the developed countries.

Fujita, Krugman and Venables (1999) describe in their book different models of the NEG. Some of these models can be used to explain the offshoring processes. The starting point of one of the models is one region that has managed to get a self-reinforcing advantage in manufacturing, an advantage that allows it to pay higher wages than other countries. Over time, the world's demand for manufactures rises. This increases the level of activity in the manufacturing region, reinforcing the agglomeration and also increasing wages. As this process continues, the wage gap between the regions might become too large to be sustainable. It is then profitable for individual firms to set up manufacturing in a second region, which begins to develop self-reinforcing advantages of its own and thus has a surge in wages. Then at a later date, a third region goes through the same process, and so on. This story offers a possible explanation of rapid growth in developing countries, and also the offshoring movement. It also tells that there will not occur a convergence of factor prices. Instead, a group of rich countries and a group of poor countries will continue to exist. Only a few countries experience surging production and wages while others are left on the sidelines.

Following Gorter et al. (2005) the agglomeration forces still dominate the dispersion forces. They also state that core-periphery patterns are relatively stable, and are up to some extend immune for differences in wages and for government policy in the stimulation of competition. For example, the Netherlands is located in the 'Blue Banana' in Europe (a highly agglomerated region situated starting in London, passing Benelux and Germany to Northern-Italy). Looking at this, the Netherlands has not much to fear because of disappearing agglomeration forces, according to Gorter et al. (2005).

However, Gorter et al. (2005) do not take into account that if a company wants to offshore part of their activities because of cost differences, agglomeration forces might be weaker than

the possibility of reducing costs. Robert-Nicoud (2006) points this out. He comes to the conclusion that in the end it is more profitable for companies to move away from other firms. Firms benefit from each others' proximity because access to intermediate suppliers and to demand increases profits in a cluster; thus, firms will choose to locate near other firms. When transportation costs decrease, markets become more integrated and the relative attractiveness of locations shrinks. However, in an agglomeration firms also face strong competition for their market share and tougher competition for inputs. As a result, firms will choose to locate away from the agglomeration. Thus, when transportation costs are low, firms will increasingly base their location decision on primary factor prices, that is, primary factors scarcity works as the main dispersion force. This theory predicts that net agglomeration forces peak for intermediate values of transportation costs. Summarized, further economic integration in the form of lower transport costs makes it more likely that developing countries will emerge as industrial powers. Next, Robert-Nicoud (2006) applies this theory to the case of offshoring.
Firms locate their headquarters and core activities in their home countries and hire workers offshore at some cost. As a result, global firms can relocate some segments of the value chain to take advantage of low wages prevailing in the developing countries and yet retain the benefits of agglomeration economies developed in the developed countries. Because of capital mobility and low communication costs, footloose capital faces a more elastic labor supply. This implies that agglomeration forces dominate dispersion forces for a wider set of transportation cost values. Low trade costs threaten the industrial base of the developed countries whereas low communication costs trap workers in low wage countries in routine tasks and impede the development of their country.
The question here is to what extend does the theory corresponds with the reality. Robert-Nicoud (2006) comes to the conclusion that only routine tasks move abroad and the high skilled jobs stay in the developed countries. However, empirical results show that high skilled jobs are increasingly being relocated, as will become clear in chapter three. It is only a small percentage of the relocations that are taking place, but it is growing.

2.4 Conclusion

In this chapter, the theoretical literature on offshoring is discussed. It started with a comprehensive definition of outsourcing and offshoring. Offshoring both includes foreign direct investment and offshore outsourcing. The key words of offshoring are:

- relocation
- activities
- low income countries

Although it looks like this is a clear definition, one has to take several other aspects into account, when discussing offshoring. These aspects include the place of the relocation, the type of activities, the served markets and the way of offshoring. Differences in wages between developed and developing countries is an important cause of offshoring. However, market opportunities and qualified personnel also play important roles.

The traditional literature on the trade theory, especially the Heckscher-Ohlin model, predicts a convergence in wages between developed and developing countries in the end, because of converging factor prices. However, the more recent trade models are usually marked by non-factor price equalization. The H-O models also assumes perfect factor mobility and full

employment. Sachs and Shatz (1994) and Krugman (1995) come to the conclusion that offshoring of activities will go together with an increase in unemployment in developed countries. Within the context of the Heckscher-Ohlin model, the offshoring of activities that intensively use unskilled labor can be expected. The high skilled labor will stay in the developed countries. Deardorff (2005) comes to the conclusion that the wages of low skilled labor in the initially high-wage country even falls below the counterpart in the low-wage country. This means that the wages of unskilled labor in developed countries could eventually be lower than those in developing countries. Grossman and Rossi-Hansberg (2006) propose to think in terms of tasks instead of in goods, which is the case in the H-O model. They state that reductions in the costs of trading tasks can generate shared gains for all domestic factors.

The new economic geography predicts that differences in wages will continue to exist because of agglomeration advantages and transportation costs. Low income countries will exist next to highly developed and high income countries and there is no convergence of prices, according to the model of Fujita et al. (2005). The studies are not compatible on the topic of at which point (concentration or dispersal) of the inverse U-curve we currently are. Gorter et al. (2002) state that agglomeration forces in highly agglomerated regions are still stronger than dispersion forces and that core-periphery patterns are relatively stable. Robert-Nicoud (2006) comes to a different conclusion: low trade costs foster the relocation of some segments of the value chain to developing countries to take advantage of the low wages. This threatens the industrial base of the developed countries. These firms keep their headquarters in developed countries because of low communication costs and can this way retain the benefits of agglomeration economies in the developed counties. These low communication costs trap workers in low wage countries in routine tasks and impede the development of their country.

However, the foregoing are all theoretical models that make assumptions when trying to model the offshoring activities in the world. Most theories predict employment loss of low skilled jobs. But what is actually observed in reality? In the next chapter the empirical evidence on offshoring, especially focused on the wage and employment effects for the source countries, will be discussed. This will shed more light on the issues.

Chapter 3: Current offshoring trends

There is much ambiguity about the precise consequences of offshoring on the development of wages and labor demand for the developed countries. Research by international management consultants as Forrester Research, Mc Kinsey Global Institute and Deloitte made their own estimates on this issue. Moreover, Dutch research agencies as the CPB (Netherlands Bureau for Economic Policy Analysis) and Berenschot made predictions about the loss of labor for the Netherlands. Most stated that a large number of jobs had already been transferred and that many more would be leaving in the years ahead. Although the majority of the studies is focused on the United States, in this chapter the distinction will be made between international and national (Dutch) research. First of all, methods of measuring employment and wage effects of offshoring will be discussed. In the next section, the international situation will be examined. Attention will be paid to a couple of analyses that focus on the employment effects in one country; these are (among others) the United States (Feenstra and Hanson, 1999), Germany (Falk and Koebel, 2002), the United Kingdom (Hijzen, Görg and Hine, 2005) and Sweden (Ekholm and Hakkala, 2006). These analyses are predominantly quantitative. A few, mainly qualitative, studies by management consultants as McKinsey Global Institute and Duke/ Booz Allen Offshoring Research Network will be discussed as well.
The Dutch research is largely positioned on the quantitative side, which implies the extensive use of surveys and interviews. There is some general data available on the foreign direct investments and trade patterns, but the general tendency of the existing research by for example the Netherlands Bureau for Economic Policy Analysis is quantitative. How accurate are all these reports and what are the predicted consequences on the topic of wages and labor demand for the developed countries?
In the last part of this chapter, the position of the Netherlands in the world will be made clearer with the use of data on foreign direct investments, wages and productivity.

3.1 Methods of measuring employment effects of offshoring

To analyze the numbers of jobs lost due to offshoring and the changes in wages, the first thing one has to know is how the companies that relocate activities abroad are registered, because otherwise one has no idea about the amount of jobs lost because of this. The Chamber of Commerce in the Netherlands does only register the birth and death of companies, and movements of companies within the Netherlands. So it is not clear whether the companies that are registered as shut down, have truly closed or whether they have moved abroad. Making it even more complicated, offshoring often involves only a part of a company, which means that the company is not closed completely, there is only a reduction of activities of the company in the source country. This means that in the case of offshore outsourcing, there is no data available at all, because there are ownership changes included. Foreign direct investments, the other part of offshoring (see chapter 2.1), in which ownership remains ‘in-house’, can be measured in billions of euro’s (see chapter 3.4). These data are collected by de Nederlandsche Bank (Dutch Central Bank, DNB).
As there are no data available of the number of companies that have relocated activities abroad, it is even harder to analyze the employment effects of these relocations. The existing

studies focusing on employment effects of offshoring primarily use three different techniques. First of all, several studies use data collected by the use of surveys and interviews. The value of these studies is reviewed in chapter 3.3. The other two methods used for measuring employment effects make use of secondary data sets. Some studies, mainly conducted by economists, use information on imported inputs from input output tables. Using input-output tables, differences across time and differences across industries can be measured. The loss of jobs due to offshoring is measured here as the imported intermediate inputs in a certain industry form the same industry abroad (e.g. a car manufacturer importing steel is not considered as offshoring, but a car manufacturer importing automobile parts from other car manufacturers, which might be produced by the car manufacturer itself, is considered as offshoring), (Vroom, 2007). In the Netherlands, these tables are produced annually by the central bureau of statistics in the Netherlands (CBS), and for several regions in the Netherlands, by the University of Groningen. These papers use existing data and econometric methods to estimate the consequences of offshoring on labor demand and wages. A third group of studies uses data on trade, employment and other factors associated with movements in the aggregate share of employment that could potentially be affected by offshoring (van Welsum and Reif, 2005). To get an idea of the 'outer limits' of employment potentially affected by offshoring, van Welsum and Vickery (2005) calculate the share of people employed who are mainly performing the type of functions that could potentially be carried out anywhere, using data on employment and occupation by industry. However, one job lost in a developed country doesn't mean one job created in a low cost country.

3.2 Consequences on a global scale

Several analyses have been done by researchers that explicitly focus on the effects of offshoring on the wages and/ or labor demand in developed countries. The general outcome is that by relocating the unskilled-intensive parts of the production process from developed countries to developing or Eastern European countries, offshoring is expected to increase the relative demand for skilled labor in the developed country and consequently increase the skill premium (Amiti and Wei, 2004). First, employment effects of the relocation of manufacturing activities will be discussed, followed by the relocation of services activities.

Manufacturing

As said, offshoring is expected to increase the relative demand for skilled labor in developed countries and consequently an increase in wages for skilled workers is predicted. But according to the study of Feenstra and Hanson (1999), wages for (skilled) non-production workers increased only for a small part due to offshoring, the biggest contributor is the development in technology. They estimate the impact of trade and technology on wages for the United States in the period 1979-1990. The results show that both foreign outsourcing and expenditures on computers have played a role in the increase of the relative wage for non-production workers. Offshoring accounts for about 15 percent of the observed increase in the relative wage of non-production workers, while the expenditures on computers account for about 35 percent of the increase in the relative wage (Feenstra and Hanson, 1999).

No evidence was found by Falk and Koebel (2002) for the substitution of labor with the lowest educational attainment for either imported materials or purchased services. Their paper examines the effect of purchased services and imported intermediate materials on the labor

demand for different skills in German manufacturing sectors in the period 1978-1990, using input-output tables. Unlike what might be expected, they find no evidence of the substitution of low skilled labor.
However, Hijzen et al., (2005), who investigate the link between offshoring and skill structure using input-output tables, state that offshoring has a strong negative impact on the demand for unskilled labor. This means that offshoring is an important component in explanations of the changing skill structure of manufacturing industries in the United Kingdom.
Ekholm and Hakkala (2006) analyze the effect of offshoring of intermediate input production on labor demand in Sweden. They do this by looking at the difference in educational attainments of the workers and show that overall offshoring and offshoring to low-wage economies tends to shift demand away for workers with a medium (high school or senior vocational education; in Dutch: havo, vwo or MBO) educational level. This contrasts with the effect of R&D investments which tend to shift demand away from workers with a low (primary school and lower secondary education; in Dutch: basisschool of mavo) education towards workers with a high (university; in Dutch: HBO or universiteit) education, according to Ekholm and Hakkala (2006). The negative results of offshoring on workers with medium education is mainly driven by offshoring to Central and Eastern Europe.
Empirical research has thus not yet agreed on the impact of material offshoring on the wages and employment effects for the source country.

Services
These foregoing studies focus on material offshoring and the amount of literature focusing on service offshoring is much smaller. A couple of quantitative studies, mostly conducted by management consultancy firms, have tried to predict the employment effects of services offshoring. Some widely quoted studies include the studies conducted by Mc Kinsey Global Institute (2003), Forrester Research (2002) and Booz Allen Hamilton (2006).
Mann (2004) investigates the impact of offshoring IT-services. Mann concludes that although technological change is the most important driver of IT price declines, globalized production and international trade made IT hardware some 10 to 30 percent less expensive than it otherwise would have been. According to Mann the IT industry exhibited a high job growth, which means that the offshoring does not hurt job growth in the sector (Mann, 2004).
Forrester Research references to an amount of 3.3 million jobs that will be offshored in the period 2003-2015 in the U.S., which means an amount of 200.000 jobs a year. Of this total, Forrester expects 437.000 jobs from the IT industry to go offshore in this period, which represents eight percent of all current IT jobs in the U.S.
In the Mc Kinsey report 'Offshoring: is it a win-win game?', it is stated that offshoring brings benefits to the global economy, and the biggest benefit will likely go to the U.S. economy. As a result of improved competitiveness and reduced costs, businesses can generate more output. Because of the large surplus generated by offshoring activities, they will create a win-win situation for the global economy. They state that the U.S. has the world's most dynamic economy and is fully able to generate new jobs. Compared to the number of layoffs in one year (for example in 1999, 1.15 million workers lost their jobs), the number of jobs Forrester predicts that will be offshored in one year is 200.000, which is 17,4% of all jobs lost in one year, a number that should not underestimated. The fact remains that the wealth created by offshoring does not completely offset the hardships it creates for some of those affected.

Statistics reveal that in the period 1979-1999, 31 percent of those whose jobs were displaced by trade were not fully reemployed. This should not be ignored.
The study 'The globalization of white collar work' conducted by the Duke/ Booz Allen Offshoring Research Network (2006), a cooperation between the Duke University's Fuqua School of Business and the global management consulting firm Booz Allen Hamilton shows some interesting new insights. Besides costs-saving considerations, offshoring is more and more about sourcing talent around the globe. The most important reason for this is the looming shortage of technically trained talent, as engineers and computer scientists. This can be seen as offshoring making its way up the value chain, starting with the offshoring of highly-codified, transactional work as administration and call center functions, then in a second wave involving more technical judgment as finance and accounting, and now according to the 2006 Duke/ Booz Allen Offshoring Research Network Survey, companies are offshoring high-end work that has traditionally been considered 'core' to the business, including chip design and financial and legal research. As this process is taking place, the offshoring of high-skilled functions does not replace the jobs onshore. In the research, in which 537 companies in the U.S. and Europe have been surveyed, the result is: the more sophisticated or higher-skilled the function, the lower the impact of offshoring on the source country. In the survey, no jobs were lost in three out of every four offshoring implementation involving R&D, sales and marketing, product design or engineering. In contrast, offshoring routine back-office functions does result in lost jobs approximately half the time.
One can conclude that most studies show that offshoring has only a limited effect on wages and labor in developed countries, but the predictions by consultancy bureaus show that offshoring will steadily increase, as the search for highly educated employees becomes more global in nature.

3.3 Offshoring effects on labor and wages in the Netherlands

After paying attention to the changes in wages and labor on the international scale, it is time to focus on the Netherlands. In the Netherlands, several reports have been written to investigate the impact of offshoring on wages and labor demand. The studies that will be reviewed here are conducted by research agencies (CPB Netherlands Bureau for Economic Policy Analysis, Regioplan Policy Research) and management consultants (Berenschot, Deloitte, Forrester).

Does the relocation of activities from the Netherlands to Eastern European countries and developing countries have negative effects on the development of wages and labor demand? Existing empirical evidence shows that, just as in the studies done to investigate the impact of wages and labor demand on international scale, the impact seems to be of minor importance compared to the total destruction and creation of jobs annually. Table 3.1 shows the results and used methods of the offshoring studies.

Table 3.1 Offshoring effects on wages and employment in the Netherlands			
Institute	Year	Methods	Results
Deloitte	2006	Survey, interviews. Response: 8,2% (157 out of 1906 firms with more than 50 employees)	Manufacturing: 20 % of the manufacturing firms expect that within two years a substantial part of their production capacity will be offshored, 34 % expects to create new capacity abroad. No exact data about the number of jobs that will be lost due to offshoring.
CPB	2005	Deskresearch.	Unfavorable position of low educated workers on the labor market caused by technological changes. Unemployment due to relocations on the short term are insignificant when compared to the annual destruction and creation of employment in the Dutch labor market. Estimate: 21.000 jobs are lost due to offshoring yearly in manufacturing.
Berenschot	2004	Survey, deskresearch, interviews. Response: 18.11% (2.106 out of 11.624 firms in 12 sectors with more than 20 employees.	Activities of approximately 37.000 employees have moved abroad in the period 2001-2004, with a margin of 27.000 and 47.000 jobs. The net-effect on the employment is lower, because of re-assigned personnel. Employment has decreased with 1,5 to 3,4% in three years.
Regioplan Policy Research	2005	Deskresearch, interviews.	IT: employment effects will be limited in the next ten years. A maximum of 2000 IT-jobs annually were offshored till 2004. If the demand for IT employees will grow at a rate of 2% per annum, the effect of moving 20.000 jobs offshore between 2004 and 2014 will mean that the employment still increases with 33.000 jobs during the same period in this period.
Forrester	2004	Survey, interviews. Response: 247 companies surveyed and 19 international European offshore service providers interviewed.	Services: In 2008, the total number of jobs offshored will be 10.698. In the year 2015, 36.663 jobs will be offshored in total.

Outcome for the Dutch labor market

In the study 'Made in Holland V' (2006) conducted by Deloitte, 20 percent of the manufacturing firms expect that within two years a substantial part of their production

capacity will be offshored, and 34 percent of the respondents expect to create new capacity abroad. *Substantial* is here defined by the reference framework of the respondent, which makes it unclear how much capacity will be relocated exactly. The number of jobs this will cost or the changes in wages in the Netherlands are not explicitly mentioned. Looking at the studies of the foregoing years, the number of firms that stated that it will offshore production within a period of two years has decreased. As already said in the introduction of this paper, Deloitte concludes that companies still relocate a part of their production or research & development division to Eastern Europe, but with a decreasing speed. The reasons for this are the recovery of the Dutch economy, the regaining of confidence and disappointing experiences of some firms abroad.

On the outcome for the Dutch labor market, the researchers of the CPB conclude that the unfavorable position of low educated workers on the labor market is hardly the result of relocation of activities; more important are the technological changes. Furthermore, unemployment due to relocations on the short term are insignificant when compared to the annual destruction and creation of employment in the Dutch labor market. Making a raw estimate, using data from Berenschot in the industry, CPB reveals that 21.000 jobs are lost due to offshoring yearly. Although this number is quite large compared to the other studies, it is small compared to the yearly destruction of jobs at a number of 856.000 annually in the period 1991-1997.

Based on their survey, Berenschot (2005) states that the activities of approximately 37.000 employees have moved abroad in the period 2001-2004, with a margin of 27.000 and 47.000 jobs. The net-effect on the employment is lower, as a 10.000 employees are thought to be assigned to other jobs. This means that employment has decreased with 1,5 to 3,4%, in three years. It should be kept in mind that only firms with more than 20 employees are included in the research. A small part of the companies are responsible for a very large part of the relocations; 10% of the companies account for 75% of the amount of jobs that are moved abroad, which means that an estimated amount of 28.000 jobs that are relocated are caused by 10% of the companies.

The results of a study of Beek et al. (2005) of the Regioplan Policy Research, commissioned by the for Council of Labor and Income, on the effects of offshoring in the Dutch IT shows that the employment effects will be limited in the next ten years. Drawing on deskresearch (literature study, analysis of existing studies) and interviews (with companies with offshore experience, policymakers, international organizations, employer and employee organizations), it is estimated that a maximum of 2000 IT-jobs a year are offshored till 2004. This is less than 1% of the total employment in the IT. Even if the demand for IT personnel will grow at a moderate rate of 2% per annum, the effect of moving 20.000 jobs offshore between 2004 and 2014 (2000 a year) will not prohibit total sector employment to grow with 33.000 jobs during the same period. With this growth rate, the availability of highly educated IT employees becomes a problem while at the same time the requirements for IT employees are becoming more severe. Flexibility and employability will become more important as IT employees have to gain more insight into business processes of the clients and develop more commercial and communicative abilities.

Forrester Research (2004) makes explicit predictions for different countries in Europe on the number of jobs that will be lost due to offshoring in the report 'Two speed Europe; why one million jobs will move offshore'. Forrester predicts that the largest number of jobs in IT and service will be lost in the United Kingdom. In the Netherlands, in the year 2008, the total

number of jobs offshored will be 10.698 (see table 3.2), which is an unrealistically exact number. The number predicted by Forrester is more than one and a half time as much as what is predicted by Ter Beek et al., 2005) (20.000 jobs by Ter Beek in the period 2004-2014, and about 34.000 jobs by Forrester in the period 2004-2015). In the year 2015, 36.663 jobs will be lost to low-wage countries according to Forrester. Only in a limited number of cases does this lead to a reduction in the employment, as most of the employees find a new job within the company.
But it is not the lost jobs that will damage Europe for years to come, according to Forrester, instead it's the lost competitiveness that will be the result for countries like Germany, France, Italy and the Netherlands as they fail to exploit the offshore possibilities for key industries like finance, auto manufacturing and aerospace (Forrester Research 2004, p. 11).

Table 3.2 Forecast: European jobs moving offshore by country; 2004-2015

Cumulative number of jobs moving offshore

	2004	*2005*	*2006*	*2007*	*2008*	*2010*	*2015*
UK	56,034	99,704	136,817	174,958	204,280	320,969	758,401
Germany	8,008	11,354	17,632	22,377	37,864	61,056	139,914
France	5,541	7,636	12,067	15,427	26,425	42,839	98,174
Netherlands	2,676	3,481	5,113	6,506	10,698	16,794	36,663
Italy	2,463	4,125	5,360	6,806	7,811	12,518	28,834
Sweden	1,425	1,845	2,816	3,592	5,942	9,213	20,240
Belgium	953	1,381	2,236	2,832	4,800	7,610	17,621
Switzerland	880	1,221	2,006	2,551	4,298	6,667	15,233
Denmark	877	1,181	1,786	2,267	3,753	5,889	13,102
Spain	873	1,489	1,955	2,480	2,834	4,465	10,303
Austria	738	1,002	1,483	1,896	3,226	5,342	12,065
Finland	590	812	1,318	1,688	2,901	4,667	10,730
Ireland	287	513	701	896	1,043	1,639	3,868
Portugal	213	356	466	594	685	1,102	2,552
Greece	171	313	415	527	612	982	2,316
Luxembourg	52	75	117	148	248	394	902
Total	81,783	136,487	192,290	245,545	317,422	502,145	1,170,918

(numbers have been rounded)

Source: Forrester Research (2004)

Value of the reports

An advantage of these reports is that new information is gathered that is not available when using investment data. However, there are also some disadvantageous using surveys and interviews. First of all, when a firm says it will move a part of their activities abroad, this does not mean it will happen for certain. Second, the samples often include only large firms or a specific sector (which means selectivity) and usually a small part of the firms responds to the surveys. Besides this, according to scientific literature, the used manner of asking a question can lead to distortion, as firms for instance might want to make a statement about their dissatisfaction about current government policy (CPB, 2005). Sometimes it is not clear what exactly is meant by relocations. What is meant in the study by Deloitte (2005) by substantial production capacity? This makes it difficult to interpret the study accurately.

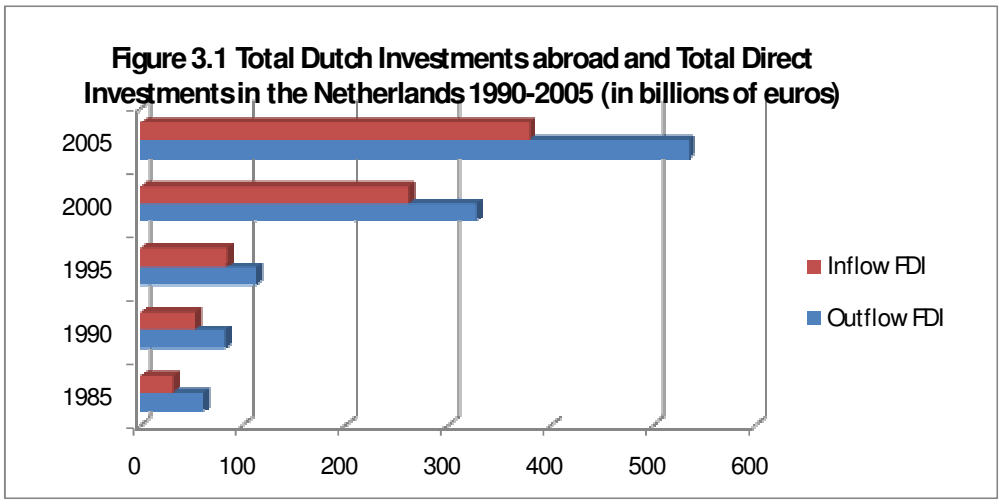
Furthermore, all of the studies focus on the relocation of activities from the Netherlands to Eastern European of developing countries, none of the studies looks at the impact of foreign companies in relocating activities to the Netherlands.

It seems right to conclude that none of these studies can predict exactly how much labor will be moved offshore and consequently how much jobs will be lost in the Netherlands. The difference between the results of the CPB (21.000 a year) and Regioplan Policy Research (2000 a year) are large. However, the latter study only takes the IT-sector into account, and the former the manufacturing sector. This means that more manufacturing jobs will relocate than services jobs. As the results of the reports differ, when put in perspective, the annual loss of jobs due to offshoring is not that large compared to the annual destruction and creation of jobs in the Netherlands in total. However, a lack of available highly educated IT employees will make companies look for new employees beyond the country borders. Thus, the Netherlands should watch out for lost competitiveness, warns Forrester (2004). Moreover, the condition of the Dutch economy also plays a role in the offshoring decision. In the next part of this chapter, I will look at the foreign direct investments and use quantitative data to look at offshoring effects on labor demand and wages.

3.4 Offshoring effects in the Netherlands: investment, wage and productivity statistics

As the differences in wages between developed countries and developing countries are one of the most important reasons to offshore part production or services, it is now time to look at the differences in these wages between the low wage and high wage countries. Consequently, the differences in labor productivity will be examined. But first, the Dutch development in foreign direct investments will be investigated, looking at the changes in the amount of FDI, the destination countries and the share of different sectors in FDI.

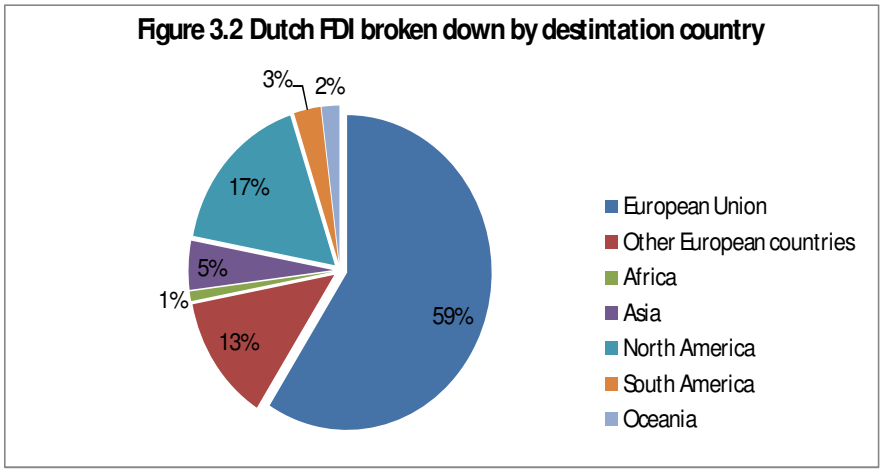
Offshoring can be divided in foreign direct investments (or in-house offshoring) and offshore outsourcing (see table 2.1). Research by Berenschot (2004) shows that only 19% percent of the surveyed companies solely uses offshore outsourcing as a method of offshoring. The main part of the companies uses the method of in-house offshoring (FDI). The remaining part, 23% of the companies, uses a combination of both. The developments in FDI are visible in figure 3.1. It shows the number of transactions that are related to the acquisition of share capital by firms in foreign companies with the aim of obtaining control in the board of the company. Other financial transactions between affiliated companies (as loans and retained profit) and buying and selling of real estate also belong to FDI. This means that when a firm opens production facilities in abroad, its developments will be visible in the statistics on FDI (Biermans and Van Leeuwen, 2006).



Source: DNB

As becomes clear in figure 3.1, the amount of both the Dutch investments abroad and the investments in the Netherlands have increased substantially since 1990. Although the amount of outflow FDI is larger than the inflow, still an amount of 379 billion euro's is invested in the economy of the Netherlands in 2005. This is called 'insourcing' by Amiti and Wei (2004). Although Amiti and Wei (2004) show that 'insourcing' is still bigger than outsourcing (see chapter 1.1), the opposite is visible in this chart. The Dutch investments were of a total of 534 billion euro's in the year 2005.

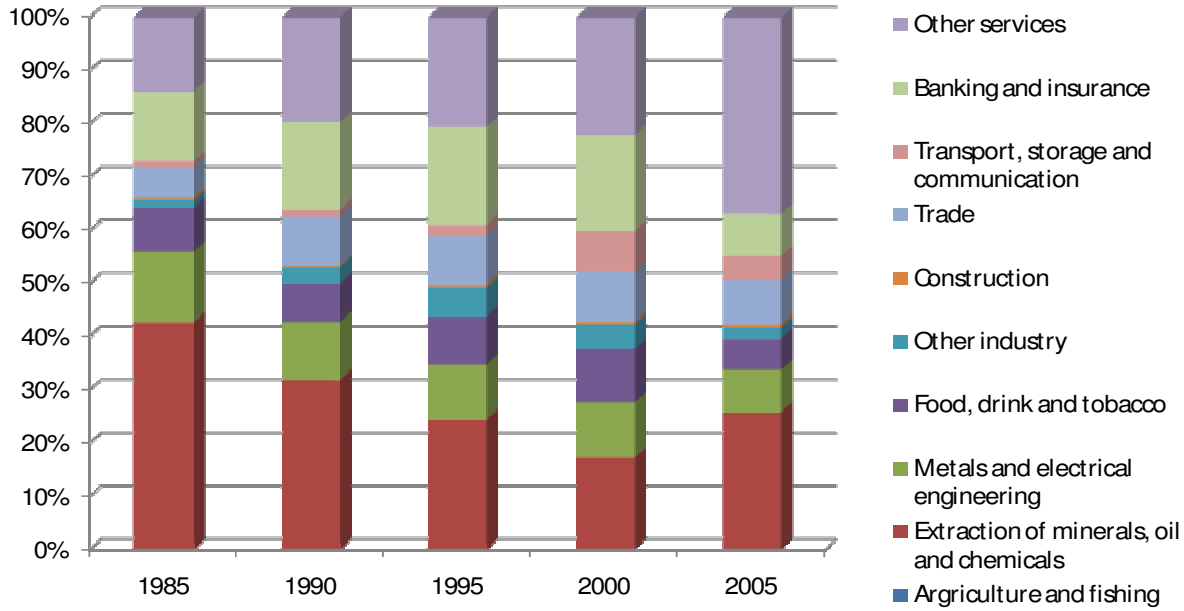
Which countries are the recipients of the Dutch investment? In figure 3.2 is made clear that largest amount of this FDI is directed towards European countries (72% in total; 59% towards European Union countries and 13% towards other European countries). Also, North America receives a fair share of the Dutch FDI. Of all investments abroad, only 5% went to Asia, of which the first generation NIC's (Newly Industrializing Countries) Taiwan, Singapore and South-Korea are the biggest recipient countries. These numbers show that the view of the massive relocation of Dutch investments towards Eastern Europe and Asia is not supported. Hardly anything goes to low wage countries as India and China, as might be expected.



Source: DNB

In figure 3.3, Dutch FDI is divided into different sectors. It becomes clear that the amount of services FDI (trade; transport, storage and communication; banking and insurance; other services) has increased substantially since 1985. In 2005, services accounts for almost 58% of total Dutch FDI, while in 1985, this was only 34%. Industry related FDI has decreased from 65% in 1985 to 42% in 2005. Agricultural FDI is so small, it is not even visible in the chart.

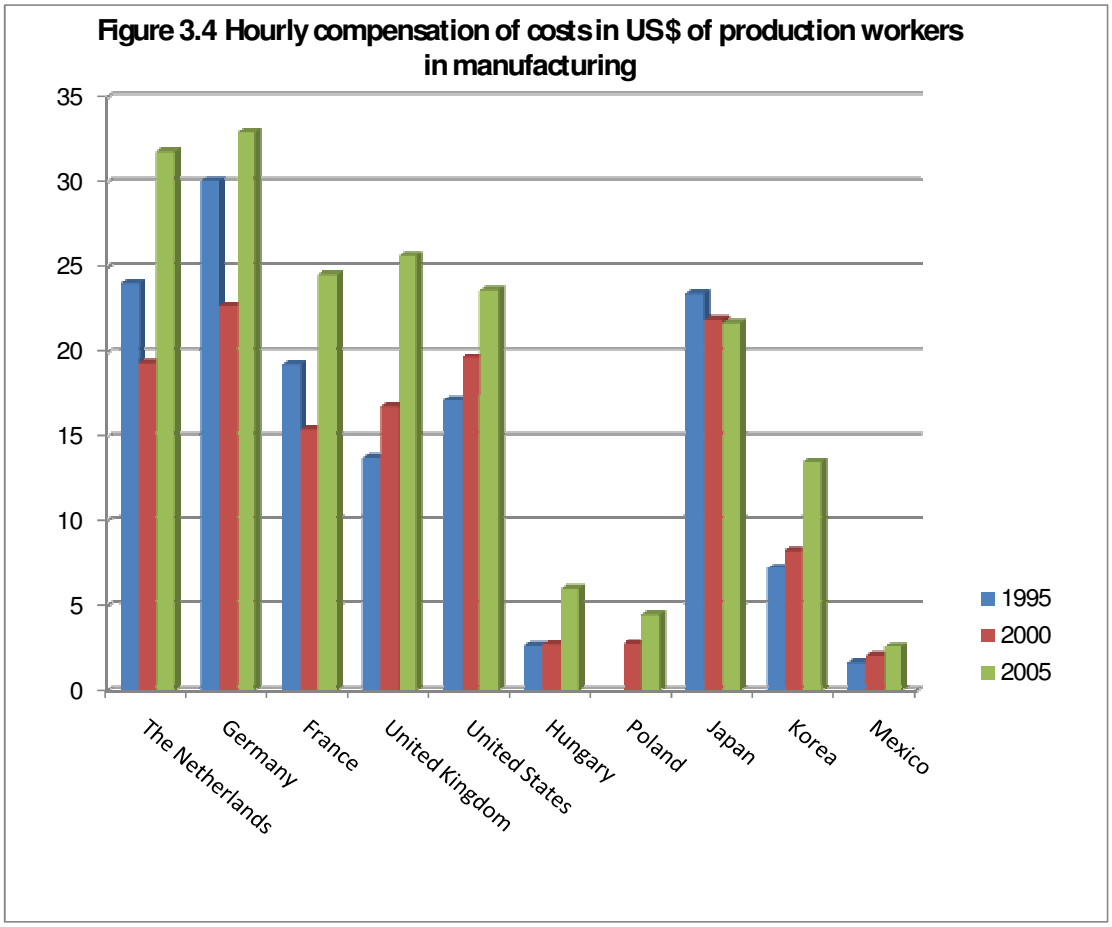
Figure 3.3 Share of each sector in Dutch FDI 1985-2005



Source: DNB

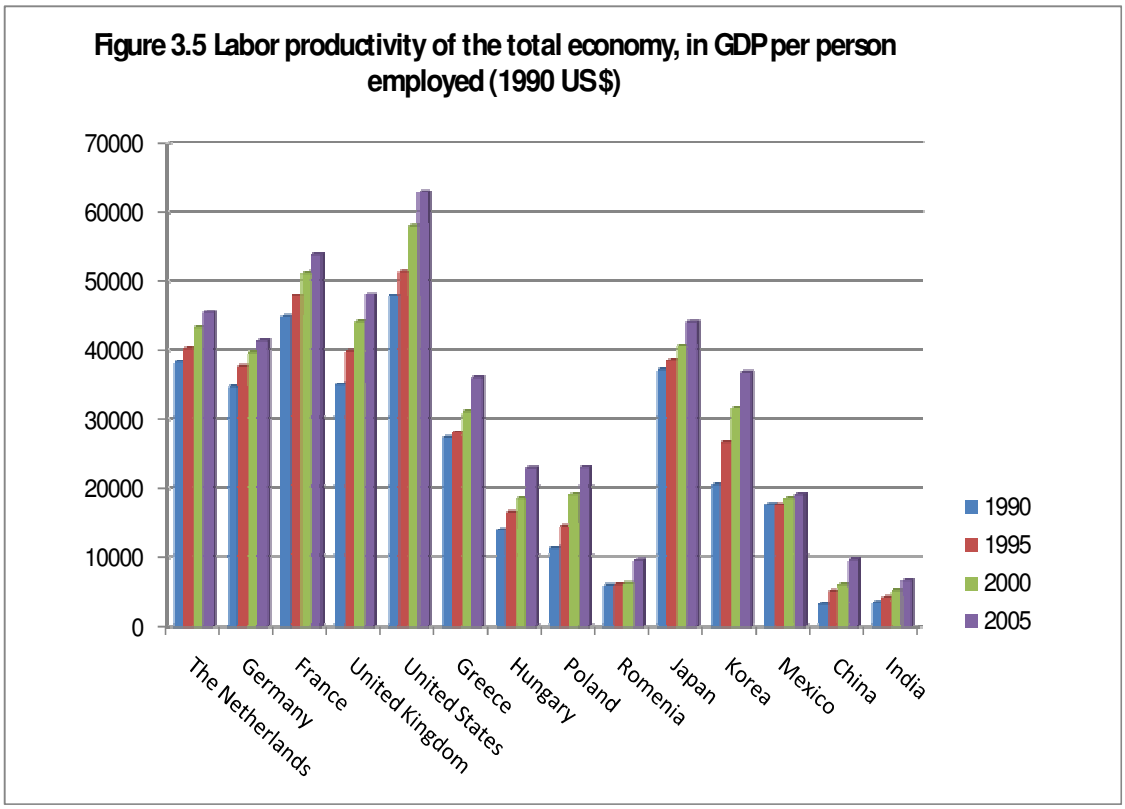
One of the most important reasons for companies to offshore activities is differences in costs between countries. But how much are these differences exactly? It is difficult to obtain data about the differences in wages and productivity between developed and developing countries. Fortunately, the International Labor Organization has some useful data on this topic.

Figure 3.4 shows the labor productivity of selected countries on the topic of wages. It clearly shows the differences in wages between developed and developing countries. No data was available on wages in developing countries as China and India. It is striking that the wages of employees in Hungary and Poland have almost doubled since 2000. The joining of the European Union in 2004 has contributed to this. Furthermore, European companies offshore to these countries because of the highly educated population and their excellent language proficiency, which increases the labor costs in these countries (NRC Handelsblad, June 20th 2007).



Source: International Labor Organization

Figure 3.5 shows the labor productivity of selected countries in 2006. It shows that the labor productivity in countries as India and China is very low. Also, there is a difference in labor productivity between countries within the European Union, especially between Western European countries and countries that have joined the European Union recently, as Hungary, Poland and Romania.



Source: International Labor Organization

Summing up, we have shown that the largest share of Dutch FDI is directed towards other European countries. Only a small part of the Dutch FDI is invested in Asian countries. This doesn't mean that these investments do not occur, they only consist of a minor part of all foreign direct investments. The biggest share of FDI is currently in services. Industry has decreased the last decades. The charts on hourly compensation of costs and labor productivity show that, although the wages are substantially lower in developing countries and Eastern European countries, so is the productivity of these countries.
This means for The Netherlands that it is very important to keep their productivity high, in order to keep labor here. Compared to the productivity level of other European countries, the Netherlands is average.

3.4 Conclusion

In this chapter, international and national (Dutch) evidence on the effects of offshoring on wages and labor is discussed. Unfortunately, there are no data available on the number of companies that have relocated activities abroad, which makes it even harder to analyze the employment effects of these relocations. Different techniques are used to estimate the effects of offshoring on wages and employment demand.
Several analyses have been done by researchers that explicitly focus on the consequences of offshoring on the wages and/ or labor demand in developed countries. Wages for non-production workers increased only for a small part due to offshoring, the biggest contributor is the development in technology. The impact of offshoring on the demand for low skilled workers is still disputable, as different studies show contradictory results. Falk and Koebel (2002) do not find any evidence of the substitution of low skilled labor for imported materials, while Hijzen et al. (2005) state that offshoring has a strong negative impact on the demand for unskilled labor.
In the Netherlands, the results of various reports show that it is still very difficult to predict exactly how much labor will be moved offshore. The studies focus on different sectors and the numbers show that more manufacturing jobs are being relocated than services jobs. Although the results of the reports differ, the general tendency is that the annual loss of jobs due to offshoring is not that large when compared to the annual destruction and creation of jobs. It should be kept in mind that the use of surveys has disadvantages, for instance samples often include only large firms or a specific sector, which means that the validity and representativeness is limited.
The statistics on foreign direct investment show that most of Dutch FDI is directed towards other European countries. Only a small part of the Dutch FDI is invested in Asian countries. The charts on hourly compensation of costs and labor productivity make clear that, although the wages are substantially lower in developing countries and Eastern European countries, so is the productivity of these countries. This means for The Netherlands that it should keep their productivity, competitiveness and educational level high.
In the next chapter I will look at the situation for the northern part of the Netherlands and try to investigate the consequences of offshoring on labor demand in the provinces of Groningen, Friesland and Drenthe.

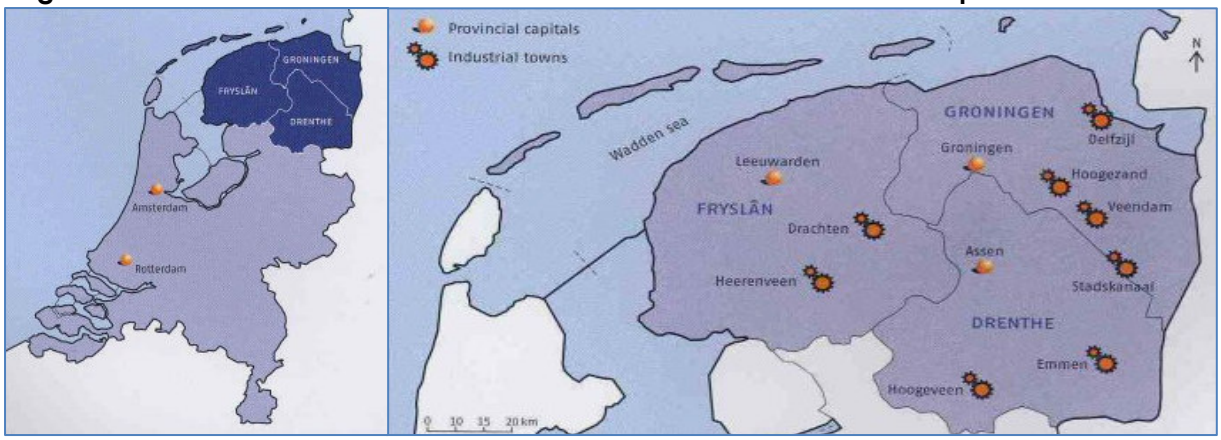
Chapter 4: Offshoring in the Northern Netherlands

This chapter focuses on the consequences of offshoring for the development of the Northern Netherlands, specifically paying attention to employment effects. In the first paragraph, an economic geographical overview of the three northern provinces will be given. It focuses on the strengths and weaknesses of the Northern Netherlands that could influence the decision of companies whether or not to engage in offshoring. The second part of the chapter consists of the current policy on regional scale that influences offshoring. Attention will be paid to the different ways that regional policy in the North is able to influence the companies in the North. Embeddedness, innovation and education play important roles in formulating these policies. Both the new economic geography and the institutional theory provide an theoretical framework for this. Empirical evidence of offshoring in the Northern Netherlands is given in the third section. Although sometimes hard to find, evidence exists of firms in the Northern Netherlands that have relocated (part of) their activities abroad. Foreign companies that are located in the North will be discussed as well. In the fourth part, the future consequences of offshoring in the North are estimated.

4.1 The Northern Netherlands: an economic geographical analysis

This analysis focuses on the economic, geographic and social facets of the North that are important determinants for firms in deciding whether to stay in, move to or leave the North. After a general introduction on the economy in the North, education, employment, innovation and firm dynamics will be discussed. These are all interrelated aspects that might influence the decision of a firm in deciding to engage in offshoring. For example, a low educational level of the labor force might influence the decision of innovative companies whether or not to locate in the North. As production activities that are dependent on a large amount of labor relocate to low cost countries, it is the innovative firms that the North needs to focus on. These firms need high skilled labor. But first of all, a general introduction of the North will be given.

Figure 4.1 Location of Northern Netherlands and the main economic and political centers



Source: www.rug.nl

The Northern Netherlands is defined here as the three northern provinces of the Netherlands: Groningen, Friesland and Drenthe. This region has 1.7 million inhabitants (11% of the Netherlands) that live on 25% of the Dutch territory. This makes the Northern Netherlands a sparsely populated area, compared to the other parts of the Netherlands. The location of the Northern Netherlands and the main cities and are shown in figure 4.1.

Education

Education is important because as firms primarily offshore low skilled activities (see chapter 3), the low educated people that lost their jobs need to find a new job, which might be difficult without adequate retraining. Thus there is no need to educate people for routine production jobs, which might be offshored in the future. As said in chapter 2, jobs where personal contact is necessary won't be offshored, which means that jobs as hairdressers and in restaurants and cafes etc will continue to exist. Moreover, as the North wants to keep labor in the region, it needs to be a competitive region, and keep and attract innovative firms. These innovative firms need high skilled labor. If there is not enough supply of high skilled personnel, these jobs will eventually move to developing countries as well.

The average educational level of the labor force in the North is lower than in the rest of the Netherlands and the supply of high educated people in the North is relatively low. This is shown in the tables 4.1 and 4.2; the educational level and the share of high educated people in both the population and the labor force in the North is lower than the Dutch average. However, the gap has decreased since 2000. The difference between the North and the Netherlands in the share of high educated people in the labor force was in the year 2000 4.1 percent point, and decreased to 2.8 percent point in 2006. The study 'The Dutch entrepreneurial climate in numbers 2006' by the Dutch Central Bureau for Statistics (CBS) predicts that the demand for high educated employees in the Netherlands will increase in the next couple of years, at the expense of low educated employees. It is predicted that the supply of high educated employees is not able to increase at the same speed which will make the high educated labor relatively scarce. Consequently, the price of highly educated labor will raise, which is not beneficial for the Dutch economy (CBS, 2006).

Table 4.1: Educational level of population 15-65 in the Netherlands and the Northern Netherlands, 2000 and 2006

	NL 2000	N-NL 2000	NL 2006	N-NL 2006
Lower	38,1%	39,2%	33,2%	34,0%
Medium	40,6%	42,9%	41,5%	43,4%
Higher	21,3%	17,9%	25,6%	22,6%
	100%	100%	100%	100%

Table 4.2: Labor force by education in the Netherlands and the Northern Netherlands, 2000 and 2006

	NL 2000	N-NL 2000	NL 2006	N-NL 2006
Lower	28,5%	29,1%	24,1%	24,0%
Medium	44,4%	47,9%	44,5%	47,5%
Higher	27,1%	23,0%	31,3%	28,5%
	100%	100%	100%	100%

Source 4.1 and 4.2: CBS

Table 4.3 shows the unemployed in the Northern Netherlands and the Netherlands by education. It shows that the number of the not working jobseekers in the Netherlands and the Northern Netherlands are foremost low educated. A jobseeker is a person who is actively looking for employment. Compared to the Dutch average, the North has less lower educated jobseekers, a large pool of medium educated jobseekers and an percentage of higher educated jobs seekers that is almost equal to the Dutch average in 2007.
The study of the CBS concluded that there will be an increased demand for higher educated employees in the next years, which means that the northern provinces have to find ways to raise the educational level of their inhabitants, in order to be able to meet the labor demands of the companies in the North, and to prevent relocations of existing firms. It is also a prerequisite in order to become a knowledge intensive economy, which is central to public policy in the Northern Netherlands (see section 4.2).

Table 4.3: Percentage of not working jobseekers by education, the Netherlands and the Northern Netherlands, October 2003 and October 2007

	NL 2003	N-NL 2003	NL 2007	N-NL 2007
Lower	50,79%	47,94%	56,04%	49,44%
Medium	31,06%	36,61%	30,14%	37,18%
Higher	16,28%	14,55%	13,82%	13,28%
Unknown	1,87%	0,9%	0%	0,09%
	100%	100%	100%	100%

Source: www.economieinhetnoorden.nl

Employment
The Northern Netherlands has 650.000 jobs, which is 9% of total Dutch employment. In the previous years, the labor productivity has increased, although it still behind the Dutch average, as is shown in table 4.4, where the Gross Regional Productivity of the North is compared to the productivity of the Netherlands.

Table 4.4: Labor productivity and welfare of Northern Netherlands, 2002

		North	***Netherlands***
GRP per hour worked	*% compared to Netherlands*	*96%*	*100%*
GRP per inhabitant	*% compared to Netherlands*	*82%*	*100%*

Source: NAV, 2005

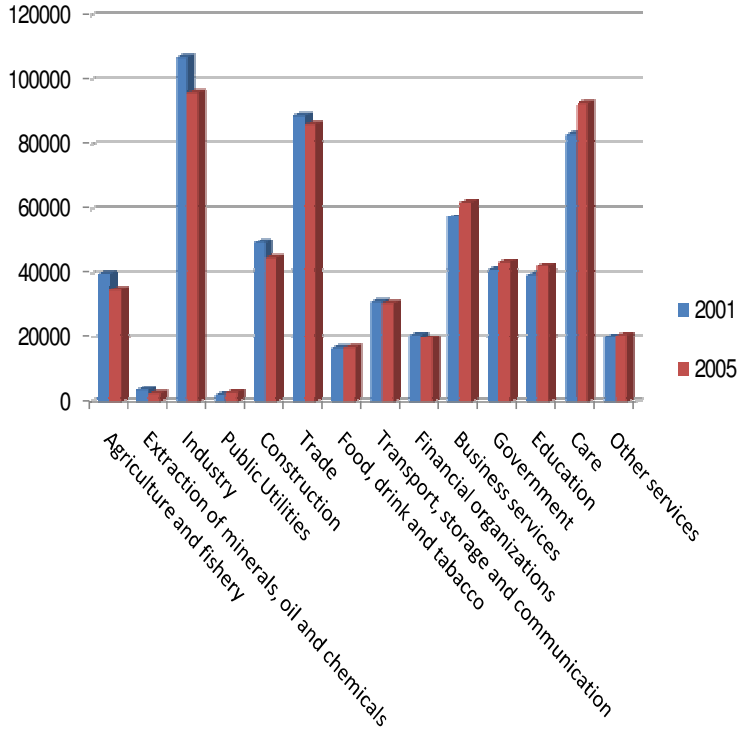
The small and medium sized enterprises (SME's) are strongly represented in the North and have an employment share of 75% (Ministry of Economic Affairs, 2007). The distribution of this sector is almost equal to the Dutch average, except for the smaller number of SME's in the services sector.

In general, on the labor market in the three northern provinces does supply exceed demand. However, the market is tight for technical professions (both lower and higher educated), lower educated agrarian professions, and higher educated medical and managerial jobs. Markets

where supply exceeds demand are lower educated caring, administrative and social personnel and higher educated juridical, linguistic and pedagogical jobs.

As is shown in figure 4.2, the largest employment sectors in the northern part of the Netherlands are industry, care and trade. Especially the care sector has increased substantially between 2001 and 2005, by 11,1%. The industry sector, although still the largest employer in the Northern Netherlands, has decreased by 9,9% in the period 2001-2005. Broersma and Van Dijk (2006) state that the number of jobs in the industry in the North in the period 2002-2025 will decrease from about 100.000 jobs in 2002 to 89.000 jobs in 2025, which is a loss of 11.000 jobs in 23 years. This trend extrapolation is an underestimate, as the number of jobs in the industry according to the latest data was 106.808 in 2001 and 96.279 in 2005, which is a loss of more than 10.000 jobs in a period of only four years. The disappearance of industry jobs might thus take place on a higher speed than was predicted by Broersma and Van Dijk. As became clear in the previous chapter, the activity that is being relocated most frequently is low skilled industrial employment. This decrease of employment in the industry sector partially caused by offshoring.

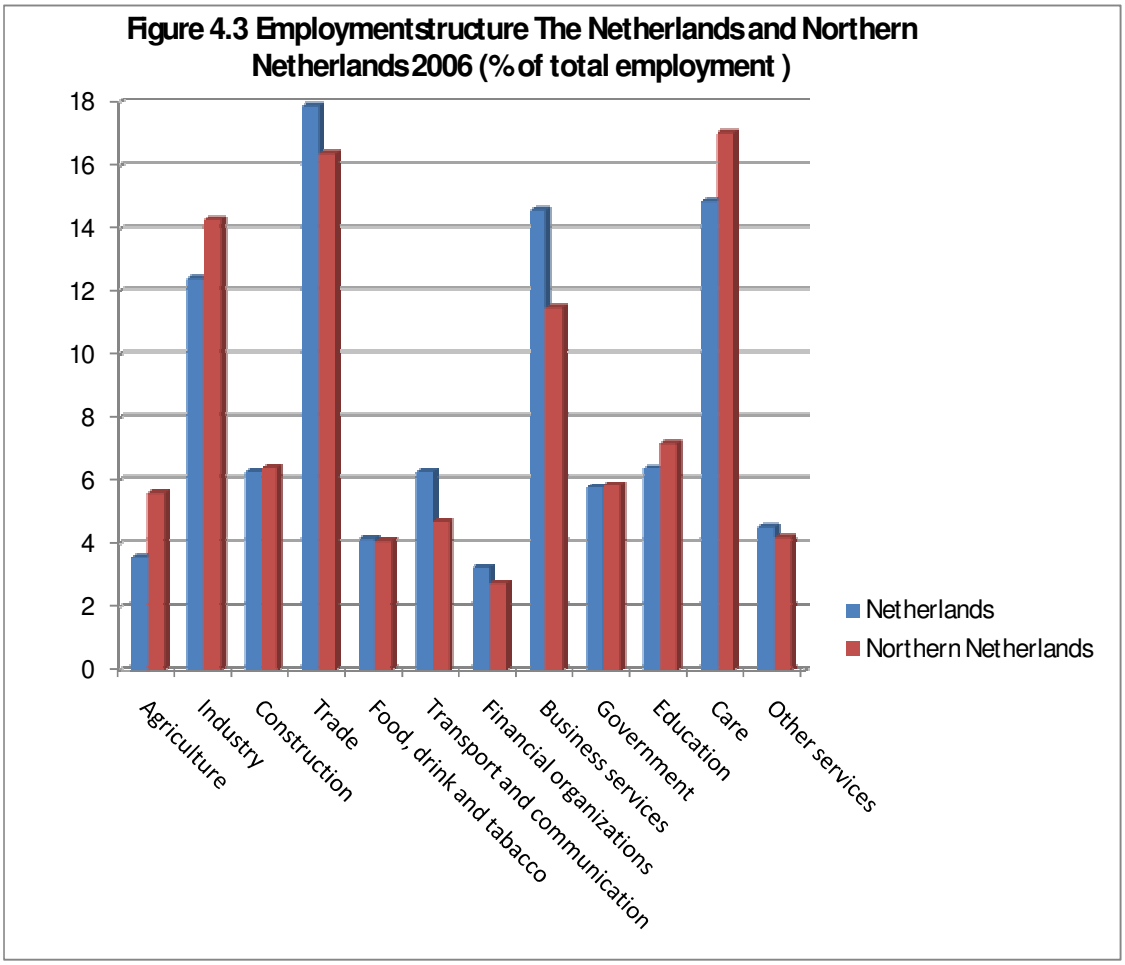
Figure 4.2 Employment per sector in the Northern Netherlands. Jobs 15 hrs or more, absolute numbers



Source: Noordelijke Arbeidsmarkt Verkenning 2007

Figure 4.3 shows the employment structure in The Netherlands and the North. Full-timers, part-timers and temporary workers are included in the graph. Agriculture, industry and care are strongly represented in the North, with a higher proportion than the national average. Although agriculture and the related industries are disproportional large in the North, this sector is under pressure because it is dependent on low costs and because of the changing

common agricultural policy and WTO agreements. Industry sectors that are traditionally large in the North, as the metal industry, also depend on low costs and are thus vulnerable for offshoring. The presence of financial and business services is still smaller than the Dutch average, but the gap has decreased the previous years (Noordelijke Arbeidsmarkt Verkenning, 2007 and Ministry of Economic Affairs, 2007). The data from LISA (a database with information about employment in the Netherlands) used and adjusted here show that the share of the industry jobs (including part time jobs) has decreased from 15.8% in 2002 to 14.3% in 2006. However, Broersma and Van Dijk (2006) predict that share of industry jobs in the North will decline from 19% in 2002 to 14% in 2025. According to LISA, this number has thus already been reached in 2006. Just as with the trend extrapolation Broersma and Van Dijk (2006) used for the absolute number of jobs, it looks like the size of the industry has been overestimated.



Source: LISA, own adjustment

Innovation

It is important to consider innovation in the context of offshoring. As primarily low skilled routine jobs are being relocated to low cost countries, the North needs to focus on stimulating innovation in companies in the North and attracting new innovative companies. It appears that the North is lagging behind, comparing the expenses and the employment in research and development (R&D) in the North to the Dutch average. The tables 4.5 and 4.6 show the

expenses and number of fulltime jobs in R&D and the growth in both. Looking at the expenses, it appears that the amount spent on R&D in the North is small, and that the growth is also smaller than Dutch average. The increase in expenses on R&D in the industry is larger than Dutch average, however the absolute numbers are very small. The growth of R&D expenses in services in the North (20%) is much slower than the Dutch average (64,12%).
The absolute number of jobs in the R&D jobs is small in all sectors, and the growth of jobs in the North (5,77%) is lagging, as the Dutch R&D employment increased by 22,57%.

Table 4.5: Expenses in R&D The Netherlands and Northern Netherlands, 1996 and 2005, in millions of euro's

	NL			N-NL		
	1996	***2005***	***% increase***	***1996***	***2005***	***% increase***
Industry	2645	3989	50.81%	115	186	61.74%
Services	549	901	64.12%	30	36	20%
Other	147	255	73.50%	13	9	-30.77%
Total	3342	5144	53.92%	157	231	47.13%

Source: CBS

Table 4.6: R&D employment in fulltime jobs, 1996 and 2005

	NL			N-NL		
	1996	***2005***	***% change***	***1996***	***2005***	***% change***
Industry	29267	33546	14.62%	1598	1603	0.31%
Services	7952	12722	59.98%	409	582	42.30%
Other	2280	2148	-5.79%	142	89	-37.32%
Total	39499	48415	22.57%	2149	2273	5.77%

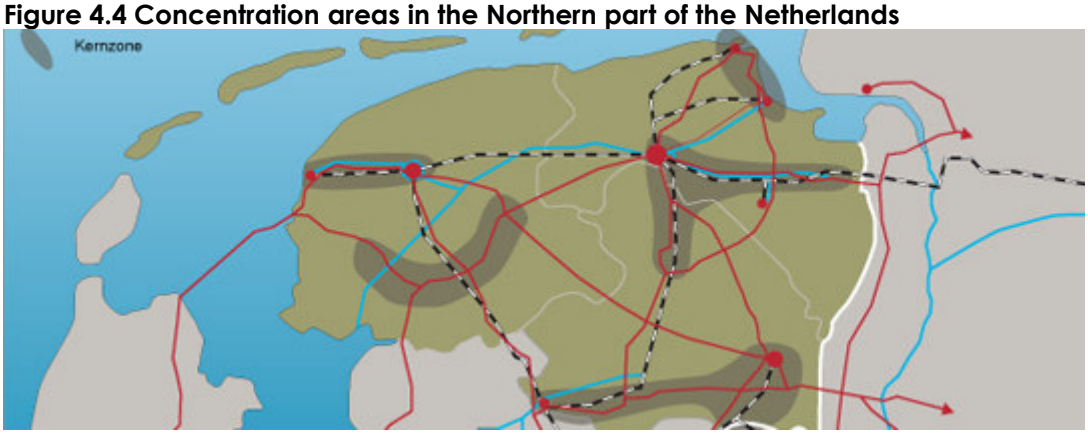
Source: CBS

Innovation in the North is primarily process innovation and to a smaller extend in renewing product innovations (Ministry of Economic Affairs, 2007). Overall, innovativeness is lower in the Northern Netherlands. Apart from the R&D expenses and R&D employment, the number of requested patents is small and the share of industrial high-tech and medium-tech employment in total employment in the Northern part of the Netherlands is average to low (Ministry of Economic Affairs, 2007). This all causes high educated people to leave the Northern Netherlands. The public sector, especially the health care, education and public administration, which has expanded substantially in the North, doesn't cause an increase in regional competitiveness (Ministry of Economic Affairs, 2007).

Firms dynamics

Figure 4.4 shows the five concentration areas of working and living in the Northern Netherlands. These zones are: Zuid-Drentse stedenrij, the zone Groningen-Winschoten-Assen, the Eemsdelta, the A-7 zone and the Westergozone. In these zones are the main cities, business locations and national and internationally oriented companies located. (www.nom.nl). Strengthening the entrepreneurial climate, intensifying the organizational abilities and improving the spatial conditions in order to create innovations are major aims of the local governments in the North (see section 4.2).

Figure 4.4 Concentration areas in the Northern part of the Netherlands



Source: www.nom.nl

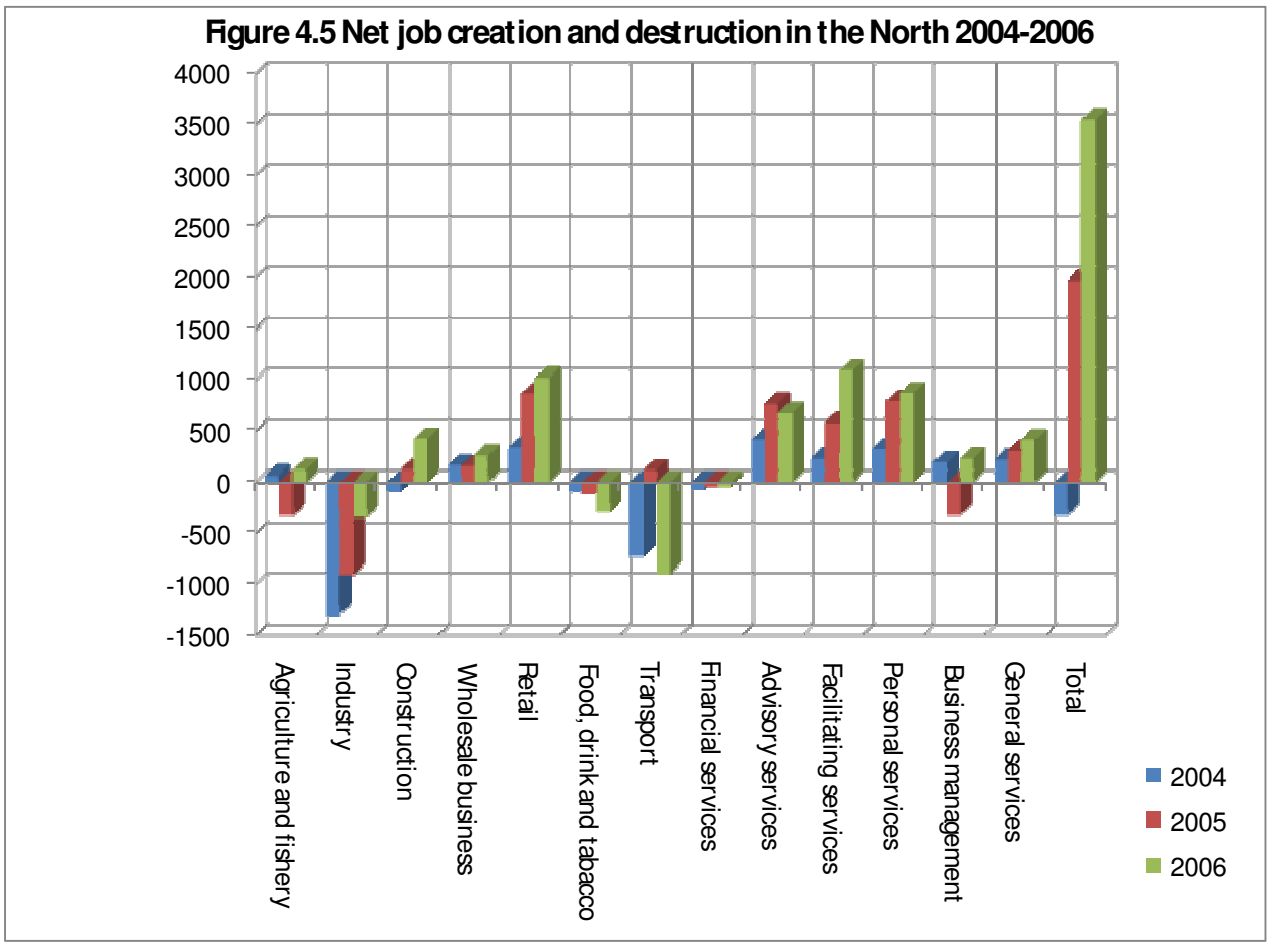
Table 4.7 shows the export intensity, i.e. the percentage of production being sold abroad, of the Netherlands and the Northern Netherlands in the years 1995 and 2005. Looking at the industry, the focus of the North is slightly more on the national market than on the international market, compared to Netherlands as a whole, but the differences are negligible. Services are less oriented at the international market, but an increase is observable. The export intensity of services is somewhat lower than national average, because the services sector in the northern provinces is more regionally focused. The increased international orientation is caused mainly by the fact that the export intensity of communication and business services has increased considerably.

Table 4.7: Export intensity 1995-2005
In % of gross production (exl. minerals)

		Northern Netherlands	Netherlands
1995	Industry	49,0	50,2
	Services	8,3	10,3
	Total	18,3	20,2
2005	Industry	51,0	51,7
	Services	9,1	10,6
	Total	15,6	18,4

Source: Noordelijke Arbeidsmarkt Verkenning 2007

Figure 4.5 shows the net job creation and destruction in the North in the period 2004 - 2006. Most new jobs are created in the retail sector, where most destruction takes place as well, and in the personal services, facilitating services and advisory services. Most jobs were lost in the transport and industry.



Source: Kamer van Koophandel

Looking at all those different economic geographical aspects in the Northern Netherlands, it appears that in general, the North is still lagging behind compared to the Dutch average. Although the differences between the North and the rest of the country have decreased, the catching-up process has not yet faded out all of the differences between the regions. The educational level of the population and the labor force is lower than national average and the number of not working jobseekers generally have a lower or medium education. The supply exceeds demand on the labor market in the three northern provinces, although the market for technical professions is tight. Innovativeness (R&D expenses, patents) is lower in the Northern Netherlands. Industry, trade and care are the largest employment sector in the North, both industry and care are proportionally larger than the national average. The industry and transport sectors have both witnessed a decrease in the number of jobs in the North in the period 2004 - 2006, which means that the destruction of jobs is larger than the creation of new jobs. All taken together, it is expected that the North is less attractive for high skilled companies compared to other parts of the Netherlands, but a catching up process is visible. As it is the high skilled companies that the North is trying to attract to the region, it is important that the discussed social and economic conditions (education, innovation, employment) in the North improve. Because offshoring mainly takes place in low-educated jobs and in the industry sector, which are both disproportional large in the northern provinces, it is expected that he North has a disproportional high number of jobs that are lost due to offshoring of industry. This will be investigated in depth in the next paragraphs.

4.2 Public policy and offshoring

This section will evaluate different policies influencing offshoring. In deciding what policy to use to influence the decisions of companies whether or not to relocate a low cost country, two points are important:

1. Keeping existing firms in the region. However, this doesn't means that the work needs to remain the same.
2. Attracting new firms to the region.

Attention will be paid here to the different ways that regional policy in the North is able to influence the companies in the North. Embeddedness, innovation and education play important roles in formulating these policies. Both the new economic geography and the institutional theory provide a theoretical framework for this.

On the topic of economic development policy, the three northern provinces Groningen, Friesland and Drenthe cooperate within the Samenwerkingsverband Noord-Nederland (Cooperation Northern Netherlands), SNN. Recently, the Dutch ministry of Economic Affairs and the SNN have created the report 'Koers Noord, op weg naar pieken. Duurzame groei door omschakeling naar een kenniseconomie' (Direction North, on the way to peaks. Sustainable growth by moving towards a knowledge economy) in which an improvement in the economic situation of the northern part of the Netherlands 2007-2010 is discussed. The government wants to stimulate the northern economy along three different lines.
The first line is expanding economic peaks of national importance. The focus is on four different clusters (energy, water, sensor technology and agribusiness) that have growth opportunities. The goal of the program is to create optimal conditions for these clusters to realize these growth opportunities. This is done by strengthening the entrepreneurial climate, intensifying the organizational abilities and improving the spatial conditions in order to create innovations. The second line is creating a transition towards more knowledge intensive and innovative businesses in regional important sectors and the development of niche markets with spin-offs for regional employment in the Northern Netherlands. Life sciences and tourism are important themes in this line. The third line concerns realizing an overall transition towards a more high-skilled and knowledge intensive economy. Increasing innovativeness, stimulating exports and raising the educational level of the existing and potential labor force are the objectives of the government. The North wants to become an knowledge intensive economy with strong cities and a vital countryside (Ministry of Economic Affairs, 2007).

In general, public policy concerning offshoring should target the improvement of the competitiveness and entrepreneurial climate in the Northern Netherlands. Policies that prevent offshoring (and the loss of employment) might backfire because the choice facing some industries is to offshore or cease to exist (Robert-Nicoud, 2006). This means that eventually these companies will leave the region even when measures are implemented that will prevent the company from leaving the region. Some of the measures that have been discussed in the literature and newspapers include giving companies a tax advantage when keeping employment in the country or region, introducing a tax when companies want to relocate labor and letting an independent organization test the offshoring plans of companies (Poort et

al., 2004). It is doubtful whether these measures are realistic considering the strict competitive rules of the European Union. Furthermore, these tax measures will probably cause companies to go for offshore outsourcing, in which formally no labor is being relocated, because of ownership changes. These measures might not be the optimal choice for a company, reducing the competitiveness of the company.
Improving the position of the Northern Netherlands by keeping existing firms in the region and attracting new firms can be done in different ways, that reinforce each other when implemented the appropriate way. Points of attention include embeddedness, innovation and education. These aspects are also important in the report of the Ministry of Economic Affairs and SNN. They will be discussed here by applying the institutional theory and the new economic geography.

Keeping existing firms in the region – creating embeddedness
Despite its popularity, embeddedness is a problematic concept and hard to define. According to Granovetter, it means that the economic life of a firm or market is territorially embedded in its social and cultural relations (cited by Atzema et al., 2002). These social and cultural structures are important institutional frameworks in which markets and organizations have a place. Trust, reciprocity, cooperation and convention play a key role in successful regional development (Martin, 2003).
The concept of embeddedness is a component of the institutional theory. This theory assumes that institutions are decisive for the economic behavior of actors (Atzema et al., 2002). This means that economic activity is socially and institutionally situated; it cannot be explained by reference to individual motives alone, but has to be understood as enmeshed in wider structures of social, economic and political rules, laws, conventions and norms. It is the role of these systems, both formal (e.g. laws and rules) and informal (e.g. norms and conventions), that is the focus of the institutional theory in economic geography (Martin, 2003). In explaining spatial differences, the role of local production factors and transport costs is given less weight than the smooth interactions between companies. On the regional level, the focus is on how the institutional context determines the market behavior of firms.
For a region as the Northern Netherlands, the social-cultural context of entrepreneurship is important. Relationships between companies and suppliers come into existence and the resulting networks with suppliers, other companies and local governments might end up in scale advantages and the exchange of information and tacit knowledge. Tacit knowledge can only be exchanged by face-to-face contact and observing and incorporating ways of acting and techniques. This will enhance the competitiveness and innovation in the region.

Companies in the Northern part of the Netherlands that have 'embedded' relationships in the region, have an extra reason to stay in the region. Personal involvement and occasional meetings make sure that these 'embedded' relations usually take place on a limited spatial scale. It is thus important to promote and stimulate 'embedded' relations in the region. In the North, the NOM and the municipalities on their own try to make the locations as attractive as possible for the companies by making sure that the business conditions are advantageous. The government can create the right conditions in which the different actors meet, and in this way, new relations can come into existence. Public institutions, as the governments and universities also play a role in this. Of course, embedded relationships are important and come into existence everywhere in the Netherlands and the rest of the world. In the Northern

Netherlands, the spatial structure of firms in the North is not as dense as in other parts of the country. As in these networks proximity is crucial, governments needs to stimulate the coming into existence of these embedded relationships.
However, these relationships are not maintained against all costs. If a company is producing low skilled products and a large part of total costs consists of labor costs, the company might nevertheless consider relocating to a low cost country. Firms are thus willing to give up their regional network in order to take advantage of differences in labor costs between countries. This means that these networks are temporary. Entrepreneurial coalitions are not permanent, they come into existence and disappear if new market opportunities occur to create innovations (Atzema et al., 2002). It is thus a challenge to make these networks as strong as possible.

Attracting new firms to the North – innovation and education
Apart from embeddedness, innovation is an important concept in the institutional theory. It is one of the most crucial ways to create a competitive environment. However, as stated in section 4.1, the number of process innovations and product innovations in the Northern Netherlands is lower than the Dutch average. Spin offs in the Northern Netherlands are also lower than Dutch average. The 'peaks' (energy, water, sensor technology and agribusiness) on which the government wants to focus in the Northern Netherlands are important in stimulating innovativeness. Apart from these four cluster, IT, tourism, chemical engineering, call centers, life sciences and the ship-building industry are important clusters for the Northern Netherlands in which innovation has to take place.
Offshoring can increase overall innovativeness in services and industry. As the less innovative, low skilled activities relocate and new high skilled companies are attracted to the North, the innovativeness of the North will increase and the number of offshoring companies decrease. Stimulating innovation is thus an important way of keeping businesses and (high skilled) employment in the region and attracting new employment.
Nevertheless this is quite a large task; it means that the northern provinces need to focus on attracting and keeping firms with a need of high skilled labor and creating relations that are deeply embedded in the region. The governments need to facilitate this by creating an environment in which these activities can be profitable. City and region marketing can be a useful tool. The images of the Northern Netherlands that exist with companies and consumers are important.

As said in chapter two, the outcome of the new economic geography is agglomeration and continuous inequality between and within countries, which depends largely on differences in levels of transport costs (causes dispersion) and economies of scale (causes agglomeration). How can economic policy cause economies of scale to be of more importance than low transport costs, which causes companies to offshore and make use of the low labor costs in low income counties? One possible aspect of economic policy can be trying to keep agglomerations attractive to the companies. The sources of agglomeration economies, as described by Marshall should be strengthened. These sources are information spillovers (because of frequent information exchanges), local non-traded inputs (availability of specialist services and specialist local infrastructure) and a local skilled labor pool (sufficient quantities to respond to market conditions and reducing search and retraining costs) (McCann, 2001). This means that promotion of the North, thus region marketing, has to stimulate companies to

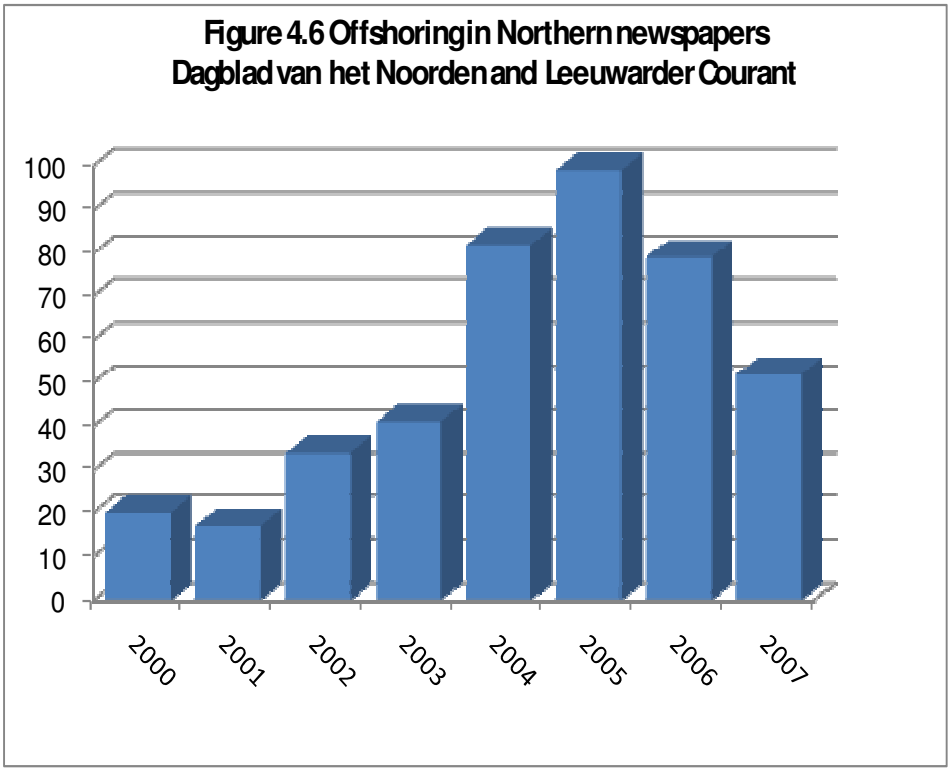
locate in the North. Region marketing will only be successful if the conditions to locate in the North are advantageous. For example the infrastructure, living and housing conditions, educational possibilities and the supply of business areas in the North need to meet the requirements of the companies and its employees.
Just as with the institutional theory, innovation plays an important role. Mainly the low skilled jobs are being relocated, and thus it is important to keep the headquarters and R&D sections of the companies in the region, which can take advantage of the agglomeration advantages in the region. The North has to stimulate innovation to keep high skilled labor in the region.

A good connection between education and the labor market is important for attracting the right firms to the region. However, according to the RWI Arbeidsmarktenquête 2006 (Council for Work and Income Labor market survey 2006), the connection between education and the labor market is not optimal in the Netherlands, 80% of the surveyed labor market professionals (e.g. politicians, representatives of organizations for employers and employees, reintegration companies) states that it is mediocre to bad. This is primarily a qualitative problem. It is expected that the number of jobs for lower educated people will be insufficient, while bottlenecks are expected for high educated jobs. Through the right education, the labor force needs to be utilized up to its maximum. One of these aspects is creating a labor force that suits the demand. The role of education is crucial in this. Anticipation to the strongly increasing demand of personnel in the care sector is necessary. Also, moving on within the educational system is important, as there is a need of higher educated labor. As became clear in section 4.1, although the labor market is large, the North needs more people with a technical education. The governments can try to facilitate this transition of workers between two different jobs by offering adequate retraining programs for people that have lost their jobs in order to suit labor demand.

Summarizing, public policy concerning offshoring should target the improvement of the competitiveness and entrepreneurial climate in the Northern Netherlands. Considering both keeping existing firms in the region and attracting new companies, policy needs to focus on embeddedness, innovation and education. Embeddedness gives companies an extra reason to stay in the North; it is thus a challenge to make these networks as strong as possible. Increasing the number of innovations is crucial for creating a competitive environment. A competitive environment, in return, will attract new companies to the North. In this way, new, high skilled jobs will be created and higher educated people and will stay in the region. This also means that policy has to focus on education and the average education in the North has to increase. The connection between the labor market and education is not optimal, and policy needs to stimulate creating a labor force that suits demand.

4.3 Existing evidence of offshoring in the Northern Netherlands: a newspaper analysis

A small research was conducted in the two largest newspapers in the Northern Netherlands, Dagblad van het Noorden and the Leeuwarder Courant, to investigate the amount of articles about offshoring in the Northern newspapers in the period 2000 - 2007. The articles in the newspapers contain one or more of the words offshoring, outsourcing and lagelonenlanden (lowcostcountries).
The amount of publications in the newspapers show that the hype around offshoring is already over its top (figure 4.6). The increased interest for offshoring started in 2002, and then culminated in the year 2005, after which the attention for offshoring in the newspapers decreased again. The reason for this upsurge in the last five years is probably the recession in the Netherlands that took place between 2002 and 2005. In these recession years, many articles were published about the possibilities and opportunities for companies to offshore and improve their position. The economy improved again in 2006, and this recovery caused regained confidence in the Dutch economy by producers and consumers. As a cause, the number of newspaper articles about offshoring decreased.



Source: Dagblad van het Noorden and Leeuwarder Courant

After this superficial investigation, a more in-depth study was conducted to estimate the total numbers of firms in the Northern Netherlands which have relocated a substantial part of their activities abroad. Again, the period 2000 – 2007 was taken, and the Leeuwarder Courant and Dagblad van het Noorden were systematically searched. The number of firms that were mentioned in the Dagblad van het Noorden and/ or the Leeuwarder Courant is 27 (see appendix 1 for more detailed information). It is difficult to measure the exact number, as it is often not clear whether a company that is closing a plant in the Northern Netherlands is

relocating activities abroad and creating new jobs in a low income country or that jobs are destructed in the Northern Netherlands because of cost savings considerations or the aim of increasing profit, which means that there aren't any new jobs created in a low income country. Some companies first try offshoring of production activities and relocate these activities, but keep the other parts of the company in the Northern Netherlands. However, after a couple of years trying with production activities offshore, it turns out that the firm still isn't making any profit and the decision is made to close the firm in the Northern Netherlands after all, sometimes including the offshoring of the knowledge intensive activities. This leads to the conclusion that after the relocation of low skilled labor, the high skilled labor (R&D and head office) is being moved to the low cost countries as well, as a self reinforcing process. Moreover, not all companies announce publicly that they are going to offshore part of their activities. However, this doesn't mean that offshoring doesn't take place. The evidence found in the newspapers is probably only a small part of the actual relocations that are taking place.

The relocations considered in the newspapers only took place in the industry sector. It is also remarkable that half of the companies that are relocating jobs are foreign. It is often said that these foreign companies are to a large extend 'footloose' and easily relocate to another place. This is thus confirmed by the newspapers articles, because only 262 foreign firms are located in the North, and they account for half of the offshoring activities. The companies are vulnerable because they are dependent on the decisions that are being made in the head office. The parent company wants results and the autonomy of the plant is usually limited and contesting a decision to relocate is often difficult (NOM, 2007).
The largest relocations since 2000 include Cordis (600 jobs in 2007) (see Box 4.1), Sanmina SCI (400 jobs in 2002) and the shipbuilding industry (estimates of 3000 jobs lost in the period 2000-2003, all firms in the shipbuilding industry taken together). In 2006, 2360 jobs were lost in the industry sector, according to LISA. At least 15.5% of these jobs are lost due to offshoring. The companies Villeroy & Boch, Fresenius, Tonerfill, Swedish Match and Advanced Medical Optics all relocated activities in 2006, and a total of 365 jobs were lost because of this. Jobs are also being lost at the companies that supply the company that is offshoring, which is an indirect effect of offshoring, but this number is unknown. Most companies in the North have relocated their activities to Eastern Europe and Asia. Often, companies are having problems before deciding to offshore and the size of the company is being reduced anyhow. Although offshoring of services also takes place, even with an increasing speed, offshoring in the industry is most visible in the North. Furthermore, the North has a disproportional high number of industry.

Box 4.1

Cordis Roden

In October 2007, Cordis Roden, a subsidiary of the American company Johnson & Johnson announced the closure of its plant in Roden at the end of 2008. Cordis Roden develops, fabricates and distributes medical devices, especially catheters and stents. Cordis is one of the largest foreign businesses in the northern part of the Netherlands. Furthermore, Cordis is important in producing innovations; it is number three in the region of requesting patents.
The production will be relocated to Mexico and the research and development division will be relocated to the United States. According to Johnson & Johnson, the cause of the closure is the increased competition and a poor market for medical products. According to the labor union CNV, the closure will cost more than 1200 people their jobs. More than 600 people that work for Cordis and the rest consists of suppliers and accompanying employment. It is a loss for the region as a whole.

The remarkable thing is that both the production as well as the research and development division will be relocated. Mexico is chosen because of the lower labor costs, but the U.S. is not cheaper than the Netherlands. Other considerations play a role here.

Apart from focusing on the firms that relocate to a low cost country, about 262 foreign firms are located in the northern part of the Netherlands. Together, they account for 27.000 jobs. Most of the companies originate from the United States, Germany and Japan. Half of the foreign companies are in the metal and machine industry, chemicals and construction. According to the NOM, it has become more difficult to convince companies to open a firm in Northern Netherlands because of the cheap labor in low cost countries. The NOM focuses instead on the existing foreign companies in the North and investor development has become important. This means meeting with the management of the foreign company and evaluating investment programs, the role of the firm in the parent company, the relationships with suppliers and the satisfaction with the current location. This an example of the creation of a network with embedded relations and smooth interactions between companies. It gives the companies an extra reason to stay in the region.

This newspaper research has shown that offshoring does take place in the North of the Netherlands. Although the amount of offshoring is still not entirely clear, it is easy to underestimate it. By scanning the northern newspapers, it is possible to find quite a few examples of firms in the North that have relocated activities to developing countries. The offshoring of low skilled industry jobs is still the largest part of offshoring as became clear in this chapter. In next section, different estimates will be made about the offshoring in the industry in the Northern Netherlands.

4.4 Consequences for the North

In this paragraph, different studies will be used to estimate the amount of jobs lost in the Northern Netherlands due to offshoring. As said in chapter 3.1, there are three ways of measuring the extent of employment effects of offshoring; surveys, input output analysis and the use of data on trade, employment and wages. These studies have been discussed in chapter 3. A frequently used model in input output analysis (for example by Amiti and Wei, 2004 and Vroom, 2007) to estimate the effects of offshoring on employment is:

$$\ln L_{it} = \alpha + \beta_1 \ln w_{it} + \beta_2 \ln \omega_{it} + \beta_3 \ln y_{it} + \varepsilon \qquad (1)$$

L_{it} = Labor demand in industry i, and year t
w = Wage rate
ω = Vector of other inputs
y = Level of output
α = Constant
β_n = Parameters
ε = Error term

In general, an increase in wage is expected to have a negative effect on employment demand, whereas an increase in the price of other inputs would lead firms to substitute away from the more expensive inputs towards labor. An increase in output would lead to higher employment (Amiti and Wei, 2004).
Van Welsum and Reif (2005) use data on trade, employment and wages. In the model, the share of potentially offshorable employment (OL) is a function of trade, investment, the industrial structure of the economy, a technological adoption/ integration variable, a product market regulation indicator, an employment protection indicator and human capital:

$$OL = f\,(TRADE, FDI, STRUC, ICT, PMR, union, HK, \varepsilon) \qquad (2)$$

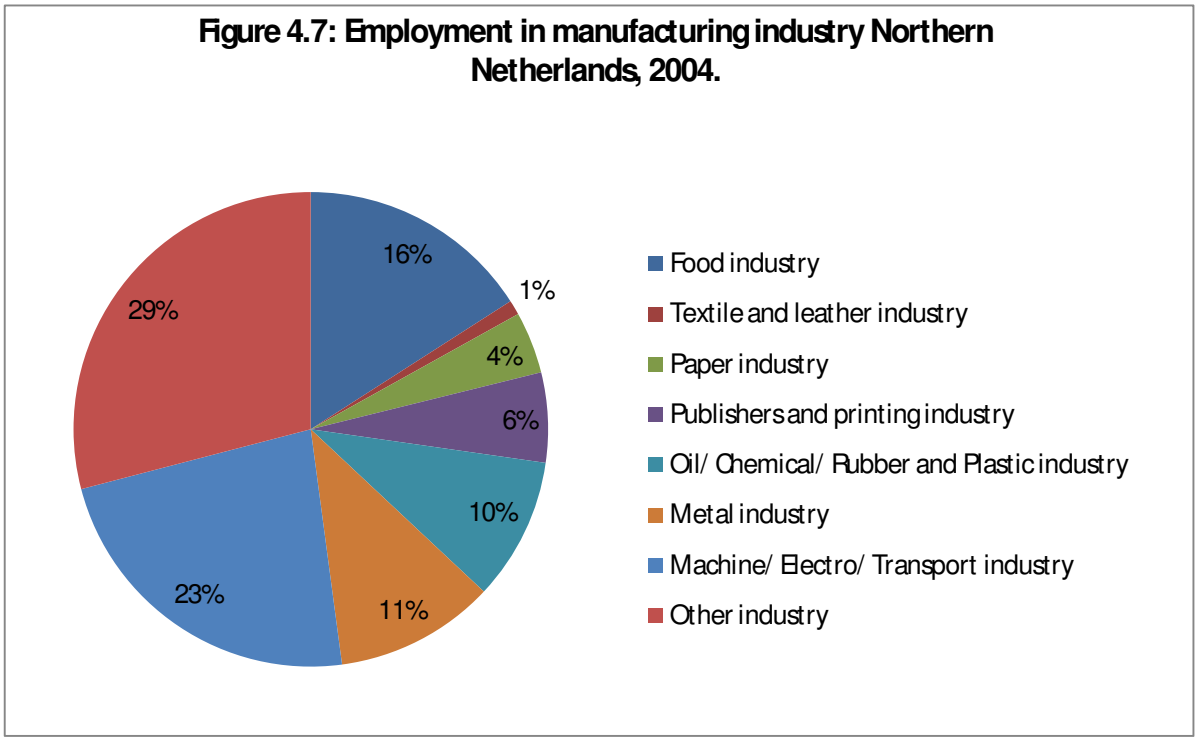
For more information on these models it is suggested to examine these articles. Due to a lack of data and considering the initiations of this thesis, the input-output analysis and the use of data on trade, employment and wages were not carried out. Consequently, the one remaining method of measuring employment effects, the use of surveys, was used here to look at the situation for the Northern Netherlands. As there is no existing research on the employment effects of offshoring in the Northern Netherlands, this study contributes to this gap with a first rough estimate, although further research is necessary. Existing sources that estimate the number of jobs lost in the entire country are used and adapted to fit the situation of the North. The prediction made by CPB Netherlands Bureau for Economic Policy Analysis, Berenschot and Forrester Research, the only existing studies that make explicit statements about the number of jobs lost in the Netherlands (see chapter 3.3), are used here to estimate the number of jobs lost due to offshoring. The focus is on employment losses in the manufacturing industry, however, the study conducted by Forrester Research only contains information about losses in the services sector.

On a national level, as became clear in chapter 3, the loss of jobs caused by offshoring is relatively small compared to the number of jobs created and constructed yearly. On a regional

level, offshoring could be relatively large. About these regional effects, nothing is known so far. In the North, the unemployment has been above the Dutch average, although it is decreasing.

As most offshoring takes place within the manufacturing industry, a deeper understanding of the industry is necessary. In the North, the industry makes up 14.3% of total employment (see chapter 4). This is divided in the different manufacturing sectors as shown in figure 4.7. Especially the machine/ electro/ transport industry and the food industry are large in the North.

Figure 4.7: Employment in manufacturing industry Northern Netherlands, 2004.



Source: CBS

Table 4.8 shows the changes in demand in the manufacturing industry and the services sector in the North in two different periods, 1997-2000 and 2001-2004. During the years 2001-2004, an economic recession took place in the Netherlands, and the period 1997-2000 was a time of economic upheaval. The changes in demand show that the demand for the manufacturing jobs has decreased substantially in the period 2001-2004, compared to the changes in demand in the period 1997-2000. The demand for services jobs has also decreased in the period 2001-2004, but less drastically than in the industry. The reductions in demand are largest in the textile and leather industry and the electrotechnical industry (both more than 18% reduction in demand in the period 2001-2004). One can consequently expect that a large part of these sectors could engage in offshoring.

Table 4.8: Changes in demand for labor in the North, manufacturing industry and services:		
Production Industries	**1997-2000 (%)**	**2001-2004 (%)**
Food industry	-6.9	-2.7
Textile and leather industry	-6.3	-18.2
Paper industry	8.1	-5.0
Publishers and printing industry	1.5	-8.3
Oil industry	-9.9	unknown
Chemical base and finished products	unknown	-1.8
Rubber and plastic industry	3.7	-5.9
Basicmetal industry	-7.7	0
Metalproductsindustry	6.8	-8.5
Machine industry	7.4	-6.5
Electrotechnical industry	0	-18.9
Transport industry	2.8	-7.8
Other industry	5.5	2.7
Services Industries	**1997- 2000 (%)**	**2001-2004 (%)**
Mail and Telecommunication	18.4	-27.3
Banking	10.0	-7.3
Insurance and Pension funds	-5.0	10.5
Financial Activities	29.6	2.9
Rental and trade in real estate	13.9	9.6
Other business services	7.4	2.8

Source: CBS

The expectation from the information in table 4.8 is confirmed by the data in table 4.9. It shows that the largest outsourcers in the manufacturing industry are the textile and leather industry and the machine/ electro and transport industry. The manufacturing industry in the North consists for a large part (23%) of jobs in the machine/ electro/ transport industry and for 1% of jobs in the food industry. It can thus be assumed that the job losses in the machine/ electro/ transport industry could be for a relatively large part due to offshoring. The other industry sectors are not far behind in outsourcing intensity, however. According to Vroom (2007) the changes in demand comes at the expense of low skilled labor and in favor of the demand for high skilled labor. This is unfavorable for the Northern Netherlands as the percentage of low skilled jobs is relatively large in the North.

Table 4.9: Percentage of firms that has engaged in offshoring			
	Lower limit	Estimate	Upper limit
Production Industries			
Food industry	8,7	10,1	11,5
Textile and leather industry	22,8	28,1	33,4
Paper industry	5,9	7,2	8,5
Publishing and printing industry	6,1	7,2	8,2
Oil/ chemical/ rubber/ plastic industry	7,9	9,0	10,1
Metal industry	10,2	11,4	12,5
Machine/ electro/ transport industry	12,8	13,9	15,1
Services Industries			
Mail and telecommunication	1,5	2,3	3,1
Banking and insurance	5,4	7,6	9,8

Source: Berenschot (2004)

It is now clear that there is a relationship between the demand for labor in a certain period and the percentage of firms that engages in offshoring. But how much of the decreases in demand for labor is caused by offshoring? The CPB Netherlands Bureau for Economic Policy Analysis states that in the manufacturing industry annually 21.000 jobs will be lost due to offshoring. This is based on a research conducted by Berenschot in the provinces of Limburg and Noord-Brabant, which estimates that 25% of the jobs in the manufacturing industry will disappear. Berenschot does not mention the time span in which this is predicted to happen. CPB makes the assumption that this will take place in a period of 10 years, which means a reduction of 2.5% a year, and as 14% of total employment is in the manufacturing industry in 2003 according to the CPB, this means a reduction of 6 million jobs x 14% x 2.5% ≈ 21.000 jobs a year.
For the North, in the period 2001-2005, about 10.500 jobs were lost in the industry sector (the number of jobs decreased from 106.808 in 2001 to 96.279 in 2005) (Noordelijke Arbeidsmarkt Verkenning, 2007). This means an average yearly destruction of 2625 jobs in the manufacturing industry in Groningen, Friesland and Drenthe. When using the estimate of the CPB, this means that in the year 2005, 96.279 x 2.5% ≈ 2407 jobs lost were due to offshoring. This is a very high percentage, as it would mean that 91.7% (2407/2625 x 100%) of all the jobs lost in the manufacturing industry are lost because of offshoring.

When comparing this to the predictions of Berenschot, a different view arises, which is less dramatic. Berenschot predicts a number of 37.000 jobs lost in the Netherlands in a three year period, which means 12.333 jobs a year. This prediction is based on surveys held in twelve different sectors in the Netherlands. Eight of these sectors make up the whole manufacturing industry sector, which means that the other four sectors (Mail and telecommunication, Banking and Insurance, IT/ Architecture and Transport) can be excluded from the research.

As almost half (46.29%) of the national employment in this study consists of employment in these four sectors, and because it is unknown how much jobs are lost in each sector, the number of jobs lost due to offshoring is also reduced by 46.29%. The number of jobs that are lost in the manufacturing industry sector in the Netherlands is 6624 jobs, which is a large difference compared to the number of jobs that was predicted by the CPB (21.000 jobs a year). As 10.9% of all industry jobs in the Netherlands are located in the North, and assuming that the number of jobs lost due to offshoring is distributed evenly across the country, this means that 10.9% x 6624 ≈ 722 jobs lost in the industry in the North in 2003.
As in the average job loss annually in the period 2001-2005 in the industry sector is 2625, the percentage of jobs in the industry due to offshoring is 27.5%, which a large difference compared to the estimates made by CPB.

Forrester Research has made estimates for job losses in the services industry in several countries. In the period 2004 – 2006, 2437 jobs were lost in the services industry in the Netherlands, according to calculations by Forrester Research. As only 8.7% of all services jobs in the Netherlands are located in the North (CBS, 2005), and assuming that the number of jobs that are being offshored is distributed evenly over the country, the number of jobs lost in the services sector in the North in the period 2004 – 2006 is 212, thus circa 100 jobs a year. This is only a small part of total destructed and created jobs in the North. According to the KvK, between the years 2004 and 2006, on average 3800 jobs annually were destructed in the services sector, which means that offshoring has contributed to the destruction of services jobs by 2.6%. Unfortunately, Forrester does not predict the number of jobs that will be offshored in the industry sector.

Table 4.10: Forecast; cumulative number of Dutch services jobs moving offshore, 2004-2015

	2004	2005	2006	2007	2008	2010	2015
Netherlands	2.676	3.481	5.113	6.506	10.698	16.794	36.663

Source: Forrester Research 2004

Table 4.11: Overview of the calculations

	Number of jobs offshored in the Netherlands a year	Number or percentage of jobs in the North	Jobs lost due to offshoring in the North	Total jobs destructed in the North	Estimate
CPB	21.000 (industry) (2.5% a year)	96.279 (industry jobs) x 2.5%	2407 jobs lost	2625 (industry)	91.7%
Berenschot	6624 (industry)	10.9% of industry in the North	722 jobs lost	2625 (industry)	27.5%
Forrester	1218 (services)	8.7% of services in the North	100 jobs lost	3800 (services)	2.6%

When comparing the different results, the estimates made by the CPB seem too high, also compared to the newspaper analysis in chapter 4.3, which estimated 15.5% job losses in the manufacturing industry due to offshoring in the year 2006. The prediction by Berenschot

looks more reliable. It is of course possible to make several remarks at the outcome of this rough method. First of all one has to keep in mind the yearly destruction and creation of jobs. The Kamer van Koophandel (KvK) registers the number of jobs destructed and created in a year (see figure 4.5). However, this data is not compatible with the data of the Noordelijke Arbeidsmarktverkenning. According to the KvK in the year 2004, the number of destructed jobs was 1987 and the number of created jobs 683, which means a reduction of people working in the industry by 1304 persons, which is less than the jobs lost in that year, 2625 according to the Noordelijke Arbeidsmarktverkenning (2006). However, the data of the KvK on the destruction and creation of jobs has been used for the services sector, as on average, there was a net increase in the number of services jobs in the North. It means that the data sources with the largest number of destructed jobs have been used for this analysis.
And secondly, it is unknown how many jobs return because of an increase in efficiency in the companies that have offshored a part of their activities. This increase can even offset the negative effect of the direct jobs losses due to offshoring, but this is impossible to measure.

Table 4.12: Jobs lost due to offshoring in the Northern Netherlands

Research	Sector	Estimate job loss due to offshoring
CPB	Manufacturing industry	91.7%
Berenschot	Manufacturing industry	27.5%
Forrester	Services	2.6%

On the base of existing data it is not possible to make reliable estimates of the employment effects within the different industry sectors. As also became clear in paragraph 4.3, the decrease in employment can be influenced very strongly by several large relocations within a sector. It can be concluded that further research is necessary because the differences between the studies are too large to be reliable. In general, one can say that for the Northern Netherlands, offshoring has larger employment effects for the manufacturing industry than for the services industry. Unfortunately, the number of created jobs because of offshoring is unknown.

4.5 Conclusion

The economic, geographic and social situation in the North, portrayed in this chapter, includes the discussion of education, employment and innovation, which are all related to the process of offshoring. It appears that in general, the North is still lagging behind compared to the Dutch average on the field of education, employment and innovativeness, but the differences have decreased. All taken together, it is expected that the North is less attractive for high skilled companies compared to other parts of the Netherlands, but a catching up process is visible. Public policy concerning offshoring should therefore target the improvement of the competitiveness and entrepreneurial climate in the Northern Netherlands. Considering both keeping existing firms in the region and attracting new companies, policy needs to focus on embeddedness, innovation and education. Embeddedness gives companies an extra reason to stay in the North; it is thus an challenge to make the networks between different actors (firm, supplier, public institutions) as strong as possible. Increasing the R&D expenses, jobs and number of innovations and is crucial for creating a competitive environment in the North.

Newspaper research has shown that offshoring and consequently the loss of employment does take place in the North of the Netherlands. Although the amount of offshoring is still not entirely clear, it is easy to underestimate it. By scanning the northern newspapers, quite a few examples of firms that have relocated activities in the North were found. The largest part of offshoring consists of the offshoring of low skilled industry jobs.
On the base of existing data on employment effects of offshoring, it is hard to make reliable estimates of employment effects in the industry sector. Following the CPB, offshoring contributes for a large part to job losses in the manufacturing industry. It looks like that the machine/ electro/ transport industry plays a large role in employment losses due to offshoring in the manufacturing industry. Following Berenschot, a less dramatic view arises. It appears that the offshoring has larger employment effects on the manufacturing industry than on the services industry.

Chapter 5: Conclusion and policy recommendations

5.1 Conclusion

Now that the offshoring hype and its doom scenario of numerous disappearing jobs has passed, offshoring needs to be treated realistically. The creation and destruction of jobs is a natural process in a free market economy, but offshoring may involve personal tragedies. The consequences of offshoring, specifically focusing on employment effects have been researched in this thesis. These employment effects of offshoring usually get only a limited amount of attention in existing research. Central issues in this thesis included the reasons for offshoring, the role of offshoring in developed countries, particularly the Netherlands and the job losses due to offshoring. This thesis has zoomed in on the offshoring effects for the northern part of the Netherlands. The policy that can be implemented to influence offshoring has been discussed as well. Some policy recommendations will be given in the finishing part of this chapter.

Offshoring, the relocation of activities to low income countries, both includes foreign direct investment and offshore outsourcing. There are multiple reasons for offshoring. Although wage differences still play a large role, sourcing talent around the globe has become an important motive for offshoring as well.
The process of offshoring is more complicated than the trade economist Ricardo imagined in his theory of comparative advantage. The outcome of the Heckscher-Ohlin model, that predicts a convergence in wages between developed and developing countries is also not observed in reality. Other authors, for example Krugman (1995), come to the conclusion that the offshoring of activities will come with an increase in unemployment in developed countries. The new economic geography predicts that differences in wages will continue to exist because of agglomeration advantages and transportation costs. Agglomeration predicts concentration, while transportation costs foster dispersion. There is still some disagreement about the role of these topics, as some authors believe that agglomeration forces are stronger than transportations costs, while other authors argue that low trade costs foster the relocation of some activities towards developing countries.

Estimating the effects of offshoring on wages and labor is difficult as there are no data available of the number of companies that have relocated activities abroad, which makes it even harder to analyze the employment effects of these relocations. This is why several techniques are used by researchers to predict the number of jobs lost to offshoring. Surveys and input-output analysis are most frequently used for this but both have their shortcomings. A third method is the use of data on trade employment and wages. Contrary to what might be expected, the impact of offshoring on the demand for low skilled workers is still disputable, as different studies show different results. In the Netherlands, the results of several reports show that it is still very difficult to predict exactly how much labor will be moved offshore. Although the results of the reports differ, the general tendency is that the annual loss of jobs due to offshoring is not that large when compared to the annual destruction and creation of jobs. However, the Netherlands should keep their competitiveness high, as firms will otherwise look for labor beyond the border. The charts on hourly compensation of costs and labor productivity make clear that, although the wages are substantially lower in developing

countries and Eastern European countries, so is the productivity of these countries. It is very important to keep this productivity in the Netherlands high.

The process of offshoring has been applied to the situation of the Northern Netherlands, instead of to a country, as it is possible that there are large differences between regions within a country. Productivity and competitiveness are also key issues for the Northern Netherlands. It appears that in general, the North is still lagging behind compared to the Dutch average on the field of education, employment and innovativeness, but the differences have decreased in the last decade. Public policy concerning offshoring should therefore target the improvement of the competitiveness and entrepreneurial climate in the Northern Netherlands. Increasing the R&D expenses, jobs and number of innovations and is crucial for creating a competitive environment in the North. Considering both keeping existing firms in the region and attracting new companies, policy needs to focus on embeddedness, innovation and education.
By scanning the northern newspapers, quite a few examples of firms that have relocated activities in the North were found. The largest part of offshoring consists of the offshoring of low skilled industry jobs.
On the base of existing data on employment effects of offshoring, it is hard to make reliable estimates of employment effects in the manufacturing industry sector. Following CPB, offshoring contributes for a large part to job losses in the manufacturing industry. It looks like that the machine/ electro/ transport industry plays a large role in employment losses due to offshoring in the manufacturing industry. Following Berenschot, a less dramatic view arises. It appears that the offshoring has larger employment effects on the manufacturing industry than on the services industry.

In the upcoming years, the employer, employee and policymaker all need to deal with the consequences of offshoring. In macro-economic terms, the consequences need not be negative only, although on personal level the effects can be tragic. It is important to monitor the offshoring processes as the employer, employee and policymaker can better prepare for the consequences of offshoring and take the right actions. To monitor this process accurately, one needs the correct data, which are not available up to this date. A start of this monitoring process would thus be a better registration of offshoring and the jobs lost because of this.

5.2 Policy recommendations

Several policy recommendations will be given here, some of which are recommendations especially for offshoring and others more general policy recommendations. General policy recommendations aimed to increase the competitiveness of the North are also appropriate for opposing the negative effects of offshoring and ultimately decreasing the amount of offshoring in the future. To start with, I will not recommend an active policy against firms considering relocating activities. Preferably a policy will be created in which the local government creates positive conditions for companies to invest in the North. It would be better to compensate the losers from offshoring than to prohibit it, as the economy as a whole does benefit from it.

Recommendations:

- The government needs to address the shortage of skilled talent, especially for technical professions. Investments in science and technical educations need to increase to ensure continued global competitiveness. For the North, a decrease of employment in the manufacturing industry does not mean this will automatically be filled up by an increase in other growing sectors and an active policy is needed to attract new companies.
- The report 'Pieken in het Noorden' is a good start for increasing the competitiveness of the North, but it is important to realize that the whole of the North has to be stimulated to reach a higher level, not only these few 'Peaks.'
- Increase the education of the labor force, making sure that the labor force meets the demand of the companies in the North. The labor force needs to be used up to its maximum. This means promoting and investing in higher technical education.
- Create embeddedness; strong social relationships and strong networks between companies in the North.
- Use city and region marketing as a tool for making the region more attractive for (innovative) companies to locate. Create an innovative environment for these companies. Infrastructure, living and housing conditions, educational opportunities and the supply of business areas need to meet the demands of the companies and its employees.
- Improve the innovativeness of the existing and new firms in the North by creating strong relationships with the University of Groningen (innovation campus) and other higher education in the North (Hanzehogeschool Groningen, NHL and Van Hall Leeuwarden).
- Set up retraining programs for (older) employees that are laid off. They have often worked for one company a lot of years and it is hard to find a new job in the same sector.

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