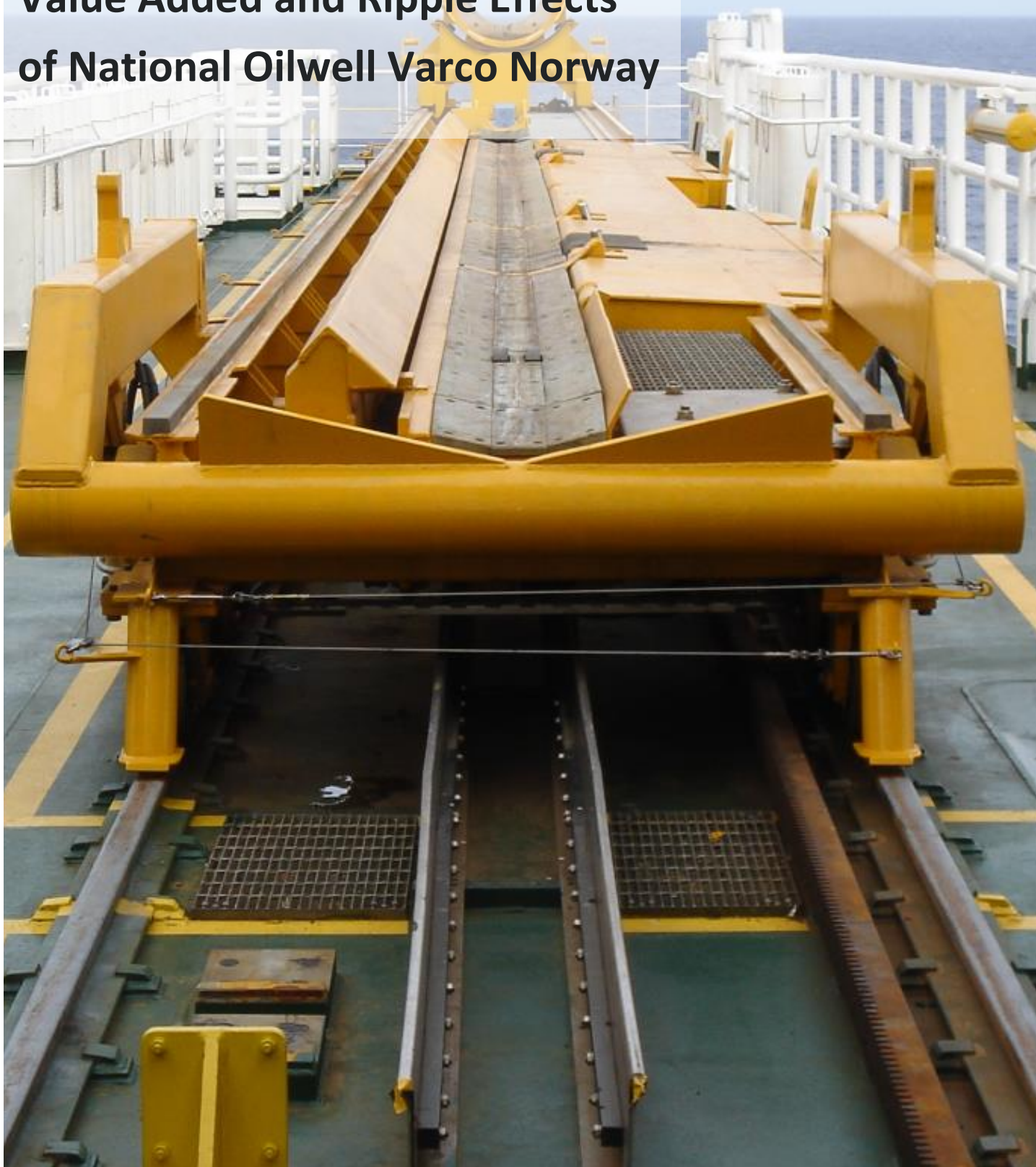


REPORT

# Value Added and Ripple Effects of National Oilwell Varco Norway



MENON REPORT 34/2013

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**MENON**  
Business Economics

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# 1. Main Findings

National Oilwell Varco Norway (NOV) generates significant value added through its production. The company was ranked as Norway's third largest exporter in 2012. In the period from 2004 to 2012, NOV Norway's value added increased by more than 900 percent. This corresponds to 31.9 percent average yearly growth and amounts to NOK 7.5 billion in 2012.

NOV Norway's growth in value added has been three times as high as in the offshore supply industry as a whole. In the same period, value added per employee reached more than NOK 2.32 million per year, far exceeding the private sector in general and the offshore supply industry.

NOV Norway's activity has substantial effects on employment and tax income through the value chain.<sup>1</sup> Estimates are calculated with the help of Menon's ripple effect model, the national Total Effect Model. According to our estimations, the company creates more than 5 700 jobs domestically.

In addition, NOV's activity creates close to NOK 3 billion in tax income for the Norwegian public sector. The largest effects from NOV's activity are generated in the Southern part of Norway. The second and third largest effects come in the Eastern and Western part of Norway, while the middle and Northern parts receive fewer effects from NOV's activities.

As we have excluded the consumption effects of labor income generated by NOV Norway, our estimations are to be considered as conservative. If consumption effects are included, the total employment effect would increase to 6 850 jobs.

We also assess the impact NOV Norway has on employment abroad. Estimates are made by running Menon's international ripple effect model, the International Total Effect Model (ITEM). A more detailed description of this model is provided in appendix II. According to our estimates, NOV Norway creates more than 25 000 jobs outside of Norway. NOV Norway's largest supplier country is USA, with purchases of more than USD 890 million. Yet, the employment effect created by NOV Norway is largest in China with more than 5 000 employees. There are also significant contributions in South Korea and in many European countries.

In our estimations internationally, we have not included the consumption effects of employment generated by NOV. If this effect is included, total effect increases by approximately 20 percent. Also our international estimations are therefore to be considered conservative. In the appendix to this report, we show in detail the method used and assumptions made in our estimations.

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<sup>1</sup> NOV's activities generate economic effects through the supply chain. These effects are known as ripple effects. Economic activity such as employment and value added generated directly by a primary activity are called first order ripple effects. By the same token, economic activities generated directly by NOV Norway's suppliers are known as second order effects. Effects induced higher up in the supply chain are called order effects. Typically, the purchases will increasingly involve services after the second order, as one move upwards in the supply chain. The effects will be gross, since it is rather complicated and beyond the scope of this project to estimate to what extent occupy factor inputs and measure the alternative activities. This is however less problematic in our context, seeing that we are interested in the values created and not the alternative economic activities. An alternative usage is generally equally or less beneficial than the one realized and could ultimately involve unemployment. In addition to the production ripple effects, there will be ripple effects related to consumption and possibly externalities, which per definition do not work through the value chain. These effects are not calculated, implying that our estimates could be considered as minimum projections.

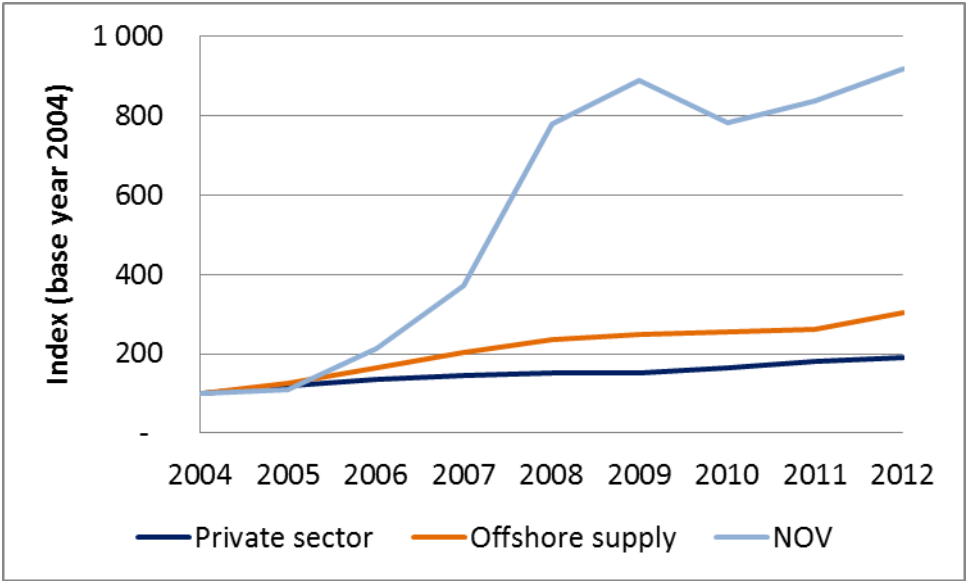
## 2. Values Created in NOV Norway: The Company has Experienced Explosive Growth Since 2004

National Oilwell Varco Norway generates significant value added through its production. The company was ranked as Norway’s third largest exporter in 2012. In the period from 2004 to 2012, NOV Norway’s value added increased by more than 900 percent. This corresponds to 31.9 percent average yearly growth and amounts to NOK 7.5 billion in 2012. NOV Norway’s growth in value added has been three times as high as in the offshore supply industry as a whole. In the same period, the value added per employee reached more than NOK 2.75 million, exceeding the private sector in general and the offshore supply industry by far.

### 2.1. Value Creation: NOV Norway Created Values for More than NOK 7.5 billion in 2012

Figure 1 illustrates NOV Norway’s remarkable development since 2004. The figure includes data for the Norwegian private sector in general and the offshore supply industry<sup>2</sup> for comparison.

Figure 1: Indexed development in value added for NOV Norway, the Norwegian private sector in general and the Norwegian offshore supply industry from 2004 to 2012. Source: Menon (2013)



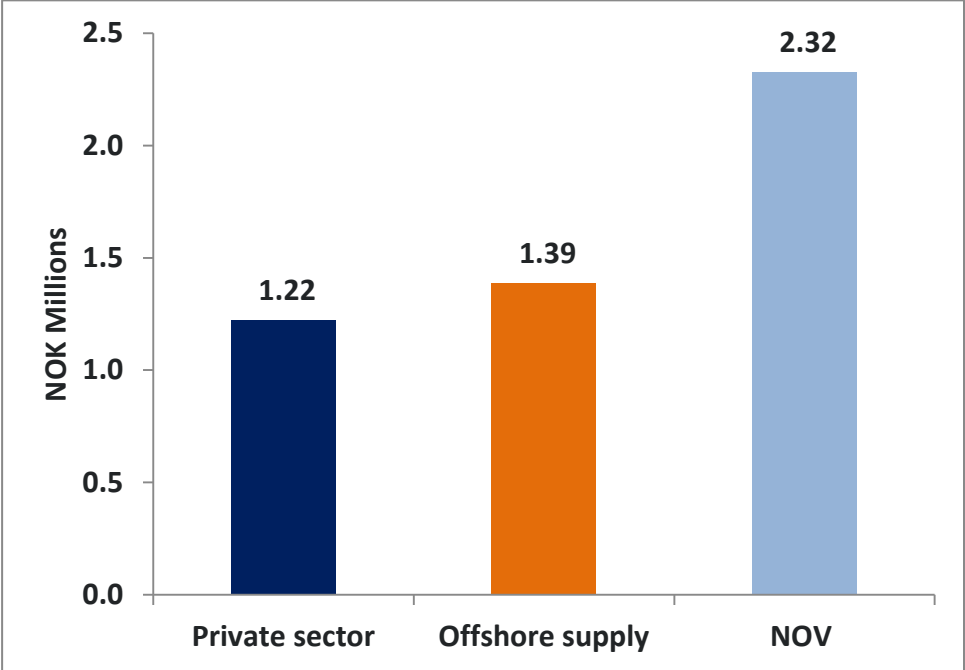
As Figure 1 shows, NOV Norway’s growth in value added has been remarkable compared to the Norwegian private sector in general. Throughout the last decade, the offshore supply industry has been the fastest growing business sector in the Norwegian economy. Compared to NOV Norway however, even the offshore supply industry’s growth seems modest.

<sup>2</sup> Over many years, Menon has built a population for the Norwegian offshore industry. The population is quality checked with similar populations from other institutions, International Research Institute of Stavanger (IRIS) amongst others.

## 2.2. Value Added per Employee: NOV Norway is More than Two Times Higher Labor Productive as the Norwegian Private Sector in General

Value added per employee is often used as an indication of labor productivity. In part value added per employee reflects a company’s or an industry’s capital intensiveness and is also affected by change in product prices. Figure 2 illustrates NOV Norway’s value added per employee in 2012. The figure includes data for the Norwegian private sector in general and the offshore supply industry for comparison.

Figure 2: Value added in NOK per employee for NOV Norway, the Norwegian private sector in general and the offshore supply industry. Source Menon (2013)



As the figure clearly shows, NOV Norway generates significantly more value added than the Norwegian private sector in general, and the offshore supply industry which is more comparable in terms of capital intensiveness. NOV Norway’s value added per employee illustrates the company’s contribution to the Norwegian economy through efficient use of scarce resources.

### **3. National Ripple Effects: NOV Norway Creates Substantial Values for the Norwegian Economy**

In this chapter, we assess the impact of National Oilwell Varco Norway on employment and tax income. Estimates are made in Menons ripple effect model, the national Total Effect Model. A further description of the model is provided in appendix I. According to our estimations, NOV Norway creates 5 700 jobs in Norway. In addition, the company's activity creates close to NOK 3 billion in tax income for the Norwegian public sector. The largest effects from NOV's activity are generated in the Southern part of Norway. The second and third largest effects come in the Eastern and Western parts of Norway, while the Middle and Northern parts receive fewer effects from NOV's activities. As we have excluded the consumption effects of labor income generated by NOV Norway, our estimations are to be considered as conservative. If consumption effect is included, total employment effect would increase to 6 850 jobs.

#### **3.1. Key Numbers: Some Key Figures for NOV Norway**

According to information collected through the Brønnøysund register, NOV Norway had a total turnover of about NOK 23,6 billion in 2012 including most of their subsidiary companies. In order to produce their final products NOV bought goods and services for a total amount of NOK 14.3 billion in 2012. NOK 4.3 billion was purchases from companies in Norway, while purchases of approximately NOK 10 billion were made from companies outside Norway.

NOV Norway had close to 3 300 employees in 2012 at different locations mainly in the Southern, Western, Eastern and Middle parts of Norway.<sup>3</sup> In 2012, approximately NOK 1,3 billion were paid in taxes by NOV Norway.

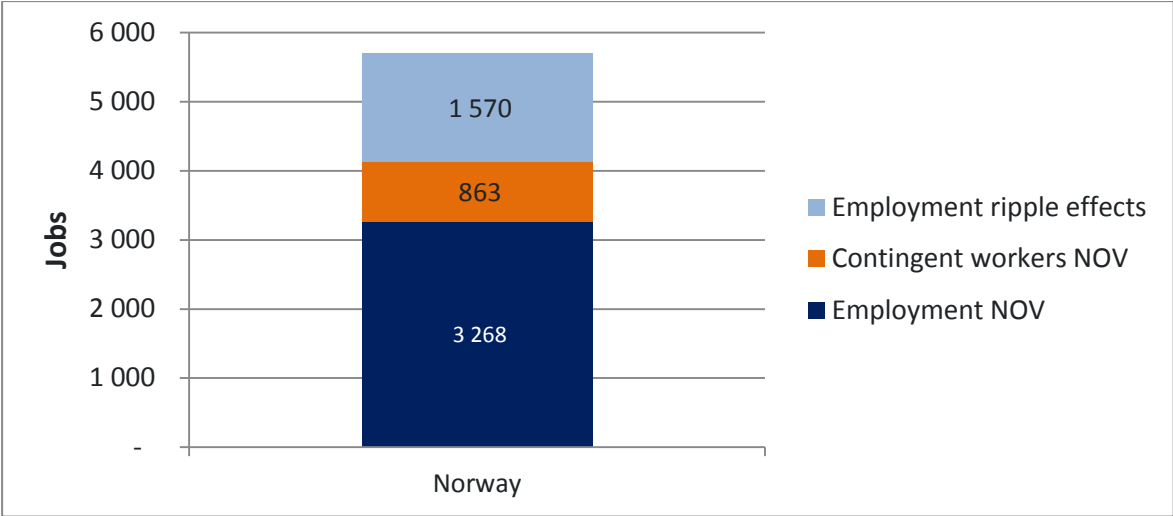
#### **3.2. Employment Effects: NOV Norway Creates 5 700 Jobs in Norway**

In total, National Oilwell Varco Norway's activity generates more than 5 700 employees through the supply chain. In the figure below we show how this effect is composed:

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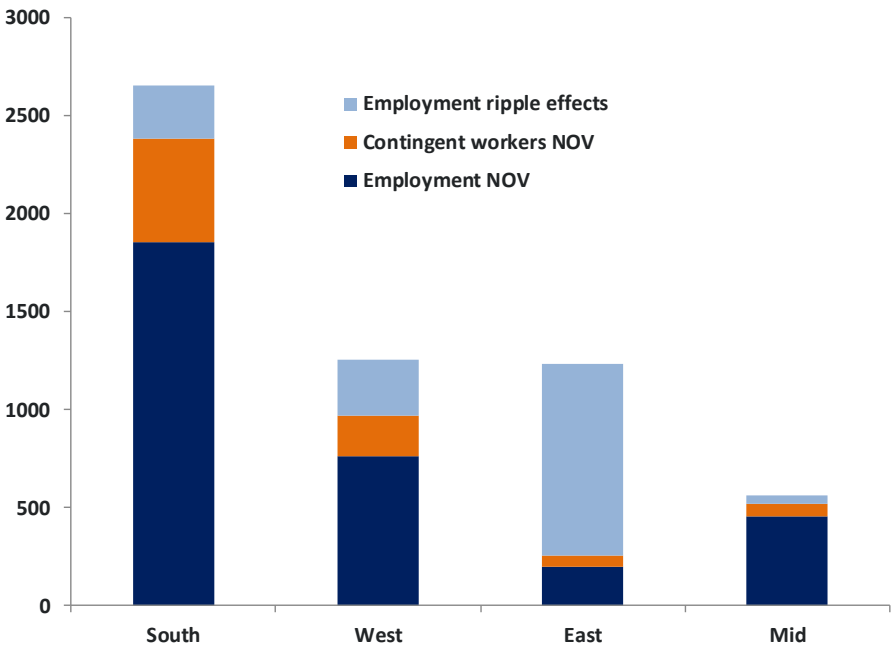
<sup>3</sup> Eastern part of Norway is defined as Østfold, Akershus, Oslo, Hedmark, Oppland, Buskerud, Vestfold and Telemark. Southern part of Norway is defines as Aust-Agder and Vest-Agder. Western part of Norway is defined as Rogaland, Hordaland, Sogn og Fjordane and Møre og Romsdal. Middle part of Norway is defined as Sør-Trøndelag and Nord-Trøndelag. Northern part of Norway is defined as Nordland, Troms and Finnmark.

**Figure 3: Total employment effect Norway**



The employment effects are distributed across the Southern, Eastern, Western and Middle regions of Norway. The main effects are generated in the Southern part of Norway with more than 1 850 persons employed directly by NOV Norway, more than 500 contingency workers and close to 300 by suppliers and sub-suppliers. In the Eastern and Western parts of Norway approximately 1 250 employees are generated with the ripple effects amounting to circa 1 000 and 500 respectively, including contingency workers. In the middle part of Norway close to 550 employees are generated, around 100 through ripple effects and contingency workers. Some of NOV’s purchases are made in the Northern part of Norway, but the employment effects are negligible. Figure 4 below illustrates NOV Norway’s effects on employment in different regions of Norway.

**Figure 4: Regional effects on employment of NOV Norway’s activities. Source: Menon (2013)**





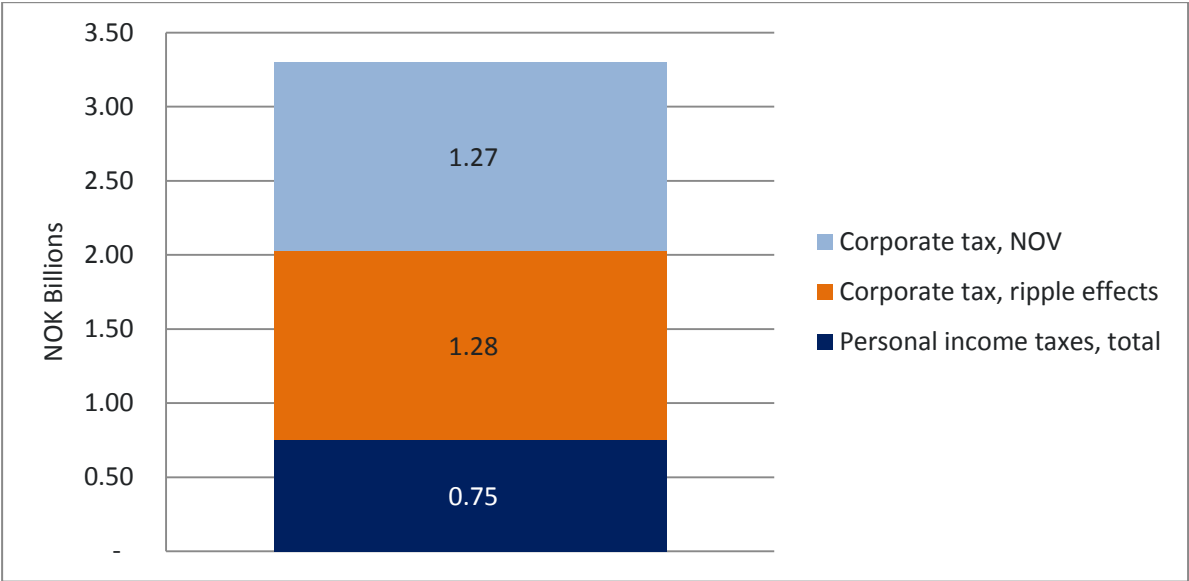
As the figure above illustrates, NOV Norway has a significant effect on employment, especially in the Southern part of Norway. For the Eastern part of Norway the ripple effects of employment outweigh the direct employment effect. This is due to large purchases in this region relative to NOV’s activity, mainly within the service industries. The employment effects in the Western part of Norway are in the same order of magnitude, but with a higher share of directly employed personnel.

It is important to emphasize that the employment numbers presented here are not net employment effects in terms of reduced unemployment. The Norwegian unemployment ratio is low, and has been for some time. This in turn means that labor is scarce and were it not for NOV’s activity most of these laborers would work somewhere else. However, it is a fair assumption that over time labor will migrate to companies that all things equal pay the highest wages. As wages, at least to some extent, reflect productivity, this means that labor will migrate to the most productive companies. So even though it is unlikely that NOV Norway keeps all its generated man power away from unemployment, there is a net benefit through increased productivity. This is amplified by looking at NOV Norway’s value added per employee, which is around three times as high as for the private sector in general.

### 3.3. Tax Revenues: NOV Norway Generates NOK 3.3 Billion in Tax Revenues

NOV Norway’s activity generates in total more than NOK 3.3 billion in tax revenues domestically. Figure 5 underneath illustrates NOV Norway’s effect on tax revenues.

Figure 5: Total tax revenue generated by NOV Norway. Source: Menon (2013)

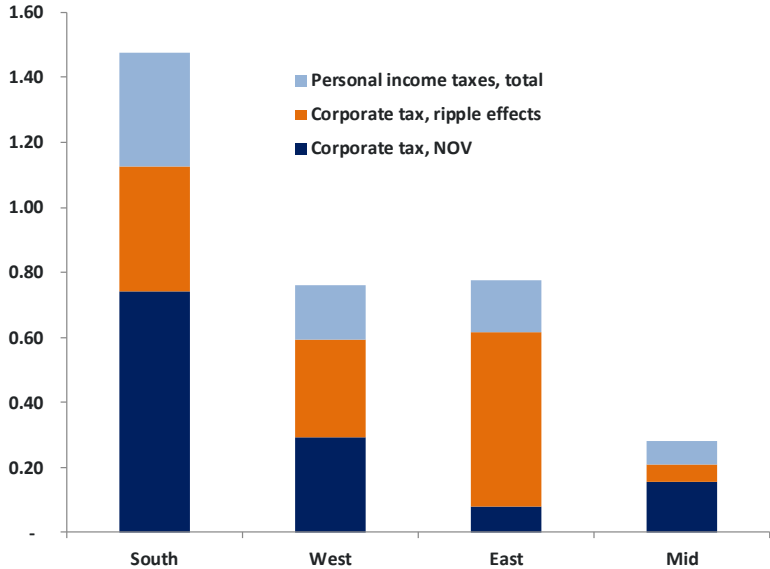


As Figure 5 shows, NOV Norway generates about the same amount of corporate taxes through ripple effects as it does directly through its activity, approximately 39 percent each. These taxes include corporate income tax, net production taxes and value added tax. Personal income tax stands for 22 percent of all taxes generated throughout the supply chain.

Figure 6 below shows tax revenues generated by region. The largest share of tax revenues are generated in the south of Norway. The tax effect is higher in the Eastern part of Norway than in the Western despite NOV Norway’s bigger presence in the West. The middle and Northern part of Norway generate less tax revenues.



**Figure 6: Regional tax effects of NOV Norway’s activities**



The tax revenues are generated across the Southern, Eastern, Western and Middle regions of Norway. The main share of tax revenues is generated in the Southern part of Norway, amounting to almost than NOK 1.5 billion in total. In the Eastern and Western part of Norway more than NOK 750 billion in tax revenues are generated in each region through NOV Norway’s activities. For the middle part of Norway, more than to NOK 250 billion are generated in tax revenues

## 4. International Ripple Effects: NOV Norway Generates Employment and Tax Revenues Worldwide

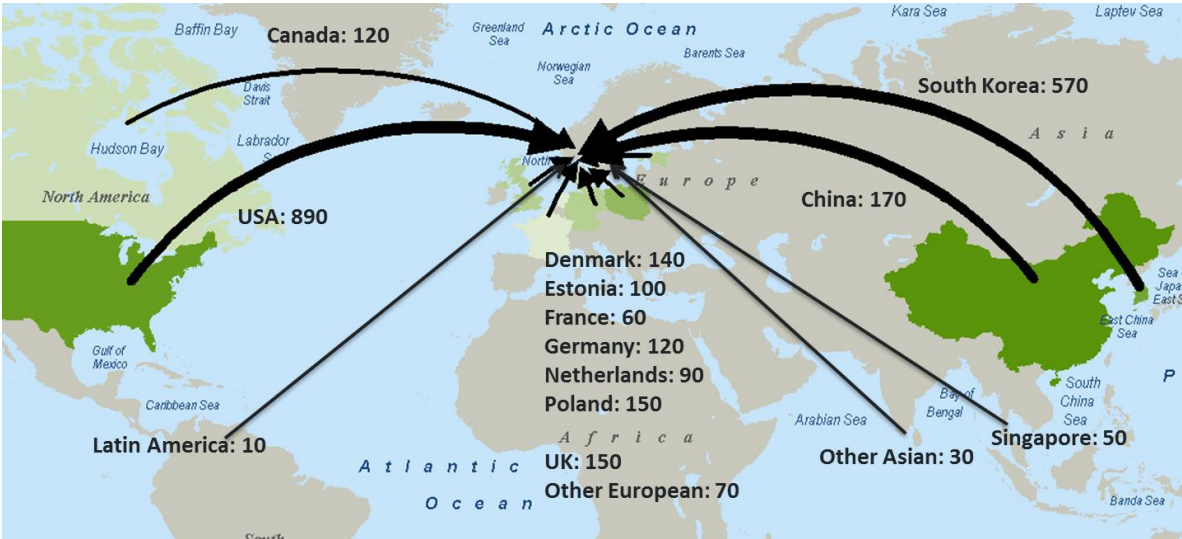
In this chapter, we assess the impact National Oilwell Varco Norway has on employment abroad. Estimates are made by running Menons international ripple effect model, the International Total Effect Model (ITEM). A further description of this model is provided in appendix II. According to our estimations, NOV Norway creates more than 25 000 jobs outside of Norway. NOV Norway’s largest supplier country are the USA, with purchases of more than USD 890 million. Yet, the employment effect of NOV’s activities is largest in China with more than 5 000 employees. There are also significant contributions in South Korea and in many European countries.

### 4.1. Purchases: NOV Buys Services for More than USD 2.7 billion

A large part of National Oilwell Varco Norway’s production is based on imported intermediates mainly produced in other NOV branches abroad. Approximately USD 2.7 billion or NOK 15 billion worth of goods and services were purchased outside of Norway by NOV Norway in 2012.

In Figure 7 underneath, we show NOV Norway’s total purchases of goods and services in different countries and regions. As the figure illustrates, NOV Norway is a highly international company purchasing goods and services worldwide. In 2012, NOV Norway bought goods and services for USD 2.7 billion, i.e. more than NOK 15 billion.

Figure 7: Geographic spread of NOV Norway’s purchases abroad in 2012. Source: Menon (2013) and NOV Norway (2013)



Most of NOV Norway’s supplies are bought from USA, representing purchases for more than USD 890 million or around NOK 5 billion. In 2012, the total purchases in other European countries than Norway amounted to USD 890 million or NOK 5 billion. NOV Norway’s purchases in South Korea and China amounted to USD 570 million (NOK 3.2 billion) and USD 170 million (NOK 930 million) respectively. Purchases in other countries added up to USD 210 million or NOK 1.2 billion. 67.5 percent of the purchases take place internally within the company.

In addition to these purchases, NOV Norway’s suppliers induced further ripple effects higher up in the supply chain. We will now turn our attention to how the company generates value in other countries.

## 4.2. Employment Effects: NOV Norway Creates More than 25 000 Jobs Abroad

National Oilwell Varco Norway’s activities employ people around the globe. In total, the company’s activities create nearly 25 180 jobs abroad. Most jobs are created in China, USA and South Korea – 6 960, 5 120 and 3 860 respectively. More than 7200 jobs are created in Europe. The distribution of jobs is illustrated in Figure 8 below.

**Figure 8: Geographic spread of ripple effects generated by NOV Norway in terms of employment. Source: Menon (2013) and NOV Norway (2013)**



10 340 jobs are created by NOV Norway’s suppliers, whereas 14 830 jobs are created higher up in the supply chain. Among the suppliers, 6 500 jobs are created in other NOV companies, whereas 3 850 jobs within other suppliers. Among the other suppliers, metal suppliers receive the highest effects, but NOV Norway also employs suppliers within machine manufacturing and services. The higher order effects involve most of the economy, but services are overrepresented. The effects across industries and countries are illustrated in Figure 9 below.

**Figure 9: Ripple effects generated by NOV Norway in terms of employment in different countries. Source: Menon (2013) and NOV Norway (2013)**

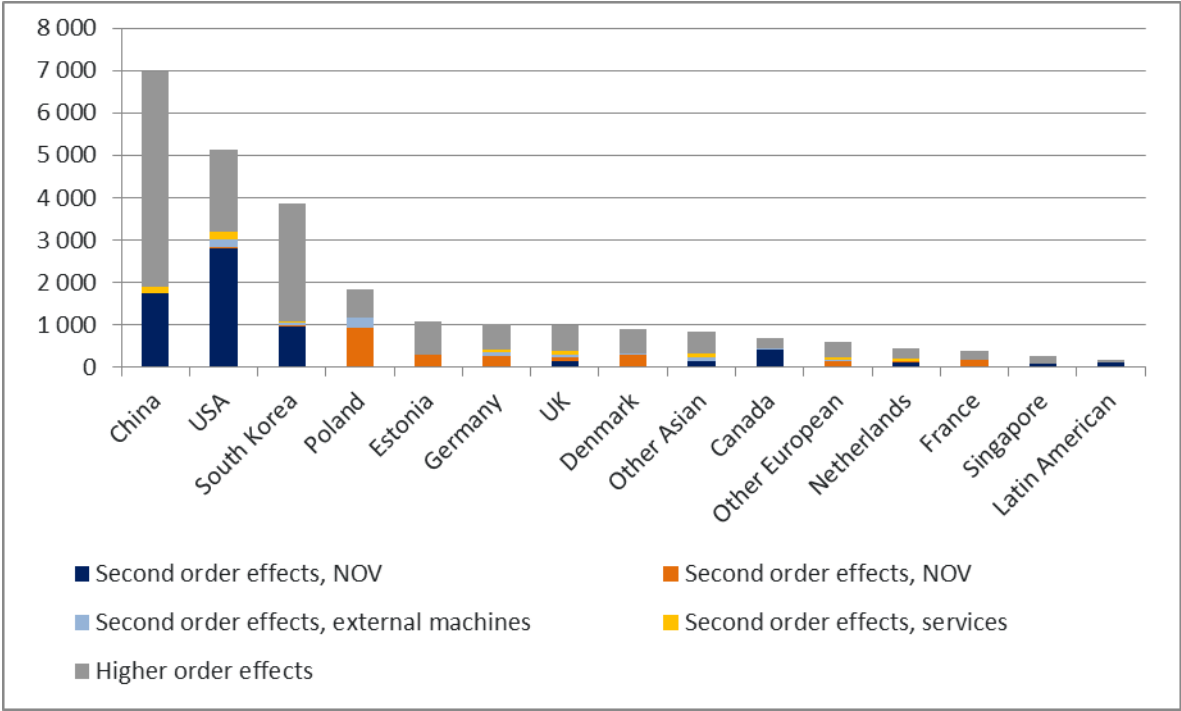
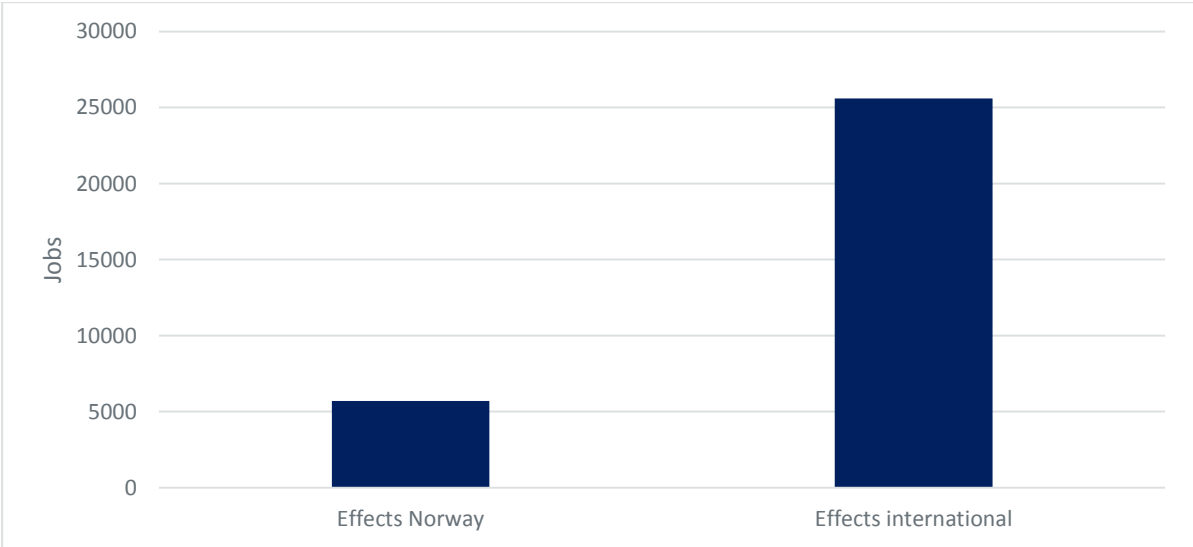


Figure 10 illustrates NOV Norway’s effect on employment both domestically and abroad. The figure gives an illustration of how an internationalized company based in Norway creates jobs and values both within and outside the country.

**Figure 10: NOV Norway’s effect on employment, domestically and abroad. Source: Menon (2013) and NOV Norway (2013)**



How large the effects are for a given country depends on the amount and types of goods and services being purchased, as well as country- and industry-specific relations between employment, production and value added. These relations in turn depend on labor productivity and consolidation.

The effects calculated in this report are gross effects, since more activity by NOV necessarily displaces labor from other activities. Yet, the alternative usages might be slim for industries in many countries and in some cases even involve unemployment. The estimates does not model re-export and reimport explicitly. Thus, they describe the employment effect generated by NOV's purchases in a specific country or region and not necessarily the employment effect in the country or region itself.

## 5. Appendix I: Menon's Ripple Effect Model for Norway

The method used to calculate National Oilwell Varco Norway's effect on employment and tax revenue domestically is a ripple effect model called the national *Total Effect Model (TEM)*. The model illustrates NOV Norway's effect through the supply chain.

### Box 1: Menon's ripple effect model – Total effect model

The model is built upon Statistic Norway's input-output matrixes (IO-matrixes). The IO-matrixes show to what extent different industries deliver goods and services to each other. However, Menon's model is strengthened by integrating Menon's unique database covering activity and accounting information for all companies in Norway over the last ten years.

The database contains detailed information on close to half a million companies. Our database includes information on different departments within each company allowing for a higher degree of precision when calculating regional effects. All information is collected from the Norwegian Business register in Brønnøysund and thereafter revised.

In our calculations we differentiate between first order effects and higher order ripple effects. The first order employment effect comprises people employed by NOV Norway directly. Likewise, first order tax revenues are taxes paid by NOV Norway directly. Second and higher order ripple effects are employment and tax payments generated by NOV Norway through the supply chain.

When calculating the second order ripple effects, we have had access to NOV Norway's complete order book for 2012. The order book has been used to identify NOV Norway's primary suppliers. This has allowed us to make precise calculations of the second order ripple effects by using each supplier's employment to turnover ratio multiplied by NOV Norway's purchases from each company<sup>4</sup>.

For third and higher order ripple effects, we have used input-output matrixes obtained from Statistics Norway to identify industry specific purchases and employment to turnover ratios further down the supply chain in combination with information from Menon's database. Table 1 shows the average employment to turnover ratios used in our calculations.

**Table 1: Average employment to turnover ratios used in our calculations for first and higher order employment effects adjusted for imports (Employees per NOK million).**

| Ripple effects | South | East | West | Midland | North |
|----------------|-------|------|------|---------|-------|
| 2. order       | 0.54  | 0.37 | 0.38 | 0.54    | 0.63  |
| Higher order   | 0.37  | 0.36 | 0.37 | 0.37    | 0.37  |

<sup>4</sup> Menon's unique database covers activity and accounting information for all companies in Norway since the 1990s. The database builds on company information reported to the Norwegian Company Register in Brønnøysund. It is revised by both Soliditet and Menon, and is continuously quality-checked.

When calculating taxes paid by companies, we use the same approach as for employment, using tax to turnover ratios instead of employment to turnover ratios. Table 2 shows the average tax to turnover ratios used in our calculations of taxes paid by companies throughout the supply chain.

**Table 2: Average company tax to turnover ratios used in our calculations for first and higher order tax revenue effects adjusted for imports (Employees per NOK million).**

| <b>Ripple effects</b> | <b>South</b> | <b>East</b> | <b>West</b> | <b>Midland</b> | <b>North</b> |
|-----------------------|--------------|-------------|-------------|----------------|--------------|
| 2. order              | 0.22         | 0.22        | 0.22        | 0.22           | 0.22         |
| Higher order          | 0.23         | 0.23        | 0.23        | 0.23           | 0.23         |

In addition to tax paid by companies, we include income tax paid through employment generated by NOV Norway. In our calculations we assume an average yearly income of NOK 450 000 with an average tax rate of 29.3 percent.

Ripple effects related to trade leakage higher up in the supply chain are neither included nor transferred as input to the international total effect model. Thus, our projections will be conservative.



## 6. Appendix II: Menon's International Ripple Effect Model

In this appendix, we present a model that addresses ripple effects across countries, called the *international total effect model* or just *ITEM*. Given an activity or purchase within an industry or country, the model provides estimates for employment effects over countries. We start by introducing the model design in subchapter 6.1. Our sources are accounted for in subchapter 6.2.

### 6.1. Model Design

Menon has established an international ripple effect model which takes country-specific sector composition and purchase characteristics into account. In this analysis, the model has been adjusted according to the specific characteristics of National Oilwell Varco (NOV) Norway. In addition to Norway, the adjusted model covers twelve countries and three residual country groups:

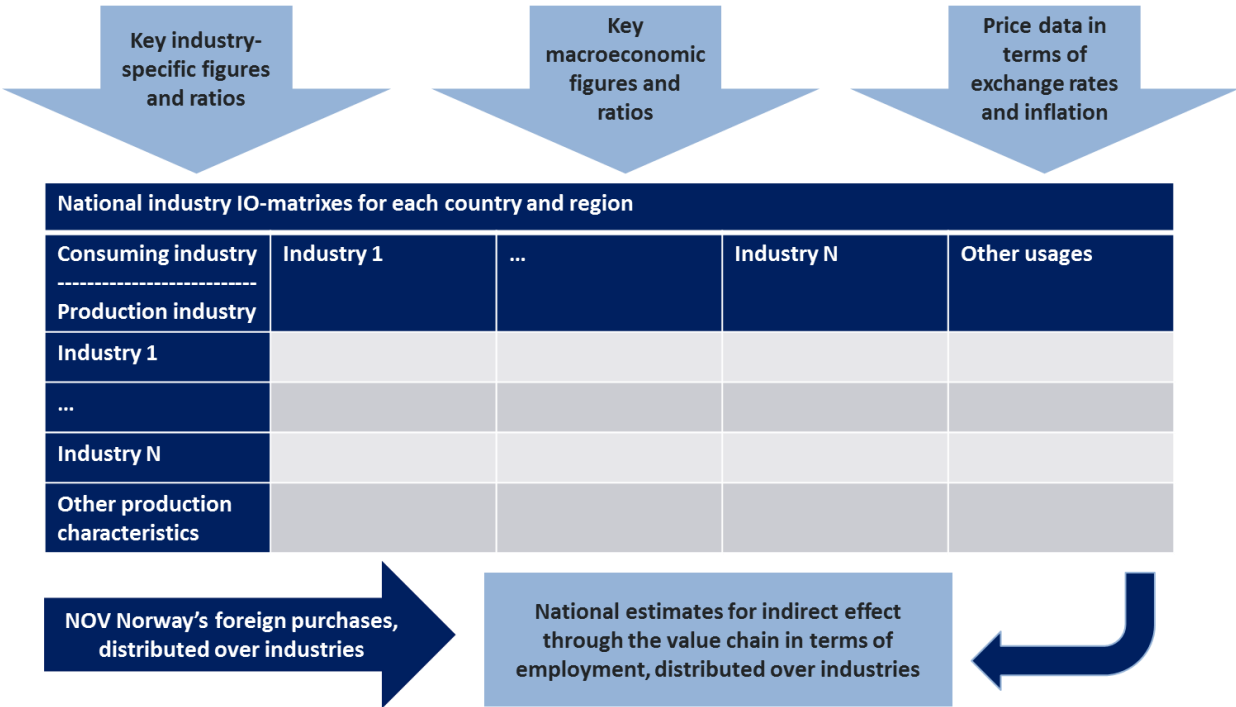
- The model provides **country-specific modeling** for Canada, China, Denmark, Estonia, France, Germany, Netherlands, Poland, Singapore, South Korea, United Kingdom and United States. In 2012, NOV Norway's purchases for these countries amounted to more than USD 29 million.
- The model covers three **residual groups** for other European countries, other Asian countries and Latin America. NOV Norway did not purchase above USD 13 million in 2012 from any of the countries in the residual groups in 2012.

In our model for NOV Norway's foreign purchases, we calculate the foreign ripple effect in terms of employment for all countries and regions. For each country, the second order effects are divided into internal and external purchases, where the external purchases are distributed over industries. Foreign higher order effects are presented as national totals, but will to a large extent involve services, as service industries dominate higher up in the supply chain.

The ripple effect model applies country- and region-specific input-output matrixes (IO-matrixes), which describe the national and regional purchase structure between all industries. More specifically, each IO-matrix involves a complete overview over purchases between all industries for the country in question. By studying the wholesaler-retailer relationships backwards in the value chain, it is possible to estimate the value generation resulting from an initial purchase or activity. In this study, the initial shock in the model corresponds to NOV Norway's country- and industry-specific purchases abroad. We calculate the ripple effects in terms of employment by utilizing country- and industry specific ratios between gross production, value added and employment.

In Figure 11 underneath, we have illustrated our model. The model adjusts the ratios in the IO-matrix for each country or region in accordance with time and geography. The adjustment relies on three sets of country- and region-specific sources; industry-specific data, macroeconomic data and price data. Firstly, the industry-specific data covers employment, gross production and value added. Secondly, the macroeconomic data includes value added in constant and local prices, labor force participation and unemployment rates. Thirdly, the price data encompasses both inflation in terms of GDP deflators and exchange rates. In combination with the data for industry-specific and macroeconomic key relations, the price data can be applied to identify productivity development. Accordingly, the country- and industry-specific key ratios applied in the IO-matrixes are adjusted for development in both price and in productivity.

Figure 11 – Illustration of the ripple effect model for EU and Norway. Source: Menon (2013)



When running the model, we introduce NOV Norway’s foreign purchases as initial shocks. The shocks are distributed over countries, regions and industries in compliance with NOV Norway’s purchase structure. Next, the model calculates national estimates for employment generated through the value chain. The foreign second order effects are presented as internal purchases, external second order effects distributed over industries and higher order effects. In the case of NOV Norway, an expedient division of foreign external second order effects is into metal manufacturing, machine manufacturing and services.

The ripple effects will not discriminate between domestic purchases and reimport higher up in the supply chain. Thus, the estimate for each country or region involves the ripple effects that are generated through suppliers in the respective region or country, but does not necessarily reflect the ripple effects generated in the country as a whole. This unlikely to be a substantial error source, seeing that reimport higher up in the supply chain is likely to be limited, and that trade goes back and forth between countries. If there is any bias, the employment effect is most likely to be underestimated, since developing countries are likely to be more present higher up in the supply chain. This underpins that our estimates could be considered as minimum projections.

The employment effects calculated will be gross, since we do neither calculate nor model how increased employment in one industry draws on employees and self-employers from other industries. The effects will be gross, since we will not be able to estimate to what extent occupy factor inputs and measure the alternative activities. Today, there is less pressure on resources abroad than in Norway, implying that the gross effect will be closer to the net effects outside of Norway. This is however less problematic in our context, considering that we are interested in the values created and not in the potential alternative economic activities.

**6.2. Model Sources**

In order to estimate and facilitate industry and macro relations in the ripple effect model, Menon has gathered data from several international data sources. These sources are listed underneath:

- **Purchase data:** Complete purchase data for National Oilwell Varco Norway's purchases are obtained from the company itself. The data provides a complete overview over NOV Norway's suppliers, including the value of purchases in USD and country specifications. During the project for NOV Norway, Menon has reviewed the purchase data for each country and mapped the supplier's industry. Intracompany purchases are treated separately for all countries.
- **Industry key relations:** Industry- and country-specific figures for employment, revenues in constant prices and value added in constant prices over time are gathered from OECD's Stan Database. USD is used as currency. We base ourselves on the European industry classification from 2002, NACE revision 1 when analyzing according to industries. The time series are applied to estimate the development in labor productivity measures and the ratios between the economic figures for every industry in every country. The data are combined across countries, industries and time to estimate missing figures.
- **Macroeconomic key relations:** Country-specific macroeconomic key figures for value added per capita in constant local prices and current USD prices, labor force participation and unemployment rates are obtained from the International Monetary Fund's World Economic Outlook Database and the World Bank's Open Database. These data are harmonized with the industry-specific and macroeconomic key figures from OECD's Stan Database. More specifically, the macroeconomic data are used to estimate missing country- and industry-specific figures, and for prediction purposes. The macroeconomic data is applied to estimate macroeconomic productivity and key ratios, as well as to ensure compliance between macroeconomic and industry relations.
- **Deflator data:** Local gross domestic product deflators are obtained from the International Monetary Fund's World Economic Outlook Database. These data are used to deflate the estimates to current prices, as well as for separate productivity and price development.
- **Exchange rates:** Data for the development in average annual exchange rates are gathered from Norway's Central Bank. Gaps in these data are filled by applying Oanda Currency Converter. The exchange rates are used to convert economic figures in local currencies to USD.
- **Input-output matrixes:** We have gathered country-specific input-output matrixes for purchases between all industries, as well as other usages from OECD's Stan Database. OECD's latest IO-matrixes were updated in 2005 with the European industry classification NACE revision 1 from 2002. The industries' purchase structure changes little over time, implying that their age will not complicate the estimation. Little evolution over time is however unlikely to hold for the industry ratios in the IO-matrix, which are estimated separately. The matrixes cover both domestic and foreign purchases, but re-export and reimport are not modeled specifically and will to a large extent offset each other over countries. Domestic industry-ratios between key figures are applied for each country.

An overview over country- and region-specific data sources is provided in Table 3 and Table 4 underneath. In addition, we have listed which countries are used as data sources for different kinds of parameters. It is important to stress that all data sources are combined to estimate different key relations for each country.

**Table 3: Overview over data sources applied for different countries and regions (1/2). Source: Menon (2013)**

| Country/Region |                        | Purchase Data        | Industry Key Relations              | Macroeconomic Key Relations                                 | Deflator Data           | Exchange Rate Data           | Input-Output Matrixes   |
|----------------|------------------------|----------------------|-------------------------------------|---|-------------------------|------------------------------|-------------------------|
| Canada         | Representative country | Canada               | Canada and United States of America | Canada  | Canada                  | Canada                       | Canada                  |
|                | Sources                | NOV Norway AS (2013) | OECD Stan Rev. 3 (2005)             | IMF WEO Database (2013) and World Bank Open Database (2013) | IMF WEO Database (2013) | Norway's Central Bank (2013) | OECD Stan Rev. 3 (2005) |
| China          | Representative country | China                | Japan and South Korea               | China, Japan and South Korea                                | China                   | China, Japan and South Korea | China                   |
|                | Sources                | NOV Norway AS (2013) | OECD Stan Rev. 3 (2005)             | IMF WEO Database (2013) and World Bank Open Database (2013) | IMF WEO Database (2013) | Norway's Central Bank (2013) | OECD Stan Rev. 3 (2005) |
| Denmark        | Representative country | Denmark              | Denmark                             | Denmark   | Denmark                 | Denmark                      | Denmark                 |
|                | Sources                | NOV Norway AS (2013) | OECD Stan Rev. 3 (2005)             | IMF WEO Database (2013) and World Bank Open Database (2013) | IMF WEO Database (2013) | Norway's Central Bank (2013) | OECD Stan Rev. 3 (2005) |
| Estonia        | Representative country | Estonia              | Estonia                             | Estonia   | Estonia                 | Estonia                      | Estonia                 |
|                | Sources                | NOV Norway AS (2013) | OECD Stan Rev. 3 (2005)             | IMF WEO Database (2013) and World Bank Open Database (2013) | IMF WEO Database (2013) | Norway's Central Bank (2013) | OECD Stan Rev. 3 (2005) |
| France         | Representative country | France               | Belgium, France and Germany         | France  | France                  | European Union (EURO)        | France                  |
|                | Sources                | NOV Norway AS (2013) | OECD Stan Rev. 3 (2005)             | IMF WEO Database (2013) and World Bank Open Database (2013) | IMF WEO Database (2013) | Norway's Central Bank (2013) | OECD Stan Rev. 3 (2005) |
| Germany        | Representative country | Germany              | Belgium, France and Germany         | Germany   | Germany                 | European Union (EURO)        | Germany                 |
|                | Sources                | NOV Norway AS (2013) | OECD Stan Rev. 3 (2005)             | IMF WEO Database (2013) and World Bank Open Database (2013) | IMF WEO Database (2013) | Norway's Central Bank (2013) | OECD Stan Rev. 3 (2005) |
| Netherlands    | Representative country | Netherlands          | Belgium and Netherlands             | Netherlands   | Netherlands             | European Union (EURO)        | Netherlands             |
|                | Sources                | NOV Norway AS (2013) | OECD Stan Rev. 3 (2005)             | IMF WEO Database (2013) and World Bank Open Database (2013) | IMF WEO Database (2013) | Norway's Central Bank (2013) | OECD Stan Rev. 3 (2005) |
| Poland         | Representative country | Poland               | Poland                              | Poland  | Poland                  | Poland                       | Poland                  |
|                | Sources                | NOV Norway AS (2013) | OECD Stan Rev. 3 (2005)             | IMF WEO Database (2013) and World Bank Open Database (2013) | IMF WEO Database (2013) | Norway's Central Bank (2013) | OECD Stan Rev. 3 (2005) |
| Singapore      | Representative country | Singapore            | Japan and South Korea               | Japan, Singapore and South Korea                            | Japan                   | Japan                        | Japan                   |
|                | Sources                | NOV Norway AS (2013) | OECD Stan Rev. 3 (2005)             | IMF WEO Database (2013) and World Bank Open Database (2013) | IMF WEO Database (2013) | Norway's Central Bank (2013) | OECD Stan Rev. 3 (2005) |

**Table 4: Overview over data sources applied for different countries and regions (2/2). Source: Menon (2013)**

| Country/Region           |                        | Purchase Data   | Industry Key Relations   | Macroeconomic Key Relations  | Deflator Data  | Exchange Rate Data   | Input-Output Matrixes    |
|--------------------------|------------------------|---|--|--|--|--|--------------------------|
| South Korea              | Representative country | South Korea   | South Korea  | South Korea  | South Korea  | South Korea  | South Korea              |
|                          | Sources                | NOV Norway AS (2013)  | OECD Stan Rev. 3 (2005)  | IMF WEO Database (2013) and World Bank Open Database (2013)                                | IMF WEO Database (2013)  | Norway's Central Bank (2013)                                     | OECD Stan Rev. 3 (2005)  |
| United Kingdom           | Representative country | United Kingdom  | Belgium, France, United Kingdom and United States  | United Kingdom   | United Kingdom   | United Kingdom   | United Kingdom           |
|                          | Sources                | NOV Norway AS (2013)  | OECD Stan Rev. 3 (2005)  | IMF WEO Database (2013) and World Bank Open Database (2013)                                | IMF WEO Database (2013)  | Norway's Central Bank (2013)                                     | OECD Stan Rev. 3 (2005)  |
| United States of America | Representative country | United States of America  | United States of America   | United States of America   | United States of America   | United States of America   | United States of America |
|                          | Sources                | NOV Norway AS (2013)  | OECD Stan Rev. 3 (2005)  | IMF WEO Database (2013) and World Bank Open Database (2013)                                | IMF WEO Database (2013)  | Norway's Central Bank (2013)                                     | OECD Stan Rev. 3 (2005)  |
| Other European Countries | Representative country | Austria, Belgium, Czech Republic, Finland, Greece, Iceland, Ireland, Italy, Portugal, Russia, Spain, Sweden and Switzerland | Austria, Belgium, Czech Republic, Finland, Greece, Italy, Slovenia, Sweden and Switzerland | Austria, Belgium, Czech Republic, Finland, Greece, Italy, Slovenia, Sweden and Switzerland | Austria, Belgium, Czech Republic, Finland, Greece, Ireland, Italy, Portugal, Spain, Sweden and Switzerland | European Union (EURO)  | European Union (EU27)    |
|                          | Sources                | NOV Norway AS (2013)  | OECD Stan Rev. 3 (2005)  | IMF WEO Database (2013) and World Bank Open Database (2013)                                | IMF WEO Database (2013)  | Norway's Central Bank (2013) and Oanda Currency Converter (2013) | OECD Stan Rev. 3 (2005)  |
| Other Asian Countries    | Representative country | Azerbaijan, Hongkong, India, Indonesia, Japan, Malaysia, Thailand, United Arab Emirates and Vietnam                         | Japan and South Korea  | Japan, Malaysia and South Korea  | Malaysia   | Japan, Malaysia and South Korea                                  | Taiwan                   |
|                          | Sources                | NOV Norway AS (2013)  | OECD Stan Rev. 3 (2005)  | IMF WEO Database (2013) and World Bank Open Database (2013)                                | IMF WEO Database (2013)  | Norway's Central Bank (2013)                                     | OECD Stan Rev. 3 (2005)  |
| Latin American Countries | Representative country | Brazil and Mexico   | Brazil, Greece and Italy   | Brazil and Mexico  | Brazil and Mexico  | Brazil and Mexico  | Mexico                   |
|                          | Sources                | NOV Norway AS (2013)  | OECD Stan Rev. 3 (2005)  | IMF WEO Database (2013) and World Bank Open Database (2013)                                | IMF WEO Database (2013)  | Norway's Central Bank (2013)                                     | OECD Stan Rev. 3 (2005)  |