THESIS WORK

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Managing resource curse, analysis of Norway and Australia from the perspective of the 2002-2014 commodity boom

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Introduction

Natural resources have always played an important role in economic development. It can be said that they have shaped human history to a profound degree. From being basic inputs for economic development, to their influence as of colonization and the many bloody wars fought for them through the centuries. Through common sense, one could wonder why anyone would question the beneficial effects of natural endowments and riches in general.

The classical approach to natural resources could be summed up as they served as useful contributing factors to industrialization and therefore development. This logic has been used to explain the outstanding development of the world’s leading nations such as the United States, United Kingdom or Australia. In contrary there is empirical evidence from the 1970s and 1980s that many countries despite their natural abundance faced economic decline instead of growth. It became especially interesting due to the spectacular rise and growth of Asian economies in the same period, who had no or little natural resources compared to their Middle Eastern, Latin-American and African counterparts. We have seen massive industrialization and growth of Asian economies (first Japan, South-Korea, Singapore, Taiwan, then China, India, lately Indonesia, Malaysia and so on), many of whom managed to go even further by transitioning their economies into higher value-added economic activities such as IT, finance and electronics manufacturing, once again by relying on commodity imports (energy, base metals and may times food as well).¹ In contrary resource rich and exporting countries such as Venezuela, Iran, Iraq and many African countries such as Congo or Nigeria remained less developed and faced decline in income levels and economic development (Sala-i-Martin & Subramanian 2003, 2012). Moreover, these countries not only faced worsening economic performance, but also many ‘associated” socio-economic downturns such as civil wars, declining social welfare, corruption and others (Ross 2001, 2003).

Based on the problems experienced in developing countries in 1950s and 1960s researchers started to focus on the relation of natural resources and economic development. As the Dutch experienced declining economic growth after exploring and utilizing their North Sea oil and gas reserves, the assumed negative relation of natural

¹ The GDP per capita of China today is 67 times bigger than it was in 1970
endowments and economic growth kicked-off. The phenomenon became known as the resource curse, Dutch disease or paradox of plenty, stating that natural resource abundance and heavily reliance on it leads to retardation in economic development (The Economist, 1977, Corden & Neary 1982).

The literature on the topic has various findings on natural resources and development, but most of them suggest a negative relation. Although most of them share one thing in common, that Australia, Norway, Canada (and others as Botswana, Chile, Indonesia) managed to tackle their commodity export dependency and became shining examples that the natural endowments can be a supportive pillar in a nation’s economy and development, thus beating the resource curse (Sachs & Warner 1997, Mikesell 1997).

Since the beginning of the 2000s, the world experienced high commodity prices, this intense growth in overall commodity prices were only disrupted by the Global Financial Crisis of 2008 and the latest collapse since 2014 January. Despite the economic slump in 2008 commodity prices hiked even higher between 2009 and 2014. The massive commodity boom that we have witnessed since the early 2000s was covering all commodities, agricultural products (wheat, corn, soybeans, etc.), base and precious metals and energy commodities (e.g. oil, gas). This incredible increase in price and demand was driven by the spectacular growth of East and South Asian countries, but most importantly by China (Ito, 1996). The past 15 to 20 years was “considered” as the golden era for commodity exporters, as the Asian hunger for raw materials seemed to be quenchless (Oil reached record peak of $145/bbl in 2008 and dropped to a $35 level today, iron ore peaked at $187/t in 2011 and soared to $55 today) (see figure 1.2). This bright picture started to darken in the past two years as the Chinese Yuan and stocks crashed in last August and repeated itself similarly in 2016 January. Declining Chinese macroeconomic figures, slowing growth did not help, as well as the markets started to realize and price in the structural inefficiencies in China’s economy.

The global political structure became more fragile lately, as new regional conflicts occurred and remained untreated such as the Syrian civil war or the Ukrainian crisis and so on. The political uncertainty is embodied in the cold American-Russian relations, regional conflicts and the factious political dynamics in the European Union (e.g. Brexit). Furthermore, slowing European growth and debt spirals combined with on-going refugee crisis and the increasing risk of global terrorism are putting many pressures on the global
economic outlook, upon which export oriented economies heavily depend. As Asian growth projections fall back, the estimated demand for commodities fall as well, thus commodity prices shall follow them. Furthermore, the end of Quantitative Easing policies of dominant central banks shall end soon, tightening the global financial liquidity (CNN Money, 2016).

According to the above mentioned the global economy is approaching a more volatile era. Although it is expected to see a continuously increasing demand for commodities as global population grows, global energy consumption is expected to grow by more than 70% by 2040 (IEA, 2015). The OPEC expects world oil consumption to hike to 110 million barres per day from the current 92.8 million (OPEC, 2015). Similar trends can be associated metal demands as well, the global demand for copper is expected to quadruple, iron to triple, aluminium and zinc to double and so forth by 2050 (Halada, Shimada, Ijima, 2008). Which are driven by the increasing demand for electronics. The expectations are similar on the food front, as total population of Earth is expected to grow to 9.6 billion by 2050 (UN, 2012)

The latest commodity boom and bust again drew attention to natural resource exporters. Although developing countries are more exposed to the bust, than developed ones, the current situation puts pressure on the champions of resource curse as well. Countries like Canada, Australia and Norway were praised for “beating the resource curse”, but remained mainly commodity exporters. The soaring commodity prices put pressures on these economies in the form of worsening trade balances, revenue shortfalls and need for diversification, preserving the relevance of the Dutch disease today as well.

In this paper, I intend to take a closer look at the Australian and Norwegian economies and analyse them if they developed any of the Dutch Disease symptoms during the latest natural resource boom cycle. Therefore, my hypothesis is the following:

*Did Australia and Norway develop symptoms of the Dutch Disease during the commodity boom of 2002-2014?*

The reason why I chose the named countries as the scope of my analysis is that they both have been cited as the countries, which have beaten the resource curse and have been posted as good examples for developing countries, despite the fact they mostly export natural resources. Australia is well known for its mining and agricultural sector, which
has played important role in its economy since the colonial times. Mineral and fuels exports were 63.4% and agricultural products were 16% of total Australian exports in 2014 (WTO, 2014). While Norway is similar in its export composition with 69.3% of Fuels and Minerals Export in terms of Total Export (WTO, 2014). Both countries are high-income, developed countries, Norway ranks number one on the United Nations Human Development Index, while Australia ranks second (UNDP, 2015), compared to other resource rich countries such as Nigeria (ranked 152), Libya (ranked 94), Venezuela (ranked 71) or Russia (ranked 50). Thus, we could say that Australia and Norway did something outstanding in terms of economic development and managing their natural resources.

Norway and Australia, despite their high income and development rank badly on the Observatory of Economic Complexity’s ECI index - Norway ranks 33th, climbing up 2 places, while Australia ranks 82th in 2014 (OEC, 2014). These results suggest that their internationally traded products are simple ones; this can be used as a proxy to describe the broader economy, although it has also its limitations.

Therefore, I found it important to look at these two economies and see if they started to develop any of the Dutch Disease symptoms in these booming years. Namely terms of trade boom, currency appreciation, spending and resource movement effects and de-industrialization, which leads to a long-term distortion of growth and productivity

In this paper, I will focus on identifying the evolving symptoms of the Dutch Disease in the Australian and Norwegian economies from the perspective of the recent resource boom.
2. Literature review

This section illustrates the Resource Curse’s literature. First, it explains the evolution of the theory, and then it demonstrates the macroeconomic challenges of the curse, through the Dutch Disease, terms of trade and linkage effects and commodity price volatility. Then, the following part covers the fiscal and industry policy challenges, such as fiscal policy and taxation, state ownership, import substitution and industry policy and corruption and rent seeking. The final sections provides examples of possible policy options to manage and mitigate the resource curse.

2.1. Evolution of resource curse theory

The paradox of plenty has been haunting our history for a long time. It is against common sense to conclude that natural riches or suddenly found wealth could be harmful, although such experiences and perception about natural resource wealth seem to be reoccurring for centuries. In the 16th century, Jean Bodin in the Six Books of the Republic (1657) reflected something similar: "Men of a fat and fertile soil are most commonly effeminate and cowards; whereas contrariwise a barren country makes men temperate by necessity, and by consequence careful, vigilant and industrious.

From a management perspective, Cervantes similarly concludes in his Don Quijote, that "The gratification of wealth is not found in mere possession or in lavish expenditure, but in its wise application.” Thereby referring to the effects of infinite flaw of gold and silver from the Americas to the Spanish Empire in the 16th century.

Might it just be true that these early remarks were telling already observing and describing an economic trend that we had been neglecting even today?

The answer could be “maybe”.

Natural resource abundance was considered a great advantage for a long time, which could benefit a nation’s development. This concept was also supported by classic economic theories, such as the theory of comparative advantages by David Ricardo. It states that countries should specialize their production into areas in which they have advantage compared to other countries, be it apples, machines or minerals. Natural resources were considered to be inputs of production, which would result in outputs which
could be re-used as capital or consumed by the economy to contribute to its development. Neo-classic economists strengthened this view as well. Natural resources are part of the country’s natural capital among others such as fertile land, forests, fisheries, etc. (Lewis, 1955). In this sense, these resources are rather blessing than curse. These “treasures” could help poor countries to break the vicious circle of poverty and foster their “take-off” in industrial development just like the “Western” developed countries did (Rostow, 1960). These countries could use their resources as assets and tools to gain the required investment for the “big push” to modernize (Rodan, 1942).

Although not everyone agreed with the “mainstream”, critical views on the issue was phrased by Raúl Prebisch and Hans Singer. Their dependency theories, later merged as the Prebisch-Singer hypothesis, argued that primary commodity exporter countries face declining growth through deteriorating trends in their terms of trade (Singer 1950, Prebisch 1949). This is due to the lower income elasticity of demand of commodities compared to manufactured goods. Therefore, if income rises, the demand for manufactured goods will be more rapid than that for commodities’ (plus their price tend to increase more due to quality development through technology improvements, as well as saving mechanisms), thus a decline in commodity prices tends to reduce their revenues rather than increasing it. These findings are suggest that commodities are inferior to manufacturing. This puts the role of natural resources into a different perspective, projecting declining economic growth for resource rich developing countries if they do not move towards industrialization and diversifying into manufacturing.

The heavy dependency on raw material exports of developing countries and their declining terms of trade described by Prebisch, was extended by the immiserizing growth theory (Bhagwati 1958). Bhagwati showed that, if countries mainly exporting a primary product, that has low price elasticity of demand or price, or both combined with increasing volume of exports lead to decline in the international price of its export good. This describes an extreme situation, when the exporter is producing such volumes that it is able to influence international prices. Thus, the increased supply will undermine the price level of the commodity, and through declining terms of trade the country itself is decreasing its own income. Such behaviour leads to immiserizing growth, which cripples the wider economy. This phenomenon is associated usually with natural resource exporting, developing countries (although Kuwait and Saud-Arabia is doing it on purpose
with oil production to gain market share). Although immiserizing growth as a possibility was raised in the core model of the Dutch Disease as well (relating the spending effect to an increased wage level), the implication of it is that the economic growth at a time can lead to a sever deterioration of terms of trade, when the gains by the output increase could be more than offset by the direct benefits or an adverse terms of trade (e.g. undermining world prices by exceed supply or too high wage increase, which reduce overall competition) (Corden & Neary 1982, Ruehle & Kulkarni, 2011).

The spectacular growth of East Asian economies in the ‘70s and ‘80s (Japan, Korea, Singapore, Taiwan, etc.) and the Oil Crisis in 1973 drew even more attention to the topic. These countries had little or no natural resources, while Latin-American, African and Middle Eastern countries with outstanding endowments went through less favourable economic growth, many of them actually declined in this period (e.g. Iran and Venezuela -1% per annum between 1965 and 1998). In 1956, the Dutch found gas reserves in the Groningen region and started utilizing it. They received significant revenues from exporting the newly found gas on the short-run, but by the 1980s they ended up in economic stagnation due to the appreciation of the Guilder and its negative effects on the economy as a whole. The appreciation is happening to such an extent that it reduces the competitiveness of the traditional industries and de-industrialization. Cause-effect assumptions were made between the natural riches and negative economic growth again, but this case in an industrialized, developed country. The phenomenon was described first by the Economist magazine in 1977 and named as Dutch Disease. The Dutch Disease symptoms were reoccurring in the British economy after they developed the North Sea oilfields in the 1980s. The economic model around the cited Dutch Disease phenomenon was established in 1982 (Corden & Neary, 1982).
Significant research has been done on the topic since, Glyfason found that OPEC member countries’ gross domestic product declined by 1.3% annually between 1965 and 1998 (Glyfason, 1999). Similarities were found on sub-Saharan African countries, where resource rich countries grew slower than their resource abundant peers (Wheeler, 1984). Alan H. Gleb in a World Bank research found that oil and mineral exporters performed worse than the non-resource rich countries in the boom of 1971-1983 (Gleb, 1988), these findings were confirmed by Richard M. Auty, who coined the phrase and theory as “resource curse” in the same paper (Auty, 1993).

The proper scientific establishment of the resource curse theory and its dynamics was done only in 1995. J.D. Sachs and A. Warner developed and conducted a cross-country regression analysis on 97 countries. They tested the countries growth rates between 1970-89 in relation to the country’s natural resource based exports in 1970. They found that countries with higher proportion of natural-based exports had lower growth rates. (Sachs & Warner, 1995). They concluded similarly in a series of research on the topic, in the following years (1997, 2001) in which they controlled for further variables, and reduced their sample with eight slow-growing oil exporting countries. (Sachs and Warner, 1997, 2001).

In addition, Atkinson and Hamilton (2003) concludes that resource abundant countries negatively develop because of irresponsible economic policy. This is due to low or negative genuine savings, as governments use the natural resource revenues to finance
government expenditure instead of investing or saving it. Furthermore, they note that the success of investment and saving policies depend on the quality of institutions. Similarly, concluded Neumayer (2004) that resource rich countries grew slower between 1970 and 2001 by analysing 99 countries in terms of genuine income (GDP - capital depreciation). He highlighted the failures of capital formation in resource abundant countries and pointed the finger at institutional qualities, more specifically at corruption. He also encouraged international policy makers to address the issue.

Many authors indicated that natural resource wealth could hinder economic development in many other forms, such as political conflicts, socio-economic development and economic policy.

Micheal Ross contributed outstandingly to the resource curse literature, by raising awareness to that the resource curse theory has other dimensions beside economic. He conducts in his research by analysing 113 countries, through cross-country data sets, that “both Oil and Minerals have strong antidemocratic effects” (Ross, 2001). In a later study, he conducted that natural wealth negatively affects poverty and human development (Ross 2003).

Some of the literature also suggest that natural resource endowments not only contribute to economic issues and anti-democratization, but directly to armed conflicts and civil war. Collier and Hoeffler (1998) find in a regression analysis of 93 countries’ civil wars over a period of 56 years, that “the effect of primary commodity exports on conflict risk is highly significant”. They also conclude that the conflicts are focused on the control of the natural resources and motivated by greed and grievance. They also indicate that these conflicts last longer, as the resource rents makes rebellions feasible.

The management aspects of natural resources are considered an important factor in whether the resource wealth turns into a curse or not. There is empirical evidence that countries that are rich in natural resources, especially in case of oil, are likely to be involved in rent seeking activities, which leads to a voracity effect. The voracity effect offsets and reverse the positive terms of trade effects of natural resources, as the growth is undermined by inefficient government, that lacks the motivation to modernize the economy because of “feeding frenzy” on rents thus preserving the status quo (Lane &
Tornell 1999, Torvik 2002). Therefore, natural resources through rent seeking diminishes democratization processes and increasing inequality (Leite & Weidmann 1999).

Since then the literature became substantial, as big institutions such as World Bank and International Monetary Fund fuelled a series of research on the topic. Lately the focused research areas can be distinguished as natural resource management, criticism of the resource curse theory, individual country analysis and associated socio-political externalities.

In contrary, Mikesell found no obvious explanation for the resource curse that could be applied to mineral exporting, but the principal explanation was incorrect governance (Mikesell, 1997). Similarly, concluded Sala-i-Martin in a regression panel analysis found that primary school enrolment, relative price of investment and initial level of GDP per capita are explaining growth. Few evidence were found in relation of primary exports. (Sala-i-Martin, 2004). While in another model the negative cross-sectional impact of natural resource exports were shown, but tracked back to the poor accumulation of human capital (Bravo-Ortega &de Gregorio 2007).

There is robust evidence stating that natural resources are having an impact on economic development, although the resource curse phenomenon rather relates to the management and poor political decisions over them, than to their pure presence. Many authors agreed on some of the disagreements of the curse, as controversial results can be found with different ways of modelling. This is proven in a paper where the authors replicated the original Sachs-Warner model, but using two different approaches. By using a net measure of resource exports, or either a gross export measure without making adjustments for two countries (Sachs and Warner used net resource exports instead of gross measurement for Singapore and Trinidad in 1997), they find that the negative impact of natural-resource abundance on growth disappears (Lederman & Maloney, 2007, 2008). Just as the countries own development path differ, the definition of “resource cursed” or “dependent” differ too. Richard Auty in 1993 used a threshold of 8% of GDP contribution and 40% of total exports to be a natural resource dependent country and therefore resource cursed, while later authors used different bottom line (Ahrend (2005) required countries to have extraction industry to be bigger than 10% of GDP, therefore Cameroon, Indonesia or Canada would net even fulfil the requirements).
Therefore, the “resource curse” is rather a multi-dimensional phenomenon that can be associated with the over-reliance of one sector of the economy and a series of unsuccessful economic policy making that is driven by short-termism. The pure presence of natural riches does not implicate a curse, but without proper institutional framework and pragmatic policymaking, it can lead to economic decline and even armed conflicts.
2.2 Monetary and trade challenges

2.2.1 The Dutch Disease

The Dutch Disease refers to a situation in which a boom in an exporting sector leads to a shift of production factors to the booming sector from the rest of the economy, and increase in the price of non-tradable goods and services, therefore, hindering the local tradable sector. This observation was made as early as 1957 in Australia. A model based on two factors (land and labour) explained the same dynamics through the example of clothing and food. The impact of increased overseas demand for products “will be to shift the distribution of income… for the production of exports to improve balance of payment”. “This will lead to a rise in wage rates … and will rise costs in the industries producing goods in competition with imports”, “such a permanent increase in demand for Australia’s exports could lead to a long term strain”. (Meade & Russel, 1957).

Although the term Dutch Disease was phrased by The Economist magazine in 1977 by reflecting on the Dutch economy’s slowdown. The phenomena relate to the exploration and utilization of the North Sea oil and gas reserves in the Groningen region, in the Netherlands. As a result the Dutch exports skyrocketed and they became one of the biggest natural gas exporters in the period. In the short-run the Dutch experienced massive influx of foreign currency, that pushed up the demand for the Guilder. They experienced a substantial appreciation of the Guilder (~41%), which made the other “traditional” parts of the economy less competitive. As the oil and gas industry is relatively capital intensive, it established only a few jobs, while to tackle the appreciation pressure the Dutch reduced interest rates, which fosters capital to escape the country. Therefore, the Dutch experienced downturns in a couple of ways, first the appreciation made the manufacturing and other traditional parts of the economy less competitive relative to imports. Secondly, when the economy became overheated they kept interest rates down, so the former capital inflows declined, parallel with the stagnation period, due to the loss of competitiveness in other sectors. Thirdly, the influx of capital led to huge amount of disposable income, which the Dutch government spent on social welfare programs (The Economist, 1977).

The “Core Model” of the Dutch Disease was established by W. M Corden and J. P. Neary in 1982. They break down the economy into two groups, tradable and non-tradable sectors. The tradable sector consists of the Booming (natural resource sector) and the Lagging
(usually manufacturing, part of agriculture and certain services e.g. tourism, export of education services), the two tradable sectors are export and import competing industries, their price is by world prices and the exchange rate. While the Non-tradeable sector consists of industries which price is determined by the domestic supply and demand. (Corden & Neary, 1982). When the positive shock reaches the economy e.g. in forms of increased commodity prices or terms of trade shocks, it will affect the economy in two channels: the resource movement (factor movement) and spending effects.

In their model, capital and labour are equally used by manufacturing and the service sectors, but not by the booming one. As the booming sector becomes the main driver of national exports in international trade (due to the natural resource endowments and increased demand for it), it is going to offer higher wages compared to the manufacturing (pushing the equilibrium wage up). The increase in the value of output in the booming sector raises the marginal product of labour (Stijns, 2002). Thus, labour will be automatically allocated to the booming sector, as it offers higher wages for workers, which is followed by the de-industrialization of the manufacturing sector. What really happens is that the booming sector not simply pull away resources from the manufacturing, but also going to allocate resources for its own technological development from both manufacturing and the non-tradable sectors. Moreover, as the Booming sector is the main driver of growth, it is attracting more capital inflows than the other sectors, as it offers higher returns for investors. This effect is called resource movement effect (or supply side approach).

Regardless of the nature of the boom, it leads to increased disposable income for the home economy. This increased income pushes domestic demand and prices up for all goods. It is stimulated by both public and private sectors spending; because the price of tradable goods is decided internationally, the income from such sources will rise and the extra spending will rise the relative price of non-tradable, leading to further higher prices and output volumes of non-tradable sector. This is all due to the increased foreign currency influx that drives up the value of the endemic currency, therefore leading to a real appreciation. This is called the spending effect (demand side approach).

Moreover, as the prices of the lagging sector is fixed on international level, their output price will not increase, meanwhile due to the real exchange appreciation the input prices will increase, as the Booming sector will drive up the wages, generally in the economy.
Thus manufacturing products will be less competitive, because they will receive less factors (both labour and capital) and because of exchange rate they will be more expensive relative to imported products. As labour leaves the Lagging sector due to the resource movement effect, the output level of manufacturing is supposed to decline, which is called “direct de-industrialization”. If, there is a further labour shift from manufacturing to the Non-tradable sector, on the top of the resource movement effect (to the Booming), because of the spending effect (increased demand for labour in the Non-tradable sector), we then speak of an “indirect de-industrialization.

All in all the Dutch Disease can be summarised as the (i) exchange rate appreciates due to positive shocks, which increases domestic prices. The increased domestic prices and disposable income results in (ii) an expansion of Non-tradable sector output, while (iii) the manufacturing production declines as it becomes uncompetitive, therefore (iv) manufacturing exports decline. (Corden, 1984)

In addition of the Dutch Disease model, there is a number of negative associated outcomes of it. There is an evolution of a two-speed economy, due to the enclave nature of extraction industries, and this also contribute to a “new” labour aristocracy, which receives more benefits (higher wages, additional trainings, etc.) from the boom than the rest. Declining manufacturing output and competitively, which struggles to establish back and forward linkages with the rest of the economy, therefore reduces the foothold for innovation and technology spill-overs. The increased disposable income if brought into the economy will lead to a further appreciation of the currency, thus increasing demand for the services sector. The increased income both for private and public consumption, establish incentives for further spending, that is likely to be done domestically. Private spending can end up in increased import consumption, if the local industries’ capacity cannot cover the demand. Therefore, it will lead to further pressures on local manufacturing in terms of competition with foreign products, while incentives for domestic service industries to grow and take away further resources from manufacturing. If the disposable income invested abroad, they tend to be invested into securities that offers higher returns, which in a commodity boom period is the mining sector. Such capital inflows into the sector, just makes the Dutch Disease effects more severe. Furthermore, Governments can easily spend these extra incomes, rather than saving them. By conducting infrastructure development, the government can enhance greater benefits
for the whole economy in form of roads, utility developments and so on, while many times it tends to launch social welfare programs and import substitution industry policies. This is particularly dangerous when the commodity booms go bust and the revenues significantly decline and leads to budget deficits, if revenue streams are overestimated. This deficit is financed from external sources in the form of debts, which turns into an accumulating obligation, if not followed by spending cuts or increasing tax revenues.

Countries with less developed institutional environment tend to develop more serious aftermaths than economic or financial issues. In places where property rights and civil rights are not emphasized an enforced, the natural riches lead to predatory behaviours. If the state lacks the capacity to act as a state, by implementing and enforcing checks and balances, totalitarian regimes can rise. The predatory behaviour prioritizes the highest earning industry in contrary with the rest of the economy, leading to substantial imbalances and over reliance on one sector. Secondly, the likelihood for conflicts over the distribution of natural rents is high. There are multiple interest groups, which might get involved even in armed conflicts as well for the control of these revenue sources. Thirdly, if these resource rents only benefit a narrow layer of the society, huge income inequalities going to be persistent. Where many struggle in poverty and a few enjoy high standards of living, thus hindering the long-term development of the country.
2.2.2 Terms of Trade and Linkage effects

As explained before the Prebisch-Singer Hypothesis was a game changer in the perception of natural resources. It suggests that commodity prices (e.g. coal, coffee beans) on the long will decline compared to manufacturing goods. This implies that commodity exporter countries will experience a worsening terms of trade due to the lower prices of commodities that makes up their exports, while he main import goods, the manufacturing products’ will increase. This process dooms the natural resource exporting country into both trade and fiscal deficit; therefore, these countries will experience lower or negative economic development. This was a major argument for developing countries to industrialize, as a development path. The Prebisch-Singer thesis contributed a lot to consider manufacturing inferior to natural resource sectors.\(^2\) Such point of view was supported by Matsuyama (1992), who argued that countries should industrialize, because the natural resource sector lacks spillovers of learning by doing (he also implicated that a plunge in manufacturing could reduce demand for education). Therefore, countries should focus on manufacturing, where productivity growth, skill and capital accumulation is higher, to avoid worsening terms of trade.

In addition to tackle the resource dependency, the enhancement to develop a solid industrial base is important to realize spillover effects. Forward and backward linkages are important for new industries, as the economy has to connect customers, capital, material, labour and information somehow. The problem with primary commodities is that they have limited linkage-creating capabilities for the wider economy (Hirschman, 1958, Torvik 2001b). The primary commodity sectors show somewhat similarity with Lewis’ Dual Economy Model, where the export sector acts as an enclave (Lewis, 1954). These enclaves tend to be owned by foreign parties, which only invest the necessary minimum in the economy, usually to develop the extraction sites and the required transportation facilities. In many cases, especially in developing countries the local labour might lack the necessary skills, thus the resource sector tends to use foreign labour. The profits are taken out of the country and not re-invested locally, while processing capabilities might be established somewhere else. All these contributes to that it is hard to create linkages with the wider economy for extraction industries.

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\(^2\) Matsuyama in his study takes agricultural goods as natural resources
An interesting point of view was raised in The Atlas of Economic Complexity, namely that a country’s economic complexity is one of the main determinants of economic growth. They state that, “the complexity of an economy is related to the multiplicity of useful knowledge embedded in it” and “expressed in the composition of a country’s productive output and the structures that emerge to hold and combine knowledge” (Hausmann & Hidalgo, 2014). Due to the learning-by-doing and spillover processes, a country’s economic development can be predicted as they accumulate knowledge in a given field that the country is producing. So if a country is producing bananas, it is more likely to move on to produce mangoes than jet engines, as it develops knowledge in that field. This kind of knowledge accumulation will develop capabilities in the agriculture sector, but not in high tech engineering (Hidalgo & Hausmann 2009). The lack of knowledge and capabilities explain why they cannot diversify into new industries. They describe diversity as the number of products connected to a country’s production and ubiquity by the number of countries that a product is connected. They explain the theory and knowledge accumulation by the product space terminology, which can be summarized as the similarity in capability requirements of a product. These products form a network where similar products require similar knowledge and capabilities, the proximity of theirs describe the possibility of spillovers and specialization into more complex products. Hausmann & Hidalgo (2014) finds that less complex products are less connected to other communities of products with the same knowledge, therefore if countries produce only low complexity products (e.g. fruits, oil, coal, etc), they will only accumulate knowledge in industries where the linkages with other products is weak, therefore they determine their future knowledge accumulation. To explain the process on a systematic level they developed the Economic Complexity Index and the Product Complexity Indexes. The indexes show that developed countries are mostly exporting complex products (e.g. machinery, electronics, etc.), while developing countries produce low complexity ones (e.g. commodities, fruits, etc.)

In contrary of the enclave effect, there is evidence that in cases resource extraction can be technology intensive (mostly offshore sites), therefore, it is capable to produce similar effects as manufacturing (Torvik 2001a).
2.2.3 Commodity Price Volatility

One of the core problems of the resource curse is the price volatility of commodities. Although the Prebisch- Singer Hypothesis suggest that commodity prices will decline in a long run, the commodity booms prove the opposite of it on the short-run. The price volatility is identified as one of the major cause of the resource curse and the Dutch Disease. It causes sever volatility in output per capita growth and roller-coastering government revenues (Poleg 2007, Frankel 2010, Corden & Neary 1982). The unpredictability and huge swings of the commodity prices increase the instability and uncertainty of government revenues and foreign exchange reserves (Levin 1960, Nurske 1958, Frankel 2010). The volatility of commodity prices affects other sectors as well, as many other industries are users of the commodities, like construction and transportation, which follows the boom in growth, and bust as well.

Figure 1.2 Commodity prices between 2001 and 2016 (in USD)

Source: Author’s creation based on IMF Commodity data
Therefore, the nature of commodity prices, require diligent institutions to put adequate policies in place. These polices should focus on enforcing reasonable budgeting, advanced planning and development of price scenarios, as the negative fluctuation can be contained (Ploeg 2007). The big swings of commodity prices, pose big threat for those countries who heavily rely on their export, as in booming period the risk is high to overspend while in bust periods it is hard to repay borrowings and to finance development projects. The volatility also undermines sector profitability and investments. Another problem of the volatility is that in booming periods it pools FDI into the mining sector, which are usually transformed into new output capacities, which are only finished a couple years after, when the boom might be over and adding new substantial supply capacity. In the past two years we had seen oil prices over $100/bbl and under $30 as well. A nice illustration of the above mentioned is the increased shale gas and oil and oil sand capacities in Poland, the US and Canada. The high oil prices made it seem profitable to deplete these unconventional energy commodities, which requires more developed technologies, set up costs and operating costs as well (just the US itself developed 1.9 million bbl/day shale oil capacity, which production cost is round $50-60) (Financial Times, 2016). The collapse of oil prices or generally commodity prices stops or hinders these investments and lead to significant losses to all stakeholders from creditors to the wider economy.
2.3 Fiscal and industry policy challenges

2.3.1 Fiscal policy and taxation

Governments and fiscal policy plays a key role as a determinant, whether the natural riches turn into blessing or the opposite. As one of the main cause of the resource curse, what can be partly explained by the spending effect, whereby governments cannot resist temptation not to spend the revenues in commodity price booms. Another explanation is, how the countries exploit these resources (Auty 1993, Sachs and Warner 1997). Sinnott (2009) finds that commodity exporting Latin-American countries’ government revenue respond significantly to commodity price. One of the biggest challenges of resource revenue windfalls is how governments handle the booms, but more importantly the bust periods (Gleb, 1988). Therefore, the nature of the resource curse lies within the management of it, prudent fiscal policies and pragmatic policymaking are essential to do so. Developing countries experience larger cyclical fluctuations than developed ones, and their monetary and fiscal policies tend adjust to it (Gleb, 1988). This is because natural resource dependent countries revenues mostly streamed from the extraction sector in forms of taxes and royalties. Therefore, engineering a natural resource rent system that ensures government budget is not severely exposed to commodity price fluctuations is crucial. Just as crucial, as ensuring that the utilization of resources is benefitting the society, but also providing flexibility for government policies (Stiglitz, 2007). Although Corden expresses, that a special resource tax would be beneficial, if it is to an extent, which does not reduce capital inflows (Corden, 2012). Although many authors praised the importance of establishing a Sovereign Wealth Fund, into which the resource rents feed in and smoothen out the spending effect. In addition, if the fund’s assets are invested abroad and only the returns on its capital is used, it can contain the exchange appreciation and the negative effects of Dutch Disease. Such well-functioning funds are Norway’s Pension Fund or Botswana’s Pula Fund (Corden 2012, Larsen 2004, Stiglitz 2007).

The procyclicality of resource rents is one of the core problem of the resource curse and the Dutch Disease (Frankel 2010, Corden and Neary 1982). The problem is that the government spending follows these patterns as well, it means not only that manufacturing loose competitiveness and crowds out, but also that education and health spending is volatile as well. The downturn is reflected in the acyclical period, when revenues are low.
and health and education budgets are cut, which have long-term effects on capital accumulation (Arze de Granado 2010, Frankel 2010, Auty 2001). The extra spending embodied in increased public employment, prestigious investment projects and many others. The problem arise, when commodity prices fall, but the wages are not following it, while public sector employment is less viable and more costly in terms of redundancies (Frankel 2005). Another problem is that in the revenue short periods, government finds it hard to carry out austerity measurements, because of the strengthened interest groups and the political costs of it. Another downturn of the procyclicality is that resource rich governments (partly because of the less developed institutional environment) cover their budget deficit from external debt, which becomes hard to pay back in the low price period. This phenomenon is related to the improved borrowing capacity of resource rich countries in boom periods (Usui 1997). These countries then can tap wider external financing sources, that they had not access in low commodity price cycles. It allows such countries to over borrow and later, the interest payments cripple the economy in the bust periods (Frankel 2010, Usui 1997, Karl 1997). In addition, when debt obligations grow to 60% of GDP, it holds back annual GDP growth by 2%, in more sever indebtedness it can reduce growth even by 50% (Reinhart & Rogoff 2010).

Other studies also draw attention to other fiscal policy challenges of the resource curse, Bronhorst (2009), after analysing 30 hydrocarbon-exporting countries between 1992 and 2005, found that countries with large resource revenues are likely to reduce their domestic tax effort and worsen their development prospects. They found that 1% increase in hydro-carbon revenues, lower about 20% of other non-hydro-carbon ones (Bronhorst 2009). In addition, governments without sound institutions can also face liquidity and financing issues, as they face increasing sovereign bond spreads in commodity boom periods (Arezki & Brückner 2011).
2.3.2 Role of state ownership

There are arguments suggest that national governments fail to get full value for their natural resources regarding extraction industries. This assumption is drawn from the agency theory; the key issue being that private corporations try to maximize their profits and minimize their payables towards the country in which they operate, thus reducing the host country’s revenues from its natural wealth and decreasing the benefits of the principles of the nation (its citizens, as a country’s natural wealth belongs to its people). Full privatization of rights to extract mineral wealth (especially oil and gas) usually leads to abuses in which governments make bad decision and receive only fractions of the real value of the natural resources. Those countries where institutions are strong and public management is developed, national oil companies (e.g. Norway – Statoil) and regulatory bodies should play crucial role in managing the resources. Some other countries are struggling to make a choice between improving public sector management and relying on a corrupt public sector to define and set up relationships with private corporations, whose interests are conflicting with the publics. There are a number of guidelines that national governments must take in consideration when it is making decision on a nation’s natural resources. Governments should avoid fire selling, natural resources should never be sold off impatiently (e.g. 1980s Regan administration fire selling oil and gas reserves), in this case better leave resources in the ground until better value could be realized. A country needs strong institutions before privatizing, the consequences of privatization with weak and low-quality institutions are well-known thorough the post-communist countries examples. The contracts should always be simple, renegotiable and to be assessed on the basis whether the provided incentives are in support of efficiency as well as serving the people’s interests. The main principles are not so indifferent from the requirements of modern governments; fairness, transparency and ownership (Stiglitz, 2007).

We can see that there is a general problem of diversion, not only due to the agency theory. Mostly government involvement in extracting and managing natural resources end up in, at least in questionable practices. These assumptions that the state cannot look after its assets led to the understanding of the “general good” of privatization. It roots from the ideas of market economies and capitalism. When it comes to auctions for extraction rights, the company who is best able to extract the resources should be the winner, as economic efficiency and governmental revenues were assured this way. Badly, after almost 3
decades since the privatization trend started, the global community had to realize that privatization does not solve the agency issue, as it continues to coexist in private corporations as well. This problem can be followed back to Adam Smith’s invisible hand theory, in which every individual is concerned with how much he can get for himself. The problem is the conditions are never perfect, as Smith and his followers assumed perfect information, what is never a condition in reality. This imperfection provides the basis for pursuing self-interests and thus is ripe for corruption; a bad combination for governments as the leading doctrine for modern economists is to maximize the stock market value of firms and maximize their profits (mostly cited by Milton Friedman). This is what most managers are told to do; otherwise, the shareholders dismiss them. By expanding this view, a company should involve itself in all form activities with what it can increase its profit and its stocks value regardless moral or social implications. So if a mining company can get out of a country without restoring the environment and paying for the clean-up costs, then it should do so. Same goes for the companies, which can get their hands on mineral resources for the fraction of its real value by any measures (bribes, cheating, etc), it should do so if the expected penalties are not too big. (Stiglitz 2007)
2.3.3 Import substitution and industry policy

There is a common ground for economists, that many resource abundant country failed to sustain adequate economic growth, because their misguided economic policies and trade policies. Another problem was highlighted as resource booms allow resource rich countries to sustain harmful policies longer, then their resource poor counterparts (Auty 1993, Sachs & Warner 1997, Mikesell 1997, Neumayer 2004).

The Prebisch-Singer Hypothesis played a key role in it, as it enhanced industrialization and discouraged countries to transform their economies into open trade and fostered protectionist measures to shelter their infant manufacturing industries. This led to the implementation of protective trade barriers and orchestrating industry policies to subsidize local infant industries (Prebisch 1949, Singer 1950). The aim of such policies were to shelter new, infant industries from foreign competition, while they are strong enough to withstand it. This was usually conducted through tariffs, tax reductions, government grants and so on, although the experience from Latin America and Africa suggests that, when industry protection is provided it is very difficult to withdraw. (Auty, 2001).

There is a number of problems with such industrial policies and substitutions. Firstly, many occasions these infant industries fail, because of the subsidies they factor endowments, which leads to irresponsible usage and wastefulness and many times policy makers identify the wrong industries, which lack international competitiveness (Bell, 1984). Secondly, these subsidies are not enhancing productivity, but the opposite, provide incentives and resources for poor management, over employment, while they tend to be unable to earn foreign currencies (Auty 1994). Thirdly, spending money on such subsidies and industry protection expose governments on the long run to different groups (e.g. unions, political parties, workers, etc.), which emerge and gets strengthened by the policy. These groups are able to put political pressure on governments to upkeep the subsidies and inefficient policies later as well. Just as well, governments, in times of resource booms, might use the increased revenues to gain popularity by piecemeal protectionism. The perfect example of such is the Common Agricultural Policy of the European Union, which became the subject of political strong arming between interest groups, rather than actually helping agriculture (Karl, 1997, Frankel 2010).
Sachs and Warner also found that resource rich countries tend to have closed trade policies and are likely to implement protectionist policies (Sachs & Warner, 1997). In a recent work Corden confirms, that the shift of labour to services is a worldwide trend, but notes that uneven protectionism is inefficient and strengthens interest groups. He also argues that protection for all manufacturing would worsen the Dutch Disease due to further appreciation, while selective protection would result suffering in the Non-tradable and unprotected Lagging sector (because of the boom in mining, and the political success of extracting protectionism measures). He also notes that, if the mining sector’s suppliers had to be local manufacturers (by regulations), then similar requirements had to be placed for government spending as well, which would lead to greater appreciation and meaningless extra costs for the mining industry (Corden 2012).
2.3.4 Rent seeking and corruption

In resource rich and dependent countries, the income from natural resource exploitation is highly important. These resource rents shall be distributed through different channels to the society, for example funding infrastructure developments, education and many others. The “rent seeking” and “rentier state” concept rose as Middle Eastern countries experienced an eroding democratic institutions, as the state interacted with competition restricting and monopolistic activities to ensure the flow of natural resource rents (Ross, 2001). “The availability of natural resources tends to lead to massive rent-seeking in the government and the elite. Rent-seeking may take the form of tariff protection or outright corruption. This in turn leads to massive distortions of the economy and slows down growth.” (Kronenberg, 2002).

The problem with rent seeking is that it is one of the easiest income sources compared to wage and profit (Tullock, 1967). As rent is money paid for the use of various assets such as capital, land, equipment, etc. Indeed, those layers of the economy who collect rents are seeking ways to preserve their capital assets (enforced through property rights in the first place, by laws, regulations and institutions. Moreover, the rent seeking is different than profit seeking, profit seeking originates from conducting value adding activates or productivity contributions, while rent seeking is the extraction of economic benefits without doing anything similar. Therefore, for many countries rent seeking is not the creation of new wealth, but rather the exploitation of social institutions such as the power of state, to collect incomes (Schenk, 2006). This activity usually rise as states own most of the natural resources in a country, which is utilized by either private actors or the state itself. Either way as the state has the monopoly of power, it is highly motivated to increase its income through rent seeking activities such as tariffs, monopolies and subsidies. Although rent seeking, provide short-term gains, it comes at a high social welfare costs on a long run ( in case of India the cost rent seeking was an estimated 7% of its GDP)( Kruger, 1974).

There is a proven link between slower economic growth and rent-seeking activities. These activities’ negative effects come in opportunity loss, eroding entrepreneurial spirit, rent defending costs and the undermining of the reputation and functioning of political institutions (Sachs & Warner 2001, Torvik 2007, Tornell & Lane 1999).
The major problem with rent seeking behaviour is that, it distracts attention and resources from long-term objectives of the economy, as the focus relies on rent increasing activities.

Natural resource abundance is generally associated with higher degree of corruption by the literature, if the countries lack democratic institutions (Sachs and Warner 2001). This is because of the rent seeking activities, which foster other arbitrary activities, instead of “traditional” value creating activities. The corruption can be described as a result of the competition for rents, in which powerful and well-connected lobby groups emerge, who are blocking needed economic reforms. These groups can influence governments to act in their favour instead of the general public’s, while the government is motivated to capture the highest possible rents (AUTY, 1995). There is evidence, which proves that African bureaucrats have “social” obligation to share public achievements with their relatives (ALAM 1989). Not only African bureaucrats have this tendency, similar activities were widely observed in post-Soviet and Latin American countries as well. This view is strengthened if we take bribes paid to government officials as rents transferred to them (KRUGER, 1974).

The rise of corruption is derived from the agency theory, in which the citizens of country are the principal, while officials are the agents. Based on this the problem lies when the agent is promoting its own benefits over the public’s and there is no effective institution to prevent it (Lambsdorff 2002). Thus, while private parties are competing for rents, it might seem to be a leeway to increase one’s profit, at low costs through corruption. This phenomenon is not only present in developing countries where institutional quality is lower, but also in developed countries, if the benefits exceeds the expected penalties (STIGLITZ, 2007).

The situation when high amount of money is available in the economy, in this case in the form of resource rents, provides opportunities for actors to maximalise their profits by illicit measures (this situation is present when rents are high or new natural resource deposits are found). Therefore, there is a strong correlation between natural resource endowments, rent seeking and corruption, which hinders the economy on many fields (Sala-i-Martin & Subramanian 2003, Leite and Widermann 1999)
3. Possible treatments for the curse

As mentioned in the previous sections the resource curse has many policy implications, to which countries should pay attention. As the literature shows, a wide range of problems can arise from erodation of democratic institutions to mismanagement of natural resources and poor fiscal policy implementation. The economic dynamics of the resource curse are demonstrated through the Dutch Disease phenomenon. In order to tackle the arising issues related to the excess amount of money in commodity boom periods, a number of policy options were offered to the countries, although every country’s approach is somewhat different. In this section I am going to provide a few possible tools and policy implication for decision makers to smoothen out the negative effects of the Dutch Disease.

Firstly, it is important to assure such an institutional framework, that prevent “grabber-friendly” institutions. Countries with weak institutional environment should develop a model, that fits their specific characteristics (political culture, geographical attributes, etc). There is a need to implement checks and balances, which prevent politicians to expand public spending excessively, and to use state revenues to finance clientism and patronage networks. Stiglitz (2007) in the Escaping the Resource Curse book, offers recommendations on how to engineer a system, to ensure that the resource rents are beneficial to the wider society. He argues, through Norway’s example that state ownership does not necessarily rule out successful utilization of resources, if institutional framework limit the possibility of diversion. He suggests that developing countries leave natural resources in the ground until they can assure impartial institutions or rather develop special institutions for the extraction industry itself like Chile, Malaysia and Norway did (Stiglitz 2007). It is also important, that resource extraction or land lease contracts should be flexible, to provide basis for renegotiation of terms as prices rises. He lays three basic principles, as transparency (for agreements and operations), the ownership and residual control rights has to remain in the country, oil companies should receive fair compensation (e.g. price setting), adjusted to the risk they face. He brought up the Alberta State’s Checkerland bidding process, in which bidding companies have to disclose their geological information of explorations with the authorities and the bidding system doses the information in different periods of the bidding, so that companies cannot
manipulate the process with information asymmetries. (Stiglitz 2007, Brahmbhatt & Canuto 2010).

Another issue is that resource rich countries’ spending should be adjusted more cautiously. Therefore, fiscal policy is a major instrument in fighting the curse. (Gleb 1988, Brahmbhatt & Canuto 2010). Therefore, a permanent income approach should be emphasized in fiscal rules\(^3\), it should be only applied to exhaustible natural resources. The approach suggests to calculate net present value of natural resources, all expected net future revenues and calculating the constant amount that the amount would yield for ever in the future. Many times the embodiment of such approach is to set up a Sovereign Wealth Fund or Investment Fund; governments restrict the spending effect while they accumulate savings abroad, therefore also reducing the appreciation pressure, as the income is only partly spent domestically and they can rely on the returns of financial assets in the future (Sitglitz 2007 pp. 51, Larsen 2004, Corden 2012, Brahmbhatt & Canuto 2010).

This concept became a popular and relatively successful instrument to fight the Dutch Disease. To address the issues of Dutch Disease, many countries set up Sovereign Wealth Fund, and not all of them are commodity based. The objective of SWFs is to make saving on higher current income for the future, it can be related to pensions and social purposes (e.g. Norway, China, etc.), stabilization and reserve purposes (e.g. Russia, Mongolia, etc.) and general investment and development purposes (e.g. Botswana, Kuwait, UAEs, Australia, etc.). The implementation and control of these funds are very different from each other. For example, Norway’s Pension Fund is the biggest, which receives all oil revenues and invest them into foreign financial assets and the government can only access 4% of total returns from the fund in government budget. Meanwhile other funds like the Alberta’s Heritage Fund in Canada, distributes half of its returns on a capita basis and allows the state government to use the other half (this approach was suggested to Nigeria by Sala-i-Martin and Subramanian 2003). The approaches that countries use is very different, in controlling and channelling revenues, countries also happen to have multiple funds for multiple purposes and there are huge differences in terms of transparency as

\(^3\) The Permanent Income Hypothesis suggests, that a person’s consumption is not only determined by one's current income, but rather by their expected future income ("permanent income"). Therefore, people will not save until, their current income is higher than the anticipated permanent income. (Friedman, 1957)
well. Although the increasing recognition of such an approach is reflected in that there is more than seven trillion USD worth of assets accumulated in those funds, according to the Sovereign Wealth Fund Institution, which serves as cooperation and technical assistance platform for SWFs. (SWFI 2016, Frankel 2010, Sala-i-Martin and Subramanian 2003, Corden 2012). Although the main purpose of the fund would be to contain appreciation and its effects by not bringing the resource revenues into the country and smoothing the spending effect by only using returns on the financial assets. Although experience shows, that in soaring economic conditions governments still tap these funds, regardless the recommendations and saving goals. The Russian government utilized $20 billion from its Reserve Fund⁴ (which returns feed the National Welfare Fund) from October 2015 until January 2016 to stabilize its economy after the fall of rubble (Reuters, 2016). Similarly did Norway this year, by withdrawing $780 million from its Pension Fund for the first time in 21 years to cover public spending (Reuters, 2016).

To fight price volatility on the commodity markets the Mexican government gained recognition for hedging its oil sales. The Mexican government hedged the risk of falling oil price by selling its oil on forward and future markets. Therefore, in case of big swings, there is no need to renegotiate oil prices; the adjustment is made automatically on the markets. The government hedged $1 billion worth in 2009 on falling oil prices, which resulted in a $5,1 billion return (Bloomberg 2015, Frankel 2010).

In terms of successfully fighting cyclicality and implementing discal rules, Chile implemented a system, which helped it to catch up with economic growth. This became knowns and the “Chile-style fiscal policy” (copper gives 16% of total government revenues). They set up two SWFs for saving purposes and used the increased revenues to build up assets abroad and to pay off their debts. The Chilean government debt to GDP was reduced to 4% in 2007. The fiscal rules makes governments to aim for budget surpluses (it peaked in 2007, by 9% surplus) ⁵, in copper price booms, and when outputs fall short or the 10 year equilibrium of copper prices decline, then it provides flexibility for governments to increase the deficit. An independent panel of experts, who enjoy special protection from political turmoil, determine the medium-term copper prices to what the budget is adjusted to. The government can decide how the revenues are spent,

⁴ its current value is around $50 Bn
⁵ See Government budget balance: http://www.tradingeconomics.com/chile/government-budget

Another form of fighting the Dutch Disease is to use inflation target or exchange rate targeting; however, this option requires Central Bank intervention and similarly complying fiscal policy. Inflation targeting is generally conducted on a Consumer Price Index basis, although recently it’s been argued for its inflexibility. If the commodity prices are falling, it has negative impact on the country’s balance of payment and economic activity. It suggests that Central Banks should increase money supply to depreciate the currency to increase the demand for the currency, although the CPI approach requires rather tightening monetary policy to maintain import prices from increasing and to keep CPI target (otherwise it would go over it). A range of other measurement was offered lately, such as rather using a CPI targeting for non-traded goods and services, or focusing on the Production Price Index, which better reflects the underlying cost of production (Arezki & Pattilo 2012). The “Peg the Export Price” regime, which links the exchange rate of the local currency to the price of commodities on a day-to-day basis was raised as an option as well (Frankel 2009, 2010, 2012, Brahmbhatt & Canuto 2010).

More generally, it is highly recommended for resource rich countries to diversify their economies to reduce the dependency of natural resources, to invest into infrastructure and education to help accumulate human capital, to assure institutional quality to prevent unfavourable socio-political outcomes (e.g. rent seeking, corruption, armed conflicts, etc.). What more the importance of prudent fiscal policy, openness to trade and saving resource rents for the “rainy days” is highly emphasized by international organizations (e.g. IMF, World Bank, UN, SWFI) and academics as well. (Martin 2005, Sacsh & Warner 1997, Auty 1993, 2011, Corden 2012, Stevens 2015, Hausmann & Hidalgo 2014).
4. Methodology

This section explain the methodology used in this paper. I will search for and demonstrate the Dutch Disease symptoms, thorough the following indicators: GDP, GDP per capita, GDP growth, Terms of trade, Trade balance, exchange rates, government deficit (as percentage of GDP), public and private debts (as percentage of GDP), Foreign Direct Investment positions by sector, Capital formation by sector, employment per industry, export composition, GDP contribution per industry (output approach), Global Competitiveness Index and the Economic Complexity Index.

In this paper I intend to search for the Dutch Disease symptoms in Australia and Norway during the latest commodity boom (see Figure 1.2). I am going to do so by using a system of indicators that could serve as tools to identify marks of the resource curse. GDP per capita and GDP growth going to serve to overlook the general development of the two countries, this is sourced from the World Bank Economic Indicator database. The data is available in current US dollars.  

As the Dutch Disease is originated from a positive Terms of Trade shock, the World Bank’s “Net barter terms of trade index” is going to serve as base of measurement. The data has to fulfill the UNCTAD’s quality requirements. The terms of trade, describes the index of import and export prices. If the commodity prices increase and commodities are big proportion of a country’s exports, then the index’s export price driver should increase and result in a positive terms of trade for the country, if the price of other goods do not follow similarly. This positive terms of trade the country can pay for more imports with its exports. This commodity price boom is the reason for the positive terms of trade shock and triggers the real exchange rate appreciation in the Dutch Disease process. (Sachs & Warner 1994, Corden & Neary 1982). The base year of the index is 2000, which allows us to better capture, the changes in the forthcoming period. Alongside the Terms of trade, it is important to check the balance of trade of the countries, as the Dutch Disease leads to an increase of imports and higher domestic consumption, that crowds out the endemic

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6 GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. World Bank National Accounts data

7 Data available until 2014
manufacturing (Sachs & Warner 1997, Frankel 2010). I am going to use consolidate the Balance of trade from the World Trade Organisation’s Time series data, which covers both commercial services and merchandise traded internationally. The balance of trade can describe whether the country spend its increased export revenues on imports or something else.

The positive terms of trade shock, results to a higher demand of the currency, which results into a real exchange rate appreciation. As the foreign currency is translated into the local currency, the money supply rises and domestic demand rises. Now a unit of foreign currency buys few “real” goods, than before, this is the case if the exchange rate is fixed. If the exchange rate is floating, it is also present, but reflected through a rise in nominal exchange rates (Ebrahim-zadeh 2003). As the Norwegian Kronen (NOK) and the Australian Dollar (AUD) both are floating currencies, I am going to use nominal exchange rates against the US dollar (most commodities are traded in dollar, oil specifically; it also can explain the spending effect). I am going pool exchange rate data from the Tradingeconomics.com, that pool data from Bloomberg.

Many times spending effect is reflected in government deficits and increasing debt obligations. (Sahcs & Waner 1997, Auty 1993, Mikesell 1997). Budget deficits are represented as a proportion of GDP, data illustrated is from the Norwegian and Australian governments’ publication. The possible over borrowing of governments will be represented by the World Bank’s “Central debt, total percentage of GDP” indicator. It covers the entire contractual obligations of governments. While I will capture the same changes of the private sector by using the OECD’s Financial Indicator, “Private sector debt”, which covers the total private sectors (including households and non-financial corporations as well (Bronhorst 2009, Sinnott 2009, Reinhart & Rogoff 2010, Brahmbhatt and Canuto 2010).

The resource movement effects will be tracked by examining the labour and capital shifts. The labour movement is represented as thousands people employed by sector, they are

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8 Merchandise data available until 2015, services only till 2014.
9 Debt is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans. It is the gross amount of government liabilities reduced by the amount of equity and financial derivatives held by the government. Because debt is a stock rather than a flow, it is measured as of a given date, usually the last day of the fiscal year. Data available until 2013.
10 Data is shown as percentage of GDP, Australian data available until 2014, Norwegian until 2015.
originated from the National Statistic Offices. The capital flows are going to be captured by FDI inflows and Capital Formation. FDI inflow data is less available, since 2014 on OECD Stat and World Bank data, the missing data I am going to substitute from National Accounts statistics. Foreign Direct Investment figures are from the OECD’s FDI Position report. Capital formation refers to the net stock of capital in the sectors, which covers equipment, buildings and intermediate goods; these are used to produce goods and services. I am going to use it to represent the movement of capital out of the manufacturing industries.\textsuperscript{11} (Corden 2012, Frankel 2010, Botta & Godin 2015, Ismail 2010).

If large appreciation is present, and the spending and resource movement effects occurs, then the manufacturing industries are supposed to crowd out. I am going to gather the export composition from the WTO merchandise and trade data, to show how manufacturing products crowds out from exports, in contrast with commodities. The de-industrialization is also represented in the decline of manufacturing as a share of GDP, this is represented through the sector share to GDP on output approach (Corden 2012, Sachs and Warner 1997).\textsuperscript{12}

To capture bigger, systematic changes in their economies that induce long-term growth determinants I am going to use two indexes, the Economic Complexity Index (ECI) and the Global Competitiveness Index. The Economic Complexity Index, the complexity explains approximately 70 percent of economic development, the more complex an economy is, the more developed it is (Hausmann & Hidalgo 2009). This is also a good measurement to show how diversified an economy is, and also to show how a country can accumulate knowledge to move on to the production of other, more complex products. (Hausmann & Hidalgo 2009, 2014, Hausmann & Cunningham 2014). The ECI index, by which takes into consideration a country’s trade data, and compares how many products are related to a country, and how many countries are related to a product (how many countries accumulated knowledge to also produce the same product). A product’s complexity is measured by the product space methodology, which describes to what other groups of products can the knowledge linked, to gather capabilities and produce them. The data and ranking is available on the Economic Atlas of Harvard University. \textsuperscript{13}

\textsuperscript{11} Data available until 2014 in ISIC rev4 breakdown on OECD Stats under “Capital formation by activity”
\textsuperscript{12} Data from OECD Gross Domestic Product output approach (GVA) by activity ISIC rev4 breakdown
\textsuperscript{13} http://atlas.cid.harvard.edu/rankings/country/2014/
data ranges from 1995 to 2014, a reference, that the index is capable of explaining systematic changes in a country’s development, can be illustrated through China’s ranking. In 2014 China ranked as 19th, while in 1995 it was only 48th. The change in the rank describes how the Chinese economy diversified into higher-value added products, especially into electronics and equipment production from traditional textile industries.

The index was used by other authors as well recently, although the relative freshness of the concept is limiting its wider usage (Rodarte and Lofgren 2015, Hasumann & Cunningham 2014).

Significant problem of the resource curse and the Dutch Disease is that the abundance leads to slothfulness and loss of competitiveness. Based on the World Economic Forum’s Global Competitiveness Report, the Global Competitiveness Index is a composite index, which has three sub-indexes, which are based on 12 pillars. The pillars focus on Institutions, Infrastructure, Macroeconomic environment, Health and Primary Education as Basic Requirements. Higher education and training, Goods and market efficiency, Labour efficiency, Financial market development, Technological readiness, Market size as Efficiency Enhancers. Business sophistication and innovation cover the Innovation and sophistication factors. Each pillar is expressed as an index as well, each pillar is calculated differently, and for example, the Macroeconomic environment pillar includes five drivers (e.g. Budget deficit, national savings, government debt, credit rating and inflation.) These five drivers are indexed and given a score that feeds into the bigger Basic requirement index. Due to the wide cover of the index, it is used in many cases to emphasize the overall development, competitiveness and prosperity of countries. It is considered to be a good tool to measure the resource booms’ impact on the overall economy, as it measures institutional environment, education, macro and micro/business level competitiveness as well. I am going to associate worsening ranking on the index as signs of the Dutch Disease, which can lead to future economic consequences and worsening development prospects (Qureshi, 2008, De Rosa and Iooty 2012, Makin 2014).

I choose the above-mentioned indicators to describe the Dutch Disease phenomenon, because these indicators proven useful for previous researches and they are sourced from reliable sources. Although there are limitations of this approach, firstly, the data quality is good, but the availability for the past two years is limited. Many times, there are no reported figures in the global databases, which is due to a range of reasons (e.g. different
reporting dates, some statistic offices only publish data with a delay, reporting frequency is not comprehensive for each stakeholder, etc.). Secondly, because as mentioned in the literature review, the whole myth of resource curse is hard to prove, as researchers found a variety of controversial results in this topic. Thirdly, I wish to draw the attention to the general dynamics of overreliance of commodities, described by the Dutch Disease, rather than proving that Norway and Australia are resource cursed, (their high development argues it fundamentally). Fourthly, the purpose and length of this paper limits the possibility to cover every bits of changes of economic development in this period, although it could serve as a starting point for future, more serious macroeconomic model building.
5. Analysis

5.1 Norway

5.1.1. Growth, trade and exchange rate

Oil was discovered in Norway in the 1960s, but became substantially important for the Norwegian economy in the 1990s. Extracting capabilities were developed and export of North Sea oil and gas started, to kick-off in the 1980s, when bigger gas deposits explorations happened. Although natural resources were always important in the Norwegian history, especially fisheries and forestry activities. Norway has a significant amount of mineral wealth beside fossil fuels, its extraction industry is considerable in iron ore, coal, copper, quartz production and Norway is the biggest titanium producer in Europe (6th in the world). Of course the most important, its estimated 6bn barrel oil and 2 trillion cu gas reserve is the most considerable asset of Norway (CIA Factbook - Norway).

Norway is considered as one of the great examples of that the resource curse can be turned into a blessing. Before that Norway was lagging behind the neighbouring countries (Denmark, Sweden, Finland), but after the increasing utilization of the oil and gas reserves, it became the leader, not only in the region, but one of the richest nation on the globe. It is important, to note, that significant technological capabilities were present due to the history of mining, shipbuilding and forestry industries (Larsen, 2003, 2004).

During the last commodity boom, the Norwegian GDP per capita more than doubled, from $38,550 in 2001 to $97,300 in 2014. The per capita gross domestic product peaked in 2011 surpassing the $100,000 / capita level (See figure 1.3). The decrease from 2011 is due to two reason, firstly the Norwegian population grew from 4.9 million to 5.2 million today (CIA Factbook - Norway), secondly because the commodity prices collapsed in early 2014 (see Figure 1.2). During this 2016 years, the Norwegian economy overall grew by 23%, on an average 1.6% pace. The dynamics were following the swings in commodity prices, although the country beared the GFC relatively well, the economic loss was 1.6% in 2009 due to low oil prices and drop of global demand for oil and gas.
Due to the high prices of oil, which peaked at $145 for a barrel of crude oil in 2008, Norway experienced a positive terms of trade boom. (see figures 1.2 & 1.4) This is due to that the oil was constantly at high prices (except after the GFC and the recent crash in 2014), staying over $100 from 2011 until 2014. These trends were true for other commodities that Norway export as well like salmon, iron, coal, gold, etc. Due to the high commodity prices Norway had a positive Terms of trade from 2004 onwards. It means that the price index of its exports were higher than its import’s price index. Although the imports became cheaper, Norway had a positive balance of trade throughout the period. The growing trend kicked off in 2005 with an ~22% increase compared to 2004. On average Norway’s export price index was 33% higher than its imports throughout the period, although the peak in terms of trade was in 2012 at 158%. The GFC had only minor impact on the terms of trade, dropping to 128%, which quickly climbed back to 150% levels in the following years. The peak point was in 2008, when the surplus accumulated for $81bn, alongside with the Terms of trade peak of 156%. (see figure 1.4). The Norwegian trade surplus was outstanding, $679 billion aggregated from 2002 to 2014. Its peak was in 2008, when the trade surplus jumped to $82 Bn.

The problem exchange rate appreciation is one of the core problems of Dutch Disease. The positive terms of trade leads to a real appreciation. The real appreciation is present in nominal exchange rates of the currency is floating. The Norwegian Kronen appreciated by 45% until 2008, having its peak in 2008 autumn, when it came to a 5 NOK to a USD level. This is an overall appreciation of 80% since 2001 until 2008. Due to the GFC the NOK dropped from 5 to 7 NOK per USD level in 2009. After 2009 a further appreciation followed just as oil prices climbed back until 2010. The strengthening trend of the NOK continued until 2011 (40% appreciation from 2009), when it stopped and turned into a depreciation trend. Due to the oil price and the inflation, policy of the Central Bank of Norway the currency started to depreciate since 2013 until January 2016 (during this period the Kronen lost 70% of value) (see figure 1.5). As oil revenues and prices soared, the depreciation pressure increased on the Norwegian Central bank, thus it had to cut rates, this March by 25 base points, to let the NOK appreciate 5%. The current FX is around 8.1 NOK for an US Dollar. The trends in the performance of the NOK was consistent with the terms of trade dynamics, following its peaks and downturns. (see figure 1.4 and 1.5)

14 8.11 on April 20 2016
5.1.2. Spending effect

As mentioned in the previous section, Norway went through a significant growth between 2002 and 2016. It had trade surplus all the way along, while the terms of trade, exchange rate and the share of resource rents were following the oil price movements and trend.

This means extra income for the government, in Norwegian government receives proceeds from the 53% special tax rate on oil production, beside the dividends received from the national oil company, StatOil and other ownership shares. Mining and oil industries are also subject of the 25% corporate tax rate and a special environment tax (carbon tax based on CO2 emission). The revenues from oil and gas sales goes into the Norwegian Pension Fund Global (Norwegian Petroleum 2016). The Fund invests abroad, following long-term terms strategic goals. At the moment the fund’s investments are 40% in North America, 38% in Europe 18% in Asia. The portfolio is dynamic, with 60% of equity, 35% of fixed income and lately growing real-estate 5% (Norges Bank Investment Management 2016). The government can only use the fund’s annual returns, although this fiscal policy was overridden recently as in 21 years the current government made its first withdrawal of $780 million to fill in budget holes (Reuters 2016).

Due to the positive terms of trade and trade surplus the Norwegian government budget was well funded by oil money during the examined period. The petroleum revenues contribute approximately 20% of the State revenues. As mentioned before, the natural resource rents are important for the country, as the natural resource rents contributed over 20% of GDP in 2008. The Norwegian government budget was constantly reporting surplus (measured as government budget surplus/deficit of GDP) during the period. The budget surplus followed the commodity price trends, but never busted into negative figures. The surplus grew from 7,2% in 2003 to an outstanding 18,7% level in 2008 ($85 Bn). The GFC of course decreased the extent of the positive budget cash balance, but even in 2009 it remained 10,2%. Lower mineral ore and agricultural commodity prices were holding back the growth of savings as the average surplus was around 12% between 2010 and 2013. In 2014 the surplus dropped to a ten-year low of 9,1% (see figure 1.6).

Despite the stunning budget surpluses and positive trade balance, the central government debt of Norway was increasing until 2006, when it peaked at 48% of GDP. This trend was ongoing since the 1997 Asian Financial crisis, which shook oil prices. Between 2002
and 2006 the total government debt grew 25%. Norway utilized the budget surpluses to reduce its debt obligations since. Despite the GFC Norway kept repaying its liabilities, the previous years’ savings, the slump made beneficial conditions for debt repayments. The total public debt was reduced to 20.9% in 2013. From 2010 to 2011 the government paid off 15% of all obligations (see figure 1.7).

Although the private sector debts are reaching concerning levels in Norway. Although its private sector debt is similar to other OECD countries (like the Netherlands, Japan, Canada). The private sector debt obligations remained of 230% of GDP until 2006. From 2006 on it increased to its peak in 2010 reaching 275.9%. Despite the debt obligations of the private sector was declining until 2014 an 8% increase occurred in 2015, up to 273%. The problem with such public sector debt is that, when the low interest rates period ends, the mortgages are going to increase significantly. These increased interests will be a burden for the wider public sector, from producers to households as well. It is also putting pressure to future Norwegian investments, especially to the non-liquid real-estate industry. The positive macroeconomic and prudent fiscal policies by restricting spending was valued by credit rating agencies as well, Norway was having AAA rating in the past 15 years (Moody’s 2016a).

The Norwegian economy was complimented for its prudent fiscal policy, which aims at smoothing oil revenues and saving. Although the International Monetary Fund highlighted in 2013 that the economy faces a few risks, such as the possibility of reoccurring Euro crisis, the 40% overvaluation of housing sector, the growing mainland deficit (excluding oil revenues) and the too optimistic return projections of the Pension Fund (IMF 2013). In addition, in the same series of paper the IMF draw attention to the arising challenges of Norway, namely the decreasing growth prospect due to low oil prices, which could last for a long time and that the decline of oil-sector output might not be off-set by a pick-up elsewhere in the mainland economy. Despite of the steady growth, depreciating real exchange rate and contained inflation, the housing market still remains a risk, as disposable income is declining and household debts increasing. (IMF, 2015a)
5.1.3. Resource movement

The other effect of the Dutch Disease is the resource movement effect. In which capital and labour shifts from the manufacturing industry into other sectors, such as the booming sector and the non-traded services sector.

In Norway the extraction sector is rather capital and technology intensive industry, due to the location of oil and gas reserves. Off-shore oil and gas production comes, with way higher costs and requires more advanced technology, than traditional mainland production. This also impacts the production costs; thus production is only profitable at a certain level of commodity price. The Norwegian production cost is around $60 per barrel. It also worth mentioning that, in Norway the engineering industry has a long history, due to the legacy of shipbuilding, fishing, mining and forestry industries. (Larsen 2003, 2004).

Generally, the services sector dominates the Norwegian economy. In Norway, the service sector is responsible for approximately 60% of total capital formation. Agriculture’s share is marginal, around 2% during the period. Mining sector drives around 25% of capital formation, while manufacturing is lagging behind, in terms of capital accumulation with an average of 7% between 2002 and 2014. Its share remained around the same level during the 2002-2014 commodity boom period. Due to the commodity boom, the mining industry substantially received more capital, than others, an annual average of 3,1% increase was present. The mining sector had NOK 61 Bn invested in it in 2002, which was constantly increasing during the period, not even the GFC impacted its growth. The capital accumulation increased by 360% in the examined 12 years, up to NOK 219 Bn in 2014. In contrary no other sector managed to have such growth in terms of capital accumulation, the services sector grew “only” by 229%, manufacturing was lagging behind agriculture as it grew only by 133% compared to 139% increase in agriculture. It is notable that the construction sector’s capital formation grew by 240%. The manufacturing industry’s share of capital formation was 9,3% in 2002, which declined to 5,1% in 2014, in contrary the mining sector’s share grew from 20,7% up to 30,4% in 2014. During the period all industry’s share declined, except for mining. Agriculture’s share dropped from 2,5% to 1,4%, services from 64,5% to 60,3%, construction from 2,7% to 2,6%. (see figure 1.9)
Similar trends can be seen in terms of Foreign Direct Investments, although the services sector’s lead is not as substantial as it is in capital accumulation. The ability of the Norwegian mining sector to attract foreign direct investments is stunning. The sector FDI position increased by an outstanding 680% between 2003 and 2014. In 2003 the sector’s FDI position was $11 Bn, which hiked up to $80Bn in 2014, without any disruption. Its growth rate was on an average of 20% pace. Manufacturing was performing well compared to other sectors, its FDI position grew by 420% in the period, starting from $9,9Bn in 2002 and peaking in 2014 at $41,1 Bn. Services are the biggest FDI attracting sector in the Norwegian economy, it gives 39% of total FDI positions, while mining is the second one with a share of 35%. Agriculture and construction sectors grew at the same level, both growing 320% in the period. Agriculture’s FDI position in 2014 was $0,9Bn, while construction’s was $2,3Bn (see figure 1.8)

The Dutch Disease also suggests that the resource movement effect impacts labour as well, by sucking labour force away from the manufacturing sector. Norway’s labour is concentrated in its service industry, almost 80% of total employees are working in this industry (approximately 2 million people). In 2014 there is 20% more people working in Norway’s services sector, than in 2002. The mining industry employed 35,000 people in 2002, which jumped up to 62,800 in 2014. Mining only employs 2,4% of total Norwegian workers in 2014, in contrast manufacturing is a bigger industry, employing 9,2% of labour. Manufacturing employed 237,800 people in 2014, which declined from 250,8000 in 2002. The decline started after 2008, when the total employment of manufacturing peaked at 265,000. Construction’s employment increased by 67% from 2002 up to 201,600 in 2014. Agriculture’s share declined from 2002’s 1,5% to 1,2 in 2014 (~33,000) (see figure 2.0).

We can see that the biggest winner in the period is undoubtedly the mining sector. It pooled foreign investments more intensively, than any other. This statement is also true for gross capital formation. It is clear, that manufacturing was falling back in terms of capital flows, meanwhile its employment level stayed at a similar level, although its share of employment declined during the commodity boom of 2002-2014.
5.1.4. De-industrialization

The previous sections demonstrated the resource movement and spending effects of Norway. The spending and resource movement effects lead to the crowding out of manufacturing sector.

The sectorial contribution to the GDP demonstrates this process clearly. The services industry is still the major contributor of GDP, around 60%. Its share was 60,5% in 2002, which dropped to 53,9% until 2008. It quickly picked up in 2009 and remained around 60% in the following years. Agriculture’s share was 1,7% in 2002, which declined to 1,6% in 2014. More interestingly the mining industry is responsible for the quarter of total Norwegian production. Its share of GDP was 23% in 2002, which followed the upswing of commodity prices and peaked at a 30,9% level in 2008. As the GFC happened its output share dropped to 24%, which picked up quickly following the rise of commodity prices, jumping up to 28,4% in 2011. In 2014 the mining industry was responsible of 24,7% of total output of the Norwegian economy. The manufacturing industry was the looser of the commodity boom as its share dropped from 10% in 2002 to 7,7% in 2014. Its lowest point was in 2012 at 7,3% of total output. Construction was a benefactor of the change its share grew from 4,4% to 5,7% (see figure 2.1)

The crowding out of manufacturing was only persistent in GDP contribution, similar trends can be observed in the country’s export composition. Since the utilization of the North Sea oil and gas fields, fossil fuels became the most important Norwegian export goods. Between 2002 and 2014 their share remained over 50% constantly, peaking in 2008, when Fuels and mining products were responsible for 61,1% of total Norwegian international trade. In 2009 the mineral export dropped to 52% , which climbed back with the increasing prices from 2011 to 2013 remaining around 60%. In 2014 due to the lower commodity prices the share of fuel and mineral exports was at 53,2%. Similar trends were present at agricultural products, which had a share of 5,5% in 2002, dropped to 3,9% low in 2008 and hiked to 6,8% until 2014. The biggest decline was demonstrated in the export of manufacturing merchandise, which gave 19,2% of total exports in 2002. It continuously decreased as minerals crowded it out, its lowest point was in 2006 at 12,9%. After the slump of 2008 the share of manufacturing products increased to 16%, which continued to decline as oil price picked up, in 2014 the share of manufacturing products stood at 13,4%. Services represents approximately one quarter of exports during the
period, 24% in 2002 and 26% in 2014. Although the impact of the high oil prices and the 
effect of the GFC was reflected in its share when it declined 21.1% in 2008 and 21.4 in 
2013 (see figure 2.2)

The above mentioned clearly resents how manufacturing products got crowded out in a 
high commodity price period. The change in GDP share was a 3.3% overall decline, 
meanwhile the export proportion of manufacturing goods was 7% of total Norwegian 
export.
5.1.5. Systematic changes

Commodity boom periods provides fertile soil to the mining industry and natural resource exports, which can lead to the Dutch Disease and long term loss of competitiveness. Natural resource, particularly the gas and oil industry plays an important role in the Norwegian economy and a main driver or its significant growth. The previous sections provided insight on the performance of Norway.

Norway was ranked 12\textsuperscript{th} on the World Economic Forum’s Global Competitiveness Report in 2006. It was the worst in 2007 and 2011, when commodity prices were at a high level (16\textsuperscript{th}). Although by 2014 it climbed back to the 11\textsuperscript{th} place. Norway’s basic requirement ranking improved to the 6\textsuperscript{th} place from the previous 8\textsuperscript{th} in 2007. Its institutional environment developed a lot from the 24\textsuperscript{th} place in 2007 up to the 5\textsuperscript{th}. Its infrastructural advancement increased significantly from the 32\textsuperscript{th} to 6\textsuperscript{th} in 2014. Norway was praised many times for its sound macroeconomic environment, in 2007 it ranked 7\textsuperscript{th}, and in 2014 it was considered to be the country with the best macroeconomic conditions (rank 1\textsuperscript{st}). It is due to the positive budget and trade balances throughout the commodity boom period. Its healthcare and primary education provision improved by 5 ranks to the 10\textsuperscript{th} position. Norway is considered to be an innovation driven economy, and it managed to improve its efficiency enhancer ranking by jumping 2 places from 2007 to 2014. The higher education and training ranking improved one place, the market efficiency by 2. Its labour market efficiency improved by jumping 4 ranking to 13\textsuperscript{th} in 2014, which is due to the high proportion of female participation in the Norwegian labour force and the efficient use of talent. Although the report highlights that in terms of labour flexibility Norway only ranks at 37\textsuperscript{th}, among 140 countries. The flexibility of wage determination is really rigid, it ranks 130\textsuperscript{th}, while hiring and firing practices ranks 109\textsuperscript{th} indicating the high costs of redundancies. Norway’s technological readiness improved to 4\textsuperscript{th} rank from the previous 8\textsuperscript{th}, although we can see a decline in FDI and technology transfers, due to the declining amount of foreign direct capital as oil prices soared. From the perspective of innovation and business sophistication Norway improved 2 ranks from 2007 to 2014, although the report highlights low quantity of local suppliers, which is related to the relative small size of the Norwegian economy. The report notes that restrictive labour regulations, high tax rates are serious burdens of making business (WEF-GCR, 2014, 2010, 2007).

In terms of Economic Complexity, Norway ranked 29\textsuperscript{th} in 2002 on the Economic Complexity Index. It dropped back to 33\textsuperscript{th} in 2014, its worst performance was in 2012,
when mineral and fuel production grew significantly and it also made up 60.9% of total Norwegian exports. The reason of the decline lies in the methodology of ECI and product space approach. The products that Norway export have low ranking, although not as low as Australia’s. Norway mostly export crude oil, petroleum gases and various kind of fish (mostly salmon). Fish fillets and meat ranks 1078th, crude oil 1231th while petroleum gas ranks 1198th. The ECI methodology explains that because the country’s comparative advantage lies in the production of these products, it has a lower capability to accumulate knowledge and move on to more complex products. Although machinery and engineering products, remains important in Norwegian export, even if in a smaller margin. Therefore, Norway’s economy became less complex from 2002 to 2014 and its capacity to accumulate knowledge in other fields, than minerals and fuels and fish products, actually declined. Although services exports, which are not subject of the EC index contributes approximately 25% of total exports during the period (see figure 2.3, Hausmann & hidalgo, 2009, 2014).
5.2 Australia

5.2.1 Growth, trade and exchange rate

Natural resources always played an important role in the Australian history, since its colonization in 1796. The South Australian gold rush in the 1850s made a fame for the country’s outstanding natural riches. Australia’s natural resource wealth is outstanding and estimated approximately $20 trillion worth (24/7 WallStreet, 2012). Australia was recognized for turning its natural riches into a supportive pillar of its economy, gold in 19th century, steel and coal during the World Wars, wool in the 1950s, iron ore and coal seems to be one lately, while LNG can be the next wave (Connolly & Orsmond, 2011, Corden 2012). These endowments made Australia the biggest producer of many minerals, such as opal, bauxite, coal. It is second largest of gold, uranium, diamond, and zinc, while it’s the third biggest producer of iron ore and Liquefied Natural Gas (CIA Factbook - Australia). It is basically rich everything from timber to rare earth minerals (Geosciene Australia 2014). There are way more mineral riches, that are not accessibly with current technology and the price drop of commodities had impact on the explorations, still the mineral deposits of the country are so huge, that depletion is very far from today (Geosicence Australia, 2014). Oil and gas industry is becoming more significant lately, embodied in giant project launched to increase both down and upstream LNG capacity (2007 Pluto project ~$15 Bn, 2009 Gorgon project ~$43Bn (Connolly & Orsmond 2011).

During the commodity boom of 2002-2014 the Australian GDP per capita tripled. It increased from $19,495 to $61,980 in 2014 (see figure 1.3) The country’s GDP accumulated to approximately $1,56 trillion in 2016, making it the 12th biggest economy on the world (CIA Factbook - Australia). The peak was in 2013, when the GDP per capita hiked over $67,000. The decline is due to the collapse of Iron ore price in 2013 spring and the additional 600,000 increase of total population since. The country’s growth rate 3% annually on average, peaking in 2004 (4,1%) and growing back to 3,6% after the GFC in 2012. The Aussie economy seemed to be unstoppable, even after the crash of 2008 it grew by 1,6% next week. The Reserve Bank of Australia expects this trend to continue by forecasting 3-4% growth for 2016 and 2017 (RBA, 2015).

Due to the high overall commodity prices, Australia enjoyed a very favourable Terms of trade. Coal and Iron prices peaked in 2013, and then dropped more than half by 2016.
The Australian export price index followed this trend and contributed to the Terms of trade decline since 2013. Although the Terms of Trade peaked in 2011 exceeding 200% compared to 2000’s prices. From this perspective, imports became super cheap from Australians, which they could cover by the increased amount and highly priced commodity exports (mostly coal, iron and other precious and base metals). Although Australia’s Balance of Trade is not as bright as Norway’s. The country is traditionally capital and technology importer, and manufacturing products consists most of its exports. In the period of 2002-2014 Australia has an aggregated trade deficit of ~$126bn (see figure 1.4). This means that Australia used its better terms of trade position to increase its imports, as they became cheaper, in contrary with Norway, which used the positive balance for not import consumption. The country’s trade deficit reached its peak of ~$23,3 Bn in 2007, and only had surpluses in 4 years out of the examined period. The trade deficit was rolling on from 2002 until 2009, in 2010 Australia created a positive position of $6,2 Bn and $18Bn in 2011. In 2012 the trade deficit increased to $15 Bn which is in line with the soaring terms of trade position.

The upward swing of commodities in the period contributed to the positive terms of trade shock for Australia. The appreciation pressure was reflected in the AUS-USD nominal exchange rates. From 2001 onwards the Aussie appreciated until 2007 by 56%, which was followed by further increase of the AUD relative to USD. This trend was continuing until the GFC, when in 2008 autumn it came close to parity with the USD, producing a 80% appreciation between 2001 and 2008. The slump pushed the FX rate down, which picked up again in early 2009. The appreciation exceeded the previous 2001-2007 period’s, peaking on 1.085 USD/AUD spot in July 2011 (approx. ~70% appreciation in this period). From 2010 until the collapse of commodity prices in early 2013 remained around parity level. The downturn of coal and iron ore prices impacted the terms of trade, which started to decline accordingly and depreciating the AUD against the USD by 54% until January 2016. The FX rate is on 0.77 today, which shows an 11% increase since the January 2016 lows. The upward and downward trends are in line and follow the trends seen on the terms of trade figures. (see figure 1.4 and 1.5).

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15 0.77233 17 April 2016
5.2.2 Spending effect

As argued before Australia experienced a positive terms of trade shock until 2013 when commodity prices started soaring. This effect was reflected in the exchange rate of the Australian Dollar which came to parity for years during the period, although corrections happen according to the upward and downward swings of commodity prices. This trend is also demonstrated in the increase of total natural resource rents as a share of GDP, which hit its peak of 12.8% in 2008, after the GFC their share remained at an 8.8% level in the following years (until 2014). It is important to note, that despite of the positive terms of trade, Australia had a massive trade deficit. Its Balance of Trade, measured by the value of merchandise and service trade, accumulated a $126 Bn hole between 2002 and 2014. It only had marginal surpluses in four years. (see figure 1.5). Despite of the spectacular GDP growth, the trade deficit suggests, that there is going to be a worsening macroeconomic environment in Australia, as it tend to have the resource rents spent on consumption, rather than saving.

In Australia corporations are subject of 28.5% corporate taxation including the natural resource sector (the corporate tax rate was reduced from 30% in 2014) (ATO, 2015). The royalties from mining companies are subject of state legislations, which rates vary on a large scale from state to state. For example, the Queensland government has a differentiating royalty rate based on the mineral extracted, which also differs whether it targets output or value. In case of coal and base metals the royalty rate is 5%, while 10% applies to shale gas and oil extraction (Queensland Government, 2013). In contrary, Western Australia, the core state of mining uses a complex system of royalties, which has a specific rate, which applies to the produced tonnage that is 73 cents per tonne in 2015 and expected to grow to 117 cents per tonne by 2020. This system is complemented by a value-added base as well, for base metals it is 2.5%, 5% for concentrate materials and 7.5% in case of bulk materials (e.g. black and brown coal) (Western Australian Government, 2015). The Australian authorities realized, after the GFC that the current system of natural resource taxation is not sufficient, as the huge profits of mining companies were taken out of the country, which is due to the high foreign ownership structure of the extraction industry. A special “super profit tax” was introduced in July 2012, called Mineral Resource Rent Tax (MRRT). The tax had a nominal rate of 30%, while having an effective 22.5% base to what allowances could be provided up to 7.5%.
The tax only applied to coal and iron ore production, targeting big companies (tax was only applying to companies having over $75 million profit). Mining trade unions, big mining companies (BHP Billinton, Rino Trinto) and conservative politicians opposed the tax heavily. As a result of mining lobby the tax was repealed by the Tonny Abbott government in September 2014. Although they left in place the Petroleum Resource Rent Tax that applies to hydrocarbon extraction at a rate of 40%, introduced alongside the MRRT. The natural resource revenues aren’t linked to Australia’s Future Fund, which is being fed by allocated annual budget payments, without any threshold of minimal allocation (ATO, 2016).

The Australian government was able to maintain budget surpluses between 2002 and 2007. The surplus as 0.9% of GDP in 2003 and 204, which jumped to 1,5-1,6% until 2007. The drop of global demand and commodity prices due to the GFC, had a massive impact on the Australian budget, which increased significantly its spending habits. The deficit grew to 2,2% in 2009 and peaked in 2010 at 4.2%, resulting in a $AUD 63 Bn hole in the budget. The deficit remained present in the following years, although the wedge between revenues and expenses decreased to 3,1% deficit in 2014 ($AUD45 Bn) (see figure 1.6). The total amount of budget shortage is $AUD 326 Bn between the period of 2002 and 2014. This is a great example of overspending in commodity boom periods

As budget deficits have to be financed from somewhere, it usually pooled from external sources. The Australian central government debt in 2002 was at a level of 25,3% of GDP. Just as budget surpluses were available in the first part of the examined period, the debt obligations were reduced, as the Australian government repaid 7% until 2008. The lowest point of total public debt was in 2008, at 18,2% of total GDP. After the GFC the debt obligations started to grow significantly, as budget spending were not hold back, despite the decline of state revenues. The government debt obligations grew to its historic peak of 40,4% of GDP in 2012, which was reduced to a 33% level in 2015. Therefore, we can see that, despite of the soaring commodity prices and declining budget revenues, the Aussie government was not restricting itself in terms of spending. Although it is important to note, that Australia’s debt level and budget deficits in the period are only outstanding with Australian standards. The budget deficit of 4,2% or the 40,4% of total government

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16 The Australian Electoral Commission estimated $22 million spent on anti-tax campaign by big mining companies (The Sydney Morning Herald, 2011)
debt is still an advantageous position compared to other OECD countries. Although the trend might justify the spending effect of the Dutch Disease (See figure 1.6)

Similar, but more severe trends can be identified in terms of public debt. Australian households and private sector debt obligations were at 160% of GDP level in 2002. It was growing at an average 4.4% annual pace, until 2014, when it hit 214% of GDP. The private sector massively borrowed during the period as credit was and still is cheap, due to low central bank interest rates, although an overall 54% increase is significant (see figure 1.7). It worth mentioning that public sector debt jumped to 204% in 2008, which decreased, until 2012, when the borrowing trend picked up again, exceeding the previous years’ pace. The growing private sector debt was drawing attention from the IMF and big financial institutions (e.g. Barclays), that the increased household debts pose substantial risks of default in case of another global shock and it might impact the closure of output gap (IMF, 2015b, The Sydney Morning Herald, 2015). Australia’s credit rating maintained AAA classification during the period, due to their low level of debt and budget deficit relative to European and North-American counterparts (Moody’s 2016).
5.2.3 Resource Movement

As demonstrated before the Australian fiscal policy was not handling the recent commodity boom. Although it goes without question, that the booming period established an advantageous position for the mining industry to pool an increased amount of capital. As mineral prices more than doubled in the period, which is makes up more than 50% of total Australian exports and also the second biggest contributor of Australian output. (see section 4.2.2 and figure 2.1)

The Australian service industry is dominant in terms of capital accumulation, especially the transportation and finance sectors. The share of services in capital formation was at 68% in 2002. Although its share declined constantly, hitting 59% in 2008 and further decline after a small growth in 2009. Its lowest point was in 2012, when it only contributed to 49% of total Australian capital formation. It slowly hiked back to a 56% level in 2014. Its overall growth was 80% during the 12 years, from AUD 90 Bn up to AUD 167 Bn. The mining industry was performing stunningly, with an overall growth of 654% in the period, starting from AUD 13,3 Bn in 2002 up to AUD 87,1 Bn in 2014. The mining sector’s capital formation peaked in 2012 at AUD 114,8 Bn, what declined in the following two years down to AUD 87 Bn in 2014. The mining industry is the second biggest capital accumulator industry in Australia, after the services sector. The mining’s share of capital formation hiked from 10% up to 29,4% in 2014, its peak was in 2012, when its share reached 34,7%. Manufacturing was affected negatively during this period, the stock of capital dropped from AUD 17 Bn in 2002 down to AUD 15,6 Bn. Manufacturing sector's share also decreased from 12,8% in 2002 to 5,2% in 2014. It means that the investments into equipment, plants and other assets actually decreased, rising serious competitively issues. Agriculture’s share in capital accumulation slowly decreased to 5,6% from 6,3, although the stock of capital doubled from 2002 to 2014 to AUD 16,6 Bn. The construction sector grew steadily during the period from AUD 3,5 Bn to AUD 9,2 Bn (see figure 1.9)

In terms of foreign capital inflows, the decline of manufacturing is even more consistent. In 2003 its share of FDI inflows was 38,4%, which means $101 Bn. This significantly decreased till 2014, down to $72 Bn in 2014. Its share of FDI inflows decreased to 12,8%, meanwhile the total Australian FDI inflows grew by 280% from 2003 to 2014. The lowest amount of FDI was received by manufacturing was in 2008 as of $48 Bn. In
contrary the mining industry was sky-rocketing, its FDI position grew by 610% from $35 Bn in 2003 up to $214 Bn in 2014, which is also the highest level during the period. Its highest proportion of FDI inflows was received in 2014, when it received 38.4% of total foreign direct investments. The mining sector’s share of FDI inflows was 17.5% in 2003. The construction sector was FDI inflow position as $4 Bn in 2003, that hiked up to $15 Bn in 11 years. Both construction’s and agriculture’s inward FDI position is marginal, construction’s share was 2.7% in 2014, while agriculture’s only 0.19%. In contrary with capital formation, the inward FDI position of services sector was at $103Bn in 2003, which grew by 260% up to $274 Bn in 2014. Its share of FDI inflows was 39% in 2003 and 48.5% in 2014. An interesting observation can be made in 2012, when the share of mining was at 37.2%, while services stocked 37.7% of foreign direct investments (see figure 1.8).

From labour perspective, the service sector dominates, by providing employment to over 70% of total employees. The service sector employed 8.3 million people in 2002, which hiked up to 9.1 million in 2014. Although the amount dropped by 50,000 to 2015. Agriculture slowly declined during the period, it employed 361,000 people in 2002 and only 306,000 in 2015. The lowest point in agricultural employment was in 2012 at a level of 301,000. It is interesting that the during the first part of the 2000s Australian agriculture was hit by extreme heats and droughts, despite of it the employment was higher compared to the period after 2010. The employment of the construction sector grew quickly, from 702,000 up to 1,02 million in 2015, the peak was in 2010. The mining industry’s employment almost tripled from 2002 to 2015. The industry only employed 90,000 in 2002, which quickly hiked up to its peak in 2012 to 271,000, although the GFC resulted in redundancies, about 15,000 in 2009. The manufacturing industry was heavily hit by the shift of labour. It employed 1.08 million people in 2002. Smaller up and downswings was present until 2007, when the employee numbers started a continuous and undisrupted decline. The employment of manufacturing industry dropped down to 870,000 in 2015 (see figure 2.0). The massive decrease of the manufacturing employment is also related to the end of Australian car manufacturing. All foreign car producer (Ford, Mitsubishi, Toyota) are shutting down its assembly lines in Australia. In addition, an Australian icon in car manufacturing, the Holden (owned by General Motors) also announced that it is going to cease production in the forthcoming years and moving production to India (Australian Government, 2016).
5.2.4 De-industrialization

The resilient shift of labour and capital out of manufacturing industry is reflected in its overall performance. Due to the resource movement effect Australia was a subject of de-industrialization.

The share of manufacturing declined significantly, from 11.9% in 2002 down to 6.8% in 2014. Its output in current prices is the equivalent of what I had in 2006. Technically the output of manufacturing industry behaved during the 12 years. The Australian agriculture was also a looser in the commodity boom of 2002-2014. Its share of total output decreased from 3.1% to 2.4%. Its output grew from AUD 23 Bn to AUD 37 Bn in 2014. The Australian economy is dominated by the service industry, which gives approximately 70% of total output. The output share of services remained around 70%, its lowest point was in 2008 at 68.6%, which climbed back to 71.9% in 2014. The construction industry’s output doubled during the period, while its share steadily grew from 6.6% in 2002 up to 8.8% in 2014. The biggest winner the commodity boom is the mining industry, without question. The mining sector’s performance is closely related to the commodity prices, therefore we can also observe the up and down swings, which are in line with the international prices of the commodities. The mining sector contributed to 7.7% of the Australian output in 2002, it grew quickly up to 12.1% in 2008. The GFC resulted in a 2% drop of output share, but it quickly recovered remained over 12% in 2010 and 2011. The boost of commodity prices helped the mining sector to stay over 11% share of output in 2012 and 2013, and it only declined to 9.8% in 2014. The output of mining tripled during the period, from AUD 56 Bn in 2002 up to its highest point AUD 173Bn in 2013, which due to soaring commodity prices dropped to AUD 148Bn in 2014 (see figure 2.1)

Similar trends can be observed in the Australian export composition as well. In 2002 Agricultural product’s share of total export was 22%, fuels and minerals 33%, manufacturing 20% and services 25%. Australia’s export composition could be determined as divers one in 2002, but it was subject to massive restructuring due to the commodity boom. The share of agricultural products dropped to 14.1% in 2014, while their value more than doubled, up to $38.6 Bn in 2014. The share of services peaked in 2003, when it contributed 27.5% of total exports, nonetheless its share declined to 19.5% in 2014. From 2002 to 2014 the value of services export grew by 270%, up to $53 Bn which is due to the increased tourism and export of educational services. The share of
fuels and minerals in the export composition was the biggest winner of the period, it grew from 33% to 55% in 2014. The value of natural resource exports grew by 588% in this 12 years, up to $152 Bn. Its peak was in 2011 when commodities contributed 59.3% to total exports, at a value of $174 Bn. The biggest looser of the restructuring was manufacturing, as the previous section described the resource movement’s impact on manufacturing, it is also reflected in the export performance of Australian manufacturing merchandise. Its share was 19.9% in 2002, that continuously decreased 10.4% in 2014. The value of manufacturing products grew from $15.5Bn in 2002 to $28 Bn in 2008, which dropped $6bn in value in 2009. The value of manufacturing products peaked in 2012 at $31.5Bn (mining was at $169Bn at the time), which declined to $28.6Bn in 2014 (see figure 2.2).

The above mentioned clearly demonstrates, how mining exports were overtaking and crowing out the manufacturing sector in terms of export and outperformance as well. Manufacturing’s share of exports and its output share behaved during the period, indicating the presence of the Dutch Disease.
5.2.5 Systematic changes

The previous sections illustrated what kind of changes took place in the Australian economy, worsening macroeconomic environment, the crowding out manufacturing products from exports and a decline in output. It also highlighted how the mining sector sky-rocketed during the period, although the changes might have medium or long-term impacts on the economy’s overall health and competitiveness.

Australia ranked 19th in 2007 on the World Economic Forum’s Global Competitions Report. It reached its best ranking in 2009, when it was classified as the 15th most competitive economy. Although since that it dropped back to the 22nd position in 2014. Australia is also considered as an innovation driven economy, despite its massive reliance of natural resource revenues from international trade. Its rank worsened in terms of basic requirements from 14th in 2009 to 17th in 2014. Australia managed to improve its ranking in infrastructure and health and primary education. Although its performance declined significantly in terms of macroeconomic environment, it ranked 18th in 2009 and dropped to 30th in 2014, which is related to the spending effects illustrated previously. Its institutional environment also declined by 7 rankings to 19th, which is driven by the reappealing of environment regulations, the Tonny Abott government reopened coal mines and the Queensland government also allowed the construction and operation of coal mines and associated transportation facilities a 100 kms away from the Great Barrier Reef (The Guardian, 2014). The decline was also present in terms of efficiency enhancers, by dropping 6 ranks backwards. Australia improved in terms of market size and technological readiness by 1 mark, while it substantially dropped back on other fields (compared to 2009). The higher education and training ranking dropped back by 3 ranks, since 2009. The biggest decline was present in labour market efficiency, which dropped from the 9th in 2009 to 56th in 2014. Goods market efficiency declined from the previous 9th rank to 29th in 2014. Financial market development ranking declined by 2 until 2014. The business sophistication and innovation ranking also declined from 21th to 26th in 2014. The report highlights the low level of investor protection (ranks 69th). The macroeconomic environment’s decline was driven by the increasing budget deficit and debt obligations, and the low level of savings compared to the increase of public sector debt. Similarly, as Norway, Australia also had rigid wage determination (ranks 117th) and expensive redundancy costs (126th). The report outline that restrictive labour regulation, government red tape and high profit
tax rates are the biggest burdens of making business in Australia (WEF-GCR 2014, 2009, 2007).

From the Economic Complexity Index’s perspective, the decline is more severe. Australia’s best ranking on the index was 57th in 2003. It substantially declined from 2006, when it ranked as the 66th most complex economy, down to 82th in 2014. The substantial decline is due to the increase of commodity exports. The explanation lies in the methodology of the Economic Complexity Index, as it focuses on merchandise exports and product space characteristics. As mentioned before Australia’s export composition became dominated by commodity exports (mostly by coal, iron ore, gold, copper, LNG and other base metals). Out of 1240 products analysed by the index, coal brickets ranks at 1012th, iron ore 1111th, while refined copper is at 1002th, unrefined at 1116th, similarly as gold at 1206th. Although the index does not capture commercial service exports, but it suggests that Australia’s ability to move on to more complex products, which are also competitive in international trade, declined significantly. The Economic Complexity methodology ranks the products by how many other countries are able to produce the same products and the product space also shows how many linkages it can establish through knowledge accumulation, that can be used to construct other, more advanced products such as pharmaceuticals or machinery. From this perspective, the decline of the Australian manufacturing has serious consequences on its ability to develop production capabilities in more complex products (see figure 2.3, Hausmann & Hidalgo 2009, 2014).
6. Conclusion

The recent commodity boom, which took place between 2002 and 2014 had significant impact on commodity exporter countries, such as Australia and Norway. During the period commodity prices increased at an outstanding pace; oil prices tripled in the period, while iron ore prices multiplied 5 times, contrary to their level in 2002, although substantial decline was observed due to the GFC and the downturn followed in 2014. This phenomenon provided a great possibility for Norway and Australia to experience a positive terms of trade boom. As part of the Dutch Disease the terms of trade boom led to a sever appreciation of both Australian Dollar and Norwegian Kronen. The appreciation of the Norwegian Kronen reached 80% from 2002 until 2008, which also picked up alongside commodity prices in 2009, appreciating 32% until 2011, which was only depreciated by the fall of natural resource prices in 2014. Similar trends could be observed on the Australian Dollar, which appreciated by 55% between 2002 and the GFC, although the appreciation continued in the following years, when the Aussie not only came to parity with the US Dollar, but also exceeded it in 2012, the soaring commodity prices also led to depreciation in from 2013/2014 onwards.

The terms of trade boom were utilized differently among the countries, Norway maintained a positive trade balance, with outstanding surpluses, while Australia accumulated a $126 Bn deficit throughout the period. The Dutch Disease symptoms can be identified in the spending and resource movement effects in both countries, although to different extent. Norway the government maintained budget surpluses, in contrary to the Australian, which reached a historically big budget deficit of 4.2% of GDP in 2010. Norway’s public debt was growing until 2006, when it hit 48.1% of GDP, but the government used the budget surpluses to repay its obligations, thus reducing it to 20.0% in 2014. In contrary Australian government debt was declining until 2008 (18.2% of GDP), but the after the GFC it more than doubled, reaching 38% in 2014. Both countries’ private sector debt increased during the examined 12 years, Norway’s by 31%, up to 265% of total GDP (2014), while Australia’s grew by 54% up to 214%. Therefore I conclude that the spending effect was present in Australia, both in private and public spending, while it’s partly present in Norway.

The commodity boom, from the Dutch Disease’s perspective leads to the shift of capital and labour from manufacturing into the booming (mining) and non-tradeable services
sectors. In Norway the share of capital formation of manufacturing industry was 9% in 2002, which declined to 5.1% in 2014, while the extraction sector’s share grew from 20% up to 30.4% in 2014. In contrast, the Australian manufacturing’s capital accumulation declined from 12.8% share in 2002 down to 5.2% in 2014, while the share of mining sector tripled (from 10% to 29.4%). Similar trends can be identified in both countries in term of foreign direct investments. In terms of employment the Norwegian manufacturing’s employment declined by 5.6%, while Australia’s dropped by 19.6%. The extraction sector in Norway increased its employee stock by 80%, while Australian mining employment almost tripled (274% growth).

The resilient shift of labour and capital out of the manufacturing industry resulted in de-industrialisation processes in both countries. The manufacturing merchandises get crowded out of the Norwegian exports, their share declined from 19% to 13.4%, while mineral and fuel exports grew to 53% in 2014 (from 50.7% in 2002). Similarly, in Australia the manufacturing share of export dropped from 19.8% to 10.4% in the period, while minerals increased from 33% to 55.9% in 2014. The trends are also captured by the GDP contribution, where the Norwegian manufacturing industry’s output decreased by 29.8% from 2002 to 2014, whilst conversely the Australian manufacturing decreased by 75% in the same time frame.

The negative effects of the Dutch Disease and the increasing reliance on commodity exports hindered the Australian economy on the Global Competitiveness Index from its best ranking in 2009 (15th) down to 22nd in 2014. The decline was driven by labour and market inefficiencies and declining macroeconomic environment. In contrary Norway ranked 12th in 2006 on the GCI, which actually improved by 2014 to 11th, the improvement was driven by the better macroeconomic environment, better capacity to absorb technology transfers and innovation. Although the GCI highlighted the rigidity of labour regulations in both countries and the high tax rates. The change in Economic Complexity is more substantial, as Australia’s ranking declined by 23, while Norway’s only by 3. Both decrease is related to the huge increase of commodity exports, that tends to reduce the knowledge accumulation of more advanced goods’ production and linkages with the rest of the economy.

According to the above mentioned I conclude that Australia was more exposed to the negative impacts of the Dutch Disease, and the de-industrialization process was more
severe compared to Norway. I also conclude that both country showed evolving symptoms of the Dutch Disease, thus confirming its relevance to developed countries as well. It is important to note, that both countries enjoyed huge growth in this period, Norway’s GDP doubled, while Australia’s tripled. However, if we look at other fields of the economy we can observe those dynamics, described by the Dutch Disease, which might hinder the growth of these countries in low commodity price periods. Therefore, the loss of manufacturing captivity and de-industrialization probably will hit back with a delay in the medium-run. It is also essential to highlight the different approaches of natural resources of the two countries. Norway’s oil and gas revenues are sterilized and not brought into the country, as they are parked and invested through its Sovereign Wealth Fund (which also serves as a massive reserve when fossil fuels deplete). In contrary Australia opposed the implementation of a natural resource tax and has no Sovereign Wealth Fund for natural resource rent, and on the top of that the government ruthlessly supported the operation of coal mines and other mining activities, which overrode the environmental issues. The fiscal policies implemented by the governments differ a lot, while Norway was concentrating on saving and reaching surpluses (only using 4% of returns of the returns of the Pension Fund in its annual budget, although it is a sad fact, that the Norwegian government had to withdraw from the Fund in 2016 to upkeep its public spending), the Australian government was not so prudent, but rather increased its debt obligations and budget deficit.

I believe this paper illustrates well, why it is important even for developed countries to better diversify their economies into other, higher value added activities and to see how important role the manufacturing industry is playing in knowledge accumulation. I recommend both countries to implement solid fiscal rules and strengthen institutions that limits overspending of governments. Although the functioning of Wealth Funds are not within the scope of this paper, Australia could learn a lot from the Norwegian approach, as it seems to reduce and mitigate the impact of the Dutch Disease better than its own methodology.
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8. Appendix

Figure 1.1 Economic growth and natural resource abundance 1970-90

Source: J.D Sachs & A.M Warner (2001)

Figure 1.2 : Commodity Prices 2001-2016 in USD

Source: Author’s creation, based on IMF Commodity prices, Commodity Prices Index values 2005=100
Figure 1.3 Norway and Australia GDP per capita and annual growth

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Source: Authors creation based on World Bank data

Figure 1.4 Terms of Trade and Balance of Trade

Source: Author’s creating based on World Bank and WTO data

Figure 1.5 Nominal exchange rates

Source: [http://www.tradingeconomics.com/norway/currency](http://www.tradingeconomics.com/norway/currency)
Figure 1.6 Government budget deficit

![Government Budget Deficit as % of GDP](http://www.tradingeconomics.com/australia/government-budget)

Source: http://www.tradingeconomics.com/australia/government-budget

Figure 1.7 Public and private debt as % of GDP

![Public and Private Debt as % of GDP](Author's creation, Central Government debt from World Bank, Private sector debt from OECD)

Source: Author’s creation, Central Government debt from World Bank, Private sector debt from OECD

Figure 1.8 FDI position (Inward in current USD; million)

![FDI Position (Inward)](Author’s creation based on OECD Inward FDI position data)
Figure 1.9 Capital formation by industry

Australia Capital formation (in current AUD, millions)

Norway Capital formation (in current NOK, millions)

Source: Author’s creation based on OECD Capital Formation by activity ISIC rev4 data

Figure 2.0 Employment by Industry

Norway Employment by Industry (thousands people)

Australia Employment by Industry (thousands people)

Source: Author’s creation, based of ABS and Statistics Norway, Note: Services demonstrated on right hand axis
Figure 2.1 GDP contribution by industry, output approach

Source: Author’s creating based on OECD Note: Services demonstrated on right hand axis

Figure 2.2. Export composition

Source: Author’s creation based on WTO merchandise and commercial service trade data

Figure 2.3. Economic Complexity Ranking

Source: http://atlas.cid.harvard.edu/rankings/country/