The Effects of the 2010 Nobel Peace Prize on Sino-Norwegian Trade Relations

An Empirical Study with the Gravity Model

Eric Blomfeldt Mathisrud

Master of Philosophy in Economics

Department of Economics

University of Oslo

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Summary

The aim of this thesis was to examine to what extent Norwegian export to China was affected by the sanctions China imposed on Norway following the Nobel Peace Prize award to Chinese dissident Liu Xiaobo in 2010. The thesis is divided into six chapters.

Chapter 1 is the introduction, which presents the research question and hypotheses and asserts the importance of the topic of study.

Chapter 2 provides some background information. A short introduction is given to the Nobel Peace Prize, which highlights its goal and the composition of the committee responsible for selecting a candidate. China’s response to the 2010 Nobel Peace Prize is described, showing the measures China imposed, which included a freeze in diplomatic relations and restrictions on the import of Norwegian salmon. The chapter finishes by giving an account of the history of the economic and political relationship between China and Norway after 1949 and shows that for most of this time the two countries enjoyed very good relations.

Chapter 3 is devoted to theory and knowledge on economic sanctions. It starts by defining what an economic sanction is, including what measures are counted as an economic sanction and what the aims of economic sanctions are, as well as briefly presenting the current usage of economic sanctions. Following is a discussion of whether or not economic sanctions actually work, and if they do not, why countries are still using them. It is argued that economic sanctions which are imposed rarely work, but that they might deter other countries from acting in way so that they themselves will become a target of economic sanctions in the future. The thesis follows up on this by examining some of the earlier literature that studied the effects of economic sanctions. Next, China’s sanctions policy is analyzed, by investigating China’s attitude to and usage of economic sanctions. It is shown in what situations China is employing economic sanctions and what kind of sanctions China usually employ. Finally, ten cases of sanctions imposed by China are examined in order to find their reason, aim, and magnitude.

Chapter 4 presents the model, data and methodology used to answer the research question. The thesis bases its empirical method on the gravity model of international trade, and this chapter begins by giving an overview of this model and its theoretical foundation. This is followed by a presentation of the data used. The thesis uses data from CEPII, a French research center studying the world economy and its development. The data section also shows the main export products
from Norway to China before and after 2010. The chapter finishes with presenting the methodology. The thesis considered three different regressions in order to analyze the effects of the sanctions on Norwegian exports to China. The first is a simple OLS regression, the second is a country-pair fixed effects regression, and the third is a country-pair, source-year, destination-year fixed effects regression. The results were checked for robustness, including testing for yearly effects for the whole period and testing with a control group. Additionally, the effects of the sanctions on different Norwegian export products to China were analyzed to discover whether some industries were hit more. Lastly, the effects of the sanctions on Norwegian import from China was tested.

Chapter 5 shows the results. The sanctions are seen to have significantly affected Norwegian export to China between 2011 and 2016, with the exports being 21 percent, or 5.5 billion USD, lower than they would have been without the sanctions. The robustness checks support this conclusion. It was further found that fresh and chilled salmon was significantly affected by the sanctions, with the results indicating that Norwegian export of fresh and chilled salmon to China between 2011 and 2016 was 92 percent, or 3 billion USD, lower than it would have been without the sanctions. This result is also supported by the robustness checks. No other product or industry was found to be significantly affected by the sanctions. Norway’s import from China between 2011 and 2016 was not found to be significantly affected. Next, some econometric concerns are highlighted and it is discussed whether or not they could have affected the results. Finally, the thesis discusses the main findings, based on the sanctions theory and analysis of China’s sanctions policy presented earlier. It concludes that despite losing most of its market share in China, the Norwegian salmon industry did not suffer notably as a result of the sanctions, however, Norwegian exporters lost opportunities to expand and grow in China. China’s aims were to make Norway apologize for the Nobel Peace Prize award, declare it respects China’s political system and promise it will not interfere in China’s internal affairs again, as well as to make Norway pose as a warning to other countries. Based on the terms Norway had to agree to in December 2016 in order to normalize relations with China, China’s sanctions can be considered successful.

Chapter 6 concludes by presenting the main findings and the analysis in the discussion. It finishes by offering some topics for future research.
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Any errors or inaccuracies are solely my responsibility.
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1 Introduction

On October 8, 2010, Liu Xiaobo was awarded the Nobel Peace Prize for “his long and non-violent struggle for fundamental human rights in China.” (Nobel Media AB 2014a). China reacted with anger at the prize and its endorsement by the Norwegian government, calling it a serious attack on its internal affairs (BBC 2010). Following this, China froze political relations with Norway and restricted trade in order to show its dissatisfaction. For a small country like Norway this can be quite threatening and damaging. Consequently, there were many stories in the media of how Norwegian exports to China was suffering from the sanctions. Particularly salmons export were said to be hurt (Krekling and Kolstadbråten 2012; Milne 2013; Lewis 2011). However, there were also reports saying that Norwegian exports did not suffer much from the sanctions (Baker and Fermann 2016; Chen and Garcia 2016).

The aim of this thesis was to uncover to what extent Norwegian exports suffered as a result of China’s sanctions. While there have been several studies looking at this previously (Sverdrup-Thygeson 2016; Kolstad 2016; Chen and Garcia 2016), my thesis contributes to the existing literature by offering a new approach and more comprehensive insight. This thesis is the first to adopt the gravity model of international trade in order to examine this case, which I believe will be better able to evaluate the effect of the sanctions than previous studies have done. To my knowledge, it is also the first study to analyze the effects on Norwegian exports of salmon and other products using econometric methods.¹ Further, as the other research studies were published before the sanctions were ended in December 2016, I believe this thesis will can give a better evaluation of the effects of the sanctions due to having newer data available. By employing the gravity model as a theoretical framework, I used STATA to test different regressions to see which one can better explain the effects of the sanctions. The focus was on overall exports, as well as exports from certain industries. This was combined with theory on economic sanctions. Based on the stated research focus, the research question has been set as:

*To what extent did the sanctions China imposed on Norway after the Nobel Peace Prize award in 2010 affect Norwegian exports to China?*

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¹ Kolstad (2016) studied the effects on overall seafood export from Norway to China
The economic expansion of China during the last decades makes this research question particularly relevant. China is now the world’s second largest economy and an important trading partner for Norway. Thus, losing access to the Chinese market could be detrimental to the economic growth of Norway. Even though it is likely that Norway would be able to compensate for the loss by exporting more to other countries, the Chinese market can offer a huge potential for growth, which can be even more important for Norway in the future. Figure 1 and Figure 2 show the importance of trade with China for Norway.

From Figure 1 it can be seen that Norway in 2016 exported goods to China for around 3 billion U.S. dollars (USD) and imported goods from China for almost 8 billion USD. Figure 2 shows that in 2016 more than 3 percent of Norway’s exports went to China while more than 10 percent of Norway’s imports were from China. As China’s economy keep growing at very high rates, and as Norway is in the process of negotiating a free trade agreement with China, these figures can be expected to increase further. Therefore, Sino-Norwegian trade relations is an important subject to study. While Figure 1 shows that Norwegian exports to China increased after 2010, it is not
possible to directly observe what would have happened had China not imposed the sanctions. By employing a fixed-effect approach in the regressions, my method should be better able to account for this and see if Norwegian exports are lower than in the case without the sanctions.

In order to answer the research question, the following hypotheses were set:

**Hypothesis 1:** The sanctions imposed by China did not have a significant effect on overall Norwegian exports to China.

**Hypothesis 2:** The sanctions imposed by China had a significantly negative effect on Norwegian salmon exports to China.

Significantly in these hypotheses means statistically significant to at least the ten percent-level. It was decided to look at the effects of the sanctions on overall Norwegian exports to China as this gives an overview of the total effects of the sanctions. As most of the media reports focused on the effects on salmon exports, it was also decided to consider salmon more thoroughly.

The thesis will start by providing some background information on the Nobel Peace Prize and China’s reaction to the 2010 Nobel Peace Prize before presenting an overview of the history of the Sino-Norwegian political and economic relationship since the founding of the People’s Republic of China in 1949. Next, the theory on economic sanctions will be discussed, including what economic sanctions are and whether or not they can be considered a useful foreign policy tool. This will be followed by a brief review of the literature discussing the effect of economic sanctions and an analysis of China’s sanctions policy. The practical part will include theoretical background for the gravity model and description of the data. Then, the methodology will be explained and the results will be presented. The thesis will finish with a discussion of the findings and their implication for the Sino-Norwegian relationship and China’s sanctions policy before offering a conclusion.
2 Background

2.1 The Nobel Peace Prize

The Nobel Peace Prize, along with the Nobel prizes in physics, chemistry, medicine and literature, was created at the request of the will of Alfred Nobel, a Swedish inventor who had become very rich from inventing the dynamite. The prize should be awarded to “the person who shall have done the most or the best work for fraternity between nations, the abolition or reduction of standing armies and for the holding and promotion of peace congresses.” (The Norwegian Nobel Institute 2018). The will requested that a committee of five people chosen by the Norwegian Parliament would be responsible for selecting a worthy candidate. These people are supposed to have no involvement in Norwegian politics. Thus, the Norwegian government is not a part of choosing who will be awarded the prize. Since 1977, in order to make the prize less political, members of the Norwegian government and parliament have not been allowed in the committee (Nobel Media AB 2018a). However, the five committee members are still selected by the largest Norwegian political parties, and there is a tradition that the Norwegian government endorses the winning candidate of the prize. Candidates can be nominated by any qualified nominator, including members of national governments and national assemblies of any sovereign state and university professors in selected fields (Nobel Media AB 2018b).

2.2 China’s Response to the 2010 Nobel Peace Prize

In 2010, Liu Xiaobo was awarded the Nobel Peace Prize for his fight for human rights in China. China, which had already threatened with consequences should Liu be awarded the prize, expressed anger towards the award and the Norwegian government’s support of it, blaming Norway for interfering in its internal affairs (BBC 2010). In China, Liu was regarded as a dissident trying to undermine the position of the ruling Communist Party, and he had been sentenced to 11 years in jail for this in December 2009. As he was jailed, he was not allowed to attend the Nobel Peace Prize ceremony in December 2010 (Rønneberg 2012). Following the Nobel Peace Prize award, China canceled all planned political meetings with Norwegian officials, as well as the Free Trade Agreement talks. Until the normalization of relations in December 2016, there was no
political contact between higher ranked officials of Norway and China. It was further reported that it became more difficult for Norwegians to get visa for China (Sverdrup-Thygeson 2016). Additionally, Norwegian exporters of salmon suddenly met new obstacles, including “stricter testing and inspection procedures and longer customs-clearance time” (Chen and Garcia 2016, p. 32). Exporters from other countries did not face these problems. Norwegian companies in other industries were also experiencing new difficulties in doing business in China. However, China did never officially impose any economic sanctions against Norway (Rønneberg 2012). In 2011, the Standing Committee on Finance and Economic Affairs of the Norwegian Parliament canceled their trip to China as Chinese officials refused to meet them (Trøite 2011). Despite this, meetings between lower ranked officials continued as normal (Rønneberg 2012). In order to normalize relations, China wanted the Norwegian government to apologize for the Nobel Peace Prize award to Liu Xiaobo. However, Norway maintained that the Nobel Committee is independent and that the Norwegian government was not responsible for awarding the prize (Morison 2011).

2.3 History of the Sino-Norwegian Economic and Political Relationship since 1949

On October 1, 1949 Mao Zedong proclaimed the founding of the People’s Republic of China and thus started a new chapter in Chinese history. The new China was to be a single-party state headed by the Communist Party of China. The Party had roots in Marxism-Leninism, but was heavily influenced by Mao Zedong Thought, which due to China’s mostly rural population focused more on peasants than industry workers. Since the 1980s, due to its economic reforms and opening up by Deng Xiaoping, China has experienced tremendous growth rates and is now the second largest economy in the world, with the economic focus shifting from the countryside to the cities (Fairbank and Goldman 2006).

During the Mao era (1949-1976), there were very limited relations between Norway and China. While Norway recognized the People’s Republic of China as early as January 7, 1950, which was earlier than most other Western countries, diplomatic relations were first established on October 5, 1954, mostly due to tensions over the Korean War. Norway signed a cultural agreement with China in 1963 and was the first Western country to do so. As relations between China and the West thawed in the 1970s, the exchange of visits between Norway and China
increased, and developed into frequent high-level visits in the 1980s. Economic relations properly started in 1980 with the signing of the Agreement on Economic, Industrial and Technological Cooperation between Norway and China and the establishment of the Sino-Norwegian Mixed Committee of Economy and Trade. Bilateral trade increased constantly from the middle 1980s. Norway’s main imports from China were ships, textiles and garments, mechanical and electrical products, shoes, suitcases and bags, while the main exports were crude oil, mechanical and electrical products, fertilizers, building and mining machines, loading and unloading equipment, and iron ore. Since 1985, Norway has provided China with government concessional loans to finance projects such as telecommunications, urban construction and environmental protection (Embassy of the People’s Republic of China in the Kingdom of Norway 2018).

Later, Norway and China signed agreements on cooperation in science and technology and environmental protection, and established programs for cultural and educational exchanges. The University of Oslo has long had exchange agreements with elite universities in China, such as Peking University and Tsinghua University in Beijing and Fudan University in Shanghai (University of Oslo 2018) and China established a Confucius Institute in Bergen in 2007 (Bergen Konfutse Institutt 2018). These have contributed to making it easier for Norwegian students to learn more about China. Fudan University established its own Nordic Centre in 1995 to foster collaboration between Chinese and Nordic students and researchers (Nordic Centre 2018). Norway has had formal human rights dialogue with China since 1997, parts of which were allowed to continue after 2010 (Ministry of Foreign Affairs 2010).

Despite tensions after the Dalai Lama was awarded the Nobel Peace Prize in 1989, Sino-Norwegian relations were robust during the 1990s and 2000s, with increasing trade and relations (Sverdrup-Thygeson 2016). In January 2000, Norway and China reached an agreement causing Norway to support China’s admittance into the World Trade Organization (WTO) (Embassy of the People’s Republic of China in the Kingdom of Norway 2018). According to Norwegian economist Øystein Dørum (2012), the economic boom in China after its 2001 admission into the WTO significantly contributed to the Norwegian economic expansion in the same period, particularly as a result of higher oil prices. In 2008, Norway became one of the first European nations to start negotiating a free trade agreement with China, having eight rounds of talk before Liu Xiaobo received the Nobel Peace Prize in October 2010 (MOFCOM 2018).
As mentioned, after Liu Xiaobo was awarded the Peace Prize, all political contact between Norway and China at higher levels stopped, and the relationship was said to be “frozen”. When the Dalai Lama visited Norway in 2014, the Norwegian government refused to meet him, despite having done so on many earlier occasions, such as in 1989, 1994, 1996, 2000 and 2001 (Remen et al. 2014). However, relations were not completely severed, as Norway supported the admission of China as an observer in the Artic council in 2013 and was accepted as one of the founders of the Asian Infrastructure Investment Bank in 2015 (Lohne 2016). In December 2016, Norway and China finally normalized their relationship and reestablished diplomatic and political ties. They also agreed to resume negotiations on the free trade agreement (Reuters 2016). In April 2017, Norwegian Prime Minister Erna Solberg visited China, the first high-level Norwegian politician to do so since the 2010 Nobel Peace Prize award (Regjeringen 2017). Despite relations being normalized, there are still some areas where Norway is left out. In April 2018, a Norwegian journalist, who had previously been the Norwegian newspaper Aftenposten’s correspondent in China, was denied visa for China as a part of the delegation of Norway’s Minister for Science and Higher Education (Glomnes 2018). Norway is still not included in the 72- and 144-hour visa-free transit schemes, which allows passport holders from 53 countries (including most of Europe) to stay 72 or 144 hours in selected Chinese cities without a visa if they are transiting to another country. However, Norway is included in the list of 59 countries that can get 30-day visa-free stay on the Chinese island of Hainan from May 1, 2018 (Travel China Guide 2018).
3 Current State of Research and Knowledge

3.1 Sanctions Theory

To properly discuss sanctions, it is first important to define what economic sanctions are. The think-tank Council on Foreign Relations defines it as “the withdrawal of customary trade and financial relations for foreign and security policy purposes. They may be comprehensive, prohibiting commercial activity with regard to an entire country, […] or they may be targeted, blocking transactions of and with particular businesses, groups, or individuals.” (Masters 2017). The Collins English Dictionary (2012) defines economic sanctions as “any actions taken by one nation or group of nations to harm the economy of another nation or group, often to force a political change.” Economist Hossein Askari (2003, p. 77) uses a streamlined version of a generally accepted definition by Daoudi and Dajani (1983), saying that “[e]conomic sanctions are coercive measures imposed by one country, or coalition of countries, against another country, its government or individual entities therein, to bring about a change in behavior or policies.” The main point is that an economic sanction aims to force a change in policy or behavior in a foreign country by harming its economic interests. As argued by Robert A. Pape (1997), economic sanctions can work either directly, by the government submitting because it considers resisting is not worth the price, or indirectly, by making the citizens demand that the government complies in order to end the harmful sanctions. The magnitude of economic sanctions can be measured by the target country’s loss of GNP over time.

There are several types of economic sanctions. The first is to impose a tariff on one or more imported goods from the targeted country. A second option is to impose a quota, meaning to put an upper limit to how much of a good can be imported from or exported to the targeted country. More severe is to impose an embargo, which means that a country forbid trade between itself and the targeted country in one or more goods. In some cases, a full embargo can be imposed, completely shutting off trade between the two countries. Yet another type is non-tariff barriers. They aim to restrict the import of certain goods from a targeted country, for example by claiming there are health or licensing issues. Finally, a country can declare freezes and seizures of assets of individuals or companies from the targeted country that are in the sanctioning country. Sanctions can be imposed unilaterally, meaning that there is only one sanctioning country, or multilaterally,
meaning that there are more sanctioning countries. Multilateral sanctions will often have larger effects due to many countries participating, but unilateral sanctions by large economies such as the United States (US), the European Union (EU) or China can still be quite harmful for the targeted country (Radcliffe 2016). In addition to economic sanctions, there are several other types of sanctions that are used. These include revoking visas of diplomats, forbidding certain individuals or groups of entering the country, military sanctions such as arms embargos or terminating military assistance or training, and cultural sanctions like banning athletes or artists from international events and competitions (Bossuyt 2012).

While all countries are able to impose economic sanctions, most of the sanctions imposed in recent history can be attributed to three senders, the United Nations (UN), the US and the EU. Before 1990, however, the UN Security Council was usually unable to impose economic sanctions due to the rivalries of the Cold War and imposed mandatory sanctions only three times between 1945 and 1989, compared to thirteen times between 1990 and 2006 (PIIE 2018). Most of the current sanctions are summed up in Figure 3, though this does not include unilateral sanctions from smaller countries, such as Russia’s counter-sanctions towards the EU following the

**Figure 3:** Sanctions Regimes in 2016

![Sanctions Regimes in 2016](image)

*Source: According to Masters (2017)*
annexation of Crimea (Herszenhorn 2017). As can be seen, most of the targets are autocratic or dictatorial countries, often developing, as well as some failed states and non-state actors.

The central questions regarding economic sanctions are the following: Do economic sanctions work? Why do countries impose economic sanctions? What can be considered one of the most influential works in answering the first question is a study by Hufbauer, Schott and Elliot (often abbreviated HSE) from 1990. They identified 115 cases of economic sanctions between 1914 and 1990, and found 40 of them to be successful, meaning that they achieved the desired policy change in the targeted country, corresponding to a success rate of 34 percent. This, they argued, was much higher than previously thought and was sufficiently high for economic sanctions to be considered a useful alternative to military force or coercion. Morgan, Bapat and Kobayashi (2014) found that, while using a restrictive definition of success, 51 percent of multilateral sanctions and 31 percent of unilateral sanctions were successful. They argue that this suggests that sanctions backed by more countries are more effective, but they do not attempt to say whether economic sanctions are preferred to military action. While HSE would likely consider this as a fairly high success rate, others, such as Shin, Choi and Luo (2016, p. 486-487) argue that this shows that “economic coercion is an ineffective foreign policy tool”. David A. Baldwin (1985, p. 372), on the other hand, even goes as far a claiming that imposing sanctions is a success in itself, saying that “to make the target […] attempt pay a price for non-compliance is to be at least partially successful.”

Several researchers have argued that economic sanctions are generally ineffective, among them Robert A. Pape. He argues that the study by HSE is seriously flawed and he considers only 5 of HSE’s 40 successes to actually have been successful, with the rest mostly being settled by force, not settled at all, or not being economic sanctions in the first place. He thus claims that instead of having a 34 percent success rate, economic sanctions have a success rate of only 4 percent, making them a relatively useless tool in foreign policy (Pape 1997). It is also interesting to note that Hufbauer et al. (the authors behind HSE) in their 2007 book found that only 13 out of more than 200 cases of economic sanctions since 1914 achieved the goal of the sanctioning countries, again suggesting a very low success rate. The more known examples of failed economic sanctions include the decade-long UN sanctions against Iraq during the 1990s, and the US sanctions against Cuba since 1960 (Hovi 2001, p. 509).
However, Hovi (2001) argues that the conclusion reached by Pape (1997) and by HSE (1990) are flawed and that they only consider cases where economic sanctions were already unlikely to succeed, which is after they are imposed. Pape claims that economic sanctions have to fulfill three criteria on order to be considered successful. First, “the target state conceded to a significant part of the coercer’s demands; [second,] economic sanctions were threatened or actually applied before the target’s change of behavior; [and third,] no more-credible explanation exists for the target’s change of behavior.” (Pape 1997, p. 97). Yet, Hovi (2001) argues that there are three stages of economic sanctions: Before they are threatened; after they are threatened; and after they are imposed. As such, he expands the second criteria made by Pape. Hovi further argues that economic sanctions are more likely to succeed in the earlier stages, particularly before they are even threatened. His argument is that before a country decides whether or not to perform an action, it considers if it is likely or not that foreign countries will respond negatively, including with economic sanctions. At this stage, it is possible that many countries reconsider their actions, and do not perform actions that might lead to economic sanctions. If the country still performs the action, it probably expects some form of threats of retaliation. However, when reaching this second stage, the country is likely prepared for sanctions. Submitting to pressure from threats will make the country’s government lose face both internationally and domestically, which can weaken its position. Not all threats are made public, though, and those that are not might have a higher chance of succeeding, as the government is not losing face by complying. One reason for submitting can be that the target country underestimated the chances of getting economic sanctions against it or the magnitude of the sanctions. If the target country’s government did not bow to threats and sanctions are imposed, the government again risks losing face by complying. However, it is still possible that the target country will comply, again because it underestimated the sanctions, or that possible interest groups in the country that are affected by the sanctions are fighting for the government to comply.

There have been suggested other reasons why economic sanctions are often not working. One reason can be that the demands of the sanctioning country is very hard to meet, and that it is costlier to comply than to allow the sanctions. Shin et al. (2016) state that target countries are likely to comply only when the economic cost for not doing so is very high. Pape (1997), on the other hand, claims that there is no support in the data showing that higher economic losses for the target state increases the chance of compliance. Another argument is made by Kaempfer and Lowenberg

11
who claim that “as long as both the demand for and the supply of internationally trade goods is sufficiently elastic, little economic hardship will be induced in the target country by sanctions.” As long as the target country can find other places to import from or export to, it is unlikely that economic sanctions will bring much harm. This can often be the case with unilateral sanctions. Furthermore, most sanctions target autocratic regimes, but economic sanctions are more likely to harm the general populace than the ruling class. Since the general populace has little influence on policy in these countries in the first place, it is unlikely that economic sanctions will make the government comply. Next, it is not always easy to sustain economic sanctions for too long. This is because in addition to the target country, the sanctioning country might also face some costs, particularly industries that were already doing business in the target country. As such, interest groups in the sanctioning country can use their influence to limit or cancel the sanctions (Hovi 2001). Lastly, modern states are not as fragile as before, and the rise of nationalism makes countries and their people more willing to endure economic hardship rather than give up their national interests. Thus, economic sanctions can increase the governments legitimacy and make them less likely to comply to foreign demand, the exact opposite of the intended effect (Pape 1997). As to when economic sanctions might succeed, Pape (1997, p. 109) argues this can happen in “disputes involving minor issues that do not affect the target country’s territory, security, wealth, or the regime’s domestic security”, or when the target country is heavily reliant on the sanctioning country.

If economic sanctions are not successful, why are they still used? One reason is that compared to other foreign policy tools, such as military force, economic sanctions are perceived to be less costly for the sanctioning country. Amy Pond (2017) argues that few policy makers expect economic sanctions to be effective, but that when facing human rights abuses in other countries, citizens will demand that some action is taken. The government will thus impose sanctions in order to appease the public, even if the sanctions will be mostly symbolic. However, such sanctions can actually make life worse for people, as the general populace in the target state is likely to be hit harder by the sanctions, and there is little chance that the government will do anything to improve human rights. Pape (1998, p. 77) seems to agree with Pond, saying that governments want to “rescue their own prestige or their state’s international reputation”. He even claims that countries can use economic sanctions as a stepping stone in order to justify military intervention, and that by giving peace a chance one will “disarm criticism of the use of force later.”
Hovi (2001) adds some more explanation, first claiming that some countries can overestimate the effect of economic sanctions, hoping that they will be effective when in fact they will not, and thus impose them even when they will likely fail. More common, however, is that countries despite knowing that the sanctions will likely fail, will impose them in order to make the threat of future sanctions more credible. If sanctions are not imposed just because they are deemed to be ineffective, other countries will know that even if they do not submit to the threat of sanctions, there is little chance that any sanctions will be imposed anyway. This seems to be supported by Jonathan Masters (2017) of the think-tank Council on Foreign Relations, who claims that even though the sanctions against Russia after the annexation of Crimea were unlikely to succeed, inaction could have been worse, as it would show that there is little consequence of military aggression.

3.2 Literature Review

There exists a substantial literature on the effects of economic sanctions. As already seen, the question of whether or not economic sanctions are successful in forcing a policy change has been discussed for a long time, with evidence suggesting that most imposed sanctions fail to achieve the desired outcome. While most research on the impact of economic sanctions have focused on the humanitarian effects, more researchers are now studying the economic impact of sanctions, for example the effects of economic sanctions on trade or economic growth.

Neuenkirch and Neumeier (2015) assessed the economic impact of sanctions imposed by the UN and the US. They found that UN sanctions on average decreased the target country’s per capita GDP growth rate by more than 2 percentage points annually, and as they on average lasted 10 years, they led to a total decrease of 25.5 percent in the target country’s GDP per capita. On the other hand, US sanctions on average decreased the target country’s GDP growth by 0.75-1 percentage point, and lasted on average 7 years, resulting in a total decrease of 13.4 percent of GDP. Evenett (2002) estimated the effect of the Western sanctions imposed on the South African Apartheid regime on their bilateral trade with South Africa and found that the US sanctions were the most effective, reducing bilateral imports by a third. Hufbauer et al. (2007) produced similar results, by using a large sample of economic sanctions and gravity models they found that economic sanctions significantly reduced bilateral trade between the imposing country and the
target country. Haidar (2017) examined the effects of the sanctions imposed on Iran in 2008 and found that two-thirds of non-oil exports were just redirected to non-sanctioning countries, which even led to increased aggregate non-oil exports for Iran. However, Iranian exporters had to lower the price of their products in order to compete and therefore suffered some economic losses. Lee (2018) looked at the economic sanctions imposed on North Korea since the middle 1990s, and found that the economic activity in the capital, trade hubs near China, and manufacturing cities in North Korea increased. This was probably because China did not join in imposing the sanctions. Lee further found that the sanctions were likely to mainly harm the already impoverished countryside. Similar results were found by Shehabaldin and Laughlin (1999), who analyzed the sanctions imposed on Iraq after the invasion of Kuwait, and by Afesorgbor and Mahadevan (2016). In both papers they concluded that economic sanctions primarily harmed the poorer population and thus increased income inequality in the target country.

Another approach was taken by Besedeš et al. (2017), who studied the effect of financial sanctions on cross-border capital flows. They based their study on financial sanctions imposed by Germany between 2005 and 2014, and found that financial flows fell in both directions. However, sanctions imposed by only the EU, as opposed to those imposed by the UN, were not very effective as the target country increased trade with other countries instead.

3.3 China’s Sanctions Policy

Like most large and powerful economies, China has imposed unilateral sanctions on other countries. This is despite China officially being against economic sanctions and China has on several occasions used its veto in the UN Security Council to block them. China is even more vocally critical of unilateral sanctions, particularly those imposed by the US. In 2012 Chinese Foreign Ministry Spokesperson Hong Lei said that “China is always against one country's unilateral sanctions on another country”. However, James Reilly (2012, p. 121) argues that since 1949, “Chinese leaders have repeatedly politicized economic relations”. China’s use of sanctions has increased during the last decade as its economic and political position has grown stronger.

China’s usage of sanctions is quite different from that of the US. While the US often justifies its economic sanctions (both unilateral and multilateral) as upholding human rights and nonproliferation, China justifies its sanctions as protecting its national interests. For China, this
usually means the issues of Tibet and Taiwan, as well as protecting against any danger towards the Communist Party’s rule. In recent time, China’s maritime interests, particularly its claims in the East and South China Seas, have been lifted up to become one of its core national interests (Reilly 2012). Additionally, China rarely announces that it imposes sanctions on other countries, which is in stark contrast to the habits of the US and the EU. Even though using economic sanctions as a policy instrument is generally prohibited by the WTO, of which China is a member, the fact that China does not announce its sanctions or formalize them through law makes it hard for other countries to prove that China is employing sanctions. Thus, China reduces potential legal challenges at the WTO (Chen and Garcia 2016).

Typical sanction types utilized by China include stalling imports at the border, thus making them rot or go bad in the case of fresh food, freezing political and business meetings, stopping investments or purchases, or encouraging consumer boycotts in China. In the words of Reilly (2012, p. 123), China’s sanctions are “more bark than bite”, instead signaling that it will get worse if the target country does not back down or apologize to China. Furthermore, China is still dependent on many imports for its economic growth and imposing economic sanctions could thus also hurt the Chinese economy. As high economic growth is important for the Communist Party’s legitimacy, it is likely that the Chinese leadership wants to avoid such measures. In order to understand China’s use of economic sanctions, the following paragraphs review some of the sanctions China has imposed or threatened in the past.

Vietnam 1975-1978: During the 1970s China was worried about the improving relationship between Vietnam and the Soviet Union, which after 1960 had been considered as China’s rival. Additionally, China and Vietnam had disputing territorial claims in the South China Sea and China was unhappy with how Chinese nationals were treated in Vietnam. Vietnam had long been a friend and ally of China, and China had been providing aid to Vietnam for a long time. In order to get Vietnam back under the Chinese sphere of influence, China used a wide range of economic sanctions, such as suspending the preferential trade agreement, imposing quotas on exports and imports and withdrawing aid. However, this was not enough to make Vietnam back down, possibly due to the sensitivity of the disputed issues, as well as increasing nationalism in Vietnam (Path 2012).

France 1992: France planned to sell 60 Mirage fighter jets and 1,000 missiles to Taiwan in 1992. China reacted by closing the French consulate in Guangzhou and halting many planned
business deals, including a plan to buy six passenger planes from France-based Airbus (Los Angeles Times 1992). While France did not back down and later completed the sale, this was the last time any European country sold arms to Taiwan on a major scale (Reilly 2012). Interestingly, China did not impose sanctions on the US, which the same year announced it would sell Taiwan 150 fighter jets, probably due to the US having more power to retaliate (Los Angeles Times 1992).

Japan 2005: In 2005 the Japanese Prime Minister Junichiro Koizumi visited the Yasukuni Shrine in Tokyo, a shrine dedicated to fallen Japanese soldiers, including several Class-A war criminals who were conducting criminal acts towards Chinese during the Second World War (Reilly 2012). Furthermore, the same year Japan published a new history textbook for students that whitewashed Japan’s wartime atrocities, such as the Nanjing Massacre where Japanese troops massacred tens or hundreds of thousands of Chinese civilians in 1937. China reacted to this by encouraging anti-Japanese demonstrations and boycotts of Japanese products (Watts 2005).

South China Sea 2007-2008: China started to threaten foreign oil companies which were cooperating with Vietnam to extract oil in disputed areas in the South China Sea. In 2007 China warned British Petroleum of economic consequences if they did not halt their work in the disputed waters, which was based on a contract with the Vietnamese government. A similar warning was given to American ExxonMobil in 2008. While British Petroleum withdrew in 2009, likely due to Chinese pressure, ExxonMobil did not do so, and even signed additional contracts with Vietnam in the disputed area (Fravel 2011).

France 2008: After pro-Tibet protesters disrupted the Olympic torch relay in Paris and criticized China over Tibet and human rights in 2008, Chinese officials called for boycotts against the French retail chain Carrefour. At the time, the boycotts were largely ineffective (Jacobs 2008). However, when it was later announced that French President Nicolas Sarkozy would meet the Dalai Lama, China reacted harsher. China postponed an EU-China summit which was to be held in Paris and got it moved to Prague, froze a large order of 150 planes from Airbus and made two Chinese trade delegations drop their travel plans to France. Chinese Premier Wen Jiaobao decided to avoid France in his tour of Europe in 2009 (Reilly 2012). Even though Sarkozy did meet with Dalai Lama in 2008, one year later he declared that France recognizes Tibet as a part of China, thus starting to normalize relations (Blanchard 2009).

United States 2010: The US sold military equipment to Taiwan worth around $6.4 billion in 2010, which prompted voiced opposition from China. Although China threatened to impose
economic sanctions on the US companies engaged in arms deliveries to Taiwan, no sanctions were actually imposed (Reilly 2012).

Japan 2010: In a dispute involving the Diaoyu/Senkaku islands in 2010 Japan arrested a Chinese fishing trawler captain that collided with a Japanese Coast Guard vessel. Subsequently, China blocked all export of rare earth minerals to Japan, minerals that are crucial in the production of many hi-tech products. As China controlled 93 percent of rare earth mineral deposits, it was difficult for Japan to find replacements (Bradsher 2010). While Japan quickly released the captain after China halted the exports, it took close to two months before China resumed exports. However, Japan made no concessions over the territorial claims (Reilly 2012).

The Philippines 2012: Another territorial dispute flared up between China and the Philippines in 2012 during a standoff between a Philippine warship and Chinese fishing vessels near the Scarborough Shoal in the South China Sea, an area claimed by both countries. China reacted by halting banana imports from the Philippines, claiming the restrictions were due to health reasons. This was very damaging for the Philippines, which sees bananas as one of its most important export goods and China as its biggest export market (Higgins 2012). Additionally, many Chinese travel agencies cancelled their trips to the Philippines, whose tourist industry heavily relies on Chinese tourists (Reilly 2012). In the end, the Philippines withdrew its ships, saying it was due to stormy weather. The Chinese ships remained (Mullen 2013).

South Korea 2016-2017: South Korea’s decision to deploy THAAD, a US anti-missile system, on its territory in 2016 greatly angered China. While South Korea argued it was a defensive measure against an increasingly aggressive North Korea, China was worried that the system’s radar could penetrate into Chinese territory, allowing the US to use it to spy on China. Even though China did not formally impose economic sanctions, business dealing of many South Korean companies in China suffered, including Hyundai, Kia and Lotte, who all experienced their sales in China plummet to the ground. Furthermore, China banned tour groups from traveling to South Korea (Mullen 2017). South Korean soap operas were removed from Chinese TV screens and K-pop stars were unofficially unwelcomed in China (Kim and Blanchard 2017). However, South Korea’s important electronics industry was not targeted, possibly due to this harming China as well (Mullen 2017). After one year, South Korean President Moon Jae-in was forced to give in, thus accepting military constraints and restrictions on future deals with the US and Japan (Volodzko 2017).
North Korea 2017: While the US and other Western countries have been imposing economic sanctions on North Korea for a long time, China long refused to join, fearing it could lead to a collapse of the North Korean government, an ally of China. As the North Korean nuclear weapons program intensified, in 2017 China joined the UN Security Council in imposing new sanctions, including bans on exports of iron, coal, lead, seafood and textiles from North Korea. Thus, China’s export to North Korea fell with 16 percent and its imports from North Korea fell by over 60 percent (Bloomberg News 2017). While North Korea in 2018 agreed to end its nuclear weapons program, it is unclear to what extent China’s economic sanctions contributed to this. It is further uncertainty around whether or not North Korea will deliver (Ripley and McKirdy 2018).

Looking at all these sanctions imposed by China, it seems clear that they were imposed as a result of what China perceived as a threat to its national security, not because China wanted to force regime change or human rights improvements in foreign countries, as is usually the case with Western economic sanctions. Even the case of North Korea can be attributed to national security, as China was getting increasingly worried about its nuclear weapons program. On the other hand, China refused to upgrade existing sanctions against Iran, as well as North Korea prior to 2017, claiming them to be ineffective. Additionally, it seems that China rarely goes for extensive economic sanctions in many areas, instead preferring to use targeted sanctions to force the target country to comply. Targeted sanctions reduce the chance that China will hurt its own economy. Tong Zhao (2010) argues that China’s own experience shows that comprehensive and intensive sanctions are usually not effective, while sanctions targeting specific industries, companies or products have a higher chance of producing a desired result. Most of China’s unilateral sanctions were imposed on countries where the political leaders were planning to meet the Dalai Lama. Fuchs and Klann (2013) found what they called the “Dalai Lama Effect”, saying that meetings between heads-of-state or government members and the Dalai Lama result in an average fall of exports from the receiving country to China by 16.9 percent. However, this was not the case if the Dalai Lama only met with lower ranked officials. Furthermore, it was only after Hu Jintao succeeded as president in 2002 that there was any significant effect, suggesting that China is getting less tolerant of the Dalai Lama as it has gotten stronger economically. There is little evidence to suggest that current president Xi Jinping is more tolerant regarding the Dalai Lama issue, and as the examples of South Korea and North Korea show, Xi is also using economic sanctions as a tool in his foreign policy.
4 The Model and Empirics

4.1 The Gravity Model

This thesis uses the gravity model of international trade in order to analyze the effects of the sanctions on Norwegian exports to China. The gravity model is useful for assessing bilateral trade relations as it allows analyzing trade data at the aggregate level, as well as at the industry level. At the basic level, the gravity model states that the larger an economy is the more it will trade, meaning that trade between two large economies will generally be larger than between two smaller economies or between a large and a small economy. This relationship was originally discovered by Jan Tinbergen in 1962, who proposed a model based on Newton’s universal law of gravitation. Just as Newton’s law states that the force of gravity between two objects increases with their mass and decreases with the distance between them, Tinbergen argues that economies trade more with each other the larger they are, and trade less the further away from each other they are. The gravity model thus took the form of

\[ X_{ij} = A \frac{Y_i^{\beta_1} Y_j^{\beta_2}}{d_{ij}^{\beta_3}} \]  

(1)

where \( X_{ij} \) is the trade value between the two countries \( i \) and \( j \), \( Y_i \) and \( Y_j \) are the GDPs of the respective countries, \( d_{ij} \) is the distance between them, and \( A \) is a constant. As it is difficult to know the exact relationship between GDP, distance and trade, GDP and distance are given exponents \( \beta_1 \), \( \beta_2 \) and \( \beta_3 \) (Feenstra 2016, p. 132-133). The model above estimates the trade in a single year, but it is possible to add a time dimension \( t \) to the variables of trade and GDP, thus having \( X_{ijt}, Y_{it} \) and \( Y_{jt} \). The definition is the same as above but for a particular year \( t \). There have been studies (eg. Head and Mayer 2014, p. 133) suggesting that \( \beta_1 \) and \( \beta_2 \) are equal to 1, thus implying that “the bilateral trade between two countries is directly proportional to the product of the countries’ GDPs.” (Feenstra 2016, p. 132).

As a model, the gravity model tries to combine three determinants that decide international trade: the demand of foreign goods in country \( i \), the supply of foreign goods in country \( j \), and the cost of trading. The demand can be measured by the GDP of the importing country, a higher GDP means higher purchasing power, which increases demand. The supply can likewise be measured...
by the GDP of the exporting country, a higher GDP means more output and thus more goods and services to sell, which increases supply. Lastly, the distance can be used as a measurement for trade costs, which can be divided into shipping costs and transaction costs. The further away the countries are, generally the higher these costs will be. Shipments between countries that are geographically close take shorter time than between countries which are further away from each other. Further, geographical proximity often means more familiarity with the other country’s laws, institutions and language, in addition to close countries having more similar tastes. All this implies that countries will trade more with other countries that are geographically close, and less with those further away (Winters and Wang 1994). However, it should be noted that distance is much less costly today than it was when the gravity model was first introduced, but it is still believed to be an important factor.

A long-time criticism towards the gravity model was that it lacked a proper theoretical foundation. Leamer and Levinsohn (1995, p. 1387) criticized it saying that it “lack[s] a theoretical underpinning so that once the facts are out, it is not clear what to make of them.” On the other hand, Deardorff (1998) criticized that there are too many theories behind it, and that it cannot be used to distinguish between different theories, as the Heckscher-Ohlin model, increasing returns to scale, Ricardian models and more all can be used to derive the gravity model. However, Taplin (1967, p. 442) recognized the empirical strength of the model, arguing it was able to “identify extreme cases of artificial barriers to trade, the role of distance and the effects of membership in various customs union and trade preference groups”. van Bergeijk and Brakman (2010, p. 1) claimed that while the model might be simple, it has been very successful from an empirical point of view. The gravity model helped fix the “missing trade” problem of the Heckscher-Ohlin model, which due to not taking distance into account predicted a much higher trade than was actually observed (Head and Mayer 2014, p. 135).

During the last decades there have been several attempts at providing a theoretical foundation. To begin with, there are some underlying assumptions. The first is that the importing country will spend a share of it’s expenditure on goods from a given exporting country, and that this share depends on the exporting country’s capability to export to a given destination. The second is that there will be market-clearing for the exporting country (Head and Mayer 2014, p. 139). Feenstra (2016) starts with a monopolistic competition model. Then, all firms are producing slightly differentiated products and countries will be exporting these varieties of differentiated
products to another. Assuming that it is costless to change the variety a firm is producing, all firms will produce different varieties in order to maximize profits. Thus, all firms and countries will completely specialize in a unique set of products. Additionally, each country’s population has similar preferences. The consequence is that expenditure on each good, including foreign goods, is proportional to the consumers’ income, and since consumers are assumed to be equal, the expenditure on each good is also proportional to a country’s GDP. When considering that distance between countries increases trade costs, consumers will demand less of a good that is from a country further away, meaning lower imports. This is exactly as the gravity model above predicts.

4.2 Data

The data used in this thesis is collected from Centre d'Etudes Prospectives et d'Informations Internationales (CEPII), a French research center producing studies, research, databases and analyses on the world economy and its evolution. It has gained recognition as a trustworthy source of international economics data and is part of the network coordinated by the Economic Policy Planning, an institution attached to the French Prime Minister. CEPII’s work is aimed at “private and public decision-makers, international institutions, economists, civil society, and the media” (CEPII 2018a). In this thesis two of CEPII’s datasets are used; the BACI dataset, which includes data on bilateral trade flows, and the Gravity dataset, which includes data useful for gravity model estimates.

The BACI dataset gives accurate bilateral trade figures down to the product level. The original data is provided by the United Nations Statistical Division’s COMTRADE database. BACI is then “constructed using an original procedure that reconciles the declarations of the exporter and the importer.” (CEPII 2018b). Because import values are reported using INCOTERMS 2010 rule CIF – Cost, Insurance & Freight, and export values are reported using INCOTERMS 2010 rule FOB – Free on Board, the CIF costs are estimated and subtracted from the reported import values in order to calculate the FOB import values. As there can be differences in countries’ reliability of reporting, the countries’ reliability is measured by how far their reports are from the computed FOB import values. The reliability of a country is then used as a weight in the reconciliation of bilateral trade flows that are reported in each end. “This harmonization procedure enables to extend considerably the number of countries for which trade data are
available, as compared to the original dataset” (CEPII 2018b). Using the HS 6-digit product disaggregation, BACI provides bilateral values and quantities of exports for more than 200 countries. Value of trade is reported in thousands of USD and quantity is reported in tons. For each observation, or trade flow, the year, exporter, importer, value, quantity and HS6 product code are reported. BACI has data on trade flows from 1995 to 2016, however, for the purpose of this thesis it was decided to only use the data from 2003 to 2016. The BACI dataset from 2003 to 2016 has more than 100,000,000 observations, of which 16,554 observations are trade flows from Norway to China. When collapsing the dataset to get total export from one country to another for a given year the dataset has 360,533 observations, of which 14 observations are trade flows from Norway to China (CEPII 2018b).

The Gravity dataset includes the most important variables for calculations using the gravity model, such as GDP, population and distance. The values for GDP and population are mainly collected from the World Bank Development Indicators (CEPII 2018c). To calculate the distance between two countries, each country is given a specific coordinate decided by the population distribution in the respective country. By taking the biggest cities in a country and finding the central point between them, while weighing the size of the cities, one coordinate that reflects its economic activity can be given to each country. One can for example imagine that the coordinate for Norway would be quite far south in the country, where most of the economic activity is concentrated, as opposed to the geographical center which is much farther north. For each country-pair, the distance between them is the distance between these coordinates (Mayer and Zignago 2011). The Gravity dataset includes data from 1948 to 2015. The Gravity dataset from 2003 to 2015 has 634,060 observations, of which 13 observations are trade flows from Norway to China (CEPII 2018c).

The statistical software STATA was used for conducting analyses and computing regressions. STATA is commonly used in economics and was chosen for this thesis due to its availability and user-friendliness.

As the Gravity dataset did not include data on trade flows, in order to calculate the gravity model, it had to be merged with the BACI dataset. All intra-country trade was dropped from the Gravity dataset, as it does not match the data in the BACI dataset and is not relevant to the calculation of the gravity model. Additionally, the years 1948-2002 were dropped from the Gravity dataset and the year 2016 was dropped from the BACI dataset. However, the Gravity dataset has
many more country-pairs than the BACI dataset, due to including country-pairs that do not trade or trade very little, for example Western Sahara and Christmas Island. After merging, the trade flows for these country-pairs were considered missing, however, this is not a problem for the regression, as these trade flows are not significant.

From the data available, there are some interesting findings. The most important Norwegian exports to China before 2010, based on the value of the exports, can be seen in Table 1. Here HS4 codes are used instead of HS6 codes, as the HS4 codes are broader and thus able to give a clearer picture of the trade flows.

<table>
<thead>
<tr>
<th>HS4 code</th>
<th>Share of trade (%)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2709</td>
<td>9.89</td>
<td>Petroleum oil and oils obtained from bituminous minerals; crude</td>
</tr>
<tr>
<td>2 0303</td>
<td>9.01</td>
<td>Fish; frozen (excluding fish fillets)</td>
</tr>
<tr>
<td>3 7502</td>
<td>7.51</td>
<td>Nickel; unwrought</td>
</tr>
<tr>
<td>4 2924</td>
<td>6.46</td>
<td>Carboxamide-function compounds; amide-function compounds of carbonic acid</td>
</tr>
<tr>
<td>5 3105</td>
<td>5.62</td>
<td>Fertilizers; mineral or chemical, containing 2 or 3 of the elements nitrogen, phosphorus, potassium; other fertilizers; goods of chapter 31 in tablets or packages of gross weight not exceeding 10kg</td>
</tr>
<tr>
<td>6 8413</td>
<td>3.44</td>
<td>Pumps; for liquids, whether or not fitted with measuring device, liquid elevators</td>
</tr>
<tr>
<td>7 8430</td>
<td>3.44</td>
<td>Moving, grading, levelling, scraping, excavating, tamping, compacting, extracting or boring machinery, for earth, minerals, or ores; pile drivers and extractors; snow ploughs and snow blowers</td>
</tr>
<tr>
<td>8 2516</td>
<td>3.13</td>
<td>Granite, porphyry, basalt, sandstone, other monumental and building stone, whether or not roughly trimmed, cut, by sawing etc, into blocks or slabs of a rectangular (including square) shape</td>
</tr>
<tr>
<td>9 8479</td>
<td>2.93</td>
<td>Machinery and mechanical appliances; having individual functions</td>
</tr>
<tr>
<td>10 8431</td>
<td>2.54</td>
<td>Machinery parts; used solely or principally with the machinery of heading no. 8425 to 8430</td>
</tr>
</tbody>
</table>

Table 1: Norwegian Export Goods to China, 2003-2010

2 Using the BACI dataset for 2003-2010
In a similar way, the most important Norwegian exports to China from 2011 can be found. This is shown in Table 2:

<table>
<thead>
<tr>
<th>HS4 code</th>
<th>Share of trade (%)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2924</td>
<td>13.14</td>
<td>Carboxamide-function compounds; amide-function compounds of carbonic acid</td>
</tr>
<tr>
<td>0303</td>
<td>10.03</td>
<td>Fish; frozen (excluding fish fillets)</td>
</tr>
<tr>
<td>7502</td>
<td>6.92</td>
<td>Nickel; unwrought</td>
</tr>
<tr>
<td>3105</td>
<td>6.18</td>
<td>Fertilizers; mineral or chemical, containing 2 or 3 of the elements nitrogen, phosphorus, potassium; other fertilizers; goods of chapter 31 in tablets or packages of gross weight not exceeding 10kg</td>
</tr>
<tr>
<td>2709</td>
<td>2.99</td>
<td>Petroleum oil and oils obtained from bituminous minerals; crude</td>
</tr>
<tr>
<td>9032</td>
<td>2.94</td>
<td>Regulating or controlling instruments and apparatus; automatic type</td>
</tr>
<tr>
<td>2707</td>
<td>2.72</td>
<td>Oils and other products of the distillation of high temperature coal tar; similar products in which the weight of the aromatic constituents exceeds that of the non-aromatic constituents</td>
</tr>
<tr>
<td>8431</td>
<td>2.58</td>
<td>Machinery parts; used solely or principally with the machinery of heading no. 8425 to 8430</td>
</tr>
<tr>
<td>8479</td>
<td>2.38</td>
<td>Machinery and mechanical appliances; having individual functions</td>
</tr>
<tr>
<td>2516</td>
<td>2.35</td>
<td>Granite, porphyry, basalt, sandstone, other monumental and building stone, whether or not roughly trimmed, cut, by sawing etc, into blocks or slabs of a rectangular (including square) shape</td>
</tr>
</tbody>
</table>

While there are some small changes, the tables show that there was little difference in what Norway was exporting to China before and after the Nobel Peace Prize was awarded in 2010.

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3 Using the BACI dataset for 2011-2016
The descriptive statistics for the most important variables in the BACI dataset\(^4\), which is the most used, can be seen in Table 3. The main variables are the natural logarithm of the trade flow value (which is reported in 1,000 USD), \(\text{logvalue}\), and the dummy variable \(X\), which is equal to 1 if the trade flow is from Norway to China in the years 2011-2016 and 0 otherwise.

<table>
<thead>
<tr>
<th></th>
<th>logvalue</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td>360,533</td>
<td>360,533</td>
</tr>
<tr>
<td>Mean</td>
<td>7.888494</td>
<td>0.0000166</td>
</tr>
<tr>
<td>Median</td>
<td>7.926629</td>
<td>0</td>
</tr>
<tr>
<td>Mode</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Min</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Max</td>
<td>19.94696</td>
<td>1</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>3.858825</td>
<td>0.0040794</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.286424</td>
<td>60086.83</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.050613</td>
<td>245.1241</td>
</tr>
</tbody>
</table>

### 4.3 Methodology

In order to analyze the effect of the Chinese sanctions on Norwegian export to China, regressions based on the gravity model of international trade will be run. First, the effect on the overall export will be considered, followed by an analysis of several industries and products. For analyzing the overall effect, three different regressions will be run, an OLS regression (Regression 1), a country-pair fixed effects regression (Regression 2), and a country-pair, source-year, destination-year fixed effects regression (Regression 3). Following the calculations, an evaluation of which of these regressions is considered the best for analyzing the effects of the sanctions will be performed.

\(^4\) After product values are aggregated across countries and year
The OLS regression (Regression 1) is the simplest of the three regressions, and the one that most closely resemble the original gravity equation. OLS is based on the lines of best fit used to show the relationship between trade and GDP or trade and distance. For the OLS estimates to be statistically useful, these conditions are necessary: The error terms must have a mean of zero and be uncorrelated to the explanatory variables, the error terms must be independently and identically distributed, and the explanatory variables cannot be a linear combination of other explanatory variables. If these conditions are fulfilled, the OLS estimates will be consistent, unbiased and efficient (Shepherd 2016, p. 17). In order to go from the gravity equation (Equation 1) to OLS, one needs simply to take the natural logarithm of both sides. Due to the laws of logarithms, the terms can then be split into additive terms. The OLS regression thus takes the following form:

\[ \ln y_{ijt} = \alpha + \beta_1 \ln Y_{it} + \beta_2 \ln Y_{jt} + \gamma \ln d_{ij} + \eta X_{ijt} + \varepsilon_{ijt} \] (2)

where \( y_{ijt} \) is the value of the export from country \( i \) to country \( j \) in year \( t \), \( Y_{it} \) is the GDP of the exporting country \( i \) in year \( t \), \( Y_{jt} \) is the GDP of the importing country \( j \) in year \( t \), \( d_{ij} \) is the distance between country \( i \) and country \( j \), \( X_{ijt} \) is a dummy for the sanctions which is equal to 1 if the trade flow is from Norway to China in the years 2011-2015 and 0 otherwise, \( \alpha \) is a constant, and \( \varepsilon_{ijt} \) is the error term. \( \beta_1, \beta_2, \gamma \) and \( \eta \) are parameters. The parameter of interest is \( \eta \), as this shows the effect of the sanctions. Finally, the regression, along with all the following regressions, will use robust standard errors, which means that it will allow heteroscedastic standard errors. This is important because it is possible that the variables have different variances over different observation points, something which will not be accounted for by using normal standard errors. Even though the Nobel Peace Prize was awarded in 2010, it was announced on October 8, which the ceremony itself being on December 10. Thus, it is unlikely that any sanctions China imposed had much effect before 2011, which is why the dummy variable for the sanctions is set to 2011 and later. However, while the OLS regression is simple, it is more prone to bias than the other regressions. One problem is that since the logarithm of zero is not defined, observations with no trade flows (value of zero) will be omitted, leading to loss of information, which again can lead to biased estimates. However, this is also a problem for Regression 2 and Regression 3. Another disadvantage is that many observable and unobservable factors are not included. While it is possible to add dummy variables for the observable factors, such as common land border, common language, former colonial relationship, trade agreements and so on, this can be a quite tedious process. Regression 1 was
based on data from both the Gravity dataset and the BACI dataset and will therefore include the years 2003-2015.

There are several ways to improve the result. One is to use an instrumental variable (IV) approach, but one then faces the difficulty of finding a valid and strong instrument. Head and Mayer (2014, p. 162) argues that in lacking a plausible instrument, the best method is to rely on country-pair fixed effects. They claim that this “forces identification to come from within the dimension of the data.” Technically, fixed effects are a range of dummy variables that equal 1 for the country-pair in question and 0 otherwise. When considering panel data, this accounts for all sources of observed and unobserved heterogeneity that are constant for the given country-pairs across time. Using a country-pair fixed effect estimation leads to Regression 2, which takes the following form:

\[ \ln y_{ijt} = \alpha \ln Y_{it} + \beta \ln Y_{jt} + \gamma_{ij} + \eta X_{ijt} + \epsilon_{ijt} \]  

(3)

where \( y_{ijt} \) is the value of the export from country \( i \) to country \( j \) in year \( t \), \( Y_{it} \) is the GDP of the exporting country \( i \) in year \( t \), \( Y_{jt} \) is the GDP of the importing country \( j \) in year \( t \), \( \gamma_{ij} \) is the country-pair fixed effect, \( X_{ijt} \) is a dummy for the sanctions which is equal to 1 if the trade flow is from Norway to China in the years 2011-2015 and 0 otherwise, and \( \epsilon_{ijt} \) is the error term. \( \alpha, \beta \) and \( \eta \) are parameters. The parameter of interest is \( \eta \), as this shows the effect of the sanctions. The advantage of using fixed effects is that they can capture the variation within country-pairs to help identify causal relationships. Firstly, the fixed effect model includes most observable variables that are excluded from the OLS, such as dummy variables for common borders, common language and trade agreements, without the need to consider which variables to include and which not to. Importantly, distance is no longer reported as an independent variable, but is included in the fixed effect. Secondly, it also includes unobservable variables such as multilateral resistance terms, or relative trade costs, as long as they are time constant. As these are relative values, they are not reported by any trade authority and are thus not observable. Failing to take multilateral resistance terms into account can overstate bilateral trade elasticities (Behar and Nelson 2012). Using the fixed effect estimation will also provide consistent estimates for the gravity model (Shepherd 2016, p. 23). Like Regression 1, Regression 2 also uses data from both the Gravity dataset and the BACI dataset and includes the years 2003-2015.
In addition to using country-pair fixed effects, it is possible to add source-year and destination-year fixed effects. Like in the previous regression, these fixed effects will account for all factors that are specific to the exporting country and importing country respectively, such as GDP. This leads to Regression 3, which takes the following form:

$$\ln y_{ijt} = \alpha_{it} + \beta_{jt} + \gamma_{ij} + \eta X_{ijt} + \epsilon_{ijt}$$ \hspace{1cm} (4)

where $y_{ijt}$ is the value of the export from country $i$ to country $j$ in year $t$, $\alpha_{it}$ is the source-year fixed effect, $\beta_{jt}$ is the destination-year fixed effect, $\gamma_{ij}$ is the country-pair fixed effect, $X_{ijt}$ is a dummy for the sanctions which is equal to 1 if the trade flow is from Norway to China in the years 2011-2016 and 0 otherwise, and $\epsilon_{ijt}$ is the error term. $\eta$ is a parameter and shows the effect of the sanctions. Unlike Regression 2, Regression 3 captures the variation not only within country-pairs, but also within countries themselves, allowing for more observable and unobservable factors to be accounted for. Additionally, as Regression 3 does not include variables for GDP or distance, it does not use data from the Gravity dataset but only from the BACI dataset. It therefore includes the years 2003-2016, one more year than Regression 1 and Regression 2. Regressions 1-3 were used to test Hypothesis 1.

To check the robustness of the results, several methods were used. The first was a modified version of Regression 3, but splitting the $X$ variable into parts, one for each year in the BACI dataset, 2003-2016. This was to check if the sanctions only lasted for the whole period or only a short period, and also to see if there is a significant difference before and after 2010. The regression takes the following form:

$$\ln y_{ijt} = \alpha_{it} + \beta_{jt} + \gamma_{ij} + \eta_3 X_{3ijt} + \eta_4 X_{4ijt} + \eta_5 X_{5ijt} + \eta_6 X_{6ijt} + \eta_7 X_{7ijt} + \eta_8 X_{8ijt} + \eta_9 X_{9ijt} + \eta_{10} X_{10ijt} + \eta_{11} X_{11ijt} + \eta_{12} X_{12ijt} + \eta_{13} X_{13ijt} + \eta_{14} X_{14ijt} + \eta_{15} X_{15ijt} + \eta_{16} X_{16ijt} + \epsilon_{ijt}$$ \hspace{1cm} (5)

where $y_{ijt}$ is the value of the export from country $i$ to country $j$ in year $t$, $\alpha_{it}$ is the source-year fixed effect, $\beta_{jt}$ is the destination-year fixed effect, $\gamma_{ij}$ is the country-pair fixed effect, $X_{3ijt}$ is a dummy which is equal to 1 if the trade flow is from Norway to China in the year 2003 and 0 otherwise, $X_{4ijt}$ is the same for 2004, and so on until 2016, and $\epsilon_{ijt}$ is the error term. $\eta_3, \eta_4, ..., \eta_{16}$ are parameters and show the effect of the sanctions in the given year.
The second method employed to check the robustness was to consider a control group. This was done by having Norway and four other similar countries as the only exporters, and China and four other similar countries as the only importers. All other observations were disregarded. For the countries similar to Norway, the other Nordic countries, Denmark, Sweden, Finland and Iceland, were chosen due to their proximity in size, geographical position and economic policy. Finding countries similar to China was much more difficult, ultimately India, Indonesia, Vietnam and the Philippines were chosen. The reason for these countries being chosen is that they are all relatively geographically close to another, as well as all being developing countries with a large population. By using Regression 3, the effect of the sanctions was tested again on this group of countries.

However, many international trade sanctions do not target all trade between the countries involved, but rather specific industries or sectors, such as China’s restrictions on Philippine bananas in 2012 (Asia Sentinel 2012) or the US’ import quota on Cuban sugar in 1960 (Wolfe 2010). As China did not formally impose sanctions on Norwegian exports in 2010, no industry or product was formally targeted either. Despite this, particularly Norwegian salmon export was being singled out by the media as having been hit hard by the sanctions. This thesis therefore analyzed the effect of the sanctions on chemicals, crude petroleum, machinery, salmon, and seafood excluding salmon. These industries and products were chosen due to their importance for Norwegian exports, together accounting for more than 60 percent of Norwegian exports to China in 2016. While salmon stood for a very low share of Norwegian export to China, its media attention made it worthwhile to analyze. These regressions tested Hypothesis 2.

Chemicals in this thesis means cyclic amides (HS6 292429) and fertilizers (HS6 310520), which together accounts for almost all of Norway’s export of chemicals to China. Chemicals were the most valuable of Norway’s exports to China from 2011 to 2016. Machinery (all HS6 codes starting with 84 and 85) was from 2011 to 2016 the second most valuable export, while crude petroleum (HS6 270900) was the fifth most valuable export. Due to several types of seafood being among Norway’s main export to China, including mackerel, cod and haddock, these are grouped together, and this group contains all seafood (HS6 starting with 03) other than salmon (fresh: HS6 030212; frozen: HS6 030322). For each of these industries and products, the thesis evaluated how important the Chinese market is for Norwegian exporters and to what extent the sanctions had an effect. The effects of the sanctions on these industries and products were estimated by using Regression 3. Any significant results were tested for robustness.
Lastly, it was interesting to see whether or not China reduced its own exports to Norway following the Nobel Peace Prize award. As Norway is importing large quantities of machines, electronics and textiles from China, another way for China to punish Norway would be to limit its export of these goods. To test this, a regression like Regression 3 was used:

\[ \ln y_{ijt} = \alpha_{it} + \beta_{jt} + \gamma_{ij} + \eta X_{ijt} + \varepsilon_{ijt} \]  

(6)

where \( y_{ijt} \) is the value of the export from country \( i \) to country \( j \) in year \( t \), \( \alpha_{it} \) is the source-year fixed effect, \( \beta_{jt} \) is the destination-year fixed effect, \( \gamma_{ij} \) is the country-pair fixed effect, \( X_{ijt} \) is a dummy which is equal to 1 if the trade flow is from China to Norway in the years 2011-2016 and 0 otherwise, and \( \varepsilon_{ijt} \) is the error term. \( \eta \) is a parameter and shows the effect of the sanctions.
5 Empirical Findings

5.1 Results and Robustness

5.1.1 Effects on the Overall Norwegian Economy

Three different regressions were used in order to analyze the effects of the sanctions on Norwegian exports to China. The results are shown in Table 4:

<table>
<thead>
<tr>
<th>Variables</th>
<th>(1) Regression 1</th>
<th>(2) Regression 2</th>
<th>(3) Regression 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanctions 2011-2016</td>
<td>0.386***</td>
<td>-0.276***</td>
<td>-0.239*</td>
</tr>
<tr>
<td></td>
<td>(0.051)</td>
<td>(0.078)</td>
<td>(0.122)</td>
</tr>
<tr>
<td>log distance</td>
<td>-1.343***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>log GDP exporter</td>
<td>1.147***</td>
<td>0.399***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.015)</td>
<td></td>
</tr>
<tr>
<td>log GDP importer</td>
<td>0.881***</td>
<td>0.769***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.014)</td>
<td></td>
</tr>
<tr>
<td>constant</td>
<td>-29.681***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.087)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year fixed effect</td>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country-pair fixed effect</td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Source-year fixed effect</td>
<td></td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>Destination-year fixed effect</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>276,921</td>
<td>274,862</td>
<td>357,243</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.648</td>
<td>0.908</td>
<td>0.910</td>
</tr>
</tbody>
</table>

The result from the OLS regression (Regression 1) was unexpected, as it indicates that the sanctions increased Norway’s export to China. As discussed earlier, the OLS regression faces several problems and may not be considered reliable in this case. Its R-squared of 0.648 means that it can explain around 65% of the variation of the data, which is much less than the other two
regressions. Regression 2 and Regression 3 provide similar results to each other. They both report a negative coefficient for the sanctions dummy, which is in line with what was expected, though Regression 2 shows a somewhat larger effect. Their R-squareds mean they are both able to explain more than 90% of the variation in the data, mostly due to including many more variables. While Regression 2 is significant at the one percent-level, Regression 3 is only significant at the ten percent-level, but they both indicate that the sanctions had a negative effect on Norwegian exports to China after 2010. As for which regression method is the better, Regression 3 has a higher R-squared than Regression 2, and due to including more fixed effects, it controls for more observable and unobservable variables than Regression 2. Additionally, Regression 3 has many more observations that the other two regressions, which is partly because it includes one more year, but also because the Gravity dataset, which is used for Regression 1 and Regression 2, has many values as missing, which leads to those observations being disregarded during the regression. Because of this, Regression 3 was considered the most suitable regression method and was the basis for the other regressions in this thesis. The result from Regression 3 shows that, as a result of the sanctions, Norwegian exports to China between 2011 and 2016 were 21\(^5\) percent lower than what they would have been had China not imposed any sanctions. This corresponds to a potential loss of 5.5 billion USD for Norwegian exporters in this period.

To check the robustness of the results, first a modified version of Regression 3 with yearly effect dummies was used. This can be seen in Table 5.

\[ 1-\exp(-0.239)=0.212 \]
Table 5: Effects of Sanctions on Norwegian Exports to China by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>0.347**</td>
<td>(0.159)</td>
</tr>
<tr>
<td>2004</td>
<td>0.260*</td>
<td>(0.156)</td>
</tr>
<tr>
<td>2005</td>
<td>-0.249*</td>
<td>(0.146)</td>
</tr>
<tr>
<td>2006</td>
<td>0</td>
<td>(omitted)</td>
</tr>
<tr>
<td>2007</td>
<td>-0.293**</td>
<td>(0.137)</td>
</tr>
<tr>
<td>2008</td>
<td>-0.151</td>
<td>(0.143)</td>
</tr>
<tr>
<td>2009</td>
<td>0.251*</td>
<td>(0.140)</td>
</tr>
<tr>
<td>2010</td>
<td>0.047</td>
<td>(0.129)</td>
</tr>
<tr>
<td>2011</td>
<td>-0.061</td>
<td>(0.133)</td>
</tr>
<tr>
<td>2012</td>
<td>-0.479***</td>
<td>(0.136)</td>
</tr>
<tr>
<td>2013</td>
<td>-0.389***</td>
<td>(0.135)</td>
</tr>
<tr>
<td>2014</td>
<td>-0.119</td>
<td>(0.144)</td>
</tr>
<tr>
<td>2015</td>
<td>-0.085</td>
<td>(0.138)</td>
</tr>
<tr>
<td>2016</td>
<td>-0.139</td>
<td>(0.146)</td>
</tr>
</tbody>
</table>

Country-pair fixed effect: YES
Source-year fixed effect: YES
Destination-year fixed effect: YES

Observations: 357,243
R-squared: 0.910

Robust standard errors in parenthesis
*** p<0.01 ** p<0.05 * p<0.1
The results from Table 5 back up the results from Table 4. They show a consistent negative effect from the sanctions since 2011, with 2012 and 2013 being statistically significant. Thus, it is possible that it during these years was a relative decline in Norwegian exports to China due to the sanctions, but that this effect became smaller from 2014. While there are many years prior to 2010 that also are significant, the fact that these results show both positive and negative effects, as opposed to the years after 2010 which only show negative effects, indicates that the sanctions did have an effect on Norwegian exports to China. The result for 2006 was omitted due to collinearity. The sample used in the regression has a very high number of observations. As this leads to smaller standard errors, it does not take too much for a result to be statistically significant.

Another way to check the robustness was to repeat the regression with a control group of five exporting countries (Norway, Sweden, Denmark, Finland and Iceland) and five importing countries (China, India, Indonesia, the Philippines and Vietnam). The result of this can be seen in Table 6.

<table>
<thead>
<tr>
<th>Table 6: Effects of Sanctions on Norwegian Exports to China with Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable = Natural logarithm of Trade Value</td>
</tr>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>Sanctions 2011-2016</td>
</tr>
<tr>
<td>Country-pair fixed effect</td>
</tr>
<tr>
<td>Source-year fixed effect</td>
</tr>
<tr>
<td>Destination-year fixed effect</td>
</tr>
<tr>
<td>Observations</td>
</tr>
<tr>
<td>R-squared</td>
</tr>
</tbody>
</table>

Robust standard errors in parenthesis
*** p<0.01 ** p<0.05 * p<0.1

The control group also seems to support the findings in Table 3. As such, there is evidence indicating that the sanctions China imposed following the Nobel Peace Prize awards had a negative effect on Norwegian exports to China. There can be several reasons for this, which will be discussed later.
5.1.2 Effects on Individual Industries or Products

While there is evidence to suggest that the sanctions had a significant effect on Norwegian exports to China as a whole, it is possible that certain industries or products were affected more than others, or that some were left unaffected. This thesis analyzed the effects on chemicals, crude petroleum, machinery, salmon, and seafood excluding salmon. These are all important export articles for Norway, and the following figures will show how important the Chinese market is for Norway’s export of these goods:

Figure 4 shows the share of the Norwegian chemicals exports that is sent to China. As seen, China is a very important market for Norwegian chemicals. Though there was a fall in the share of Norwegian chemicals going to China in 2010, there has been an upwards trend since then, spiking at about 50 percent in 2015. This trend ended in 2016 with a small reduction, but China is still the...
destination for more than half of Norway’s chemicals exports. While the fall in 2010 could be attributed to the Nobel Peace Prize, the later results show that there is little to indicate this.

Figure 5 shows the share of the Norwegian machinery exports that is sent to China. The graph suggests a slight upwards trend of Norwegian machinery export to China since 2003, though with some falls, most notably in 2010, 2012 and 2016. However, while a large share of Norway’s export to China is machinery, not too much of Norway’s machinery export is sent to China, mostly lying between 6 and 8 percent of total machinery export. Again, it is possible to interpret the falls in 2010, 2012 and 2016 as a result of the Chinese sanctions, but this is not supported by the later results.

Source: Author’s own processing based on data from CEPII
Figure 6 shows the share of the Norwegian oil exports that is sent to China. Crude oil is alongside gas Norway’s most important export good. Norwegian crude oil export to China has been heavily fluctuating since 2003, with nothing being exported in 2008, 2012 and 2013. Despite a large increase in 2016, China remains a fairly insignificant market for Norwegian oil, with less than 1.5 percent of Norway’s oil exports going to China. Imposing sanctions on oil from Norway would likely be very ineffective as a means to punish Norway, and there is no indication that any such sanctions were imposed.
Figure 7 shows the share of the Norwegian seafood exports that is sent to China. The share of Norwegian seafood as a whole being sent to China has mostly been between 3 to 5 percent, which is not a very large amount. For salmon it is even lower, mostly being around 1 to 2 percent. Salmon saw a large fall in 2011, which can indicate that sanctions were imposed. However, this does not seem to be the case for seafood other than salmon.

As seen from these graphs, the share of Norwegian chemicals going to China has been steadily increasing for most of the last 15 years, and China is now the destination of half of Norwegian chemicals being exported. For the other products, however, China remains a fairly insignificant market, particularly for petroleum and salmon. Yet several of these graphs, such as for chemistry, machinery and salmon, indicate that there might have been some short-term effects of the sanctions. The results from the regressions are shown in Table 7.
Table 7: Effects of Sanctions on Norwegian Goods Exports to China

<table>
<thead>
<tr>
<th>Variables</th>
<th>(6) Chemicals</th>
<th>(7) Machinery</th>
<th>(8) Oil</th>
<th>(9) Salmon</th>
<th>(10) Seafood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanctions 2011-2016</td>
<td>0.094</td>
<td>0.081</td>
<td>-0.513</td>
<td>-1.971***</td>
<td>-0.130</td>
</tr>
<tr>
<td></td>
<td>(0.277)</td>
<td>(0.157)</td>
<td>(0.498)</td>
<td>(0.577)</td>
<td>(0.187)</td>
</tr>
<tr>
<td>Country-pair fixed effect</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Source-year fixed effect</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Destination-year fixed effect</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

Observations | 38,100 | 253,934 | 13,053 | 11,351 | 94,080 |
R-squared     | 0.806  | 0.908   | 0.902  | 0.875  | 0.866  |

Robust standard errors in parentheses

*** p<0.01 ** p<0.05 * p<0.1

The results show that there is no statistically significant proof that chemicals, machinery, oil or seafood in general was hit by the sanctions. While the results for oil and seafood are negative, their standard errors are large. Salmon, on the other hand, gives a significant reduction in exports as a result of the sanctions. However, this includes both fresh/chilled and frozen salmon. Therefore, the effect of the sanctions was tested on both types, as seen in Table 8.
These results show that there is little indication that frozen salmon was targeted, though it is quite clear that fresh/chilled salmon exports suffered as a result of the sanctions China imposed after the Nobel Peace Prize award. The coefficient for fresh salmon is -2.427, which implies that the export of fresh salmon from Norway to China after 2010 was 92 percent lower than it would have been without the sanctions.\(^6\) Between 2011 and 2016, Norway exported fresh/chilled salmon to China worth around 280 million USD. However, without the sanctions, this might have been over 3 billion USD. Why salmon, for which China is a very small market, was hit by sanctions, but seemingly no other product or industry was, will be discussed later.

To check the robustness of this result, a similar test was done as before, by adding a dummy variable for each year in the regression. The result is seen in Table 9.

\(^{6}\) \(1 - \exp(-2.427) = 0.916\)
<table>
<thead>
<tr>
<th>Variables</th>
<th>Salmon, by year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>-1.12</td>
</tr>
<tr>
<td></td>
<td>(1.262)</td>
</tr>
<tr>
<td>2004</td>
<td>0.251</td>
</tr>
<tr>
<td></td>
<td>(1.152)</td>
</tr>
<tr>
<td>2005</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(omitted)</td>
</tr>
<tr>
<td>2006</td>
<td>-0.098</td>
</tr>
<tr>
<td></td>
<td>(1.257)</td>
</tr>
<tr>
<td>2007</td>
<td>0.398</td>
</tr>
<tr>
<td></td>
<td>(0.126)</td>
</tr>
<tr>
<td>2008</td>
<td>0.442</td>
</tr>
<tr>
<td></td>
<td>(1.161)</td>
</tr>
<tr>
<td>2009</td>
<td>0.351</td>
</tr>
<tr>
<td></td>
<td>(1.278)</td>
</tr>
<tr>
<td>2010</td>
<td>0.630</td>
</tr>
<tr>
<td></td>
<td>(1.213)</td>
</tr>
<tr>
<td>2011</td>
<td>-2.249**</td>
</tr>
<tr>
<td></td>
<td>(1.139)</td>
</tr>
<tr>
<td>2012</td>
<td>-0.845</td>
</tr>
<tr>
<td></td>
<td>(1.212)</td>
</tr>
<tr>
<td>2013</td>
<td>-1.856*</td>
</tr>
<tr>
<td></td>
<td>(1.102)</td>
</tr>
<tr>
<td>2014</td>
<td>-1.810*</td>
</tr>
<tr>
<td></td>
<td>(1.062)</td>
</tr>
<tr>
<td>2015</td>
<td>-2.875**</td>
</tr>
<tr>
<td></td>
<td>(1.393)</td>
</tr>
<tr>
<td>2016</td>
<td>-4.134***</td>
</tr>
<tr>
<td></td>
<td>(1.184)</td>
</tr>
</tbody>
</table>

Country-pair fixed effect: YES
Source-year fixed effect: YES
Destination-year fixed effect: YES

Observations: 8,035
R-squared: 0.886

Robust standard errors in parenthesis

*** p<0.01 ** p<0.05 * p<0.1
The results from all years after 2010, apart from 2012, are statistically significant. The reason for 2012 not being significant can be that exports in salmon rebounded and came close to the level from 2010 again. None of the results from 2010 or before are statistically significant, and while the result from 2005 was omitted due to collinearity, this suggests that the method used correctly estimates the effects of the sanctions. The fact that all the dummies after 2010 have a negative coefficient is in support of the result from before and indicates that Norwegian export of salmon to China was hit by sanctions after the 2010 Nobel Peace Prize award.

5.1.3 Effects on China’s Export to Norway

As mentioned, it could also be possible for China to punish Norway by limiting its own exports to Norway. As Norway is a fairly small market for China, this would likely not have brought much harm to Chinese exporters. This was tested with a similar regression to Regression 3, and the results can be seen in Table 10.

<table>
<thead>
<tr>
<th>Table 10: Effects of Sanctions on Chinese Exports to Norway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable = Natural logarithm of Trade Value</td>
</tr>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>Sanctions 2011-2016</td>
</tr>
<tr>
<td>Country-pair fixed effect</td>
</tr>
<tr>
<td>Source-year fixed effect</td>
</tr>
<tr>
<td>Destination-year fixed effect</td>
</tr>
<tr>
<td>Observations</td>
</tr>
<tr>
<td>R-squared</td>
</tr>
</tbody>
</table>

Robust standard errors in parenthesis
*** p<0.01 ** p<0.05 * p<0.1
While the regression indicates a negative effect, meaning that China’s exports to Norway fell after 2010, the result is not statistically significant. As such there is little proof that China was trying to punish Norway in this way.

5.1.4 Econometric concerns

It is possible that other factors than the sanctions imposed by China could have had an effect on the bilateral trade between Norway and China. These include changes in the exchange rates, the global shipping crisis, the Chinese economy’s transition to the “New Normal”, the recent demand and price fall of minerals, the oil crisis, and China’s new trade agreements with Southeast Asian countries. The thesis gives a brief overview of how these could affect the trade and assess whether or not they are already accounted for in the model used.

Currency exchange rates tells how much of one currency one must pay in order to buy another currency. An appreciation, or increase, in a country’s exchange rate means that it needs to pay less for other countries’ currencies, and thus for their products. It can therefore boost import. On the other hand, it also makes foreign countries having to pay more for the country’s exports, which might lead to a fall in exports. In the period since 2010, both the Norwegian krone and the Chinese yuan have seen changes in their exchange rate. The krone is heavily reliant on the oil price, as such, the huge fall in the oil price in 2014 led to a massive depreciation of the krone (Jensen 2016). In contrast, the Chinese yuan – which many politicians and experts claim was long undervalued – has been slowing appreciating for a long time, despite a devaluation by the Chinese government in August 2015 (Rothko Research 2016). Both of these events would make Norwegian products cheaper in China, which would likely increase exports. Thus, this could offset a potential fall in exports as a result of sanctions. As long as changes in the exchange rate affect all of a country’s trading partner this should already be accounted for in Regression 3, as part of the source-year and destination-year fixed effects. It should therefore not affect the sanction coefficient. However, if the Norwegian krone appreciated or depreciated in relation to the Chinese yuan, but not in relation to other currencies, this would not be captured by the model, and could be a problem. Figure 8 shows the development of the Norwegian krone in relation to the Chinese yuan and a basket of other currencies.
The trade-weighted effective exchange rate index (TWI) is an index showing the value of the Norwegian krone measured against a weighted average of the currencies of 25 of Norway’s most important trading partners. An increasing index value represents a depreciation of the Norwegian krone. 100 CNY shows how much 100 Chinese yuan are worth in Norwegian kroner. As can be seen, the Chinese yuan has mostly been following the TWI since 2010 but appreciated at the end of 2014. This would make Norwegian goods cheaper to buy in China, which would often lead to increased exports from Norway to China. As this is not accounted for in the model, it might make it underestimate the trade loss. Nonetheless, it does not affect the fact that Sino-Norwegian trade relations did suffer as a result of the Nobel Peace Prize award.

A global shipping crisis, which peaked in 2016 when the South Korean Hanjin company bankrupted, saw many shipping companies around the world bankrupting from 2015 and onwards. This resulted in it being more difficult to ship goods, especially fresh food such as salmon, thus potentially reducing exports (Barry 2016). Because this was affecting Norway’s trade with all overseas countries, it should be included in the model as part of the source-year effect.

In May 2014, Chinese President Xi Jinping introduced the phrase “New Normal” when describing the next phase of China’s economic development. As China’s economic growth had
been steadily declining for several years, the “New Normal” will see a slower but more sustainable economic growth. China will try to move its economy from being driven by investments to being driven by innovation. As such, China will have a lower demand for goods spurring economic growth, such as chemicals, machinery and raw materials (China Daily 2017). As these goods account for a very large part of Norway’s exports to China, it would seem likely that China would reduce its imports from Norway, regardless of the 2010 Nobel Peace Prize award. However, this should already be captured by the model through the destination-year fixed effect, as this effect is specific to China.

Starting in the summer of 2014, the international crude oil price started falling, from $115 a barrel to less than $35 a barrel in January 2016. This was largely fueled by the huge increase in supply of American shale oil, which due to new technology and the high oil price had started becoming profitable (Rogoff 2016; Kilian 2015). Because crude oil is a very large part of Norway’s export, also to China, this would mean that the value of Norway’s exports to China would decrease. As the oil price fall is specific to Norway (and other oil-producing countries) it should already be included in the model as a source-year effect.

Furthermore, during the last years, international prices for metals and minerals have fallen significantly. This is mainly because the slowing growth of China is causing it to reduce its demand, and China stood for a large portion of the demand for these raw materials (Sanderson 2015). As Norway is exporting several metals and minerals, such as aluminum, nickel and copper, also to China, this lowers the value of Norway’s exports to China, in the same way as for crude oil. Like crude oil, this should also already be included in the model as a source-year effect.

On January 1, 2010, the ASEAN7-China Free Trade Area came into effect. It was at the time the world’s third largest free trade area (Gooch 2009). This could make it cheaper for China to import goods from the ASEAN countries, and as a result, it might have reduced its imports from countries such as Norway. While most of Norwegian exports to China are not competing with those of ASEAN, some products such as minerals and crude oil are. On the other hand, tariffs between ASEAN and China were already quite small. While the effect of this Free Trade Area is not captured by the fixed effects of the model, it is unlikely that it had a significant effect on Sino-Norwegian trade.

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7 Association of Southeast Asian Nations, consisting of Thailand, Laos, Cambodia, Vietnam, Myanmar, Malaysia, Singapore, Brunei, Indonesia and the Philippines
5.2 Discussion of Findings

The findings in this thesis indicate that Norwegian exports to China as a whole were affected negatively by the sanctions China imposed after the Nobel Peace Prize award in 2010. This is in contrast to what was predicted in Hypothesis 1, which assumed that exports on the aggregate level were not affected by the sanctions, and thus Hypothesis 1 is rejected. The results indicate that, as a consequence of the sanctions China imposed, Norwegian exports to China after 2010 were 21 percent, or 5.5 billion USD, lower than they might have been if not for the sanctions. Fresh/chilled salmon was the only product or industry that was found to be clearly hit by the sanctions, which is also suggested in a report from Statistics Norway in September 2011 (all salmon mentioned hereafter will be fresh or chilled). The reason why there was a significant negative result for overall exports but not for any individual product or industry other than salmon is probably because the trade in individual products and industries has a much higher variation over time, which makes it difficult to get any statistically significant results. While it seems that no other industry than salmon was specifically targeted by China, it is possible that Chinese firms were more reluctant to do business with Norwegian firms following the freezing of political relations, as well as Norwegian firms being more reluctant to do business in China, as it could be possible that China would impose further sanctions. In order to avoid this uncertainty, Norwegian and Chinese firms might have found it safer to find other trading partners. This is not to say that Norwegian exports to China decreased following the sanctions, as exports from 2010 to 2014 still rose with more than 33 percent. However, following 2014 Norwegian exports to China started falling again and in 2016 they were back to the same level as 2010, though it is hard to say how much of this was a result of the sanctions, as Table 5 (p. 33) does not give significant results from the sanctions for these years.

From the results, it seems that Norwegian salmon export to China suffered as a result of the sanctions. Salmon exports to China fell by around 63 percent between 2010 and 2011, meaning a loss of 48 million USD, but in 2012 they were back to 95 percent of the level in 2010. While this suggests that the effects of the sanctions were quite short-lived, it should be noted that China actually increased its salmon import by almost 50 percent during these two years. As such, Norway, which had controlled 80 percent of the Chinese salmon market prior to the Nobel Peace Prize award, saw its market share drop to around 50 percent in 2012. This fall continued after 2012, as can be seen in Figure 9. The results indicate that Norwegian export of salmon to China
after 2010 were 92 percent lower than they might have been if not for the sanctions, corresponding to a potential loss of 3 billion USD. Thus, most of Norway’s potential loss of 5.5 billion USD in exports to China was because of salmon. However, China’s total import of salmon in the period 2011-2016 was for 1.5 billion USD, suggesting that the number from the result is inflated. Yet, it is also possible that China would have increased its salmon imports even more if it had not imposed sanctions on Norway and that Norway would have remained its largest source of salmon.

Figure 9 shows China’s main sources of imported salmon, which together account for more than 99 percent of its salmon imports in every year from 2003 and 2016. As can be seen, Norway’s market share has dropped considerably since 2010 and was reduced to around 5 percent in 2016. Countries such as the United Kingdom, Denmark and recently Chile and Canada have started to gain a larger market share. In March 2014, China announced it would stop all imports of Norwegian salmon from the counties Sør-Trøndelag, Nordland and Troms, claiming the salmon
was infected by a disease. Exporters from other Norwegian counties would have to test their salmons to control for any sign of this disease, otherwise they would not be allowed to export to China (Lysvold 2015). The same was not applied to exporters from other countries, and Norwegian exporters claimed China had no documentation proving that this disease was found in Norwegian salmon (Chen and Garcia 2016). While a solution was reached in April the same year so that Norwegian salmon could be sent to China, this did not include salmon from the three aforementioned counties (Mikalsen 2015). However, as suggested by Chen and Garcia (2016), the official trade data are not fully reliable regarding Norwegian export of salmon to China after 2010. They claim that Norwegian salmon was sent to Hong Kong or Vietnam and then re-exported to China (Figure 10).

Figure 10 shows trade in salmon between Norway, Hong Kong, Vietnam and China. Most notable is the huge increase of Norwegian export to Vietnam after 2010. Yet, there is no increase in the

![Figure 10: Exports of Fresh/Chilled Salmon](image-url)
export of salmon from Vietnam to China, which in fact is zero for all years except 2016, and even then is marginal. The data does not show that Vietnam increased its salmon export to any other country either. As it is very unlikely that Vietnamese consumers suddenly increased their consumption of salmon 27-fold between 2010 and 2013, and yet more from 2013 to 2016, the most likely solution is that Norwegian salmon was sent to Vietnam and then smuggled into China, as claimed by Chen and Garcia (2016). Assuming this to be true, Norwegian salmon export to China was higher than ever during this period. While Hong Kong could also have served as a gateway into China, there is little indication that Hong Kong was used, as the increase in salmon export to Hong Kong was within what one could expect from Hong Kongese consumers’ demand. Chen and Garcia (2016) further claim that several of the fisheries in the United Kingdom and Denmark are owned by Norwegian companies, and that these firms simply shifted their source of export to China from Norway to elsewhere, as salmon from other countries, despite being owned by Norwegian companies, was not targeted by the sanctions. As shown in Figure 11, the sanctions did not seem to affect the overall salmon industry in Norway in any notable way.

![Figure 11: Norwegian Fresh/Chilled Salmon Export](image)

Source: Author’s own processing based on data from CEPII
Figure 11 shows that China is a fairly insignificant market for Norwegian salmon and that the salmon industry does not seem to have suffered noteworthy losses since the introduction of the sanctions. This indicates that China’s economic sanctions towards Norwegian salmon was ineffective. As argued before, unilateral sanctions can often be ineffective, as it may be easy for the target country to shift its exports to other countries. However, without the sanctions, it is possible that Norway would have been able to have a much larger share of the Chinese market than it does today, a loss that potentially can be quite large due to the size of the Chinese economy. Based on the presented results, Hypothesis 2, which assumed that Norwegian exports of salmon was affected by the sanctions, is approved.

If unilateral economic sanctions often are not effective, why did China employ them? First of all, it should be examined if China’s response actually could be considered economic sanctions. As previously established, economic sanctions aim to force a change in policy or behavior in a foreign country by harming its economic interests. There is little doubt that this was the case of the restrictions on salmon imports. Moreover, ending the free trade agreement talks and stopping Chinese trade delegations from going to Norway could also fall within the scope of economic sanctions, as these measures too aimed at harming Norway’s economic interests in order to force a policy change. Like the cases of Chinese unilateral sanctions discussed earlier, the economic sanctions imposed on Norway after the Nobel Peace Prize award of 2010 were quite limited in their scope, instead mostly targeting a specific industry. As for why the salmon industry was specifically targeted, it is possible that this was because it is an important industry to Norway and therefore China hoped the salmon industry would pressure the Norwegian government into complying with China’s demand. Furthermore, the high trade complementarity between Norway and China meant that targeting most other industries could hurt China as well, as products such as chemicals and machinery are important for China’s economic growth. Additionally, it is quite easy to impose restriction on food imports by claiming they pose a health risk, without actually having to prove it, which makes legal challenges at the WTO difficult.

The aim of China was not to force Norway to revoke the Nobel Peace Prize, as they knew this would not be possible. Instead, it is likely that China wanted a form of response from Norway saying that Norway apologized and would not interfere in China’s internal affairs. As discussed earlier, the continued dominance of the Communist Party is one of China’s most important goals, and legitimizing Liu Xiaobo, who wanted more democracy and human rights in China, could risk
undermining the Party, as well as causing increased unrest in China. Thus, China wanted to make an example out of Norway so that other countries would not want to threaten China’s core interests in the future. When Norway and China in December 2016 agreed to normalize relations, Norway also agreed to the following in a signed document:

“The Norwegian Government fully respects China's development path and social system, and highly commends its historic and unparalleled development that has taken place. The Norwegian Government reiterates its commitment to the one-China policy, fully respects China's sovereignty and territorial integrity, attaches high importance to China's core interests and major concerns, will not support actions that undermine them, and will do its best to avoid any future damage to the bilateral relations.” (Xinhua 2016).

Together with the Norwegian government’s refusal to meet the Dalai Lama when he visited Oslo in 2014, these terms makes it likely that the economic sanctions imposed by China were a success, as they invoked the desired response from Norway. However, it is also possible that political pressure played an important role.

The case of China’s economic sanctions on Norway fits well together with the other cases of Chinese unilateral sanctions. There is little indication that China wanted to harm the Norwegian economy considerably or harm the long-term relations between Norway and China. Evidence of this can be seen in the development of Chinese investments in Norway, which according to Gåsemyr and Sverdrup-Thygeson (2017) did not see a large change as a result of the sanctions. While some smaller investments might have been suppressed, several major investments were completed during the period of the sanctions. However, Sverdrup-Thygeson (2016) still argues that the diplomatic conflict between Norway and China after 2010 is unprecedented in China’s recent relations with Western countries. This might be because the position of the Communist Party is even more important to China than its other core interests. Additionally, this was not the first time Norway had angered China, as the Dalai Lama was awarded the Nobel Peace Prize in 1989 (Nobel Media AB 2014b). The Nobel Peace Prize award is widely covered globally by media and many foreign government representatives attend the ceremony. When given to Chinese dissidents it thus makes China lose face internationally. Therefore, it is likely that China wanted to punish Norway hard to make sure something similar would not happen again in the future, as well as to pose as a warning for other countries. It seems that China has little trouble using its economic might against other countries if the government feels its core interests are threatened.
6 Conclusion

By using the gravity model of international trade as a theoretical framework, this thesis examined to what extent there was an effect of the economic sanctions China imposed on Norway after the Nobel Peace Prize award to Chinese dissident Liu Xiaobo in 2010. The analysis provides evidence that the sanctions significantly affected Norwegian exports to China, with the exports being 21 percent, or 5.5 billion USD, lower than what might have been the case without the sanctions. While the exports continued to rise after 2010, they did not rise as much as might have been the case without the sanctions. This was probably due to the uncertain business environment created by the sanctions, which made Norwegian and Chinese companies seek alternative markets in fear of new or prolonged sanctions. Additionally, there is evidence that fresh/chilled salmon was targeted specifically by the sanctions, with import procedures for Norwegian salmon becoming stricter and more time-consuming. As a result, export of Norwegian salmon to China dropped significantly after 2010, falling 60 percent between 2010 and 2011. Even though the salmon exports quickly rebounded, with only slightly less being exported in 2012 than in 2010, Norwegian companies exporting salmon were missing out on opportunities to expand. Norwegian companies had controlled almost the whole Chinese market in 2010, but their market share quickly fell, and by 2016 it was down to five percent. Thus, the results of the thesis indicate that Norwegian fresh/chilled salmon exports were 92 percent, or 3 billion USD, lower than they might have been without the sanctions. The data suggests that large amounts of Norwegian salmon was exported to Vietnam and then smuggled into China after 2010. As such Norway still had a large share of the market, but it is difficult to prove exactly how much salmon was re-exported to China via Vietnam. Furthermore, it is likely that entering the Chinese market via Vietnam is a more cumbersome and less profitable way for Norwegian companies.

Seen from the perspective of China’s sanctions policy, the sanctions imposed on Norway after 2010 fit well into China’s foreign policy strategy. China primarily uses economic sanctions against countries that threaten its core interests, which was the case of the 2010 Nobel Peace Prize. Due to the importance of Liu Xiaobo for China, as well as this being the second time the Nobel Peace Prize was given to a Chinese dissident, China decided to impose harsher sanctions on Norway in order to send a clear message to prevent other countries to interfere with China’s core interests and internal matters in the future.
As this thesis was written before trade data from 2017 was available it was not possible to examine the effects of the normalization of the relationship between Norway and China in December 2016. This could be an interesting topic to study. Future research could also investigate how the salmon was sent to China via Vietnam and analyze the recent development of Norwegian salmon exports to other countries. Finally, I hope this thesis can be an important contribution to the research on China’s sanctions policy and China’s use of its economic power in its foreign policy.
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