Czech University of Life Sciences Prague

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Diploma Thesis

The Brexit Influence on Foreign Trade of the United Kingdom of Great Britain and Northern Ireland in Terms of Agricultural Sector Trade Change as % of GDP

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DIPLOMA THESIS ASSIGNMENT

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Thesis title

The Brexit Influence on Foreign Trade of the United Kingdom of Great Britain and Northern Ireland in Terms of Agricultural Sector Trade Change as % of GDP

Objectives of thesis

The main objective of the thesis is to determine the influence of Brexit on the agricultural sector of Great Britain. More specifically, it concerns the foreign trade with agricultural commodities of UK and its influence on country's GDP.

Methodology

The theoretical part is conducted by analysis and synthesis of literature resources, magazines, online articles and other relevant sources of information.

The empirical part analyses GDP of Great Britain and its trade balance in detail based on all commodities and worldwide trading partners with a consequential focus on agricultural commodities and EU trading partners only. The ongoing Brexit negotiations provide information about the possible result of the UK separation. However, the thesis considers the "Hard Brexit" as an outcome of the negotiations to be able to provide the full possible impact. The empirical part of the thesis measures impact as a difference of two prognosis. The first one assumes that Brexit does not happen and no change in foreign trade is applied. The second one assumes application of EU 3rd party tariffs on UK trade. The result is shown in balance trade change as an impact on GDP of the United Kingdom of Great Britain and Northern Ireland.

The dataset for statistical accuracy is provided mainly from Eurostat, Com Trade and Office for National Statistics of Great Britain.

The proposed extent of the thesis

70 – 90 pages

Keywords

Brexit, economic model, GDP, agriculture, trade, sector

Recommended information sources

DAGENAIS, M.G. and MUET, Pierre-Alain. 1992. International Trade Modelling. Boca Raton : CRC Press, 1992. ISBN 9780412450006.

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Declaration

I declare that I have worked on my diploma thesis titled "The Brexit Influence on Foreign Trade of the United Kingdom of Great Britain and Northern Ireland

in Terms of Agricultural Sector Trade Change as % of GDP" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 26.03.2019 _____

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The Brexit Influence on Foreign Trade of the United Kingdom of Great Britain and Northern Ireland in Terms of Agricultural Sector Trade Change as % of GDP

Abstract

The diploma thesis describes reasons and conditions of the United Kingdom of Great Britain and Northern Ireland to leave European Union. It is the first time any member state decided to leave EU and it brings many political, economic and social consequences. This thesis further analyses GDP of Great Britain and then it goes into detail with foreign trade of this country. Its export and import are analysed by commodities and trading partners. The focus lies in the agricultural sector of UK. The goal of this work is providing an analysis of the Brexit impact on agricultural sector of United Kingdom hence the analysis of GDP, main commodities and trading partners. This allows determining two comparable prognoses to measure the Brexit impact on trade balance of the United Kingdom. The statistical data serve as necessary information for calculating a trend function per each commodity type from both export and import perspective. By analysing the applicable tariffs which EU passes on its third country trading partners, it is possible to distinguish the economic impact on British trade.

Keywords: UK, EU, common, market, deal, impact, Brexit, prognosis, GDP, agriculture, tariffs, trade, sector

Vliv Brexitu na zahraniční obchod Spojeného království Velké Británie a Severního Irska z pohledu zemědělského sektoru jako podílu na HDP v %

Abstrakt

Diplomová práce popisuje důvody a podmínky Spojeného království Velké Británie a Severního Irska opustit Evropskou unii. Je to poprvé, kdy se některý členský stát rozhodl opustit EU, a to přináší mnoho politických, ekonomických a sociálních důsledků. Tato práce dále analyzuje HDP Velké Británie a pak podrobně analyzuje na zahraniční obchod této země. Vývoz a dovoz Velké Británie jsou analyzovány komoditami a obchodními partnery a poté se zaměřuje na zemědělský sektor ve Velké Británii. Cílem této práce je poskytnout výpočet dopadu Brexitu na zemědělský sektor Spojeného království, a proto poskytuje analýzu HDP, hlavních komodit a obchodních partnerů. To umožňuje stanovit dvě srovnatelné prognózy pro měření vlivu Brexitu na obchodní bilanci Spojeného království. Statistické údaje slouží jako nezbytné informace pro výpočet trendové funkce pro každý druh komodity z pohledu exportu i dovozu. Analýzou platných sazeb, které EU aplikuje na své obchodní partnery ze třetích zemí, lze odhadovat hospodářský dopad na britský obchod.

Klíčová slova: Brexit, UK, EU, obchod, vliv, HDP, prognóza, clo, zemědělský, sektor

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EU …… European Union
EEC ……. European Economic Community
MFN……. Most Favoured Nation
UK ……... United Kingdom
UN …… United Nations

1 Introduction

Brexit represents many changes in the world, many opinions and consequences of past decisions. It is also a very broad topic which can be discussed from many angles, for a very long time and there would not be many answers in the end anyway. It is still an ongoing process which makes it quite difficult to simply say how it happened, what it caused and what consequences there are.

Despite all this, the purpose of this thesis is to explain what can already be explained and to simulate what could be the possible outcome of Brexit under certain conditions. This is possible because of thorough and deep analysis of available resources on Brexit and its political, demographical and economical background, and through prognosing the trade development. Brexit is a separation of UK from EU and that will influence many economies, businesses, services, governments and people. This thesis cannot comprehend the broadness of impact which Brexit will bring in the future.

The focus is aimed solely on the agricultural sector of UK and its trade with EU. This sector will be undoubtedly influenced as well. Also, it is important to mention that when this thesis is being written, the "Brexit negotiations" are still ongoing. In a situation where there is not an agreed solution between UK government and EU negotiation team, there will be so called "Hard Brexit." It is a plausible resolution if the negotiations are not successful before the given deadline – March 29, 2019.

The empirical part of the thesis pursues "Hard Brexit" as the default one since it is always a given option even though both parties are trying to avoid it. The thesis analyses GDP and foreign trade of Great Britain to come to a prognosis of two situations. The first one suggests that Brexit theoretically would not happen, and trade would not be affected in any way and the other situations considers Hard Brexit as an application of third country tariffs. The result is then discussed to determine the influence of trade balance of agricultural commodities in relationship between UK and EU.

2 Objectives and Methodology

2.1 Objectives

The main objective of this thesis is to forecast the economic change in foreign trade of UK's agricultural sector if The Great Britain leaves European Union under the option called "Hard Brexit."

This prognosis is possible by achieving intermediate goals such as explaining the process and reasoning behind Brexit, showing the importance of the Single Market for The Great Britain and determining variables for trade comparison with and without Brexit impact.

2.2 Methodology

The literature review provides necessary information about Brexit in enough detail. It illustrates reasons why citizens of The Great Britain decided to leave EU, why the British Government opted for a referendum and why the result was very close. The review also shows the aftermath of Brexit, so called "Brexit talks" when the head of British Government negotiates with EU representatives about future economic organization of Europe.

The empirical part of the thesis analyzes GDP of the United Kingdom per each component in general and then it focuses on the net exports. The analysis of net exports is also done in a full scope of all industries with consequential focus on agriculture by commodities to identify importance of this sector and by trading partner to identify significance of trading relationship between EU and UK. The next step in achieving main objective is describing economic theory around net exports with agricultural commodities. The economic theory clearly defines the relationship between export and import. Furthermore, prognoses are established to distinguish between two approaches. The first one says that Brexit hypothetically does not happen, therefore trade will not be affected in any way. The second approach suggests the Hard Brexit. It means that third party EU tariffs will apply. This is projected in the data set of UK's foreign trade with agricultural commodities. The calculated difference represents Brexit impact on the trade balance, therefore GDP of UK.

3 Literature Review

3.1 Reasons Initiating Departure from European Union

The Brexit is a decision made by the citizens of Great Britain and there are many different opinions on the whole situation. Basically, anybody can have their own reason to vote for leaving the European union. But that is not what happened. There have been certain social and political movements which led Britons to the point where they started questioning the EU membership nationwide (HUNT, et al., 2018).

3.1.1 British Criticism on EU Efficiency

The Great Britain has been for centuries one of the strongest economies in the world. It is even more significant in the past before the formation of EU. Naturally, British people are aware of their strong position in the world. It is given geographically, historically and socially (HUTTON, 2017). The UK waited for 16 years to join EU after it was formatted, and some opponents already argued against the Prime Minister John Major at that time to withdraw from such arrangement. UK has relied on their own economy and never felt benefit from joining the bloc. Opponents of the EU claimed that EU is dysfunctional and does not address issued it promised to solve. For example, unemployment in south of Europe. There is a 20% unemployment rate since 2008 while there was 4.2% unemployment rate in Germany. And given the fact that such difference is among EU countries with free movement of people, goods and services is enormous. But that touches another issue of EU related to language and administrative barriers. But on topic of Brexit, citizens who voted to leave understood that there are going to be challenges for UK economy but they also knew two very important factors. First of all their reliability on UK economy which was from historical point of view always prospering and strong. Secondly, staying in the economical and political organization which is stagnating is not a solution to any of UK problems (Centre for Social Investigation, 2018).

Looking in to current time analyzing UK economy so it is not only history that British people and polititians rely on is London. Capital of UK is a financial super centre of Europe. It is a headquarters for the most important financial entities in UK and Europe together. There have been wild assumptions after Brexit that those

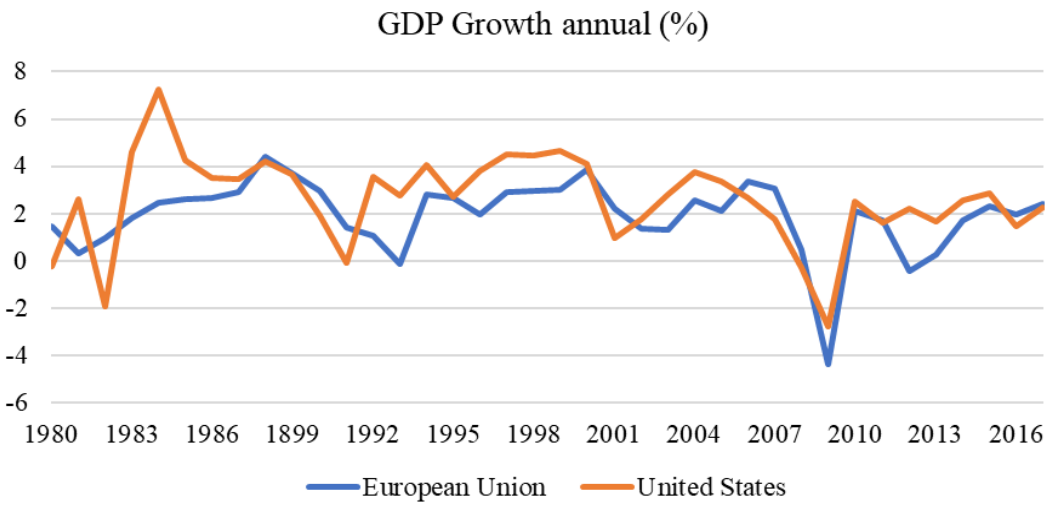
institutions will move to another European city, possibly Frankfurt. However, everyone very soon realized that it is logistically and technically absolutely impossible. That means that EU still needs London and cannot cut off itself from it (LEE, 2016).

Another fact that connects UK criticism and EU is its mutual integration. Britain joined the European Economic Community (EEC) in 1973 and as this institution transformed into EU, UK naturally became a member as well. UK has been one of the most important members from the very beginning. Even though it is in EU for longer time than majority of current members, it has been always very cautious and sceptical about deepening the integration. For example, it has never become the part of Schengen area and never accepted Euro (HUTTON, 2017).

Financial Crisis 2008

The trigger for initiating Brexit was not purely economic reason. It will be discussed later but there is a major reason showing the stagnation of EU and that was recovery from financial crisis in 2008. It has affected the whole world and some parts more than other but due to UK history, there is an important comparison between EU and USA (TOOZE, 2018).

Chart 1 – GDP Growth Comparison - USA and EU (The World Bank, 2018)



It is important to notice in the chart 1 above the difference in recovery between USA and EU. After brief recovery in EU, there is another decrease in 2012 while USA keeps recovering from the financial crisis. EU sceptics argue that position of United

Kingdom would have been different, and the development would be aligned with US (HUNT, et al., 2018).

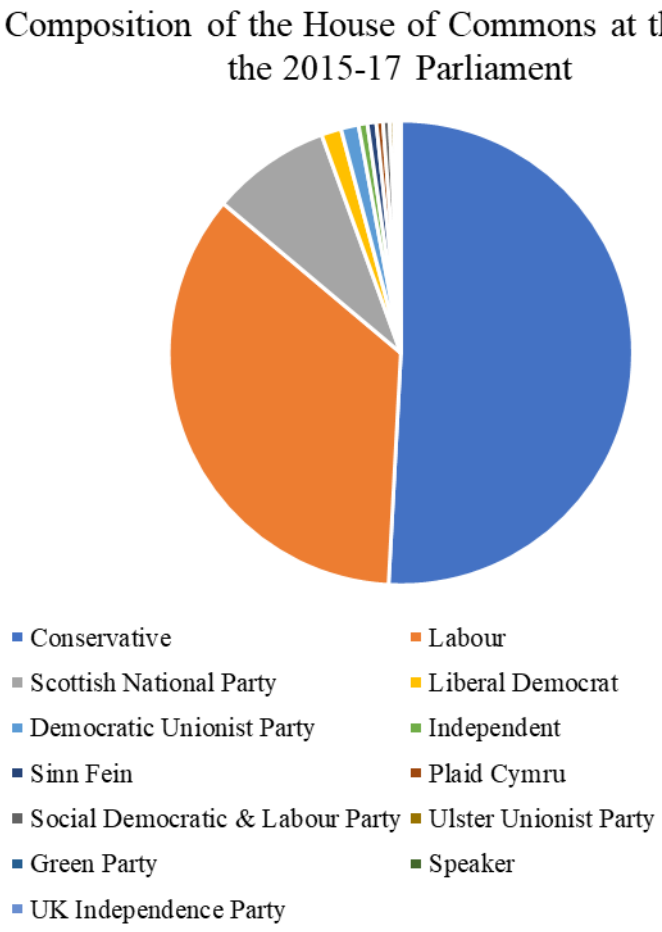
3.1.2 Political Elitism

This is one of the reasons that most likely changed the result of the referendum. It seems hidden next to other main Brexit initiatives but the political situation around Brexit caused that many people decided to vote ‘Leave’ (HENRY, 2015).

Political Situation in UK

It is important to understand the polarity of parties in the United Kingdom and which party denied Brexit and which supported it. Two strongest parties in UK are Conservatives and Labour Party. Let’s introduce the scheme around Brexit until 2017 and after that (MAULDIN, 2016).

Chart 2 – Composition of the House of Commons at the end of the 2015 - 2017 Parliament (UK Parliament, 2017)



There has been an election in 2018 and that also brought a slight change in the members of the Parliament but not a significant one. Please see the table 1 below:

Table 1 – Composition of the House of Commons (UK Parliament, 2017)

Composition of the House of Commons	End of 2018	Current situation
Party	**Seats**	**Seats**
Conservative	330	315
Labour	229	257
Scottish National Party	54	35
Liberal Democrat	9	12
Democratic Unionist Party	8	10
Independent	4	8
Sinn Fein	4	7
Plaid Cymru	3	4
Social Democratic & Labour Party	3	0
Ulster Unionist Party	2	0
Green Party	1	1
Speaker	1	1
UK Independence Party	1	0
Total	**649**	**650**

As can be seen, the biggest influence is in hands of Conservative Party and Labour Party. Conservative Party is centre-right political party led by The Prime Minister Theresa May (ELLIOTT, 2018). It is one of the oldest parties established in 1834. It is also clear from the table that the new election has weakened Conservative party even though it is still in the lead (DOREY, 2010).

Labour Party is a centre-left party led by Jeremy Corbyn. The party emphasises social justice and strong workers' rights. It has been founded in 1900 and it is the 2nd biggest political party in UK (HARRIS, 2018).

Political Struggle

The main parties stand against each other in opposition as right versus left spectrum indicates. When it came to Brexit, both parties endorsed staying in EU, but many members of both parties went into opposition in this issue. For citizens, who were about to decide on Brexit, this was a struggle. Britons saw two main parties supporting the same outcome and a rebellion movement from their own members. Another impulse came from financial markets. They loudly said that Brexit is a

threat to them and to British people. However, there was not understanding from British people as they lost trust in financial markets after the financial crisis in 2008. Leave supporters believed that it was incompetence and recklessness of those financial markets which caused disaster for many businesses in the country. This point of view was not entirely correct but that is what the nations saw and believed (CLARKE, 2016).

This picture was building itself as a puzzle. Citizens of Great Britain voted against the elite of UK. For many of them, it was a vote against politicians, business leaders, financial institutions and intellectuals who they blame for looking after their interests instead of what is best for people who voted for them. It is nothing new in the world. The same situations are currently happening also in the USA, China and other states of Europe. If you put this into combination with mindset of individuality of the Great Britain with feeling of being controlled by EU without any tools to change that, the only viable solution seems to leave EU and with it replace the government and institutions trying to control the system (O'HAGAN, 2016).

3.1.3 Sovereignty and the Immigration Crisis

Sovereignty is understood to be an authority to govern itself as a state and determine its own policies and laws. As was already mentioned this is something UK struggles with since it joined the European Community in 1973. In the very beginning of Brexit, striking any deal with EU seemed like still giving up what Brexit should ensure. Later, however, it became clear that hard Brexit would not be a solution at all and so some deal must be agreed (BARKER, 2018).

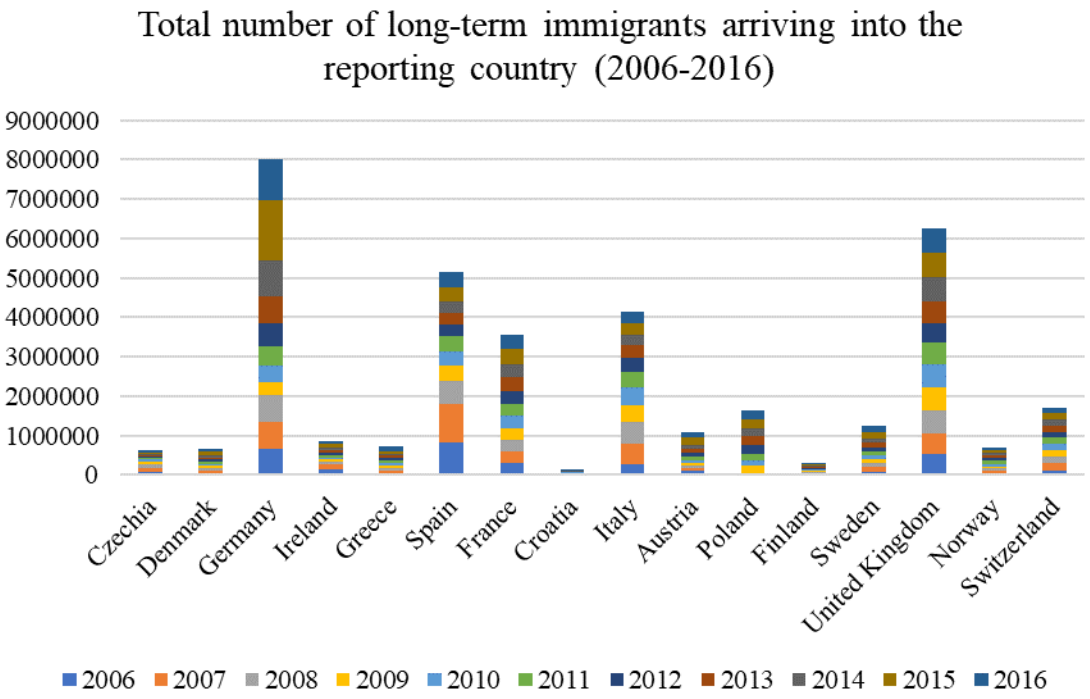
There is also a rise of nationalism across the world. That helped Brexit, too. Since the World War II., there are multinational organizations providing stability, safety and security. At least, that is how it should be. For example, it is NATO, IMF and EU. All these organizations were founded in the second half of 20th century to create economic, political and social relationships among countries which would prevent next war. And as for this purpose, it works well. It creates stability but after time, those organizations must develop and set new goals which it becomes more difficult to live up to. These blocs struggle, and countries look more and more for independency. That has influenced British citizens. Mistrust in such organizations

and losing control over decisions. Many argue that these organizations must be renewed and updated to fight current issues but not abandoned (TODD, 2016).

Immigration Crisis

The immigration crisis started in 2013 after the civil war in Syria caused by president Bashar Assad and ISIS. Syria is not the only country of origin from which the refugees come. However, it is the main one. Over 4 million of Syrian refugees had left their homes from the beginning of war. Other refugees come from The Republic of Congo, South Sudan, Afghanistan and Somalia. The civil war has begun already several years ago in 2011 but the immigration crisis revealed itself later due to more effects. Many tried to stay if they could, but it became clear that this situation will not be resolved any time soon. For that reason, citizens of Syria decided to risk moving rather than staying. Under U.N. Refugee Convention from 1951, refugee is a status of a person who is escaping residence country because the person's freedom is threatened. European countries must accept refugees under this Convention and protect them from harm. Also, the refugee cannot be returned or anywhere else where there could be harm caused upon the person. It is an act of an international humanitarian help (BAJEKAL, 2015). Most of refugees did not go to Europe in the beginning of immigration crisis. The first destination was Turkey which sheltered more than 3 million refugees. However, it became impossible for Turkey to sustain this situation and it asked European countries for help (DEAN, 2018).

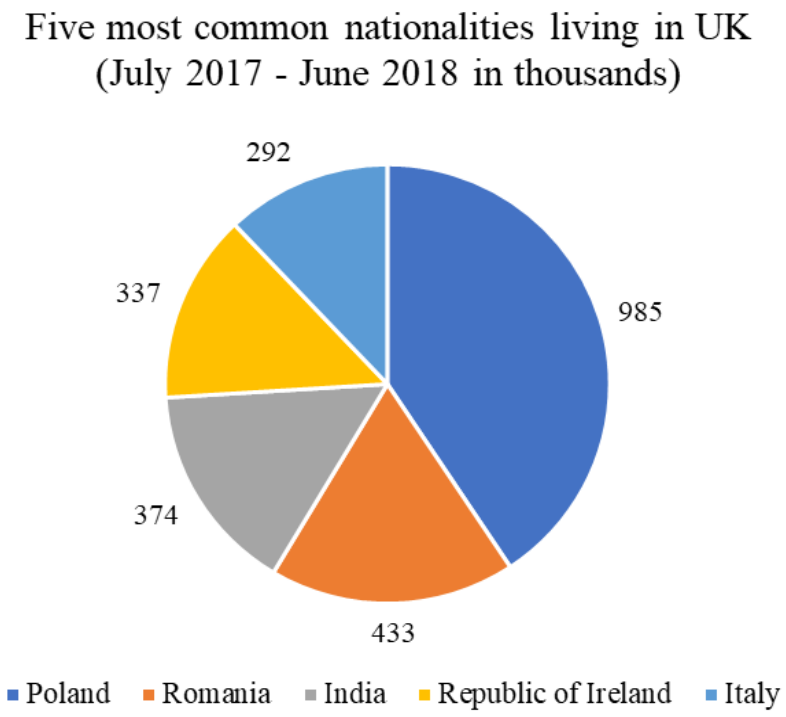
Chart 3 – Total number of long-term immigrants (2006-2016), (Eurostat, 2018)



The immigration crisis in Europe was a trigger for Brexit. It seems quite logical for a country which significantly protects is against setting deeply into EU, constantly requires some level of independence and sovereignty on multinational entities. Some EU countries argued that it is a moral obligation to help people who run from poverty, violence and war. But those who oppose EU, they saw an invasion into their lives and national values. This was a deciding moment for many British citizens (SMITH, et al., 2017).

In the chart below, we can see five most common nationalities living in UK so already during the time of immigration crisis in Europe. There is only one country outside EU and that is India. The biggest nationality of them is Poland. It is a long-term trend in UK which has also caused some issues regarding the immigration policy of Great Britain (Office for National Statistics, 2017).

Chart 4 – Five most common nationalities living in UK (Office for National Statistics, 2017)



As can be seen from chart 4, there is a significant part of population arising from immigration but as can be seen in the chart 4, none of the major nationalities come from the latest immigration crisis initiated by Syria and other surrounding states. UK has a population of around 66 million citizens. Even the largest part of Polish people is around 1.5% of total UK population. According to (O'LEARY, 2017), around 240 000 citizens from EU emigrated to UK and around 140 000 citizens from UK emigrated to EU. That gives UK net migration around 100 000 people. Interestingly, that is the lowest result since 2013. The latest trend in UK is that more people are emigrating from UK and less people choose UK as their residence, therefore net migration decreases (CHAKELIAN, 2018). In the charts 5 and 6, it can be seen what reasons have been granted for immigrants to enter UK.

Chart 5 – Reasons given for immigrating in UK – EU Nationals (O'LEARY, 2017)

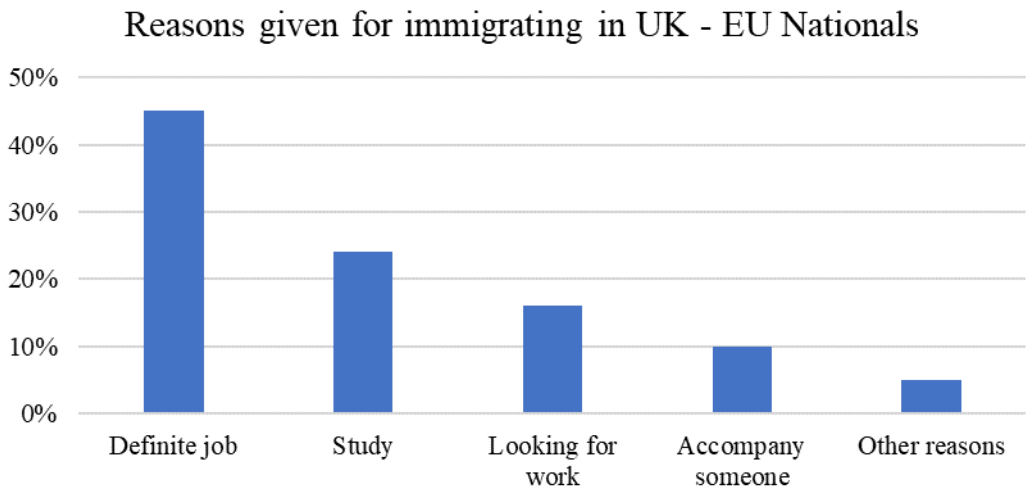
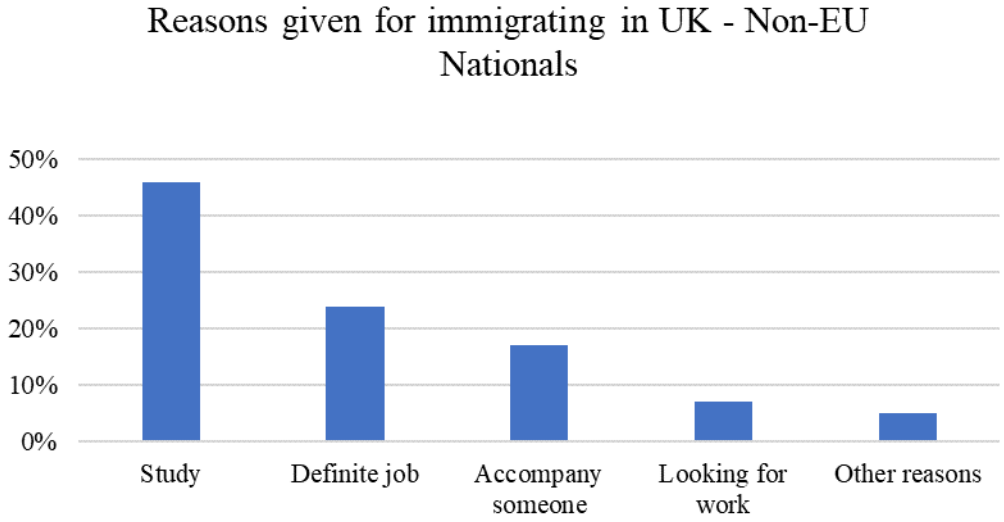


Chart 6 – Reasons given for immigrating in UK – Non-EU Nationals (O'LEARY, 2017)



The immigration crisis did not bring any significant change to the citizens on UK. The number of immigrants remained generally the same and the largest immigrant nationality consists of Polish citizens who usually live in UK for a long time and they work mostly in construction and factories. Therefore, they do not create a burden on UK economy. They support it even though UK citizens often think that they take their jobs. And they claim it despite the fact, they would not apply for those jobs because most of them are considered ‘low class’ jobs. There were around 3.8 million people living in UK from EU in 2017. That is around 5.75% of UK population and around 2.3 million are active workers. That makes about 7% from all active workers in UK. It is quite large share, but it should not mean any collapse after Brexit comes into power (PERFAR, 2017).

When this is all supported by data analysis and there is not such impact to put UK in danger, why was it a trigger for Brexit? The reason is that EU wanted to allocate immigrants coming from Syria, Sudan and Somalia among all member states as an act of solidarity. However, many countries did not want to submit to this idea and saw it as a threat to its national values. Especially in UK, around 30,000 immigrants were caught for passing the border illegally and all this caused that many people thought that this comes from EU membership and free movement of people and unguarded borders across Europe. By 2017, many countries already activated their provisions to protect borders like Hungary which built a fence even though EU has strictly criticized it (AMBROSINI, 2018).

This feeling of damaging Europe and losing the national or even European identity was spreading faster and stronger than need for humanitarian aid. In times of crisis even though when it is often enlarged by media, fear and self-preservation are strong influencers. All this combined made many people in UK decide to prefer more control over borders, international agreements, reassuring domestic decision-making and all that is something that Brexit should provide (MINTER, 2015).

3.2 The Referendum Outcome

The EU Brexit Referendum took place on 23rd June 2016 on whether UK should remain in EU or leave. It is an outcome of situation in UK during 2016. As was already mentioned, Brexit was a result of many factors combined and even though it is still argued if referendum was the best decision how to take another step, the decision power was not in hands of elected members of parliament, but it was a direct vote of citizens of Great Britain. In other words – referendum (UK Government, 2016).

3.2.1 Subject of Referendum

The subject of this referendum is a single question.

"Should the United Kingdom remain a member of the European Union or leave the European Union?"

All British citizens, Irish and Commonwealth citizens aged over 18 who are residents in UK or Gibraltar were eligible to vote. The UK Government has published information on EU membership to anyone who is interested prior to the referendum. The information is in a form of papers explaining benefits of UK being in EU and the other way around, what alternatives there are compared to EU membership, the withdrawal process and analysis of short-term and long-term economic impact on UK. This way, the Government approached UK citizens and offered to really think through the situation before vote. Many argue that this was the "most democratic" approach that UK could have taken and as was already said, the UK Government promised to honour a result of the referendum (The Electoral Commision, 2016).

3.2.2 Regional Results

The United Kingdom has 12 regions (reviewed in table 2) which were then also used to divide voting sections. Please see the table below for vote results per region. The turnout around UK was very similar in all regions. Majority of regions voted to leave EU. The result was very close mostly because of London and Scotland which represent UK parts with many citizens who voted to remain in the European Union (BBC, 2016).

The result of referendum was very surprising for the whole world which can be seen in drop of British Pound exchange rate for example. The British Government said they will respect the outcome of the referendum, therefore leave EU. However, some opponents of Brexit did not want to give up that easy and wanted a second referendum. That did not happen and as the deadline approaches for UK to leave EU, it is very unlikely to happen anymore (BUCKLEDEE, 2018).

Table 2 – Brexit Regional Results (The Electoral Commision, 2016)

Region of UK	Electorate	Vote Remain	Vote Leave	Turnout %
East	4,398,796	1,448,616	1,880,367	75.74%
East Midlands	3,384,299	1,033,036	1,475,479	75.45%
London	5,424,768	2,263,519	1,513,232	69.82%
North East	1,934,341	562,595	778,103	69.13%
North West	5,241,568	1,699,020	1,966,925	70.74%
Northern Ireland	1,260,955	440,707	349,442	62.69%
Scotland	3,987,112	1,661,191	1,018,322	68.62%
South East	6,465,404	2,391,718	2,567,965	77.05%
South West	4,138,134	1,503,019	1,669,711	77.50%
Wales	2,270,272	772,347	854,572	71.96%
West Midlands	4,116,572	1,207,175	1,755,687	74.53%
Yorkshire and The Humber	3,877,780	1,158,298	1,580,937	72.32%
TOTAL	**46,500,001**	**16,141,241**	**17,410,742**	**72.13%**

3.2.3 National Results

The United Kingdom is historically and geographically divided into 4 nations. England, Scotland, Wales and Northern Ireland. England has the biggest population of their 4 nations and the result in England is showing a direction for whole UK which is then very difficult to change (BBC, 2016).

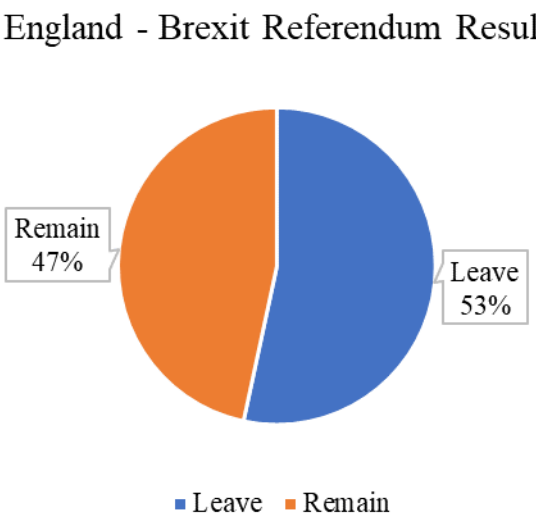
England

Leave: 15 188 406 votes

Remain: 13 266 996 votes

Turnout: 73.00 %

Chart 7 – England Brexit Referendum Result (The Electoral Commision, 2016)



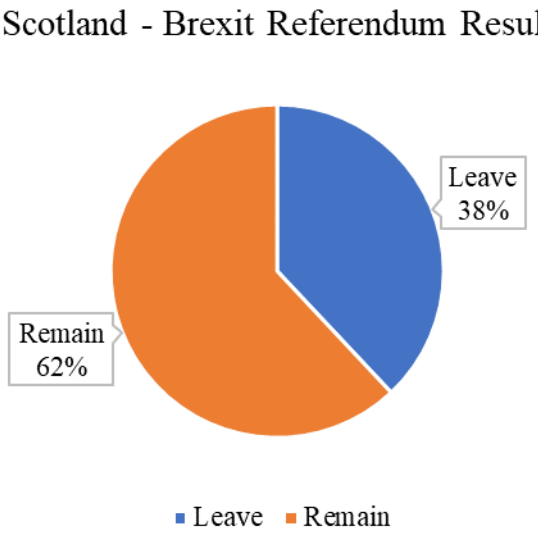
Scotland

Leave: 1 018 322 votes

Remain: 1 661 191 votes

Turnout: 67.20 %

Chart 8 – Scotland Brexit Referendum Result (The Electoral Commision, 2016)



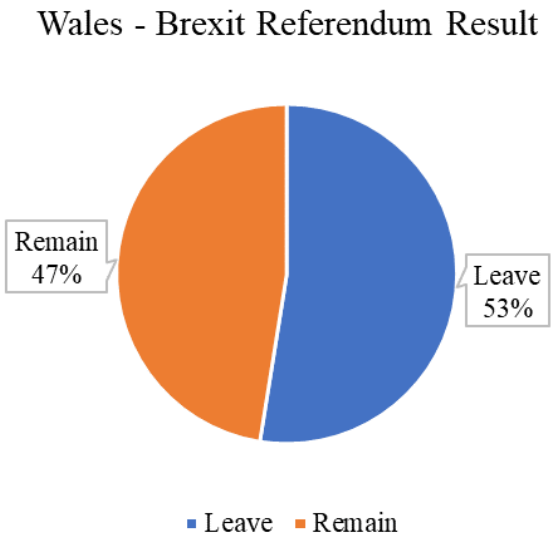
Wales

Leave: 854 572 votes

Remain: 772 347 votes

Turnout: 71.70 %

Chart 9 – Wales Brexit Referendum Result (The Electoral Commision, 2016)



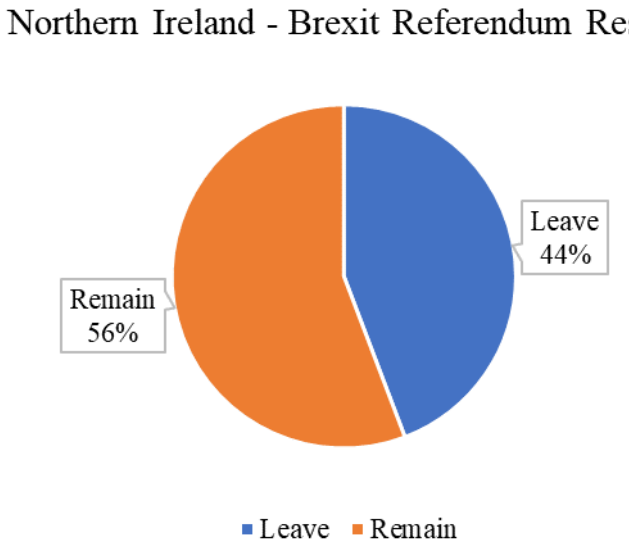
Northern Ireland

Leave: 349 442 votes

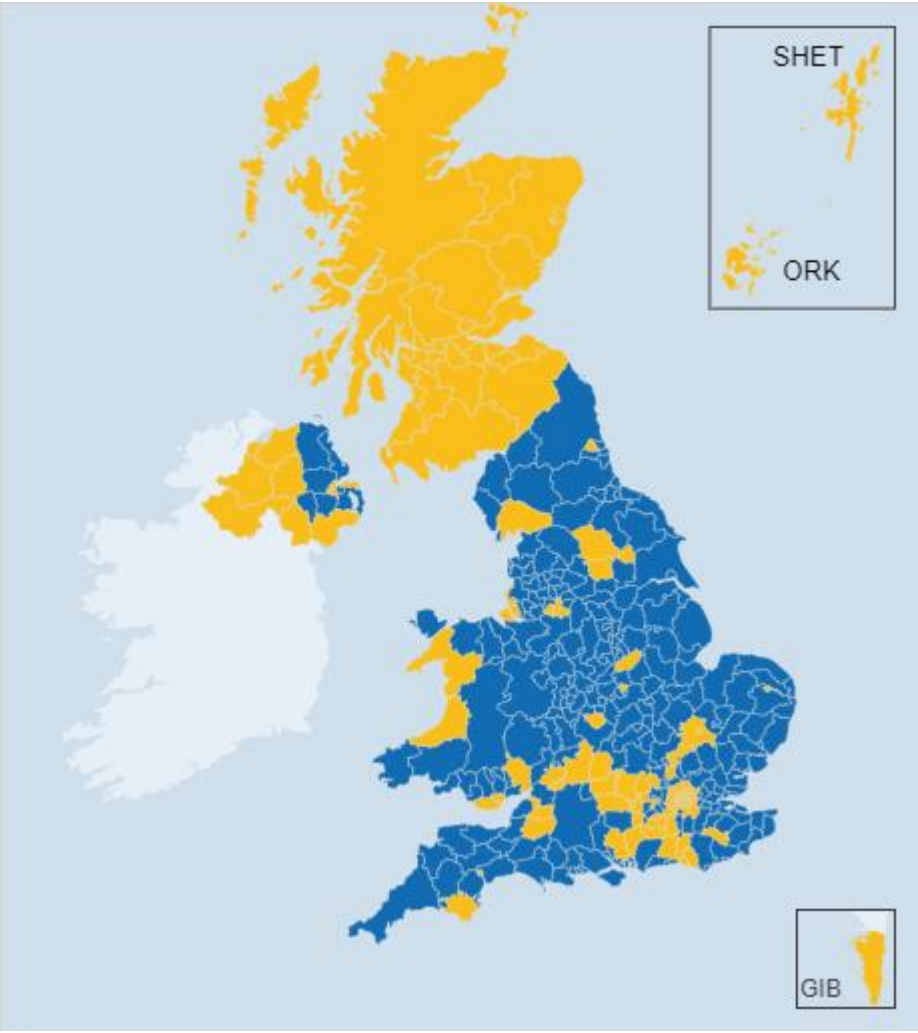
Remain: 440 707 votes

Turnout: 62.70 %

Chart 10 – Northern Ireland Brexit Referendum Result (The Electoral Commision, 2016)



Charts 7 - 10 represent national results according to remain and leave votes. It can be seen in the chart 7 that England voted to leave with 53% which is very close to the overall result in UK. All 3 remaining nations have significantly lower numbers of voters. Even though that Scotland voted to remain in majority with 62%, the net result of votes is only around 600 000. The Northern Ireland is a very similar example. On the other hand, Wales voted the same as England (AEGEE Europe, 2017).



Picture 1 – Brexit Referendum Results Geographically (BBC, 2016)

The picture 1 above shows blue colour represents voters – leave and yellow colour represents voters who want to stay in EU. There is clear division in the map. It is not a coincidence that majority leave voters are positioned in south. There is higher risk of immigration, UK elite and most ports connecting UK to EU. It matches reasons why UK citizens wanted to leave EU (BBC, 2016).

3.3 The Legal Grounds for Brexit

The reasons why Great Britain decided to leave European Union have been highlighted and described in the previous part of the thesis. At this point, however, the referendum only informs the government about the public opinion about remaining or leaving EU. There is still a very complex and unclear legal process how such decision must be dealt with (MILLER, et al., 2017).

The Treaty of Lisbon amends the Treaty on European Union and came into force in December 2009. It is not a new document. Basically, it updates the previous treaty which updated the one before. Every new treaty enhances the stability of The European Parliament, The European Council, The Council, The Commission and The Court of Justice of EU (PANIZZA, 2017).

The Article 50 is a very short paragraph allowing member state to depart from EU. It is the only legal way to leave EU. It merely provides the respective country to notify the European Council of such intention and negotiate an agreement of withdrawal. This article does not provide any timeframe or other specifications. The conditions of withdrawing from EU are concluded with each state individually. Article 50 is linked to Article 238 of the Treaty on the Functioning of the European Union. It can be said that this complicates the withdrawal from EU (Eurostep, 2008). It has been assumed that this paragraph is will not been triggered by any country as since the beginning of EU, all member states prospered and joining EU was considered an accomplishment. Nevertheless, this provision has been added in The Treaty of Lisbon and could be used if member states decides to do that (MILLER, et al., 2017).

After the member state decided to leave, EU must be informed but as was already mentioned, there is not any given timeframe which must be held up. In case of Brexit, this was achieved by the former Prime Minister David Cameron in his speech on 22nd February 2016. He said that if the referendum vote was “no” meaning – leave EU, he would immediately trigger the Article 50 of the Treaty of Lisbon (RILEY, et al., 2016). He although did not pursue the notification for EU himself but he resigned and left the duty to his successor – newly appointed Theresa May who became Prime Minister in July 2016.

It is important to understand that the referendum itself is not legally binding. Its result is merely advisory for the British government. However, the government respected the outcome shown by the referendum (MILLER, et al., 2017).

3.3.1 Role of Approving the Notification

The Article 50 is vague in many ways and one of the is the institutional role of approving the notification to leave EU. The Article says that it depends on the country's constitutional laws. It means that this process can be different in each country of EU. There has been a large debate about this role and in conclusion, there were 4 possibilities (BARLETT, et al., 2017).

Government prerogative power is the first one. It can be seen mostly in UK and USA. In both cases, government or president can withdraw from any treaty by using its prerogative power. UK parliament can object to ratifying any treaty along the House of Commons and this can mean a complete block for ratification. However, when it comes to withdrawal, the UK Parliament has no role in this process. Interestingly, Lord Hamilton asked the Parliament for approval in February 2016 and he faced a disagreement from many members. Even though, it only meant that Government was assured it needs to decide itself (BARLETT, et al., 2017).

Parliamentary involvement is the second possible way for approving the notification. Constitutionally, there is no need to involve the UK Parliament or the House of Commons, but some politicians argued that in this case, at least the House of Commons should be involved in the process. There was a strong democratic reason for involving the Parliament. The referendum was only advisory and did not discuss the wide impact it could have in the future. The UK nation merely expressed its opinion on remaining the member of UK. That is very valuable outcome of referendum but that is all it is. It does not reach further to answer countless issued related to that. As the politicians argued, that should have been the role of UK Parliament (European Parliament, 2017).

Order in Council was another possible option. According to several professors in UK. The only correct way to trigger Brexit was by making a secondary legislation known as the Order in Council. The UK law professor, Mark Elliott, argues prerogative power and involving Parliament are suitable options but the Order in

Council has a strong position in the European Communities Act which came into power in 1972 and this is the exact quotation:

'Subject to Schedule 2 to this Act, at any time after its passing Her Majesty may by Order in Council, and any designated Minister or department may by order, rules, regulations or scheme, make provision …

(a) for the purpose of implementing any EU obligation of the United Kingdom, or enabling any such obligation to be implemented, or of enabling any rights enjoyed or to be enjoyed by the United Kingdom under or by virtue of the Treaties to be exercised …'

In other words, it means that Order in Council can be legally exercised to trigger leaving EU. This method, however, as any law depends on the meaning of the wording. Some argued that it is arguable to choose the right which would be used to create Order in Council (ELLIOTT, 2018).

The last but not the least is the Act of Parliament. Some commentators argued that right after the Brexit result, the Act of Parliament should be required before EU is notified about an intention to leave EU. The reason behind it again the explanation of the Article 50 because it says that the member state may decide based on its constitutional laws and the most fundamental is that the UK Parliament agrees with such decision. In terms of law, this opinion goes so far that many well-known lawyers and law professors like Nick Barber, Tom Hickman or Jeff King said that in the Prime Minister sends a letter of notification to EU informing them about withdrawal, such decision is legally ineffective (MILLER, et al., 2017). There has been a legal dispute whether the Act of Parliament was needed. It all depended on determining conflict between statutory and prerogative power. If there would be any reason to believe that statutory power is needed to invoke the Article 50, the Act of Parliament would be needed before notifying the EU. If there would be no such reason, the government, more specifically the Prime Minister would be eligible to move forward with triggering the Article 50 (ROBERTSON, 2018). As it usually goes, this legal dispute has been resolved by the court.

3.3.2 The Miller Supreme Court Case

The Miller Case has a very important part in the decision of notifying EU about and intention to withdraw membership. The ruling of the supreme court was essential for the future events. This case was brought by Gina Miller and the People's Challenge in 2016 and it challenged the prerogative royal power of the government (Good Law Project, 2017).

The British legal system works similarly as the US one but differently from most of the European states. The Common Law system does not contain written series of documents, but it is based on the most important legislature passed by the UK Parliament (University College London, 2017). It is the only body in UK which has this kind of power. The Parliament consists of House of Commons and the House of Lords (CILEx, 2015). The most important piece of information is that the court rules based on previous rulings in the past. On one hand, this gives the judge a bit of guidance in similarity with the present case but on the other hand, the judge makes his decision based on abstract boundaries and logic which he places in the case (PAYNE, 2017). Additionally, it makes judges vulnerable against criticism when they deal with extraordinarily sensitive matters as the source of ruling comes directly from them (CILEx, 2015).

The Miller case challenges the UK government against applying only prerogative power for notifying the EU about withdrawal. There are in total three main reasons why this case was brought to a court. Firstly, at the moment of withdrawal, UK Parliament had given British citizens the EU rights. It means that even though UK is a constitutional monarchy, its citizens have more rights thanks to the EU. Secondly, triggering the Article 50 would mean a removal of those rights which is against the current applicable law and using only prerogative power should not have any effect. That relates to the last argument that if the UK Parliament ratified joining EU, it cannot be only Government who will decide to leave (Supreme Court, 2018).

The above presented arguments stood in front of the Supreme Court against the UK Government which wanted to apply the prerogative power only. The Supreme Court, despite the fact that the UK Government can withdraw from any treaty ruled in favour of Gina Miller and others. In total eleven judges ruled in split of eight to three in favour of necessity to involve the Parliament in to the notifying the EU. It meant

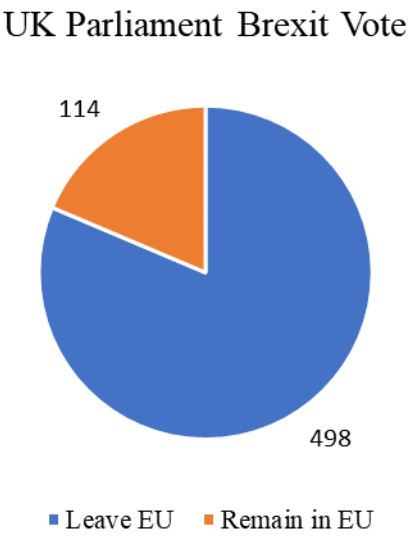
complications for the Government as it now could not proceed alone and suddenly needed the Act of Parliament to be passed (CRAIG, 2018).

The court investigated many related cases such as 1972 Act, Prerogative Power, The Royal Prerogative and Treaties. It can be said the that 1972 Act had the biggest role in the ruling. This case has shown that the international law and society changes much faster than UK law develops, and UK still lacks written solid constitution because its power lies with the Crown. And here comes the importance of the 1972 Act. This Act did not remove the Crown's Treaty allowing the express and sole use of the prerogative power (Supreme Court, 2018).

It is clear now after the legal process that Act of Parliament in necessary to leave EU. The newly appointed Prime Minister – Theresa May, the head of UK Government now had to get a "yes" from the Parliament. The vote took place in the House of Commons on 7th December 2016. The vote happened shortly after the Supreme Court ruling. On the same day of the vote, Theresa May was called by the members of the Parliament to publish the Government's plan on leaving the EU (WALKER, 2018).

The vote ended clearly in favour of leaving the EU. The vote to remain in the EU was only 114 against 498 as the chart below shows. The debate before this vote took two days and it was regarding the format of the debate preceding the vote. It is very important because the sole format of the debate could influence the result of the vote (NICHOLLS, 2018). The Scottish National Party mostly and some Liberal Democrats with several Labour MPs voted against the Bill, but it was far from enough to change the outcome. Most of the members voting against Brexit realized the situation and announced that the Brexit cannot be stopped by the Parliament. For example, Jeremy Corbyn was criticized for his announcement that all options are still possible and soon after that he changed the course and said that the decision is made (The Guardian (2), 2018). There are results of the vote below in the chart 11.

Chart 11 – UK Parliament Brexit Vote (KROET, 2017)



The vote itself was to ensure the fact that UK wants to leave EU and its exit deal as well as ensuring regarding the government which will lead UK in the negotiations for the new deal. Both of those steps were included in one vote procedure (Institute for Government, 2018).

If the UK Parliament voted "no" to the exit deal, it could lead to several results but as it did not happen in the end, it is difficult to predict exact reaction because even at the time of vote, it was not absolutely clear. However, what was clear is that the "no" vote would very unlikely mean that there would be no Brexit. If the negative vote would take place early enough, there would be an endless negotiation among the UK Parliament, UK Government and EU. This would go on as long as necessary to achieve an agreement. And if the negative vote would take place later, the negotiation period for the exit deal would be extended (Parliament UK, 2017).

3.3.3 Formal Notification to the EU

The formal notification when The UK Prime Minister Theresa May informed the European Council took place on 29 March 2017. The Article 50 of the Treaty on European Union requires this step to trigger the exit procedure (Lex Europa.eu, 2018).

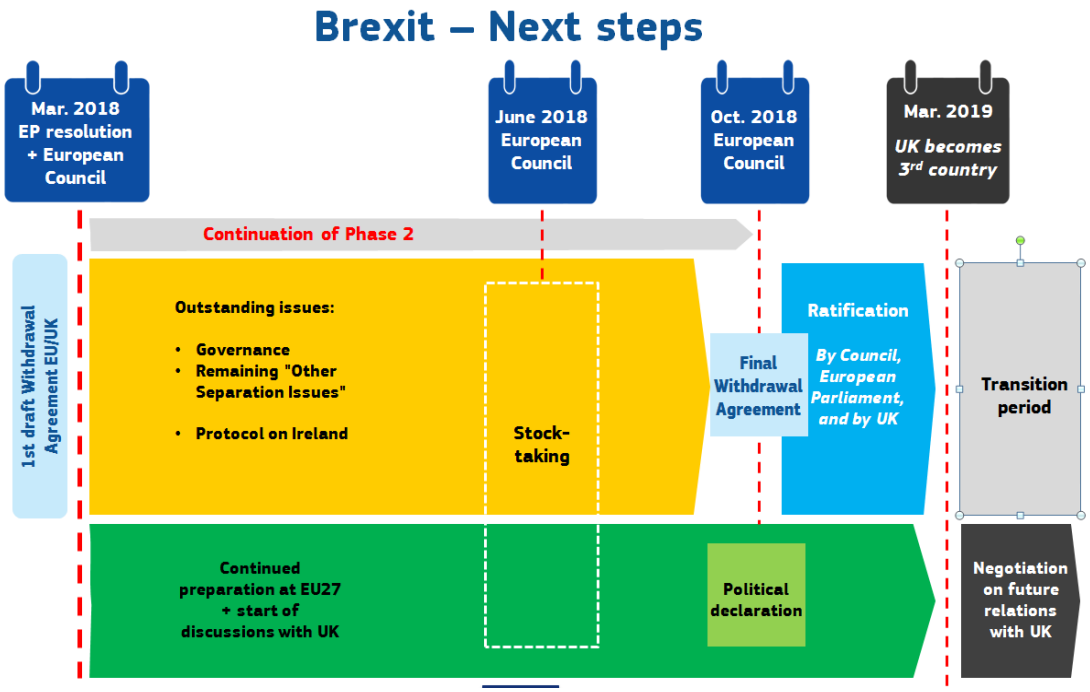
The Article 50 does not explicitly provide the form which UK has to take to inform the European Council. Theresa May has sent the letter to Donald Tusk informing about the UK's intentions. The letter has been handwritten and it is quite short. The

UK Prime Minister provides the background behind the decision of the people of United Kingdom. In its content, the letter informs about legality of exiting EU, its projected Article 50 into the legal system of UK and the further actions done by UK Parliament which will conclude the legal process. Moreover, the letter provides an offer from UK to EU about negotiations of the Brexit. It is written in a good spirit with desire to maintain good relations between both parties and work hard on the best possible exit strategy. More specifically, the proposed principles of negotiation relate to constructive and respectful cooperation. Theresa May admits that there will be downsides of leaving EU for British companies, decision power of the country and the loss of the access to the single market. Furthermore, The Prime Minister highlights the importance of British people, their safety, safety of the UK future. And even though the letter is quite general, it does not forget to mention the border between Northern Ireland and Ireland (GILCHRIST, 2018).

The first official letter sent by the UK Prime Minister is not of course the only communication between UK and EU. It is more likely just the first step in a very long and vast discussion between UK and all main institutions of European Union (European Commission, 2018).

The following discussion has been summarised by the European Commission and it is not a part of the Brexit deal. More than that, it provides topics and areas which must be negotiated to achieve a deal. This is a desire on both sides. Technically called “Hard Brexit” is a solution as well but it is unfavourable for everybody. The official Communication from The Commission to The European Parliament, The European Council, The Council, The European Central Bank, The European Economic and Social Committee, The Committee of The Regions and The European Investment Bank Preparing for the withdrawal of the United Kingdom from the European Union on 30 March 2019 is the first step in achieving an agreement (JACOBS, 2018).

Below, there is a picture no.2 of the next steps which were communicated at first between EU and UK.



Picture 2 – Brexit: Next steps (European Commission, 2018)

In this letter, the European Council is quite sceptic regarding the departure of UK. However, it does not underestimate the reality and decision taken by British citizens. It merely doubts reaching a deal. The most difficult issue is to realize the impact of Brexit and think about every change that will happen. It starts with new border all the way to data collection and protection (FABBRINI, 2017).

UK will leave EU on 30 March 2019. This information is also represented in the picture above. However, it is already known that there are some changes to the original plan. For example, the first deadline for drafting a deal was set to March 2018 but happened in November 2018 (European Commission, 2018).

The original approach needs to be more general and broader. Only by making a progress, the discussion will get on a certain path and will be narrowed down. The initial communication therefore lists all possible scenarios which are described in two possible options (BAILEY & BUDD, 2017).

Scenario 1

The withdrawal agreement is finished and ratified before 30 March 2019 which means it can enter into force. The EU will still apply in the United Kingdom until the end of 2020. This gives UK 21 months of a transition period during which, the UK

Government must set the terms of the agreement. If this is the way Brexit will be executed, then:

- The United Kingdom will become a third country
- EU law will still apply in UK during the transition period
- UK will no longer participate in EU decision-making and will lose influence over all EU institutions and governance
- EU institutions will manage and oversee that UK is committing to the withdrawal agreement and takes all steps during the transition period
- UK and EU will negotiate the future relationship which should be ideally finished, signed and ratified before the end of a transition period

This is the scenario both sides would like to see before 30 March 2019. Everything depends on the ongoing negotiations (JACOBS, 2018).

Scenario 2

The 2nd scenario is the one that both sides are trying to avoid. This situation predicts that there will not be any agreement between UK and EU by 30 March 2019. If that happens, there is not going to be a transition period. This situation is also referred to as "hard Brexit," "no deal," or "cliff-edge." The consequences of such action are different and severe:

- The EU law instantly stops being applicable in UK
- There is no specific arrangement about what will happen with UK citizens in EU and with EU citizens in UK. This question remains unanswered.
- The European Union must apply regulations and tariffs at the borders with UK and treat it as a third country. This includes sanitary and phytosanitary controls. This will cause big delays in transport on the roads, ports and airports. The transport would be severely impacted.
- Regarding trade, UK as a third country would become a subject of international public law, including rules from the World Trade Organisation. The market is now highly integrated, and this would mean huge drawback for UK as all systematic regulations specific to each industry would become non-applicable.

- The future negotiations may change its form from treating UK as a close partner to EU to any other third country and the distance between UK and EU would increase.
- EU entities would cease all available funding for UK entities. In other words, until 30 March 2019, UK companies, school, small entrepreneurs can apply for EU funding. However, if agreement is not achieved, all UK applicants should be instantly rejected (JACOBS, 2018).

Preparedness and Contingency

As was already addressed before, the result of negotiations is still ongoing and cannot be predicted by either UK or EU. Even though both parties invest a lot of energy in the preparation of UK's withdrawal, they realize this risk and they know it cannot remain open and unprotected. For that reason, a very significant part of communication before the negotiations even start is to make sure there is a plan for each outcome of the discussion (BIRKINSHAW, et al., 2016).

The European Commission distinguishes between preparedness and contingency. Preparedness is in this situation a set of tools to have a plan for any result of the discussion. It relates to protection of all remaining 27 countries and must be applied immediately to protect the interests of EU. It also means assessing all risks on all levels related to each scenario that could happen in March 2019. The preparation cannot stop the risks, but the aim is to mitigate them as possible (KELLY, 2017).

Contingency aims for a different purpose. The contingency plan is there to secure the situation after Brexit deadline if there is not any withdrawal agreement in place. This situation is much more dangerous as the second scenario above explains. It is another form of planning for the worst possible outcome of negotiations. This planning goes deeper into operational situations and practicality. It does not necessarily involve only EU but also member states, especially those on UK border. It also includes relocation of institutions in the UK and many other London-based agencies (European Commission, 2018).

Preparedness Illustration

Transportations, mainly aviation is a big topic because this is very integrated area which is not easily changeable. EU has its aviation standards and rules in place

regarding safety, security and access to EU market. These standards are different when EU deals with third country. EU should then carefully decide how the status of UK will influence this policy (European Commission, 2018). The European Commission has already been heard that it will accept proposals to amend the existing regulations under any scenario. This however must be part of withdrawal agreement and thus, it yet must be discussed and ratified (Civil Aviation Authority, 2015).

In conclusion, preparing for withdrawal of the United Kingdom from EU is a matter for everyone because it will have a worldwide impact and so far, nobody can predict the size of such action. Even more so, each Member State and citizen should follow the steps suggested by the European Commission. Preparedness for withdrawal is one of the most important tasks of the European Commission and it will continue so until the deadline of March 2019. This is the thought, the Brexit negotiations should begin with (GRANT, 2017).

3.4 Situation After Brexit Referendum

There are many political events happening in the United Kingdom every day as the day of departure from EU approaches. However, this day is a result of a very long period of certain struggle in Great Britain. The former Prime Minister, David Cameron has committed in January 2013 to initiating an in-out referendum for British citizens to sum up on the UK position in EU (House of Commons Library, 2018).

In October 2015, David Cameron sets a package of four important areas to achieve a renegotiation from EU. It aims at economic governance, competitiveness, sovereignty and social benefits. It resembles with the reasons why UK eventually decided to leave UK which shows an increasing national pressure which needs to lead to some resolution. David Cameron has been negotiating with European Council and he has achieved a result in form of policy paper called: *'The best of both worlds: the United Kingdom's special status in a reformed European Union.'* This document gives UK a special status as the title indicates and it fights the problematic issues which David Cameron has pointed out to European Council. This document was published by the British Government in February 2016. David Cameron announces a

referendum to strengthen the UK's position in EU as he believes the result will be to remain in EU (O.G.L, 2016).

3.4.1 Chronological Order of Events

June 2016 – November 2016

Unfortunately, to a worldwide surprise, citizens of Great Britain decide to leave the European Union by a very close result in referendum which took place on 23 June 2016. The very next day, David Cameron announces his intention to resign on the Prime Minister position. In mid-July 2016, Theresa May becomes new Prime Minister. Later, in October 2016, Theresa May confirms she is going to trigger Article 50 in March 2017, but her intention is based on the royal prerogative power which as this thesis explained was overruled in Miller case. The High Court has ruled in favour of its claimants in November 2016 and Government appealed against the ruling. The Supreme Court has rejected the appeal and that means withdrawal from UK must be legally passed by Parliament (About Britain, 2016).

June 2017 – December 2017

Considering those events, Prime Minister Theresa May calls for a general election which took place in June 2017. Her Conservative Party wins the election with most seats and she forms a new Government to prepare Great Britain for Brexit. The members of new British Government have stated that they will honour the result of referendum and UK will leave EU as the Article 50 of Lisbon Treaty allows to any member state. This process has officially started with a letter sent to European Council which was a formal trigger of Brexit on 29 March 2017, UK will leave EU on 29 March 2019 at 23:00 exactly (House of Commons Library, 2018).

Still in June 2017, there has been first round of UK-EU negotiations and Queen Elisabeth II. has introduced the 'Great Repeal Bill' to the Parliament. It is a common term used to refer to European Union Withdrawal Bill. This bill has passed also second reading in Parliament. The Prime Minister continues with a progress in negotiations until the end of 2017 (McLAUGHLIN, et al., 2018).

January 2018 – June 2018

The beginning on 2018 was in process of negotiations and covering all topics of Brexit deal. The Parliament has changed the withdrawal agreement several times, but it was finish in May 2018 and it became an Act of Parliament in June 2018 as the law requires it (CONNELLY, 2017).

In the meantime, The Prime Minister Theresa May has delivered another speech in March 2018 regarding Brexit negotiations. She addressed a need for achieving a deal between UK and EU and she said that there will not be a 'Hard Brexit.' She focused on free trade which is of course very important for both parties, but she completely failed to cover the so far biggest issue of Brexit deal – land border between the border of Northern Ireland and the Republic of Ireland which is EU member state.

Neither side wants a hard border and introduction of border controls eliminating free movement of people. However, if there is not a ratified deal before 29 March 2019 between EU and UK, there cannot be an open border anymore. EU will be forced to treat UK as a third country and the hard border would be re-established (DUNT, 2017).

Both EU and UK call it a 'back door' and nobody wants that. In means that if there is the Hard Brexit but open border with the Republic of Ireland, good and materials which do not comply with EU laws can be smuggled in to the common market and on the other hand, the illegal immigrants would be able to pass into UK from EU. The issue is that the opinion on Brexit deal is not the same across British citizens. Some prefer the Hard Brexit, and some prefer cooperation with EU and maintaining the common market. The issue with land border is the opening gate for this issue (About Britain, 2016).

July 2018 – December 2018

Theresa May has secured a compromise deal with EU which she has introduced to the UK cabinet and she united them for the opinion on it. However, this deal very quickly got name 'BRINO' meaning Brexit In Name Only. That refers to a fact that the deal is very soft and means that UK will remain aligned with EU on trade of good but not services. This deal was not fancied by hard-line right-wing ministers and Theresa May's own political party thought the deal is too soft. The doubt of accepting this deal in UK Parliament became very significant (BBC, 2018).

Although, if this deal would theoretically pass into force, UK would be still largely aligned with EU on many factors, but it would lose influence in European Parliament and European Commission since it would leave EU. It is hard to see in this situation that UK would gain more than it would lose. UK would be able to block some immigration from EU even though there are many very important workers coming from EU to help UK economy (CONNELLY, 2017).

As it seems, the deal introduced in July 2018 does not have any supporters among politicians, businesses or citizens. The likelihood of leaving the Brexit idea increases, the Hard Brexit option probability also increases and performing a second referendum for a new vote increases as well (BBC, 2018).

Right after this deal was introduced to the UK cabinet, all ministers have been united on the opinion but just few days later, the UK Government has suffered two shocks by resignation of David Davis as Secretary of State replaced by Dominic Raab and another resignation from Boris Johnson as UK Foreign Secretary. David Davis oversaw UK-EU negotiations. He stated that could not support the current withdrawal deal with EU. The second resignation by Boris Johnson left the Conservative party in even bigger chaos. The probability of new referendum increases even more (OUTHWAITE, 2017).

In November 2018, Theresa May has announced she finalized the Brexit deal with EU. As the deadline was approaching, there were almost certainly two possibilities. The Prime Minister would convince the Government to approve it and UK Parliament to ratify the current deal on Brexit or the Government or Parliament would reject it and then the course would be settled for unknown, most likely Hard Brexit or a second referendum (JACOBS, 2018).

The situation in November showed that reaching a deal with EU was maybe the easiest part because Theresa May had to convince UK as well and that seemed much more difficult. The problem is that the deal did not change much from July 2018, it is still a soft Brexit deal which does not really handle the Ireland land border well. The only solution for Ireland border is custom union which nobody wants to apply. UK would still be strongly aligned with EU and the overall impression is that UK would lose a lot more than it gains. It was seen more like a miracle to succeed with ratifying Brexit deal in November 2018 as the crisis deepens without any reachable solution.

Many opponents called for a second referendum or general election, but The Prime Minister said she would not initiate either of those. The November survey on opinion regarding Brexit show that majority of people wish to exit the Brexit (HUMPHREYS, 2018).

Additionally, to the Government's crisis, four more ministers have left the cabinet, including Dominic Raab, new Britain's chief Brexit negotiator. The Brexit deal have been heavily criticized in the UK Parliament. Some even prefer no deal at all which has been ruled out a long time ago. As it seemed in the end of November 2018, there are only two options left if Theresa May cannot convince the Members of Parliament and those are a second referendum to stop Brexit or leave without a deal (DUNT, 2017).

In December 2018, the vote should have taken place to accept or reject Theresa May's Brexit Deal. However, one day before the vote, Theresa May announced that the vote would not take place. She cancelled the vote because it was clear that it would be rejected. She wants to continue with negotiations in EU to achieve some changes before the vote would take place. But as many critics pointed out, Theresa May could not achieve any significant changes within two years, so it is unlikely to achieve them in last 3 months. The second referendum was still an option to back away from Brexit. More and more people were inclined to remain in the European Union (BBC, 2018).

4 Results and Discussion

Gross domestic product is one of the most important measures of economic power of a respective country. It consists of 4 parts with different importance to provided information. It is a total value of everything produced by a country. It counts both people living in the country and people who live abroad but still are citizens of this country. There are different ways to calculate GDP, but it is vital to avoid double-counting. For that reason, only the final value is considered and not processed items during its production (AMADEO, 2019). According to (ARNOLD, 2007), gross domestic product is the monetary value of all finished goods and services produced inside a country's territory in a specific period. GDP is usually calculated based on annual data but it can be also measured quarterly but the issued GDP always covers period of an entire year.

There are three primary menthods how to calculate GDP. When all of them are correctly calculated, result must be the same. The first approach is called GDP based on spending which consists of 4 components and is described in more details below. The second approach is based on production. It works as a reversal of expenditure approach because the calculation considers output of the economy and deducts costs of intermediaries. The last approach is based on income. It works with an idea that what is being spent by someone must be earned by someone else. National income then covers all that has been paid as wages, salaries, corporate income, etc (ASSA, 2016).

<u>Gross domestic product based on spending consists of 4 components:</u>

1. Personal consumption expenditures
    a. It means how much citizens of a country spend on good and services. It included two sub-categories. The first are durable goods which are long-lasting items like electronics, bikes or cars and the second are non-durable goods which are well-known groceries and items we spend on daily basis (BREZINA, 2012).
2. Business investment
    a. It refers to business expenditures on long-term assets such as buildings, plants and equipment.

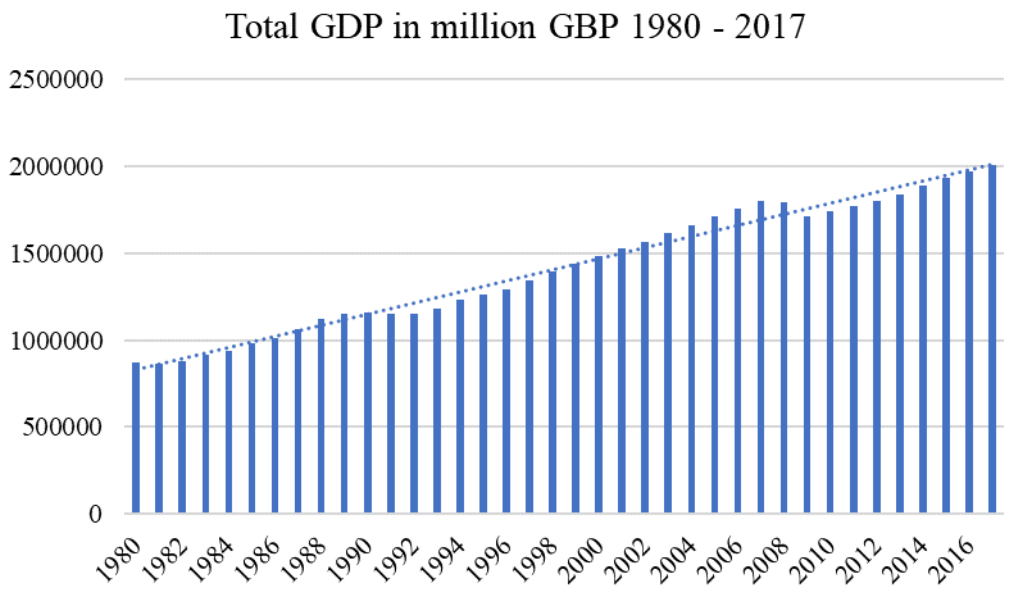
3. Government spending
    a. It is a total spending of government of a respective state from its budget. Usually, most expenses are in social security, infrastructure, medical care or for some states even military expenses.
4. Net exports
    a. It is a part of GDP calculation which is the only one that can vary. It depends on each country's policy regarding exporting goods and services and importing them (AMADEO, 2019).

Formula for calculating GDP based on spending according to (BREZINA, 2012):

GDP = C + I + G + (X-M)

4.1 Analysis of Current UK GDP and its Components

Chart 12 – Total GDP in million GBP 1980 – 2017 (Office for National Statistics, 2018)

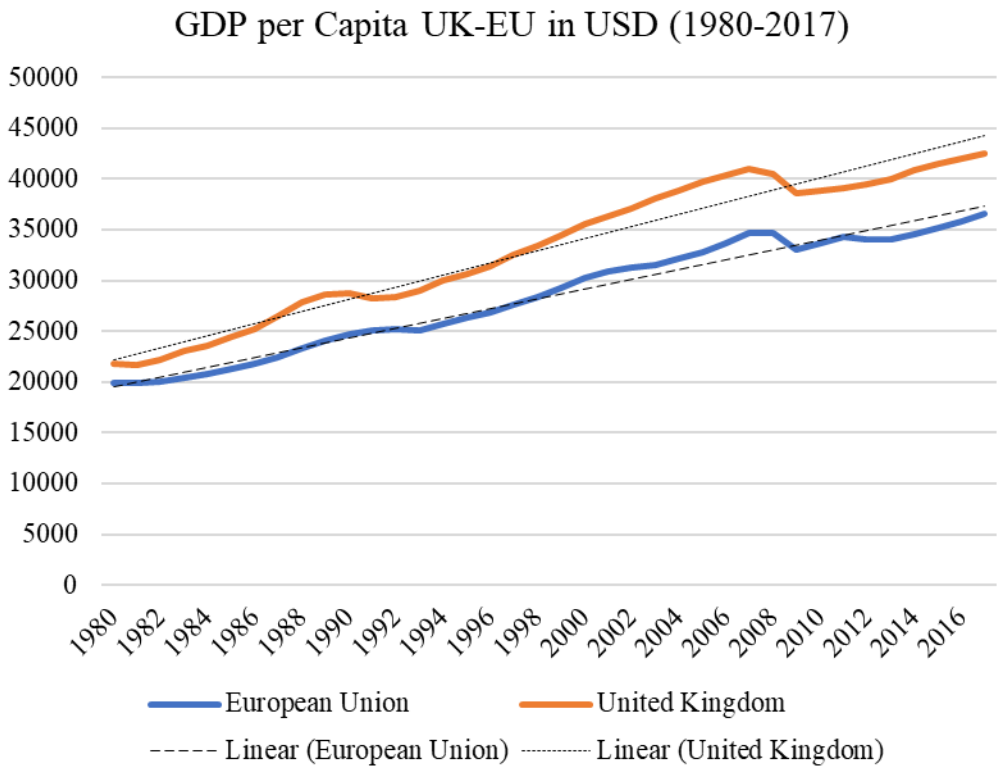


It can be seen in the chart 12 above that UK GDP is steadily growing for past 37 years and in December 2017 it reached 2 005 427 million GBP. According to the (Office for National Statistics, 2018), GDP has been measured from 1948 when in reached overall minimum at 350 107 million GBP but it has been steadily growing since then. UK Statistics Bureau also releases monthly estimates of GDP progress.

Chart 13 – UK GDP Growth in % for 1980 – 2017 (RICHARDS, 2018)

Chart 13 displays different important information compared to the chart which shows only nominal GDP. The actual trend of growth is slightly decreasing, and it contradicts the average overall growth. It is important to realize that the chart above compares the difference in growth from one period to another.

Chart 14 – GDP per Capita UK-EU in USD (The World Bank (2), 2019)



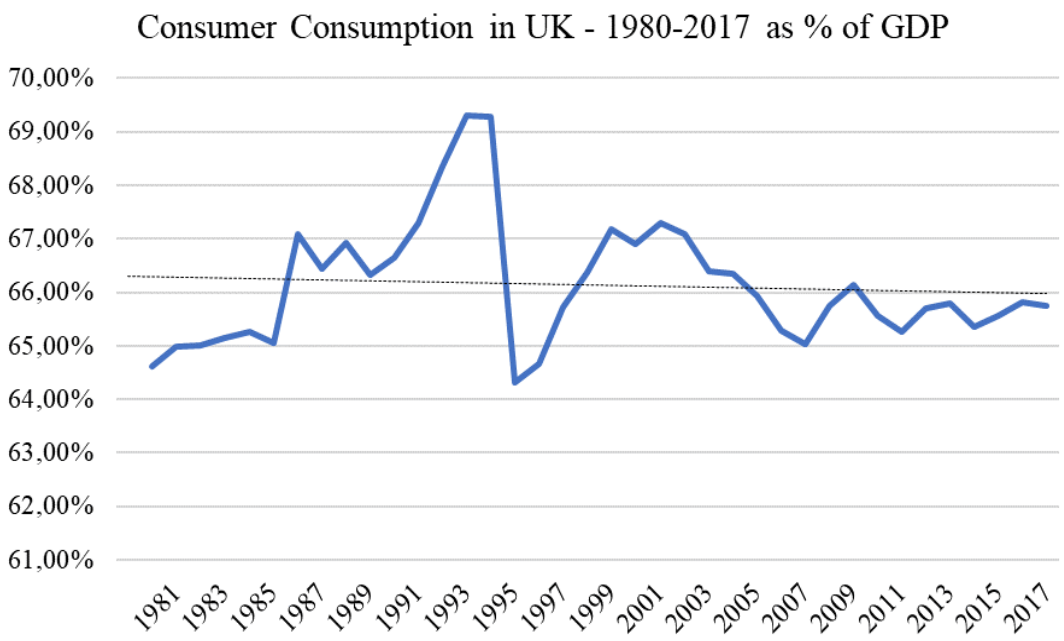
The chart 14 above relates to GDP per capita of United Kingdom in comparison with European Union. It shows very similar, almost identical development over time, including increase around 1986 – 1990 and then influence of financial crisis in 2008 which meant a significant decrease. There is an additional piece of information from comparing the linear trendlines. It clearly shows that UK is increasing its GDP per capita faster than EU. GDP in EU was around 19 930 USD in 1980 in comparison with UK where it was 21 865 USD. UK GDP is around 9.7% bigger. Same calculation done in 2017 shows that GDP in UK is around 42 514 USD while in EU it is 36 593 USD. The difference this time is 16.2% (The World Bank (2), 2019). It is not extreme difference, but it indicates that UK is developing faster than EU. On the other hand, it must be considered that EU is large block of states with variation of economies which are either developed or still developing and UK is already fully developed country (BAMFORD, et al., 2000).

4.1.1 Analysis of UK GDP Components

It was already mentioned that calculating GDP based on a spending approach means using four variables. And it is a consumer consumption or also called a household consumption, government spending, net investment in the country and net export which can be negative that means that import is bigger than export or the other way around (AMADEO, 2019).

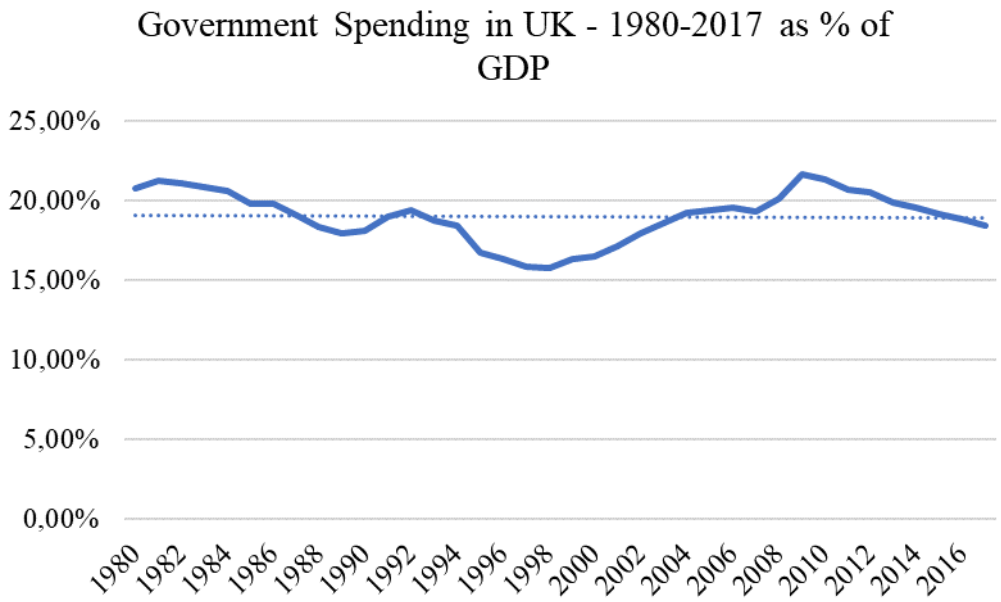
The chart 15 shows first component, consumer consumption in period 1980-2017 as a percentage portion of GDP. The value fluctuates between 64% and 70% which indicates that it is more than half of UK GDP in a long-run in a slightly downward direction (The World Bank (3), 2018).

Chart 15 – Consumer Consumption in UK – 1980-2017 (The World Bank (3), 2018)



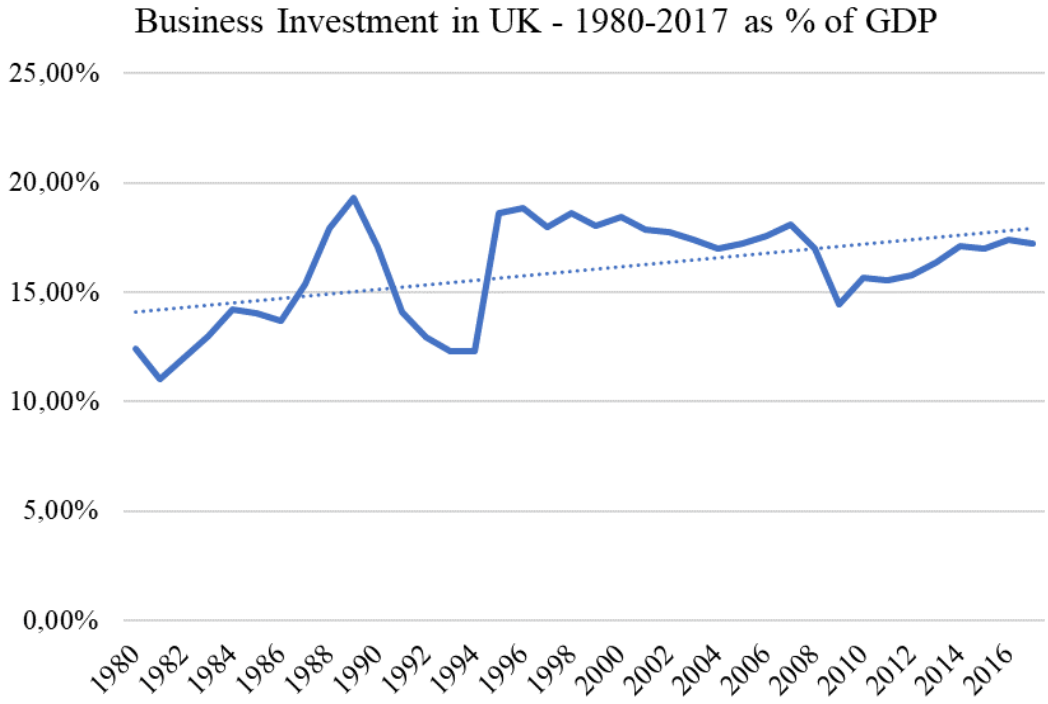
The next component is government expenditure which is displayed in chart 16 below. This component fluctuates between 15% and 23% and therefore makes up about one quarter of UK GDP in a long-run based on data from 1980 to 2017. Additionally, it is noticeable that the trendline does not change direction over time and is almost perfectly stable (The World Bank (4), 2019).

Chart 16 – Government Spending in UK – 1980-2017 (The World Bank (4), 2019)



The chart 17 below shows third component of GDP of the United Kingdom. This component is strongly influenced by current international political situation of the country. It fluctuates between 10% and 20%. The range during 1980 and 2017 is around 8.00% of GDP. The trend function signalizes a long-term substantial increase (The World Bank (5), 2017).

Chart 17 – Business Investment in UK – 1980-2017 (The World Bank (5), 2017)



The last component of GDP used in this equation is the net exports which use symbol NX or M (E-I). It is a difference between sum of all legally exported goods and services from the country and all goods and services which have been legally imported into the country. This is the only value which can be negative if a country is an 'importer.' It is not an unusual situation for many countries in the world (The World Bank (6), 2018).

Chart 18 – Export of Goods and Services from UK – 1980-2017 (The World Bank (6), 2018)

Chart 19 – Import of Goods and Services in UK – 1980-2017 (The World Bank (7), 2019)

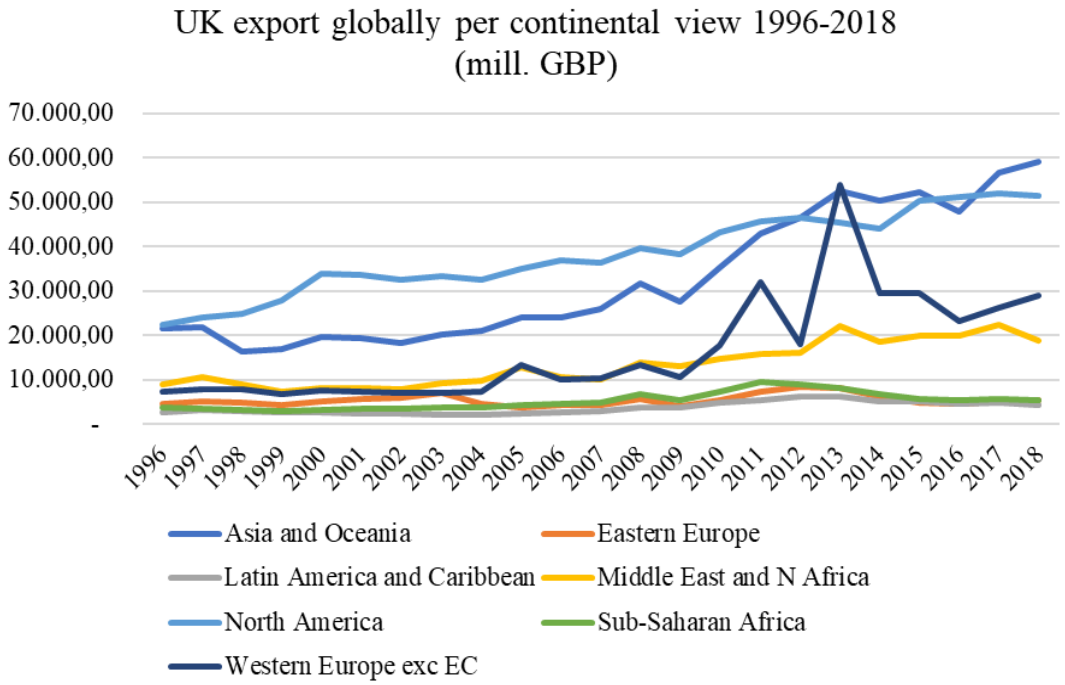
4.2 Analysis of Net Exports of UK

The United Kingdom is the 10th largest export economy in the world. UK is trading with more than 70 countries. The value of export according to the latest data from 2017 reaches 442 billion USD and the import was more than 640 billion USD. It is more than 28% of UK GDP for export and 30% of GDP for import. Foreign trade is clearly a fundamental part of British economy (WORKMAN, 2019).

The United Kingdom's export is from continental perspective valued for 54% to the European trade and almost 48% goes to European Union member states. The second place belong to Asia with almost 23%, then North America with around 15% and then other smaller export destinations (OEC, 2017).

The chart 20 shows the summary of export from continental point of view to reflect global overview of the international trade of the United Kingdom (UK Trade Statistics, 2018).

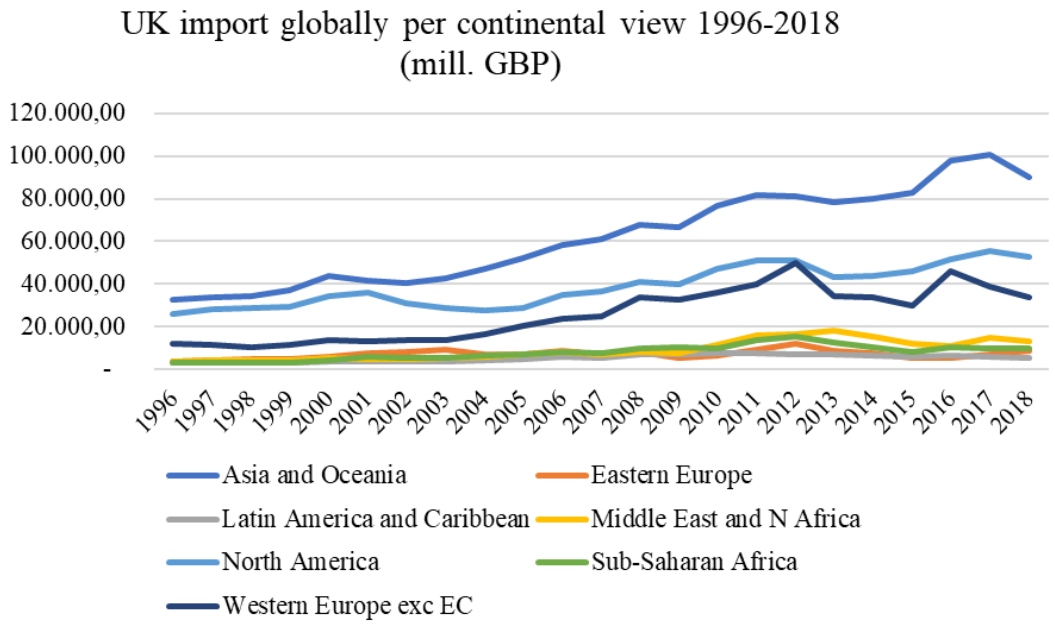
Chart 20 – UK export globally per continental view 1996-2018 in millions GBP (UK Trade Statistics, 2018)



Great Britain is even bigger importer which means that its net exports figure is negative according to the latest data from 2017. It is the 4th largest importing country in the world. The forecast for 2018 is based on current data 671 billion USD.

The UK import is from continental perspective valued for almost 59% in the European countries, then Asia with nearly 23%, North America with 12% and then the rest of smaller import origins in 2017 (TransferWise, 2017).

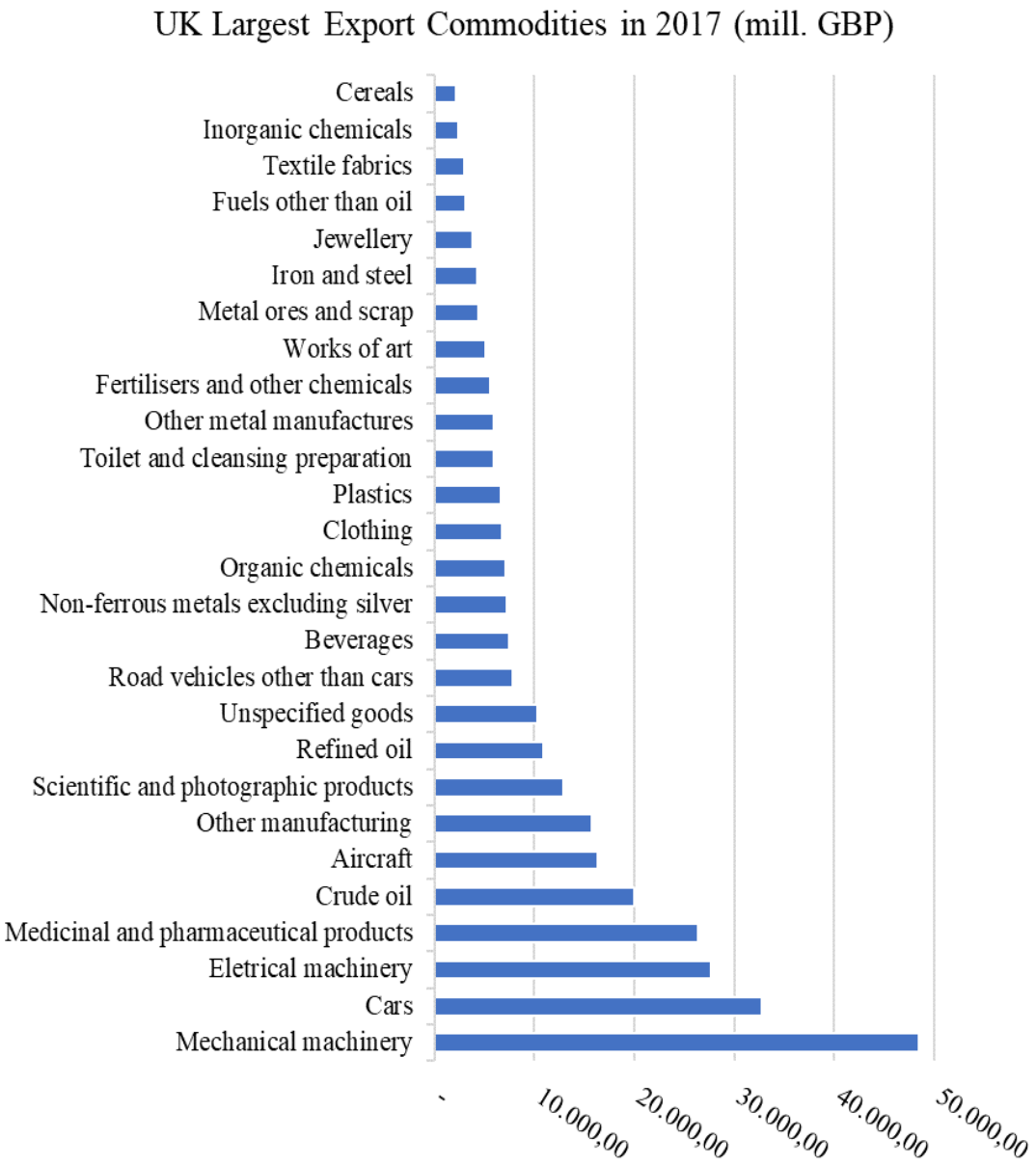
Chart 21 – UK import globally per continental view 1996-2018 in millions GDP (UK Trade Statistics, 2018)



The foreign trade of United Kingdom is one of the largest in the world from both export and import points of view. UK trade commodities are presented in charts 22 and 23. Each chart shows a category of respective commodity either exported or imported in millions of British Pounds (Statista, 2018).

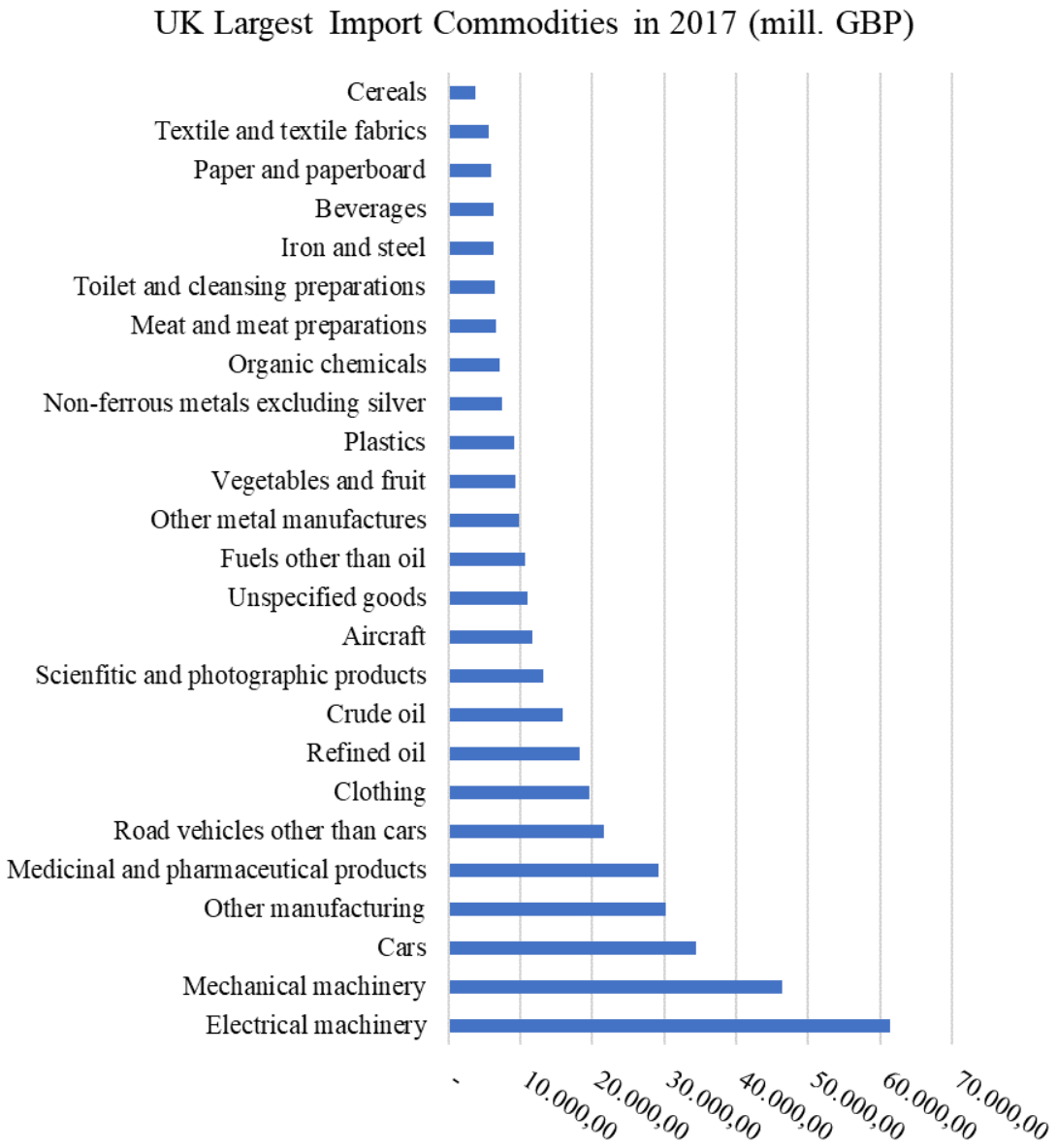
In both situations, major sectors are mechanical machinery, cars and electrical machinery which indicates high focus on heavy and light engineering industries. These industries are followed by medicinal and pharmaceutical products, other manufacturing and road vehicles other than cars. It clearly shows continuing trend of focus on heavy machinery and engineering. Other than heavy industries and medicine, the UK foreign trade can be described as focused on organic and other chemicals, rare ores such as silver or gold. By derivation of chemicals, there is a significant portion of cleansing and toilet products, along with fertilisers and, steel, jewellery, plastics and textile (Statista (2), 2018).

Chart 22 – UK Largest Export Commodities in 2017 (Statista, 2018)



It is clearly shown in the chart 22 that agricultural categories have very low portion on overall export of the United Kingdom. At the lowest position, there are cereals with 2 147 000 000 GBP exported in 2017. That is very low figure on overall exported goods and services from UK (Statista, 2018).

Chart 23 – UK Largest Import Commodities in 2017 (Statista (2), 2018)



4.2.1 Trading Partners with UK

The United Kingdom has several main trading partners in the world. When a trading bloc is considered, then EU is the UK's largest trading partner. In 2017, the EU accounted for 44% of UK's export and 53% of import. It has been already established that import exceeds export in the United Kingdom, however, Great Britain is a very strong trading partner to any country in the world and its position on a global market is significant. Nevertheless, the EU share on UK's market has been decreasing since 2002 when the export reached 55% and import 58%. It could be

caused linked to increasing importance of China on the global market as its and UK's trading relations have increased in last 20 years (WARD, 2019).

Table 3 – UK Trade in 2017 in billions GBP (WARD, 2019)

UK Trade, 2017 (billions GBP)			
	Exports	Imports	Balance
Goods	338.9	476.3	-137.4
Services	277.0	165.5	111.5
Total	615.9	641.8	-25.9

The UK has exported in 2017 in both goods and services 616 billion GBP and imported 642 billion GBP worth goods and services. When it comes to goods only, as was already mentioned, there is a large deficit in the United Kingdom. The value of exported goods is around 339 billion GBP while import is over 476 billion GBP. However, when it comes to services, UK is in surplus. The value of exported services is 277 billion GBP while the imported value is around 165 billion GBP.

Table 4 – UK Trade with EU and Non-EU countries (WARD, 2019)

UK Trade with EU and Non-EU countries 2017					
Goods and services					
	Exports		Imports		Balance
	Billion GBP	Share %	Billion GBP	Share %	Billion GBP
EU	274.00	44.5%	341.00	53.1%	-67.00
Non-EU	341.90	55.5%	300.80	46.9%	41.10
Total	615.90	100.0%	641.80	100.0%	-25.90

The table 4 above shows the importance of EU and UK trade relationship. By restricting trade policies between these two entities, both will struggle significantly. Especially for UK because majority of this country's trade for EU and non-EU countries is going through Rotterdam port in Netherlands (Economics Online, 2018).

Table 5 – Top UK 25 export and import trading partners (Office for National Statistics, 2018)

Top 25 UK export markets			Top 25 UK import markets		
Goods and services	Billion GBP	Share %	Goods and services	Billion GBP	Share %
United States of America	112.20	18.2%	Germany	78.10	12.2%
Germany	56.80	9.2%	United States of America	70.40	11.0%
France	40.40	6.6%	Netherlands	46.90	7.3%
Netherlands	39.00	6.3%	China	45.20	7.0%
Ireland	34.00	5.5%	France	40.80	6.4%
China	22.30	3.6%	Spain	31.30	4.9%
Switzerland	19.00	3.1%	Belgium	28.20	4.4%
Italy	18.90	3.1%	Italy	24.00	3.7%
Belgium	18.70	3.0%	Ireland	21.80	3.4%
Spain	16.10	2.6%	Norway	21.30	3.3%
Japan	13.50	2.2%	Japan	14.20	2.2%
Hong Kong	11.40	1.9%	Poland	12.80	2.0%
Sweden	11.10	1.8%	Switzerland	11.70	1.8%
Australia	10.80	1.8%	India	10.90	1.7%
Canada	10.00	1.6%	Turkey	10.40	1.6%
Singapore	9.60	1.6%	Hong Kong	9.40	1.5%
South Korea	8.20	1.3%	Sweden	9.10	1.4%
Turkey	7.80	1.3%	Canada	7.20	1.1%
India	6.90	1.1%	Russia	6.50	1.0%
Poland	6.90	1.1%	Denmark	6.40	1.0%
Denmark	6.60	1.1%	Czech Republic	6.30	1.0%
Saudi Arabia	6.20	1.0%	Portugal	5.90	0.9%
Norway	6.10	1.0%	Australia	5.30	0.8%
Russia	5.90	1.0%	Singapore	5.20	0.8%
South Africa	4.70	0.8%	South Korea	5.10	0.8%
Total	**503.10**	**81.8%**	**Total**	**534.40**	**83.2%**

The table 5 above shows main 25 trading partners for UK from export and import perspective. The main 25 trading partners represent similar traded volume and share of total exported or imported amount of goods and services. The most significant partner to UK is according to the table the United States of America. They make up twice higher value of export market for UK than Germany in the second place and USA is also second in terms of import, closely behind Germany. However, as was already mentioned, when it comes to trading blocs, EU makes up around half of UK total trade value (Office for National Statistics, 2018).

4.3 Implementation of Hard Brexit Impact

The deadline for reaching and ratifying any deal between the United Kingdom of Great Britain and Northern Ireland and European Union ends on 29th March 2019. The new conditions will apply since the next day and it is still not decided what these conditions will be (WHYMAN, et al., 2017).

Long before the negotiations between UK and EU reached a critical situation, there were two options on the table for UK. The first one was based on a Norway model. It was almost immediately rejected from UK's side because it would mean the acceptance of EU rules but not any decision power. This solution was according to the Prime Minister, Theresa May, politically unsaleable. The second option was based on Canadian-style free trade agreement. This agreement does not cover most of the service sector which makes up 80% of British economy. Accepting a deal with this condition would almost inevitably damage the British economy (Institute for Government (2), 2019).

The European Union is not willing to give more flexible access conditions to the UK because of the British position. This kind of action from EU, when better and more flexible conditions are given can be seen with eastern neighbours of EU. For example, Ukraine has a partial access to EU market but for a cost of adoption of EU rules and EU institutional oversight. However, even if this was intriguing for UK, it is not applicable because it is moving outside EU while Ukraine is moving towards it. Different approach can be seen in relations between EU and Switzerland. Switzerland has a vast network of agreements with EU which allows participation in the Single Market. These agreements are not being overseen by EU institutions and even if this solution was preferred by UK, it became unpopular among EU representatives which makes it unlikely to offer this option to UK (DAVIDIAN, 2018).

The United Kingdom is trying to find a unique solution for their position in the Single Market. However, no matter what way British Government will propose, they will not avoid a fundamental choice to either give up some sovereignty or losing the access to market. If UK does not want to give up any control and be constrained by EU rules, then it will experience trade barriers and on the other hand, entering the market means accepting commitments on the UK side (WHYMAN, et al., 2017).

This thesis must reflect the aspect of time since Brexit is still an ongoing process. There is not much time to achieve an agreement between UK and EU and more and more of British citizens are preferring the No-Deal Brexit or also called Hard Brexit. If that happens, there will be a hard border between UK and Ireland, price levels may vary for some products due to its shortage. All of this is a short-term effect after Brexit becomes applicable on 29th March 2019 at midnight (KEE, 2017).

4.3.1 Change from EU Member to a Third Country

From a long-term perspective, if The United Kingdom leaves EU without any deal, both parties acknowledged application of World Trade Organisation rules to the Single Market and UK would become a third country for all purposes. According to those rules, EU must give UK the same access to the Single Market as to other countries except developing countries and those with free trade agreements. British experts argue that WTO rules will have a damaging effect on several sectors of UK economy, mostly on services, manufacturing and agriculture. Brexit does not affect only trade with EU. The United Kingdom is now trading with the rest of the world as an EU member state. Positively, these free trade agreements can be rolled over to the UK status as a country (SANDFORD, 2019).

4.3.2 WTO Rules

The application of tariffs would affect 90% of British goods exported. The average tariff on UK exports would be 4.3% and imports from EU to UK around 5.7%. There would be significantly higher tariffs for some sectors such as agriculture as the table 6 below shows. The average tariff on exported agricultural products will be 17.70% and for imported goods 16.40%. That is a significant part of the final products' prices. The second highest tariff average belongs to food, drinks and tobacco and the third place belongs to textiles, clothing and footwear. Some sectors such as motor vehicles, chemicals and other machinery have lower applied tariffs, but the traded volume is much higher. And most importantly, tariffs are a part of Brexit negotiations and both parties will try to diminish the final tariffs as much as they can (CBI, 2017).

Table 6 – Applicable tariffs for trade after Brexit (CBI, 2017)

Sector	Average MFN import tariff, %	Average MNF export tariff, %
Aerospace and defence	2.60%	2.70%
Agriculture, forestry and fishing	17.70%	16.40%
Chemicals	3.80%	3.50%
Electrical machinery	2.60%	2.00%
Financial services	n/a	n/a
Food, drinks and tobacco	13.40%	10.30%
Insurance	n/a	n/a
Machinery and equipment	2.70%	1.80%
Metal and metal products	2.00%	2.30%
Motor vehicles	9.00%	8.50%
Non-motor vehicles transport	1.80%	1.30%
Pharmaceuticals	0.00%	0.00%
Post and telecoms	n/a	n/a
Scientific goods	1.30%	1.60%
Textiles, clothing and footwear	10.40%	10.50%

4.4 The Analysis of Brexit Impact

The Brexit prognosis is in general terms the most likely impact on British economy. Also, it can be called forecast or even prophecy is being estimated for each sector in UK. The biggest impact is expected in mostly traded commodities from heavy industry and pharmaceuticals. The agricultural sector is not being traded in such volume, but it does not change its big importance in the economy. Agricultural sector consists of vital commodities mentioned in the section below (RAPHAEL, 2019).

4.4.1 Economic Theory

The respective economic model explains the net exports of agricultural commodities between the United Kingdom and top 10 EU trading partners which represent majority of UK trade with EU. Net export is a result of figures representing exported goods from the analysed country to trading partners and figures representing imported goods from trading partners into the analyzed country. The outcome represents net exports for agricultural sector between The United Kingdom of Great

Britain and Northern Ireland and the rest of its trading partners in the European Union (GANDOLFO, 2013).

Net exports = exports – imports

The above formula represents the economic theory of net exports and its grouped variables. Net exports are also known as balance of trade or commercial balance. It is one of the variables of GDP and depending on the result, it either increases or decreases the final GDP value. The main variable of net exports is the price of goods exported and imported. There are additional factors influencing trade balance such as customers' preferences, trade costs, government policies, international agreements or exchange rates when applicable (Policonomics, 2017).

By addressing these conditions to The United Kingdom, price remains the main factor for commercial balance. Government policies and international agreements are identical with EU policy for the time of membership, therefore it doesn't imply additional factor to trade and exchange rate between two strong currencies as British Pound and Euro doesn't record significant discrepancies and the impact on final trade is minimal (RAPHAEL, 2019).

Table 7 – Top 10 export trading partners 2017 of UK in EU (Office for National Statistics (2), 2018)

Top 10 export EU trading partners		
Goods and services	Billion GBP	Share %
Germany	56.80	9.2%
France	40.40	6.6%
Netherlands	39.00	6.3%
Ireland	34.00	5.5%
Italy	18.90	3.1%
Belgium	18.70	3.0%
Spain	16.10	2.6%
Sweden	11.10	1.8%
Poland	6.90	1.1%
Denmark	6.60	1.1%
Total	**248.50**	**40.3%**

Table 8 – Top 10 import trading partners 2017 of UK in EU (Office for National Statistics (2), 2018)

Top 10 import EU trading partners		
Goods and services	Billion GBP	Share %
Germany	78.10	12.2%
Netherlands	46.90	7.3%
France	40.80	6.4%
Spain	31.30	4.9%
Belgium	28.20	4.4%
Italy	24.00	3.7%
Ireland	21.80	3.4%
Poland	12.80	2.0%
Sweden	9.10	1.4%
Denmark	6.40	1.0%
Total	**299.40**	**46.7%**

Tables 7 and 8 provide a list of top trading partners from UK perspective in both export and import. The traded volume changes but the list of countries is consistent and there are still 10 countries in single values when compared. As can be seen in table 4, the total EU export is 44.5% and import is 53.1%. Therefore, the top 10 trading partners entail 90.5% of total EU trade and from import perspective, it is 87.9%. Both are extremely high values enough to explain the UK-EU trade (Office for National Statistics (2), 2018).

4.4.2 Explanation of Commodities

There are the following variables representing groups of agriculture products traded between UK and the trading partners. Each group contains specific list of products and commodities described in the tables 9 - 12 below. Each variable is, of course, measured from export and import perspective. Therefore, the total number of explaining variables in the economic model is 8.

- Animal and vegetable bi-products: export/import
- Animal products: export/import
- Foodstuffs: export/import
- Vegetable products: export/import

Variable to be explained

y_1 = trade balance of agricultural commodities between UK and EU trading partners

Explaining variables

x_1 = exported animal and vegetable bi-products

x_2 = exported animal products

x_3 = exported foodstuffs

x_4 = exported vegetable products

x_5 = imported animal and vegetable bi-products

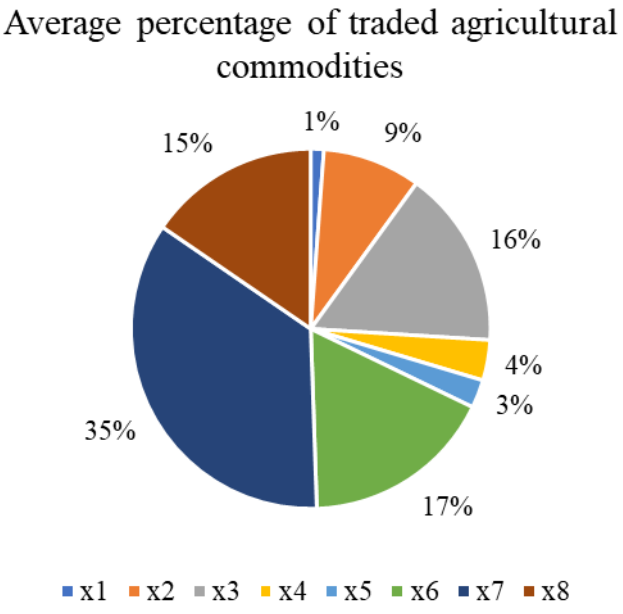
x_6 = imported animal products

x_7 = imported foodstuffs

x_8 = imported vegetable products

The chart 24 below represents the percentage participation in total traded amount among agricultural commodities for the past 23 years. It clearly shows that commodity group marked as x_7 – imported foodstuffs has the biggest impact on final trade balance in this sector. The next one in volume order is imported animal products, exported foodstuffs and imported vegetable products (OEC, 2017).

Chart 24 – Average percentage of traded agricultural commodities (OEC, 2017)



The trade values of export and import has been summarized per each commodity group and the result can be seen in the table 9 below. The data set follows last 22 years from 2017 to 1995. There has not been any missing data due to a reliable source of information (OEC, 2017).

Table 9 – Total UK agricultural foreign trade in millions USD (OEC, 2017)

Year	Data Set - Totals in millions USD							
	Export (millions USD)				Import (millions USD)			
	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8
2017	680.91	4,989.60	8,753.00	1,831.50	1,508.30	10,038.00	22,773.00	8,876.00
2016	559.60	4,626.90	8,558.00	2,081.60	1,306.40	9,425.00	21,827.00	8,759.30
2015	578.50	4,694.60	8,657.00	1,920.00	1,367.80	9,983.00	22,697.00	8,979.50
2014	763.60	5,697.50	9,625.00	2,022.10	1,641.50	11,297.00	24,430.00	9,507.20
2013	719.33	5,438.70	9,731.00	2,103.00	1,739.90	10,983.00	23,358.00	9,625.30
2012	721.60	5,142.90	8,764.00	2,443.60	1,689.31	9,838.00	21,306.00	8,199.40
2011	677.10	5,433.20	9,204.00	2,741.50	1,895.18	10,310.00	21,421.00	8,314.00
2010	621.30	4,475.40	7,808.00	2,267.40	1,342.64	9,339.00	19,046.00	7,731.20
2009	548.20	4,030.90	7,909.00	1,844.70	1,278.95	8,990.00	17,984.00	7,277.60
2008	736.69	4,583.40	9,150.00	2,162.00	1,823.20	10,419.00	19,924.00	8,900.60
2007	724.89	4,232.90	8,424.00	1,730.70	1,370.80	9,836.00	18,595.00	8,561.30
2006	578.73	3,682.70	6,984.20	1,403.70	1,052.18	8,323.00	15,257.00	7,370.60
2005	498.86	3,449.80	6,596.90	1,328.34	922.90	7,656.60	14,185.00	7,067.40
2004	457.70	3,386.90	6,397.10	1,290.11	875.03	7,648.90	13,281.50	6,543.00
2003	443.13	2,946.20	5,930.00	1,268.37	772.29	6,541.20	11,278.60	5,766.77
2002	345.16	2,368.60	5,151.60	900.91	584.02	5,095.50	9,480.90	5,000.82
2001	296.93	2,179.92	4,786.00	787.36	569.98	4,610.80	8,369.40	4,363.18
2000	280.80	2,524.40	4,653.70	893.90	598.61	4,309.50	8,240.60	4,149.90
1999	310.27	2,873.60	5,132.20	979.10	715.70	4,230.60	9,171.80	4,233.45
1998	336.92	2,959.60	5,180.80	1,110.78	703.52	4,115.38	9,135.00	4,736.67
1997	388.80	2,961.00	5,232.50	1,193.40	695.33	4,301.73	8,787.80	4,468.24
1996	314.60	3,210.60	5,181.10	1,340.60	761.92	4,497.18	8,475.10	4,289.05
1995	302.32	3,937.10	4,867.90	1,293.83	609.22	4,001.63	8,018.00	4,215.79
Average	516.78	3,905.50	7,072.91	1,606.02	1,122.81	7,643.04	15,523.55	6,823.32

4.4.3 Data Set

The data source for statistical information provided for this model is The Observatory of Economic Complexity (OEC, 2017). Its published data is categorized according to the Standard International Trade Classification or Harmonized System. The data from 1962 – 2000 have been collected by (The Center for International Data, 2013) and data from 2001 – 2017 have been collected by (UN Comtrade Database, 2017). The OEC is a tool originally created by (SIMOES, 2018) at Massachusetts Institute of Technology. The data set contains years and periods in the following analysis. The data set starts with year 1995 which represents period 1 and ends with a prognosed year 2022 which represents period 28.

4.5 The First Prognosis

The first prognosis suggests that Brexit would be cancelled, therefore theoretically never happened. If it is understood that a decision of the Great Britain would never become relevant in any stage of the process, the outcome is the same. It is still possible for Great Britain to reverse the process (MILAN, 2019).

The advocate general, Manuel Campos Sanchez-Bordona has advised to the Europe's highest court that UK can stay in the EU if the British parliament decides that way unilaterally (The Guardian, 2018). As was already mentioned, this thesis is being written when the Brexit talks are still ongoing even though the time is running out.

It proves that a possibility of reversing Brexit and avoiding any substantial impact on British economy is still a viable option and not only a hypothesis. Especially, after the declined solution proposed by The Prime Minister, Theresa May and after her latest thinking of prolonging the period for negotiations, any solution is still quite possible (MILAN, 2019).

The first prognosis is therefore defined as following:

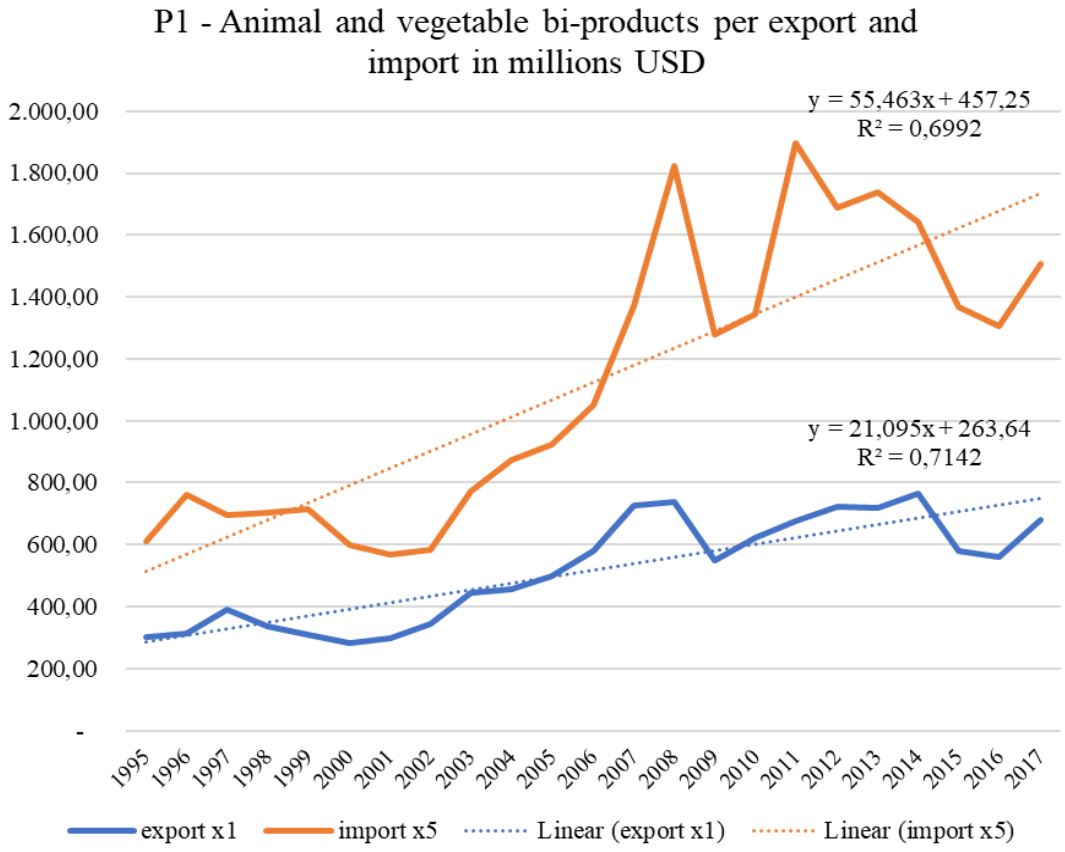
P1 = The trade balance between UK and EU is not impacted in any way

4.5.1 Animal and Vegetable Bi-products

Analysis per each commodity from perspective of export and import. The first analysed commodity is animal and vegetable bi-products. Values for this commodity are presented the appendix as variables x_1 from export perspective and x_5 from import perspective.

The chart 25 below shows the historical development of trade between UK and top 10 trading partners in terms of commodity group animal and vegetable bi-products. It also provides information about goodness of fit R^2 which measures how well the linear trend function describes the development of the trade. From export perspective, it is 70% and from import side, it is 71% which is a passable result (OEC, 2017).

Chart 25 – P1 Animal and vegetable bi-products per export and import in millions USD (OEC, 2017)



Based on the calculated trend functions, it was possible to prognose future time periods if the trade between UK and EU does not change. The below table 10 and

chart 26 both show that import of animal and vegetable bi-products overcomes the export of this group of commodities.

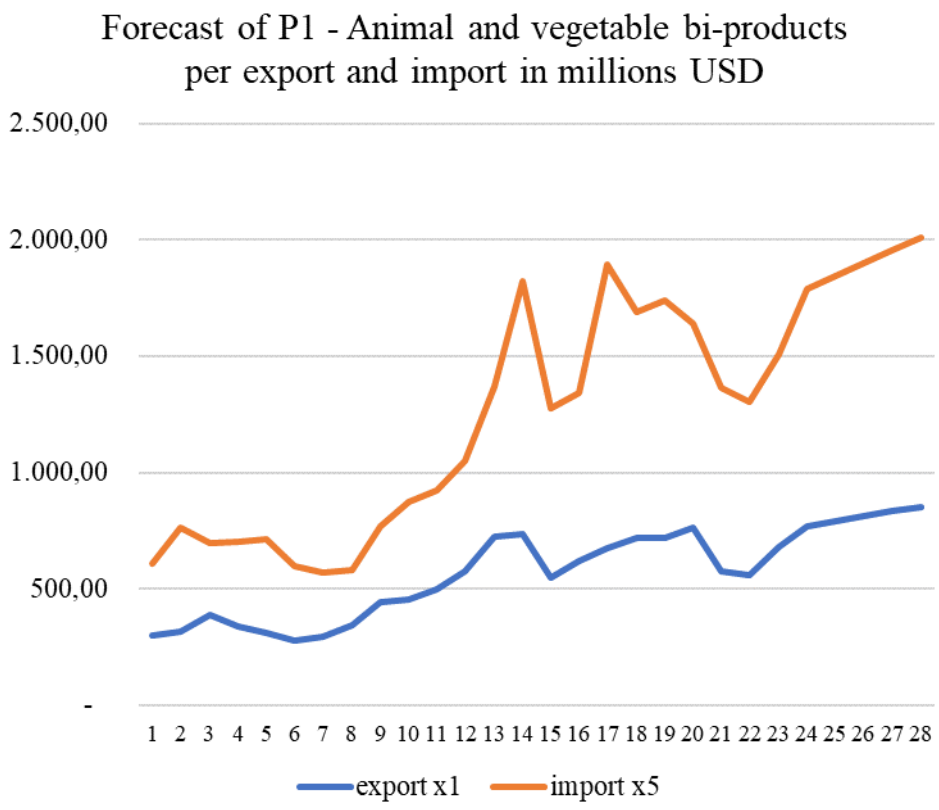
Linear export trend function x_1: y = 21,095x + 263,64

Linear import trend function x_5: y = 55,463x + 457,25

Table 10 – P1 variables x_1 and x_5 for years 2018 until 2022 (OEC, 2017)

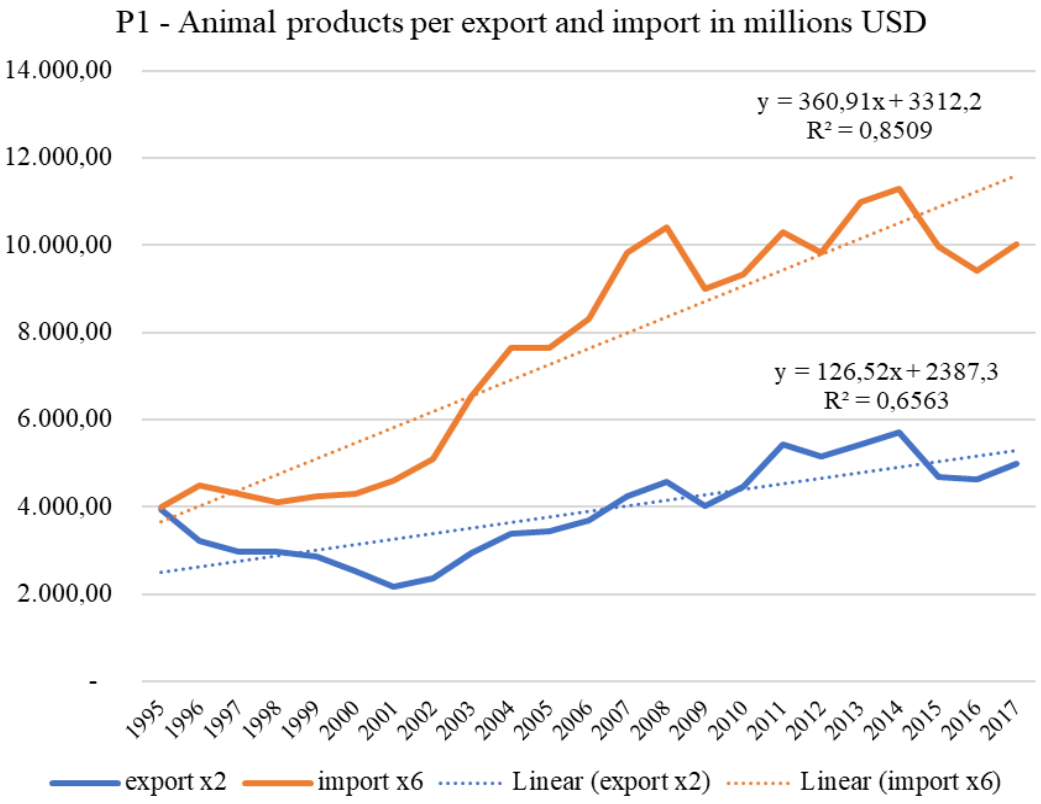
Year	Period	export x_1	import x_5
2018 - Prognosis	24	769.92	1,788.36
2019 - Prognosis	25	791.02	1,843.83
2020 - Prognosis	26	812.11	1,899.29
2021 - Prognosis	27	833.21	1,954.75
2022 - Prognosis	28	854.30	2,010.21

Chart 26 – Forecast of P1 - Animal and vegetable bi-products per export and import in millions USD (OEC, 2017)



4.5.2 Animal Products

Chart 27 – P1 Animal products per export and import in millions USD (OEC, 2017)



The above chart 27 shows export and import of traded group of commodities called animal products. It provides information that import is higher than export. Based on the calculated trend functions, it was possible to prognose future time periods if the trade between UK and EU does not change. The goodness of fit for x_2 is 85% and 66% for x_6.

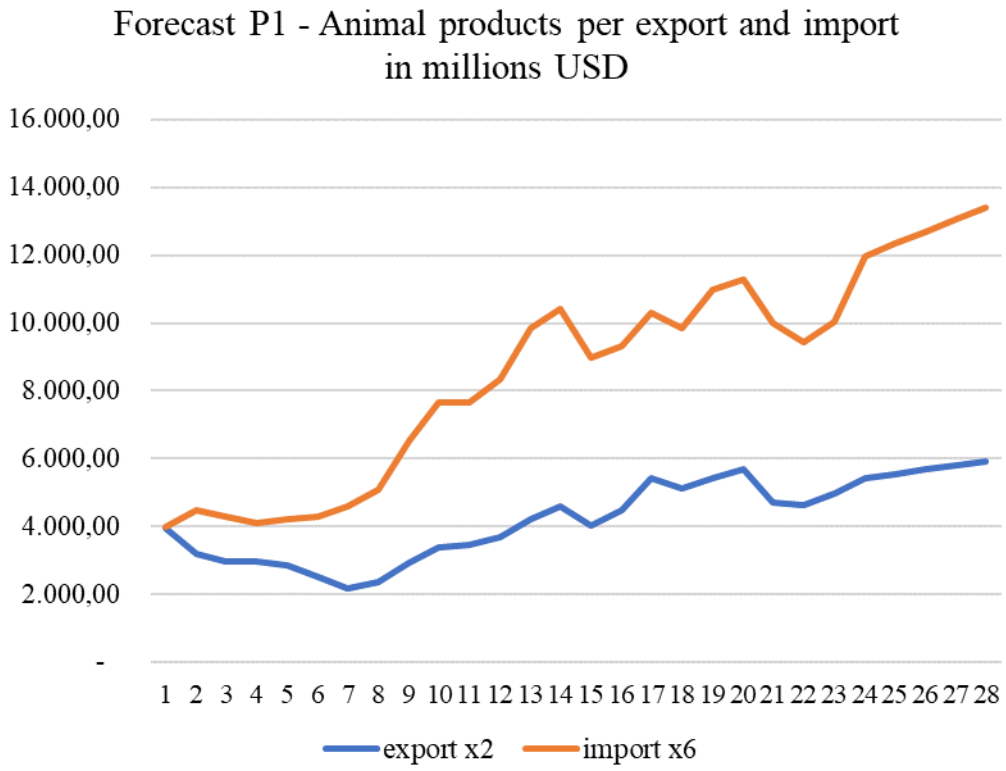
Linear export trend function x_2: y = 126,52x + 2387,30

Linear import trend function x_6: y = 360,91x + 3312,20

Table 11 – P1 variables x_2 and x_6 for years 2018 until 2022 (OEC, 2017)

Year	Period	export x_2	import x_6
2018 - Prognosis	24	5,423.78	11,974.04
2019 - Prognosis	25	5,550.30	12,334.95
2020 - Prognosis	26	5,676.82	12,695.86
2021 - Prognosis	27	5,803.34	13,056.77
2022 - Prognosis	28	5,929.86	13,417.68

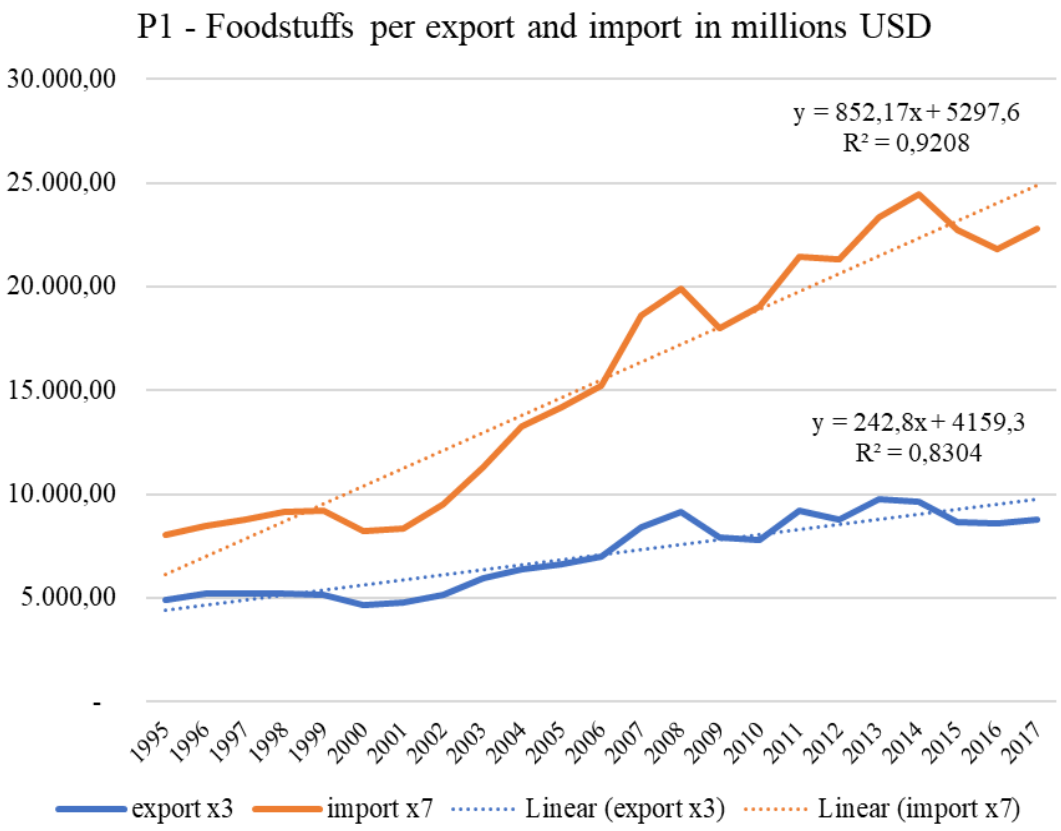
Chart 28 – Forecast of P1 - Animal products per export and import in millions USD (OEC, 2017)



The chart 28 shows forecasted trade development of animal products between UK and EU if there is not any change in the trade policies.

4.5.3 Foodstuffs

Chart 29 – P1 Foodstuffs per export and import in millions USD (OEC, 2017)



The above chart 29 shows export and import of traded group of commodities called foodstuffs. It provides information that import is higher than export. Based on the calculated trend functions, it was possible to prognose future time periods if the trade between UK and EU does not change. The goodness of fit for x_3 is 92% and 83% for x_7. It is a very suitable function for this commodity.

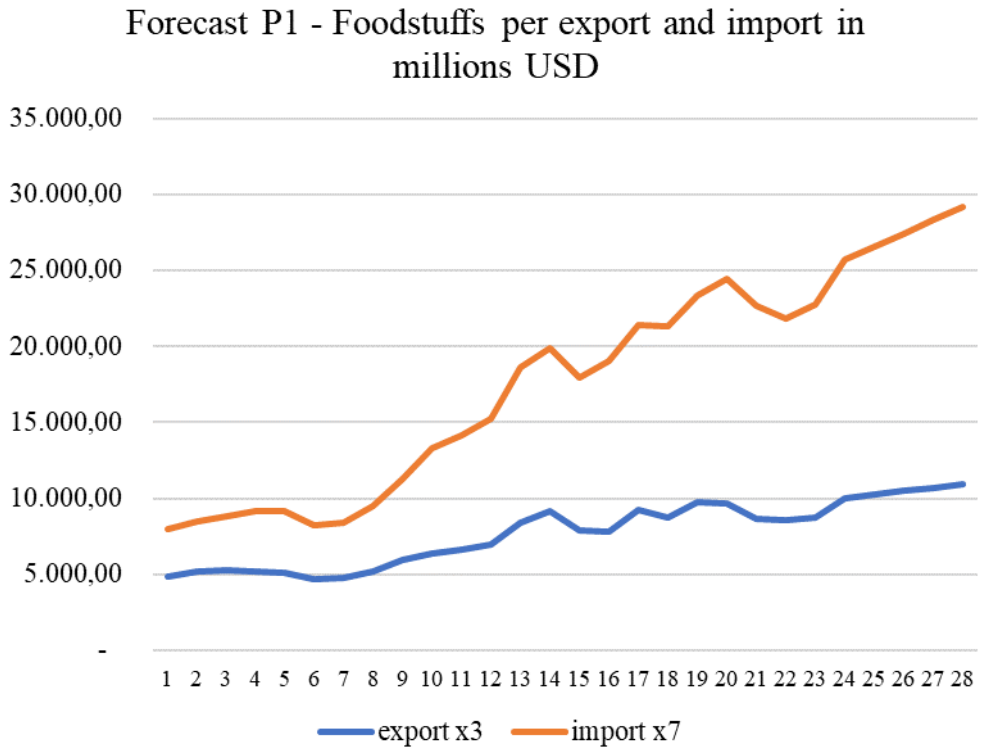
Linear export trend function x_3: y = 242,80x + 4159,30

Linear import trend function x_7: y = 852,17x + 5297,60

Table 12 – P1 variables x_3 and x_7 for years 2018 until 2022 (OEC, 2017)

Year	Period	export x_3	import x_7
2018 - Prognosis	24	5,423.78	11,974.04
2019 - Prognosis	25	5,550.30	12,334.95
2020 - Prognosis	26	5,676.82	12,695.86
2021 - Prognosis	27	5,803.34	13,056.77
2022 - Prognosis	28	5,929.86	13,417.68

Chart 30 – Forecast of P1 - Foodstuffs per export and import in millions USD (OEC, 2017)



The above chart 30 displays forecasted data calculated in table 16. Import of foodstuffs represents the biggest volume of traded goods and it is anticipated that its growth will continue. The export also grows but much slower than import. It indicates increasing difference for most influential commodity traded between UK and EU in the agricultural sector.

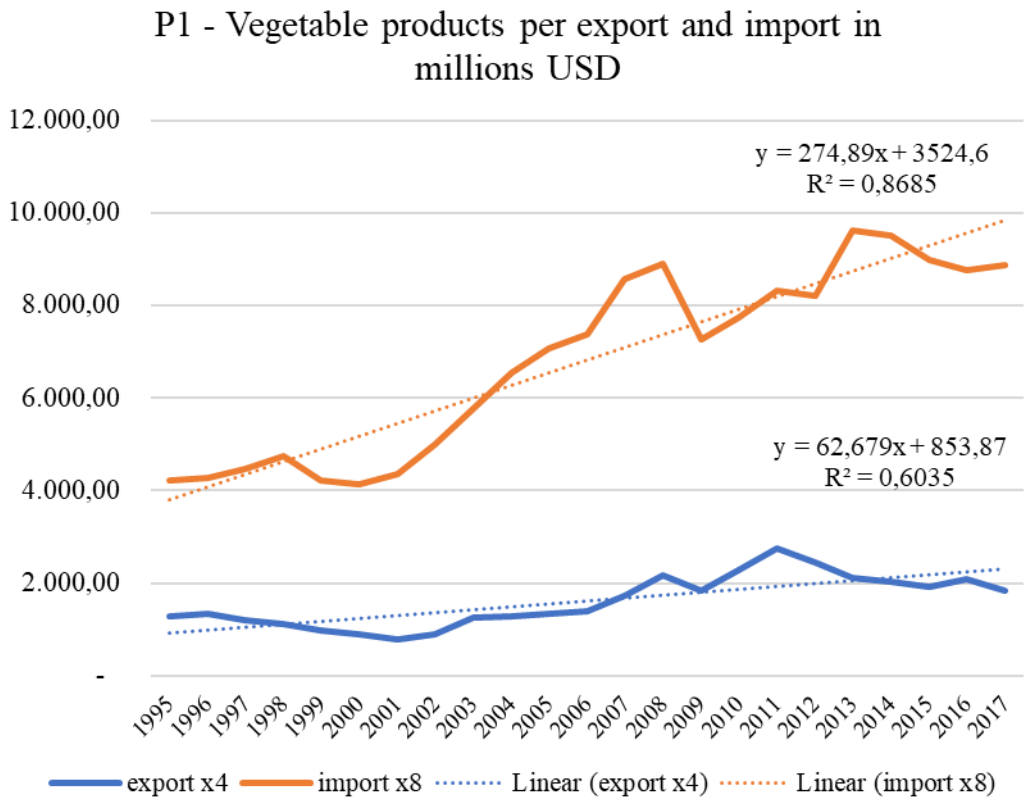
The foodstuffs group of commodities consists of many basic goods which customers buy every day in the grocery stores. It is a possible explanation of why this is the most traded group of products. Among the mostly traded, it can be mentioned wine,

baked goods, chocolate, fruit juice, sausages, beer, pasta, sugar, prepared meat but also food for pets and hundreds of others (OEC, 2017).

According to (HANWELL, 2018), the analysts are well aware of the fact that UK is importing significantly more food than it exports. In case of Hard Brexit, it is questionable what effect it will have on daily lives of British citizens. Among relevant concerns, there is variability in prices of food and drinks, at least in short-term. But it can also lead to shortage of available food in stores.

4.5.4 Vegetable Products

Chart 31 – P1 Vegetable products per export and import in millions USD (OEC, 2017)



The above chart 31 shows export and import of traded group of commodities called vegetable products. It provides information that import is higher than export. Based on the calculated trend functions, it was possible to prognose future time periods if the trade between UK and EU does not change. The goodness of fit for x_4 is 87% and 60% for x_8.

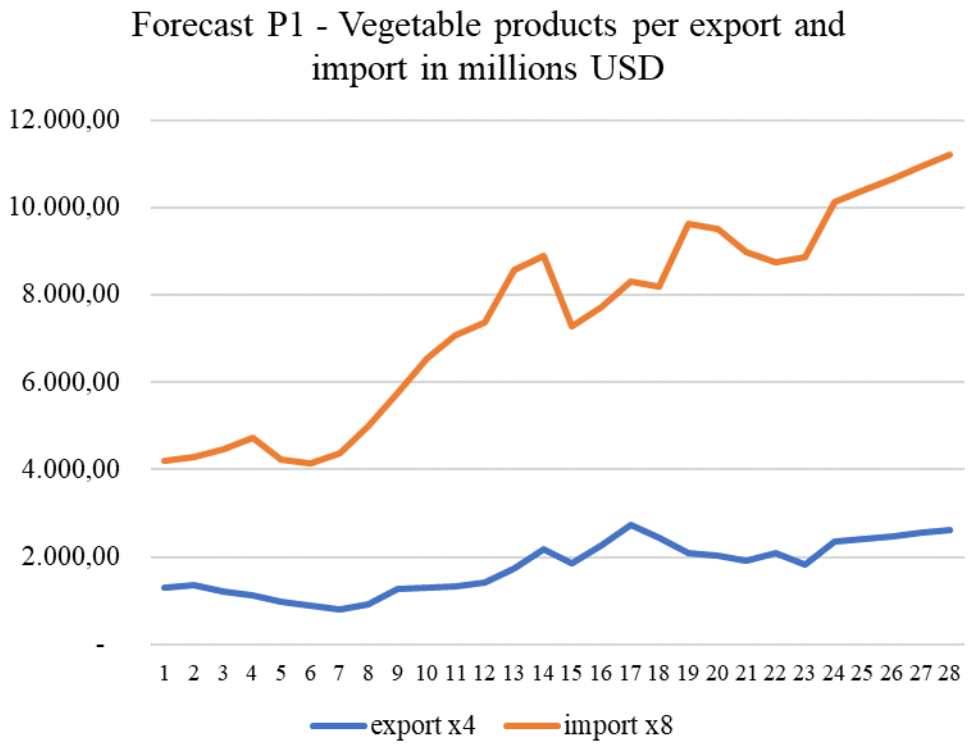
Linear export trend function x_3: y = 62,68x + 853,87

Linear import trend function x_7: y = 274,89x + 3524,60

Table 13 – P1 variables x_4 and x_8 for years 2018 until 2022 (OEC, 2017)

Year	Period	export x_4	import x_8
2018 - Prognosis	24	2,358.17	10,121.96
2019 - Prognosis	25	2,420.85	10,396.85
2020 - Prognosis	26	2,483.52	10,671.74
2021 - Prognosis	27	2,546.20	10,946.63
2022 - Prognosis	28	2,608.88	11,221.52

Chart 32 – Forecast P1 - Vegetable products per export and import in millions USD (OEC, 2017)



The chart 32 shows forecasted trade development of vegetable products between UK and EU if there is not any change in the trade policies.

4.6 The Second Prognosis

The second prognosis suggests that The United Kingdom of Great Britain and Northern Ireland will be treated as a third country in terms of tariff application from EU side. It means that according to table 8, each industry will be burdened with direct trade barrier in form of export and import tariffs to respective product. Additionally, it is important to include indirect trade barriers which have effect on the traded volume, its prices, trade efficiency and economy of participating parties.
The following table 18 shows applicable tariffs for the second prognosis.

The second prognosis suggest that Brexit really happens and that is happens in the most severe way, therefore, the Hard Brexit. That would mean a third country treatment from EU side and application of tariffs reviewed in table 6. EU trade rules would not be applicable anymore and they would be replaced by WTO rules. This option is still quite possible and therefore this prognosis is also based on plausible future situation. (FXCM, 2018).

The first prognosis is therefore defined as following:

P2 = The trade balance between UK and EU is impacted by Hard Brexit and WTO rules are applied accordingly

Table 14 – Selected tariffs applicable to agricultural sector (CBI, 2017)

Sector	Average MFN import tariff, %	Average MNF export tariff, %
Agriculture, forestry and fishing	17.70%	16.40%
Food, drinks and tobacco	13.40%	10.30%

The tariffs related to agriculture, forestry and fishing are related to the animal and vegetable bi-products, animal products and vegetable products. The food, drinks and tobacco tariffs are applicable for foodstuffs.

4.6.1 Tariff Application

It is important to correctly apply the tariff policy on the traded goods. Tariff represents an additional tax on goods and services and is usually used to restrict imports by increasing price of a product which makes them less attractive to final customers. Tariff can be applied in a fixed amount, for example as 5 USD per cigarette package or as ad-valorem tariff which means that a percentage from the base amount is applied (export.gov, 2018).

Governments apply tariffs to increase revenues or to protect domestic market. There are several side-effects that tariffs can cause. Domestic markets can become less efficient due to lack of competition or the competition can use it as an advantage and increase prices as well making final customers pay more. In extreme cases, applying tariffs can lead to trade wars (MEYER, 2019).

4.6.2 Elasticity of Agricultural Products

When tariff is applied on goods or services, its price changes. And the demand changes according to the price change. This is price elasticity. It is a relationship between change in price of respective goods or services and its demand for it (AGMRC, 2017).

The agricultural products, even those which are not directly sold to final customers are part of agricultural production. Food is one of primary human needs and therefore, the change in demand is quite inelastic. Also, majority of food products have middle or low prices and change in price does not significantly affect customers (COLMAN, et al., 1989).

The second prognosis applies the theoretical knowledge of tariffs and elasticity to suggest that even with applied tariffs, the elasticity will not change, and volume sold will remain the trajectory of a trend function. The only cost application comes to food, drinks and tobacco where (CBI, 2017) has estimated 30,10% additional cost of business due to new paperwork.

4.6.3 Animal and Vegetable Bi-products

From UK perspective animal and vegetable bi-products are categorized under agriculture, forestry and fishing sector with potentially applicable tariff on exported products with 17,70% and 16,40% on imported products. The table 15 shows the original data from 2015 – 2017 in comparison with the simulated tariffs on this trade commodity.

Table 15 – Tariff application on animal and vegetable bi-products in mill. USD (OEC, 2017)

Year	Period	export x_1	import x_5
2015	21	578,50	1.367,80
2016	22	559,60	1.306,40
2017	23	680,91	1.508,30
Year	Period	export x_1	import x_5
2015	*21*	*680,89*	*1.592,12*
2016	*22*	*658,65*	*1.520,65*
2017	*23*	*801,43*	*1.755,66*

This simulates a Hard Brexit impact if it becomes effective for animal and vegetable bi-products. For the prognosis part, it allows calculating a new trend function for this commodity from export and import perspective.

Linear export trend function x_1: $y = 24{,}29x + 239{,}25$
Linear import trend function x_5: $y = 62{,}26x + 405{,}46$

The chart 33 shows simulated development of animal and vegetable bi-products with applied tariffs and provides information about goodness of fit which is very satisfying. For export, variable x_1, goodness of fit is almost 83% and for import, variable x_5, it is almost 79%.

Chart 33 – P2 Animal and vegetable bi-products per export and import in millions USD (OEC, 2017)

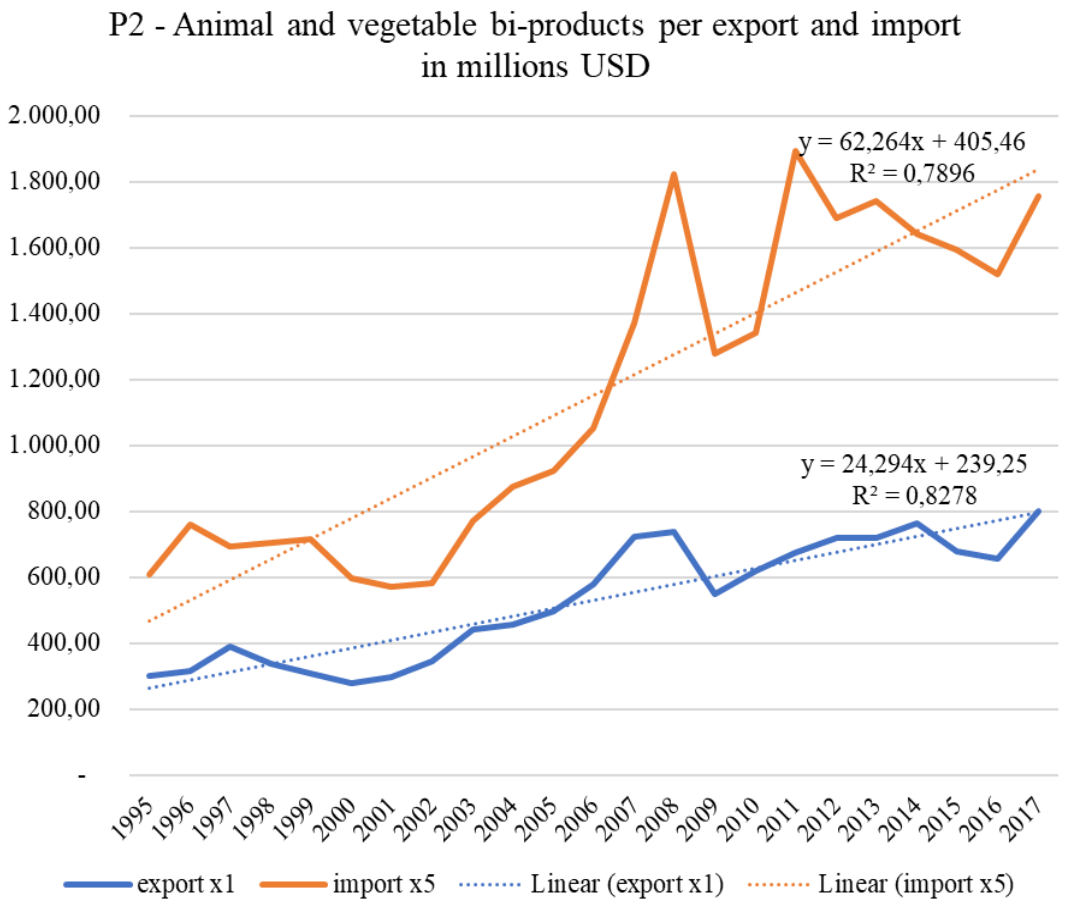
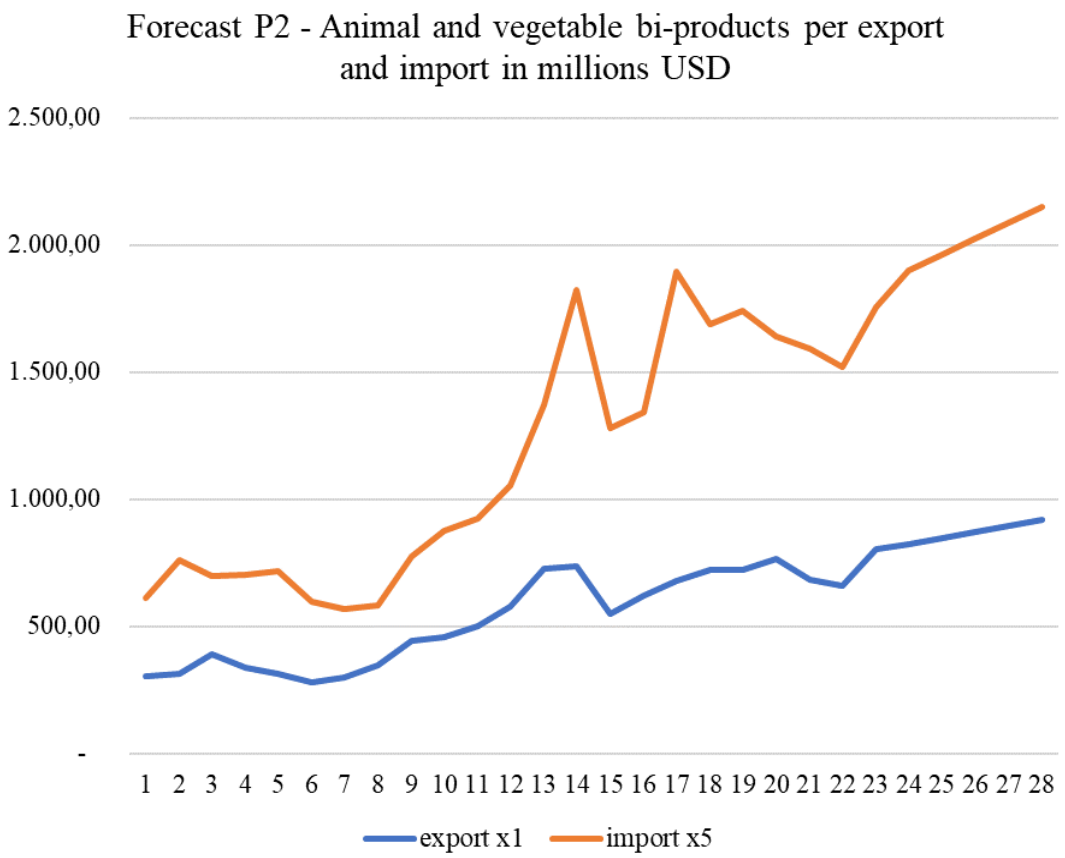


Table 16 – P2 variables x_1 and x_5 tariffs and prognosis for years 2018 until 2022 (OEC, 2017)

Year	Period	export x_1	import x_5
2015	*21*	*680,89*	*1.592,12*
2016	*22*	*658,65*	*1.520,65*
2017	*23*	*801,43*	*1.755,66*
2018 - Prognosis	24	822,31	1.899,80
2019 - Prognosis	25	846,60	1.962,06
2020 - Prognosis	26	870,89	2.024,32
2021 - Prognosis	27	895,19	2.086,59
2022 - Prognosis	28	919,48	2.148,85

The table 16 shows the new prognosis for 2018 - 2022 calculated with trade figures between 2015 - 2017 impacted tariffs applicable for Hard Brexit. The chart 34 represents visual development of a prognosed trade.

Chart 34 – Forecast of P2 – Animal and vegetable bi-products per export and import in millions USD (OEC, 2017)



4.6.4 Animal Products

From UK perspective animal products are categorized under agriculture, forestry and fishing sector with potentially applicable tariff on exported products with 17,70% and 16,40% on imported products. The table 17 shows the original data from 2015 – 2017 in comparison with the simulated tariffs on this trade commodity.

Table 17 – Tariff application on animal products in mill. USD (OEC, 2017)

Year	Period	export x_2	import x_6
2015	21	4.694,60	9.983,00
2016	22	4.626,90	9.425,00
2017	23	4.989,60	10.038,00
Year	Period	export x_2	import x_6
2015	*21*	*5.525,54*	*11.620,21*
2016	*22*	*5.445,86*	*10.970,70*
2017	*23*	*5.872,76*	*11.684,23*

This simulates a Hard Brexit impact if it becomes effective for animal products. For the prognosis part, it allows calculating a new trend function for this commodity from export and import perspective.

Linear export trend function x_2: y = 151,60x + 2196,40
Linear import trend function x_6: y = 408,63x + 2949,40

The chart 35 shows simulated development of animal products with applied tariffs and provides information about goodness of fit which is very satisfying. For export, variable x_2, goodness of fit is around 75% and for import, variable x_6, it is around 92,5%.

Chart 35 – P2 Animal products per export and import in millions USD (OEC, 2017)

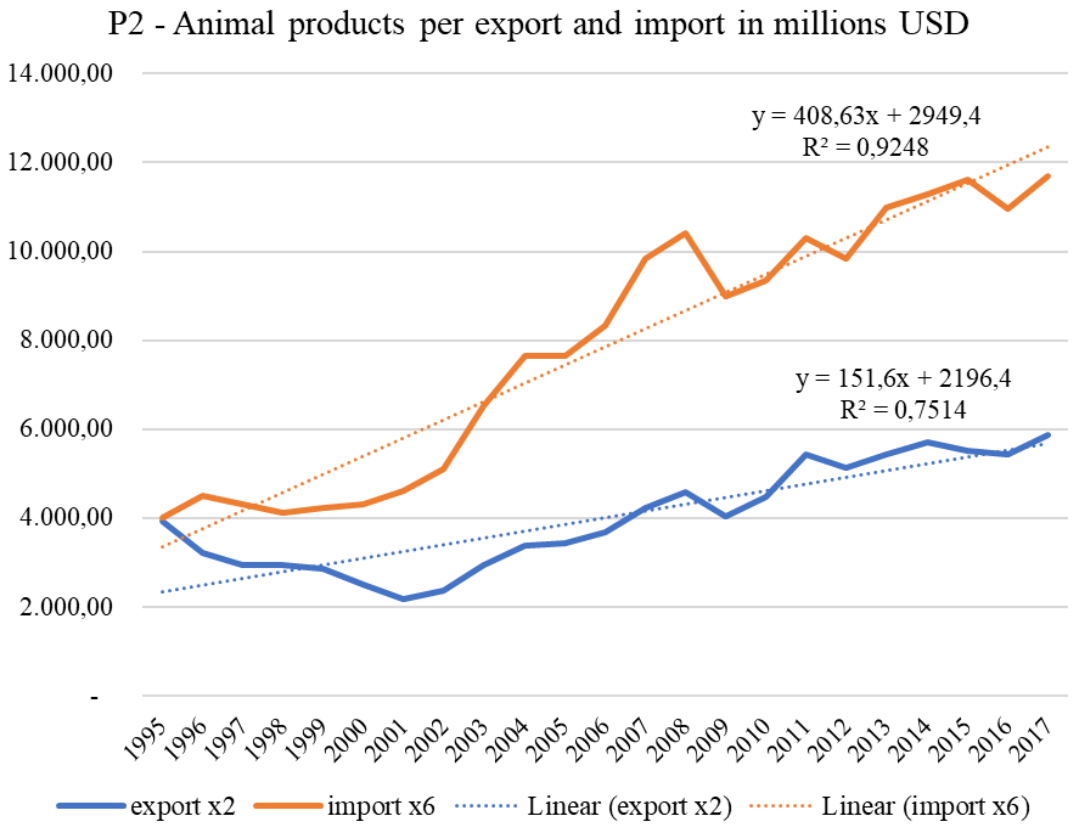
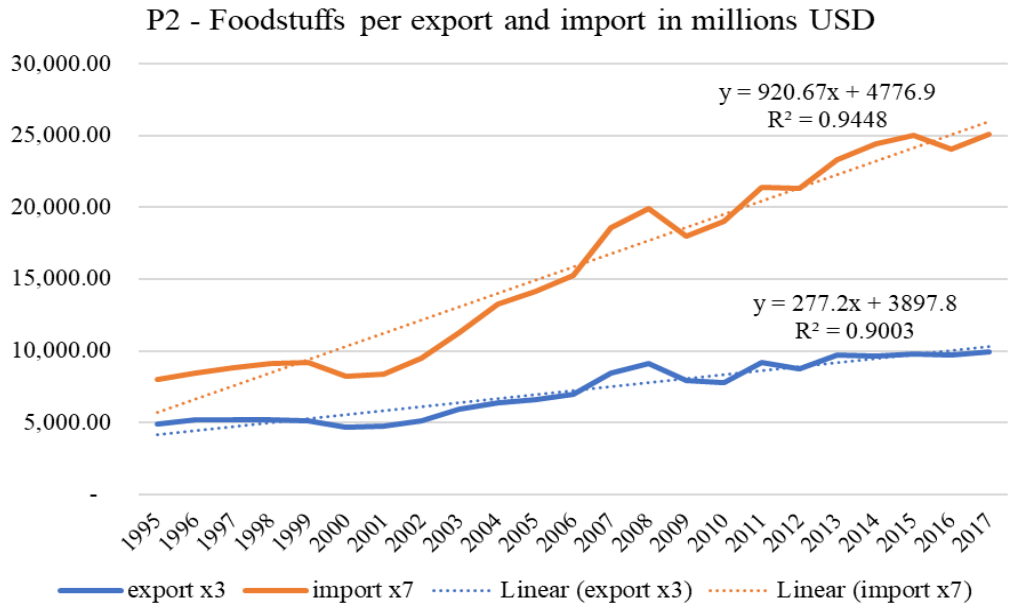


Table 18 – P2 variables x_2 and x_6 tariffs and prognosis for years 2018 until 2022 (OEC, 2017)

Year	Period	export x_2	import x_6
2015	*21*	*5.525,54*	*11.620,21*
2016	*22*	*5.445,86*	*10.970,70*
2017	*23*	*5.872,76*	*11.684,23*
2018 - Prognosis	24	5.834,80	12.756,52
2019 - Prognosis	25	5.986,40	13.165,15
2020 - Prognosis	26	6.138,00	13.573,78
2021 - Prognosis	27	6.289,60	13.982,41
2022 - Prognosis	28	6.441,20	14.391,04

Chart 36 – Forecast of P2 – Animal products per export and import in millions USD (OEC, 2017)



The table 18 displays the new prognosis for 2018 - 2022 calculated with trade figures between 2015 - 2017 impacted tariffs applicable for Hard Brexit. The chart 36 represents visual development of a prognosed trade.

4.6.5 Foodstuffs

From UK perspective foodstuffs are categorized under food, drinks and tobacco sector with potentially applicable tariff on exported products with 13,40% and

10,30% on imported products. The table 19 shows the original data from 2015 – 2017 in comparison with the simulated tariffs on this trade commodity.

Table 19 – Tariff application on Foodstuffs in mill. USD (OEC, 2017)

Year	Period	export x_3	import x_7
2015	21	8.657,00	22.697,00
2016	22	8.558,00	21.827,00
2017	23	8.753,00	22.773,00
Year	Period	export x_3	import x_7
2015	*21*	*9.817,04*	*25.034,79*
2016	*22*	*9.704,77*	*24.075,18*
2017	*23*	*9.925,90*	*25.118,62*

This simulates a Hard Brexit impact if it becomes effective for foodstuffs. For the prognosis part, it allows calculating a new trend function for this commodity from export and import perspective.

Linear export trend function x_3: $y = 277{,}20x + 3897{,}80$
Linear import trend function x_7: $y = 920{,}67x + 4776{,}90$

The chart 37 shows simulated development of animal products with applied tariffs and provides information about goodness of fit which is very satisfying. For export, variable x_3, goodness of fit is 90% and for import, variable x_7, it is around 94,5%.

Chart 37 – P2 Foodstuffs per export and import in millions USD (OEC, 2017)

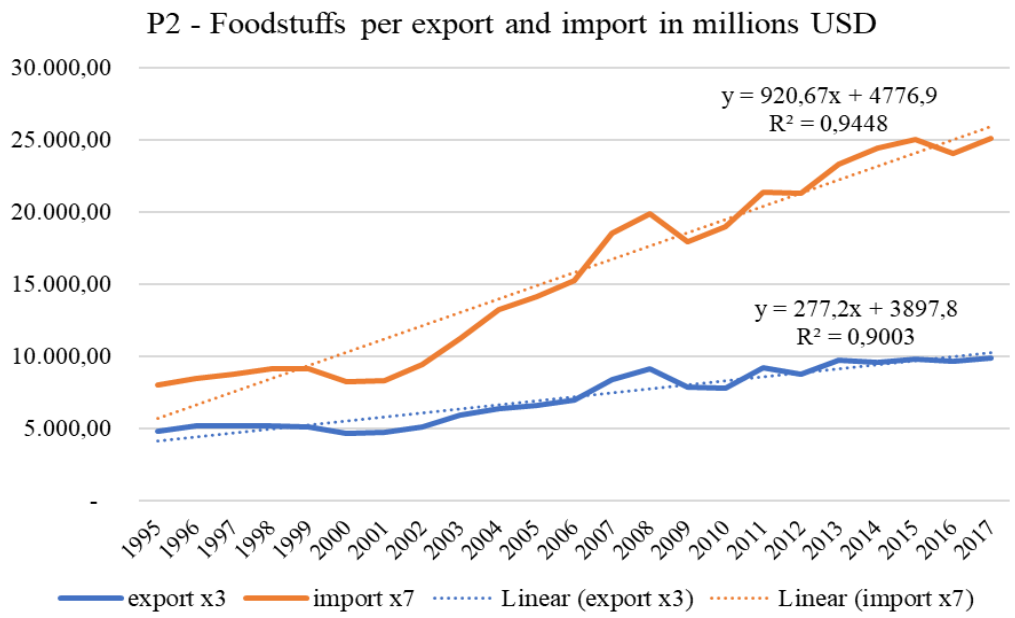


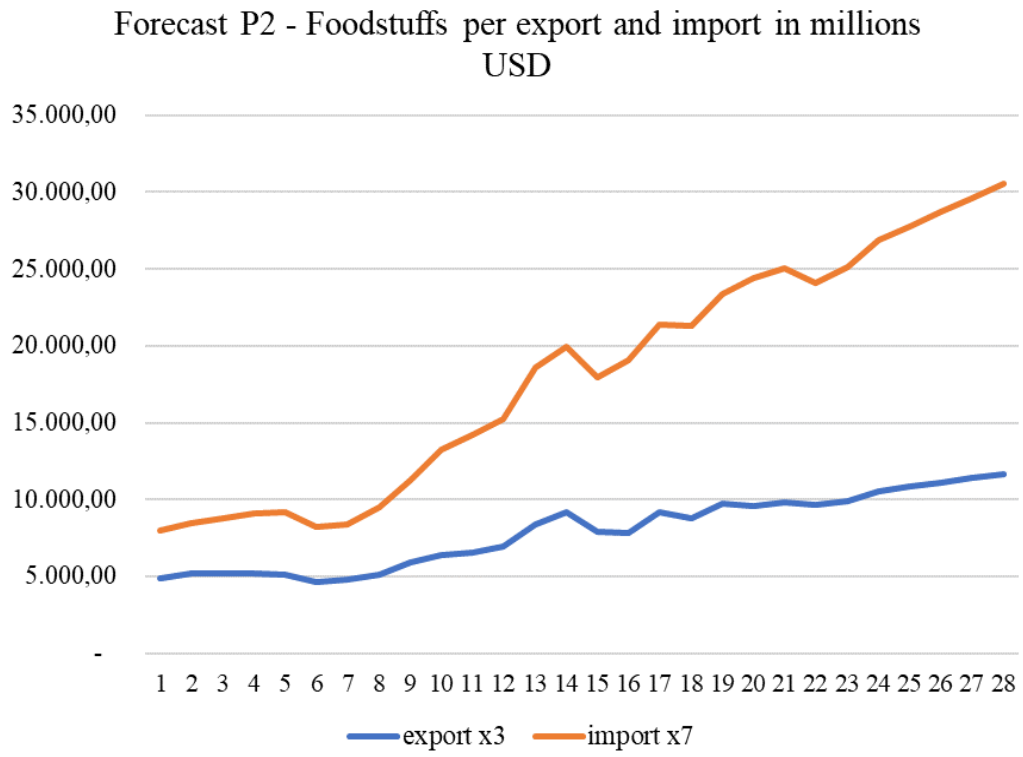
Table 20 – P2 variables x_3 and x_7 tariffs and prognosis for years 2018 until 2022 (OEC, 2017)

Year	Period	export x_3	import x7
2015	*21*	*9.817,04*	*25.034,79*
2016	*22*	*9.704,77*	*24.075,18*
2017	*23*	*9.925,90*	*25.118,62*
2018 - Prognosis	24	10.550,60	26.872,98
2019 - Prognosis	25	10.827,80	27.793,65
2020 - Prognosis	26	11.105,00	28.714,32
2021 - Prognosis	27	11.382,20	29.634,99
2022 - Prognosis	28	11.659,40	30.555,66

The table 20 and chart 38 represent prognosed trade development according to the WTO trading rules which are in this case different. Foodstuffs belong into food, drink and tobacco category which is treaded separately from other agricultural products.

It also shows that the traded amount from all commodity groups is the highest for foodstuffs. Especially imported goods will affect the final trade volume.

Chart 38 – Forecast of P2 – Foodstuffs per export and import in millions USD (OEC, 2017)



4.6.6 Vegetable Products

From UK perspective vegetable products are categorized under agriculture, forestry and fishing sector with potentially applicable tariff on exported products with 17,70% and 16,40% on imported products. The table 21 shows the original data from 2015 – 2017 in comparison with the simulated tariffs on this trade commodity.

Table 21 – Tariff application on Vegetable products in mill. USD (OEC, 2017)

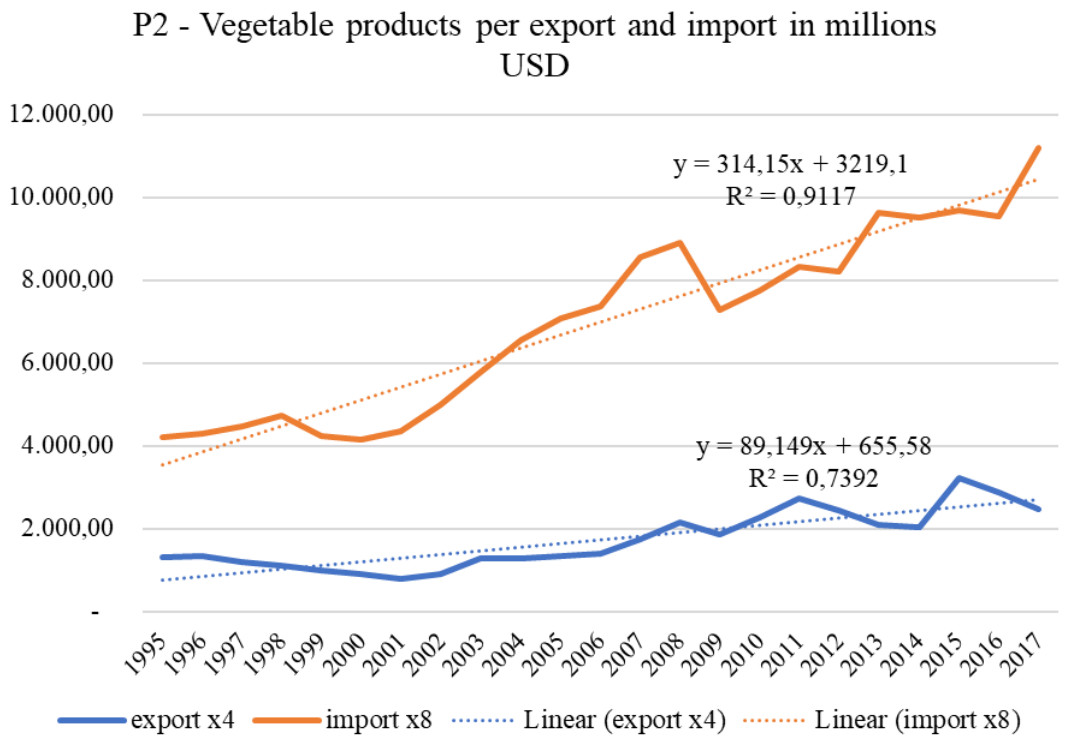
Year	Period	export x_2	import x_6
2015	21	1.920,00	8.979,50
2016	22	2.081,60	8.759,30
2017	23	1.831,50	8.876,00
Year	Period	export x_2	import x_6
2015	*21*	*2.259,84*	*10.452,14*
2016	*22*	*2.450,04*	*10.195,83*
2017	*23*	*2.155,68*	*10.331,66*

This simulates a Hard Brexit impact if it becomes effective for vegetable products. For the prognosis part, it allows calculating a new trend function for this commodity from export and import perspective.

Linear export trend function x_4: y = 89,15x + 655,58
Linear import trend function x_8: y = 314,15x + 3219,10

The chart 39 shows simulated development of animal products with applied tariffs and provides information about goodness of fit which is very satisfying. For export, variable x_3, goodness of fit is 74% and for import, variable x_7, it is around 91%.

Chart 39 – P2 Vegetable products per export and import in millions USD (OEC, 2017)

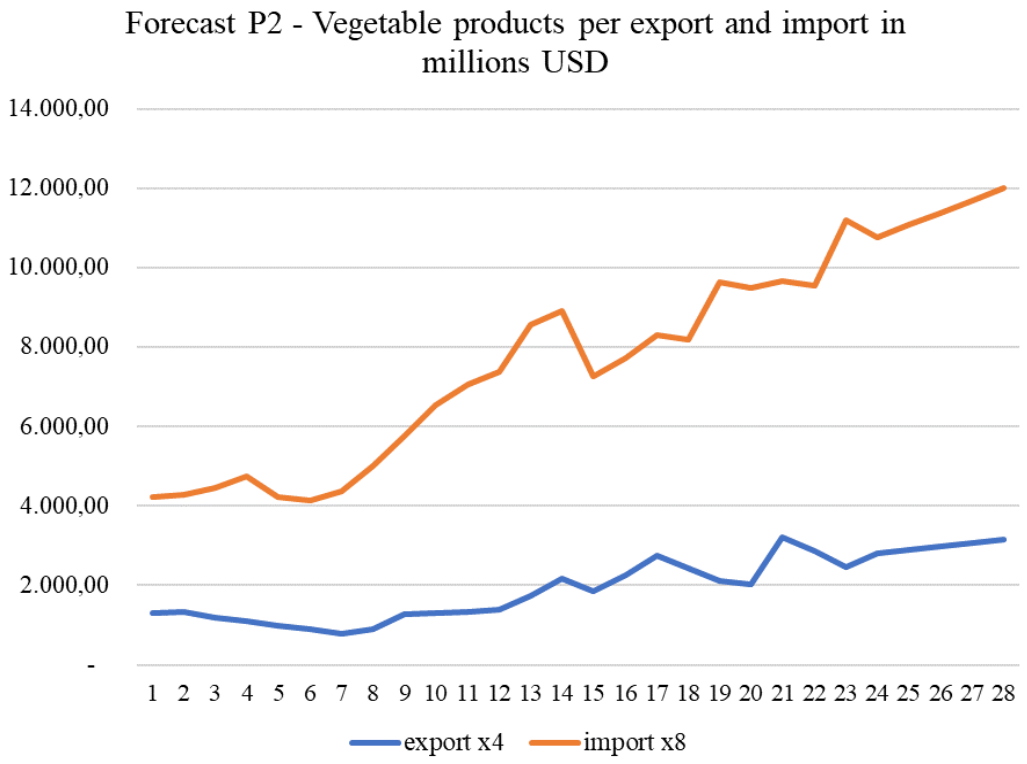


The chart 40 represents visual development of a prognosed trade. The table 22 displays the new prognosis for 2018 - 2022 calculated with trade figures between 2015 - 2017 impacted tariffs applicable for Hard Brexit.

Table 22 – P2 variables x_4 and x_8 tariffs and prognosis for years 2018 until 2022 (OEC, 2017)

Year	Period	export x_4	import x_8
2015	*21*	*3.226,75*	*9.677,50*
2016	*22*	*2.876,12*	*9.544,10*
2017	*23*	*2.475,23*	*11.203,85*
2018 - Prognosis	24	2.795,16	10.758,22
2019 - Prognosis	25	2.884,31	11.072,35
2020 - Prognosis	26	2.973,45	11.386,48
2021 - Prognosis	27	3.062,60	11.700,61
2022 - Prognosis	28	3.151,75	12.014,74

Chart 40 – Forecast of P2 – Vegetable products per export and import in millions USD (OEC, 2017)



4.7 Interpretation of Results

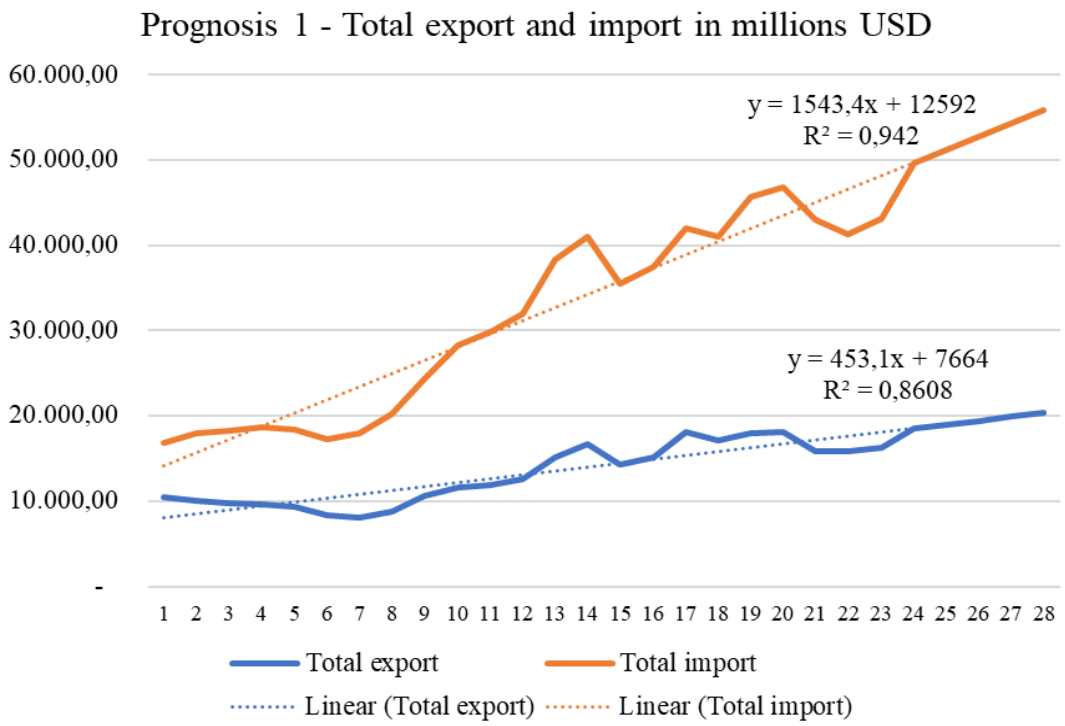
The first prognosis assumes that Brexit eventually does not happen and therefore, it does not influence the trade balance between the United Kingdom and EU. If this scenario happens, the below table 23 shows how this thesis forecasts the development of trade which should keep slowly growing in terms of both import and export.

Table 23 – P1 for net exports in millions USD (OEC, 2017)

Prognosis 1 Year	Total export	Total import	Net exports
1995	10.401,15	16.844,64	(6.443,49)
1996	10.046,90	18.023,25	(7.976,35)
1997	9.775,70	18.253,10	(8.477,40)
1998	9.588,10	18.690,57	(9.102,47)
1999	9.295,17	18.351,55	(9.056,38)
2000	8.352,80	17.298,61	(8.945,81)
2001	8.050,21	17.913,36	(9.863,15)
2002	8.766,27	20.161,24	(11.394,97)
2003	10.587,70	24.358,86	(13.771,16)
2004	11.531,81	28.348,43	(16.816,62)
2005	11.873,90	29.831,90	(17.958,00)
2006	12.649,33	32.002,78	(19.353,45)
2007	15.112,49	38.363,10	(23.250,61)
2008	16.632,09	41.066,80	(24.434,71)
2009	14.332,80	35.530,55	(21.197,75)
2010	15.172,10	37.458,84	(22.286,74)
2011	18.055,80	41.940,18	(23.884,38)
2012	17.072,10	41.032,71	(23.960,61)
2013	17.992,03	45.706,20	(27.714,17)
2014	18.108,20	46.875,70	(28.767,50)
2015	15.850,10	43.027,30	(27.177,20)
2016	15.826,10	41.317,70	(25.491,60)
2017	16.255,01	43.195,30	(26.940,29)
2018 - Prognosis	18.538,37	49.634,04	(31.095,68)
2019 - Prognosis	18.991,46	51.177,48	(32.186,02)
2020 - Prognosis	19.444,55	52.720,91	(33.276,35)
2021 - Prognosis	19.897,65	54.264,34	(34.366,69)
2022 - Prognosis	20.350,74	55.807,77	(35.457,03)
Total	398.550,63	979.197,21	(580.646,58)

It can be seen in table 23 that years 1995 – 2017 are not affected by any trade disruption in form of tariffs or quotas because the UK maintained a Single Market access. Export and import during 2018 – 2022 are then prognosed by linear trend function applied to historical data as shows the chart 41 below.

Chart 41 – Prognosis 1 – Total export and import in millions USD (OEC, 2017)



The total exported volume for all agricultural commodities without Brexit is prognosed to be 398 550 million USD for analyzed time 1995 – 2022. The total imported volume for all agricultural commodities is prognosed to be 979 197 million USD which is 2,45 times more than the export. In represents almost 1 trillion USD in imported agricultural products.

The linear function explains the development of trend in a very satisfying rate. The goodness of fit for export is more than 86% and for import, it is over 94%.

The second prognosis assumes that Hard Brexit becomes a valid decision of the United Kingdom to leave European Union and that also means that the United Kingdom loses its access to the Single Market and EU trading rules do not apply anymore. Instead, WTO rules and its applicable tariffs are in place.

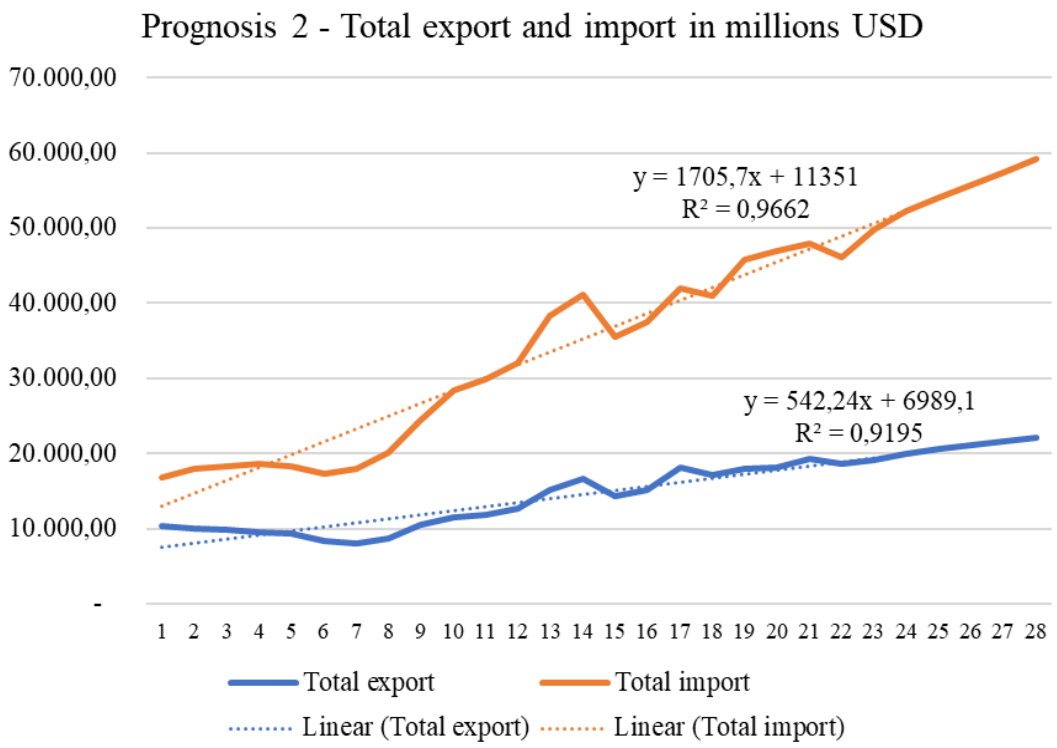
Table 24 – P2 for net exports in millions USD (OEC, 2017)

Prognosis 2 Year	Total export	Total import	Net exports
1995	10.401,15	16.844,64	(6.443,49)
1996	10.046,90	18.023,25	(7.976,35)
1997	9.775,70	18.253,10	(8.477,40)
1998	9.588,10	18.690,57	(9.102,47)
1999	9.295,17	18.351,55	(9.056,38)
2000	8.352,80	17.298,61	(8.945,81)
2001	8.050,21	17.913,36	(9.863,15)
2002	8.766,27	20.161,24	(11.394,97)
2003	10.587,70	24.358,86	(13.771,16)
2004	11.531,81	28.348,43	(16.816,62)
2005	11.873,90	29.831,90	(17.958,00)
2006	12.649,33	32.002,78	(19.353,45)
2007	15.112,49	38.363,10	(23.250,61)
2008	16.632,09	41.066,80	(24.434,71)
2009	14.332,80	35.530,55	(21.197,75)
2010	15.172,10	37.458,84	(22.286,74)
2011	18.055,80	41.940,18	(23.884,38)
2012	17.072,10	41.032,71	(23.960,61)
2013	17.992,03	45.706,20	(27.714,17)
2014	18.108,20	46.875,70	(28.767,50)
2015	*19.250,22*	*47.924,62*	*(28.674,40)*
2016	*18.685,40*	*46.110,63*	*(27.425,23)*
2017	*19.075,32*	*49.762,36*	*(30.687,04)*
2018 - Prognosis	20.002,86	52.287,52	(32.284,65)
2019 - Prognosis	20.545,11	53.993,21	(33.448,11)
2020 - Prognosis	21.087,35	55.698,90	(34.611,56)
2021 - Prognosis	21.629,59	57.404,60	(35.775,01)
2022 - Prognosis	22.171,83	59.110,29	(36.938,46)
Total	415.844,34	1.010.344,50	(594.500,17)

It can be seen in table 24 that years 1995 – 2014 are not affected by any trade disruption in form of tariffs or quotas because the UK maintained a Single Market access. However, years 2015 till 2017 are impacted by Brexit. Applying WTO tariffs is applied to 3 periods because doing so with only one year, for example 2017, would

not bring valid results to analyze the trade. Export and import during 2018 – 2022 are then prognosed by linear trend function applied to historical data as shows the chart 42 below.

Chart 42 – Prognosis 2 – Total export and import in millions USD (OEC, 2017)



The total exported volume for all agricultural commodities without Brexit is prognosed to be 414 844 million USD for analyzed time 1995 – 2022. The total imported volume for all agricultural commodities is prognosed to be 1 010 344 million USD which is 2,45 times more than the export. In represents almost 1 trillion USD in imported agricultural products.

The linear function explains the development of trend almost perfectly. The goodness of fit for export is more than 92% and for import, it is over 96,6%.

Each prognosis is also reviewed and compared during differencing periods in tables 25 and 26 below. The second prognosis shows faster increase in both export and import due to applied tariffs and the fact that agricultural products are quite inelastic. That means that the demand for agricultural products changes very little even if price for the respective product changes. Therefore, the trade will continue in linear increasing direction and the difference in trade will be caused by the volume increased by tariffs.

Table 25 – Prognosis 1 – net exports for affected period in millions USD (OEC, 2017)

Prognosis 1 Year	Total export	Total import	Net exports
2015	15.850,10	43.027,30	(27.177,20)
2016	15.826,10	41.317,70	(25.491,60)
2017	16.255,01	43.195,30	(26.940,29)
2018 - Prognosis	18.538,37	49.634,04	(31.095,68)
2019 - Prognosis	18.991,46	51.177,48	(32.186,02)
2020 - Prognosis	19.444,55	52.720,91	(33.276,35)
2021 - Prognosis	19.897,65	54.264,34	(34.366,69)
2022 - Prognosis	20.350,74	55.807,77	(35.457,03)
Total	145.153,98	391.144,84	(245.990,86)

Table 26 – Prognosis 2 – net exports for affected period in millions USD (OEC, 2017)

Prognosis 2 Year	Total export	Total import	Net exports
2015	*19.250,22*	*47.924,62*	*(28.674,40)*
2016	*18.685,40*	*46.110,63*	*(27.425,23)*
2017	*19.075,32*	*49.762,36*	*(30.687,04)*
2018 - Prognosis	20.002,86	52.287,52	(32.284,65)
2019 - Prognosis	20.545,11	53.993,21	(33.448,11)
2020 - Prognosis	21.087,35	55.698,90	(34.611,56)
2021 - Prognosis	21.629,59	57.404,60	(35.775,01)
2022 - Prognosis	22.171,83	59.110,29	(36.938,46)
Total	162.447,69	422.292,13	(259.844,45)

Years 2015, 2016 and 2017 and essential for interpreting the result of this prognosis. These periods have been used for tariff simulation but at the same time, the GDP of UK has been published. Therefore, the difference between original data and simulated situation can be seen in table 27 below. The gap between export and import is increasing and negatively affecting the UK GDP.

Table 27 – P1 and P2 – tariff impacted period 2015 – 2017 in millions USD (OEC, 2017)

Prognosis 1 Year	Total export	Total import	Net exports
2015	15.850,10	43.027,30	(27.177,20)
2016	15.826,10	41.317,70	(25.491,60)
2017	16.255,01	43.195,30	(26.940,29)
Prognosis 2 Year	Total export	Total import	Net exports
2015	*19.250,22*	*47.924,62*	*(28.674,40)*
2016	*18.685,40*	*46.110,63*	*(27.425,23)*
2017	*19.075,32*	*49.762,36*	*(30.687,04)*
Difference Year	Total export	Total import	Net exports
2015	3.400,12	4.897,32	(1.497,20)
2016	2.859,30	4.792,93	(1.933,63)
2017	2.820,31	6.567,06	(3.746,75)

Table 27 shows the actual impact of Brexit applied tariffs by subtracting prognosis 1 and prognosis 2. This difference is in millions USD and it is then used in table 28 to calculate effect on GDP of the United Kingdom.

Table 28 – GDP % share of Brexit impact in millions USD (OEC, 2017), (The World Bank, 2018)

Value Year	Net exports (millions USD)	UK Total GDP (millions USD)	Difference GDP % value share
2015	(1.497,20)	2.885.570,00	**-0,0519%**
2016	(1.933,63)	2.650.850,00	**-0,0729%**
2017	(3.746,75)	2.622.430,00	**-0,1429%**

The overall impact on UK GDP is negative but also insignificant. Even with applied tariffs and growing import of agricultural products, the trade difference is on average for three simulated years 0.8923%. The biggest impact is in last year but even if the difference increases in the future years, it does not seem to reach a significant value.

5 Conclusion

The thesis pursued reasoning and explanation behind a unique geopolitical situation called Brexit. The opinion voiced in a referendum on 23rd June 2016 by British citizens meant beginning of a difficult political and economic process of Great Britain to leave European Union for the first time in history of its existence. The result of the referendum was surprising to the whole world; however, this thesis showed that it was more than anything else a result of dissatisfaction of British citizens with government of the country.

The ongoing Brexit negotiations with European Union prove the complexity of political and economic differences between UK and EU. One of the ultimate options of separation is Hard Brexit. It is a solution where the relationship between two sides is terminated without any additional arrangement to soften the consequences of separation across all sectors.

This thesis has analyzed gross domestic product of United Kingdom to determine the importance of foreign trade. The United Kingdom is one of the biggest trading countries in the world and any disruption in trading terms would certainly affect the final trading balance. The analysis was limited in terms of scope it can cover and the focus was placed into the agricultural sector and more specifically in agricultural commodities exported and imported within UK and EU.

There are EU trading rules applicable for members of the Single Market. Third countries from EU perspective follow WTO rules in absence of bilateral or multilateral agreements which imposes tariffs on these countries and EU. These tariffs would cause a change in trading balance of UK but due to mostly inelastic goods, the trade would maintain the linear increasing direction. The elasticity of agricultural products has been established on information from external source. It was outside the scope of this thesis to calculate elasticity for agricultural products and calculation for commodity groups would be inefficient due to variety of goods as it consists of large variety of goods.

The first prognosis suggested a withdrawal of Brexit at any, even final stage and that would result in no impact on the foreign trade with agricultural products. The linear function has been calculated for this potential situation based on the extracted data set and used to forecast future periods 2018 – 2022 of trade in each group of

commodities. As a result, the tendency of trade is both increasing export and import, however, import grows faster which increases negative trade balance final value and therefore GDP of UK.

The same approach was used on the second prognosis but with WTO applicable tariffs in this situation. The second prognosis suggested that Hard Brexit would become a valid decision made by UK and therefore news trading rules would apply. This considered, last three years of the data set were adjusted for export and import tariff impact and new trend functions were calculated. It allowed forecasting future periods of trade with this impact.

The difference between these prognoses provided final net export value when Brexit impact is considered. This value is presented as an absolute figure and a percentage share on GDP of the United Kingdom. The Hard Brexit has a negative impact on the trade balance between UK and EU. Consequently, the UK GDP is negatively impacted as well in value of 0.089%.

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7 Appendix

Table 29 – Total GDP Summary (The World Bank, 2018)

Year	Consump	Gov	Invest	Export	Import	Total
1980	64,62%	20,79%	12,45%	26,06%	23,93%	100,00%
1981	64,98%	21,23%	11,03%	25,44%	22,67%	100,00%
1982	65,02%	21,10%	12,02%	25,10%	23,24%	100,00%
1983	65,15%	20,88%	13,03%	25,23%	24,28%	100,00%
1984	65,27%	20,59%	14,20%	26,97%	27,03%	100,00%
1985	65,05%	19,82%	14,04%	27,31%	26,23%	100,00%
1986	67,08%	19,79%	13,72%	24,33%	24,91%	100,00%
1987	66,44%	19,10%	15,37%	23,86%	24,77%	100,00%
1988	66,92%	18,34%	17,94%	21,48%	24,69%	100,00%
1989	66,32%	17,93%	19,33%	21,94%	25,51%	100,00%
1990	66,64%	18,12%	17,05%	22,61%	24,42%	100,00%
1991	67,28%	18,96%	14,12%	21,90%	22,27%	100,00%
1992	68,35%	19,43%	12,92%	22,21%	22,91%	100,00%
1993	69,31%	18,75%	12,29%	24,06%	24,42%	100,00%
1994	69,28%	18,41%	12,33%	25,27%	25,29%	100,00%
1995	64,32%	16,77%	18,64%	25,16%	24,89%	100,00%
1996	64,65%	16,34%	18,84%	25,74%	25,57%	100,00%
1997	65,73%	15,85%	18,01%	25,29%	24,89%	100,00%
1998	66,36%	15,81%	18,63%	23,73%	24,53%	100,00%
1999	67,18%	16,30%	18,06%	23,61%	25,16%	100,00%
2000	66,90%	16,48%	18,47%	24,84%	26,69%	100,00%
2001	67,29%	17,16%	17,86%	24,74%	27,04%	100,00%
2002	67,09%	17,94%	17,76%	23,77%	26,57%	100,00%
2003	66,40%	18,61%	17,38%	23,53%	25,94%	100,00%
2004	66,35%	19,25%	17,02%	23,44%	26,07%	100,00%
2005	65,93%	19,42%	17,22%	24,69%	27,25%	100,00%
2006	65,28%	19,54%	17,59%	26,71%	29,12%	100,00%
2007	65,03%	19,34%	18,11%	24,86%	27,34%	100,00%
2008	65,74%	20,13%	16,99%	26,80%	29,67%	100,00%
2009	66,13%	21,63%	14,43%	26,13%	28,32%	100,00%
2010	65,57%	21,36%	15,68%	28,21%	30,82%	100,00%
2011	65,26%	20,72%	15,56%	30,51%	32,05%	100,00%
2012	65,71%	20,51%	15,76%	29,73%	31,71%	100,00%
2013	65,80%	19,86%	16,36%	29,67%	31,68%	100,00%
2014	65,35%	19,54%	17,11%	28,25%	30,25%	100,00%
2015	65,57%	19,17%	16,97%	27,38%	29,10%	100,00%
2016	65,83%	18,83%	17,42%	28,26%	30,33%	100,00%
2017	65,74%	18,41%	17,25%	30,53%	31,93%	100,00%

Table 30 – Animal and vegetable bi-products listed by products (OEC, 2017)

Animal and Vegetable Bi-Products	HS92 ID
Bovine, sheep and goat fat	1502
Coconut oil	1513
Fat and oil residues	1522
Fish oil	1504
Glycerol	1520
Ground nut oil	1508
Inedible fats and oils	1518
Lard	1503
Margarine	1517
Olive oil	1510
Other animal fats	1506
Other pure vegetable oils	1515
Other vegetable oils	1516
Palm oil	1511
Pig and poultry fat	1501
Pure olive oil	1509
Rapeseed oil	1514
Seed oils	1512
Soybean oil	1507
Stearic acid	1519
Waxes	1521
Wool grease	1505

Table 31 – Animal products listed by products (OEC, 2017)

Animal Products	HS92 ID
Animal fat	0209
Animal organs	0504
Bird feathers and skins	0505
Bovine	0102
Bovine meat	0201
Butter	0405
Cheese	0406
Concentrated milk	0402
Crustaceans	0306
Edible offal	0206
Eggs	0407
Fermented milk products	0403
Fish fillets	0304
Frozen bovine meat	0202
Honey	0409
Horses	0101
Live fish	0301
Milk	0401
Molluscs	0307
Non-fillet fresh fish	0302
Non-fillet frozen fish	0303
Other animals	0106
Other inedible animal products	0511
Pig hair	0502
Pig meat	0203
Poultry	0105
Poultry meat	0207
Preserved meat	0210
Processed bones	0506
Processed egg products	0408
Processed fish	0305
Sheet and goat meat	0204
Whey	0404

Table 32 – Foodstuffs listed by products (OEC, 2017)

Foodstuffs	HS92 ID
Alcohol >80%	2207
Animal food	2309
Animal meal and pellets	2301
Baked goods	1905
Beer	2203
Chocolate	1806
Cocoa powder	1805
Coffee and tea extracts	2101
Confectionery sugar	1704
Flavoured water	2202
Fruit juice	2009
Hard liquor	2208
Ice cream	2105
Jams	2007
Malt extract	1901
Other edible preparations	2106
Other fermented beverages	2206
Other frozen vegetables	2004
Other prepared meat	1602
Other processed fish and nuts	2008
Other processed vegetables	2005
Other sugars	1702
Other vegetable residues	2306
Pasta	1902
Prepared cereals	1904
Processed crustaceans	1605
Processed fish	1604
Processed tomatoes	2002
Raw sugar	1701
Rolled tobacco	2402
Sauces and seasonings	2103
Sausages	1601
Soups and broths	2104
Water	2201
Wine	2204
Yeast	2102

Table 33 – Vegetable products listed by products (OEC, 2017)

Vegetable products	HS92 ID	**Vegetable products**	HS92 ID
Apples and pears	0808	Other fruits	0810
Bananas	0803	Other live plants	0602
Barley	1003	Other nuts	0802
Bulbs and roots	0601	Other oily seeds	1207
Cabbages	0704	Other vegetables	0709
Cassava	0714	Pepper	0904
Cereal flours	1102	Perfume plants	1211
Cereal meals and pellets	1103	Pitted fruits	0809
Cereal straws	1213	Potato flours	1105
Citrus	0805	Potatoes	0701
Coconuts, Brazil nuts and cashews	0801	Preserved vegetables	0711
Coffee	0901	Processed cereals	1104
Corn	1005	Rapeseed	1205
Cucumbers	0707	Rice	1006
Cut flowers	0603	Root vegetables	0706
Dried fruits	0813	Rye	1002
Dried legumes	0713	Sorghum	1007
Dried vegetables	0712	Sowing seeds	1209
Frozen fruits and nuts	0811	Soybeans	1201
Frozen vegetables	0710	Spices	0910
Grapes	0806	Starches	1108
Ground nuts	1202	Sunflower seeds	1206
Hops	1210	Tea	0902
Insect resins	1301	Tomatoes	0702
Legume flours	1106	Tropical fruits	0804
Legumes	0708	Vanilla	0905
Lettuce	0705	Vegetable saps	1302
Linseed	1204	Wheat	1001
Malt	1107	Wheat flours	1101
Oats	1004	Wheat gluten	1109
Onions	0703		

Table 34 – Trading data of Germany (OEC, 2017)

Year	Germany							
	Export (millions USD)				Import (millions USD)			
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**
2017	89,60	438,00	1.004,00	163,00	159,00	1.160,00	3.520,00	945,00
2016	91,60	396,00	1.002,00	194,00	178,00	1.003,00	3.400,00	858,00
2015	91,80	397,00	980,00	202,00	235,00	1.150,00	3.450,00	836,00
2014	148,00	490,00	1.009,00	265,00	278,00	1.310,00	3.870,00	855,00
2013	149,00	489,00	1.100,00	363,00	203,00	1.290,00	3.570,00	952,00
2012	133,00	478,00	998,00	476,00	246,00	1.160,00	3.400,00	634,00
2011	137,00	500,00	986,00	447,00	241,00	1.130,00	3.380,00	581,00
2010	131,00	380,00	829,00	276,00	193,00	967,00	3.080,00	606,00
2009	85,70	295,00	766,00	150,00	165,00	934,00	2.780,00	574,00
2008	124,00	330,00	897,00	192,00	238,00	1.190,00	3.080,00	672,00
2007	275,00	301,00	828,00	172,00	160,00	1.130,00	2.730,00	543,00
2006	194,00	295,00	677,00	118,00	169,00	899,00	2.210,00	420,00
2005	139,00	282,00	677,00	82,00	199,00	764,00	2.170,00	436,00
2004	75,80	256,00	536,00	91,80	157,00	645,00	1.870,00	380,00
2003	63,50	256,00	553,00	113,00	126,00	558,00	1.600,00	314,00
2002	70,90	248,00	544,00	84,90	88,60	431,00	1.420,00	296,00
2001	71,20	228,00	539,00	89,90	69,50	401,00	1.180,00	245,00
2000	63,20	260,00	462,00	101,00	76,60	340,00	1.100,00	239,00
1999	55,80	329,00	563,00	93,00	72,40	305,00	1.110,00	251,00
1998	56,20	356,00	599,00	96,60	78,30	288,00	1.030,00	307,00
1997	48,30	311,00	571,00	129,00	84,40	316,00	1.040,00	273,00
1996	47,80	331,00	568,00	159,00	72,20	323,00	1.090,00	252,00
1995	40,60	364,00	549,00	110,00	81,50	285,00	1.140,00	307,00

Table 35 – Trading data of France (OEC, 2017)

Year	France							
	Export (millions USD)				Import (millions USD)			
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**
2017	62,60	1.320,00	1.450,00	182,00	178,00	911,00	4.130,00	915,00
2016	53,80	1.230,00	1.380,00	213,00	167,00	935,00	3.790,00	890,00
2015	55,10	1.220,00	1.460,00	184,00	181,00	1.040,00	4.200,00	1.000,00
2014	65,50	1.390,00	1.640,00	195,00	200,00	1.290,00	4.530,00	1.040,00
2013	57,00	1.350,00	1.530,00	196,00	252,00	1.230,00	4.590,00	1.310,00
2012	50,30	1.200,00	1.410,00	176,00	337,00	1.110,00	4.400,00	995,00
2011	75,00	1.400,00	1.690,00	218,00	284,00	1.120,00	4.370,00	964,00
2010	68,70	1.240,00	1.370,00	213,00	195,00	1.110,00	3.960,00	929,00
2009	73,40	1.180,00	1.500,00	135,00	179,00	1.130,00	3.810,00	913,00
2008	128,00	1.180,00	1.640,00	193,00	262,00	1.320,00	4.470,00	1.140,00
2007	102,00	1.000,00	1.540,00	138,00	181,00	1.250,00	4.340,00	1.130,00
2006	103,00	963,00	1.250,00	91,20	143,00	1.080,00	3.770,00	979,00
2005	94,20	935,00	1.160,00	87,30	94,60	1.020,00	3.420,00	1.000,00
2004	94,20	922,00	1.170,00	91,10	95,80	968,00	3.210,00	948,00
2003	85,80	858,00	1.040,00	86,10	71,30	825,00	2.790,00	851,00
2002	60,50	677,00	933,00	87,00	62,70	647,00	2.290,00	791,00
2001	48,90	611,00	840,00	69,20	70,70	582,00	2.070,00	770,00
2000	27,10	810,00	861,00	76,70	76,30	581,00	2.100,00	766,00
1999	28,20	963,00	1.000,00	86,20	78,10	654,00	2.530,00	800,00
1998	36,80	951,00	1.110,00	89,80	68,10	690,00	2.520,00	956,00
1997	42,40	974,00	1.080,00	88,70	56,20	728,00	2.290,00	1.030,00
1996	42,80	1.150,00	1.140,00	82,70	76,50	712,00	2.100,00	1.010,00
1995	40,00	1.510,00	1.030,00	80,70	75,30	662,00	1.910,00	1.020,00

Table 36 – Trading data of Netherlands (OEC, 2017)

Year	Netherlands							
	Export (millions USD)				Import (millions USD)			
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**
2017	221,00	632,00	1.140,00	364,00	556,00	1.790,00	3.670,00	2.830,00
2016	181,00	560,00	1.080,00	351,00	436,00	1.740,00	3.610,00	2.820,00
2015	176,00	596,00	1.210,00	344,00	428,00	1.840,00	3.710,00	2.930,00
2014	256,00	792,00	1.340,00	359,00	545,00	2.070,00	4.060,00	3.230,00
2013	246,00	793,00	1.180,00	431,00	626,00	2.040,00	3.940,00	3.130,00
2012	230,00	842,00	1.030,00	448,00	555,00	1.850,00	3.420,00	2.790,00
2011	160,00	817,00	977,00	638,00	674,00	1.910,00	3.220,00	2.960,00
2010	135,00	542,00	592,00	362,00	445,00	1.710,00	2.940,00	2.760,00
2009	130,00	459,00	543,00	309,00	457,00	1.790,00	2.810,00	2.490,00
2008	143,00	531,00	686,00	430,00	730,00	2.040,00	3.060,00	3.100,00
2007	80,80	465,00	525,00	278,00	484,00	2.020,00	3.060,00	3.150,00
2006	70,30	393,00	438,00	205,00	239,00	1.620,00	2.430,00	2.710,00
2005	51,30	313,00	432,00	158,00	215,00	1.560,00	2.160,00	2.580,00
2004	62,80	350,00	542,00	160,00	250,00	1.540,00	2.030,00	2.340,00
2003	102,00	303,00	515,00	155,00	289,00	1.380,00	1.730,00	2.110,00
2002	66,80	281,00	398,00	112,00	202,00	1.060,00	1.530,00	1.710,00
2001	40,50	243,00	347,00	90,10	216,00	995,00	1.310,00	1.390,00
2000	54,00	278,00	374,00	98,60	230,00	1.010,00	1.290,00	1.340,00
1999	66,90	305,00	376,00	109,00	340,00	905,00	1.360,00	1.250,00
1998	87,40	270,00	416,00	105,00	326,00	832,00	1.320,00	1.310,00
1997	94,00	315,00	549,00	112,00	325,00	854,00	1.300,00	1.160,00
1996	67,50	349,00	600,00	160,00	339,00	1.050,00	1.250,00	1.150,00
1995	78,30	537,00	602,00	168,00	226,00	753,00	1.320,00	1.170,00

Table 37 – Trading data of Ireland (OEC, 2017)

Year	Ireland							
	Export (millions USD)				Import (millions USD)			
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**
2017	102,00	1.190,00	2.540,00	524,00	49,20	2.820,00	2.660,00	399,00
2016	97,30	1.170,00	2.610,00	539,00	33,30	2.510,00	2.770,00	394,00
2015	103,00	1.310,00	2.630,00	510,00	38,70	2.980,00	2.830,00	479,00
2014	121,00	1.530,00	2.900,00	524,00	48,50	3.140,00	2.960,00	477,00
2013	133,00	1.350,00	2.870,00	567,00	64,30	3.070,00	2.750,00	471,00
2012	127,00	1.270,00	2.750,00	524,00	61,50	2.670,00	2.400,00	344,00
2011	118,00	1.180,00	2.740,00	600,00	80,20	2.920,00	2.420,00	425,00
2010	107,00	996,00	2.440,00	558,00	33,40	2.640,00	2.180,00	343,00
2009	121,00	955,00	2.460,00	541,00	43,60	2.320,00	2.250,00	298,00
2008	161,00	1.200,00	2.700,00	537,00	45,20	2.670,00	2.470,00	353,00
2007	132,00	1.130,00	2.560,00	498,00	29,10	2.260,00	2.550,00	342,00
2006	108,00	921,00	2.110,00	425,00	20,50	1.860,00	2.180,00	302,00
2005	117,00	880,00	1.870,00	343,00	20,40	1.710,00	2.140,00	316,00
2004	96,40	818,00	1.730,00	339,00	25,10	1.920,00	2.130,00	292,00
2003	95,00	645,00	1.510,00	320,00	24,30	1.530,00	1.870,00	282,00
2002	76,20	413,00	1.380,00	242,00	24,60	1.150,00	1.550,00	222,00
2001	74,50	431,00	1.250,00	188,00	29,00	994,00	1.300,00	207,00
2000	74,70	431,00	1.180,00	194,00	47,10	950,00	1.260,00	192,00
1999	87,00	432,00	1.260,00	229,00	51,20	994,00	1.600,00	212,00
1998	78,40	424,00	1.190,00	215,00	44,80	1.030,00	1.560,00	226,00
1997	91,60	397,00	1.150,00	183,00	51,60	1.010,00	1.590,00	194,00
1996	89,30	342,00	1.070,00	220,00	57,30	1.010,00	1.590,00	207,00
1995	83,70	360,00	922,00	207,00	41,40	1.010,00	1.490,00	186,00

Table 38 – Trading data of Italy (OEC, 2017)

Year	Italy							
	Export (millions USD)				Import (millions USD)			
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**
2017	39,90	281,00	390,00	90,80	152,00	437,00	2.540,00	527,00
2016	27,00	245,00	398,00	74,70	128,00	420,00	2.470,00	524,00
2015	26,30	249,00	375,00	69,80	128,00	399,00	2.590,00	555,00
2014	29,20	298,00	380,00	77,00	149,00	462,00	2.790,00	588,00
2013	31,30	292,00	351,00	61,20	152,00	437,00	2.520,00	520,00
2012	32,20	287,00	358,00	56,20	140,00	403,00	2.240,00	501,00
2011	25,60	345,00	374,00	83,60	164,00	421,00	2.300,00	532,00
2010	28,30	288,00	403,00	109,00	140,00	367,00	2.150,00	528,00
2009	15,70	272,00	456,00	108,00	119,00	347,00	2.140,00	542,00
2008	34,50	298,00	564,00	131,00	145,00	394,00	2.220,00	662,00
2007	32,00	302,00	567,00	103,00	134,00	379,00	1.860,00	620,00
2006	21,10	265,00	452,00	99,70	153,00	301,00	1.590,00	514,00
2005	16,40	226,00	404,00	119,00	141,00	300,00	1.540,00	457,00
2004	18,80	215,00	453,00	136,00	127,00	287,00	1.480,00	410,00
2003	16,70	180,00	383,00	163,00	83,10	234,00	1.230,00	360,00
2002	13,10	146,00	310,00	76,70	60,10	180,00	972,00	303,00
2001	9,88	141,00	278,00	96,60	52,70	160,00	996,00	278,00
2000	12,30	175,00	282,00	132,00	44,70	124,00	1.010,00	236,00
1999	13,00	187,00	308,00	135,00	49,10	142,00	1.010,00	280,00
1998	15,50	214,00	335,00	185,00	43,70	122,00	1.120,00	282,00
1997	21,70	206,00	320,00	146,00	46,20	101,00	1.060,00	289,00
1996	19,50	275,00	344,00	227,00	55,00	109,00	1.040,00	301,00
1995	19,90	361,00	346,00	210,00	46,90	102,00	836,00	241,00

Table 39 – Trading data of Belgium (OEC, 2017)

Year	Belgium							
	Export (millions USD)				Import (millions USD)			
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**
2017	100,00	439,00	515,00	167,00	139,00	477,00	2.170,00	496,00
2016	53,40	343,00	453,00	182,00	116,00	425,00	2.160,00	489,00
2015	45,70	263,00	429,00	181,00	114,00	473,00	2.220,00	515,00
2014	59,50	380,00	513,00	186,00	180,00	593,00	2.460,00	604,00
2013	36,50	403,00	660,00	185,00	186,00	576,00	2.260,00	573,00
2012	54,10	366,00	577,00	306,00	172,00	488,00	1.960,00	583,00
2011	64,60	431,00	483,00	275,00	259,00	531,00	2.020,00	588,00
2010	89,30	328,00	401,00	180,00	169,00	493,00	1.730,00	542,00
2009	64,60	269,00	412,00	120,00	151,00	500,00	1.730,00	507,00
2008	79,90	306,00	440,00	157,00	222,00	545,00	1.960,00	631,00
2007	46,40	323,00	405,00	142,00	200,00	579,00	1.780,00	543,00
2006	31,20	309,00	345,00	90,20	150,00	491,00	1.460,00	454,00
2005	28,00	289,00	378,00	116,00	123,00	455,00	1.270,00	418,00
2004	55,60	327,00	363,00	93,80	110,00	408,00	1.190,00	415,00
2003	41,90	276,00	424,00	106,00	84,00	330,00	946,00	327,00
2002	28,20	231,00	430,00	87,60	70,80	250,00	785,00	300,00
2001	26,70	203,00	346,00	71,50	62,50	230,00	669,00	282,00
2000	22,30	240,00	410,00	66,30	52,00	219,00	673,00	314,00
1999	27,20	297,00	480,00	76,70	39,50	198,00	704,00	316,00
1998	24,10	339,00	367,00	65,80	64,00	180,00	651,00	405,00
1997	41,90	340,00	387,00	81,90	60,00	225,00	608,00	346,00
1996	17,40	331,00	336,00	79,80	91,10	214,00	563,00	312,00
1995	9,94	336,00	353,00	88,50	77,40	240,00	560,00	256,00

Table 40 – Trading data of Spain (OEC, 2017)

Year	Spain							
	Export (millions USD)				Import (millions USD)			
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**
2017	26,50	349,00	740,00	165,00	227,00	287,00	1.470,00	2.270,00
2016	21,10	338,00	725,00	364,00	183,00	293,00	1.300,00	2.340,00
2015	36,20	305,00	738,00	260,00	178,00	267,00	1.380,00	2.230,00
2014	25,40	355,00	864,00	243,00	179,00	261,00	1.510,00	2.230,00
2013	21,10	322,00	1.060,00	122,00	204,00	265,00	1.510,00	2.150,00
2012	18,80	334,00	852,00	256,00	131,00	219,00	1.370,00	1.890,00
2011	27,80	371,00	1.130,00	261,00	130,00	227,00	1.390,00	1.950,00
2010	15,10	364,00	1.090,00	399,00	126,00	203,00	1.150,00	1.770,00
2009	11,50	351,00	1.120,00	340,00	113,00	198,00	1.110,00	1.690,00
2008	12,10	420,00	1.410,00	321,00	134,00	209,00	1.180,00	2.010,00
2007	10,60	475,00	1.320,00	295,00	122,00	181,00	1.010,00	1.910,00
2006	9,82	380,00	1.170,00	270,00	141,00	169,00	776,00	1.750,00
2005	13,00	365,00	1.180,00	353,00	91,50	188,00	748,00	1.640,00
2004	13,20	350,00	1.150,00	306,00	74,30	158,00	690,00	1.580,00
2003	10,50	317,00	1.100,00	248,00	58,20	148,00	594,00	1.380,00
2002	12,30	274,00	812,00	149,00	38,70	117,00	474,00	1.250,00
2001	8,37	250,00	886,00	130,00	39,60	85,40	451,00	1.070,00
2000	7,91	240,00	784,00	167,00	39,90	82,40	436,00	963,00
1999	13,70	268,00	804,00	181,00	45,00	83,90	490,00	1.000,00
1998	15,70	276,00	778,00	274,00	40,10	81,20	534,00	1.120,00
1997	21,80	290,00	790,00	314,00	42,60	70,00	495,00	1.060,00
1996	14,50	325,00	756,00	263,00	40,10	61,90	423,00	934,00
1995	13,00	348,00	742,00	340,00	21,20	52,80	342,00	874,00

Table 41 – Trading data of Sweden (OEC, 2017)

Year	Sweden							
	Export (millions USD)				Import (millions USD)			
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**
2017	9,80	55,60	363,00	76,80	12,40	246,00	293,00	36,00
2016	9,63	53,90	322,00	68,70	10,40	249,00	270,00	51,30
2015	16,90	57,60	297,00	69,60	14,80	200,00	265,00	32,50
2014	19,20	79,50	430,00	65,50	34,50	214,00	273,00	28,20
2013	23,00	83,70	352,00	60,80	18,30	192,00	298,00	36,30
2012	36,00	65,90	297,00	69,70	14,10	147,00	313,00	42,40
2011	22,60	41,20	322,00	57,70	24,90	138,00	222,00	22,00
2010	18,80	43,40	291,00	51,40	15,00	145,00	206,00	12,80
2009	19,40	36,90	261,00	38,60	13,50	129,00	171,00	17,60
2008	24,70	58,40	308,00	44,30	13,20	146,00	185,00	22,60
2007	17,40	44,50	263,00	38,30	32,40	122,00	176,00	18,30
2006	20,70	27,00	205,00	30,10	6,43	110,00	130,00	23,60
2005	18,20	25,80	198,00	26,40	10,70	37,60	114,00	18,90
2004	21,60	22,70	186,00	28,30	8,63	50,90	96,50	12,10
2003	14,10	14,00	173,00	21,60	6,78	16,70	75,40	7,97
2002	10,10	11,40	156,00	18,90	6,51	16,10	75,70	7,82
2001	10,20	12,70	137,00	16,50	5,97	22,40	50,30	4,78
2000	9,05	17,10	136,00	19,10	5,71	29,70	37,60	3,70
1999	9,07	18,80	155,00	29,80	5,69	30,00	38,40	9,35
1998	12,70	17,90	179,00	27,00	7,01	17,60	44,40	9,47
1997	16,40	21,10	181,00	24,20	5,83	13,30	42,20	9,44
1996	5,00	21,90	190,00	30,60	5,62	14,50	36,40	5,05
1995	7,87	31,20	137,00	27,70	11,40	5,00	26,20	2,79

Table 42 – Trading data of Poland (OEC, 2017)

Year	Poland							
	Export (millions USD)				Import (millions USD)			
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**
2017	22,90	160,00	325,00	56,60	25,60	640,00	1.540,00	339,00
2016	18,60	167,00	311,00	49,70	22,50	530,00	1.280,00	288,00
2015	22,80	162,00	250,00	50,10	22,50	504,00	1.230,00	289,00
2014	26,00	220,00	242,00	55,60	13,60	497,00	1.080,00	286,00
2013	15,50	216,00	246,00	53,80	10,30	453,00	993,00	291,00
2012	21,50	182,00	194,00	51,60	9,91	371,00	939,00	275,00
2011	31,30	194,00	212,00	92,90	5,88	343,00	1.240,00	179,00
2010	16,90	176,00	155,00	64,60	3,24	264,00	975,00	164,00
2009	10,30	128,00	159,00	54,10	5,75	222,00	574,00	142,00
2008	8,69	134,00	176,00	58,30	2,00	265,00	563,00	194,00
2007	6,19	101,00	108,00	14,30	1,10	255,00	434,00	182,00
2006	7,71	48,80	77,20	23,20	0,25	173,00	283,00	124,00
2005	6,66	45,40	69,90	7,74	0,10	132,00	180,00	97,50
2004	6,60	32,90	55,10	6,71	0,20	102,00	147,00	57,90
2003	6,01	12,30	54,00	6,37	0,01	49,50	92,20	33,80
2002	4,26	11,00	38,60	6,11	0,01	14,40	74,20	23,70
2001	3,87	9,42	33,00	8,66	0,01	11,00	61,10	29,20
2000	3,85	10,30	28,70	10,50	0,30	11,40	45,00	16,70
1999	4,04	10,70	36,20	2,50	0,01	11,70	33,40	20,30
1998	4,22	21,00	43,80	7,28	0,01	9,58	27,60	27,20
1997	4,75	19,20	40,50	38,70	0,40	8,43	31,60	17,50
1996	5,59	19,40	33,10	46,80	0,70	7,78	27,70	18,70
1995	6,15	17,90	43,90	3,83	0,02	4,83	16,80	63,50

Table 43 – Trading data of Denmark (OEC, 2017)

Year	Denmark							
	Export (millions USD)				Import (millions USD)			
	x1	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**
2017	6,61	125,00	286,00	42,30	10,10	1.270,00	780,00	119,00
2016	6,17	124,00	277,00	45,50	32,20	1.320,00	777,00	105,00
2015	4,70	135,00	288,00	49,50	27,80	1.130,00	822,00	113,00
2014	13,80	163,00	307,00	52,00	13,90	1.460,00	897,00	169,00
2013	6,93	140,00	382,00	63,20	24,00	1.430,00	927,00	192,00
2012	18,70	118,00	298,00	80,10	22,80	1.420,00	864,00	145,00
2011	15,20	154,00	290,00	68,30	32,20	1.570,00	859,00	113,00
2010	11,20	118,00	237,00	54,40	23,00	1.440,00	675,00	76,40
2009	16,60	85,00	232,00	49,00	32,10	1.420,00	609,00	104,00
2008	20,80	126,00	329,00	98,40	31,80	1.640,00	736,00	116,00
2007	22,50	91,40	308,00	52,10	27,20	1.660,00	655,00	123,00
2006	12,90	80,90	260,00	51,30	30,00	1.620,00	428,00	94,00
2005	15,10	88,60	228,00	35,90	27,60	1.490,00	443,00	104,00
2004	12,70	93,30	212,00	37,40	27,00	1.570,00	438,00	108,00
2003	7,62	84,90	178,00	49,30	29,60	1.470,00	351,00	101,00
2002	2,80	76,20	150,00	36,70	30,00	1.230,00	310,00	97,30
2001	2,81	50,80	130,00	26,90	24,00	1.130,00	282,00	87,20
2000	6,39	63,00	136,00	28,70	26,00	962,00	289,00	79,50
1999	5,36	63,10	150,00	36,90	34,70	907,00	296,00	94,80
1998	5,90	90,70	163,00	45,30	31,50	865,00	328,00	94,00
1997	5,95	87,70	164,00	75,90	23,10	976,00	331,00	89,30
1996	5,21	66,30	144,00	71,70	24,40	995,00	355,00	99,30
1995	2,86	72,00	143,00	58,10	28,10	887,00	377,00	95,50

Table 44 – Total amount of the P1 for export and import with prognosis in millions USD (OEC, 2017)

Year	x1	x2	x3	x4	x5	x6	x7	x8
1995	302,32	3.937,10	4.867,90	1.293,83	609,22	4.001,63	8.018,00	4.215,79
1996	314,60	3.210,60	5.181,10	1.340,60	761,92	4.497,18	8.475,10	4.289,05
1997	388,80	2.961,00	5.232,50	1.193,40	695,33	4.301,73	8.787,80	4.468,24
1998	336,92	2.959,60	5.180,80	1.110,78	703,52	4.115,38	9.135,00	4.736,67
1999	310,27	2.873,60	5.132,20	979,10	715,70	4.230,60	9.171,80	4.233,45
2000	280,80	2.524,40	4.653,70	893,90	598,61	4.309,50	8.240,60	4.149,90
2001	296,93	2.179,92	4.786,00	787,36	569,98	4.610,80	8.369,40	4.363,18
2002	345,16	2.368,60	5.151,60	900,91	584,02	5.095,50	9.480,90	5.000,82
2003	443,13	2.946,20	5.930,00	1.268,37	772,29	6.541,20	11.278,60	5.766,77
2004	457,70	3.386,90	6.397,10	1.290,11	875,03	7.648,90	13.281,50	6.543,00
2005	498,86	3.449,80	6.596,90	1.328,34	922,90	7.656,60	14.185,00	7.067,40
2006	578,73	3.682,70	6.984,20	1.403,70	1.052,18	8.323,00	15.257,00	7.370,60
2007	724,89	4.232,90	8.424,00	1.730,70	1.370,80	9.836,00	18.595,00	8.561,30
2008	736,69	4.583,40	9.150,00	2.162,00	1.823,20	10.419,00	19.924,00	8.900,60
2009	548,20	4.030,90	7.909,00	1.844,70	1.278,95	8.990,00	17.984,00	7.277,60
2010	621,30	4.475,40	7.808,00	2.267,40	1.342,64	9.339,00	19.046,00	7.731,20
2011	677,10	5.433,20	9.204,00	2.741,50	1.895,18	10.310,00	21.421,00	8.314,00
2012	721,60	5.142,90	8.764,00	2.443,60	1.689,31	9.838,00	21.306,00	8.199,40
2013	719,33	5.438,70	9.731,00	2.103,00	1.739,90	10.983,00	23.358,00	9.625,30
2014	763,60	5.697,50	9.625,00	2.022,10	1.641,50	11.297,00	24.430,00	9.507,20
2015	578,50	4.694,60	8.657,00	1.920,00	1.367,80	9.983,00	22.697,00	8.979,50
2016	559,60	4.626,90	8.558,00	2.081,60	1.306,40	9.425,00	21.827,00	8.759,30
2017	680,91	4.989,60	8.753,00	1.831,50	1.508,30	10.038,00	22.773,00	8.876,00
2018 - Prognosis	769,92	5.423,78	9.986,50	2.358,17	1.788,36	11.974,04	25.749,68	10.121,96
2019 - Prognosis	791,02	5.550,30	10.229,30	2.420,85	1.843,83	12.334,95	26.601,85	10.396,85
2020 - Prognosis	812,11	5.676,82	10.472,10	2.483,52	1.899,29	12.695,86	27.454,02	10.671,74
2021 - Prognosis	833,21	5.803,34	10.714,90	2.546,20	1.954,75	13.056,77	28.306,19	10.946,63
2022 - Prognosis	854,30	5.929,86	10.957,70	2.608,88	2.010,21	13.417,68	29.158,36	11.221,52

Table 45 – Total amount of the P2 for export and import with prognosis in millions USD (OEC, 2017)

Year	x1	x2	x3	x4	x5	x6	x7	x8
1995	302,32	3.937,10	4.867,90	1.293,83	609,22	4.001,63	8.018,00	4.215,79
1996	314,60	3.210,60	5.181,10	1.340,60	761,92	4.497,18	8.475,10	4.289,05
1997	388,80	2.961,00	5.232,50	1.193,40	695,33	4.301,73	8.787,80	4.468,24
1998	336,92	2.959,60	5.180,80	1.110,78	703,52	4.115,38	9.135,00	4.736,67
1999	310,27	2.873,60	5.132,20	979,10	715,70	4.230,60	9.171,80	4.233,45
2000	280,80	2.524,40	4.653,70	893,90	598,61	4.309,50	8.240,60	4.149,90
2001	296,93	2.179,92	4.786,00	787,36	569,98	4.610,80	8.369,40	4.363,18
2002	345,16	2.368,60	5.151,60	900,91	584,02	5.095,50	9.480,90	5.000,82
2003	443,13	2.946,20	5.930,00	1.268,37	772,29	6.541,20	11.278,60	5.766,77
2004	457,70	3.386,90	6.397,10	1.290,11	875,03	7.648,90	13.281,50	6.543,00
2005	498,86	3.449,80	6.596,90	1.328,34	922,90	7.656,60	14.185,00	7.067,40
2006	578,73	3.682,70	6.984,20	1.403,70	1.052,18	8.323,00	15.257,00	7.370,60
2007	724,89	4.232,90	8.424,00	1.730,70	1.370,80	9.836,00	18.595,00	8.561,30
2008	736,69	4.583,40	9.150,00	2.162,00	1.823,20	10.419,00	19.924,00	8.900,60
2009	548,20	4.030,90	7.909,00	1.844,70	1.278,95	8.990,00	17.984,00	7.277,60
2010	621,30	4.475,40	7.808,00	2.267,40	1.342,64	9.339,00	19.046,00	7.731,20
2011	677,10	5.433,20	9.204,00	2.741,50	1.895,18	10.310,00	21.421,00	8.314,00
2012	721,60	5.142,90	8.764,00	2.443,60	1.689,31	9.838,00	21.306,00	8.199,40
2013	719,33	5.438,70	9.731,00	2.103,00	1.739,90	10.983,00	23.358,00	9.625,30
2014	763,60	5.697,50	9.625,00	2.022,10	1.641,50	11.297,00	24.430,00	9.507,20
2015	*680,89*	*5.525,54*	*9.817,04*	*3.226,75*	*1.592,12*	*11.620,21*	*25.034,79*	*9.677,50*
2016	*658,65*	*5.445,86*	*9.704,77*	*2.876,12*	*1.520,65*	*10.970,70*	*24.075,18*	*9.544,10*
2017	*801,43*	*5.872,76*	*9.925,90*	*2.475,23*	*1.755,66*	*11.684,23*	*25.118,62*	*11.203,85*
2018 - Prognosis	822,31	5.834,80	10.550,60	2.795,16	1.899,80	12.756,52	26.872,98	10.758,22
2019 - Prognosis	846,60	5.986,40	10.827,80	2.884,31	1.962,06	13.165,15	27.793,65	11.072,35
2020 - Prognosis	870,89	6.138,00	11.105,00	2.973,45	2.024,32	13.573,78	28.714,32	11.386,48
2021 - Prognosis	895,19	6.289,60	11.382,20	3.062,60	2.086,59	13.982,41	29.634,99	11.700,61
2022 - Prognosis	919,48	6.441,20	11.659,40	3.151,75	2.148,85	14.391,04	30.555,66	12.014,74