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Chinese Cybercrime – A Threat to the Occident?

The Impact of Chinese Cybercrime on EU –China Relations

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Abstract

With the increasing appearance of cyber attacks on European economic, political as well as infrastructure systems in the mid of the former decade, the fear of uncertain damages done by Hackerism have ascended between politicians, scientists and economists. Especially the People's Republic of China (PRC) appears to be the source of the grand majority of sophisticated and economically motivated 'Cybercrime'. Thus the goal of this paper is to determine the impact of Chinese Cybercrimes on the economic relationship between the European Union (EU) and the PRC. Based on Copeland's (1996) theory of Future Trade Expectations (FTEs), the evaluation of the impact of Chinese Cybercrime will follow a Qualitative Comparative Analysis to figure out the most influential determinant on FTEs. The outcome proves that institutional cooperation is the most crucial indicator. Finally, this paper seeks to find out what institutional cooperation implies for Chinese Cybercrime and its effects on the respective partnership and the FTEs at stake.

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1. Introduction

“The European Union-China Relationship is one of the most intense on the economic front, one of the largest in terms of people-to-people exchanges – and our formal European Union - China dialogues cover almost all conceivable areas”

- EU Commissioner Füle, on behalf of the HR/VP

This statement on the EU - China relations in March 2013 in Strasbourg by Commissioner Füle highlights the facts stated by the European Commission. According to an official report of the European Commission, the People's Republic of China (PRC) became an important, if not the important trading partner of the European Union (EU) during the past two decades. It is assumed that until 2015, the PRC will host the world's biggest economy with 1.39 billion potential consumers and increasing export rates to the EU, which amount up to more than 400 billion Euros (European Commission, 2012, p.1). This partnership is fostered by an advanced cooperation between the EU and its Member States (MSs), which have recognized that the deepened exchange of economic interests will lead to widely mutual benefits. In order to enhance collaboration even further, MSs and the EU identified special political and economic targets in their “China Agenda”, including the notion of human rights and technological transfers. Nonetheless, there are still huge interest gaps between the MSs towards the PRC (Fox & Godement, 2009). Additionally, several criminal events in recent history overshadowed this partnership. These criminal incidents seek to steal certain technological data from companies all over the world through access via Internet. They are called “Hackerism” or “Cybercrime”. In 2010, the EU's Emission Trading Scheme (ETS) was the victim of cyber attacks, which could be traced back to the PRC. In early 2013, cyber attacks on companies in the United States and countries within the European Union recognized illegal access to their databases by Chinese Hackers. As a consequence, NATO set out guidelines for dealing with cyber attacks as a tool in international warfare (Harley, 2013).

These developments can be a signal for further conflict propagation and might have incalculable impacts on the respective economies and international trade relationships so far. Thus the purpose of this paper is to examine whether the incidences occurred due to Hackerism originating in the PRC have a negative impact on the future traderelationship between the EU and the PRC. A negative impact is epitomized in e.g. arising conflicts leading to the cut-off of trading ties or the abandonment of any cooperation. Therefore the underlying research question is as follows:

To what extent does Chinese Hackerism affect the development of the economic cooperation between the EU and the PRC in the future?

By applying this question, it is possible to assess the threat of Chinese Hackerism on the EU- China trade relationship and thus on the European economy. So **chapter 2** aims at identifying what Chinese Hackerism implicates for the respective partnership. Therefore the chapter also seeks to determine which features characterize EU-China relations. However, in order to study the phenomenon at stake, the theory of trade expectations by Copeland (1996) has to be applied, which merges the different approaches of liberalism and realism on the development of conflicts through the introduction of an additional causal variable, namely Future Trade Expectations (FTEs). The variable FTEs embodies an explanation on how relationships between international actors are shaped under different circumstances, which have an impact on the future trade between the respective actors. So **chapter 3** serves as the theory body for this study. It introduces Dale Copeland's (1996) theory of trade expectations and emphasizes the theory's implications for the assessment of the situation at stake, namely the new causal variable of Future Trade Expectations (FTEs) and the sub-questions necessary in order to answer the overall research question. Nonetheless, Copeland (1996) failed to conceptualize FTEs in a more detailed manner. This paper fills this scientific gap by conceptualizing the missing indicators and evaluating the most influencing one. By doing so, it is possible to examine whether Chinese Hackerism has the potential to change FTEs in the long run or whether the phenomenon under study has an unoffending impact on the relationship at stake. Thus **chapter 4** explains how the research is constructed and which attributes are studied. It also recognizes the cases under study namely Belgium (BE), Germany (GER), France (FR), the Netherlands (NL), the European Union (EU) and the People's Republic of China (PRC) including Hong Kong, excluding Taiwan. **Chapter 5** presents the analytical findings and seeks to answer the sub-questions posed in chapter 3 by following the methodology instructions embattled in chapter 5. In **Chapter 6**, the conclusion will provide an evaluation of whether or not Chinese Hackerism presents a threat to the European FTEs and thus the EU-China trade relationship.

2. EU-China trade relations and Chinese Hackerism

The EU-China relationship is marked by a variety of events starting in the mid of the 70's. To assess whether Chinese Hackerism has an impact on the relationship, one has to evaluate which potential consequences can emerge. The following chapter provides an advanced insight in the structure of EU-China cooperation and the nature of Chinese Hackerism. By characterizing the underlying phenomenon, namely Chinese Hackerism, and its circumstances, namely the EU-China relationship, it is possible to identify the dimensions on which Chinese Hackerism has a potential influence, which in turn represent a potential object for this study. The underlying research is based on previous studies about the nature of the EU-China cooperation.

2.1 EU- China trade relationship

2.1.1 Development of the EU-China relationship since 1975

The following section aims at explaining and evaluating EU-China relations until today. It is very useful to know on which elements the partnership is build to frame the phenomenon of Chinese Hackerism. To start with, after the fall of the Mao regime, in 1975, four years after the recognition of the Chinese government as the legitimate government of the PRC by the General Assembly of the UN, the diplomatic relationship between the EU and the PRC was established. The then Prime Minister Zhou Enlai launched a project called 'Four Modernizations' which realized the age-old dream of opening up the largest consumer market on the globe to countries outside the 'Soviet orbit' (Möller, 2002, p. 11). Three years later, the former head of the Chinese communist party, Den Xiaoping, declared the economic sector prior to all other policies (Möller, 2002, p.13). The arising relationship has been deepened by the installation of a Trade Agreement between both parties in 1978, followed by a Trade and Economic Cooperation in 1985 (Algerie, 2002, pp. 64). The European motivation behind the trading agreements was to strengthen and to enlarge its economic benefits, but at the same time to bring the PRC into the international trade framework, which also was thought to imply support for the Chinese population based on anti-poverty measures as well as stability of future trade ties (Algerie, 2002, p. 70). However, the PRC's violent reaction to the student demonstration on Tiananmen Square in 1989 unsettled the relationship. The development of the 'Post-Cold-War' cooperation stagnated, which was mainly because of the trade embargos on China implemented in 1991 by the Western allies as a reaction to the incidences on Tiananmen Square. These embargos, applied within the framework of the Coordinating Committee on Multilateral Trade Controls (COCOM), included the prohibition of the sale of arms and high technology transfers to the PRC (Casarini, 2006, p. 9). Besides these trade

embargos, an advanced interaction between businesses and an exchange of goods took place, which increased the importance of the PRC on the international market. This phenomenon can be affiliated to the PRC's admission to the standardization formula of the World Trade Organization (WTO) in 2001. Thus in 2002, China became for imports as well as exports EU's third largest non-European trading partner (Algieri, 2002, p.6 4). As a crucial consequence, the economic interdependence grew significantly (Algieri, 2002, p. 76). Summarizing, EU-China relations alternated various times and the ties are rather loose than strong. Nonetheless a degree of cooperation is given, however only on the economic dimension.

2.1.2 Aspects and obstacles of the EU-PRC relationship

Based on the findings of the previous chapter, namely that the economic dimension is the most crucial one compared to the political, it is important to identify the most important developments in the past. Thus this section aims at exploring more detailed economic concerns on both sides in order to see how strong the trade relationship has developed and why.

The economic interdependence is remarkable in the interest of the EU towards China, which set the goal to secure market outlets and fair competition for European companies in the PRC, since an increase in European exports as well as the success of European companies abroad would lead to the expectation, that future jobs would be created within the EU (Casarini, 2006, p. 12). But the interdependence is clearly visible on both sides: Beijing reinforces its foreign relations to the EU also for commercial reasons. The most important aspect of the relationship, for the PRC, is the acquisition of advanced Western technology that is needed to foster its modernization process from a planned economy to a market oriented one. The reason behind this process is China's struggle for economic power in order to encounter US containment policies (Casarini, 2006, pp. 13).

Until today, especially the arms embargo remains a vividly discussed issue. Even though Washington and some European politicians like the former German Chancellor Gerhard Schröder urged the European Union to lift this embargo, the European Parliament decided, in early 2005 with 431 votes in favor and 85 against, not to abandon the embargo on arms in order to maintain some control over Chinese military policies (Casarini, 2006, p. 31). The embargo on the sales of advanced technologies to the PRC was not always directly enforceable. Thus due to increased trade exchanges, the EU supplies the PRC heavily with exports containing capital and technological intensive goods whilst the PRC exports mainly labor and low technological intensive commodities (Casarini, 2006, p. 16). This advanced technology transfer, also occurring due to Foreign (Direct) Investment, is identified by

Beijing as one of the most important tools with the purpose to enhance China's technology base and to increase the technological content of their products (Casirini, 2006, p. 30). Consequently, nearly half of the EU companies expect the situation to worsen within the next two years, mainly because foreign companies encounter a number of trade obstacles in the PRC (European Commission, 2006, p.2). On the summit of the WTO in 2012, the EU ambassador Angelor Pangratis (2012) formulated a solution to this problem in his appeal as follows: "China must now take the next step: increase its internal consumption, rely less on exports and open its economy more, especially to services and foreign investment." However, it is not only China that has to tackle a revision of the current system. The European policy can also be criticized for its incoherent mismanagement of its different demands in its external economic and political relations towards the PRC (Algieri, 2002, p. 76). The government of China has recognized this feature. A Chinese governmental report refers to a statement of the neo-authoritarian Chinese academic Pan Wei. According to him, the EU is weak, politically divided and militarily non-influential. He adds that the EU is more economically dependent on China than vice versa (Fox & Godement, 2009, p. 3). To evaluate the latter proposition will be one of the aims of this paper. Nonetheless, China has learned to take its advantage of the division among the European Member States, which are split over two main questions concerning the management of China's impact on the European economy and its political engagement (Fox & Godement, 2009, p. 3).

Summing it is possible to say that China's policy towards the EU remains essentially economic in their nature with the focus on technology transfers (Fox & Godement, 2009, p. 8). In addition, it appears that both sides have recognized the partnership as a source of benefits and thus are willing to cooperation. Nonetheless, the partnership still faces several obstacles, which might make the relation fragile. Furthermore, Europe's competitiveness depends on its capacity to protect and develop further its comparative advance in high-technology goods. Consequently, the transfer of these technologies, which China seeks to obtain, has the clear potential to undermine the EU's competitiveness and welfare due to a loss of jobs in the long run (Casarini, 2006, p. 30), even though the economic dimension proves to be the more stable side in the relationship (Algieri, 2002, p. 77). Thus it seems that the PRC just collaborates to obtain high technologies. This paper debates another other way of receiving Western technologies, namely the role of Hackerism originating in China.

2.2 Chinese Hackerism

2.2.1 Definition of Hackerism

Hackerism in itself became an advanced discussion during the end of the past decade with the increasing interconnectedness via the Internet. Scholars like Anna-Maria Talihärm (2010)¹ discussed the use of Hackerism as a tool for terrorists. The issue of Cyberterrorism and its implied Cyberdefence is also discussed by Alan E. Brill (2012)². But Hackerism has also other faces, for example Cyberwarfare or 'Hactivism'. Cyberwarfare, as argued by Adam P. Liff (2012)³, is becoming an increased threat and a means in international warfare. It has become such a threat that NATO recently has seen the need to implement an international set of legal guidelines, which seek to regulate the use of Cyberwarfare and its consequences (Bowcott, 2013). According to this manual, a governmental organized cyber-attack can, if it fulfills certain requirements⁴, be treated as a military strike against a NATO member and therefore personifies a symbol of war declaration. Hactivism implies a political motivation behind online attacks and is primarily focused on governmental institutions in order to emphasize dissatisfaction with current regulations and laws (Anderson, 2008, p.10).

2.2.2 Chinese Cybercrime

The threat of Hackerism originating in the People's Republic of China (PRC) is not directly observable. Even though several cases in the past exhibited evidence that the order for some attacks came from the Chinese government (The Economist, 2013), most cases of cyber attacks are anonymous in nature and hard to root back. In fact, it is argued that Chinese hackers are very decentralized and have no central management (Tan, Tan & Shan, 2011, p.9). Thus they lack a certain transparency and organization which would be found in either a civil organization or a governmental institution. The latter represents one condition for the classification of Cyberwarfare (Denning, 2008). Chinese Hackerism lacks political motivation and can therefore not be classified as Hactivism. It is largely aimed at stealing and sharing hacking information, including advanced technology and corporate secrets (Tan, Tan & Lim, 2011, p.10) & (Hille, 2013). Since theft is in legal systems a crime, it is thus possible to label

¹See: Talihärm, A.-M. (2010). Cyberterrorism: in Theory or in Practice? *Defense against terrorism review*, Vol. 3, No. 2, pp. 59-74.

²See: Brill, A. E. (2010). From Hit and Run to Invade and Stay: How Cyberterrorists Could Be Living Inside Your Systems. *Defense against terrorism review*, Vol. 3, No. 2.

³See: Liff, A. P. (2012). Cyberwar: A new 'Absolute Weapon'? The Proliferation of Cyberwarfare Capabilities and interstate war. *Journal of Strategic Studies*. No 35 (3), pp. 401-428.

⁴See: Denning, D. E. (2008). The Ethics of Cyber Conflict. *The Handbook of Information and Computer Ethics*.

Chinese Hackerism as “*Cybercrime*”. A clear explanation of Cybercrime is given by Nir Kshetri (2013)⁵:

“(Cybercrime is...) a crime in which an offender inflicts a harm or takes property from a victim by using computer or computer networks.” (Kshetri, 2013, p. 46).

The definition finds its application in several cyber attacks in the past. A wave of recognized cyber attacks occurred in 2011, whereby Chinese Cybercrime targeted 12 companies in the United States (US), five companies in the United Kingdom (UK) and two companies in Denmark (Kshetri, 2013, p.46). These cases are evidence indicating that the PRC is increasingly recognized as one of the largest sources of economically motivated Hackerism, in which the majority of sophisticated cyber-attacks seek to steal high value Intellectual Property (IP) as well as advanced technologies and trade secrets (Kshetri, 2013, pp. 48). However, one has to be careful in allocating Cybercrime with a specific (sovereign) actor because the borders between Cybercrime and Cyberwarfare are floating. Two reasons are indicative that the application of the concept of Cyberwarfare would fail to explain the underlying phenomenon. The first point is that the majority of cases occurring are not easy to trace back. The outcome mostly just matched IP addresses with computers used within the Chinese territory. Actors all over the world could have used the computers in order to commit Cybercrimes (Unicri, United Nations, 2013). The other reason is the danger of the so-called ‘blame-game’. In 2011, the Chinese ambassador in the UK, Dai Qingli, suggested in a letter to the Financial Times that pointing fingers at others would increase potential conflicts due to the loss of mutual respect. Voices rejecting the responsibility for Cybercrimes also came from other Chinese government officials, arguing that the PRC were likewise the target of cyber attacks, and that China is putting effort into the preparation of stricter domestic Cyber regulations (Lan, 2011).

2.3 Preliminary Conclusion

However, some facts still remain. Cybercrimes traced back to China lead to an outflow of high technologies from the EU to the PRC. Thus, according to Casarini (2006), it represents a potential threat to the European Union’s economy, which is based to a large extent on the production of high technological incentive commodities. If the Chinese economy were able to use the technology received efficiently, the EU would lose ground on the international market, and as a consequence, cannot secure its welfare at home anymore, as

⁵See: Kshetri, N. (2013). Cybercrime and cyber-security issues associated with China: some economic and institutional considerations. *Springer Science & Business Media*. New York.

argued by Casarini (2006, p.30). As one can see, Chinese Cybercrime incorporates a threat for the economies and thus it might also have an impact on how European Union and China's politicians are reacting to it. Summarizing, the study has resulted to two implications so far. The first one concerns Chinese Cybercrime, which in its nature potentially undermines future benefits and thus makes trade less attractive. The second one aims at identifying the degree of economic interdependence between both actors. It might appear that economic interdependence can have an impact on the reaction of to the phenomenon of Chinese Cybercrime.

In order to evaluate the impact Chinese Cybercrime has on the relationship between the EU and the PRC, an international economic theory by Dale Copeland will be applied. He found a way to combine the different approaches of liberalism and realism on the development of conflicts between two states in different economic situations by introducing the new causal variable Future Trade Expectations (FTEs). By bringing Chinese Cybercrime within the framework of FTEs, it is possible to determine how international relations might change. The following section provides an advanced discussion of his "theory of trade expectations".

3. Theory of Trade Expectations after Dale Copeland

Adam Liff (2012, p. 403) stated that research for data about the damage reported due to Chinese Cybercrime is senseless since it either does not exist or is highly protected. This statement is justified by the fact that Europol just established a sub-committee for tackling Cybercrime problems in the fall of 2012.⁶ In addition, the EU enforced a regulation to collect this kind of data in early 2013 (Forsyth & Kalman, 2013), which supports Liff's statement since data is not useful yet. However, by adopting Copeland's (1996) theory of Trade Expectations, it is possible to assess whether Chinese Cybercrime has de jure an impact on international relations. His debate of liberalism and realism in international relations theory provides a useful tool to evaluate the impact of Chinese Cybercrime. The theory of trade expectations can be applied in order to identify other important influences on the positioning of the respective actors on the phenomenon at stake. Copeland (1996) also gives a possible explanation of the role of economic interdependence in international relations. An advanced discussion of his theory is presented in the following chapter.

⁶<https://www.europol.europa.eu/ec3>

3.1 Economic theory of trade expectations

The following section introduces Dale Copeland's (1996) theory of trade expectations. He managed to conflate features of both realist and liberal views in order to find an answer to the development of conflicts between two sovereign actors. Even though the European Union has no absolute sovereignty, as it is not a complete federal system, it is possible to classify it as one since it possesses some legal competences. However, these competences are restricted in its scope and are mainly focused on economic relations.⁷ Thus it is of high importance to narrow the EU-China partnership on the economic dimension. The theory of trade expectation serves as the basic guideline for the further elaboration of the impact of Chinese Cybercrime. It gives inside in other possible indicators, stimulating or obstructing the propagation of conflicts.

According to Copeland (1996), there are only two ways of maintaining or increasing the welfare within a state: the specialization in the production of unique commodities in order to receive welfare inputs from another state through trading, or the exploitation through war, as a result of occurring conflicts over the possession of welfare increasing means. However, most states prefer the former solution due to increased costs for war and its justification at home. Thus, assuming that the underlying relationship is based on the first way, namely trading, economic interdependence is the only factor to which both realism and liberalism refer (Copeland, 1996, p.5). The phenomenon under study is the development of conflicts between two sovereign actors regarding their degrees of economic interdependence. Whilst liberals argue that economic interdependence would decrease the likelihood of emerging conflicts due to an increase of the importance of trade (Copeland, 1996, p.5), realists assume that high economic interdependence increases conflict potential because states have to constantly worry about their welfare security at home (Copeland, 1996, p.6). Rosecrance redefined the liberal view on this aspect by arguing that high interdependence will maintain or support peace, because trading is more profitable than invading (Copeland, 1996, p. 9). Controversially to this, Waltz states that the anarchic structure of international cooperation makes states constantly caring about their vulnerability and their control, fostering the outbreak of conflicts (Copeland, 1996, p.10). However, the abolition of a factor that might hurt one state's control or exploits its vulnerability which would normally lead to the outbreak of conflicts and war would decrease its probability if the respective state's dependence is low (Waltz, 1993, p. 60).

Regarding economic dependency, Copeland (1996, p. 10) refers to John Mearsheimer, who argued that the dependency on critical economic supplies will increase the fear about an

⁷European Union (2009). Treaty on the Functioning of the European Union. Art. 3-6.Brussels.

economic cut-off in times of crises, conflicts or war. In order to decrease these fears, states have to try to obtain and maintain the control over the source of supply, fostering conflict potential with its owners (Copeland, 1996, p. 10). In case of a situation where asymmetric interdependence characterizes the relationship, according to liberalism, the more dependent state is less willing to initiate a conflict since it has more to lose from breaking economic bonding. According to realism, however, the more dependent state is also more likely to start discords since it wants to escape its vulnerability (Copeland, 1996, p. 12).

This raises a fundamental problem since both theories assume situations odd to each other, letting grow uncertainty about the accuracy of the assessment of the respective partnership at stake. Thus Copeland (1996) introduces a new causal variable, which, according to him, would explain the development of conflicts better than just the use of the degree of economic interdependence: "Future Trade Expectations" (Copeland, 1996, p. 6). As a consequence, liberals are partly correct by saying that interdependence can foster peace, but this would only be the case if FTEs are positive. If FTEs were negative, the realists' argument would apply that highly dependent states will foster conflicts since they fear losing their economic stability in the long run (Copeland, 1996, p. 6). Therefore, the outbreak of conflicts depends on the valuations of the benefits of future trade (Copeland, 1996, p. 7). In this sense, liberals are on solid ground by arguing that trade offers valuable gains to any particular state (Copeland, 1996, p. 8). On the other hand, realists emphasize that these gains also have limits due to the political interests in international relations. States have to have their security and their control over resources and markets always in mind. Thus the liberal optimism for constant peace in times of high benefits from trade on both sides is objectionable (Copeland, 1996, p. 11). Nonetheless, states can foresee future potential benefits, linked to the simple progress of trading, even when current trade exchanges are low (Copeland, 1996, p. 18). However, if a state after having specialized on a specific good (which is the result of interaction between markets particularly relying on human or material resources), expects to get cut-off from trade, the expected value of trade will be negative and makes conflict more likely. Resulting from these facts, the expected value of trade can be located everywhere between the two extremes securing open trade or conflict resolution due to being cut-off (Copeland, 1996, p. 19).

3.2 Theory implications & sub - questions

Having all aspects of Copeland's (1996) theory of trade expectations in mind, it is possible to summarize it to one central assumption, which will be the underlying criterion for the phenomenon evaluation in this paper:

A. The lower the FTEs, the lower the expected value of trade and therefore the more likely conflicts occur.

B. And vice versa: the better FTEs, the better is the expected value of trade and therefore cooperation would be the rational consequence.

Adopting these assumptions to the impact of Chinese Cybercrime on the respective economic partnership, a question occurs:

Assuming that Chinese Cybercrime corroborates the European economy due to technology transfers and has the potential to cut off the European market from global competition due to its specialization on high technological incentive goods, as explained in section 2, what does the theory imply for the European –China cooperation and which influence has Chinese Cybercrime on FTEs?

To start with, the latter assumption forms the starting position for the further analysis, since both states are currently trading⁸ and FTEs, according to Copeland (1996), have to be positive. Dale Copeland argued that FTEs are the essential determinant when it comes to the dynamics of international relations. However, his theory lacks a more detailed conceptualization of the respective independent variable. To answer the above-mentioned specific inquiry, the following section seeks to identify several indicators, which might have a crucial influence on the perception of FTEs. Thus, the analysis will follow two central sub-questions:

1. “How can Future Trade Expectations be conceptualized?”

This question seeks to conceptualize and in the end operationalize Future Trade Expectations in order to make the concept measurable. Ensuing, one has to ask:

2. “Which determinant is the most influential one and what does it imply for the role of Chinese Cybercrime in the respective partnership at stake?”

By asking this question, it is possible to figure out what impact Chinese Cybercrime has on the relationship at stake, and therefore provides a tool to answer the overall research question. The attribute “influential” seeks to explain why FTEs are positive or negative, in this specific case positive. Summarizing, by applying Copeland’s (1996) theory of trade expectations, the impact of Chinese Cybercrime is now measurable. By answering the arising sub-questions it

⁸See: Protocol of the third summit of the EU-China High Level Economic and Trade Dialogue (2010).

is also possible to embed Chinese Cybercrime in an international relations frame. The following section seeks to conceptualize FTEs and thus makes a further detailed analysis practicable.

4. Methodology

The following chapter aims at introducing the assessment and evaluation methods as well as the case selection and data collection. In section 4.1, the measurement of FTE's indicators will be identified. By selected only a group of subjects it is possible to reduce the scope of this work. The case selection as well as the data collection is discussed in the following section. An advanced discussion of other possible FTE's indicators takes place in section 4.2. The additional indicators are crucial when it comes to the influence of Chinese Cybercrime on the trade relationship at stake. Only if a variety of indicators is taken into account, a valid conclusion can be drawn. Finally, in section 4.3, the method of Qualitative Data Analysis (QCA) is envisaged. By applying QCA, the most affecting indicator is determined, and as a result, combined with the potential role of Chinese Cybercrime, the consequence for the Future Trade Expectations in the EU-China trade relationship can be calculated.

4.1 Measuring FTEs' indicators

4.1.1 Case selection

Since the European Union is a 'quasi-federation' of European states with different interests and bilateral diplomatic capabilities, Fox and Godement's (2009) classification of European Member States' positions towards the PRC will be used. The authors divide all states into four different groups – 'Assertive Industrialists', 'Ideological Free-Traders', 'Accommodating Mercantilists' and 'European

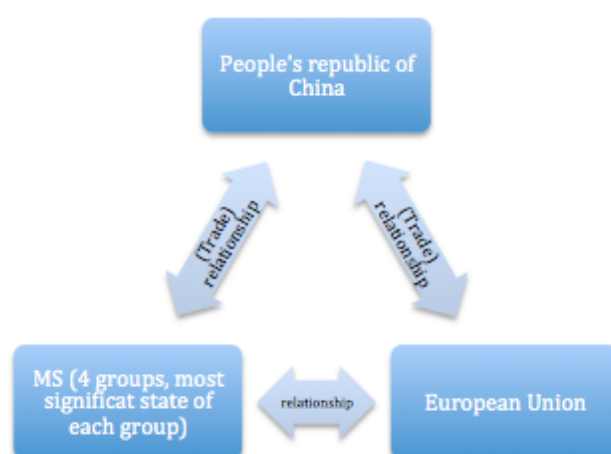


Table 2 - Pattern of relationships

Followers' (Fox & Godement, 2009, p.4). Only the most crucial state of each group is studied in order to narrow the scope of this paper. The evaluation criteria will be, since the focus of this paper lies on the economic dimension, the size of the money exchange per Member State (MS) with the PRC, including investments and trade. The Balance of Payments proved itself

to be the most useful adjudication indicator.⁹ So by matching the respective BoPs, the study concluded that the five European actors, including the European Union (EU), Belgium (BE), Germany (GER), France (FR) and the Netherlands (NL) as well as the People's Republic of China (PRC), including Hong Kong, excluding Taiwan, will be part of the analysis.

4.1.2 Data collection

For the collection of quantitative data, the use of the Eurostats database will prove to be a useful tool. Through Eurostats it is possible to evaluate the phenomenon under study in a proper way. Eurostats serves as the databank for analysis of all kind of research concerning the European Union and its Member States. It contains data about economic as well as sociological developments and thus provides Europe's largest data collection for the comparison of regions and countries. In addition, the data set is updated in a regular basis. Eurostats code of practice prescribes the highest quality of data possible due the independence, actuality, anonymity and neutrality of its sources. Consequently, the reliability can also be considered as high (Eurostats, 2012). The data collected can be perceived in ANNEX B in the respective country's sectorial and data breakdown. Qualitative data can be found especially in governmental / negotiation reports as well as newspaper articles and other economic assessments. To list some examples, the negotiation reports on the Third High Level Economic and Trade Dialogue are taken into considerations. Its bias can be abandoned since the protocol reflects to the detailed analysis of both the European and China's position. Combined with their relatively current publications (2010-2012), one can assume that these reports are valid and reliable. (Newspaper) articles used for the study of this paper have to be seen from different perspectives. Hereby, it strongly depends on the journal or its publisher. *Sage publication*, for instance just publishes publicly funded research. Furthermore, a sophisticated publishing method is applied, whereby anonymous researchers co-read written articles to check for mistakes, actuality, reliability and plagiarism.¹⁰ This also accounts for, e.g., the publisher *Oxford University Press*.¹¹ However one has to be careful when it comes to newspapers, which can be biased. So it was not possible to find a code of conduct for, e.g. articles published in *the Economist*. Nonetheless, the reputation and the reliability of the chosen sources characterize the underlying study in this paper and thus make it to a valid reference. The selection depended on the counts of citations (google scholar, web of science), the content and if available, current or recent publications. A list of articles and sources used can be perceived in the Bibliography part of this paper.

⁹See: Table 3 – Balance of Payments, ANNEX A

¹⁰<http://www.uk.sagepub.com/home.nav>

¹¹<http://ukcatalogue.oup.com>

4.2 Operationalization of Future Trade Expectations (FTEs)

This section deals with the first sub- question namely the conceptualization of FTEs. A short description and the type of measurement as the guidelines for the analytical part of this paper will be discussed. General findings to the sections under study can be perceived in ANNEX B, whereby ANNEX A contains the tables representing a detailed data analysis of the respective indicators.

4.2.1 Economic dependency & the degree of specialization

Since states, according to Copeland (1996), have to constantly fear about their economic situation, the evaluation of economic interaction by the respective actor can have a clear impact on FTEs. Thus economic dependency will be measured by one attribute, namely the ‘degree of specialization’. The degree of specialization is measured on a scale, ranging from high skill intensive production area (1) to labor intensive production area (3). Linked to these categories, the degree of technological content will decrease from high skill intensive production (high) to labor intensive production (low). The underlying assumption is that high skill intensive production implies a high degree of specialization and a vast amount of specialization-costs. Thus, states classified in area 3 are more dependent on states in area 1 since the costs of adaption are not bearable. On the other hand, states in area 1 have to fear a cut-off from trade since if they get cut-off; they have to adapt their industries, which is only possible in the long run. The former one is weighted as the more crucial aspect since re-adaption in the latter case is still possible and likely bearable. Thus states in area 3 can be considered to be more economically dependent on states in category 1 than vice versa.¹²

4.2.2 Development of trade relation & the Balance of Payments (BoP)

The other attributes of ‘Future trade expectations’ can be built up on four different elements. The first one is the most obvious one: *Amount of trade and its development*. The criterion under study reflects the trade benefits (credit) / losses (debit) due to mutual economic exchanges. Copeland (1996) argued that short-term economic losses only have a marginal affect on FTEs. Nonetheless one has to examine whether the EU-China trade relationship has a rather credit perspective than a debit one. Thus, a measure of the outflow and inflow of money based on trade for each actor, and the resulting profit / trade deficit is one indicator for FTEs. The measurement criterion is called Balance of Payments and reflects the money flows between the PRC and the EU27 and its selected Member States. The scale ranges from debit (imports) to credit (exports). This also includes the measurement of Foreign Investment (FI), comprising portfolio or direct investment as well as service flows.

¹²See: Table 1 – Product specialization, ANNEX A

4.2.3 Institutional cooperation & Stability

The second element is called *institutional cooperation*, which also has an influence on trade expectations since institutionalized cooperation might bind a state to a certain framework of trade partnership. The indicator institutional cooperation is not included in Copeland's (1996) theory of trade expectations, however, institutional cooperation might have an impact on FTEs since both camps can expect a certain stability of trade agreements and arrangements due to the existing possibility of exchanging interests in organized negotiation processes. Thus institutional cooperation is measured as follows: If both camps are taking part in institutionalized cooperation, the involved actors can expect that the controversial state will follow certain trade regulations, which, in turn, provides some evidence for stability and certainty in FTEs. The analysis will evaluate the institutional dimension of the respective partnership. The attributes are measured dichotomous, namely as present or absent.

4.2.4 Biased interests in trade & protectionism versus liberalism

The third point is *biased interest in trade*, meaning that if one of the partners focuses solely on its own economic welfare, "biased interest" would have a negative impact on the FTEs of the other partner. Biased interests are also not discussed by Copeland (1996). However, the propensity of one state's commitment to a certain set of policy orientations might also have an impact on the perception of trade by its economic partner. Thus the measurement will classify the actor's mutually economic interests on a scale ranging from protectionist (focused on its own economy) to liberalist (open trade and mutual benefits). Fox & Godement's (2009) classification of Member States' political and economic interests will serve as the guideline for the European camp.

4.2.5 Unintended phenomena – Chinese Cybercrime

The history has shown that unintended events might hamper the relationship between two states. A quarter century ago, the Tiananmen Square incident represented one of these events that might have an influential aspect on FTEs. As the trade embargos, explained in section 2, restricts the trade in its very nature, Chinese Cybercrime also might have the potential to manipulate FTEs. Thus it is of importance to evaluate the threat of Chinese Cybercrime, representing the variable 'unintended phenomena', as there might be a causal relationship between abruptly occurring incidents and the perception of FTEs due to their consequences. The measurement will be, like in institutional cooperation, dichotomous with the attributes 'absent and present' and is based on the specialization classification of economic dependency. Thus the guiding assumption is: the more specialized a country on high technology intensive commodity production, the more harmful is Chinese Cybercrime.

4.3 Method for assessing FTE's indicators: QCA

In order to assess the importance of FTEs' indicators, a research design is applied called Qualitative Comparative Analysis (QCA), which seeks to evaluate the most influential indicator of FTEs by applying an expulsion proceeding (Gerring, 2012). By utilizing QCA, an evaluation of the different indicators is possible, and as a consequence, one can assess the impact of Chinese Cybercrime on the EU-China trade relationship in a more advanced and detailed manner. This section aims at conceptualizing the given indicators. Thus, all factors are equally weighed and measured either with a 0 or a 1. A 1 indicates that the trade relation proves to be beneficial for the respective state, that institutional cooperation is present and influences positively the perception of trade and that the interests in trading with the other partner(s) are liberal and seek to be mutually beneficial as well as the actor is rather economically independent and Chinese Cybercrime does not represent a threat to the economy / industry. A 0 indicates a trade deficit in the import/export relation, institutional cooperation is rather absent and that trade is seen as just beneficial for one side. Furthermore economic dependency is strong and Chinese Cybercrime does represent a threat to the respective economy / industry. According to Gerring (2012), the method of QCA does imply certain problems, namely the problem of multicollinearity and missing value problem. The former occurs if too many variables are used, the latter occurs with too few. However, by using five variables, both problems are reduced to the minimum degree possible in this paper. In addition, one has to consider an outcome in which every variable scores the same. In such a situation, QCA would fail to determine the most influential variable(s) since either none or all variables would count. However, by applying six actors and five variables it is highly unlikely that the outcomes occurs 30 times the same.

4.4 Research implications

Due to the conceptualizing of FTEs and the case selection it is now possible to analyze and to evaluate whether Chinese Cybercrime has an impact on the respective trade partnership. The concept of FTEs as explained by Copeland (1996) in section 3 proves to be the most useful tool to frame Chinese Cybercrime. The methodology delivered a proper way to assess the phenomenon due to the emerging guidelines for the following analysis. As the conceptualization has shown, some indicators are only measureable with qualitative data whereby other indicators can be examined by using quantitative data. A more elaborated data review is also discussed in section 4.1.2, which gives the analysis in this paper a scientific basis. A scientific discussion of the chosen indicators and the evaluation of the results by the means of the methodology instructions can be found in the following chapter.

5. Analysis

Copeland (1996) identified Future Trade Expectations as the most influential variable in international relations theory. According to him, Future Trade Expectations can be positive or negative. However, his analysis lacks the conception of this specific variable. As discussed in the methodology part, the analysis will follow the conceptualization of FTEs' indicators in order to identify the most important element and what it implies for the impact of Chinese Cybercrime on EU-China trade relations. Thus sections 5.1 to 5.4 contain a debate of the findings in order to elaborate the FTEs of the respective actors. Finally, section 5.2 approaches the method of QCA to spot the most affecting element, which allows answering the posed sub-questions and, concluding, the overall research question.

5.1 Trade development

The first attribute under study is the development of trade exchanges during the past decade. Copeland (1996) argued that the value of trade governs the overall perception of FTEs. If the value of trade is positive, it is more likely that the respective actors employ a rather friendly and unaggressive policy towards the partner. A complete data set for the breakdown of FI, trade and service flows with the PRC to the Member States' level is only available for the time frame 2004 until 2009.¹³ However, the development shows that, by comparing the inflows and outflows of money in the European market and the PRC's market (including Hong Kong), a negative trend of money outflow from the EU solidified. Thus in 2011, this overall European trend increased to a debit of estimated 162,57 billion Euros. By looking at the Balance of Payments (BoP) in table 3¹⁴, it is salient that the Netherlands have an immensely growing margin to the rest of the countries under study. Likewise, all other BoPs are clearly settled on the debit end of the scale. The overall EU27-BoP rate's slope indicates an increasing trade deficit in the prospective years. The expectations are rather negative. Moreover, after some minor fluctuations the trend is still increasing. Nonetheless, FI from the European side seems to increase over time. However, comparing the total amount of money flows with the trade in goods, one can say that FI does only play a marginal role in the trade relationship, the same accounts for the services provided and received. Thus even if FI will bring money back into the European market in the long run, imports are still high enough to create a rising trade debit. The data clearly underpin the situation for the actors involved. The PRC received 162.57 billion Euros in 2011 from the European market through economic interaction. It has to be added that the import of services data for Germany was not available since the data was treated confidentially. Regarding the sectorial breakdown of Balance of

¹³Euro.stats

¹⁴See: Table 3 – Balance of Payments, ANNEX A

Payments (BoPs) in table 6¹⁵, it is salient that nearly all MSs as well as the EU have a debit in each sector, namely FI, trade in services and trade in goods. Concluding, the trade relationship on the European side, including all four Member States and the EU, is rated with a 0. Consequently, the PRC is rated with a 1.

5.2 Economic Dependency and vulnerability to Chinese Cybercrime

Starting from the basic assumption that if a state has a shortage in the supply for a certain good, it is more dependent on its import partners (Copeland, 1996), one has to take a look at the industrial structure of every actor. Even though Copeland (1996) identified economic (inter-) dependency as the less crucial independent variable, economic dependency does have an influence on the perception of FTEs. Thus the less dependent a state is on the trade with its partner, the less likely conflicts occur (Waltz, 1993, p.60). So the aim of this section is to evaluate the economic dependency of the respective actors, measured by their industry specialization and different types of commodity production surplus (exports).

To start with, Table 4¹⁶ reflects the actors' specialization of its industries. As the table shows, the pattern of the industry structures under study are nearly equally distributed. The only apparent difference can be found in the production sectors for chemicals, pharmaceutical industry as well as the production of rubber, petroleum and minerals. The difference between the EU27 and the PRC in this sector is about 8,3%. Controversially, in the sector of electronics production and machinery, the average EU27 specialization accounts for 23,5%, whereby the PRC scored 27,4%. Nonetheless, Germany, as the outlier case, has still a higher production with 28,6%. All other sectors have a relatively equal proportion distribution of sectorial specialization, i.e. the sector 'metals' in which both the EU27 average and the PRC scored 13,5% and 13,4%, respectively. Through identifying the balance of trade for these types of sectors it can be deduced in which sectors of the EU27 and its four selected Member States imports or export are more pivotal. Table 5¹⁷ reflects the 'Balance of Trade' between the respective actors. Goods classified in Group A are less technological intensive commodities, namely food, beverages and tobacco as well as textiles, apparel leather and wood products. Goods classified in Group B are more technological intensive commodities, namely metal products, chemicals, pharmaceutical products, electrics, cars and transport vehicles. As the table shows, France is the only exception by importing goods from Group B. Germany constitutes an exceptional case. Its exports of goods from Group B exceeded estimated 270 billion Euros in 2008. Nearly all rates experienced a downward slope in 2009, which can be affiliated to the beginning of the Euro-crisis (The Economist, 2013). When it

¹⁵See: Table 6 – Sectorial breakdown of BoPs, ANNEX A

¹⁶See: Table 4 – Industrial specialization, ANNEX A

¹⁷See: Table 5 – Balance of Trade, ANNEX, A

comes to commodities in Group A, the Netherlands form the outstanding case. It is the only country that exports more goods from Group A than it imports. All other countries import more commodities in this group than they export. Applied to the classification of commodity production, the overall average trend of the cases under study shows that the European community primarily exports high intensive commodities, whilst the PRC provides the European market predominantly with less intensive commodities. Even though the industrial structures of all actors under study show strong similarities, one can consider China, in its production as well as its export behavior, as a member of countries classified in category 3 of table 1¹⁸. France at the same time has its highest production rate in the chemical and pharmaceutical commodity fabrication; however, it exports more goods in Group B (and A) and is thus more dependent on its export partner country. Nonetheless, since its European partner states have a high production in this sector that can provide a potential alternative source for these types of goods, France can be considered as a member of category 2. Germany, the Netherlands and Belgium exhibited a credit due to exports of commodities type B. Belgium can be considered as the ‘average’ country by importing goods type A and exporting goods type B, both to a small degree. Germany as the extreme case which, compared to its imports, has a high proportional outflow of commodities Type B. The Netherlands, since it exports both type of goods, form the exceptional case. Thus the latter three can be considered as members in category 1, headed by the Netherlands. Concluding, merely referring to the type of good exchange, the People’s Republic is more dependent on the EU27 and its Member States, indicated by a 0, than vice versa, indicated by a 1. France however, under current circumstances, is more dependent on the PRC and therefore also scores 0. Consequently, economic dependency is rather asymmetric, whereby the EU performs the less dependent partner.

Since all European Countries at least produce and partially export more high technological goods than the PRC, successful Chinese Cybercrime can be considered as a serious threat for their markets in the long run. France, as the only chosen Member State that does not produce a surplus of high technology goods, does not have to fear Cybercrime as such as the other countries do, based on their export and production structures. Finally, France gets labeled with a 1 whilst the other countries as well as the overall EU27 are rated with a 0 when it comes to the vulnerability to Chinese Cybercrime. The PRC, as the country of origin of Cybercrime is labeled with a 1.

¹⁸See: Table 1 – Product specialization, ANNEX A

5.3 Economic interests

Economic interests reflect an important indicator in determining FTEs. Controversial interests might lead to uncertainty and instability of the partnership at stake due to their negative affecting impact on FTEs. Thus the underlying assumption is that the more protectionists a state acts, the more likely conflicts in the relationship occur. The following section seeks to identify the respective actors' economic interests in the partnership measured by their economic behavior ranging from protectionist to liberal.

At the Third High Level Economic and Trade Dialogue (HED) in 2010, the EU ambassador Angelo Pangratis addressed the delegation of the PRC with several issues, reflecting the EU's position and interest towards the PRC. According to him, the EU urges China to increase its internal consumption, rely less on exports as well as opening the economy more to services and FI (Pangratis, 2010, p.1). Furthermore, he argues that transparency problems make China's trade and investment policies "opaque and complex". In addition, the EU accuses the PRC of financial subsidization of its companies, destroying the balance and competition amongst market operators (Pangratis, 2010, p.2). Moreover, Pangratis (2010) argued that "domestic behind boarder measures" obstruct the accumulation of benefits, which should be realized due the commitments that China "de jure" had already established (Pangratis, 2010, p.3). Summarizing, the EU pushed for more balanced trade, increased business opportunities, deepened economic cooperation and economic regulation, indicating a more regulated view of economic ties. The intention is to increase the own economic position, but also to make trade for the PRC more profitable on the basis of increased economic exchanges. This view is supported by Fox & Godement (2009)¹⁹ who criticized the unconditional nature of the engagement. According to them, China has to liberalize in several economic sectors such as energy distribution or governmental subsidies (Fox & Godement, 2009, p. 15). In return, the EU would offer package deals, including technology transfers and financial support (Fox & Godement, 2009, p. 16). Nonetheless, the PRC also accuses the EU of highly protectionist measures due to its set of economic standards. Zhong Shan, China's international trade representative stated that these measures are not acceptable and that the PRC will react to certain trade policies, such as the solar energy debate in 2013, with own countermeasures, supporting the Chinese economy (Yang, 2013).

The PRC, however, also established a protectionist perception of the economic partnership. As the problem assessment of the EU shows, China tackles the majority of its economic policy field with protectionist measures. Financial support reflects one issue; the

¹⁹See: Fox & Godement (2009). A Power Audit of EU-China relations. European Commission. Brussels.

inefficiency of China's prosecution body regarding the protection of Intellectual Property Rights (IPR) and high technologies is another. These measures also do not reflect the guidelines of the WTO's Agreement on Government Procurement (GPA), in which the PRC is currently in negotiations with (Pangratis, 2010, p.3). In general, Chinese economic interests can be summarized to the intention to broaden markets for Chinese goods, increase its exports to achieve most favored nation state ranking and to maintain the status of 'developing country' in order to profit from specific trade regulations (Algieri, 2002, p.74). But not only the PRC has some problems to tackle; the EU MSs are also disunited in their economic interests. According to Casarini (2006), the European governments have continued to perform their own economic agenda to promote their individual national industries. Thus Germany has increasingly fostered bilateral economic agreements with the PRC to champion its industry in the European context (Geinits & Plickert, 2012). The division restricts the EU in its 'playing field' and just allows implementing a strategy called "unconditional engagement" which is largely based on the assumption that China will liberalize its economy under the influence of European engagement. The scope of this agenda is clearly limited, because there are no conditional requirements for the PRC to behave in any specific way (Fox & Godement, 2009, p. 2). The results are unregulated governmental interventions in the market on the Chinese side, which have again a negative influence on the trade relationship between the EU and the PRC (Fox & Godement, 2009, p. 9).

According to Fox & Godement (2009, p. 5), Germany, as representative for countries classified as 'Assertive Industrialists', does not agree that the economic dimension should dominate and shape the nature of the EU-China relationship. Linked to political requirements, economic exchange with the PRC is partially seen from a protectionist rather a liberalist point of view. The 'Ideological Free Traders', including the Netherlands, however, make any European approach as a response to China's bilateral organized trade policy impossible (Fox & Godement, 2009, p.6). With denying any international regulation, they form the most economically liberal part of the four groups. Belgium, as a part of the group 'European Followers', does not consider the cooperation with China as an important aspect in international policy-making (Fox & Godement, 2009, p.7). Since China does not play an important role in its foreign policy, Belgium is the most neutral actor on the economic as well as the political dimension, neither protectionist or liberal, nor critical or supportive. Finally, the 'Accommodating Mercantilists', including France, see the European-China cooperation as a commercial benefit. Thus they are less critical when it comes to political issues, e.g. the Taiwan or Tibet crisis (Fox & Godement, 2009, p.6).

Concluding one can say that the European economic interests towards the PRC are distinct. The EU scored a 0 since its policy goals are rather protectionist. In the cases of the Netherlands and France, as well as Belgium, seen as neutral actor with rather liberal

perceptions of trade, trade measures are liberal, and thus imply a 1. Germany however scored 0 since it has the highest protectionist point of view. The PRC, even though it might prefer the Accommodating Mercantilists as trading partners due to their supportive emplacement, has to be counted as a 0. The reason for this is China's conflicting protectionist measures which mainly contains a mix of three elements, namely world order considerations, considerations of regional (East Asian) order and security, and linked to these two, economic considerations (Möller, 2002, p. 30).

5.4 Institutional cooperation

The following section aims at evaluating the institutional cooperation between the EU and the PRC. Negotiations, proceeding in institutional talking rounds, give FTEs stability and certainty. The exchange of economic as well as political interests might ensure a mutual harmonization and standardization of benefits, emerging due to economic interaction. Besides MSs' bilateral negotiation competences and their different influencing roles on the EU, especially the European Council, the following analysis will treat the selected countries and the EU as one camp. This approach rests on the fact that international cooperation is rather made by the EU, representing its MSs, than by the MSs themselves (European Union, 2009)²⁰.

Kai Möller (2002, p.10) argued that due to globalization, geography lost its relevance and gave rise to international pressure on China but also on the EU to shape and redefine their roles on the economic and political global stage. By doing so, cooperation, as identified by both partners, should lead to an exchange of experiences on 'good customs practices and procedures' in order to facilitate trade (Möller, 2002, p. 6). This cooperation, stressed by both sides on the third HED in Beijing, should be further enhanced within the framework of the WTO negotiations (Pangratis, 2010, p. 3). In general, both sides see the development of cooperation, partially represented in the HEDs, as a significant progress towards an improved strategic partnership. This also includes a broad range of economic and trade areas (Pangratis, 2010, p. 3). Several areas such as investment policy will be further improved through regular high-level contacts, and the action plan implemented on the G20 summit in Seoul to promote strong sustainable and balanced economic growth, became a central aspect in the discussion (Pangratis, 2010, p. 4). Algieri (2002, p. 67) even states, that the development of the cooperation at stake forms an essential part of the EU's external relations. But also on the Chinese side, indicated by China's EU policy paper, a positive trend of deepening economic as well as political ties is seen as desirable (Casarini, 2002, p. 23). Thus a constant growth of institutionalized organization and structuring of the relationship cannot be denied (Algieri,

²⁰European Union (2009). Treaty on the Functioning of the European Union. Art. 21 § 1.Brussels.

2002, p.72). The past decade epitomizes a remarkable development of this institutional pattern. Just before the admission of the PRC to the WTO, the EU urged and proposed advanced dialogues, implying annual summits at the level of head of state or government, meetings of Troika foreign ministers and the Chinese counterpart as well as experts on the field of human rights and arms control (Council decision, general affairs, 2001).

Concluding, it is possible to state that with the emerging economic interdependence, the cooperation between both partners has become increasingly institutionalized, e.g. due to the establishment of the High Level Economic and Trade Dialogue (HED). Even though the institutional cooperation between the EU and the PRC is not as developed as the cooperation between the EU and the United States of America (Casarini, 2002, p. 75), it is possible to state that cooperation is increasingly institutionalized. Thus every actor involved scored 1.

5.5 Assessment of FTE indicators

5.5.1 Application of QCA

After analyzing and labeling the various indicators and their respective actor's perception, it is possible to come up with the following table:

	Independent variables					Dependent variable
State	Trade relation	Institutional cooperation	Economic interest	Economic Dependency	Vulnerability to Cybercrime	FTE Positive (situation at stake)
PRC	1	1	0	0	1	Yes
EU	0	1	0	1	0	Yes
BE	0	1	1	1	0	Yes
GER	0	1	0	1	0	Yes
FR	0	1	1	0	1	Yes
NE	0	1	1	1	0	Yes

According to the Qualitative Comparative Approach, the following equation determines the most influential indicator for Future Trade Expectations.

$$1. \text{PRC} = 1 * \text{trade relation} + 1 * \text{institutional cooperation} + 0 * \text{Economic interest} + 0 * \text{Economic dependency} + 1 * \text{Vulnerability to Cybercrime}.$$

Since economic interests and economic dependency do not have any effect on positive FTEs in the case of the PRC, it is possible to exclude these indicators. Thus:

2. EU = 0 * trade relation + 1 * institutional cooperation + 0* Vulnerability to Cybercrime

As one can see, trade relation and the vulnerability to Cybercrime in the case of the European Union don't have any influence on its positive FTEs, thus one can exclude trade relation and vulnerability to Cybercrime as determining elements in FTEs. So:

3. BE/GER/FR/NE = 1 * institutional cooperation

One might argue that Future Trade Expectations are reciprocal and that the outcome of one camp does influence the perception of the other camp. However, by excluding the PRC from this equation, the same outcome is obtained. So:

1. EU = 0* trade relation + 1* institutional cooperation + 1* economic interests + * economic dependency + 0* vulnerability to cybercrime

2. BE = 1* institutional cooperation + 1* economic interests

3. GER = 1* institutional cooperation + 0* economic interests

4. FR/ NE = 1* institutional cooperation

5.5.2 QCA: Institutional Cooperation

Summarizing, it is possible to answer both sub-questions. The answer to the first question concerning the conceptualization and operationalization of Future Trade Expectations provides the various indicators and its measurement, namely "Trade relationship", "Institutional cooperation", "Economic interests", "Economic dependency" and "Unintended phenomena". The second concern about the importance and the influence of the indicators came apart due to the assessment of FTEs within the framework of the QCA. The expulsion proceeding conducted to the result that "Institutionalized cooperation" is the most crucial indicator in FTEs since it is the only indicator which can be uniquely affiliated to all cases under study. The results have shown that neither trade relationship, nor economic interests, nor economic dependency or unintended phenomena have an influence on FTEs indicators and thus on the relationship at stake. The analysis of all of these indicators has shown that in nearly all cases no reason for positive FTEs is given. The outflow of money, the armament of protectionist measures and the presence of the threat of Chinese Cybercrime should normally lead to a solidification of establishing shielding policies in order to protect the home market more, which in turn negatively affect FTEs and lead to fissures in EU-China trade relations (as it happens now with Solar-energy-production policies). The implications arising due to the importance of institutional cooperation for the phenomenon of Chinese

Cybercrime on the respective partnership at stake and for Dale Copeland's (1996) theory of trade expectations are discussed in the next chapter.

6. Conclusion

As the analysis has shown, trade relationships today are characterized by an exchange of mutual interests and perceptions. Today, war is no alternative anymore since it just represents a short-term boost for the welfare at home. Competitiveness in terms of peace is more desirable. This can already be seen in the early 90's, when the former Chinese Prime Minister Li Peng and its Foreign Minister Qian Qichen presented a paper, which supported the world formation towards a multipolar system of international relations in order to promote peace and stability to solve international problems through consultation rather than the use of force. The HED represents one tool to debate international problems; in addition, China also acknowledged the UN's leading role in conflict resolution (Möller, 2002, p. 21). Chinese Cybercrime, as not bound to any geographical classification, can be considered as one of these international problems. In its very nature, Cybercrime represents a way to facilitate technological transfers since it is not linked to any kind of package deal. Deductively it reflects a problem for the European market in the long run. But instead of breaking up economic ties such as Copeland (1996) assumed, states or international actors prefer to discuss solutions in the framework of international cooperation. In addition, Algieri (2002, p. 65) states that institutional cooperation affects the distribution of resources. Technology transfers in package deals represent a redistribution of a specific resource, namely an advanced production factor. Even though a loss of advanced technology in the long run represents a threat to the European market, a controlled technology transfer might also lead to benefits due to foreign investment in the technology receiving market operator. Thus one can say that Chinese Cybercrime does not have any impact on the Future Trade Expectations. Consequently, FTEs maintain positive and the potential for arising conflicts is minimized to the lowest degree possible, which leads to the final assessment: **Chinese Cybercrime does not represent, according and assessed within the framework of Copeland's (1996) theory of future trade expectations, to any extent a threat to the EU – China economic relationship.**

This can be already seen in several negotiation protocols. For instance on the third summit of the HED in 2010, both sides agreed to strengthen their cooperation to enhance the protection of intellectual property rights and to fight efficiently against piracy, predominantly in the Internet (Third HED, p. 5). Furthermore, the Australian foreign minister Bob Carr also acknowledged that Chinese Cybercrime does not represent a danger for bilateral ties, basically because Cyberdefence inhibited further damage. Thus one can assume that Chinese

Cybercrime has not developed a serious harmful and damaging character yet (The Guardian, 2013). However some problems might occur in the future. As observations in the recent past have shown, China's government increasingly supports Chinese Cybercrime (McGregor, 2013). This might be a dangerous step for international relations since the European countries are bound to the war-pact of the North Atlantic Treaty Organization on the one side, but it might also hamper negotiations progresses, in e.g. the HED, on the other side. In addition, the European Union is bound in its politics to other important global actors such as the United States of America. Even though European diplomacy is rather considerate, as the concept of 'blame game' predicts; American leaders' foreign policy has lately seen rather forceful as the Pentagon Chief Chuck Hagel proved in early June 2013 (The Australian, 2013). Thus the Pentagon's statements are the most crying out, letting grow harsh critic on Western politics in Beijing (McGregor, 2013). Linked to that, Chinese Cybercrime fosters a loss of trust in international politics. Tianqi (2013) states that due to the ongoing accusation which always point in the direction of the PRC, countries' leaders loose their faith and reliance in each other. This can be a very harmful development besides the initial purpose of Chinese Cybercrime. To avoid these dangers in the future, legal agreements concerning Cybercrime and other types of Hackerism have to be essential in the European foreign policy. However, testing to what extent a Cybercrime agreement is possible should not be included in this paper and thus represents an incentive for future research.

Regarding Copeland's (1996) theory of Future Trade Expectations, it is possible to say that it is applicable in international relations, however, with several limitations. The first limitation refers to the geographical nature of Copeland's theory. As the geographical distance between the EU and the PRC is too large to make invasion and the use of force possible, the alternative option of war is not always a feasible solution. The second limitation tackles economic dependency. As the cases have shown, economic dependency, neither symmetric nor asymmetric, does not have any affect on Future Trade Expectations and the evolving of conflicts, in this case partially fostered by the phenomenon of Cybercrime, provided institutional cooperation is present. Controversial to this, institutional cooperation might channel the fear of a break down of economic ties and support an alternative way to ensure mutual benefits. Moreover, Copeland (1996) only studies the emergence of conflicts from the more economically dependent side. However, it is also important to link Future Trade Expectations to economically more independent actors. In the case of the European Union, trade with higher technological intensive commodities can also ensure certain retentions of international guidelines since political pressure, as response to various trade and political behavior, is still possible. Thus the EU can maintain some control over China's

military capabilities as well as enforcing political/ economic related policy goals, e.g. better working conditions, higher product standards or, eventually, Cybercrime regulations.

Nonetheless, some features are still valid. Thus Waltz' argumentation that the abolition of a factor, in this case Chinese Cybercrime, that might hurt one state's control or exploits its vulnerability will prevent the outbreak of conflicts, also supports the finding of this paper (Waltz, p. 60). As a consequence, institutional cooperation is the perfect tool in order to abandon the respective factor, namely Chinese Cybercrime, due to the cooperative nature of negotiations. Linked to that, Rosecrance also argues on solid ground by saying that trade is more profitable than invading (Copeland, 1996, p. 9). However, it has to be added that the value of trade does not solely depend on the exchange of goods. It also includes investment policy and services delivered, which in turn require advanced regulation and cooperation based on the additional exchange of expertise, human capital and irrevocable capital investments, whereby these further indicators will enlarge potential future benefits to other economic sectors and thus make conflicts again less likely.

So finally a new equation has to be formulated:

The better developed institutional cooperation; the better are FTEs and the higher the value of trade. Consequently conflicts are less likely occurring, since underlying damaging factors (e.g. Chinese Cybercrime) can be wiped out in negotiations.

Comments

The findings of this paper reflect the economic behavior of four European Member States. Even though the operationalization of FTE's combined with the results for the EU-27 average justifies a generalization of the economic situation of every single European state, errors and ambiguities cannot be ruled out completely. Another issue concerns Copeland's theory itself. He assumed that leaders are acting rather rationally than unreasonably. As history has often shown, rationality is not always a variable to count on in international relations. Furthermore Copeland's theory is published in 1996, and thus gives incentives to question its validity. However, scientific critics on his thoughts are absent. As a consequence, it is possible to take his statements as given, even though critics on its application cannot be ruled out completely neither (as reflected in this paper). Last but not least, the analysis has conducted to the assumption, that the emerging trade deficit, the establishment of protectionist policy measures and the potential threat of Chinese Cybercrime normally would lead to a more aggressive and shielding states' behaviour. Even if institutional cooperation provides a unique opportunity to tackle international problems, it is not an immortal solution in every case. Thus the solar –energy production debate in mid 2013 lead to the hardening of controversial positions in institutional cooperation. The highly protectionist reaction from the European side, especially from Germany, let rise to what politicians like Li Keqiang and journalists refer as a "trade war" (Chaffin, 2013). In such a situation, advanced institutional cooperation and the possibility of Cybercrime agreements are less likely and Chinese Cybercrime remains another unsolved problem in the future.

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Abbreviations

BE	-	Belgium
EU	-	European Union
EU 27	-	European Union with the focus on its 27 Member States
F(D)I	-	Foreign (Direct) Investment
FR	-	France
FTEs	-	Future Trade Expectations
GER	-	Germany
HED	-	High Level Economic and Trade Dialogue
IP	-	Intellectual Property
MS(s)	-	Member State(s)
NL	-	The Netherlands
PRC	-	People's Republic of China
WTO	-	World Trade Organization

I hereby declare that I, David Hanel, wrote the presented Bachelor Thesis on my own, without any assistance apart from the constructive critic of my supervisor Dr. M. R. R. Ossewaarde.

The presented paper reflects the guidelines and standards of the Code of Conduct for scientific research and analysis.

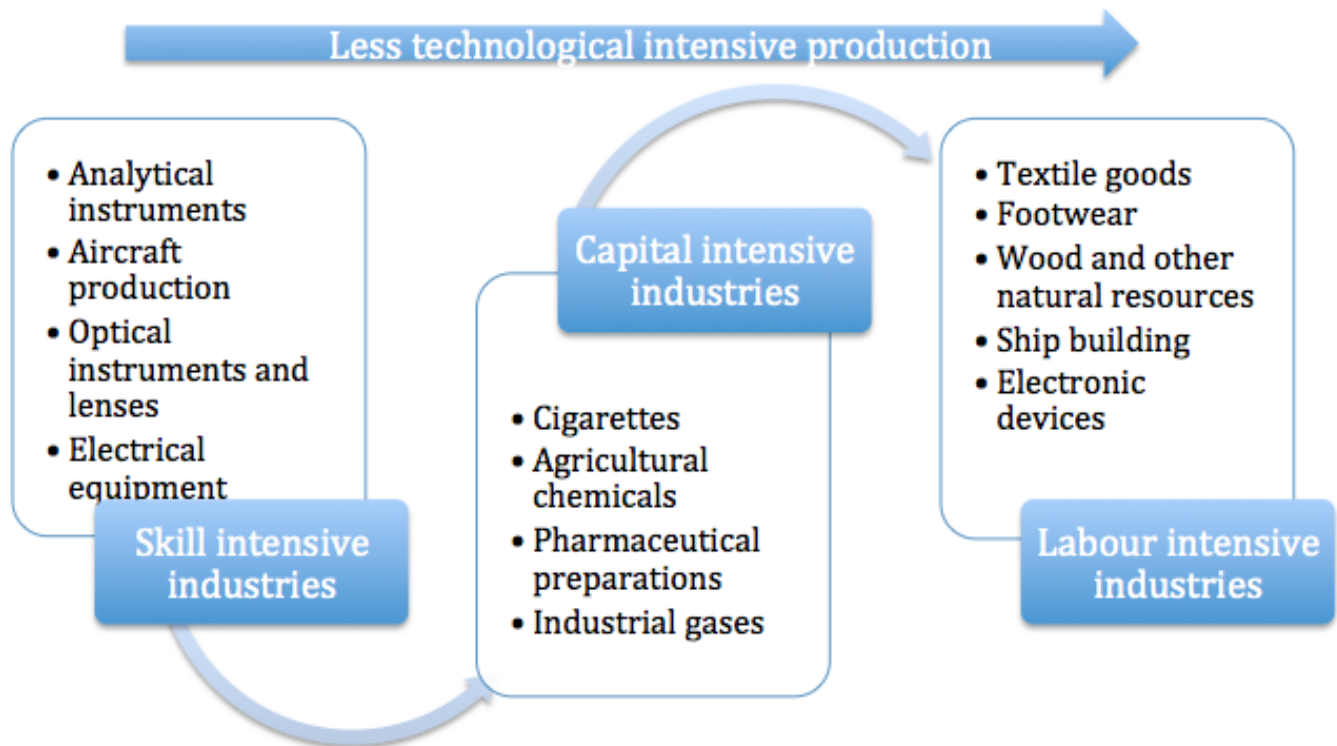
The author

Date and location

ANNEXA- Tables

A – Table 1: Product Specialization

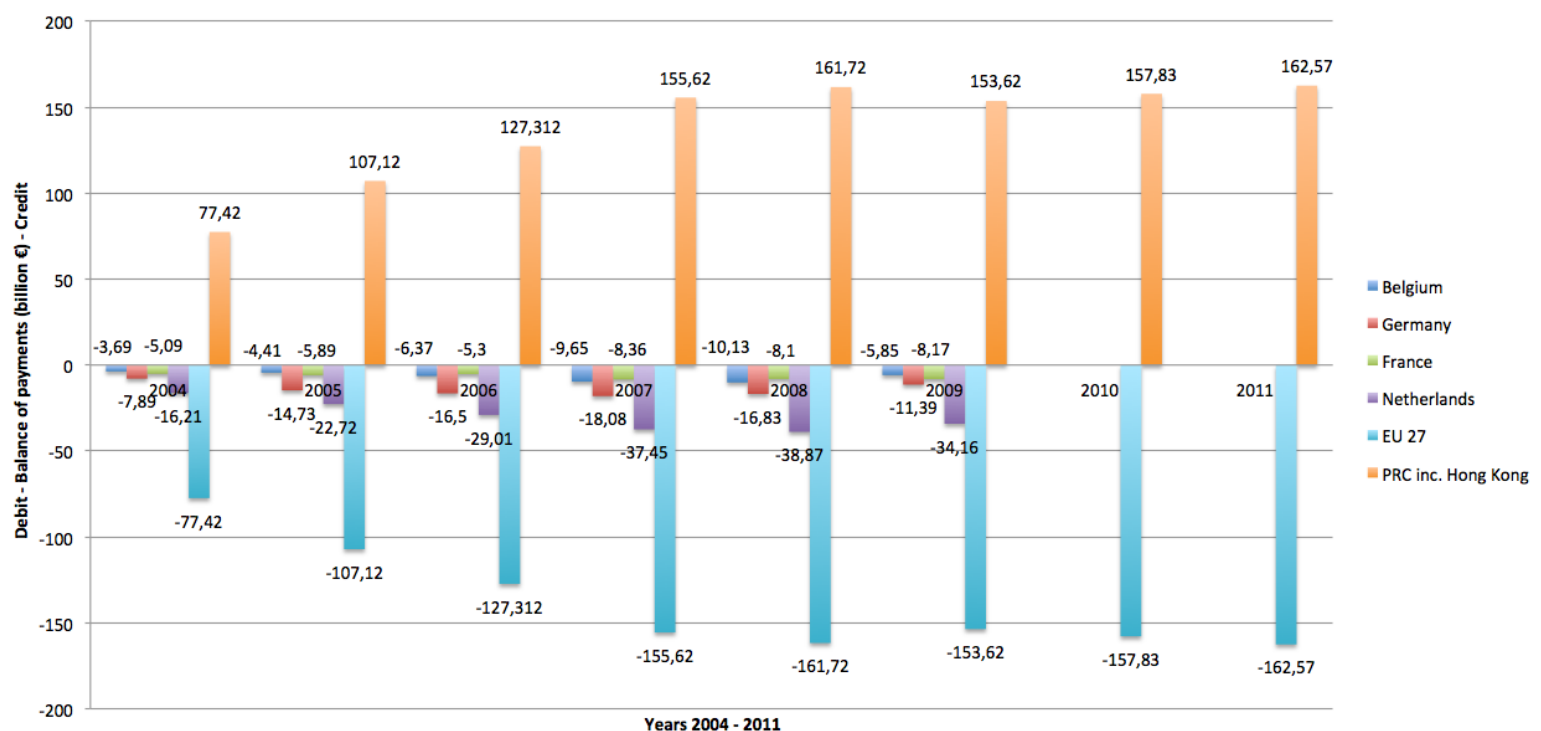
(Data taken from Ramalis, 2004, p. 79)



B – Table 3: Balance of Payments

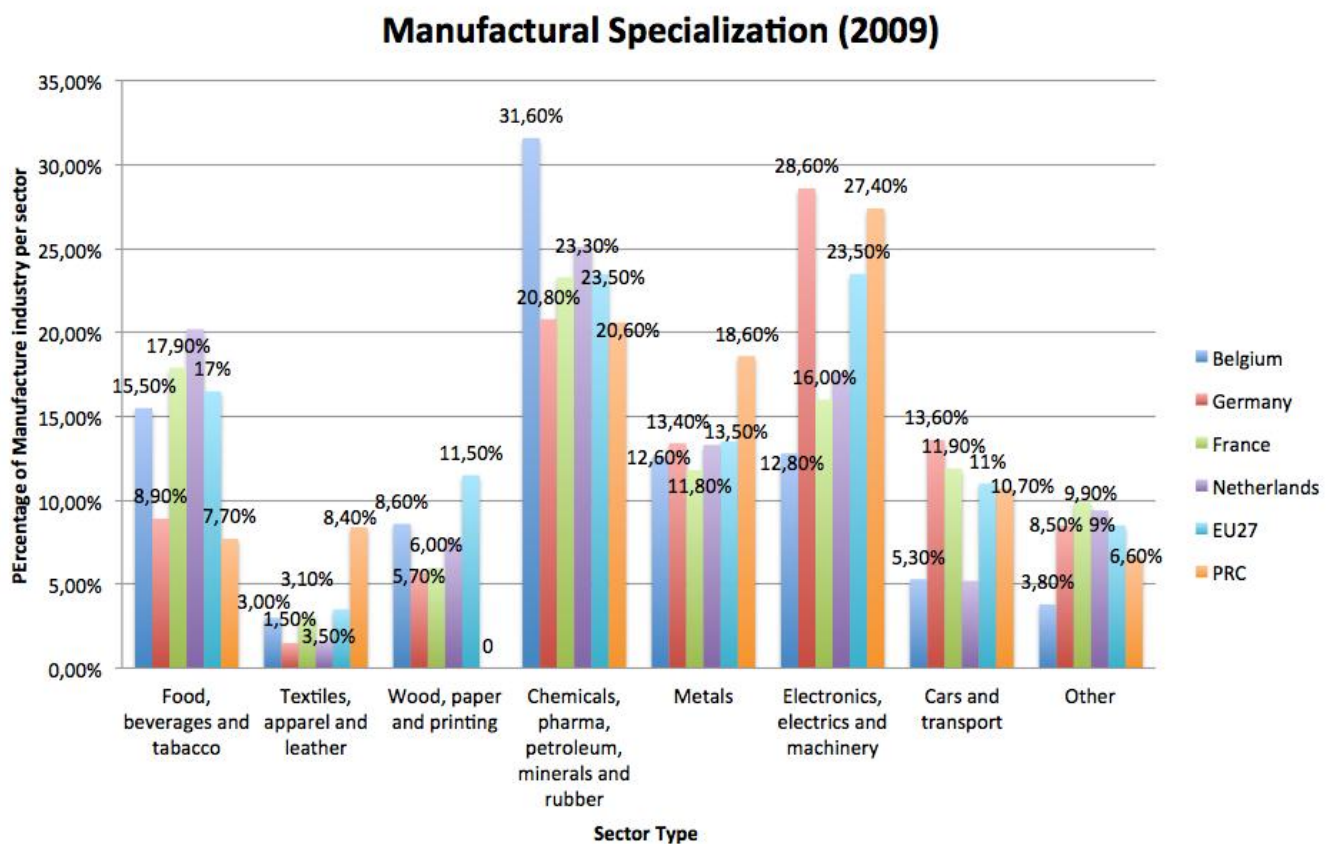
Data taken from Eurostats, measured in billion Euros

Balance of Payments 2004 - 2011, country breakdown



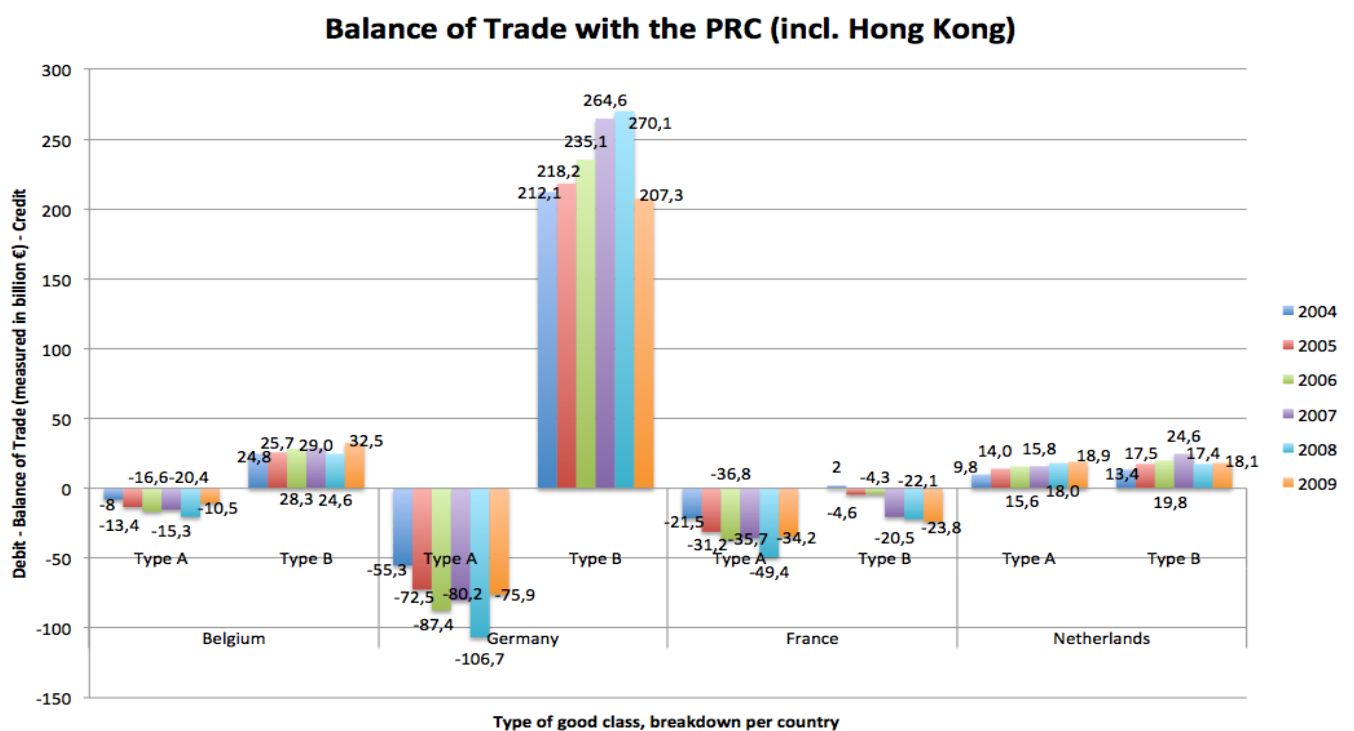
C – Table 4: Manufactural Specialization

Data taken from Eurostats, measured in total percentages



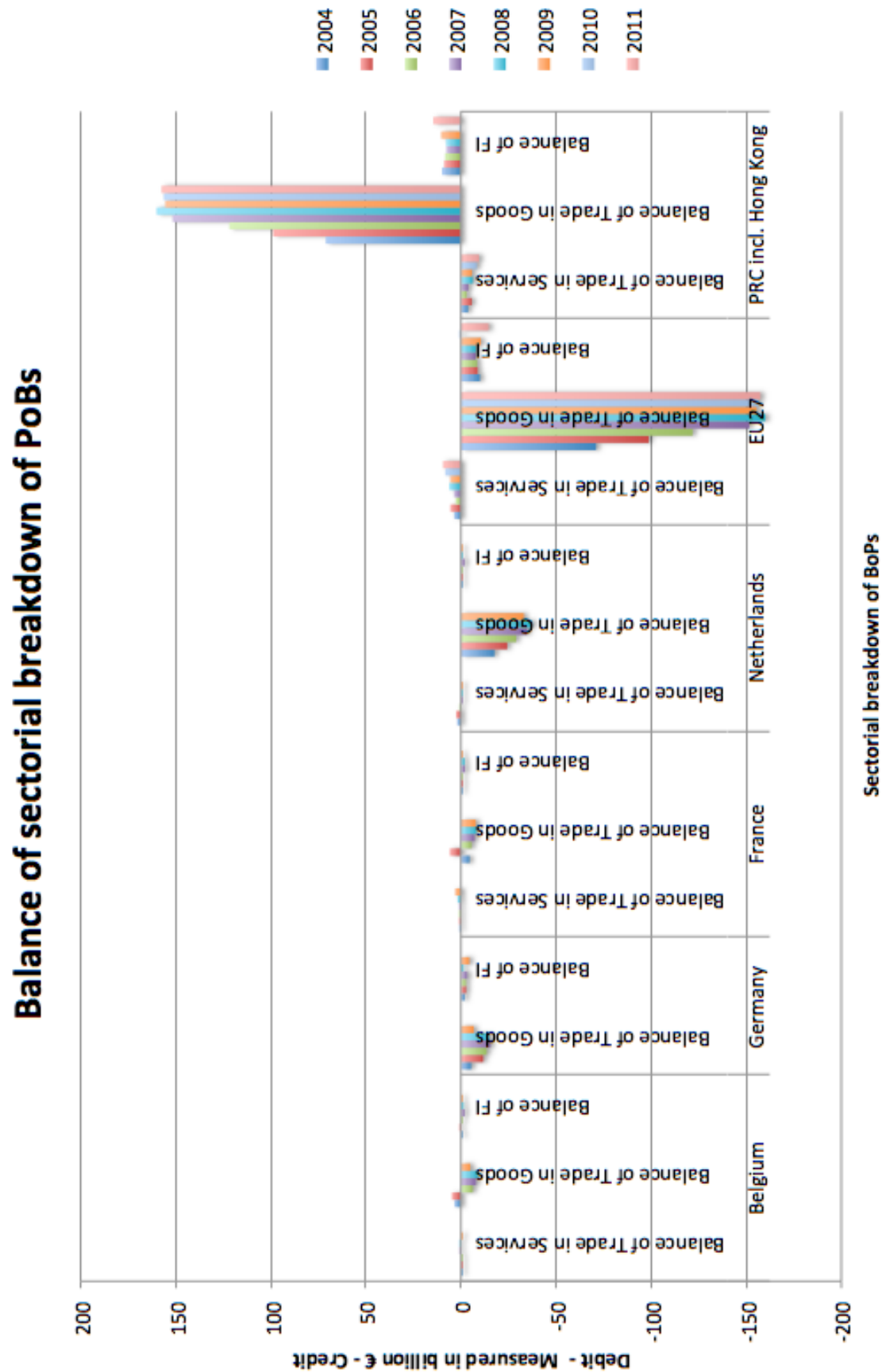
D – Table 5: Balance of Trade

Data taken from Eurostats, measured in billion Euros



E – Table 6: Sectorial Breakdown of BoPs

Data taken from Eurostats, measured in billion Euros



ANNEX B: Data collected, breakdown per actor

A – Belgium (BE)

Data taken from Eurostats, measured in billion Euros

Belgium		2004	2005	2006	2007	2008	2009
Import/exports balance per group of goods to PRC, incl. Hong Kong	Type A	-8	-13,4	-16,6	-15,3	-20,4	-10,5
	Type B	24,8	25,7	28,3	29	24,6	23,5
Import/ exports of Services to the PRC	Imports	0,22	0,18	0,26	0,34	0,4	0,35
	Exports	0,12	0,19	0,2	0,66	0,87	0,67
Import/ exports of Services to Hong Kong	Imports	0,38	0,41	0,35	0,57	0,59	0,54
	Exports	0,24	0,26	0,16	0,35	0,32	0,2
Balance of Trade in Services	Total	-0,04	-0,16	-0,13	0,1	0,2	-0,02
Import/Export of goods to the PRC	Imports	6,8	8,6	10,3	12,6	13,4	10,4
	Exports	2,4	2,7	2,9	3,3	3,4	4,3
Import/Export of goods to Hong Kong	Imports	0,67	0,69	0,76	0,67	0,69	0,64
	Exports	1,65	1,77	1,96	2,06	1,72	1,81
Balance of Trade in Goods	Total	-3,42	-4,82	-6,2	-7,91	-8,97	-4,93
FI flows with PRC	Inflow	-0,1	0,1	-0,2	0,06	-0,07	-0,02
	Outflow	-0,3	0,04	0,07	0,4	-0,25	-0,06
FI flows with Hong Kong	Inflow	0,17	0,29	0,07	-1,1	0,6	-1,1
	Outflow	0,2	-0,12	0,1	0,42	2,14	-0,16
Balance of FI	Total	-0,43	0,23	-0,3	-1,84	-1,36	-0,9
Balance of Payments	Total	-3,69	-4,41	-6,37	-9,65	-10,13	-5,85

Sectorial breakdown of industry, data measured in %, taken from Eurostats

Belgium 2009	Goods Type A				Goods type B			
	Food, beverages and tobacco	Textiles, apparel and leather	Wood, paper and printing	Other	Metals	Electronics, electrics and machinery	Cars and transport	Chemicals, pharma, petroleum, minerals and rubber
	15,5 %	3 %	8,6 %	3,8 %	12,6%	12,8 %	5,3 %	31,6%

B – Germany (GER)

Data taken from Eurostats, measured in billion Euros

Germany		2004	2005	2006	2007	2008	2009
Import/exports balance per group of goods to PRC, incl. Hong Kong	Type A	-55,3	-72,5	-87,4	-80,2	-106,7	-75,9
	Type B	212,1	218,2	235,1	264,6	270,1	207,3
Import/ exports of Services to the PRC	Imports	Conf.	Conf.	Conf.	Conf.	Conf.	Conf.
	Exports	1,92	2,68	3,04	3,53	4,12	4,36
Import/ exports of Services to Hong Kong	Imports	1,56	1,47	1,61	1,79	2,14	1,59
	Exports	0,96	1,09	1,17	1,22	1,56	1,24
Balance of Trade in Services	Total	NA due to Conf.	NA due to Conf.	NA due to Conf.	NA due to Conf.	NA due to Conf.	Na due to Conf.
Import/Export of goods to the PRC	Imports	28,5	35,1	43,1	48,1	51,5	46
	Exports	21	21,2	27,1	29,9	34	36,4
Import/Export of goods to Hong Kong	Imports	1,9	1,86	2,21	1,87	1,71	1,17
	Exports	4,05	4,05	4,7	4,57	4,41	4,07
Balance of Trade in Goods	Total	-5,35	-11,71	-13,51	-15,5	-14,79	-6,7
FI flows with PRC	Inflow	0,1	0,16	0,33	0,03	-0,05	-0,1
	Outflow	1,2	2,5	2,5	2,1	1,8	4,2
FI flows with Hong Kong	Inflow	-0,04	0,07	0,009	0,007	0,007	-0,037
	Outflow	0,8	0,37	0,39	1,23	-0,48	0,2
Balance of FI	Total	-1,94	-2,64	-2,55	-3,29	-1,36	-4,38
Balance of Payments	Total	-7,89	-14,73	-16,5	-18,08	-16,83	-11,39

Sectorial breakdown of industry, data measured in %, taken from Eurostats

Germany 2009	Goods Type A				Goods type B			
	Food, beverages and tobacco	Textiles, apparel and leather	Wood, paper and printing	Other	Metals	Electronics, electrics and machinery	Cars and transport	Chemicals, pharma, petroleum, minerals and rubber
	8,9 %	1,5 %	5,7%	8,5%	13,4 %	28,6%	13,6%	20,8%

C – France (FR)

Data taken from Eurostats, measured in billion Euros

France		2004	2005	2006	2007	2008	2009
Import/exports balance per group of goods to PRC, incl. Hong Kong	Type A	-21,5	-31,2	-36,8	-35,7	-49,4	-34,2
	Type B	2	-4,6	-4,3	-20,5	-22,1	-23,8
Import/ exports of Services to the PRC	Imports	1,57	1,9	2,16	2,47	2,3	2,7
	Exports	1,56	2,65	2,96	3,34	4,01	3,27
Import/ exports of Services to Hong Kong	Imports	0,63	0,53	0,48	0,72	0,75	0,82
	Exports	0,8	0,87	0,81	0,89	0,87	0,88
Balance of Trade in Services	Total	0,16	1,09	1,13	1,04	1,83	3,08
Import/Export of goods to the PRC	Imports	11,7	14,5	15,8	18,2	19,2	17,8
	Exports	5,4	6,3	8,1	9	9	7,9
Import/Export of goods to Hong Kong	Imports	0,37	0,42	0,46	0,41	0,4	0,25
	Exports	2,17	2,75	2,68	2,37	2,55	2,37
Balance of Trade in Goods	Total	-4,5	-5,87	-5,48	-7,24	-8,05	-7,78
FI flows with PRC	Inflow	0,01	0,02	0,01	0,04	-0,08	0,07
	Outflow	0,4	0,7	0,5	0,9	1,3	1,3
FI flows with Hong Kong	Inflow	0,06	0,06	0,17	0,18	0,33	0,38
	Outflow	0,42	0,49	0,63	1,48	0,83	0,17
Balance of FI	Total	-0,75	-1,11	-0,95	-2,16	-1,88	-1,02
Balance of Payments	Total	-3,69	-4,41	-6,37	-9,65	-10,13	-5,85

Sectorial breakdown of industry, data measured in %, taken from Eurostats

France 2009	Goods Type A				Goods type B			
	Food, beverages and tobacco	Textiles, apparel and leather	Wood, paper and printing	Other	Metals	Electronics, electrics and machinery	Cars and transport	Chemicals, pharma, petroleum, minerals and rubber
	17,9 %	3,1 %	6 %	23,3 %	11,8 %	16 %	11,9 %	9,9 %

D – The Netherlands (NL)

Data taken from Eurostats, measured in billion Euros

Netherlands		2004	2005	2006	2007	2008	2009
Import/exports balance per group of goods to PRC, incl. Hong Kong	Type A	9,8	14	15,6	15,8	18	18,9
	Type B	13,4	17,5	19,8	24,6	17,4	18,1
Import/ exports of Services to the PRC	Imports	0,5	0,6	1,1	2,5	2,3	2,7
	Exports	0,8	1	1	1,2	1,3	1,2
Import/ exports of Services to Hong Kong	Imports	0,4	0,5	0,6	0,5	0,5	0,5
	Exports	2	2,6	1,1	1,1	1	0,9
Balance of Trade in Services	Total	2	2,6	0,5	-0,8	-0,6	-1
Import/Export of goods to the PRC	Imports	19	25,8	31	37,7	40,4	36,9
	Exports	2,3	2,6	3,3	3,7	4,0	4,7
Import/Export of goods to Hong Kong	Imports	1,8	2,1	2,4	2	2,2	2,1
	Exports	0,9	0,9	1	1,1	1,1	1,2
Balance of Trade in Goods	Total	-17,6	-24,3	-29	-34,9	-37,5	-33,1
FI flows with PRC	Inflow	0,01	0,01	0,01	0,4	0,04	-0,06
	Outflow	0,2	0,5	0,3	0,4	0,8	0,1
FI flows with Hong Kong	Inflow	-0,02	-0,03	-0,03	-0,73	0,2	0,1
	Outflow	0,3	0,3	-0,01	1,1	0,3	0,1
Balance of FI	Total	-0,5	-0,8	-0,3	-1,9	-0,8	-0,2
Balance of Payments	Total	-3,69	-4,41	-6,37	-9,65	-10,13	-5,85

Sectorial breakdown of industry, data measured in %, taken from Eurostats

Netherlands 2009	Goods Type A				Goods type B			
	Food, beverages and tobacco	Textiles, apparel and leather	Wood, paper and printing	Other	Metals	Electronics, electrics and machinery	Cars and transport	Chemicals, pharma, petroleum, minerals and rubber
	20,2 %	1,6 %	7,7 %	9,4 %	13,3%	17,6 %	17,6 %	25,1%

E – European Union, 27 Member States (EU-27)

Data taken from Eurostats, measured in billion Euros

EU 27		2004	2005	2006	2007	2008	2009	2010	2011
Import/ exports of Services to the PRC	Imports	7,35	9,9	12,5	14,2	15,3	14,13	17,26	18,31
	Exports	9,11	12,5	14,5	16,76	20,41	19	23,9	26,25
Import/ exports of Services to Hong Kong	Imports	9,11	12,5	14,5	16,76	20,41	19	23,9	16,25
	Exports	9,98	10,7	12,2	11,7	12,26	13,28	14,3	10,9
Balance of Trade in Services	Total	3,64	5,63	2,87	3,74	6,22	5,68	8,28	9,496
Import/Export of goods to the PRC	Imports	128,69	160,32	194,93	232,62	247,85	244,15	282,52	131,69
	Exports	48,4	51,82	63,79	71,79	78,25	82,31	113,27	136,37
Import/Export of goods to Hong Kong	Imports	9,98	10,7	12,2	11,7	12,26	13,28	14,3	10,9
	Exports	19,19	20,45	21,56	20,92	21,77	19,66	27,24	30,76
Balance of Trade in Goods	Total	-71,08	-98,75	-121,78	-151,61	-160,09	-155,46	-156,31	-157,46
FI flows with PRC	Inflow	0,5	-0,1	2,1	0,7	-0,4	0,06	0,7	3,2
	Outflow	3,9	6,1	6,7	7,1	5,9	8,2	7,1	17,5
FI flows with Hong Kong	Inflow	4,7	1,18	-0,25	5,9	3,16	1,44	13,94	7,6
	Outflow	11,34	3,78	3,56	7,17	4,72	3,79	7,3	7,9
Balance of FI	Total	-9,98	-8,8	-8,4	-7,67	-7,85	-10,48	0,23	-14,6
Balance of Payments	Total	-77,42	-107,1	-127,3	-155,6	-161,7	-153,6	-157,8	-162,5

Sectorial breakdown of industry, data measured in %, taken from Eurostats

EU 27 2009	Goods Type A				Goods type B			
	Food, beverages and tobacco	Textiles, apparel and leather	Wood, paper and printing	Other	Metals	Electronics, electrics and machinery	Cars and transport	Chemicals, pharma, petroleum, minerals and rubber
	17%	3,5 %	11,5 %	23,5 %	13,5 %	23,5 %	11 %	9 %

F – People's Republic of China (PRC), incl. Hong Kong

Controversial calculation of imports/ exports of EU-27, measured in billion Euros,
taken from Eurostats

EU 27		2004	2005	2006	2007	2008	2009	2010	2011
Import/ exports of Services to the PRC	Imports	9,11	12,5	14,5	16,76	20,41	19	23,9	26,25
	Exports	7,35	9,9	12,5	14,2	15,3	14,13	17,26	18,31
Import/ exports of Services to Hong Kong	Imports	9,98	10,7	12,2	11,7	12,26	13,28	14,3	10,9
	Exports	9,11	12,5	14,5	16,76	20,41	19	23,9	16,25
Balance of Trade in Services	Total	-3,64	-5,63	-2,87	-3,74	-6,22	-5,68	-8,28	-9,496
Import/Export of goods to the PRC	Imports	48,4	51,82	63,79	71,79	78,25	82,31	113,27	136,37
	Exports	128,69	160,32	194,93	232,62	247,85	244,15	282,52	131,69
Import/Export of goods to Hong Kong	Imports	19,19	20,45	21,56	20,92	21,77	19,66	27,24	30,76
	Exports	9,98	10,7	12,2	11,7	12,26	13,28	14,3	10,9
Balance of Trade in Goods	Total	71,08	98,75	121,78	151,61	-160,09	155,46	156,31	157,46
FI flows with PRC	Inflow	3,9	6,1	6,7	7,1	5,9	8,2	7,1	17,5
	Outflow	0,5	-0,1	2,1	0,7	-0,4	0,06	0,7	3,2
FI flows with Hong Kong	Inflow	11,34	3,78	3,56	7,17	4,72	3,79	7,3	7,9
	Outflow	4,7	1,18	-0,25	5,9	3,16	1,44	13,94	7,6
Balance of FI	Total	9,98	8,8	8,4	7,67	7,85	10,48	0,23	14,6
Balance of Payments	Total	77,42	107,1	127,3	155,6	161,7	153,6	157,8	162,5

Sectorial breakdown of industry, data measured in %, taken from Eurostats

PRC incl. Hong Kong 2009	Goods Type A				Goods type B			
	Food, beverages and tobacco	Textiles, apparel and leather	Wood, paper and printing	Other	Metals	Electronics, electrics and machinery	Cars and transport	Chemicals, pharma, petroleum, minerals and rubber
	7,7%	8,4 %	NA	6,6 %	18,6 %	27,4 %	10,7 %	6,6 %