

Mendel University in Brno
Faculty of Regional Development and Territorial Studies

**Analysis of trade cooperation of the Czech Republic and
ASEAN countries**

Diploma thesis

Supervisor:

Ing. Veronika Jadczková, Ph.D.

Author:

Bc. Natálie Potáčková

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In Brno, December 21, 2016

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Bc. Natálie Potáčková

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Abstract

The aim of the thesis is to analyze the trade cooperation between the Czech Republic and ASEAN countries. The thesis examines the scope and content of trade between selected countries, the cooperation between countries is increasing due to the liberalization of trade and bilateral relations. The theoretical part defines main concepts that are associated with international trade, trade policy, trade and bilateral relations between the countries. The analytical part is dedicated to correlation, cluster analysis, a composite indicator and convergence. Finally, the obtained results are discussed and several recommendations for trade cooperation are suggested.

Key words

Trade, ASEAN countries, the Czech Republic, analysis, imports, exports, composite indicator, cluster analysis, convergence

Abstrakt

Cílem diplomové práce je analyzovat obchodní spolupráci České republiky a zemí ASEAN. Práce zkoumá rozsah a obsah obchodu mezi zvolenými zeměmi, spolupráce mezi zeměmi stoupá díky liberalizaci obchodu a bilaterálním vztahům. V teoretické části jsou vymezeny stěžejní pojmy, které jsou spojeny se zahraničním obchodem, obchodní politikou, obchodními a bilaterálními vztahy mezi zeměmi. Analytická část se věnuje korelaci, shlukové analýze, kompozitnímu indikátoru a konvergenci. Závěrem jsou získané výsledky rozebrány a jsou navržena některá doporučení pro obchodní spolupráci.

Klíčová slova

Obchod, země ASEAN, Česká republika, analýza, importy, exporty, kompozitní indikátor, shluková analýza, konvergence

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LIST OF ABBREVIATIONS

ASA	Association of Southeast Asia
ASEAN	Association of Southeast Asia Nations
ASPAC	Asian and Pacific Council
BRICS	Brazil, Russia, India, China, South Africa
CMEA	Council for Mutual Economic Assistance
CNB	Czech National Bank
CPI	Cumulative relative frequencies
CQI	Cumulative relative totals
CSO	Czech Statistical Office
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IEA	International Energy Agency
IMF	International Monetary Fund
IWC	International Whaling Commission
Lao PDR	Lao People's Democratic Republic
MFA	Ministry of Foreign Affairs
MIT	Ministry of Industry and Trade
NATO	North Atlantic Treaty Organization
OECD	Organization for Economic Co-operation and Development
SAI	Integration of South Asia
SEA	Southeast Asia
SITC	Standard International Trade Classification
SRV	Socialist Republic of Vietnam

TAC	Treaty of Amity and Cooperation
TCI	Trade Complementarity Index
TII	Trade Intensity Index
UN	United Nations
WITS	World Integrated Trade Solution
WTO	World Trade Organization
ZOPFAN	Zone of Peace, Freedom and Neutrality Declaration

1 INTRODUCTION AND OBJECTIVES

This diploma thesis focuses on analysing trade cooperation between the Czech Republic and ASEAN countries. This topic was chosen because trade with Asian countries has become a crucial theme in the recent years. Due to the increasing globalisation and economic growth the volume of trade has multiplied several times. Czech companies together with the Czech Government are trying to decrease the dependency of the Czech economy on the EU28 market and this effort is mostly focused on BRICS and Asian countries. Southeast Asia region is remarkable, the degree of economic development of the region diverse, but these countries have one thing in common and that is the dynamic growth of their economies. ASEAN consists of countries whose economies have grown significantly due to industrialization. Connection of states has increased the importance of the organization.

Foreign trade and associated international economic relations are an important prerequisite for a functioning market economies in most of the world. In the Czech Republic, the economy is limited by the size of the market and the lack of necessary resources, foreign trade plays a key role. This role was further enhanced after 2004, when the Czech Republic joined the European Union. Because of trade liberalization the Czech Republic gained new possibilities for the development of foreign trade. ASEAN is tied to the birth of a dynamic region that was previously barely visible. Its economic and political position strengthened, geographically there are important maritime ways in terms of world trade. These events influenced the choice of the theme for this theses.

This thesis is divided into 5 chapters. First chapter will be devoted to describe objectives and formulate hypothesis. Second chapter is literature review which will describe development of foreign trade of the Czech Republic and its functions, the development of ASEAN, bilateral agreements and commodity structures of imports and exports. Third chapter consist of data and methodology, where all statistical methods used in this thesis will be explained source of data will be mentioned. Fourth chapter contains results from methods used to find

out best trading partner from ASEAN countries. At the end of this chapter is discussion where I will discuss my results with other authors. Finally, the conclusion will summarize and evaluate cooperation between the Czech Republic and ASEAN countries and possible solutions for improving the current cooperation will be suggested.

The principal objective of this thesis is to find out best trade partners from ASEAN countries for the Czech Republic. Another objective of this thesis is to give to reader a comprehensive look at foreign trade of the Czech Republic with ASEAN countries. To inform the reader about the development of relations with these countries and map current trade cooperation of the Czech Republic and ASEAN countries. By analysing commodity structure I will find out which commodities are imported and exported between countries. By applying different statistical methods I will analyse which country is most suitable for trade cooperation, the similarities and differences in trade with ASEAN countries will be identified. Publically available information from the Internet portals and books will be used to achieve objectives of this theses. To analyse the data various statistical methods and comparisons will be used.

There are 2 hypothesis formulated in the following way:

- Hypothesis 1: Favourable conditions for mutual international trade are with countries with a higher proportion of GDP per capita.
- Hypothesis 2: In the "post-crisis" period 2010/2011, thanks to favourable development in most industries and economy growth, the competitiveness of our products has increased, even on products with higher added value. Also the ability to succeed in even more mature markets has increased i.e. there is a presumption that in this period should be an obvious reverse in the balance of trade with most observed countries, mainly by more dynamic export growth.

2 LITERATURE REVIEW

This chapter will give an overview of basic information about the Czech Republic and ASEAN countries. Firstly, the Czech Republic will be described and its economic development since the formation. Another sub-chapters will describe foreign trade of the Czech Republic and its function, comparative advantages and disadvantages and export strategy. Next, formation and further development of ASEAN integration will be described. At the end of this chapter actual cooperation and agreements between the Czech Republic and ASEAN countries will be mentioned and commodity structures of import and exports will be analysed.

2.1 General characteristics of the Czech Republic

The Czech Republic is a landlocked country located in the heart of Europe and it was founded by the disintegration of the two countries on January 1, 1993. Geographical size of the Czech Republic is 78 866 km², has 14 regions, population is 10 564 866¹, density of the population is 134 inhabitants per square kilometre and capital city is Prague². Official language is Czech and currency is Czech crown. Head of State is the President Miloš Zeman. Political system of the Czech Republic is parliamentary republic and the Czech Republic is EU member since 2004. The Czech Republic is also a member of these international organizations: UN, WTO, IMF, OECD, IEA, NATO and IWC. The state border forms neighbourhood with Poland, Germany, Austria and Slovakia³.

¹ On June 30, 2016. Czech Statistical Office. *Population*.

² Embassy of the Czech Republic in Dublin, *Basic Facts about the Czech Republic*.

³ European Union, *The Czech Republic: Overview*.

Picture 1 Location of the Czech Republic



Source: www.mapsof.net

2.2 Economic development of the Czech Republic

The Czech Republic was founded in 1993 by the disintegration of the Czech and Slovak Federal Republic. There was rivalry between the two nations at the time of the joint state. Although Czechoslovakia appeared as a stable solid state to outsiders "the struggle" for equality of both nations were gradually decomposing the state from the inside. Since 1918, the two nations have experienced a lot of events, solving uneasy problems of own existence, stance against fascism and communism. In 1968 there was a federalization of Czechoslovakia, when both nations had admittedly its own parliament and government, but the main decision were made in Prague. In 1989, it briefly appeared that both nations have found a common path again, but only for a short time, so that in 1993 split into two independent states. After the official formation of independent republics followed by the

distribution of state assets, liabilities and competencies, review the state border and naturalization⁴⁵.

Paradoxically since then, states cooperated much more together and they have become important trading partners. After dividing the Czech Republic continued to transform the economy and started with privatization of enterprises, which was divided into three processes: restitution and small and large coupon privatization. Some businesses were sold directly to foreign investors, while others were returned to their original owners. During 1994 and 1995 the Czech economy prospered with the liberalization of capital with a fixed exchange rate, combined with a balanced budget and economic growth. However, capital inflows induced pressure on the currency, which began to strengthen, causing the current account deficit⁶. In 1996, the central bank tried to release the pressure by expanding the bandwidth oscillation, causing the outflow of short-term capital. In late 1996 and early 1997, the situation was already tense, the strong Czech crown and the fixed exchange rate of the CNB, political instability and a high current account deficit of the balance of payments. These factors created an ideal environment for the crisis, which erupted in 1997 and economic growth slowed. The central bank tried to influence the currency by introducing higher interest rates and exchange rate interventions. But eventually, CNB switched from fixed exchange rate to the managed floating. The move restored exchange rate stability and helped the Czech economy from the crisis⁷⁸.

The turning point for the Czech economy was the Czech Republic's accession to the European Union on 1 May 2004, during the so-called Eastern enlargement⁹. The accession of the Czech Republic to the EU meant a better international position and the possibility of drawing from EU funds for development of the sector to improve the state of the Czech economy. After the

⁴ The Czech National Bank, *Historie ČNB: Ekonomický vývoj na území České republiky*.

⁵ The Czech Republic. *Vývoj České republiky*.

⁶ The Czech Republic. *Vývoj České republiky*.

⁷ The Czech National Bank, *Annual Report 1996*.

⁸ HORVÁTH, Julius. *The Czech Currency Crisis of 1997*.

⁹ In 2004 except of the Czech Republic these countries also joined the EU: Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

Czech Republic joined the EU, legal emigration was simplified to work in other EU countries, but it also increased the immigration of citizens from EU member states to the Czech Republic. Financial and the economic crisis during 2008 - 2009 (in some respects still ongoing) also hit the Czech Republic¹⁰.

Nowadays, the Czech Republic is one of the most developed industrial economies in Central and Eastern Europe. The industry is focused on metallurgy, glass manufacturing, chemical processing, machinery, pharmaceuticals, motor vehicles, electronics, food and beverage processing, textiles and paper and make up 41% of GDP. The largest percentage has the services sector, which contributes 55% to GDP. The agricultural sector creates 5% of GDP, which is a relatively low percentage. Trade partners of the Czech Republic are mainly in Germany, United States, Slovakia, UK, France Poland, Austria, Italy, the Netherlands, Russia and China¹¹.

2.3 General features of international trade

International trade is historically the oldest and still significant form of external economic relations. Their impact on the economic development of the country has significantly deepened throughout the post-World War II. (compared to the inter-war development), in the last decades of developments in international trade is one of the most dynamic element in the world economy. In line with the theories of international trade, classical, neoclassical and modern it can be stated that international trade is currently factor affecting the economic growth of individual economies and the global economy.

Looking at the operation of international trade in the economy of each country can be found significant differences depending on the type of economy in terms of their economic dimension and economic development. However, it is possible to identify certain features such as the generally applicable:

¹⁰ The Czech Republic. *Vývoj České republiky*.

¹¹ The Czech Republic. *Vývoj České republiky*.

- Transformation function, i.e. the impact of foreign trade on the formation of the state of internal economic balance.
- Growth function, i.e. fulfilment of the terms "economics of time" with the outcome of national savings in labour participation in international division of labour.
- Foreign trade may under certain specific conditions act as a barrier to the growth of the domestic economy.
- Mutual interaction between the growth (or decline) of national income, an increase (or decrease) of imports and an increase (or decrease) of exports¹².

2.4 Comparative advantages and disadvantages of the Czech Republic

Although the Czech economy options are rather limited, the Czech Republic can derive on its comparative advantages, which ranks the Czech Republic ahead of the possibilities of other countries. Determining these indicators is rather relative and based on the comparison of the country with international environment. The main criteria for evaluation are the natural and economic conditions.

Czech Republic is a country of relatively small size with a relatively low number of population. This constitutes a limit to the economy in terms of the size of the internal market and the volume of domestic labour. Geographical conditions of temperate belt can also have an impact on agricultural production, for example, which does not allow to grow up tropical and subtropical crops. Natural conditions failed to provide sufficient raw materials for the Czech economy. The disadvantages can be attributed to a certain level of pollution and environmental degradation. Another disadvantages is that the Czech Republic has no access to the sea¹³.

¹² PLCHOVÁ, Božena. *Zahraniční ekonomické vztahy ČR*.

¹³ PLCHOVÁ, Božena, et al. *Zahraniční ekonomické vztahy České republiky*.

On the other hand, the Czech economy boasts a convenient location in the heart of Europe, which allows the international transit of goods and services. For the development of tourism is a priority rich natural topography and the relative incidence of numerous mineral springs and thermal baths, necessary factors for the development of spa tourism¹⁴.

However, economic terms are also important for involvement of the Czech Republic to international trade and international division of labour. The aforementioned small population limits the size of the economy. The lack of domestic capital is another negative. The competitiveness of domestic industrial products for demanding markets is also insufficient. Only some of the traditional brand of engineering products are able to take hold in international markets. Comparative disadvantage can be seen in the lack of adaptability of almost all domestic entities and the overall domestic economic environment. This inability is certainly a relic of a long period of centrally planned economy.

Although the Czech economy takes small size, its population is educated and workforce is skilled. Compared to other European countries, the Czech Republic a mainly focused on industrial development, where can be found some benefit to the economy. Nevertheless, some industries are technically underdeveloped and insufficiently specific and to maintain their competitiveness in the sector it will be necessary to innovate the production.

Previously the low level of wages and salaries were regarded as an advantage attracting foreign investors. Today, the production moved to countries to the east, where it is possible to take advantage of lower wages than in the Czech Republic and produce more cheaply. Workforce on Czech territory should make more use of their education and offer qualified and experienced personnel to the world^{15 16}.

¹⁴ Univerzita online, *Zahraniční obchod: Výhody mezinárodního obchodu*.

¹⁵ PLCHOVÁ, Božena, et al. *Zahraniční ekonomické vztahy České republiky*.

¹⁶ Business info, *Analýza konkurenceschopnosti České republiky*.

2.5 International trade of the Czech Republic

Foreign trade has undergone during the 90s of dramatic changes. There has been a large increase in foreign trade volume and change the orientation from east to west. There has been a transition from primary production and production less difficult for technology processing to sophisticated production. This trend is a sign of developed market economy and helps to enforce the Czech goods in developed economies.

Nowadays, growing globalization and continuing economic integration within Europe, international trade plays an increasingly important role. Therefore, it can be assumed that, especially for a small economy such as the Czech Republic, international trade will have great significance. Considering the country's size its main function is keeping the internal economic balance. International trade structure transforms the limited domestic production (domestic resources) in a structure that is demanded in the manufactured and final use. Unfavourable natural and economic conditions cause a shortage of raw materials and products that may be replaced by imports. The transformation function of external economic relations increase the possibility of meeting the needs¹⁷.

2.6 Trade policy of the Czech Republic

The existence of a common commercial policy of the EU does not mean that individual EU member states fully give up their sovereign rights and opportunities to influence the economic development of the country through trade policy. Each EU member state has its own foreign trade policy. The body responsible for the formulation of trade policy in the Czech Republic is the Ministry of Industry and Trade (MIT). It creates in cooperation with other state authorities, especially the Ministry of Foreign Affairs, Ministry of Agriculture and other ministries. Due to the high level of involvement of the Czech Republic in international trade and the structure of the economy, trade policy is mainly oriented to promote exports.

¹⁷ MESÁROŠ, Oldřich. *Vývoj a hlavní strukturální změny v zahraničním obchodě České republiky.*

The MIT process export strategy that reflects the interests of the state in foreign trade relations. The MIT creates institutions and various tool to promote the strategic objectives.

The MIT was also established as an advisory body to the Minister of Industry and Commerce in 2008, the Czech Council for Trade and Investment, whose role is to mediate business contact with the MIT¹⁸.

Among the most important institutions in the field of export policy is the Czech Export Bank, the Export Guarantee and Insurance Corporation - EGAP, the Czech Trade Promotion Agency - CzechTrade. The CzechInvest agency also contributed to the implementation of the export strategy¹⁹.

The Czech centres in abroad (established at the Ministry of Foreign Affairs) contribute to promote export policy and the trade and economic sections of Czech embassies abroad²⁰.

2.7 Export Strategy of the Czech Republic

The real export policy is currently based on Export Strategy of the Czech Republic for the period 2012 - 2020, approved by the Government and based on three main pillars:

- **Export Intelligence** – aim is to reduce export barriers from lack of information
- **Export Development** – aim is to create the most favourable export and internationalisation conditions for Czech businesses
- **Development of Trade Opportunities** – aim is to open the doors for Czech exporters especially to complex non-European markets and strengthen their position in global production chains²¹

The overall strategic objectives are: more opportunities for business (facilitating conditions for trade, activity in key markets, building a quality brand of the Czech Republic in the

¹⁸ KALÍNSKÁ, Emilie. *Mezinárodní obchod v 21. století*

¹⁹ Business info, *Zahraniční obchod: Export v kostce*

²⁰ KALÍNSKÁ, Emilie. *Mezinárodní obchod v 21. století*

²¹ Ministry of Industry and Trade. *2012 – 2020 Export Strategy of the Czech Republic*.

World), providing professional and efficient support (effective assistance for exporters, increase in exports of services, increase of direct investments and acquisition, development of export alliances), improving and expanding the quality of services (a new state system of services for export, customer service centre for export) and increase the capacity for export (network for export, expanding financing of Czech exports, the export Academy).

Export Strategy also defined the framework for the Green line for export. This is a service that is provided free of charge to all exporters, in the field of information services for export-oriented state institutions, effective mediation of contacts between entrepreneurs and export institutions and processing of entrepreneur's incentives to expand state export services.

In the following years there will be more emphasis on diversification of territories and to support the sector of small and medium-sized enterprises. The concept of diversification is meant that the state in the following years will encourage more exporters to countries outside the European Union. Specifically were identified 12 priority countries (including Vietnam) and 25 countries of interest (which includes Singapore, Thailand and Indonesia)²².

2.8 Formation of Association of Southeast Asian Nations

Southeast Asian countries have been under pressure from colonial powers for a long time. The first significant steps in the area of integration can be found in Southeast Asia after World War II, after the Japanese withdrawal a number of new states had been created that have begun to seek deeper cooperation within the region and tried to actively participate in international relations. There were organizations in Southeast Asia that preceded the emergence of ASEAN. First there was an organization called the Association of Southeast Asia known as ASA. Alliance containing of the Philippines, Malaysia and Thailand, which was founded in 1961 and existed only until 1963, due to a territorial dispute about Sabah between the Philippines and Malaysia. As another forerunner of the ASEAN can be considered Integration of South Asia (SAI), which connected the Philippines, Thailand and

²² Business info, *Zahraniční obchod: Exportní strategie ČR*.

Indonesia and existed only for one year, 1963. During the 60s the fears of the spread of communist ideology and the growing expansion of Beijing had been increasing constantly. That is why the Asian and Pacific Council (ASPAC) was founded in 1966, which included Malaysia, Thailand, Philippines, Taiwan, South Vietnam, Australia, New Zealand, Japan and South Korea, whose aim was to fight together against communism and defend the independence of individual states. Those events such as China's Cultural Revolution, the Vietnam War and disputes between the Philippines, Indonesia and Malaysia supported the idea of unification and joint cooperation for the stabilization of the region. Thailand acted as a neutral intermediary, then succeeded in 1966 to mediate reconciliation of disputes between the Philippines, Indonesia and Malaysia and the Thai foreign minister Thani Koman came with a proposal for establishment of a new regional integration. After calmed tensions between Malaysia and Indonesia, representatives of the original member states of ASA (Philippines, Malaysia, Thailand), and Indonesia were invited to the meeting in Bangkok in Thailand, where Foreign Minister of Singapore Sinnathamby Rajaratnam came with a proposal of joining Singapore to the integration group. His requirement was gladly accepted. At this session, which was held 8 August 1967, was signed the founding document of the ASEAN Declaration also known as the Bangkok Declaration and on the basis of this document the ASEAN itself was founded. These 5 Foreign Ministers (Adam Malik - Indonesia, Narciso Ramos – the Philippines, Abdul Razak - Malaysia, Sinnathamby Rajaratnam - Singapore and Khoman Thani - Thailand) are considered as a founders of the organization also called Founding Fathers^{23 24}.

2.9 Bangkok Declaration

Bangkok Declaration is the founding document consisting of only five articles declaring the establishment of an association for regional cooperation among the countries of Southeast Asia and covers the main tasks and aims of this association, whose aim was:

²³ ASEAN, *History: The Founding of ASEAN*.

²⁴ KHOMAN, THANAT. *ASEAN Conception and Evolution*.

1. To accelerate economic growth and social and cultural development of the region through joint effort in the spirit of equality and partnership in order to strengthen the foundations of a prosperous and peaceful community of Southeast Asian Nations.
2. To promote regional peace and stability by respecting justice and the rule of law in relations between states in the region and adherence to the principles of the UN Charter.
3. To encourage active cooperation for mutual assistance in matters of these areas: economic, social, administrative, technical, cultural and scientific.
4. To provide assistance to one another in the form of training and research activities in the field of education, vocational, technical and administrative.
5. To collaborate more efficiently for better utilization of agriculture and industry, trade expansion including the examination of the problems of international commodity trade, the improvement of the transport system, communications equipment and increasing the standard of living of the population.
6. To promote the studies focusing on Southeast Asia.
7. To maintain close and beneficial cooperation with existing international and regional organizations with similar aims and purposes, and to seek other ways for enhanced mutual cooperation²⁵.

We can see that there were no binding obligations in the Declaration. The Declaration was founded on a voluntary basis to assuming that the Member States that joined the association of their own volition, they want to cooperate. ASEAN represents the collective will of nations in Southeast Asia, committing to work together in friendship and they want to secure their people, peace, freedom, prosperity by working together. There was not specified a limited number of ASEAN members in the contract, the organization is open to the participation of all the Southeast Asian countries, which will share its principles. Even Vision of ASEAN 10 was known, which expected that 10 major powers of the SEA region would be involved in the organization. In order to achieve these targets organizational mechanism had to be set.

²⁵ ASEAN, *The Asean Declaration (Bangkok Declaration) Bangkok, 8 August 1967.*

This was mainly the annual meeting of foreign ministers called Ministerial Meeting. Also Standing Committee was established, chaired by the Minister of Foreign Affairs of the host country or his representative, then Ad-Hoc Committees and Permanent Committees, consisting of experts and officials working on specific topics. In the individual member countries were also created National Secretariats, which served as a support to hold annual Ministerial Conferences or special ministerial meetings that may be convened at any time as needed^{26 27}.

2.10 Development of integration within ASEAN

Although the original intention of the ASEAN was primarily political cooperation, member countries began to cooperate in the fields of security, economic and social. Initial efforts in integration were relatively weak and cooperation was developing slowly. In 1968, the conflict between the Philippines and Malaysia deepened again, which had to be addressed. The effort of the leaders of the member countries for support in the events relating to these disputes was an important motive which kept countries more together and helped to achieve progress in the activities of the Association. At the end of 1969, the relations between Malaysia and the Philippines eased and in December the 3. Ministerial Meeting occurred to sign agreements on cooperation in the cultural activities and the mass media.

Once international tensions were calmed down in the late 60s - 70s, ASEAN countries began to show bigger interest in regional affairs. The ASEAN Declaration on the Zone of Peace, Freedom and Neutrality Declaration (ZOPFAN) was signed on 27 November 1971 in Kuala Lumpur, which obliges member states to make efforts to ensure respect for the recognition of Southeast Asia as a zone of peace, freedom neutrality, without any form of interference of external forces. Besides ZOPFAN urged all countries of Southeast Asia to make joint efforts to extend the cooperation, which would contribute to their strength, solidarity and improving

²⁶ ASEAN, *The Asean Declaration (Bangkok Declaration) Bangkok, 8 August 1967.*

²⁷ ASEAN, *History: The Founding of ASEAN.*

relations between states. There was first uttered mention of cooperation in security matters and the separation of the region from the conflict of powers²⁸.

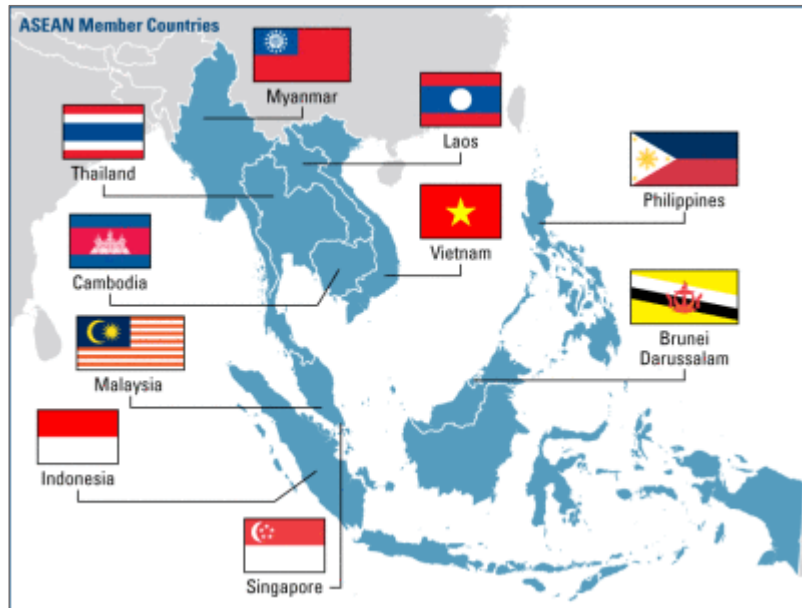
A significant milestone in the development of ASEAN became the first summit in Bali, which took place on 23 and 24 February 1976, where three important documents were adopted: Treaty of Amity and Cooperation (TAC), Declaration of ASEAN Concord and Agreement Establishing the ASEAN Secretariat. TAC have established the basic principles of cooperation such as respect for independence, sovereignty, equality and national identity; the right of every state to national existence free from external interference; non-interference in the internal affairs of others; peaceful settlement of disputes and disagreements; renunciation of the threat or use of force and related effective cooperation among members. The primary goals became the elimination of poverty, hunger, disease and illiteracy.

Regarding the admission of new ASEAN members, there was a single extension in 1984, when Brunei joined the organization. Another wave of expansion came up in the 90s after the end of the Cold War, when in 1995 joined Socialist Republic of Vietnam and at the 30th anniversary of ASEAN three states namely Laos, Myanmar and Cambodia should have become new members. Due to tense situation in Cambodia, the enlargement of ASEAN in 1997 was only about Laos and Myanmar. Cambodia could join in two years later in 1999, when the situation inside the country managed to calm. Thanks to the enlargement of very poor countries, economic disparities within ASEAN have widen. The new states were accepted relatively soon after the end of the Cold War, especially for safety reasons. This fulfilled the Vision of ASEAN 10²⁹.

²⁸ ASEAN, *Political achievement*.

²⁹ ASEAN, *Political achievement*.

Picture 2 ASEAN Member Countries



Source: www.emergingequity.org

2.11 Trade between the Czech Republic and ASEAN countries

To succeed in exporting to Southeast Asian countries, we have to offer not only high quality products and favourable price compared to other global competitors, but quickness also plays a crucial role, flexibility in the way of negotiations and the ability to understand well the local business customs. Moreover, it is necessary to build good relations and strengthen diplomatic ties with any country.

Therefore, the Czech Republic has embassies in five ASEAN countries namely Malaysia, the Philippines, Viet Nam, Indonesia (encompass also Singapore and Brunei) and Thailand (encompass also Cambodia, Laos and Myanmar). The level of diplomatic relations also show bilateral agreements. Attachment 6 give an overview of signed bilateral treaties and agreements between the Czech Republic and the ASEAN countries. The largest number of

signed agreements are with Viet Nam (45 signed documents as a result of solid diplomatic relations established during the time of mutual cooperation within the Council for Mutual Economic Assistance (CMEA), in contrast with Myanmar and Brunei is currently listed on the website Ministry of Foreign Affairs (MFA) none valid contract. In the case of Myanmar, which at the turn of 2011 and 2012 came from a military regime to a presidential republic, can be expected that some the bilateral agreements will appear in next years³⁰.

2.12 Commodity structure by Standard International Trade Classification

The traditional approach to the analysis of the commodity structure of foreign trade is to monitor the exports and imports of commodity classification by internationally used Standard International Trade Classification (SITC). Category SITC 1 will be used to classify imports into groups.

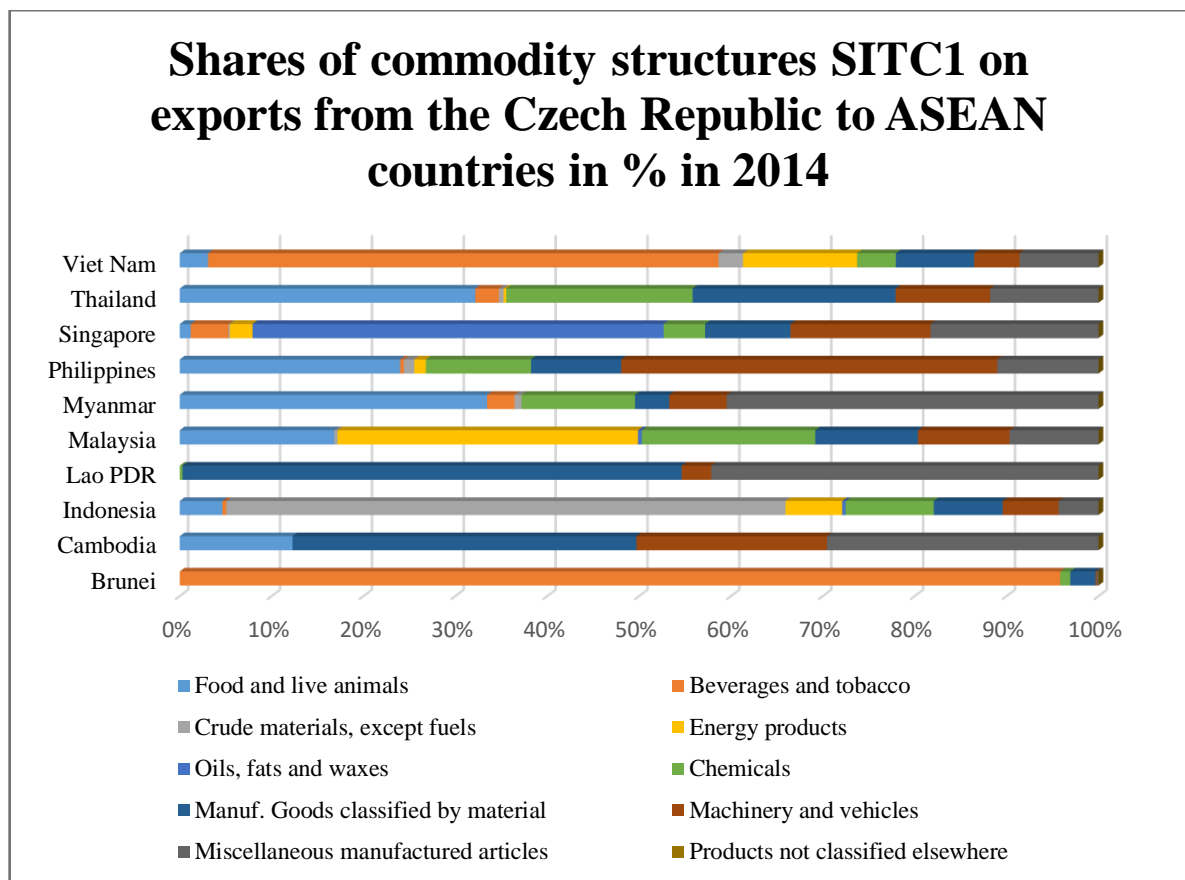
According to commodity structure of exports from the Czech Republic to ASEAN countries in 2014, the most numerous groups of exports were machinery and vehicles. Table 21 (in attachments) shows that other most numerous group of exports were miscellaneous manufactured articles, chemicals, manufactured goods classified by material, crude materials and food and live animals.

The Figure 1 shows proportion of each group of exports in overall exports from the Czech Republic to each country in 2014. Exports to Brunei were mostly created by beverages and tobacco reaching over 95%. Exports to Cambodia were more diverse, biggest parts of exports created manufactured goods classified by material, miscellaneous manufactured articles and machinery and vehicles. The Czech Republic exported to Indonesia mainly crude materials. Exports to Lao PDR were created by two main group of exports containing of manufactured goods classified by material and miscellaneous manufactured articles. The Czech Republic's

³⁰ Ministry of Foreign Affairs of the Czech Republic, *International agreements*.

exports to Malaysia were most diverse, exporting mainly energy products, chemicals, food and live animals, manufactured goods classified by material and machinery and vehicles. Exports to Myanmar were created mostly by food and live animals and miscellaneous manufactured articles. The biggest proportion of exports to Philippines were created by machinery and vehicles and food and live animals. Exports to Singapore were mainly oils, fats and waxes, machinery and vehicles and miscellaneous manufactured articles. The Czech Republic's exports to Thailand were also very diverse, containing by food and live animals, chemicals and manufactured goods classified by material. Exports to Viet Nam were mainly created by beverages and tobacco and energy products.

Figure 1 Commodity structure of exports from Czech Republic to ASEAN countries by SITC1 in 2014

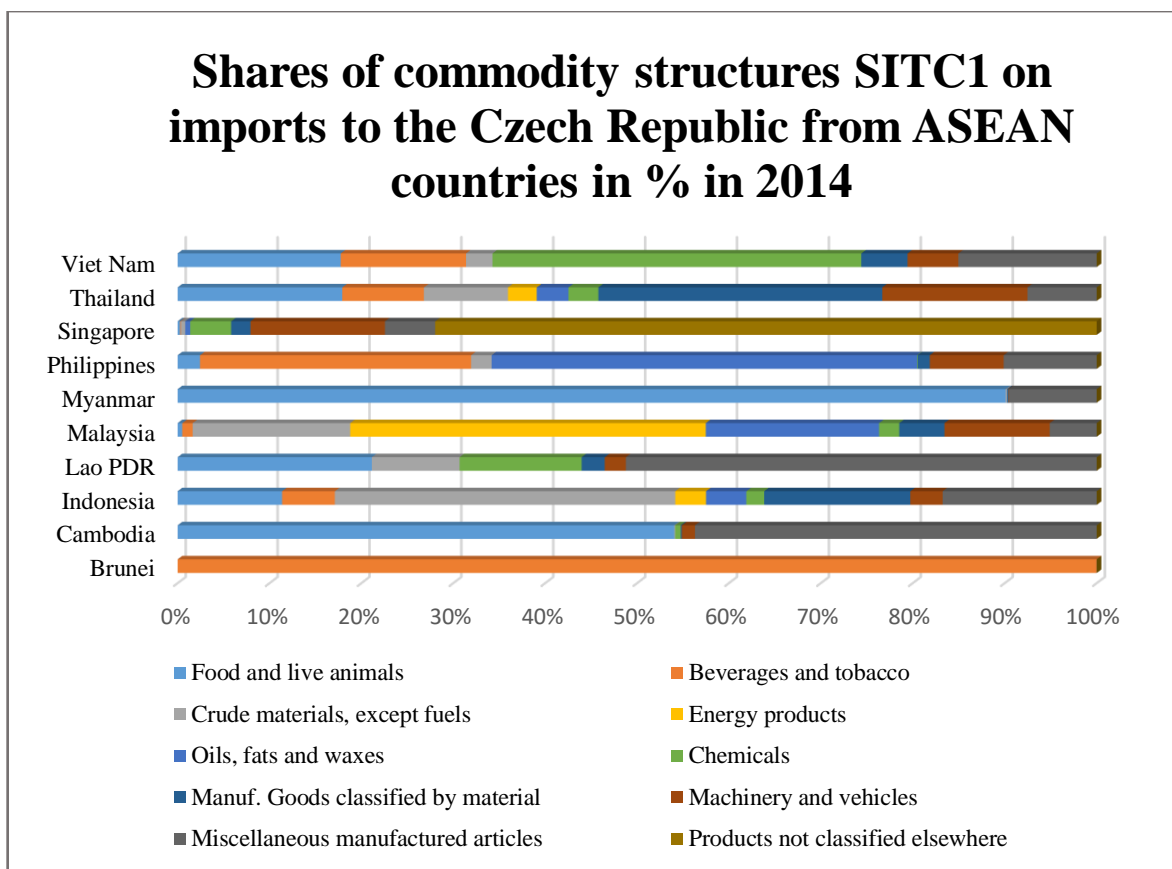


Own graph, source of data CSO

Overall imports to the Czech Republic from ASEAN countries were four times higher than exports from the Czech Republic to ASEAN countries in 2014, see the Table 22 (in attachments). Just the same as exports from the Czech Republic to ASEAN countries, also imports from the Czech Republic to ASEAN countries had as most numerous group machinery and vehicles. Other most numerous group of imports were miscellaneous manufactured articles, chemicals, manufactured goods classified by material, crude materials and food and live animals.

The Figure 2 shows proportion of each group of imports in overall imports from ASEAN countries to the Czech Republic in 2014. All imported goods from Brunei were beverages and tobacco. Imports from Cambodia were mainly food and live animals and miscellaneous manufactured articles. Indonesia imported to the Czech Republic mostly crude materials, manufactured goods classified by material, miscellaneous manufactured articles and food and live animals. More than half Lao's imports were created by miscellaneous manufactured articles, than food and live animals, chemicals and crude materials. Imports from Malaysia contained by energy products, oils, fats and waxes, crude materials and machinery and vehicles. Almost 90% of imports from Myanmar were food and live animals. Philippines imported to the Czech Republic beverages and tobacco, oils, fats and waxes. Singapore's imports were created by products not classified elsewhere and machinery and vehicles. Imports from Thailand were diverse contained of manufactured goods classified by material, machinery and vehicles, food and live animals. Imports from Viet Nam were also very diverse, created by chemicals, food and live animals, beverages and tobacco and miscellaneous manufactured articles.

Figure 2 Commodity structure of imports to the Czech Republic from ASEAN countries by SITC1 in 2014



Own graph, source of data CSO

3 DATA AND METHODOLOGY

During processing diploma thesis a literary search has been used, which consists of searching, collecting, sorting and processing of data and information. Analysed information data were obtained from relevant internet sources, specialized publications, reports, scientific articles and books. Data used in diploma theses are collected from the internet databases of Czech Statistical Office, EUROSTAT, World Bank and World Integrated Trade Solution (WITS).

The fulfilment of the objectives of this thesis requires the use of common and specific scientific methods to process the obtained data and subsequently used them for evaluation and formulation of conclusions and recommendations. The Statistica software, Microsoft Excel and WITS software will be used to compute and create statistical analysis. The Statistica software will be used to create descriptive statistics, correlation, standardization, cluster analysis. Microsoft Excel will be used to create Composite indicator, convergence, Balance of trade and Terms of trade. To compute Trade intensity index and Trade complementarity index WITS software will be used. Outcomes of these analysis will be presented in figures, tables and charts. There will be used many other methods such as data interpretation, comparison, deduction, analysis, generalization, induction, abstraction, synthesis and description.

Cluster analysis is a multivariate statistical method that is used to classify objects. This method was used to sort sub-indicators into clusters which units belonging to the same group are more similar than objects of different groups.

Other used method will be the composite indicator method and for its assessment the correlation of selected sub-indicators will be used. Analysis enabling the creation of composite indicator will be subjected to a normalization min-max method. Data processing is understood normalization process, which eliminates uneven impact or importance of selected variables. The resulting values of min-max method will be aggregated. Based on the

final outcome, ranking of individual ASEAN countries will be evaluated. And composite indicator index will be calculated.

Finally, from the development of composite indicators values we will observe whether values of composite indicators draw near i.e. converge or whether they draw apart i.e. diverge.

The results and discussion will summarize and evaluate achieved results, and best countries for trade cooperation will be chosen.

3.1 Trade Complementarity Index

The trade complementarity index displays to what amount the export profile of the reporter country matches the import profile of the partner country. A high index displays that countries can profit from increased trade. This can be useful when considering regional or bilateral trade agreements.

Mathematical Definition:

$$100 * \left[1 - \sum_k \left| \frac{m_{jk}}{M_j} - \frac{x_{ik}}{X_i} \right| \right]$$

Where x is the value of exports of product k from reporter country i , and X is country i 's total exports. Partner country j 's value of imports of product k is given by m , and its total imports value is denoted by M .

Range of values are 0 to 100. A value of 0 displays that two countries are perfect competitors, contrary a value of 100 displays ideal trading partners.

Limitations of trade complementarity index are distances between countries because transportation cost may be too high to make trade still favourable. Another limitation can be that index can undergo from aggregation bias³¹.

Trade complementarity index is trade indicator according World Bank. This indicator was selected to be used as a trade indicator in other statistical analysis computed below. To calculate trade complementarity index WITS online tool was used. Table 10 with calculated trade complementarity indexes can be found in attachments.

3.2 Trade Intensity Index

The trade intensity index works the same as revealed comparative advantage, but focuses on markets. It displays whether a reporter exports, as a percentage, to a partner than the world does on average. The calculation is made as country i 's exports to country j 's relative to its total exports divided by the world's exports to country j relative to the world's total exports.

Mathematical definition:

$$100 * \left[\frac{x_{ijk}}{X_{ik}} / \frac{x_{wjk}}{X_{wk}} \right]$$

Where x is the value of exports of product k from origin country i to destination j , and X is total exports from i of product k ; w indicates the world as origin.

Range of values are from 0 to $+\infty$. If a value is greater than 100, it displays more intense relationship than the world average for the partner³².

³¹ The World Bank, *Online Trade Outcomes Indicators, User's Manual, Version 1.0 September 2013. Trade complementarity index. p. 19*

³² The World Bank, *Online Trade Outcomes Indicators, User's Manual, Version 1.0 September 2013. Trade intensity index. p. 17*

The trade intensity index is trade indicator according World Bank. This indicator was selected to be used as a trade indicator in other statistical analysis computed below. To calculate trade intensity index WITS online tool was used. Table 11 with calculated trade intensity indexes can be found in attachments.

3.3 Cluster analysis

Cluster analysis is concerned with methods and algorithms through which associates data with similar characteristics to the cluster. They aim is to organize the data into meaningful structures to create taxonomies. Cluster analysis is a data analysis tool that classifies different objects into clusters so that the similarity of the two objects belonging to the same cluster is the maximum, while similarity to objects outside the cluster is minimal. Clusters can find relationships between objects without any further explanation or interpretation. In other words, cluster analysis is a structure between objects with no explanation of why they exist.

Cluster is a group of objects that are similar to each other and different from the objects not belonging to this group³³.

There are six stages in cluster analysis that need to be formulated:

Stage 1 – Objectives of Cluster analysis - research problem: selecting clustering variables

Stage 2 – Research design in Cluster analysis: correlation, Euclidean distance, data standardization

Stage 3 – Assumptions in Cluster analysis: focus on two critical issues – representativeness of the sample and multicollinearity among variables in the cluster variate

Stage 4 – Deriving clusters and assessing overall fit - Selecting a clustering algorithm: Hierarchical method – Ward's method

Stage 5 – Interpretation of the Clusters: name clusters based on clustering variables

³³JADCZAKOVÁ, Veronika. *Measuring proximity*. Brno, 2015.

Stage 6 – Validating and profiling the clusters: validation with selected outcome variables³⁴

The aim of cluster analysis is to compare ASEAN countries regarding selected trade related indicators. The aim is to find similarities and differences across regions over certain period of time.

3.3.1 Selecting of variables

Appropriateness of variables for analysis can be assessed both substantively and statistical terms. It is necessary to determine which variables are important for assessing the similarity of the object (objective, subjective). From a statistical point of view it is appropriate to the file to leave only the variables that are statistically independent.

To process cluster analysis and comparison of individual countries following indicators were selected:

- GDP per capita in \$US
- Unemployment rate (%)
- Trade Complementarity Index
- Trade Intensity Index
- FDI as % of GDP (mil. \$US)
- Inflation GDP deflator (annual %)

It was difficult to find indicators that are related with trade and also that are not highly correlated (influencing each other). Some of these selected indicators were selected because they are related with trade or they could influence while considering trade with other country. Some indicators were selected base on World Bank website, where trade indicators are described and summarized.

GDP per capita indicator was selected to consider wealth of the population, meaning higher GDP per capita higher spending of the population and higher demand for various products.

³⁴ HAIR, Joseph F. et al. *Multivariate data analysis: a global perspective*.

Unemployment rate was selected to find out the economic activity reflected by the labour market, showing how many people who are able to work do not have any. Trade complementarity index was selected to determine whether countries are ideal trading partners and can gain from increased trade or considering regional or bilateral agreements or if they are perfect competitors. Trade intensity index was selected to measure relationship with partner country. Foreign direct investments can give picture of international investment in reporting economy and shows if there are any enterprises in the economy managed by foreign country this is why this indicator was selected. Finally, inflation GDP deflator was selected to determine price changes in the economy, this can influence partnering country when considering trade.

3.3.2 Correlation and correlation matrix

Correlation matrix was made to assess dependency between variable marks in statistical file. It is used in case of incomparable units. Diagonal value is 1, which is full variable correlation itself – standardized variance. Other cells contain correlation of variables³⁵.

Based on performed correlation matrix any strong link between indicators was found. Therefore there is no necessity to exclude any of these indicators for following calculations.

Interdependence of variables can greatly influence the results of cluster analysis, this analysis does not use interdependent variables. For this reason, cluster analysis includes such indicators that are not correlated with each other, see the correlation matrix.

The correlation matrix contains pairwise correlation of coefficients of all variable pairs. The correlation matrix is symmetrical according to the diagonal and the main a diagonal holds ones. Symbolically, correlation matrix can be represented as:

³⁵ JADCZAKOVÁ, Veronika. *Overview of basic statistical methods*.

$$\mathbf{R} = \begin{bmatrix} r_{a,a} & r_{a,b} & r_{a,c} & r_{a,d} & r_{a,e} \\ r_{a,b} & r_{b,b} & r_{b,c} & r_{b,d} & r_{b,e} \\ r_{a,c} & r_{b,c} & r_{c,c} & r_{c,d} & r_{c,e} \\ r_{a,d} & r_{b,d} & r_{c,d} & r_{d,d} & r_{d,e} \\ r_{a,e} & r_{b,e} & r_{c,e} & r_{d,e} & r_{e,e} \end{bmatrix}$$

Source: Dolinar, Sean. *Making a correlation matrix*.

3.3.3 Data standardization

Before starting cluster analysis it is necessary to solve the question of whether use standardized data. It must respect the fact that most measures of distance is very sensitive to scaling, leading to different size of numeric characters. Generally, characters with a greater degree of variability meaning larger standard deviation have greater influence on the degree of similarity. Variables are expressed in different units therefore they need to be standardized before using them in further calculations³⁶.

The most common form of standardization is normalization of each character into its Z-score, i.e. by subtracting the mean and dividing the standard deviation. This standardization is known as Z-score.

$$Z_j = \frac{X_j - \bar{x}_j}{\sqrt{\text{var } x_j}}$$

Z_j is a dimensionless variable. This transformation eliminates differences in scale, often on the order of differing characters. Advantage of standardization of characteristics is that they can be in a uniform scale (where the average value of 0 and standard deviation 1) and

³⁶ HAIR, Joseph F. et al. *Multivariate data analysis: a global perspective*.

compare them is more easily. Positive values are above average, negative values are below the average. With the change of the scale there will be no change in standardized characters³⁷.

3.3.4 Squared Euclidean distance

In this thesis squared Euclidean distance will be used. Euclidean distance is straight line distance between two points.

$$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

Squared or absolute Euclidean distance is the Euclidean distance see the formula above without taken the square root. Clustering with the squared Euclidean distance is faster than clustering with regular Euclidean distance³⁸.

3.3.5 Measuring similarity between clusters

In this thesis Ward's method will be used, which is based on analysis of variance. Combines such clusters that have a minimum sum of squares. First, each object is itself a cluster and thus the distance from the centroid is zero. Distance from the centroid is found out by the square Euclidean distance. The criterion for joining clusters is the increase of total intragroup sum of squared deviations of observations.

This increase is expressed as the sum of the squares in the emerging cluster, and it is reduced by the sum of the squares of the disappearing clusters. Ward's method creates clusters by maximizing intragroup homogeneity. The indisputable advantage of this method is its efficiency and tendency to remove small clusters and form clusters of similar size. This method is only used in conjunction with the square Euclidean distance³⁹.

³⁷ JADCZAKOVÁ, Veronika. *Measuring proximity*. Brno, 2015.

³⁸ JADCZAKOVÁ, Veronika. *Measuring proximity*. Brno, 2015.

³⁹ HAIR, Joseph F. et al. *Multivariate data analysis: a global perspective*.

3.3.6 Hierarchical cluster procedure

To perform cluster analysis, several clustering methods, which can be classified in many ways, must be used. One of the criteria by which these methods are classified is the method of clustering. According to the process of clustering, i.e. according to the objectives for which the individual methods are directed, the cluster analysis divided into a non-hierarchical and hierarchical. For this thesis hierarchical method of clustering will be used.

The main objective of hierarchical clustering is the gradual joining of objects based on their similarity, whereby it is not necessary to define the number of clusters in advance. The result of clustering is a hierarchy of objects.

For hierarchical clustering method, there are two methods which differ in the way in which the clustered objects. This is a divisive and agglomerative approach. Method of agglomerative clustering will be used.

Agglomerative approach is used in cases where the individual objects are grouped sequentially, until all objects are grouped into one unit. At the beginning of clustering is determined assumption that each object is unique and is considered a separate cluster, this means that we have n clusters. According to the distance matrix of $n \times n$ type, two objects that are the most similar and are the closest are selected, i.e. they have a minimum distance between each other. These objects are merged into a single cluster, the distance matrix is recalculated and the shortest distance between objects is searched again. Clustering process ends when a single cluster is formed, containing all the n elements. Graphic representation of the hierarchical clustering is dendrogram, which helps in determining the appropriate number of clusters⁴⁰.

⁴⁰ HEBÁK, Petr. et al.: *Statistické myšlení a nástroje analýzy dat*.

3.3.7 Dendrogram

The dendrogram is a graph which generally shows the results of the agglomerative clustering. It is a graphical representation of a sequence of pairs, where is non-decreasing sequence of levels of merging and is categorizing objects to corresponding level. In the left column of the graph there are individual objects, other columns represent clusters in which the objects were classified and line length represents the distance between clusters. The dendrogram of similar objects is standard output of clustering of the hierarchical methods from which should be apparent structure objects in clusters. The dendrogram of similar character reveals generally m-tuple character, but mostly a pair or a trio characters that are similar and highly correlated together. These characters, which are common in the cluster, are then substitutable. From this may occur that there is no need to find out some characters or compute because they can be replaced by other characters that have greater explanatory value⁴¹.

3.3.8 Determination of the optimal number of clusters

We can say that there is no objective way to determine the most optimal number of clusters in cluster analysis. For this reason, some criteria are used that can help determine the optimal number of clusters or at least estimate. The simplest method is to derive the number of clusters based on the dendrogram, it is a visual method. This method will be used in this thesis. The tree diagram can be displayed in both horizontal and vertical form. On the y-axis shows the individual objects and on the X axis the distance. Best clusters consist of short dendrogram branches. The disadvantage of this method is a subjective evaluation of individual clusters.

⁴¹ HAIR, Joseph F. et al. *Multivariate data analysis: a global perspective*.

3.4 Composite indicator

Although the composite indicators in recent years gained a lot of attention, this concept is something completely new. A composite indicator is constructed on the basis of several individual indicators (sub-indicators). These sub-indicators are often incompatible, because they are defined in different units. In this manner they express diverse level variability and degree of mutual dependence. Finally, it should be noted that each sub-indicator can have a different weight. Based on this characteristics further steps in the construction of the composite indicator are derived⁴².

The composite indicator is an important indicator, which is often used in international comparative national figures. Among the indisputable advantages composite indicator includes transparency, since summarizes a number of indicators. Areas of researched topics using the method of composite indicator are very diverse. Parts of these topics are areas of economic freedom, attractiveness of given country, competitiveness, prosperity, quality of life, etc.)⁴³.

3.4.1 Selection of sub-indicators

After defining the theoretical framework the selection of indicators to the aggregate index. The selection of sub-indicators largely influences strong and weak sides of composite indicators. Choice of variables should therefore be established based on their relevancy, accuracy, availability and reliability⁴⁴.

⁴² OECD Publications, 2, *Handbook on Constructing Composite Indicators*.

⁴³ JADCZAKOVÁ, Veronika. *Composite indicators*. Brno, 2015.

⁴⁴ OECD Publications, 2, *Handbook on Constructing Composite Indicators*.

To process composite indicator following indicators were selected:

- GDP per capita in \$US
- Unemployment rate (%)
- Trade Complementarity Index
- Trade Intensity Index
- FDI as % of GDP (mil. \$US)
- Inflation GDP deflator (annual %)

At this point it should be noted that it is necessary to distinguish the indicators for which important to achieve the highest levels - MAX indicators (e.g. economic growth, employment, level of education) and for which it is necessary to achieve the lowest levels - MIN indicators (e.g. mortality, level of corruption, amount of emissions). As regards the optimal indicators (OPT), it is desirable to achieve optimum values. Between examples where it is desirable to achieve optimum values include fertility and the median age⁴⁵.

3.4.2 Standardization

Next step in construction of composite indicator is data standardization. Data standardization is important because it transform original values into dimensionless which can be then easily aggregated.

For standardization method min-max or re-rescaling will be used. Min-max method transform scale to hundred-point scale from 0 to 100. Min and max represent the smallest and largest file unity determined the value of the indicator. Point values can be aggregated, correlation coefficients with these transformations in absolute values and change outliers are eliminated⁴⁶.

⁴⁵ JADCZAKOVÁ, Veronika. *Composite indicators*. Brno, 2015.

⁴⁶ MINAŘÍK, et al. *Analýzy v regionálním rozvoji*.

The min-max method normalizes indicators transformation from initial values to a hundred-point scale. Max type indicator max is calculated on a dimensionless point value.

$$B_j = \frac{X_j - \min\{X_j\}}{\max\{X_j\} - \min\{X_j\}} 100$$

Min type indicator is normalized opposite way, the value subtracted from the maximum value of the variable and divide the variation range.

$$B_j = \frac{\min\{X_j\} - X_j}{\max\{X_j\} - \min\{X_j\}} 100$$

Outliers are removed, correlation coefficients of this transformation will remain unchanged and the resulting values can be aggregated without further intervention. The disadvantage of this method is that it is based on the minimum and maximum values and if these values outliers, it adversely affects such modified indicators. Other disadvantage is different variation, which can be eliminated only partially⁴⁷.

3.4.3 Aggregation

Last step in the creation of composite indicator is aggregation. Aggregation adds several options how to work with indicators. There are two ways how to aggregate composite indicator: weighted average approach and weighted sum approach. Weighted average approach is used when missing values are present and weighted sum approach is used if there are no missing values in dataset.

Next step is to check if there are any missing values in our dataset, based on present or no present missing values we choose a method of aggregation. Missing values mean that values

⁴⁷ OECD Publications, 2, *Handbook on Constructing Composite Indicators*.

for one or more variable are not available. Allowable missingness is below 5%⁴⁸. Fortunately, there are not missing values in our dataset.

The aggregation using a weighted mean approach will be used in our case. Aggregation is used to produce dimensionless composite indicator^{49 50}.

The resulting value of the composite indicator is affected by using the aforementioned methods of standardization, meaning various methods lead to different results.

3.4.4 Expressing a value of composite indicator as index

A value of composite indicator can be expressed in relative terms, meaning in relation to its mean value. To compute index value we divide mean of the first row with overall mean of composite indicator in the dataset and multiply by 100. This gives us index value in percentage.

3.5 Measuring convergence

Generally, convergence means that the difference between the two variables decreases during time until the difference between variables is negligible and converges to zero. Convergence is a term denoting concurrence, a development which leads to a rapprochement. The opposite of convergence is the divergence. Divergence is a concept indicating a deviation, a development which leads to stagnation.

One of the objectives of this thesis is also assessing developments of disparities in the development of composite indicators ASEAN countries, i.e. assessment of the degree of convergence or divergence in composite indicators. It is therefore necessary to define the term convergence and methods of evaluation, which is the content of this subchapter.

⁴⁸ JADCZAKOVÁ, Veronika. *Composite indicators*. Brno, 2015.

⁴⁹ JADCZAKOVÁ, Veronika. *Composite indicators*. Brno, 2015.

⁵⁰ MINAŘÍK, et al. *Analýzy v regionálním rozvoji*.

The term convergence expresses the difference between two (or more) variables in time decreases. If we consider only the two countries, then the convergence a variable y in these two countries in the period between t and $t + s$ occurs if:

$$|y_{1,t} - y_{2,t}| > |y_{1,t+s} - y_{2,t+s}|$$

where $y_{1,t}$ is the value of the variable y at time t in the first country and $y_{2,t}$ is the value of the variable y at time t in another country⁵¹.

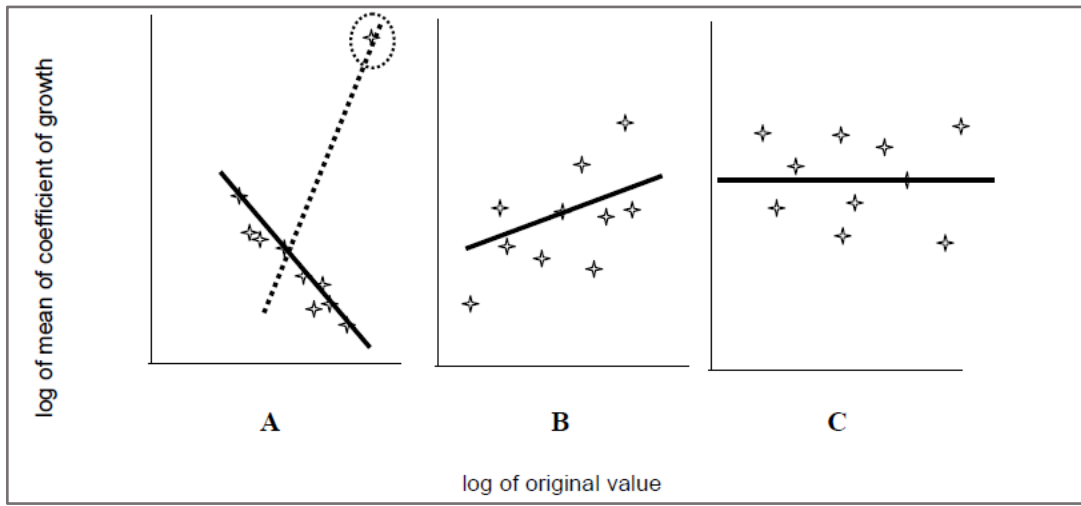
Standardly in the literature we can find two evaluation methods convergence at country level. The methods of beta and sigma convergence. Both methods have their basis in neoclassical theory. Individual methods are described in the following lines.

Beta-convergence – expresses the situation where initially poorer countries grow faster than richer ones and this leads to reducing disparities between countries. Conversely, if units showing initially low values, evinced lower growth than units showing initially high values, units would draw apart, we are talking about divergence⁵².

⁵¹ SLAVÍK, C. *Reálná konvergence České republiky k Evropské unii v porovnání s ostatními novými členskými zeměmi. Politická ekonomie.*

⁵² JADCZAKOVÁ, Veronika. *Measuring convergence.*

Picture 3 Beta-convergence



Source: JADCZAKOVÁ, Veronika. *Measuring convergence*, Lectures.

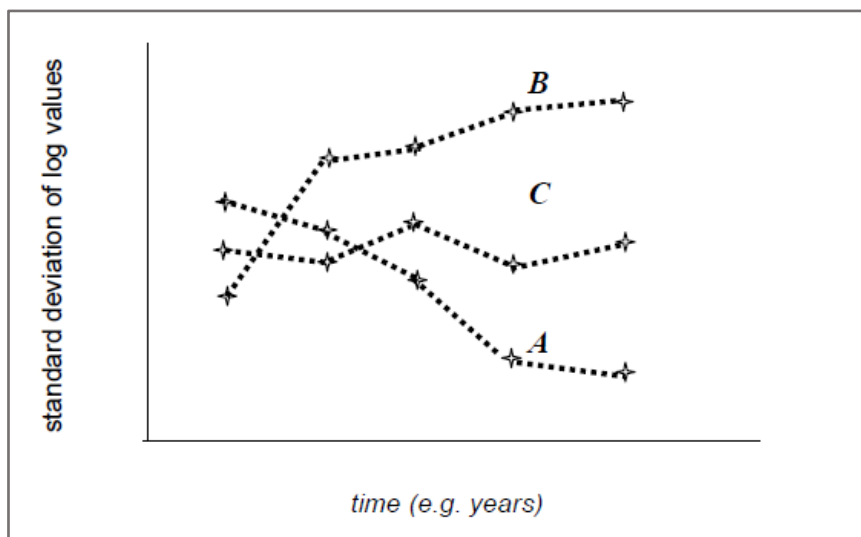
Base year values are plotted on x-axis (or their log-values if values are skewed) and mean coefficient of growth on y-axis (more precise is logarithm of mean coefficient of growth) and scatter to be fitted by a straight line is obtained.

Picture 3 shows three examples of beta-convergence. A shows a strong convergence, where one disparity element appears referred by the dotted line. B shows lower level divergence, where is a line of moderate slope and low coefficient of determination. C shows neither convergence nor divergence. Coefficient of determination is zero and line is parallel to x-axis.

Sigma-convergence - is defined similarly intuitively, if convergence takes place, then variability of values systematically decreases in time. If original data are skewed we use log-values. Variability of values are measured by standard deviation. Contrarily, divergence occurs when standard deviation increases systematically⁵³.

⁵³ JADCZAKOVÁ, Veronika. *Measuring convergence*.

Picture 4 Sigma-convergence



Source: JADCZAKOVÁ, Veronika. *Measuring convergence*, Lectures.

Observed years are plotted on x-axis while standard deviation of log values are plotted on y-axis. Dotted line A shows convergence, because standard deviation of log values declines in time systematically. Contrarily, dotted line B shows divergence, because standard deviation of log values rises in time systematically. And dotted line C shows neither convergence nor divergence, because variability does not change in time and standard deviation of log values fluctuates around constant⁵⁴.

⁵⁴ JADCZAKOVÁ, Veronika. *Measuring convergence*.

4 RESULTS AND DISCUSSION

The aim of this chapter is to use all methods explained in previous chapter to figure out what ASEAN countries are suitable for trade cooperation. To fulfil the objectives the thesis statistical methods will be used in this chapter and to determine the desired outcome, planned empirical investigation will be implemented. Each performed analysis will help to achieve the final result. At the end of this chapter is a summary of the results where the best country for trade cooperation will be determined. Discussion will evaluate this thesis and the critical part of this thesis will be highlighted and comparison the results with results of selected works of other authors will be done.

4.1 Analysis of imports, exports, trade balance and terms of trade

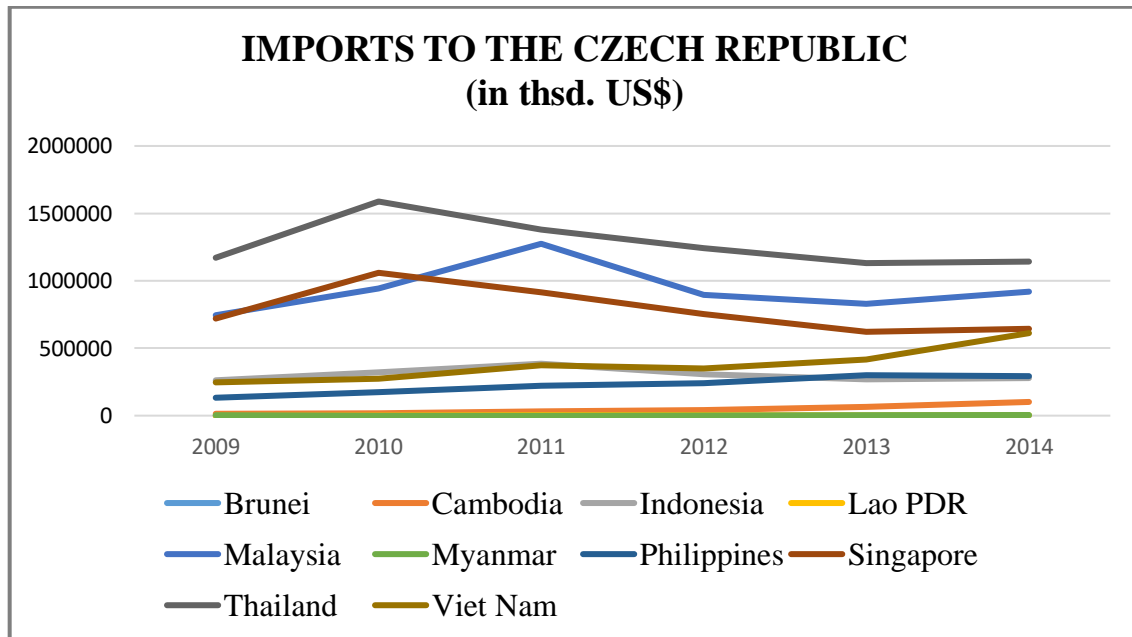
This subchapter will give us insight into real amounts of imports and exports are traded between the Czech Republic and ASEAN countries. The development of imports, export, trade balance and terms of trade during observed time period of 6 years.

4.1.1 Imports

The Figure 3 shows the development of import from ASEAN countries to the Czech Republic during years 2009 – 2014. As we can see Thailand have the highest numbers in imports during all observed years from 2009 - 2014. Imports were increasing from 2009 to 2010, since then numbers of imports have slightly decreasing tendency. The second highest imports are obtained by Malaysia. Malaysia's imports were increasing since 2009 up to 2011, then imports started to decrease and in 2014 imports were increasing again. Singapore's tendency worth mentioning because as we can see from the figure above it has the same shape as Thailand's tendency. Imports were rising to 2010 and since then started to slightly decrease. Vietnamese imports are increasing since 2009 to 2014 with exception of 2012 small fall.

Imports of Indonesia were increasing up to 2011 and then started to decrease linearly. Brunei, Cambodia, Lao PR, Myanmar and Philippines have the lowest number of imports to the Czech Republic and their import tendency are very similar with slightly increasing tendency.

Figure 3 Imports from ASEAN countries to the Czech Republic (2009-2014)

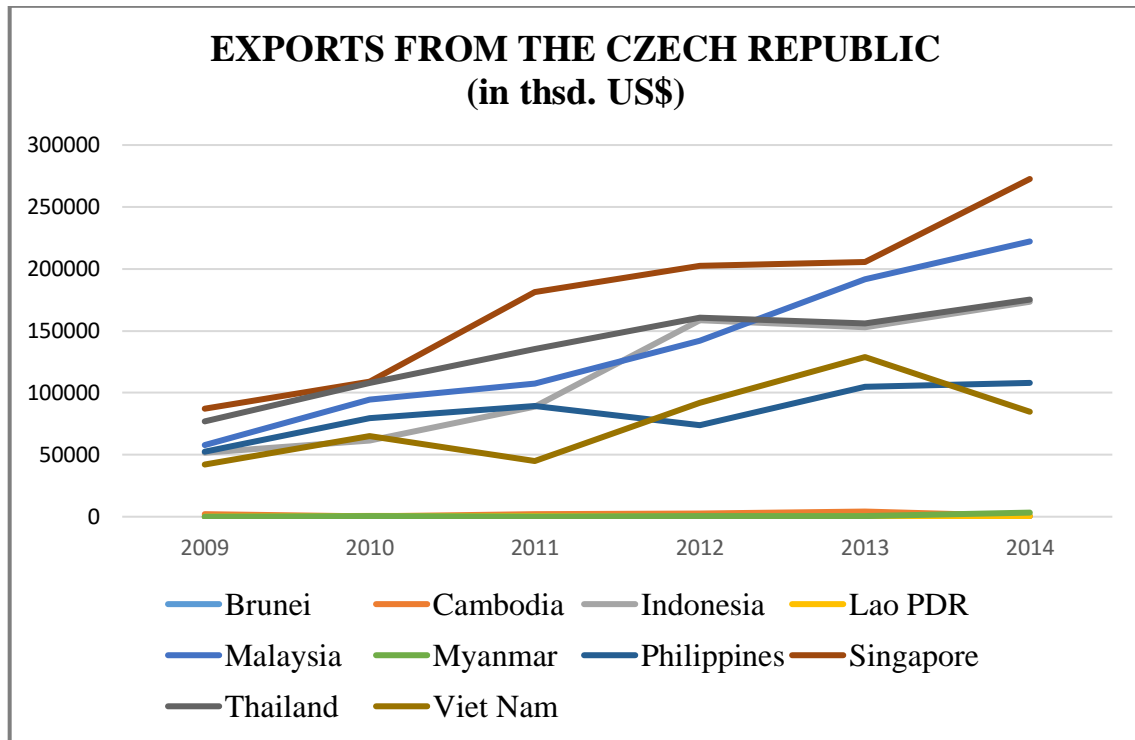


Source of data: CSO, own work

4.1.2 Exports

The Figure 4 shows overall export from ASEAN countries are increasing. Singapore has the highest exports from the Czech Republic from all ASEAN countries and having highest progress over the time. Exports to Thailand have increasing tendency with exception of small fall during 2012-2013. Exports to Malaysia as well as to Indonesia are increasing all the time from 2009 to 2014 showing large progress. Exports to Philippines and Viet Nam are fluctuating from year to year but overall showing small increase. From tendency of Brunei, Cambodia, Lao PDR and Myanmar we can see that exports have the same linear tendency.

Figure 4 Exports from ASEAN countries to the Czech Republic (2009-2014)



Source of data: CSO, own work

4.1.3 Balance of trade

Balance of trade is calculated as country's export minus its imports.

Mathematical definition:

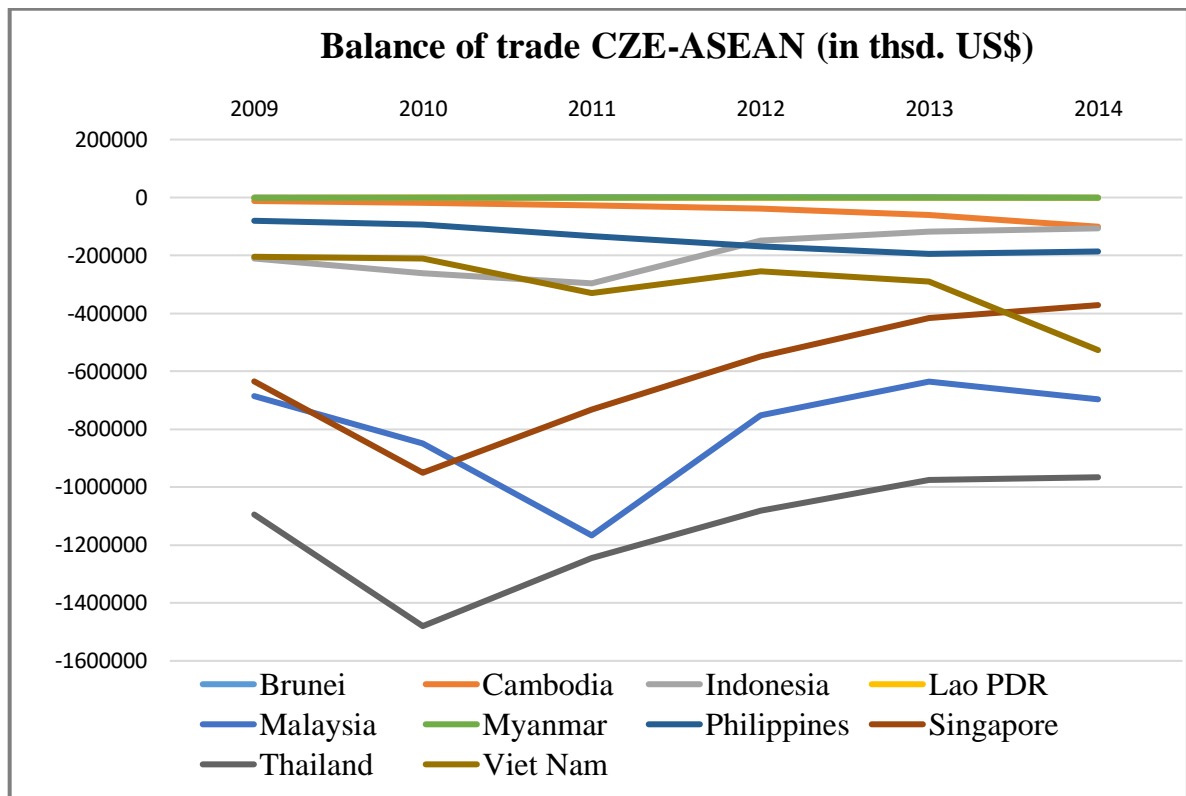
$$\text{BoT} = \text{exports} - \text{imports}$$

When a country imports more than it exports, the result is negative it is called trade deficit.

When opposite is true, result is positive and it is called trade surplus⁵⁵.

⁵⁵ Investopedia, *Balance of trade*, [online]

Figure 5 Balance of trade ASEAN countries – Czech Republic



Source of data: CSO, own work

Overall, Figure 5 shows mostly negative numbers resulting trade deficit. This means that the Czech Republic imports more than exports from ASEAN countries. There is only one exception which is Brunei, showing trade small trade surplus. Biggest trade deficit is created by Thailand showing highest deficit in 2010. Thailand's deficit is followed by Malaysia's deficit creating second largest deficit from ASEAN countries. Singapore create the third place showing similar tendency like Thailand also highest decrease in 2010. Vietnamese tendency is decreasing which means there are continuously increasing exports from Viet Nam to the Czech Republic. Other countries have similar tendency showing smaller deficit than above mentioned countries.

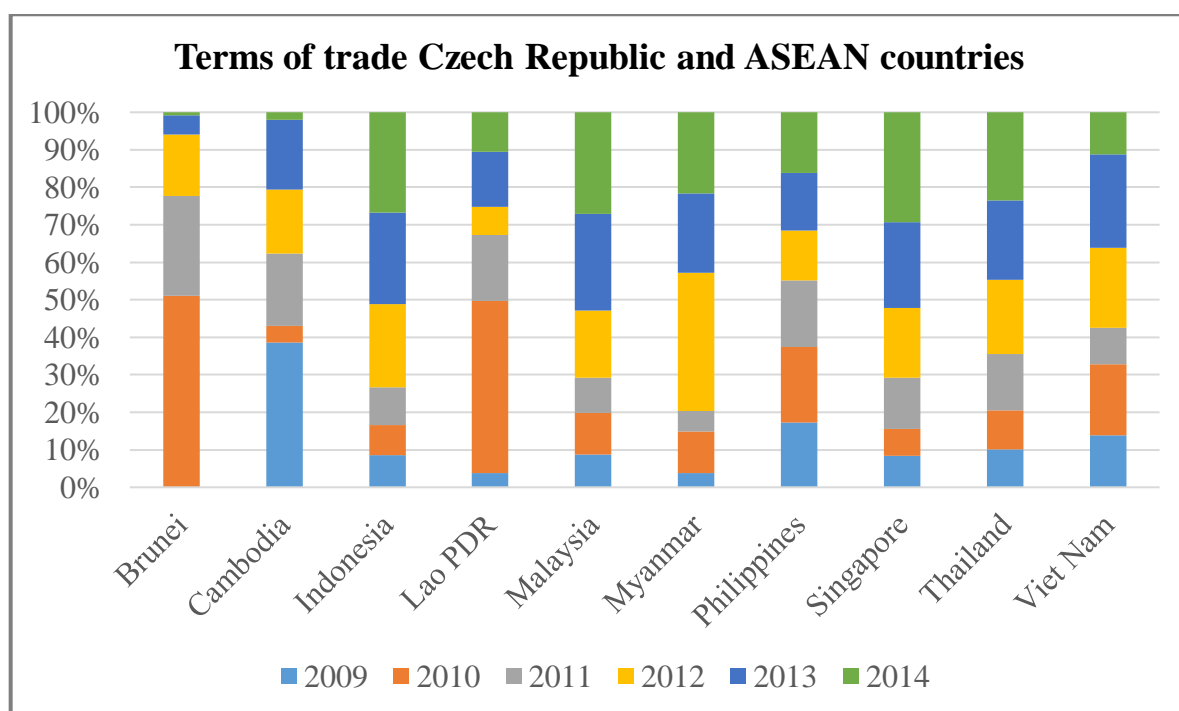
4.1.4 Terms of trade

Terms of trade is a value of the country's exports relative to the value of its imports. Terms of trade is calculated by dividing the value of the exports by the imports and the result is multiplied by 100. More capital is going out than coming in when terms of trade is less than 100%. Country is accumulating more money from exports than is spending when term of trade is greater than 100%⁵⁶.

Mathematical definition:

$$\text{ToT} = (\text{exports/imports}) * 100$$

Figure 6 Terms of trade of the Czech Republic and ASEAN countries



Source of data: CSO, own work

⁵⁶ Economics Online, *Terms of trade*. [online]

The Table 10 (in attachments) shows that only Brunei from all ASEAN countries has higher terms of trade than 100%. From 2010 when terms of trade reached 126.50% the tendency is dramatically decreasing year by year reaching 183.97% in 2014. Only Myanmar exceeded borderline of 100% in 2012 reaching 120.43%. In 2010 Lao PDR almost approached borderline 100% reaching 92.47%. Terms of trade in other countries have not reached high percentage over observed time period. Overall, it is obvious that more capital from ASEAN countries is going out to the Czech Republic than coming in with only one exception of Brunei. In case of Brunei, the Czech Republic is accumulating more money from exports than is spending.

The Figure 6 shows overview of terms of trade between the Czech Republic and ASEAN countries in years 2009-2014. Brunei's terms of trade have been changing dramatically during observed period of time. In 2009 there was no trade between the Czech Republic and Brunei in contrast with 2010 when terms of trade created 50% of overall terms of trade between years 2009-2014. From 2011 terms of trade in Brunei started to decrease up to 2014. Terms of trade between the Czech Republic and Cambodia have irregular tendency. In 2009 terms of trade reached up to 40%, in contrast with 3% in 2010. Lao PRD similarly as Brunei has reached 45% in 2010 and other years has much lower percentage of terms of trade. Myanmar has highest percentage of terms of trade in 2012 reaching 38%. Other countries such as Indonesia, Malaysia, Singapore, Thailand and Viet Nam have from 2009 to 2014 increasing tendency of terms of trade with the Czech Republic.

4.2 Descriptive statistics and correlations

Before calculating cluster analysis and composite indicator some statistical characteristics must be analysed. By using Statistica software these statistical characteristics were calculated: mean, median, minimum, maximum, variance, standard deviation, skewness and kurtosis.

Table 1 Descriptive statistics

Variable	Descriptive Statistics							
	Mean	Median	Minimum	Maximum	Std.Dev.	Coef.Var.	Skewness	Kurtosis
GDP per capita (USD)	12673,8	3186,05	1094,6	56007,3	19447,38	153,445	1,821	2,143
Unemployment (%)	2,5	2,45	0,2	7,1	2,03	81,388	1,208	2,110
TCI	46,02	58,01	0	62,66	24,74	53,762	-1,618	1,044
TII	7,36	6,56	0,07	27,67	8,58	116,615	1,571	2,964
FDI % of GDP (mil. US\$)	5,99	3,23	0,92	22,36	6,43	107,273	2,172	5,062
Inflation, GDP deflator (annual %)	3,39	2,85	-0,3	10,1	3,23	95,317	0,967	0,683

Source of data: WB, WITS, own work using Statistica

As Table 1 shows, the first indicator GDP per capita reaches the highest mean values, reaching 12673.8 \$US as well as median reaching 3186.05 \$US. On the other hand, lowest values in mean and median represents unemployment rate.

GDP per capita reaches also highest values in variation coefficient, this means that GDP per capita has the highest variability. Contrarily, lowest variability has also TCI.

Values of GDP per capita, unemployment rate, trade intensity index, FDI and inflation GDP deflator are positively distributed meaning these indicators have a right-sided asymmetry. In case of GDP per capita, high portion of people have low GDP per capita and low portion of people have high GDP per capita. High portion of countries have low unemployment rate, low portion of countries have high unemployment rate. Also, high portion of countries have low trade intensity index, low portion of countries have high trade intensity index. High portion of countries have low FDI, low portion of countries have high FDI. High portion of

countries have low and inflation GDP deflator, low portion of countries have high and inflation GDP deflator.

Only trade complementarity index is negatively skewed, meaning left-sided asymmetry of the distribution. Low portion of countries have high trade complementarity index and high portion of countries have low trade complementarity index.

All indicators have positive kurtosis meaning that is higher than expected. The higher the kurtosis, the greater peak distribution of the indicators. The lower the kurtosis, the flatter distribution of the indicators. The highest value of kurtosis represented by FDI reaching 5.06234 meaning the greatest peak distribution of the indicators. The indicator Inflation GDP deflator displays lowest value which means relatively flat distribution.

For the construction of cluster analysis and composite indicator it is important to compute dependencies between sub-indicators. Pearson coefficient of correlation will be used to find out relationships between variables. Intensity of relationship can be different. If the correlation coefficient is equal to 1 or -1, the greater interdependency. From Table 2 below it is obvious that no major relationship is found between these indicators. Data reduction is not necessary since no major relationships were found and these indicators can be used for construction of cluster analysis and composite indicator.

Table 2 Correlation matrix of selected trade indicators

Correlation matrix 2014						
Variable	GDP per capita (\$US)	Unemployment (%)	TCI	TII	FDI % of GDP (mil. \$US)	Inflation, GDP deflator (annual %)
GDP per capita (USD)	1	0,156	0,267	0,016	0,643	0,112
Unemployment (%)	0,156	1	0,091	0,580	-0,111	0,377
TCI	0,267	0,091	1	0,474	-0,051	0,095
TII	0,016	0,580	0,474	1	-0,048	-0,228
FDI % of GDP (mil. US\$)	0,643	-0,111	-0,051	-0,048	1	-0,485
Inflation, GDP deflator (annual %)	0,112	0,377	0,095	-0,228	-0,485	1

Source of data: WB, WITS, own work using Statistica

4.3 Cluster analysis

First correlation matrix needs to be done. It is important to find out if there is any dependence between indicators. If a strong dependence between variables is present, variables must be excluded.

Correlation matrix Table 2 was made to assess dependency between variable marks in statistical files. It is used in case of incomparable units. Diagonal value is 1, which is full variable correlation itself – standardized variance. Other cells contain correlation of variables.

Based on performed correlation matrix no strong link between indicators was found. Therefore there is no necessity to exclude any of these indicators for following calculations.

Variables are expressed in different units therefore they need to be standardized before using them in further calculations see Table 14 (in attachments).

After standardization of data, data are comparable and can be used for calculations.

Table 3 Dissimilarity matrix (based on squared Euclidean distance)

Case No.	Euclidean distances									
	Brunei	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
Brunei D.	0	3,9	2,62	4,72	3,63	3,38	4,63	4,61	3,76	3,01
Cambodia	3,9	0	2,14	2,08	2	3,08	4,84	3,9	1,87	1,68
Indonesia	2,62	2,14	0	3,13	1,68	2,45	3,36	4,42	1,66	0,67
Lao PDR	4,72	2,08	3,13	0	3,13	2,49	5,1	4,44	2,93	2,93
Malaysia	3,63	2	1,68	3,13	0	3,47	3,85	4,1	0,95	1,44
Myanmar	3,38	3,08	2,45	2,49	3,47	0	4,54	5,3	3,4	2,81
Philippines	4,63	4,84	3,36	5,1	3,85	4,54	0	5,12	3,91	3,47
Singapore	4,61	3,9	4,42	4,44	4,1	5,3	5,12	0	4,39	4,12
Thailand	3,76	1,87	1,66	2,93	0,95	3,4	3,91	4,39	0	1,28
Viet Nam	3,01	1,68	0,67	2,93	1,44	2,81	3,47	4,12	1,28	0

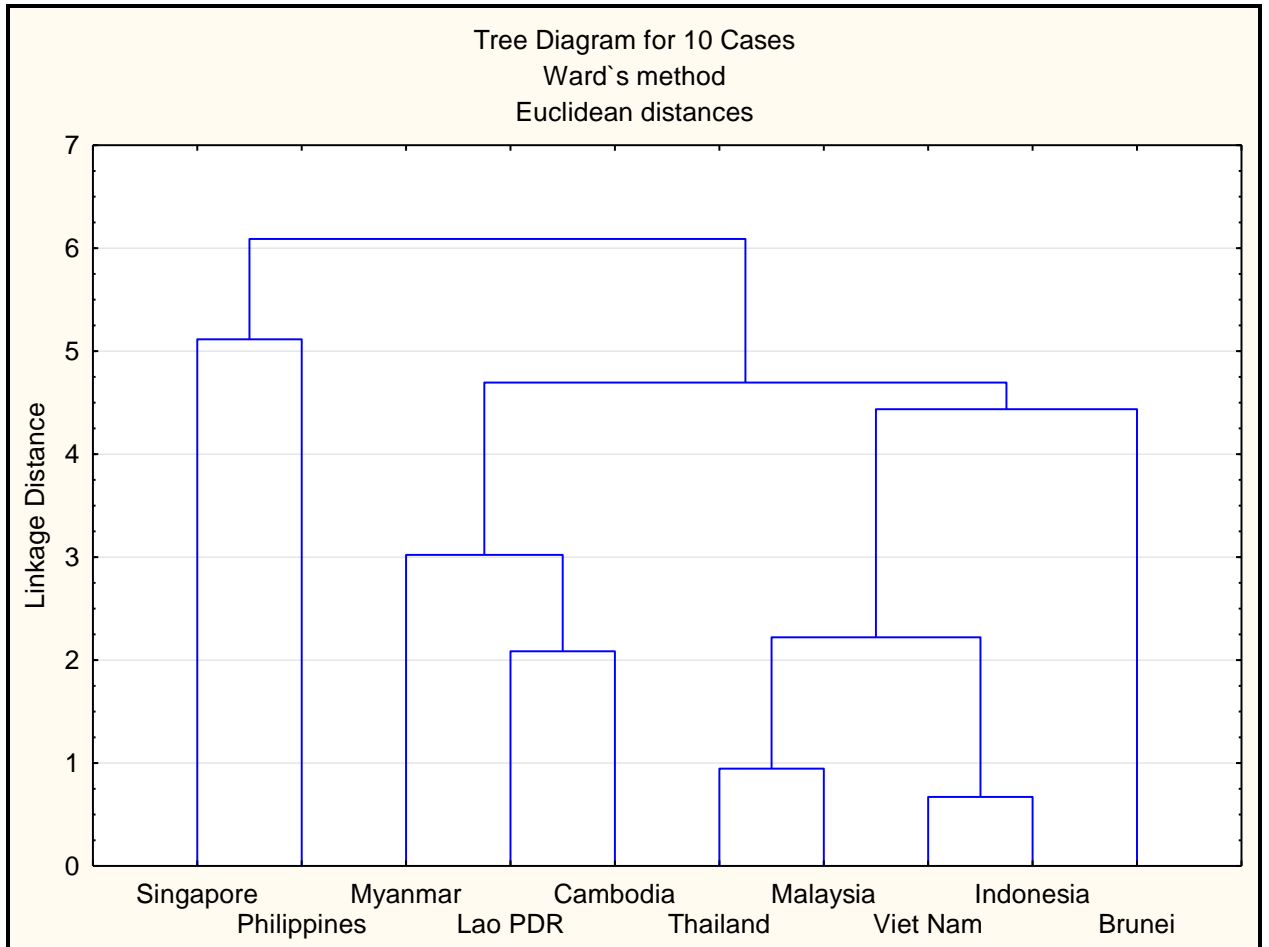
Source of data: World Bank, WITS, own work

From dissimilarity matrix Table 3 is obvious that Indonesia and Viet Nam show the lowest (squared Euclidean) distance which is 0.67 and point to the greatest similarity.

Contrarily, Singapore and Myanmar show the highest (squared Euclidean) distance which is 5.3 and point to the greatest dissimilarity.

Squared distance was selected as a distance measure and clusters were constructed using Ward's method. Dendrogram demonstrates the whole procedure graphically – countries were plotted on the x-axis and distance at which clusters were combined was plotted on the y-axis.

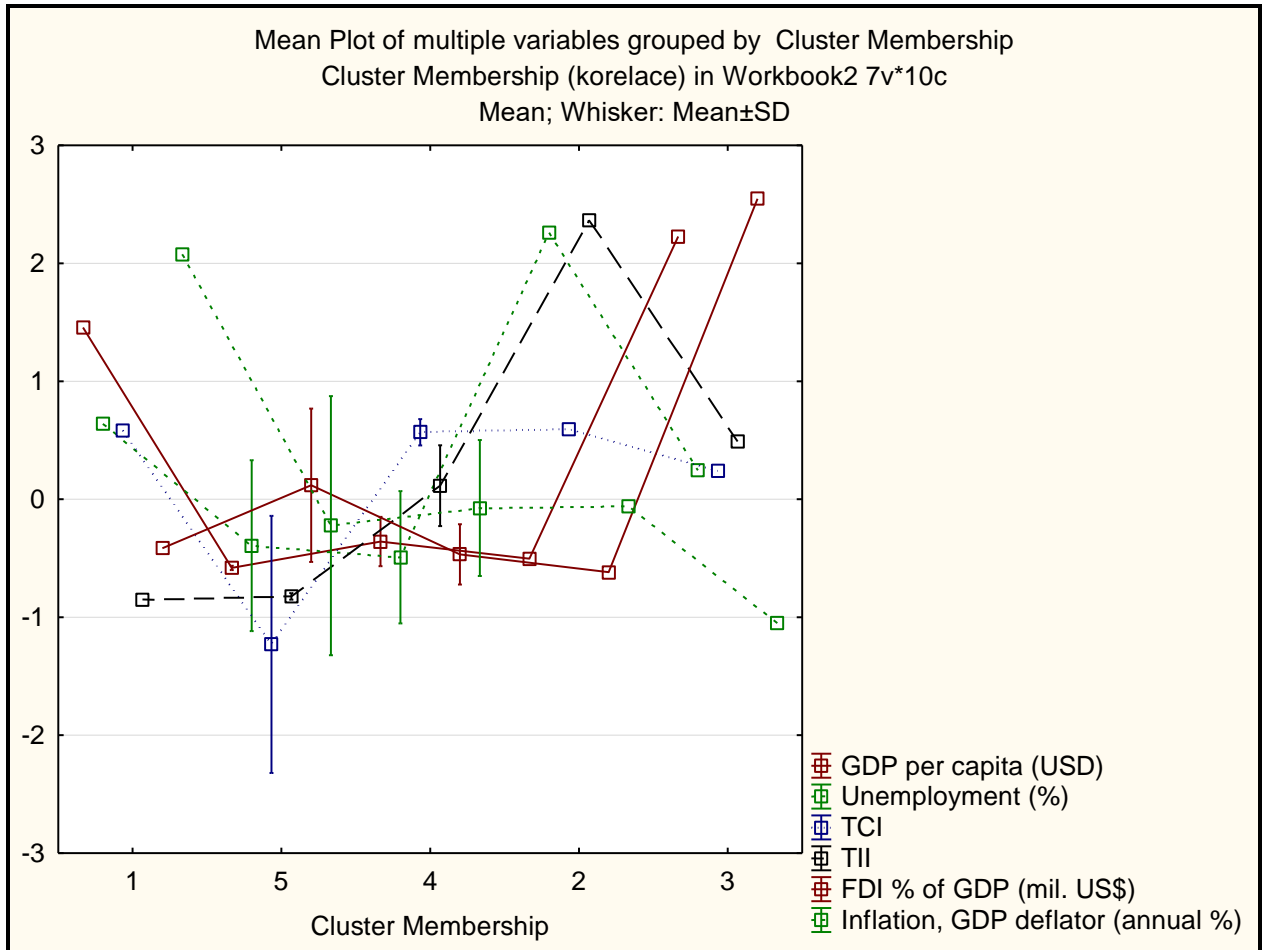
Figure 7 Dendrogram of countries (using Ward's method and squared Euclidean distance)



Own work using Statistica software

A dendrogram Figure 7 along with amalgamation schedule Table 16 (in attachments) manifests, Indonesia and Viet Nam merged together at first. Then Malaysia and Thailand merged together and Cambodia and Lao PRD. In the fourth step Indonesia, Viet Nam, Malaysia and Thailand gave a rise to cluster 1. In the next step cluster 2 was created by Cambodia, Lao PDR and Myanmar. Cluster 3 was created in sixth step consisting of Brunei. In the eighth step were created last two single member clusters, cluster 4 involving Philippines and cluster 4 involving Singapore.

Figure 8 A profile-diagram, heterogeneity of the clusters



Own work using Statistica software

Profile diagram (Figure 8) demonstrates mean values of standardized variables (y-axis) for respective clusters (x-axis). The whiskers represent standard deviations of a given variable and indicate the level of cluster homogeneity with respect to a measured indicator. Cluster 5 is most heterogeneous cluster while clusters 1, 2, 3 are most homogeneous clusters. These clusters are homogeneous because they are only one member clusters.

Description of each cluster together with interpretation of the result is contained in the Table 4.

Table 4 Interpretation of cluster analysis results

Cluster identification	Involved countries	Cluster description
Cluster 1	Brunei	For this cluster is characteristic high Inflation GDP deflator and lowest TII.
Cluster 2	Philippines	For this cluster is typical highest TII and low GDP per capita.
Cluster 3	Singapore	For this cluster is characteristic highest GDP per capita and lowest Inflation GDP deflator.
Cluster 4	Indonesia, Malaysia, Thailand, Viet Nam	This cluster is relatively heterogeneous with high TCI and lowest unemployment.
Cluster 5	Cambodia, Lao PDR, Myanmar	This strongly heterogeneous cluster involves countries with second highest FDI and lowest TCI.

Own work

4.4 Composite indicator

The Table 5 displays summary of trade indicators. This table contains division of indicators based on the min or max type. GDP per capita is assigned at max type indicator. The higher GDP per capita the higher welfare for population. Unemployment rate was set as a min type indicator, because less people unemployed the better for the economy of the country. Trade complementary index is assigned as max type of indicator. The closer to value of 100 the better trading partners appear. Trade intensity index was set as a max type of indicator, higher value demonstrates more intense relationship between partner countries. FDI is assigned as a max type of indicator. Higher FDI improves economic situation in a receiving country. Inflation GDP deflator is set as a min type indicator, because lower Inflation GDP deflator, less changes in price of all goods in the economy of the country.

Table 5 Summary of trade indicators

Indicator	Unit	Source	Type
GDP per capita	\$US	WB	MAX
Unemployment	%	WB	MIN
TCI	value	WITS	MAX
TII	value	WITS	MAX
FDI % of GDP	%	WB	MAX
Inflation, GDP deflator	%	WB	MIN

Source of data: World Bank, WITS, Own work

The Table 6 shows the values of composite indicator and ranks of countries. Singapore reaches the highest value of composite indicator and lowest value of rank performs the best. On the other hand, Myanmar reaches the lowest value of composite indicator and highest rank performs the worst in terms of composite indicator.

Table 6 Results of aggregation of trade indicators

Countries	SUM	Rank	Index (%)
Brunei D.	228,17	8	8,27
Cambodia	296,28	4	10,74
Indonesia	238,88	7	8,66
Lao PDR	216,58	9	7,85
Malaysia	342,93	2	12,43
Myanmar	96,4	10	3,5
Philippines	271,57	6	9,85
Singapore	481,21	1	17,45
Thailand	313,52	3	11,37
Viet Nam	272,28	5	9,87

Own work

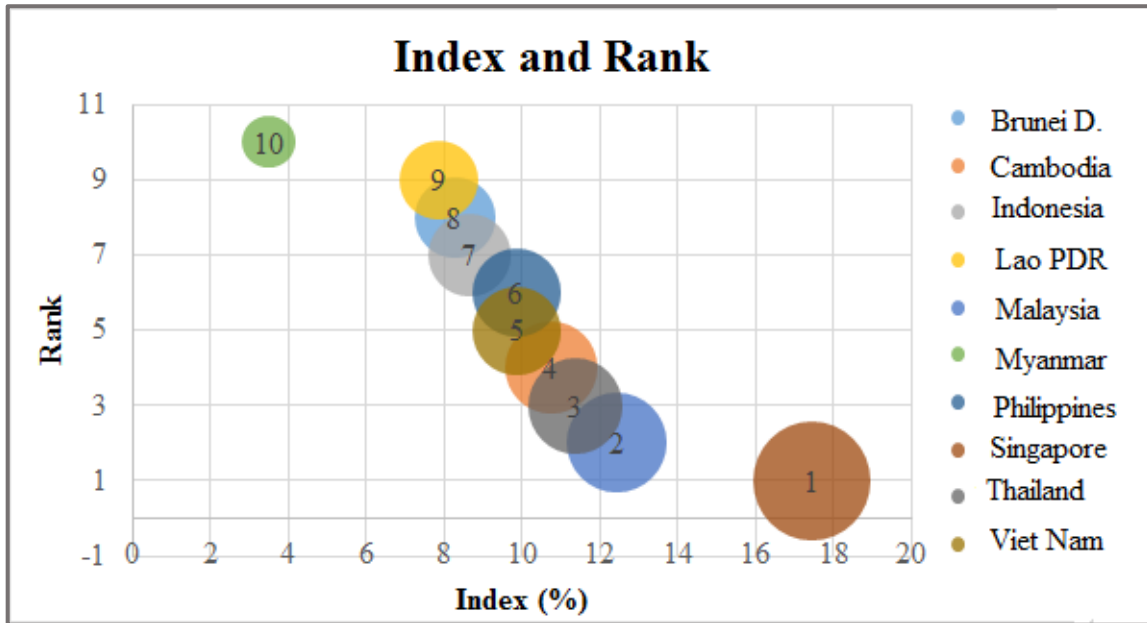
The result of this index focused on trade performance is to indicate worst country which is suitable for trade cooperation with the Czech Republic. As the Figure 9 shows Myanmar is

far behind the rest of the countries reaching only 3.5%. Next country with second lowest index is Lao PDR with 7.85% and on the eight place is Brunei reaching 8.27%.

On the opposite side of the order are situated countries with above average results i.e. the value of over 10%. A considerable leader is Singapore which stand out all the countries reaching 17.45%. By this result is it clear that Singapore is best possible country for the Czech Republic to trade with. On the second place is Malaysia reaching 12.43%, on the third place is Thailand with 11.37%. Last country which has over 100% is Cambodia with 10.74%. From this result it can deduced that these four countries are best performing countries and the Czech Republic's best possible trade partners from ASEAN countries.

In contrast, other below average values below 10% can be found in countries: Viet Nam (9.87%), Philippines (9.85%), Viet Nam and Philippines can be still considered as average but have percentage below 10%. For the Czech Republic it will not be so advantageous to trade with these group of countries that perform as average. In that way only Indonesia (8.66%) would be considered to not be so advantageous to trade with.

Figure 9 Index and Rank of ASEAN countries



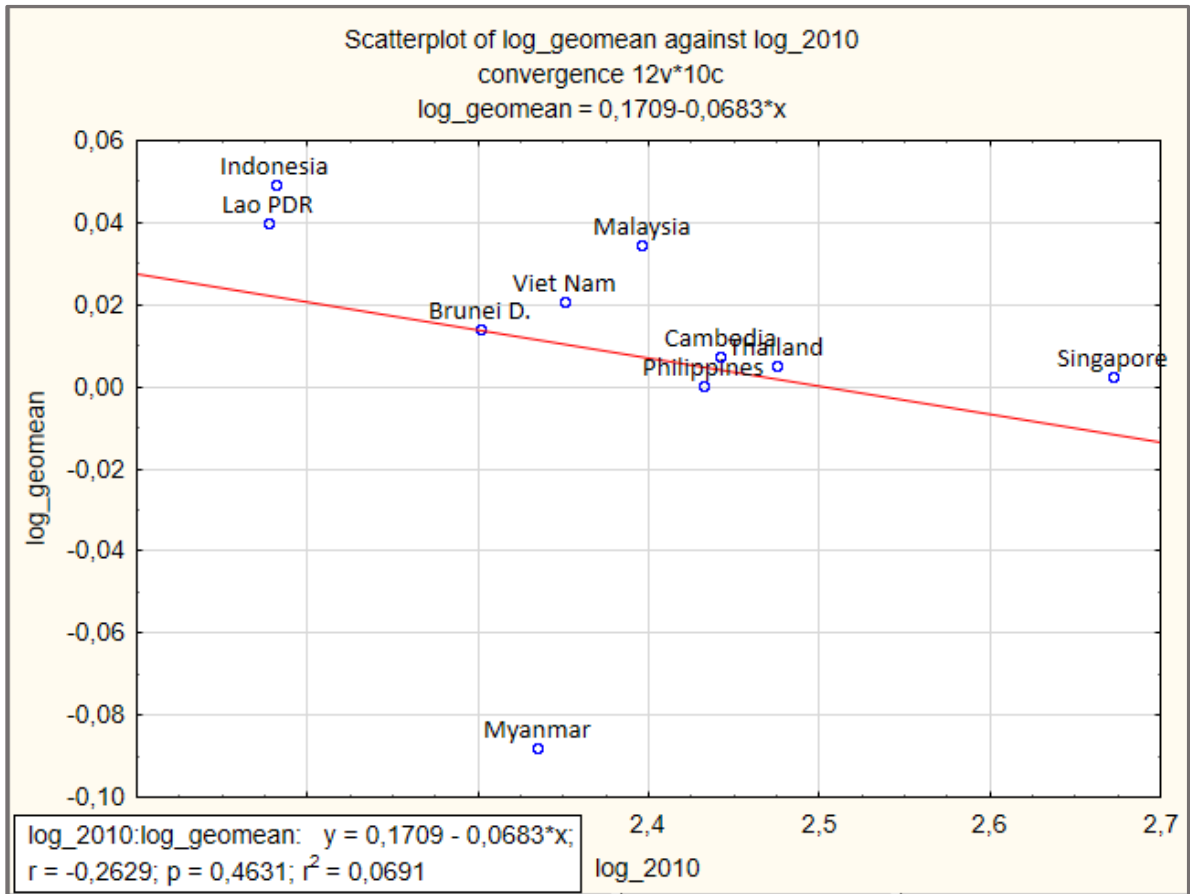
Source of data: WB, own work, own calculation

4.5 Measuring convergence

The Figure 10 shows the graphical visualization of convergence of composite indicators from ASEAN countries in 2010. Log values of composite indicators in 2010 are plotted on x-axis and log of geomean is plotted on y-axis. This figure confirms convergence thanks to the downwardly sloping line. Coefficient of determination is: $100r^2 = 6.91\%$

The prevailing tendency in a sample of 10 countries within 2010 was convergence insofar the slope of the regression line was negative. Furthermore, the low value of coefficient of determination (6.91%) indicates insignificant result.

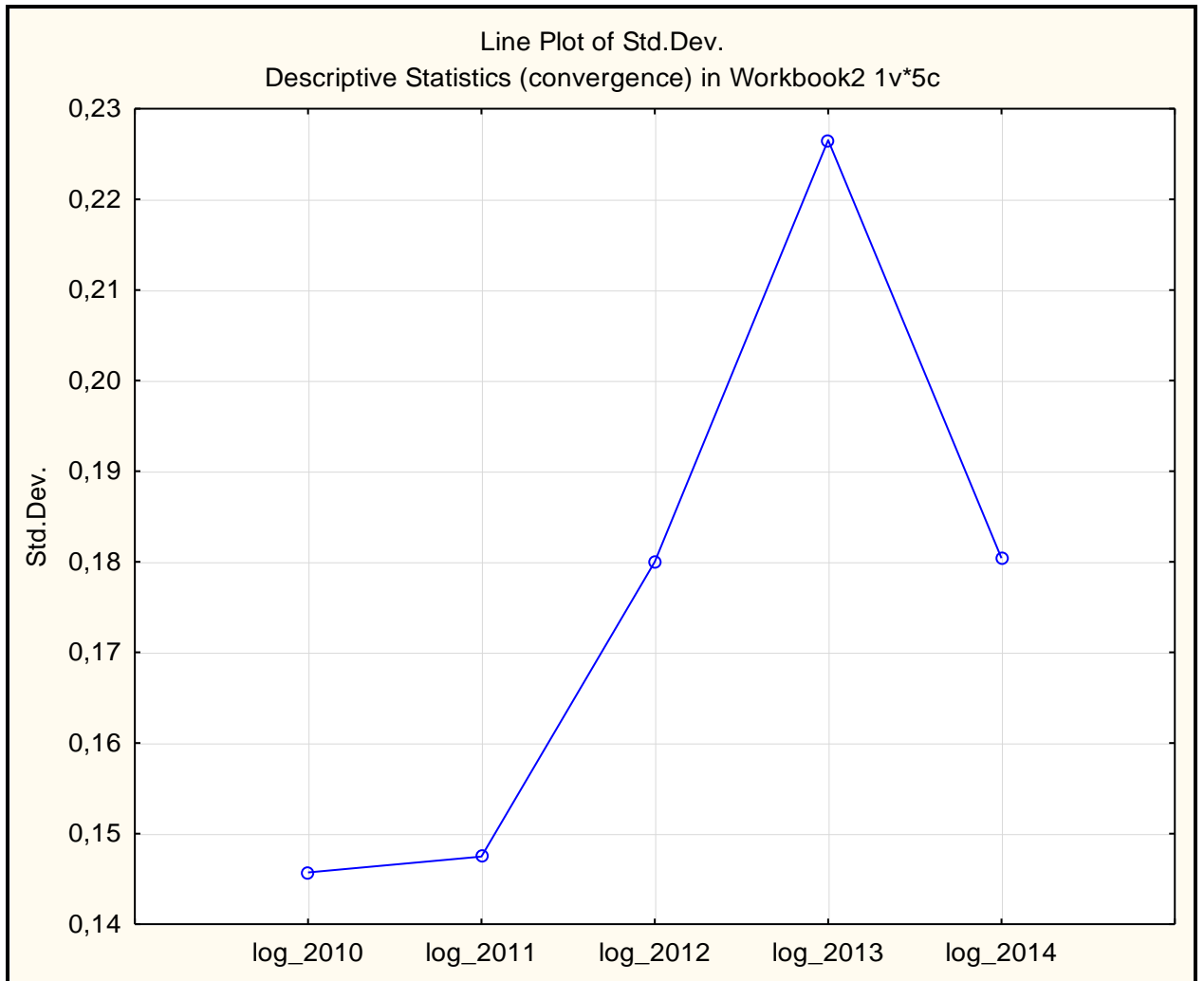
Figure 10 Graphical visualization of ASEAN convergence in 2010



Own work using Statistica software

The Figure 11 shows lime plot of standard deviations. Log of indicator value for respective years are plotted on the x-axis and standard deviations are plotted on the y-axis. The line in the figure presents standard deviations of log-transformed values. The result of this analysis is that neither divergence nor convergence was proved, because the standard deviations values in given period of 5 years vary, the values are not clearly declining or rising. The result of sigma-convergence/divergence provided us a clearer picture about overall process in comparison with beta-convergence.

Figure 11 Line Plot of Standard Deviation



Own work using Statistica software

4.6 Summary of the results

The biggest import partner with the Czech Republic is Thailand followed by Malaysia and Singapore. Overall imports to the Czech Republic within observed six year period have slightly decreased in volume, on the beginning of 2009 and at the end of 2014 no major changes happened.

Contrarily, exports from the Czech Republic have undergone great changes in observed time period. Four countries have great increase of exports from the Czech Republic. In case of Malaysia the volume of exports is four time higher in 2014 than it was in 2009. The exports to the Singapore and Indonesia have tripled and exports to the Thailand have doubled during six year period.

Although exports from the Czech Republic to ASEAN countries have experienced some great changes, imports from the ASEAN countries to the Czech Republic, where no major changes had happened, are still higher. This was proved by computing balance of trade which showed mostly negative numbers resulting to the trade deficit.

The results of terms of trade between the Czech Republic and ASEAN countries proved that more capital from ASEAN countries is coming in to the Czech Republic than going out with one exception of Brunei.

Calculating descriptive statistics were quantitatively described main features of the data collection. Descriptive statistics briefly captured the essential information on the given data. Construction of correlation matrix was important to determine if there were any major relationships in the dataset. Data reduction was not necessary, because none variables had high correlation.

Cluster analysis resulted in five clusters, three of them were one member clusters (Brunei, Philippines and Singapore). These countries have such unique features that differs from other ASEAN countries that they were not merged together to clusters and stayed only one member clusters. Cluster 4 containing of Indonesia, Malaysia, Thailand and Viet Nam together with Singapore (cluster 3) are considered to be best in terms of trade cooperation considering high TCI, low unemployment rate and low inflation GDP deflator. Cluster 5 (Cambodia and Myanmar) is considered to be the worst in terms of trade cooperation because of its low GDP per capita, TCI and TII.

Composite indicator was constructed out of trade related indicators. Composite indicator ranks countries from 1 to 10 and from this results best countries for trade cooperation can be

reported. The best results had Singapore followed by Malaysia and Thailand while the worst results had Brunei, Lao PDR and Myanmar. Next, composite indicator was computed, which helped to define final results. Composite indicator index proved best performing country which appeared to be far before the rest of the countries, contrarily with Myanmar with visible lost to the rest of the countries.

By measuring convergence it was found out that values of composite indicators in given period 2010-2014 are neither converging nor diverging.

To sum it up, from all computations and analysis made in this thesis, the best and worst countries for trade cooperation should be mentioned. The best country for trade cooperation for the Czech Republic is Singapore as well as Malaysia, Thailand, Indonesia and Viet Nam. On the other hand, the rest of the countries are less suitable for trade cooperation and to trade with them it is not as advantageous as with other ASEAN countries.

4.7 Discussion

In this thesis I was looking for countries that are advantageous to trade with. ASEAN has 10 member countries, five of them were considered to be good trading partners for the Czech Republic, and five of them were indicated as not the best partners for trade cooperation. Based on composite indicator index Myanmar is the least advantageous country to trade with.

Critical part of my work is that ASEAN has only 10 member countries. From statistical point of view 10 countries are quite a few, having at least 15 countries would be more appropriate to reach proper and more various results. Another critical part was the selection of trade related sub-indicators for analysis. The indicators had to be trade related this means that indicators presenting economy and trade attractiveness of the country were selected, but they were not allowed to correlate each other. Six indicators were selected, but of course if more indicators were selected, more precise and definite the results would be.

Limitation of my thesis is that it was difficult to find any report or study dealing with trade cooperation between countries and using the same methods. Most of the studies focusing on

trade cooperation between countries describe commodity structures of imported or exported goods and services, the amount of exports and imports, compute balance of trade or terms of trade.

The report by Jefferey A.⁵⁷ investigates the impact of international trade on standards of living. In on chapter author examines how geographic characteristics influence country's trade. He constructs equations to determine international and within-country trade. Gravity model is constructed to determine bilateral trade, where country's distance is considered. The results confirms that distance has a large and significant negative impact on bilateral trade. Basically this study confirms that countries which share borders trade more intensely than countries with long distance. Gravity model is great method to measure trade between countries, but I think it is clear that distance between the Czech Republic and ASEAN countries is enormous and result would be the same in this case.

The study by Cyrus T.⁵⁸ provides several ways of estimating the relationship between trade and convergence. They used initial income and factor accumulation variables as instruments for income. It was proved that countries with similar incomes per capita trade more with each other. By fixed and random regressions was proved that income differences reduces trade while trade reduces income differences. This study investigated that more similar countries trade more. It is based mainly on income per capita, which is not very comprehensive in my opinion. My thesis I use six different variables (as minimum) in different analysis to determine final results.

One report studying trade and income in Asia by Benno Ferrarini⁵⁹ uses empirical strategy to find out relationship between trade and income. First, he identify country's geographical characteristics, which is distance from trading partners and its size. Then it is correlated with intensity with which it trades bilaterally, but uncorrelated with its income per person, this in

⁵⁷ JEFFEREY, A. et al.: *Trade and Growth: An Empirical Investigation: Does Trade Cause Growth?*

⁵⁸ CYRUS, Teresa. *Does convergence cause trade, or does trade cause convergence?*

⁵⁹ FERRARINI, Benno. *Trade and Income in Asia: Panel Data Evidence from Instrumental Variable Regression.*

fact is gravity equation. The second stage of this report is regressing countries' income per person on their trade share and their size. The report's results are that international trade has helped to increase income in Asian countries. He was comparing 157 countries over period 1990-2007 and he proved that international trade raised income across trading nations but the strongest effect were in developing countries of Asia. This report is very complex in my opinion, because it is not focused just on Asia but 157 countries are compared. Both, this report and my thesis measure trade between countries. But my thesis is focused to determine best trading partners rather than identify what are the results of trade.

The article by Samuel G. Endoumiekumo⁶⁰ examines the contribution of international trade to economic growth of Nigeria over a period of 27 years. In this article methods of multiple regression analysis with Ordinary Least Square were used, with following variables: real gross domestic product, exports and import. The positive relationship was found between export, import and economic growth, however Nigeria should diversify or increase export goods to enjoy more of the benefits of trade. This article shows Nigeria's involvement in international trade, this is a good way how to measure contribution of international trade in country. It would be interesting to examine and compare all 10 ASEAN member countries how international trade contributed to the individual country.

Another example of study focusing on trade between Asian countries is study by Sayuri Shirai⁶¹ describing trade patterns, structures of imports and exports of Indonesia, Malaysia, Singapore, Thailand and other countries. This study does not contain any further analysis, in comparison my thesis is more complex, going more into detail, because I analysed import and exports but also statistical methods were used to determine trade between countries.

⁶⁰ EDOUMIEKUMO, G. S. et al. *Economic Growth Factor in Nigeria: The Role of Global Trade*.

⁶¹ SHIRAI, SAYURI. *The Pattern of International Trade Between Japan and the Pacific Basin Countries: A comparison between 1975 and 1985*.

5 CONCLUSION

The principal objective of this thesis was to find out best trade partners from ASEAN countries for the Czech Republic. In order to find out the best trading partners, statistical methods such as cluster analysis, composite indicator and convergence were used. Six trade sub-indicators were selected to measure these methods. Another objective of this thesis was to give to reader a comprehensive look at foreign trade of the Czech Republic with ASEAN countries and to inform the reader about the development of relations with these countries and map current trade cooperation.

The chapter literature review provided deeper insight to the topic of international trade of the Czech Republic and ASEAN. Despite the fact that in the coming years and decades, we are likely to witness significant changes and major growth of the economies of ASEAN countries, there are still many barriers for the successful implementation of the market that Czech exporters need to overcome. The competitiveness of local enterprises over time is increasing and exports from ASEAN countries to the Czech Republic dominated. By 2020, the Czech Republic applied existing Export Strategy, which should help Czech exporters to settle in distant foreign markets and diversify by this the territorial export portfolio.

The Czech Republic has a positive relationship with all the ASEAN countries, which are demonstrated by signed bilateral agreements. So far, the Czech Republic has signed 45 bilateral agreements with Viet Nam (which is a lot more than with any other ASEAN country), this shows that intergovernmental cooperation between those two countries are at a good level. In the Export Strategy the government placed Indonesia, Thailand, Vietnam and Singapore among the priority countries of the interest. The Czech Republic gives a strong signal which direction will encourage Czech exporters.

The chapter results and discussion was primarily focused on interpreting results of cluster analysis, composite indicator, convergence and also the development of imports, exports, balance of trade and terms of trade during observed period of six years. Based on the achieved

results, ASEAN countries were divided into two groups. The first group of countries are countries which had best results such as Singapore, Malaysia, Thailand, Indonesia and Viet Nam i.e. these countries were stated as best partners for trade cooperation with the Czech Republic. The rest of the ASEAN countries (Brunei, Cambodia, Lao PDR, Myanmar, Philippines) with worse results were stated as countries not as advantageous for trade cooperation. Based on findings from this chapter, I was able to verify given hypothesis:

- Hypothesis 1: Favourable conditions for mutual international trade are with countries with a higher proportion of GDP per capita.
- Hypothesis 2: In the "post-crisis" period 2010/2011, thanks to favourable development in most industries and economy growth, the competitiveness of our products has increased, even on products with higher added value. Also the ability to succeed in even more mature markets has increased i.e. there is a presumption that in this period should be an obvious reverse in the balance of trade with most observed countries, mainly by more dynamic export growth.

The first hypothesis was confirmed. It turned out that the mutual balance of trade of 3 out of 4 countries with the highest share of GDP per capita has a tendency toward improvement, mainly due to high export growth potential. The only exception is Brunei, which has a high index of GDP per capita, given by the exploitation of own oil resources. And because the Brunei's one-sided focus mutual trade with the Czech Republic is minimal.

The second hypothesis was also confirmed. Although in the observed period imports from ASEAN countries showed a slight decrease, the main impact on the positive development of the balance of trade had increase of exports from the Czech Republic.

I firmly believe that this thesis is benefiting to the reader, to help the reader to understand international trade between the Czech Republic and ASEAN countries and the structure of the work has created a comprehensive picture of current events in the countries of the region. In conclusion, I would like to highlight that the development of ASEAN markets in the coming years remain very dynamic and therefore the Czech Republic should strive to

maintain these relations at least at the same level, because it is important to cooperate with the prosperous regions such as ASEAN. The cooperation between countries is improving, as evidenced by the number of signed bilateral agreements and increasing exports from the Czech Republic. It is undoubtedly necessary to monitor the ASEAN market to notice changes in the territory, which can affect the balance of trade, and it is important to react to these changes accordingly.

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ATTACHMENTS

Attachment 1 Balance of trade

Table 7 Imports to the Czech Republic

IMPORTS TO THE CZECH REPUBLIC (in thsd. US\$)						
Country	2009	2010	2011	2012	2013	2014
Brunei	0	2	8	20	58	156
Cambodia	14 001	18 476	29 723	40 857	63 780	101 568
Indonesia	262 225	323 388	385 235	306 853	269 776	279 971
Lao PDR	823	704	1 138	1 677	1 933	1 731
Malaysia	744 708	943 142	1 274 434	894 768	827 495	918 508
Myanmar	2 081	792	771	470	977	4 711
Philippines	132 875	173 744	222 203	242 062	299 892	293 440
Singapore	721 418	1 059 373	913 219	751 296	621 785	644 248
Thailand	1 171 190	1 587 896	1 380 936	1 241 399	1 131 073	1 141 270
Viet Nam	246 821	275 336	375 593	347 743	418 239	611 914

Source of data: CSO, own work

Table 8 Exports from the Czech Republic

EXPORTS FROM THE CZECH REPUBLIC (in thsd. US\$)						
Country	2009	2010	2011	2012	2013	2014
Brunei	91	253	527	813	748	287
Cambodia	1 904	284	2 028	2 452	4 183	727
Indonesia	51 665	61 377	88 849	158 527	152 756	173 517
Lao PDR	64	651	406	257	569	370
Malaysia	57 833	94 324	107 614	142 215	191 770	222 181
Myanmar	256	287	141	566	678	3 325
Philippines	52 482	79 809	89 509	73 810	105 110	108 016
Singapore	87 200	109 061	181 065	202 284	205 761	272 595
Thailand	76 942	108 002	135 280	160 713	155 954	175 254
Viet Nam	42 130	65 067	45 075	91 905	128 874	84 957

Source of data: CSO, own work

Table 9 Balance of trade the Czech Republic and ASEAN countries

Balance of trade CZE-ASEAN (in thsd. US\$)						
Country	2009	2010	2011	2012	2013	2014
Brunei	91	251	519	793	690	131
Cambodia	-12097	-18192	-27695	-38405	-59597	-100841
Indonesia	-210560	-262011	-296386	-148326	-117020	-106454
Lao PDR	-759	-53	-732	-1420	-1364	-1361
Malaysia	-686875	-848818	-1166820	-752553	-635725	-696327
Myanmar	-1825	-505	-630	96	-299	-1386
Philippines	-80393	-93935	-132694	-168252	-194782	-185424
Singapore	-634218	-950312	-732154	-549012	-416024	-371653
Thailand	-1094248	-1479894	-1245656	-1080686	-975119	-966016
Viet Nam	-204691	-210269	-330518	-255838	-289365	-526957

Source of data: CSO, own calculation

Table 10 Terms of trade the Czech Republic and ASEAN countries

Terms of trade Czech Republic and ASEAN countries						
Country	2009	2010	2011	2012	2013	2014
Brunei	0,00	12 650,00	6 587,50	4 065,00	1 289,66	183,97
Cambodia	13,60	1,54	6,82	6,00	6,56	0,72
Indonesia	19,70	18,98	23,06	51,66	56,62	61,98
Lao PDR	7,78	92,47	35,68	15,32	29,44	21,37
Malaysia	7,77	10,00	8,44	15,89	23,17	24,19
Myanmar	12,30	36,24	18,29	120,43	69,40	70,58
Philippines	39,50	45,93	40,28	30,49	35,05	36,81
Singapore	12,09	10,29	19,83	26,92	33,09	42,31
Thailand	6,57	6,80	9,80	12,95	13,79	15,36
Viet Nam	17,07	23,63	12,00	26,43	30,81	13,88

Source of data: CSO, own calculation

Table 11 Trade Complementarity Index

Trade Complementarity Index of the Czech Republic and ASEAN countries by product classification: HS 1988/92 (H0)						
Country	2009	2010	2011	2012	2013	2014
Brunei D.	0	0	0	62.08	68.56	60.48
Cambodia	45.39	45.37	43	43.45	44.82	46.73
Indonesia	60.82	60.99	57.71	59.69	58.48	56.36
Lao PDR	0	0	0	0	0	0
Malaysia	66.11	63.83	64.10	64.42	62.08	59.66
Myanmar	0	51.60	0	0	0	0
Philippines	60.70	61.26	54.50	60.82	59.37	60.69
Singapore	58.44	57.42	54.92	53.61	52.39	52.01
Thailand	63.95	64.55	61.61	65.80	61.58	62.66
Viet Nam	61.13	60.56	60.87	61.86	61.06	61.61

Source: Own calculations using WITS, online trade outcomes tool

Table 12 Trade Intensity Index

Trade Intensity Index of the Czech Republic and ASEAN countries by product classification: HS 1988/92 (H0), product code 85 - electrical machinery equipment part thereof; sounds recorders,..						
Country	2009	2010	2011	2012	2013	2014
Brunei D.	0.40	0.26	4.03	2.18	2.30	0.07
Cambodia	25.17	0.06	9.94	0.20	0.31	0.08
Indonesia	6.21	11.99	7.38	17.81	5.21	6.88
Lao PDR	0.49	4.08	0.02	0.04	0	0.26
Malaysia	1.95	1.90	2.45	6.23	9.85	12.68
Myanmar	4.31	0	0	0.22	0.05	0.55
Philippines	22.37	28.06	25.37	2011	30.91	27.67
Singapore	3.97	5.74	8.07	9.55	10.65	11.57
Thailand	3.96	2.26	4.29	8.03	5.57	7.60
Viet Nam	4.20	3.49	3.22	10.77	21.89	6.24

Source: Own calculations using WITS, online trade outcomes tool

Attachment 2 Cluster analysis

Table 13 Input data for cluster analysis (before standardization)

Countries	GDP per capita (\$US)	Unemployment (%)	TCI	TII	FDI % of GDP (mil. \$US)	Inflation, GDP deflator (annual %)
Brunei D.	40979,6	3,8	60,48	0,07	3,32	10,1
Cambodia	1094,6	0,4	46,73	0,08	10,31	1,7
Indonesia	3499,6	2,6	56,36	6,88	2,95	5,4
Lao PDR	1751,4	1,4	0	0,26	7,80	-0,3
Malaysia	11307,1	0,2	59,66	12,68	3,14	2,5
Myanmar	1203,8	3,3	0	0,55	2,15	6,6
Philippines	2872,5	7,1	60,69	27,67	2,02	3,2
Singapore	56007,3	3	52,01	11,57	22,36	0
Thailand	5969,9	0,9	62,66	7,6	0,92	1
Viet Nam	2052,3	2,3	61,61	6,24	4,94	3,7

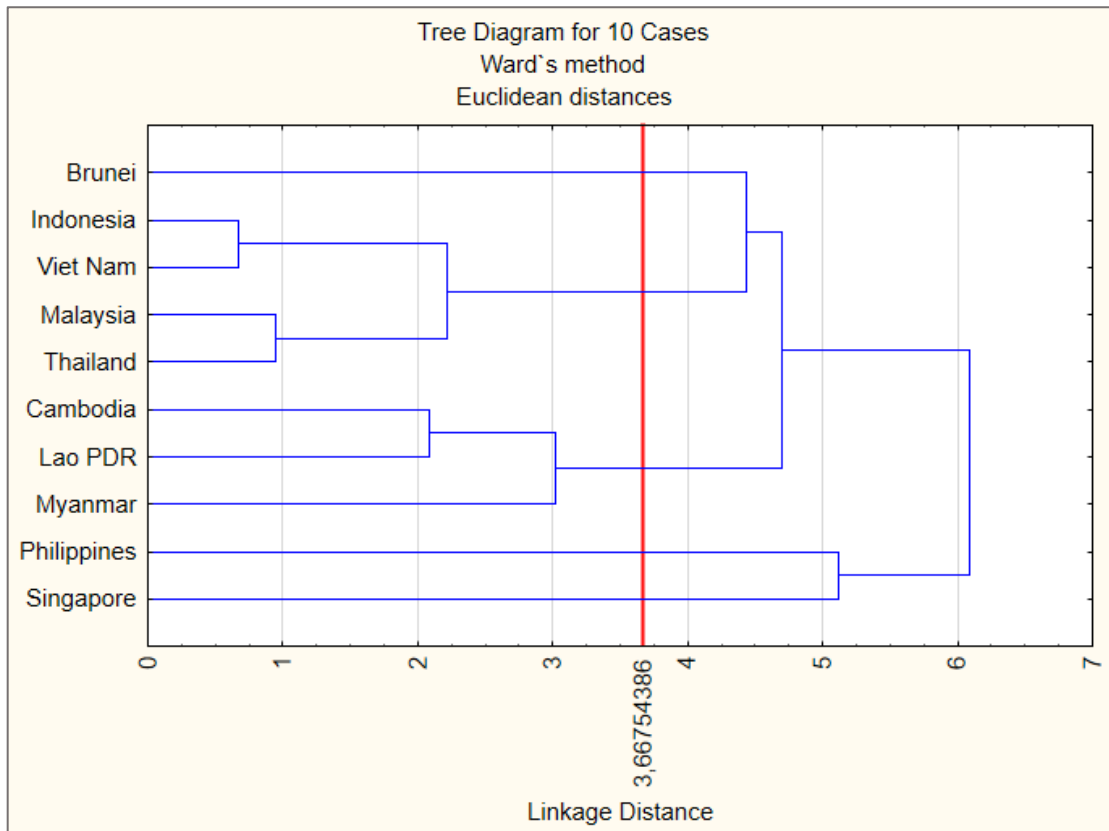
Source of data: World Bank, Own calculations using WITS, online trade outcomes tool

Table 14 Input data for cluster analysis (after standardization)

Countries	Standardized data					
	GDP per capita (\$US)	Unemployment (%)	TCI	TII	FDI % of GDP (mil. \$US)	Inflation, GDP deflator (annual %)
Brunei D.	1,455	0,638	0,584	-0,849	-0,415	2,076
Cambodia	-0,595	-1,032	0,028	-0,848	0,672	-0,523
Indonesia	-0,472	0,049	0,417	-0,055	-0,473	0,622
Lao PDR	-0,562	-0,540	-1,86	-0,827	0,281	-1,142
Malaysia	-0,07	-1,130	0,551	0,619	-0,443	-0,275
Myanmar	-0,59	0,393	-1,86	-0,793	-0,597	0,993
Philippines	-0,504	2,260	0,592	2,366	-0,617	-0,058
Singapore	2,228	0,245	0,242	0,490	2,547	-1,049
Thailand	-0,345	-0,786	0,672	0,028	-0,789	-0,739
Viet Nam	-0,546	-0,098	0,630	-0,130	-0,163	0,095

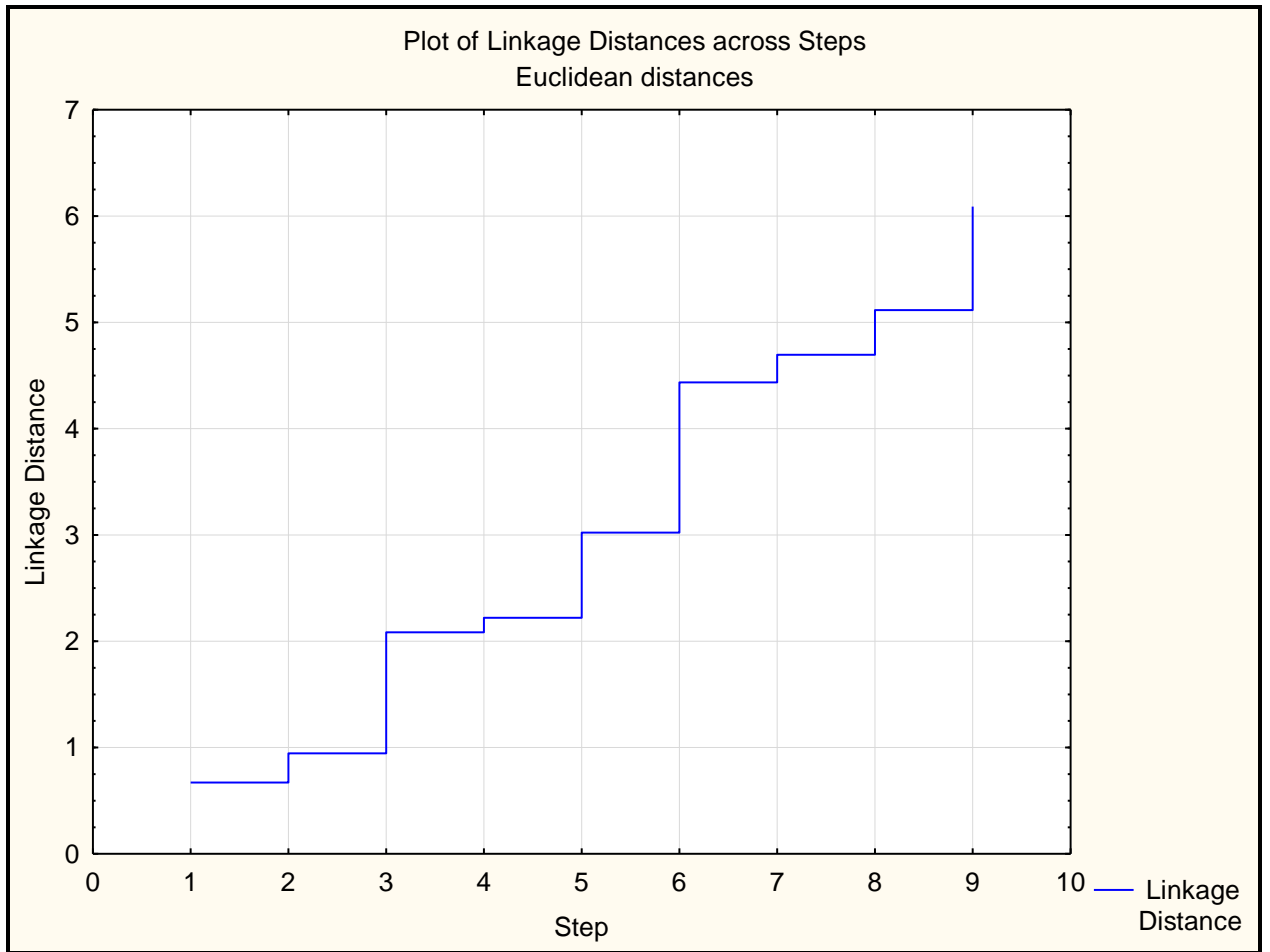
Source of data: World Bank, WITS, own work

Figure 12 Squared Euclidean distances



Own work using Statistica software

Figure 13 Plot of Linkage Distances across Steps



Own work using Statistica software

Table 15 Cluster membership

Cluster Membership Linkage distance = 3,66754386 Ward's method Euclidean distances							
Country	Cluster membership	GDP per capita (\$US)	Unemployment (%)	TCI	TII	FDI % of GDP (mil. \$US)	Inflation, GDP deflator (annual %)
Brunei	1	1,455	0,638	0,584	-0,849	-0,415	2,076
Cambodia	5	-0,595	-1,032	0,028	-0,848	0,672	-0,523
Indonesia	4	-0,471	0,049	0,417	-0,055	-0,473	0,622
Lao PDR	5	-0,561	-0,540	-1,860	-0,827	0,281	-1,141
Malaysia	4	-0,070	-1,130	0,551	0,619	-0,443	-0,275
Myanmar	5	-0,589	0,393	-1,860	-0,793	-0,597	0,993
Philippines	2	-0,503	2,260	0,592	2,366	-0,617	-0,058
Singapore	3	2,228	0,245	0,242	0,490	2,547	-1,049
Thailand	4	-0,344	-0,786	0,672	0,027	-0,789	-0,739
Viet Nam	4	-0,546	-0,098	0,630	-0,130	-0,163	0,095

Source of data: World Bank, WITS, own work using Statistica software

Table 16 Amalgamation schedule

linkage	Amalgamation Schedule									
distance	Ward's method									
	Euclidean distances									
	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.	Obj. No.
	1	2	3	4	5	6	7	8	9	10
0,6712214	Indonesia	Viet Nam								
0,9452601	Malaysia	Thailand								
2,084723	Cambodia	Lao PDR								
2,220106	Indonesia	Viet Nam	Malaysia	Thailand	Cluster 4					
3,022239	Cambodia	Lao PDR	Myanmar	Cluster 5						
4,436048	Brunei	Indonesia	Viet Nam	Malaysia	Thailand	Cluster 1				
4,694916	Brunei	Indonesia	Viet Nam	Malaysia	Thailand	Cambodia	Lao PDR	Myanmar		
5,115151	Philippines	Singapore	Cluster 2	Cluster 3						
6,089627	Brunei	Indonesia	Viet Nam	Malaysia	Thailand	Cambodia	Lao PDR	Myanmar	Philippines	Singapore

Own work using Statistica software

Variable	Descriptive Statistics								
	Mean	Median	Minimum	Maximum	Variance	Std.Dev.	Coef.Var.	Skewness	Kurtosis
GDP per capita (USD)	12673,8	3186,05	1094,6	56007,3	378200663	19447,38	153,445	1,821	2,143
Unemployment (%)	2,5	2,45	0,2	7,1	4	2,03	81,388	1,208	2,110
TCI	46,02	58,01	0	62,66	612	24,74	53,762	-1,618	1,044
TII	7,36	6,56	0,07	27,67	74	8,58	116,615	1,571	2,964
FDI % of GDP (mil. US\$)	5,99	3,23	0,92	22,36	41	6,43	107,273	2,172	5,062
Inflation, GDP deflator (annual %)	3,39	2,85	-0,3	10,1	10	3,23	95,317	0,967	0,683

Table 17 Descriptive statistics, own work using Statistica software

Attachment 3 Composite indicator

Table 18 Raw data matrix

Raw data matrix	MAX	MIN	MAX	MAX	MAX	MIN
Countries	GDP per capita (USD)	Unemployment (%)	TCI	TII	FDI % of GDP (mil. US\$)	Inflation, GDP deflator (annual %)
Brunei D.	40 979,60	3,80	60,48	0,07	3,32	10,10
Cambodia	1 094,60	0,40	46,73	0,08	10,31	1,70
Indonesia	3 499,60	2,60	56,36	6,88	2,95	5,40
Lao PDR	1 751,40	1,40	0,00	0,26	7,80	-0,30
Malaysia	11 307,10	0,20	59,66	12,68	3,14	2,50
Myanmar	1 203,80	3,30	0,00	0,55	2,15	6,60
Philippines	2 872,50	7,10	60,69	27,67	2,02	3,20
Singapore	56 007,30	3,00	52,01	11,57	22,36	0,00
Thailand	5 969,90	0,90	62,66	7,60	0,92	1,00
Viet Nam	2 052,30	2,30	61,61	6,24	4,94	3,70
MIN	1 094,60	0,20	0,00	0,07	0,92	-0,30
MAX	56 007,30	7,10	62,66	27,67	22,36	10,10
RANGE	54 912,70	6,90	62,66	27,60	21,44	10,40

Source of data: World Bank, WITS, own work

Standardized data matrix	MAX	MIN	MAX	MAX	MAX	MIN				
Countries	GDP per capita (USD)	Unemployment (%)	TCI	TII	FDI % of GDP (mil. US\$)	Inflation, GDP deflator (annual %)	SUM	Rank	Index (%)	
Brunei D.	72,63	47,826087	96,5209	0	11,1940299	0	228,17	8	8,27	
Cambodia	0,00	97,101449	74,5771	0,0362319	43,7966418	80,769231	296,28	4	10,74	
Indonesia	4,38	65,217391	89,9457	24,673913	9,46828358	45,192308	238,88	7	8,66	
Lao PDR	1,20	82,608696	0	0,6884058	32,0895522	100	216,58	9	7,85	
Malaysia	18,60	100	95,2123	45,688406	10,3544776	73,076923	342,93	2	12,43	
Myanmar	0,20	55,072464	0	1,7391304	5,7369403	33,653846	96,40	10	3,50	
Philippines	3,24	0	96,856	100	5,13059701	66,346154	271,57	6	9,85	
Singapore	100,00	59,42029	83,0035	41,666667	100	97,115385	481,21	1	17,45	
Thailand	8,88	89,855072	100	27,282609	0	87,5	313,52	3	11,37	
Viet Nam	1,74	69,565217	98,3243	22,355072	18,75	61,538462	272,28	5	9,87	
							Overall SUM	2757,82		

Table 19 Standardized data matrix, Source of data: World Bank, WITS, own work

Attachment 4 Measuring of convergence

Table 20 Input data matrix – composite indicators 2010-2014

Country	2010	2011	2012	2013	2014
Brunei D.	200,16	168,53	349,10	342,49	228,17
Cambodia	276,62	327,74	302,60	254,55	296,28
Indonesia	151,77	208,50	268,32	152,47	238,88
Lao PDR	150,19	188,76	153,90	98,35	216,58
Malaysia	248,96	291,05	305,23	278,44	342,93
Myanmar	216,24	163,68	113,95	92,73	96,40
Philippines	270,43	274,99	277,18	243,49	271,57
Singapore	470,28	478,68	484,20	452,18	481,21
Thailand	298,62	303,20	334,93	279,64	313,52
Viet Nam	224,45	212,16	247,57	281,92	272,28

Source of data: World Bank, WITS, own work

Table 21 Standard Deviation

Descriptive Statistics (convergence)	
Variable	Std.Dev.
log_2010	0,14572
log_2011	0,147469
log_2012	0,180005
log_2013	0,226551
log_2014	0,180404

Own work using Statistica software

Commodity structure of exports from the Czech Republic to ASEAN countries in 2014 (in thsd. US\$)

SITC 1	Commodity	Brunei	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam	ASEAN
0	Food and live animals	0	21	3 361	0	15 859	428	4 418	1 227	19 468	2 145	46 927
1	Beverages and tobacco	52	0	8	0	0	1	2	112	41	1 017	1 233
2	Crude materials, except fuels	0	0	79 539	0	630	18	376	250	553	3 366	84 732
3	Energy products	0	0	77	0	532	0	4	44	3	149	809
4	Oils, fats and waxes	0	0	2	0	3	0	0	346	0	0	351
5	Chemicals	57	0	17 489	1	44 906	398	5 309	11 736	30 938	7 416	118 250
6	Manuf. Goods classified by material	134	152	12 882	168	25 010	113	4 289	22 795	31 728	14 091	111 362
7	Machinery and vehicles	33	414	51 481	49	109 999	935	88 005	183 742	72 786	40 225	547 669
8	Miscellaneous manufactured articles	11	140	8 677	152	25 242	1 433	5 613	52 342	19 738	16 548	129 896
9	Products not classified elsewhere	0	0	0	0	0	0	0	0	0	0	0
	SUM	287	727	173 516	370	222 181	3 326	108 016	272 594	175 255	84 957	
Source of data: CSO											SUM	1 041 229

Table 22 Commodity structure of exports from the Czech Republic to ASEAN countries in 2014

Attachment 5

Commodity structure of imports to the Czech Republic from ASEAN countries in 2014 (in thsd. US\$)

SITC 1	Commodity	Brunei	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam	ASEAN
0	Food and live animals	0	13 993	11 012	77	1 270	2 698	2 497	396	37 130	38 076	107 149
1	Beverages and tobacco	145	0	39	0	20	0	212	1	129	205	751
2	Crude materials, except fuels	0	24	38 146	37	45 870	5	2 437	731	20 143	6 538	113 931
3	Energy products	0	0	1	0	30	0	0	0	2	0	33
4	Oils, fats and waxes	0	0	57	0	637	0	637	11	96	0	1 438
5	Chemicals	0	343	4 127	106	12 135	0	159	14 497	14 757	188 550	234 674
6	Manuf. Goods classified by material	3	56	26 871	16	21 570	6	2 364	5 475	111 700	18 827	186 888
7	Machinery and vehicles	4	9 675	88 678	218	748 980	41	214 132	567 324	850 546	308 730	2 788 328
8	Miscellaneous manufactured articles	6	77 477	111 040	1 278	87 995	1 961	71 002	55 755	106 768	220 688	733 970
9	Products not classified elsewhere	0	0	0	0	0	0	0	57	0	0	57
	SUM	158	101 568	279 971	1 732	918 507	4 711	293 440	644 247	1 141 271	781 614	
Source of data: CSO											SUM	4 167 219

Table 23 Commodity structure of imports to the Czech Republic from ASEAN countries in 2014

Attachment 6

List of international agreements with the Czech Republic

Source: Evidence database of international treaties the international law department of the MFA of the Czech Republic

Cambodia

1. Air Services Agreement between the Czechoslovak Socialist Republic and the Kingdom of Cambodia
2. The Treaty of Friendship and Cooperation between the Czechoslovak Socialist Republic and the Kingdom of Cambodia
3. Agreement between the Government of the Czechoslovak Socialist Republic and the Cambodian People's Republic of granting a loan to cover the balance of trade in the years 1984 – 1985
4. Agreement between the Government of the Czechoslovak Socialist Republic and the Cambodian People's Republic of granting a loan for repairs and modifications of a power plant in Phnom Penh
5. Agreement on Scientific and Technological Cooperation between the Czechoslovak Socialist Republic and the Cambodian People's Republic
6. Payment Agreement between the Czechoslovak Socialist Republic and the Cambodian People's Republic
7. Agreement on Cultural Cooperation between the Government of the Czechoslovak Socialist Republic and the People's Revolutionary Council of Cambodia
8. Agreement between the Government of the Czech Republic and the Government of the Kingdom of Cambodia for the Promotion and Reciprocal Protection of Investments
9. Protocol amending the Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the People's Republic of Kampuchea for a loan for repairs and modifications of a power plant in Phnom Penh
10. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the People's Republic of Kampuchea for a loan to finance the Czechoslovak participation in the implementation of economic cooperation activities in the People's Republic of Kampuchea
11. Agreement on Economic Cooperation between the Government of the Czechoslovak Socialist Republic and the Royal Government of Cambodia

Indonesia

1. Agreement Between the Government of the Czechoslovak Republic and the Government of the Republic of Indonesia on Scientific and Technical Co-operation
2. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Republic of Indonesia on amendments to the Annex of the Air Transport Agreement between the Government of the Czechoslovak Socialist Republic and the Indonesia
3. Agreement between the Government of the Czech Republic and the Government of the Republic of Indonesia on Cooperation Activities in the Field of Defence
4. Agreement between the Government of the Czech Republic and the Government of the Republic of Indonesia for the Promotion and Protection of Investments
5. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Republic of Indonesia on the consolidation of Indonesia's debt obligations
6. Air Transport Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Republic of Indonesia
7. Agreement between the Czechoslovak Socialist Republic and the Republic of Indonesia on the Payments of Indonesian Obligations and Protocol
8. Treaty of Friendship and Co-operation between the Czechoslovak Socialist Republic and the Republic of Indonesia
9. Agreement between the Government of the Czech Republic and the Government of the Republic of Indonesia on Economic Cooperation
10. Agreement between the Government of the Czech Republic and the Government of the Republic of Indonesia for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with respect to Taxes on Income and Protocol
11. Agreement on Scientific, Educational and Cultural Cooperation between the Czechoslovak Republic and the Republic of Indonesia

Lao PDR

1. Agreement between the Government of the Czech Republic and the Government of the Lao People's Democratic Republic on the settlement of mutual claims and obligations
2. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Lao People's Democratic Republic amending the exchange of

goods between the Czechoslovak Socialist Republic and the Lao People's Democratic Republic from July 11, 1979

3. Agreement on Civil Air Transport Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Lao People's Democratic Republic
4. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Lao People's Democratic Republic on the abolition of visa requirements for holders of diplomatic, special and service passports
5. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Lao People's Democratic Republic on cooperation in the health sector changed exchange of notes dated 03/06 1995 17.4 1996
6. Agreement on exchange of goods between the Czechoslovak Socialist Republic and the Lao People's Democratic Republic
7. Agreement on Scientific and Technological Cooperation between the Czechoslovak Socialist Republic and the Lao People's Democratic Republic
8. Consular Convention between the Czechoslovak Socialist Republic and the Lao People's Democratic Republic
9. Agreement on cultural cooperation between the Government of the Czechoslovak Socialist Republic and the Government of the Lao People's Democratic Republic

Malaysia

1. The Partial Visa Abolition Agreement between the Government of the Czech and Slovak Federal Republic and the Government of Malaysia
2. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of Malaysia for Air Services between and beyond their respective territories
3. Agreement between the Czech Republic and Malaysia for the Promotion and Protection of Investments
4. Agreement between the Government of the Czech Republic and the Government of Malaysia for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with respect to Taxes on Income

Philippines

1. Agreement between the Government of the Czech Republic and the Government of the Republic of Philippines on Cooperation in the Fields of Culture, Education, Science and Sports

2. Agreement on Scientific and Technical Cooperation between the Government of the Czechoslovak Socialist Republic and the Government of the Republic of the Philippines
3. Convention between the Czech Republic and the Republic of the Philippines for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with respect to Taxes on Income
4. Memorandum of Understanding on Cooperation in the Field of Agricultural, Science and Technology between the Government of the Czechoslovak Socialist Republic and the Government of the Republic of the Philippines
5. Air Transport Agreement between the Government of the Czech and Slovak Federal Republic and the Government of the Republic of the Philippines
6. Agreement between the Czech Republic and the Republic of the Philippines for the Promotion and Reciprocal Protection of Investments and Protocol
7. Agreement between the Government of the Czech Republic and the Government of the Republic of Philippines on the waiver of visa requirements for holders of diplomatic or service passports of the Czech Republic and for holders of diplomatic or office passports of the Republic of Philippines

Singapore

1. Protocol Amending the Agreement between the Government of the Czech Republic and the Government of the Republic of Singapore for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income
2. Agreement between the Government of the Czech Republic and the Government of the Republic of Singapore for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with respect to Taxes on Income
3. Agreement between the Government of the Czech Republic and the Government of the Republic of Singapore on Abolition of Visa Requirements
4. Air Transport Agreement between the Government of the Czech Republic and the Government of the Republic of Singapore
5. Agreement between the Government of the Czech Republic and the Government of the Republic of Singapore on the Promotion and Protection of Investments

Thailand

1. Agreement between the Czech Republic and the Kingdom of Thailand on the Transfer of Offenders and Co-operation in the Enforcement of Penal Sentences

2. Arrangement on Cooperation between the Ministry of Foreign Affairs of the Czech Republic and the Ministry of Foreign Affairs of the Kingdom of Thailand
3. Air Services Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Kingdom of Thailand
4. Agreement between the Government of the Czech Republic and the Government of the Kingdom of Thailand to amend the Agreement on Air Services between the Government of the Czechoslovak Socialist Republic and the Government of the Kingdom of Thailand on 14 June 1988 concluded by an exchange of notes
5. Agreement on Economic Cooperation between the Government of the Czech Republic and the Government of the Kingdom of Thailand
6. Agreement on the abolition of visa requirements for holders of diplomatic and official passports between the Government of the Czech and Slovak Federal Republic and the Kingdom of Thailand
7. Agreement between the Government of the Czech Republic and the Government of the Kingdom of Thailand for the Promotion and Protection of Investments
8. Convention between the Government of the Czech Republic and the Royal Government of the Kingdom of Thailand for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with respect to Taxes on Income
9. Agreement between the Government of the Czech Republic and the Government of the Kingdom of Thailand to amend the Annex to the Agreement on Air Services between the Government of the Czechoslovak Socialist Republic and the Government of the Kingdom of Thailand on 14 June 1988 concluded by an exchange of notes

Viet Nam

1. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan Socialist Republic of Vietnam / the supply of flour /
2. Agreement between the Government of the Czech Republic and the Government of the Socialist Republic of Vietnam on the readmission of citizens of both States
3. Additional Agreement to the Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam on the exchange of goods, wages and the provision of credit to offset the surplus between the Czechoslovak export and import
4. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan intended for the

supply of equipment and materials for the reconstruction of railways Ho Chi Minh City – Vinh

5. Protocol between the Government of the Czech Republic and the Government of the Socialist Republic of Vietnam implementing the Agreement between the Government of the Czech Republic and the Government of the Socialist Republic of Vietnam on the on readmission of citizens of both countries
6. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam on cooperation in the cultivation of the coffee plant
7. Third Supplementary Agreement to the Agreement between the Government of the Czechoslovak Socialist Republic of Vietnam and the Government of the Democratic Republic of the loan agreement for the supply of thermal power equipment into the Democratic Republic of Vietnam from November 6, 1970
8. Arrangement between the Ministry of Defence of the Czech Republic and the Ministry of National Defence of the Socialist Republic of Vietnam concerning Co-operation in the Field of Military Education
9. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to cover the balance of trade in the years 1981 – 1985
10. Treaty between the Czechoslovak Socialist Republic and the Socialist Republic of Vietnam on legal assistance in civil and criminal cases
11. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam on the establishment and activities of cultural and information centres and Protocol
12. Agreement on Economic Cooperation between the Government of the Czech Republic and the Government of the Socialist Republic of Vietnam
13. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam on cooperation in the cultivation of rubber trees
14. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to finance the Czechoslovak participation in the implementation of investment projects in the Socialist Republic of Vietnam
15. Protocol between the Government of the Czech and Slovak Federal Republic and the Government of the Socialist Republic of Vietnam on the settlement of claims and

liabilities in payment relations between the Czech and Slovak Federal Republic and the Socialist Republic of Vietnam

16. Agreement between the Government of the Czechoslovak Socialist Republic and the Democratic Republic of Vietnam on cooperation in the field of health
17. Protocol on Cooperation between the Federal Ministry of Foreign Affairs of the Czech and Slovak Federal Republic and the Ministry of Foreign Affairs of the Socialist Republic of Vietnam
18. Agreement between the Government of the Czechoslovak Socialist Republic of Vietnam and the Government of the Democratic Republic of the exchange of goods and salaries and the provision of credit to offset the surplus between MS. exports and imports for the period 1976-1980
19. Agreement between the Government of the Czech Republic and the Government of the Socialist Republic of Vietnam concerning Air Services
20. Memorandum of Understanding on Cooperation in the Field of Environmental Protection between the Ministry of Environment of the Czech Republic and the Ministry of Natural Resources and Environment of the Socialist Republic of Vietnam
21. Arrangement between the Government of the Czech Republic and the Government of the Socialist Republic of Vietnam on the abolition of visa requirements for holders of diplomatic passports of the Czech Republic and for holders of diplomatic passports Socialist Republic of Vietnam concluded by an exchange of notes
22. Agreement between the Government of the Czechoslovak Socialist Republic of Vietnam and the Government of the Democratic Republic of the loan agreement for the supply of thermal power equipment into the Democratic Republic of Vietnam
23. Agreement between the Ministry of Labour and Social Affairs of the Czech Republic and the Ministry of Labour, War Invalids and Social Affairs of the Socialist Republic of Vietnam on cooperation in labour, employment and social security
24. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan intended for the supply of equipment and installation centres for trainee drivers
25. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to finance the Czechoslovak participation in modernizing the depot in the Socialist Republic of Vietnam
26. Agreement on Cultural Cooperation between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam

27. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to meet the needs of Socialist Republic of Vietnam
28. Fourth Supplementary Agreement to the Agreement between the Government of the Czechoslovak Socialist Republic of Vietnam and the Government of the Democratic Republic of the loan agreement for the supply of thermal power equipment into the Democratic Republic of Vietnam from November 6, 1970
29. Agreement between the Government of the Czech Republic and the Government of the Socialist Republic of Vietnam on training Vietnamese citizens in secondary vocational schools in the Czech Republic
30. Interchangeable letter of loan Czechoslovak Socialist Republic of Vietnam Socialist Republic intended for the purchase of grain
31. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to finance the Czechoslovak participation in the modernization of electronic factories in the Socialist Republic of Vietnam
32. Additional Agreement to the Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to finance the Czechoslovak participation in the modernization of light industry in the Socialist Republic of Vietnam
33. Agreement between the Government of the Czech Republic and the Government of the Socialist Republic of Vietnam for the Promotion and Reciprocal Protection of Investment
34. Consular Convention between the Czechoslovak Socialist Republic and the Socialist Republic of Vietnam
35. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to finance the Czechoslovak participation in the modernization of light industry in the Socialist Republic of Vietnam
36. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam on cooperation in the intensification of geological exploration works on the territory of the Socialist Republic of Vietnam

37. Agreement between the Government of the Czech Republic and the Government of the Socialist Republic of Vietnam for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with respect to Taxes on Income and on Capital
38. Agreement on regulation of obligations arising from mutual cooperation in the years 1976-80 / Czechoslovak Socialist Republic - Socialist Republic of Vietnam /
39. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to finance the Czechoslovak participation in the design and construction of hydroelectric power plant Vinh Son
40. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam on cooperation in the development of science and technology in 1990
41. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to cover part of the Czechoslovak surplus balance of payments in the years 1986 – 1990
42. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to finance the Czechoslovak participation in the intensification of geological exploration works in the SRV in 1988-1990
43. Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to finance the Czechoslovak participation in the modernization of machinery plants in the Socialist Republic of Vietnam
44. Protocol between the Government of the Czech Republic and the Government of the Socialist Republic of Viet Nam on the amendments to the Agreement between the Government of the Czech Republic and the Government of the Socialist Republic of Viet Nam
45. The Protocol to the Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Republic of Vietnam to grant a loan to cover the balance of trade in the years 1981 - 1985