Bachelor's Thesis

Switzerland's Opportunity Costs for not Joining the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)

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Management Summary

Switzerland has faced growing troubles concerning negotiating new and renegotiating existing free trade agreements (FTAs). These agreements are a critical part of the country's ability to provide its companies with competitive parity compared to businesses from other countries. Therefore, new options have to be assessed to even the playing field in terms of trade for Swiss companies. One such option is the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), which to date includes 11 nations. So far, the discussion regarding a Swiss membership in this agreement has been held on a qualitative basis. Therefore, it is unknown what membership in this agreement would mean for Switzerland in numeric terms.

This Bachelor's thesis provides a first approach to calculating the opportunity costs (OC) for Switzerland in the form of lost trade. In addition, it gives an overview of all current and potential CPTPP countries, their current relationship with Switzerland, and their demographic situation. Moreover, it estimates the FTAs' impact on different Swiss industries and lists the most important countries among current CPTPP members. These countries are then compared with the current priority list of the State Secretariat for Economic Affairs (SECO). To make these forecasts, Swiss trade data from 2012 to 2020 is used to predict how trade might behave in the future. The forecasts estimate how trade between Switzerland and CPTPP members might behave between 2020 and 2030. All detailed calculations can be found in the appendix and an additional Excel file attached to this thesis.

The calculations conducted in this thesis have forecasted that the OC for Switzerland is equal to approximately CHF 989.6 million. Of these costs, CHF 283.9 million are expected to be carried by exporters and CHF 705.7 million by importers of goods. Therefore, imports are expected to rise more than exports if Switzerland enters this FTA. Sectors that will benefit from this treaty were found to be the pharmaceutical, chemical, and metal industries. The industries of precision instruments, watches, jewelry, textiles, precious metals, machinery, agriculture, forestry, and fishing will be at a disadvantage. Another version of this analysis was conducted without Vietnam and found that precision instruments, watches, jewelry, and machines would also benefit from a Swiss CPTPP membership. The most crucial CPTPP members for Switzerland were found to be Vietnam, Japan, Australia, Singapore, Malaysia, and Canada. Of these nations, Australia is the only one that Switzerland does not view as one of its priorities or has started the process of negotiating an FTA.

This thesis recommends that Switzerland becomes a member of the CPTPP as the potential costs resulting from lost trade are significant. It would be beneficial to enter into this FTA from a monetary perspective as the costs of the currently higher tariffs are carried by domestic consumers, reducing their welfare. However, an entry into this agreement is estimated to reduce Swiss net exports, which could put additional stress on domestic producers.

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List of Abbreviations

APAC .....Asia-Pacific

CH.....Confoederatio Helvetica (Switzerland)

CPTPP .....Comprehensive and Progressive Agreement for Trans-Pacific Partnership

EEA .....European Economic Area

EFTA .....European Free Trade Association

EU.....European Union

FDFA .....Federal Department of Foreign Affairs

FDI.....Foreign Direct Investments

FOCBS .....Federal Office for Customs and Border Security

FTA.....Free Trade Agreement

LN.....Natural Logarithm

Log 10.....Base 10 Logarithm

LR .....Linear Regression

OECD .....Organisation for Economic Co-operation and Development

OC.....Opportunity Costs

RTA .....Regional Trade Agreement

SECO.....State Secretariat for Economic Affairs

TPP .....Trans-Pacific Partnership

UK .....United Kingdom

WTO .....World Trade Organization

1. Introduction

1.1. Background Information

Since the end of World War II, the relevance of global trade has become increasingly important every year (Urata, 2002). Between 1950 and 2020, the world trade volume increased by 4000% and trade values have increased 274-fold (WTO, n.d.-a). This significant increase in trade is partially attributable to the increased development of Free Trade Agreements (FTA) (Baier & Bergstrand, 2007). Another reason for this increase is the invention of modern cargo containers and the revolution of global shipping (NOAA Office of Response and Restoration, 2017). These factors contributed and ultimately paved the path toward globalized trade.

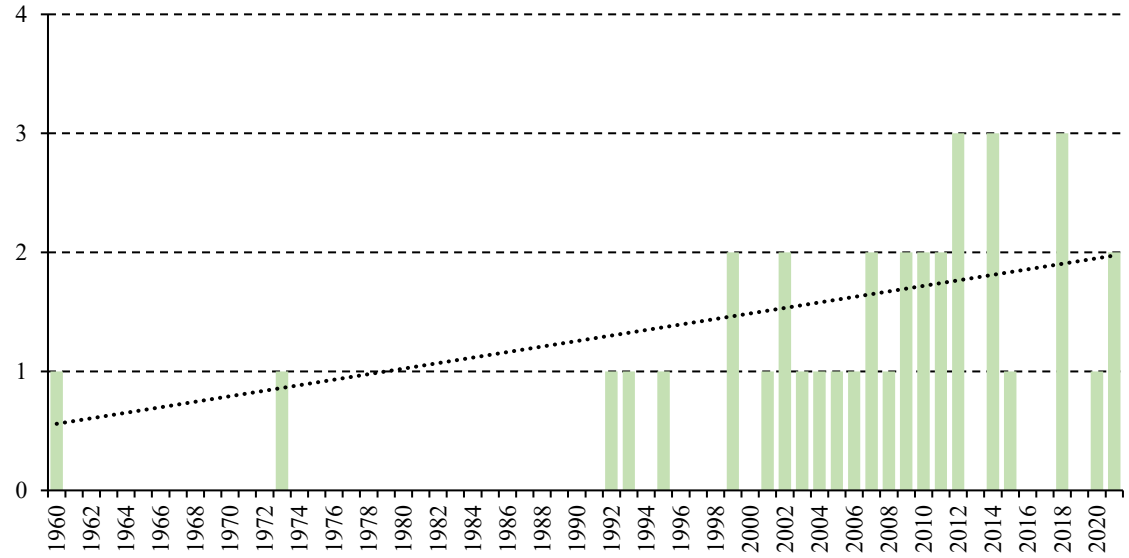
Within this strongly growing global economy, Switzerland finds itself as a landlocked nation at the heart of Europe. The country has experienced low but consistent growth over the past 40 years (SECO, 2021a). Part of this growth can be attributed to the openness of the Swiss economy (Föllmi, et al., 2018). This led the country to enter into many FTAs directly or indirectly through the European Free Trade Association (EFTA) (SECO, 2021b). These FTAs served to address challenges posed by the Swiss geography. As mountainous terrain covers more than two-thirds of the country (Bundesamt für Umwelt BAFU, 2021), sustaining its population of around 8.7 million inhabitants would be a challenge without the import of foreign goods (Rossi, 2021). In addition, some of the staple sectors of the Swiss economy, for example, the chemical and pharmaceutical industries, are highly dependent on revenue generated by the export of their goods to foreign markets (Federal Statistical Office, 2021).

Therefore, the government has enacted policies that foster trade in these critical industries. As can be seen in Figure 1, the total volume of the Swiss free trade legislature has been increasing significantly. Moreover, the data represented in this chart includes the FTAs that Switzerland has entered into by itself and agreements reached through EFTA. However, Switzerland encountered growing challenges in the re-negotiation process of FTAs with larger countries such as Japan (Ursprung & Ziltener, 2020). This is also underlined by the recent visit of the federal president of Switzerland, where he stated that Japan's unwillingness to renegotiate existing trade agreements forces Switzerland to look for alternative solutions (Kölling, 2022). Furthermore, the amount of regional trade agreements (RTA) has been rising significantly over the same period (WTO OMC, n.d.). As these often include creating a market that focuses on the economic integration between the member states, non-members could face significant competitive disadvantages due to

new common rules and standards implemented throughout the RTA (Crawford & Fiorentino, 2005).

Figure 1

Amount of new CH Free Trade Legislature per year 1960-2021



Note: Amount of new free trade legislature that the Swiss government has enacted and ratified per year from 1960 to 2021. Own illustration based on *Free trade partner of Switzerland*, by SECO (2021b).

One of these RTAs that could significantly impact the global and the Swiss economy is the CPTPP. Formerly known as the Trans-Pacific Partnership (TPP), this agreement aims to foster trans-pacific trade and consists of 11 countries (Weerth, n.d.). Essential targets of the agreement are reducing tariffs between the contracting parties, the standardized protection of intellectual property, and creating a court to handle disputes regarding foreign direct investments (FDI) (Weerth, n.d.). As new countries could join this agreement at any time, this fact presents Switzerland with a unique choice to tackle the difficulties mentioned above in renegotiating bilateral trade agreements. The conditions for entry into this agreement are that all current member states agree on the applicant joining the CPTPP as a new member (Kane, 2021). In theory, Switzerland would be able to enter this agreement and profit from the increase in trade resulting from further economic integration with its members.

1.2. Problem Statement and Research Questions

Switzerland's increasing difficulties in renegotiating trade agreements can be viewed as a growing problem for the country's strategic positioning in the global economy (Rötheli, 2021). Furthermore, the growth of RTAs throughout the global economy provides an additional challenge as Switzerland did not join many economic integration

projects such as the European Economic Area (EEA) (Bondolfi, 2022). Even though these threats do not impact the country severely, their impact could drastically increase over the coming years (Sieber-Gasser, 2020). These issues could manifest in the form of competitive disadvantages for Swiss companies (Settelen, 2020). As companies from member states of RTAs follow the same guidelines, sourcing becomes increasingly attractive within such a market (Settelen, 2020).

Switzerland faces choices regarding which agreements it should strive to enter into. One of these agreements is the previously mentioned CPTPP. Swiss legislators and other institutions have already assessed this agreement within the country (Schneider-Schneiter, 2020; Ursprung & Ziltener, 2021). These discussions focused on the political aspects of the agreement and the effects of such a treaty on Switzerland. The discussion has been held qualitatively, not accounting for quantitative factors. Therefore, the absence of a quantitative factor establishes the first research question:

What are the opportunity costs (OC) for Switzerland for the first ten years if the country would not enter into the CPTPP? This thesis intends to answer this research question by applying quantitative means by gathering trade data and analyzing this data through a modified gravity equation. Furthermore, it made use of forecasting based on the usage of past data.

In addition, the political debate surrounding free trade in Switzerland also revolves around the winners and losers of such agreements, as seen in the debate surrounding free trade with Indonesia (Komitee Stop Palmöl, 2021). This leads to the second research question of this thesis:

Which economic sectors of the Swiss economy would profit and which would lose the most? This question will be answered by using the data on trade development with different nations. The figures will then be compared with current data on the export of various goods to the countries that are currently members or might join the CPTPP in the future. Therefore, it will be answered as if all factors surrounding the composition of trade would remain equal.

Lastly, an important question that has to be analyzed within the debate on this FTA is whether or not the member states within the agreement are highly relevant to the country. This question is significant as a lack of significance of the members could misallocate the resources that the department of commerce could have used more effectively. As a result of this, the third research question of this paper is as follows:

Which countries are the most relevant trading partners for Switzerland within the agreement? This question will be answered by analyzing the country's forecasted total

volume of trade with Switzerland and the OC that arise from not being a member. Moreover, an analysis of the demographics will determine how significant the respective country is for the Swiss economy. Although the effect of the working-age population is important when trying to assess the importance of a country, the trade forecasts are viewed as more critical as they indicate the relevance of the countries in monetary terms.

1.3. Overview of the Thesis

This Bachelor's thesis is structured as follows. The literature review in Section 2 introduces the reader to the existing literature on the CPTPP and economic concepts regarding trade. The theoretical framework follows it in Section 3, which displays what constitutes an FTA, followed by the calculations used to forecast the OC Switzerland might face until 2030. While Section 3 represents the formulas used to answer the research questions, Section 4 introduces the reader to how and where the data used in this thesis has been gathered. Section 5 then gives an overview of all current and potential CPTPP members and their relationship with Switzerland. In addition, this section will inform the reader about demographic trends that are estimated to affect the analyzed nations. Four scenarios are then drawn up in Section 6, showing how the entry of different nations into the CPTPP impacts the forecasts made. After that, Section 7 will discuss the findings of the previous section and is followed by the limitations of results in Section 8. A recommendation regarding entering into the CPTPP is drawn up in Section 9. Furthermore, recommendations for further research will be presented in this section. Finally, Section 10 will conclude the thesis and its most important findings, limitations, and recommendations.

2. Literature Review

In this part of the paper, current literature on the CPTPP will be outlaid and assessed to provide the reader with insights regarding this trade agreement. As this paper concerns itself with the OC that could arise for Switzerland if it would not opt in to such an agreement, literature regarding this specific topic could not be found. The scope of the review will concern itself with the most important literature available from policymakers and economic theory. The literature used within this review comprises policy papers, economics textbooks, and journal articles. First, literature regarding policymakers will be analyzed, followed by an analysis of sources gathered from research institutes and concluded with a list of important economic literature.

2.1. Literature from Policymakers

The Department for International Trade (2021) of the United Kingdom (UK) assessed a potential entry of the Union into the CPTPP. The department evaluated the potential impact the agreement would have on trade, real income, foreign direct investments, and GDP within this report. However, these figures could prove to be derived in a way that could be politically motivated, as this agreement is part of the country's Brexit plan (Truss, 2020). In addition, this governmental institution has only been formed after the Brexit vote had taken place, meaning that new experts on trade had to be trained from 2017 onwards (Ryan, 2017).

New Zealand foreign affairs & trade (2018) made a national interest analysis regarding an entry into the CPTPP. This report assessed the socioeconomic implications that the agreement would pose for New Zealand. The department assesses the impact on various economically relevant sectors, tariffs, and foreign direct investments within this report. The methodology behind the paper is transparent and could be taken as an example of a report a government could produce when wanting to enter into an FTA.

In addition, the Swiss government published an interpellation regarding an entry into the CPTPP. Schneider-Schneiter (2020) wrote about qualitative reasons as to why Switzerland might not be able to join the said agreement. This interpellation discusses different political issues that come up if the country were to consider becoming a CPTPP member, focusing mainly on the negative aspects of the agreement.

2.2. Literature from Other Institutions

Moving over to literature created by other institutions, there is a report published by Ursprung and Ziltener (2020). Within it, the authors focus on how Switzerland is currently positioned within global trade and on what potential risks the Swiss economy might face in the future. Furthermore, this report includes a map of the Swiss perspective on the new mega-regions in the Asia-Pacific (APAC) region. Moreover, the paper draws back to past policy decisions regarding FTAs where the Swiss democratic almost led to the failure of new beneficial agreements. These findings were further underlined by an article written by the same authors exploring current developments of the CPTPP regarding Switzerland (Ursprung & Ziltener, 2021).

When analyzing the topic from a global perspective, a policy brief by Petri and Plummer (2019) shows an analysis of different scenarios. These scenarios mainly focus on the possibilities that a Chinese entry into the CPTPP would present as it was drafted up after the US left the TPP in 2016 (Rappleye & Blackwill, 2017). Therefore, the institute created six scenarios that could arise through different countries entering the CPTPP. The implications on real income, exports, Chinese bilateral trade, and shifts in Chinese sectoral trade were calculated within these other frameworks. These results were based on the calculations by the institute. Additionally, the publishers came under fire due to them accepting funding from Chinese state corporations, which might impair the quality and credibility of the research produced by the institute (Kakutani, 2020). However, the Columbia University Press (n.d.) wrote that the institute holds a good record of research in regional studies on macroeconomics, trade and investment, finance, globalization, and human welfare that undergo thorough peer-review processes accepted by leading academic presses.

2.3. Gravity Equation

As international trade follows certain fundamental principles, Head and Mayer (2013) created a working paper. The book summarizes what economists have come up with over the past 50 years and presents these findings and approaches. The authors gathered all the different methods to a vital formula used in trade economics called the gravity equation. The main parts of the formula are the sizes of the economies, then affected by the geographic distance between the countries. According to the theory, this distance has grave implications for the amount of trade between two nations.

Further research on the topic has been compiled by Rauch (2016), who wrote a journal article on the geometry of the distance coefficient. Within this article, he further reaffirms the findings presented by Head and Mayer (2013). This journal article adds to the equation by considering certain outliers provided by geographic features that might invalidate the equation to a certain extent.

In addition, a paper on the effects of globalization on the gravity equation stands as a counter to the strong impact that distance has on the formula (Dias, 2010). The author analyzed that the role of tariffs affects the flow of goods that were previously only attributed to geographic distance. Furthermore, the author discussed the effects of production decentralization on trade which is not included in most gravity equation formulas.

3. Theoretical Framework

The OC that arise from a country not taking part in FTA can be calculated through various means. Fernando (2021, para. 1) describes OC as the difference between the status quo and a scenario derived from enacting a policy change. This change, in turn, leads to the country entering the FTA becoming more prosperous. When FTAs are discussed on the political stage, the costs for certain parties within a country are used to argue against gaining membership in such agreements. Therefore, defining these costs when analyzing if a country should strive to enter into such an agreement becomes crucial to discussing such an objective manner.

3.1. Free Trade Agreement and Regional Trade Agreement

This thesis will use the International trade administration's (n.d.) definition of what constitutes an FTA. The primary aim of an FTA is to help increase companies' competitiveness by lowering the barriers to trade with other nations. Therefore, these treaties are mainly focused on economic collaboration by reducing tariffs, strengthening intellectual property laws, and the increased protection of foreign investors (New Zealand Foreign Affairs & Trade | Manatū Aorere, n.d.). The World Trade Organization (WTO) broadens the definition of an FTA to include any reciprocal trade agreement between two or more partners and adjusts the name to RTA (WTO, n.d.-b). Therefore, the terms FTA and RTA will be used interchangeably throughout this thesis.

Moreover, these agreements can be classified as modern or not (Fontanelli, 2019). According to Fontanelli (2019), the anatomy of a modern FTA includes eight key aspects. These aspects are the deeper integration exceeding the mere exchange of trade concessions, the liberalization of the trade in all goods, the specific liberalization of agricultural goods, and seeking the alignment of product specifications in participating countries (mutual recognition of members' standards is encouraged), locking in current concessions and the prohibition of future discriminatory measures, further the protection of foreign investment, serve to protect each countries geographical indications, and might include the parties' pledges to key topics (Fontanelli, 2019). This definition was further backed by Haggart (2017), who wrote that modern FTAs are focused more on intellectual property and the political economy of discourse.

3.2. Opportunity Costs

This term is primarily used in the academic fields of economics and accounting when a decision must be made (Leininger, 1977). According to Samuelson & Scott (1968), OC are derived from the loss of doing something else, leading one to miss out on

the potential benefit of an alternative option. This means that you will have to give up something to gain additional benefits from another thing. Therefore, to benefit from one unit of x a decision-maker will have to give up a certain quantity of good y. However, the field of accounting defines the term differently. Kohler (1975) described OC as the costs incurred when altering a business's machines, processes, raw materials, specifications, or operations. Therefore, it is defined as the costs that stem from changing something up within a running system. Another definition of OC views this term in a more general sense. As Fernando (2021, para. 1) wrote, "Opportunity Costs represent the potential benefits that an individual, investor, or business misses out on when choosing one alternative over another." Another more general definition states that OC are derived from not using the next best alternative action (Becker et al., 1974). This means that the decision-maker misses out on the potential benefit of said option.

3.3. Calculation

To calculate the effects of OC, a party first needs to have at least two or more different investment options (Becker et al., 1974). Thus, all expenses and revenues that will arise from choosing either option must be considered in a calculation. Leininger (1977) calculated OC with an order and demand matrix. In this matrix, a deciding agent had to order a quantity of a seasonal product that would lose all its value at the end of the season. The OC, in this case, materialize themselves in the demand the business has missed to capture or the inventory that it could not sell until the end of the season. However, to use this concept in international trade, one must adjust these approaches. Therefore, a base scenario will be drawn up, which will be used as a benchmark. This benchmark will then be modified by applying a different growth rate representing the change brought about by the other decisions.

3.3.1. Formulas

The equations used to calculate the benchmark scenario show how trade could develop if Switzerland did not join the CPTPP and is as follows:

$$TRV^{BS} = TRV_{tp}(1 + g_{TRV})^n$$

or

$$TRV^{BS} = TRV_{tp}(1 + log\ (1 + g_{TRV}))^n$$

This formula has been derived from a compound interest formula (Venkat & Essien, 2011, p. 369). Within the adapted version TRV^{BS} represents the future value of total trade country A has with country B. TRV_{tp} is the amount of total trade country A has with country B in the current year. Furthermore, the formula entails g_{TRV} representing

the average growth rate over a certain amount of time. This growth rate is derived from a simple linear regression (LR) where the y-axis represents the total volume of trade. The x-axis represents the flow of time which means that the formula works with time-series data. Lastly, *n* represents the time in years that the forecast will predict.

To create multiple scenarios, a first scenario is drafted up in which the regression is used to make a forecast on the future growth of the total volume of trade. In the second and third scenarios, two different kinds of logarithms will be used. This is done as trade data is characterized by high heteroscedasticity that a logarithm can reduce (Riveros, 2019). Riveros' (2019) method uses a natural logarithm (LN) as growth in this formula is assumed to be exponential. This assumption has been further backed up by Gujarati and Porter (2009, pp. 144-149), who used a LN to forecast a growth rate.

Furthermore, Gelman and Hill (2007, pp. 60-61) explain that the advantages of a LN over a base 10 logarithm (Log 10) include approximate proportional differences in its coefficient. However, they also propose that a logarithm with a base of 10 can benefit the predicted values produced by said logarithm are easier to interpret (Gelman & Hill, 2007). Therefore, this thesis will use both a natural and a Log 10 and a growth rate derived by LR to create a range of possible outcomes.

As a scenario must be created to compare the previously created benchmark to a formula including a higher growth rate:

$$TRV^{FT} = TRV_{tp}(1 + g_{TRV} \pm g_{TFT})^n$$

or

$$TRV^{FT} = TRV_{tp}(1 + log\ (1 + g_{TRV}) \pm g_{TFT})^n$$

Within the adapted equation, the variable TRV^{FT} represents the total value of total trade under an FTA of which a country has become a member. Like TRV^{BS}, this number varies by the additional growth of exports that country A might experience when entering a bi- or multilateral trade agreement. Therefore, the term g_{TFT} comprises of g_{TRV} multiplied with an additional growth rate. This additional rate represents how global exports might change in different scenarios and can be modified through a LN to reduce high heteroscedasticity. Therefore, g_{TFT} shows what fraction of growth of global exports is captured by country A trading with other nations within an FTA. The computation of this captured growth rate, in turn, represents an adapted gravity equation. Where only the economic size of country A is multiplied by the size of country B. In the case of a multilateral FTA, the global growth rate is applied to the growth of trade between countries A and B, which represents an additional increase/decrease in the growth/decline of trade between them. This serves to address the findings of Baier and Bergstrand (2007),

who found that entering an FTA will generally increase the trade between the member states of these agreements.

After creating a benchmark that can be compared against different scenarios, it is now possible to utilize a formula that derives the OC for country A in one year:

$$OC_1^A = TRV_1^{FT} - TRV_1^{BS}$$

Within this formula OC_1^A represents the OC that arise from lost trade for one year. Therefore, the value of total trade from the benchmark is deduced from the value of the forecasted total trade.

As this formula does not represent the result of the OC for multiple years for a given country, it must be adapted to include multiple years. By calculating the sum of the results of the years that should be forecasted, under the assumption that the development of the trade over time is linear, it will give us the total OC for the timeframe:

$$OC_t^A = \sum_{t=0}^{n} TRV_t^{FT} - TRV_t^{BS}$$

Where OC_t^A represents the OC for country A for the timeframe *t*. As growth is assumed to be linear, this formula results from multiple years of lost trade that could arise from country A not joining a bi- or multilateral trade agreement.

This approach of deriving OC from past data on the total flow of trade between two countries can be helpful when making assumptions about future developments. In addition, it can be applied straightforwardly as it is possible to make use of reliable data provided by government agencies. Lastly, the assumption of linearity based on past data enables whoever intends to use this model to forecast future developments precisely.

These OC per country will then be taken and inserted into their current balance of trade with country B. This means that the share of OC that imports and exports will carry can be derived from this formula. This balance of trade is assumed to remain unchanged over the forecasting period and gives us the following formula:

$$EX_t^A = OC_t^A * \frac{EX_b^A}{TRV_b^A}$$

or

$$IM_t^A = OC_t^A * \frac{IM_b^A}{TRV_b^A}$$

EX_t^A and IM_t^A represent the forecasted OC that exporters or importers will carry for the observation period. After that, EX_b^A and IM_b^A are the amount of exports/imports of country A to country B in the benchmark year. This number is then divided by the total trade volume TRV_b^A of country A to country B in the base year. Thus, this formula

assumes the linearity of the share of imports and exports throughout the observation period.

The result gathered from the prior calculation can then be inserted into another formula to forecast which industries might gain or lose from entering into an FTA. Industries that gain from the agreement will fare an increase in net exports while losers are classified as increasing the amount of net imports. The formula to receive this looks as follows:

$$IN_I^A = EX_t^A * SX - IM_t^A * SI$$

The variable IN_I^A represents an industry branch of country A that is analyzed by the calculation. Then the share of OC that are carried by exports can be inserted and will be multiplied by the current share of total exports SX that are generated by the analyzed industry. The same can be done with the share of total imports SI. Then the OC of the imports are deducted from the costs carried by the exports, which shows whether or not the industry will gain or lose from the FTA in question. Lastly, this calculation should be conducted for each potential member who might be part of a multilateral trade agreement to determine the treaty's benefits for the applicant.

3.4. SECO List of Priority Countries

Switzerland's development cooperation focuses on advancing the economies of developing countries in Africa, South-East Asia, and Latin America (SECO, 2021c). The SECO's priority list countries are Colombia, Egypt, Ghana, Indonesia, Peru, South Africa, Tunisia, and Vietnam (SECO, 2021c). The results of the calculations will then be compared against these countries to assess if the strategy chosen by the SECO aligns with the quantitative forecast made.

3.5. Demographics in Regard to Trade

According to Frankel, Romer, and Cyrus (1996), a country's working-age population (defined according to the definition of the Organisation for Economic Co-operation and Development (OECD) (n.d.) and area can contribute significantly to the growth it experiences according to the gravity equation. Therefore, this thesis will consider how the working-age population will evolve over the period between 2020 and 2030 for all current and potential CPTPP members. This will highlight which countries are the most important in terms of their labor pool. In addition, Busse and Königer (2012) used the LN applied to the average population growth rate as an effect on trade as well as on GDP per capita. Therefore, the working-age population of each country will be analyzed to find the countries that are the most relevant in terms of population growth.

3.6. Limitations to the Theory

There are significant limitations to the methodology and the approaches chosen to calculate the OC in this paper. First, the assumptions made on the flow of trade might impair the quality of the findings within this paper. This is due to the assumption that the flow of trade between two countries will grow linearly; the problem here is that falling into an estimating or forecasting trap is possible (Hammond et al., 1998). In addition, the growth rate parameter has a significant impact on both the benchmark and the forecasted scenario. Therefore, minor differences in the additional growth attributed to the FTA will lead to inflated or deflated figures.

Furthermore, the quality of the data inserted into the formula also presents a significant challenge. As has been proven by Pfister (2018), there are significant asymmetries in the reporting of bilateral trade. These asymmetries often arise because of trade in commodities like gold (Pfister, 2018). Therefore, the data used to forecast the flow of trade might be impaired by a difference in how countries record their exports/imports. This leads to all forecasts made on a dataset of one country not being able to reliably replicate the same estimates made based on the data of another country.

Additionally, the methodology assumes that trade between countries is not impacted by any other agreements the nations might have entered recently. Therefore, the additional growth rate might overestimate the impact of the new FTA as the two countries could have entered into such an agreement recently (e.g., FTA between Switzerland and Indonesia (SECO, 2022a)).

Moreover, applying the gravity equation in the formulas within this paper poses limitations to its results. The approach chosen spreads the growth of global exports equally across all countries within the treaty. It does not consider the effect of geographic distance on members of multilateral trade agreements. Therefore, the economic impact on trade that a new member would experience might be greater or smaller depending on their geographic location. Nevertheless, Dias (2010) argued that distance has less impact on trade over time due to globalization. Therefore, the distance would certainly affect the results received by the calculations but are neglected to generalize the formula further.

4. Collection of Data

The data used in this thesis has been gathered through secondary sources provided by governmental institutions on the flow of trade. In addition, some of the data used within this paper stem from non-governmental or supra-national organizations. In this chapter, the approach of gathering necessary data as inputs into the formula will be disclosed and discussed.

4.1. Governmental Institutions

The sources provided by governmental institutions can be limited to data gathered and published by Swiss authorities. The most important register on data regarding trade is the Swiss-Impex (FOCBS, n.d.). This tool collects all data gathered by the Swiss customs authorities and enables users to precisely request the exact statistics they need. A user must first select the interval and period from which he wants to request data. Next, the direction of the flow of trade can be chosen, followed by the types of goods that a user wants to analyze. Lastly, commercial partners need to be selected and the user is given a choice between the Total Trade 1 and the Total Trade 2.

It can be said that the data provided by this web page is elemental to the outcome of this paper as they provide the growth rates within the formulas. First, the data requested from the database was gathered annually. Next, total trade has been selected as the flow of all goods is relevant when determining the impact of an FTA on the Swiss economy as a whole. Then the countries included in the scenarios of the report created by Petri and Plummer (2019) have been chosen as they are relevant for the scenarios used in this paper. Lastly, the Total Trade 2 has been selected. The Total Trade 2 has a disadvantage against the Total Trade 1 as it also includes the trade with gold bars and other precious metals, coins, precious stones, gems, and works of art and antiques. Nevertheless, some of the trading partners in the CPTPP trade high volumes of said goods with Switzerland, which are used in value-adding industries. This is further underlined by this figure being used by the State Secretariat for Economic Affairs (SECO) for their information brochures on countries (SECO, 2022b).

The data gathered on the type of goods traded between Switzerland and the CPTPP members' aforementioned information brochures provide an overview of most countries analyzed in this thesis (SECO, 2022b). As these brochures are not updated simultaneously, a comparison between the values of different countries is not consistent. In addition, not all countries that Switzerland trades with are covered by the SECO, meaning that there are inconsistencies within this dataset.

4.2. Other Institutions

The report created by Petri and Plummer (2019) was used as a basis for the additional growth rates in the different scenarios described in Section 3.2.1 of the thesis. The report provides information on the effect of the CPTPP on real income, exports, the shifts in Chinese bilateral trade, and sectoral trade and output. The information is grouped into different scenarios, depending on which countries might join the RTA, and forecasts the changes this agreement has on global trade until 2030. This thesis will make use of the scenarios that were created to forecast global exports. Therefore, the average change in the number of exports attributable to the CPTPP will be used as an input into the formulas.

Additionally, trade policy reviews from the WTO (n.d.-c) will be used to show what level of tariffs Switzerland currently has with current and potential member states of the CPTPP. However, this dataset cannot make assumptions on how these tariffs will be reduced. This is due to the reduction being determined individually for every country aiming to join this RTA. Furthermore, this is underlined by a report from the department for international trade (2021, p. 45), as they estimated the level of tariff reduction the UK would face if they entered the CPTPP.

In order to assess the development of the population in the current and potential members of the CPTPP, forecasts made by the World Bank (2022) will be used. The relevant information retrieved from this website revolves around forecasts of how the analyzed countries' total and working-age populations will evolve. Therefore, forecasts on the total population from 2020 to 2030 and the age dependency ratio can be found. Furthermore, the National Development Council's (2021) database will be used to include Taiwan in assessing demographic development.

5. Country analysis

5.1. Australia

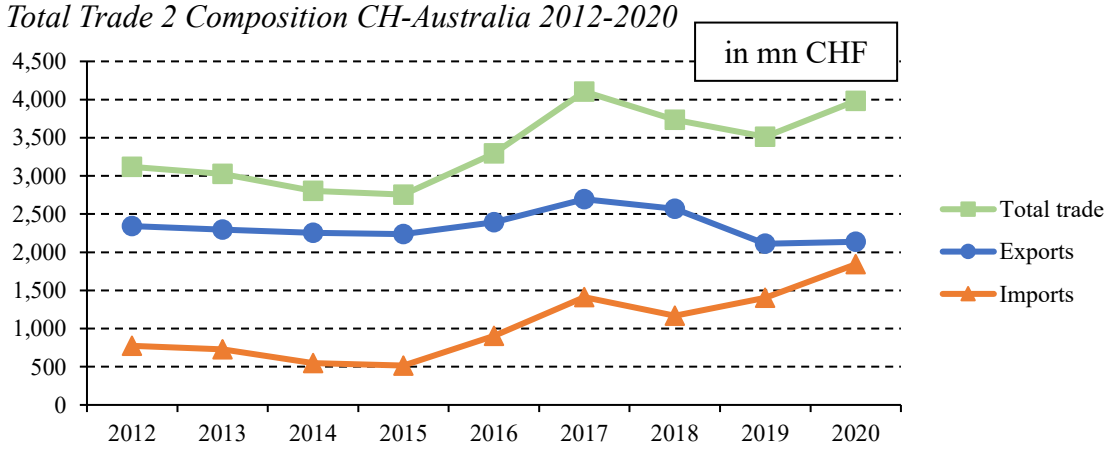
When looking at the relationship between Switzerland and Australia, it becomes apparent that it is Switzerland's fourth most important trading partner among current CPTPP members (Appendix R). Switzerland currently is a net exporter of goods to Australia, with imports to Switzerland growing (FOCBS, n.d.). At the moment, Switzerland and Australia trade without having signed an FTA or being members of an RTA. However, the Australian government commissioned a feasibility study in 2021 on strengthening trade with EFTA (Department of Foreign Affairs and Trade, 2021). Therefore, the economic relationship between the countries is good, and there are prospects for increased economic collaboration and integration (FDFA, 2022a).

5.1.1. Development of Trade with Switzerland

Over the past eight years, trade between Switzerland and Australia has increased by 27.57%, indicating that Australia has become a more important trading partner for Switzerland (Appendix A). As shown in Appendix A, Switzerland's main exports to Australia are pharmaceuticals, chemicals, precision goods, watches, jewelry, and machines (SECO, 2022b). Australia's main export to Switzerland is precious metals (SECO, 2022b), to which the sizable increase in imports starting from 2015 can be attributed.

Figure 2

Total Trade 2 Composition CH-Australia 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Australia. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.1.2. Demographics

The World Bank (2022) estimates that the Australian population is estimated to grow to 28.3 million people in 2030, representing a 10.18% increase by 2020. Meanwhile, its total working-age population is estimated to grow by 6.59%, from 16.6 million to 17.7 million people (Appendix V). Therefore, it is expected that Australia's labor pool will grow the seventh most out of all current and potential CPTPP members in relative terms. However, the country will change from the 13th to the 12th biggest provider of labor among the countries analyzed (Appendix V).

5.2. Brunei Darussalam

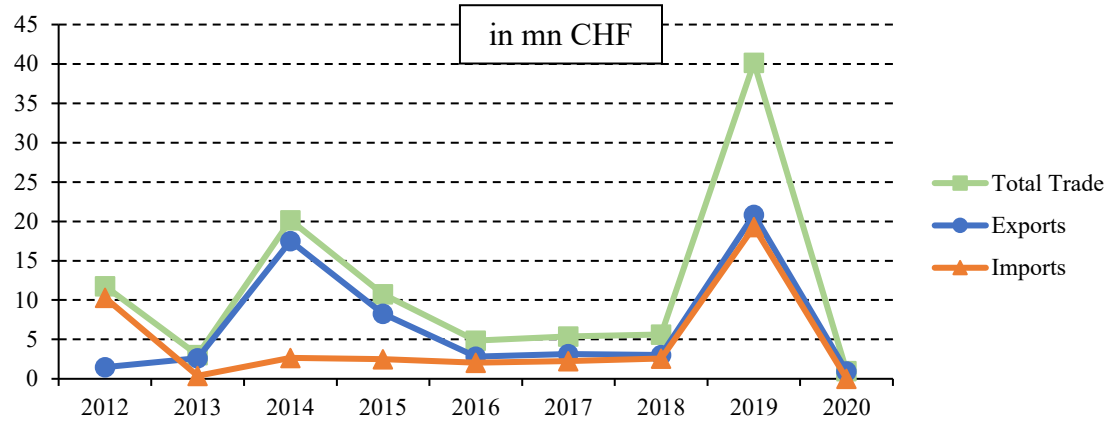
As Brunei Darussalam is a small country, its economic relevance for Switzerland among the current CPTPP members is relatively small (Appendix R). Furthermore, the Federal Department of Foreign Affairs (FDFA) (2022b) states that the economic collaboration between the two countries is minimal (Appendix B). This is due to Brunei's economy being profoundly based on natural gas and petroleum (OEC, 2020; FDFA, 2022b). Due to this, negotiations on FTAs between the two nations have not been held.

5.2.1. Development of Trade with Switzerland

Trade between Brunei and Switzerland has been highly volatile over the past eight years due to the low volumes of imports and exports (Figure 3). The main outliers in the trade volume between the two countries can be found in 2014 and 2018. The first outlier can be identified as a Swiss export of machines, appliances, devices, or other electronic goods. T second outlier is explained through a surge in the trade of gems, pearls, or goods produced with precious metals (FOCBS, n.d.). Although there has been a growing tendency for trade between Brunei and Switzerland, this does not imply that trade between the two countries will reach a significant level. In addition, the countries mainly trade luxury goods in small volumes, which further proves that their supply chains are disconnected.

Figure 3

Total Trade 2 Composition CH-Brunei Darussalam 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Brunei Darussalam. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.2.2. Demographics

Brunei Darussalam's population is expected to grow by 7.66% to 471,000 people in 2030 (The World Bank, 2022). At the same time, its total working-age population is approximated to increase by 5.93%, from 318,748 to 334,150 people (Appendix V). Thus, Brunei Darussalam's working-age population is expected to grow the tenth most out of the countries analyzed in absolute terms. Nevertheless, the sultanate will remain the smallest labor provider among the current and potential CPTPP members (Appendix V).

5.3. Canada

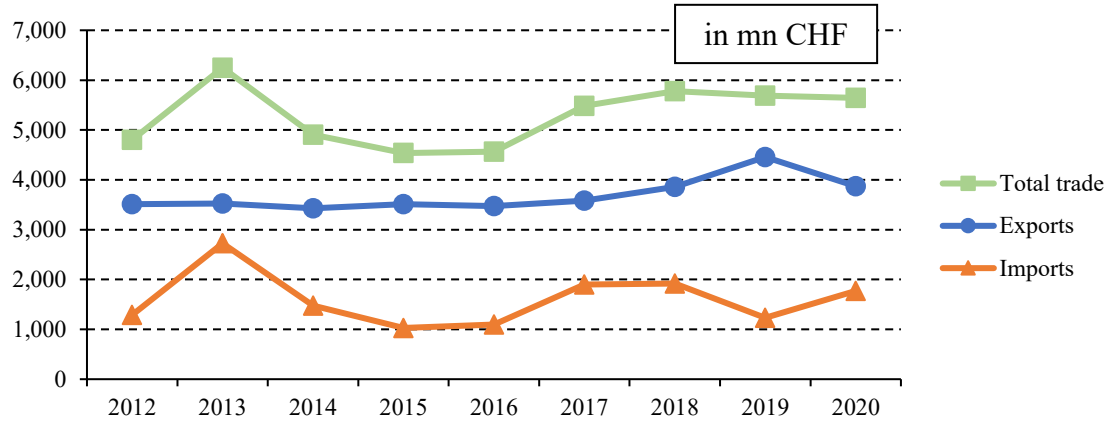
Within the CPTPP, Canada is Switzerland's third most important trading partner (Appendix R). In addition, it is its second most important trading partner in the Americas (FDFA, 2022c). Currently, Switzerland has a trade surplus with Canada and can export approximately CHF 2 billion more in goods than it imports (Appendix C). The two nations are part of a free trading zone through an agreement signed between Canada and EFTA in 2009 (EFTA, n.d.-a). The treaty includes concessions on tariffs for industrial goods, fish, marine products, and agricultural products. Canada aimed to reduce reliance on its large neighbor by entering new FTAs looking to diversify their dependence on the US (SECO, 2022b). As the two countries are in an FTA, the economic relations and integration are high, indicating an above-average level of relevance to one another. However, the FTA should be updated to adhere to the principles of modern FTAs (Fontanelli, 2019) and guarantee the competitiveness of Swiss companies in the Canadian market (Atteslander & Baur, 2022)

5.3.1. Development of Trade with Switzerland

Switzerland and Canada have traded on a relatively stable level over the analyzed eight-year period (Figure 4), increasing by 17.45%. Appendix C indicated that most Swiss exports to Canada stem from exports of pharmaceuticals and chemical products (SECO, 2022b). Furthermore, Swiss exports are strong in the areas of agriculture, forestry, fishery, precision goods, watches, and jewelry (SECO, 2022b). Canada's main exports to Switzerland are more diversified in the industry, with vehicles being an essential good exported to Switzerland. In addition, pharmaceuticals, chemicals, machines, agricultural, forestry, and fishery products are exported. Noticeable exports in processed agricultural, fish, and other marine products can be attributed to the EFTA FTA, which aimed to facilitate trade in these industries (EFTA, n.d.-a).

Figure 4

Total Trade 2 Composition CH-Canada 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Canada. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.3.2. Demographics

The population of Canada is estimated to increase by 7.9% to 41.1 million people in 2030 (The World Bank, 2022). Concurrently, the working-age population is going to grow by 1.56%, from around 25.2 million to 25.5 million (Appendix V). Therefore, it is estimated that Canada's working-age population will grow the eight most out of the countries analyzed in absolute terms. However, Canada is expected to remain the ninth biggest country in terms of its labor force among current and potential CPTPP members (Appendix V).

5.4. Chile

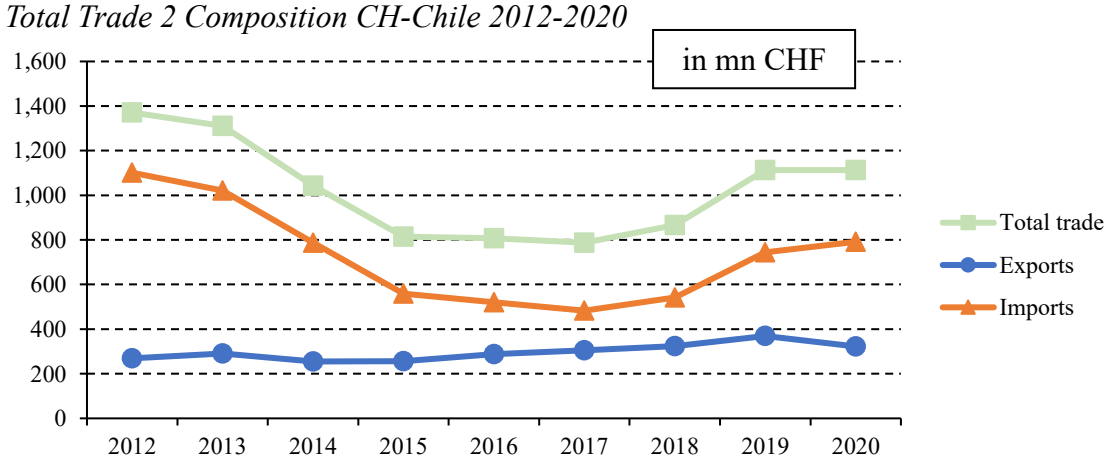
Chile is Switzerland's ninth most important trading partner among the current CPTPP members (Appendix R). At the moment, Switzerland is a net importer of goods from Chile as it imports around CHF 470 million more than it exports (Appendix D). Since 2004 the two countries have been part of an FTA through EFTA (EFTA, n.d.-b). However, tariffs on agricultural goods between Switzerland and Chile have been negotiated individually (EFTA, n.d.-b). This agreement does not adhere to the principles found in modern FTAs as it does not liberalize the trade in all goods and keeps the integration efforts between the two countries relatively low (Fontanelli, 2019). However, Switzerland fosters relationships with the country regarding scientific collaboration, combating climate change, and water management (FDFA, 2022d). Therefore, it can be said that Swiss relations with Chile are good and collaborative efforts are growing, yet the economic relevance between the two countries is not seen as high.

5.4.1. Development of Trade with Switzerland

Trade between Switzerland and Chile has been on a downward trend for the first six years that have been analyzed, after which it began to grow again (Figure 5). This meant that trade has declined by 18.76 % as Swiss imports were halved at their lowest. Appendix D shows that most Swiss exports comprise pharmaceuticals, chemicals, machines, precision goods, watches, and jewelry (SECO, 2022b). Chile's main exports mainly consist of precious metals. In addition, Switzerland imports agricultural, forestry, and fishery products that are subject to the tariffs negotiated under the FTA.

Figure 5

Total Trade 2 Composition CH-Chile 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Chile. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.4.2. Demographics

The World Bank (2022) approximated that the total population of Chile is expected to grow by 1.79% to roughly 19.5 million people in 2030. At the same time, its working-age population is expected to decline by 2.01%, from 13.1 million to 12.8 million (Appendix V). Thus, Chile's working-age population is the first of the countries analyzed that is estimated to decline, putting it in the 12th position in this category. In addition, the nation will remain the 14th largest country in terms of its labor force among current and potential CPTPP countries (Appendix V).

5.5. Indonesia

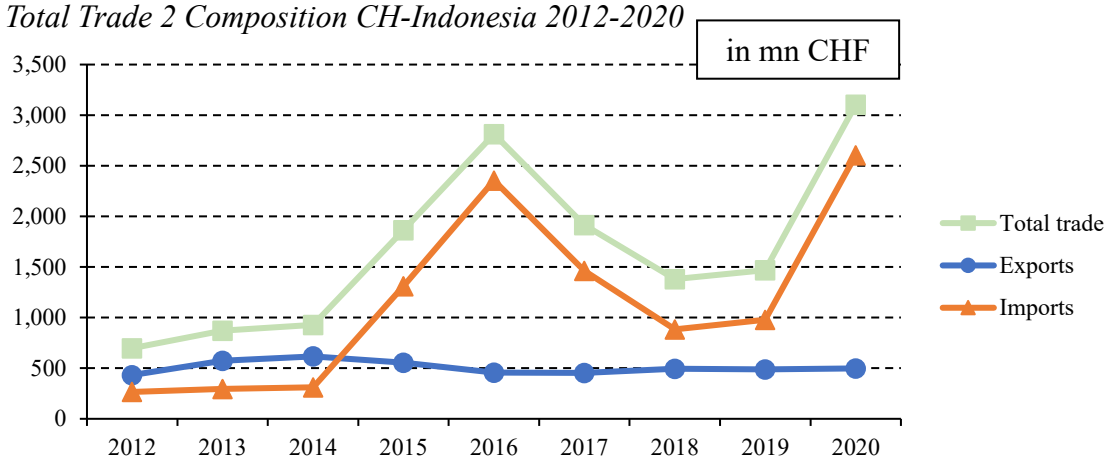
Among all current and potential CPTPP members, Indonesia is Switzerland's 10th most important trading partner (Appendix U). Currently, Switzerland is a net importer of goods, with imports growing significantly stronger than exports (FOCBS, n.d.). This trade imbalance amounts to around CHF 2.1 million as of 2020 (Appendix E). On the 1st of November 2021, a Comprehensive Economic Partnership Agreement between EFTA and Indonesia went into effect (EFTA, n.d.-c). As this is Switzerland's most recent FTA, it adheres to the standards of modern FTAs (Fontanelli, 2019) as it also includes terms on sustainable development and fosters further cooperation (EFTA, n.d.-c). In addition, Swiss economic interest in the Southeast Asian country is growing as the FDFA (2022e) writes that it is a priority country for the SECO's economic cooperation (SECO, 2021c).

5.5.1. Development of Trade with Switzerland

The trade growth between Indonesia and Switzerland has accelerated, growing by approximately 355% since 2012. This astronomic increase in Total Trade 2 can be partially explained by the significant growth in the imports of precious metals to Switzerland, which makes up most Indonesian exports (Appendix E). Other Swiss imports are textiles, agriculture, forestry, and fishery goods (SECO, 2021b). The primary goods imported by Indonesia are pharmaceuticals, chemicals, machines, precision goods, watches, and jewelry. In addition, Switzerland's agricultural, forestry, and fishery products to the Indonesian market amount to 7.3% of Swiss exports (FOCBS, n.d.).

Figure 6

Total Trade 2 Composition CH-Indonesia 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Indonesia. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.5.2. Demographics

Indonesia's total population is expected to grow by 9.39% to roughly 299.2 million in 2030 (The World Bank, 2022). In addition, its working-age population is estimated to grow by 9.21%, from 185.5 million in 2020 to 202.5 million in 2030 (Appendix V). This represents the fourth most significant relative change in the working-age population among the analyzed countries. Furthermore, this substantial increase in the working-age population means that the country will grow the most in this category out of current and potential CPTPP members in absolute terms. Indonesia will remain at rank two among all countries that have been analyzed in terms of the absolute size of their working-age population (Appendix V).

5.6. Japan

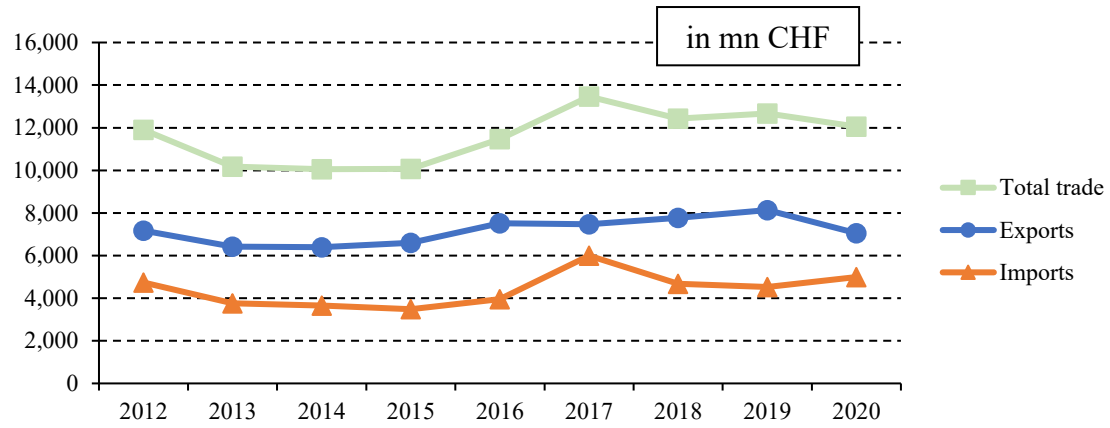
Appendix R shows that Japan is Switzerland's most important trading partner among current CPTPP members. Japan becomes even more relevant to the Swiss when it is a net importer of goods with a trade deficit of around CHF 2 billion (Appendix F). Switzerland and Japan signed an FTA in 2009 (SECO, 2021b). The main contents of the agreement focused on deepening trade, economic relations, and bilateral ties (SECO, 2020). Therefore, this treaty does not adhere to the principles of a modern FTA (Fontanelli, 2019). Due to the high relevance of Japan to Swiss exporters, Switzerland aimed to renegotiate and update the treaty (Kölling, 2022). However, the Japanese are blocking this process as Switzerland is not one of their priorities (Dümmler, 2021). Therefore, the president of the federal council, Ignazio Cassis, announced that Switzerland would have to adjust its strategy regarding free trade with Japan (Kölling, 2022).

5.6.1. Development of Trade with Switzerland

Although Japan is Switzerland's most important trading partner among current CPTPP members, their trade volume with Switzerland has only grown by 1.22% over the observed eight years (Figure 7). The stagnation in trade growth between the two nations can be partially attributed to new FTAs being ratified between Japan and other parties such as the EU (Minsch, 2019). The most important Swiss exports to Japan are pharmaceuticals, chemical products, precision instruments, watches, jewelry, and machines (Appendix F). In addition, agricultural, forestry, and fishery products are exported to the country at a reduced tariff rate due to the FTA. Japanese exports mainly comprise pharmaceuticals, chemical products, precious metals, machines, and vehicles. Moreover, Switzerland imports precision instruments, watches, and jewelry goods to Switzerland (SECO, 2022b).

Figure 7

Total Trade 2 Composition CH-Japan 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Japan. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.6.2. Demographics

Japan's total population is expected to decrease by 5.22% to approximately 119.3 million in 2030 (The World Bank, 2022), making it the country expected to shrink most of the nations analyzed. Furthermore, its working-age population is estimated to decline by 7.07%, from roughly 74.4 million in 2020 to 69.2 million in 2030 (Appendix V). This change represents the second-highest relative decline in the labor pool provided by all countries analyzed. Additionally, it represents the second-largest decline in the working-age population in absolute terms. Therefore, the country will lose its position as the fourth biggest labor provider in 2020 and will only be the sixth biggest provider in 2030 (Appendix V).

5.7. Malaysia

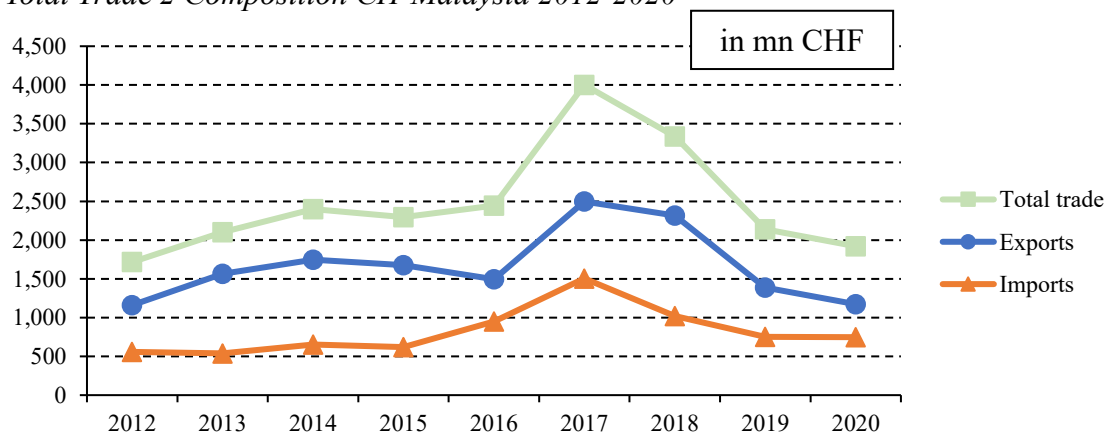
Moving over to Malaysia, we can see that the country is Switzerland's seventh-most important trading partner among current CPTPP countries (Appendix R). Switzerland is a net exporter of goods to Malaysia, where around CHF 423 million more is exported than imported (Appendix G). Moving over to the way trade has been conducted between Malaysia and Switzerland, it can be said that there have been no FTAs signed between the two countries (SECO, 2021b). However, negotiations regarding an FTA between EFTA and Malaysia have continued since 2012 (FDFA, 2022f). Switzerland's favorable conditions within the Malaysian business environment make it an attractive hub for Swiss companies to conduct business in the APAC market (FDFA, 2022f).

5.7.1. Development of Trade with Switzerland

Trade between Malaysia and Switzerland has grown by 12% from 2012 to 2020 (Figure 8). However, trade between the two nations has been the strongest in 2017 as the FOCBS' (n.d.) shows that the trade in precious metals and gems has surged significantly. Both countries' most important traded goods are classified under precious metals/stones and jewelry (Appendix G). Furthermore, machines are the second most important good traded. Other important Swiss exports to Malaysia include pharmaceuticals, chemicals, watches, and optical/medical instruments. Moreover, Switzerland imports optical/medical instruments, plastics, rubber, and agricultural products (FOCBS, n.d.).

Figure 8

Total Trade 2 Composition CH-Malaysia 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Malaysia. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.7.2. Demographics

Malaysia's total population is estimated to grow by 11.52% to 36.1 million in 2030, according to the World Bank (2022). This makes the nation the second most growing in terms of the total population of current and potential CPTPP members. Meanwhile, its working-age population is expected to grow by 9.67%, from 22.7 million to 24.6 million (Appendix V). In relative terms, this represents the third-highest positive change among all countries that have been analyzed. Moreover, the country is expected to fare the fifth highest change in the working-age population in absolute terms. Malaysia is expected to remain the tenth provider of labor among the analyzed countries (Appendix V).

5.8. Mexico

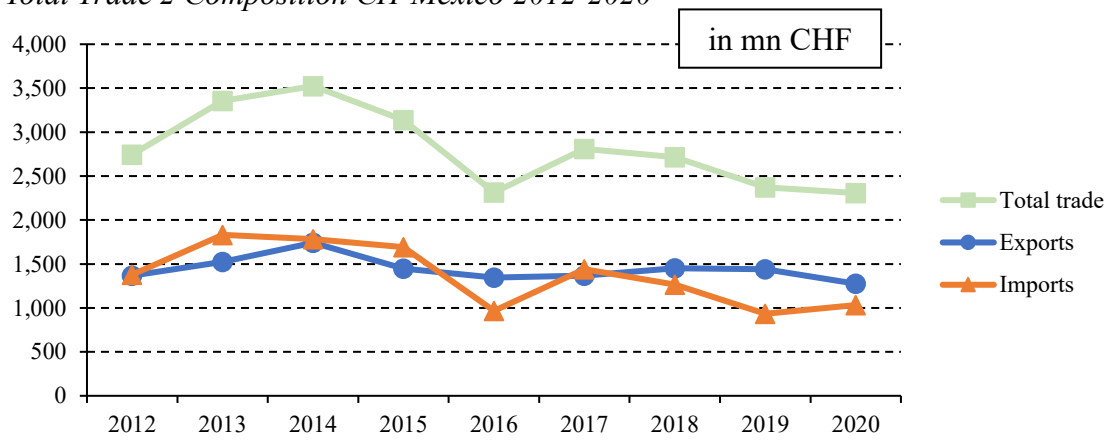
When examining trade between Switzerland and current CPTPP members, Mexico is Switzerland's sixth-most important partner (Appendix R). Currently, Switzerland is a net exporter of goods to Mexico, faring a trade surplus of around CHF 244 million in 2020 (Appendix H). The two countries have traded under the guidelines of an FTA, which came into effect in 2001 (EFTA, n.d.-d). Like the FTA signed between Chile and Switzerland, this agreement falls into the category outside of the classification of modern FTAs (Fontanelli, 2019). However, exploratory discussions between the trading partners are on their way with prospects of updating and expanding the agreement (FDFA, 2022g). This process has been ongoing since 2016 (SECO, 2022b). Both Mexico and the member states of EFTA have made a statement reaffirming the political will for constructive negotiations (Atteslander & Capaul, 2022).

5.8.1. Development of Trade with Switzerland

Mexico and Switzerland's trade have been on a downward trend over the reference period, declining by 15.95% (Figure 9). This tendency can be explained by a decline in Swiss imports in the categories of precious metals and vehicles and a decline in the export of pharmaceuticals and machines to Mexico (SECO, 2022b). In 2020, the most important exports of Mexico to Switzerland were classified as precious metals, vehicles, machines, precision instruments, watches, jewelry, pharmaceuticals, and chemicals (Appendix H). Meanwhile, the most important Mexican imports were pharmaceuticals, chemicals, machines, precision instruments, watches, and jewelry (Appendix H).

Figure 9

Total Trade 2 Composition CH-Mexico 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Mexico. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.8.2. Demographics

The World Bank (2022) expects the Mexican population to grow by 9.26% to 140.9 million in 2030, making the country the sixth most growing in this category among the countries analyzed. In addition, Mexico's working-age population is forecasted to grow by 10.42%, from 86.9 million in 2020 to 94.7 million in 2030 (Appendix V). This represents the second-highest change in relative terms among all current and potential CPTPP members. In addition, the working-age population of Mexico is estimated to experience the third-highest absolute increase among the countries that were analyzed. Furthermore, the country is expected to remain the third biggest supplier of labor from 2020 to 2030 (Appendix V).

5.9. New Zealand

The relevance of New Zealand in terms of trade for Switzerland is negligible as they are the second least important trading partner of the Swiss among current CPTPP members (Appendix R). Switzerland can be classified as a net exporter of goods to New Zealand, achieving a trade surplus of approximately CHF 96 million (Appendix I). The economic collaboration between the two countries is low as they have not established a joint chamber of commerce thus far (FDFA, 2022h). Therefore, both parties have made little effort to develop the groundwork on which free trade could be conducted in the future.

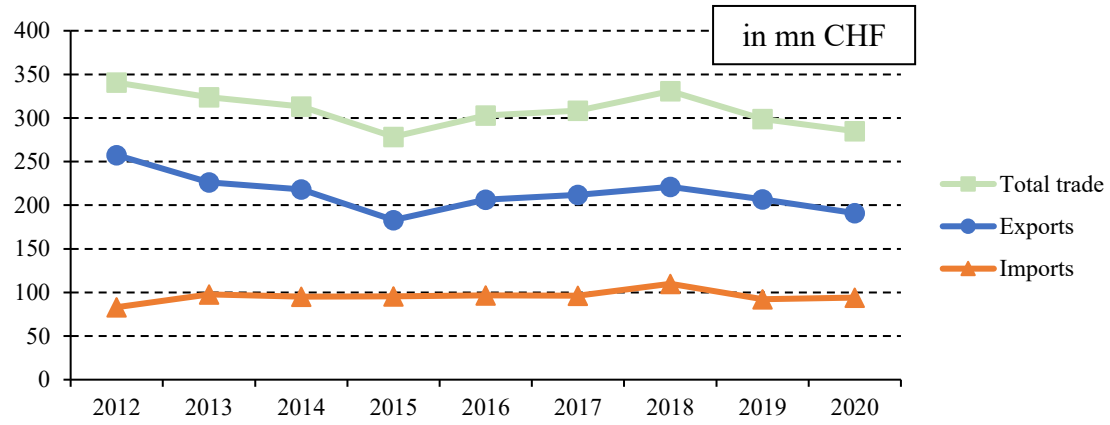
5.9.1. Development of Trade with Switzerland

As shown in figure 10, trade between New Zealand and Switzerland has been on a downward trend, declining by 16.29% over the observed time. The most important Swiss exports to New Zealand were pharmaceuticals, chemicals, machines, precision

instruments, watches, jewelry, and optical/medical instrument (Appendix I). Meanwhile, the most important exports of New Zealand include agricultural products, pharmaceuticals, chemicals, and optical/medical instruments (Switzerland Global Enterprise, 2020).

Figure 10

Total Trade 2 Composition CH-New Zealand 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and New Zealand. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.9.2. Demographics

New Zealand's total population is expected to increase by 6.78% to 5.43 million in 2030 (The World Bank, 2022). During the same period, its working-age population is expected to increase by 2.63%, from 3.26 million in 2020 to 3.35 million in 2030 (Appendix V). Thus, New Zealand's working-age population is expected to grow the ninth most of all countries analyzed in absolute terms. However, it will remain the second smallest provider of labor among current and potential CPTPP members (Appendix V).

5.10. Peru

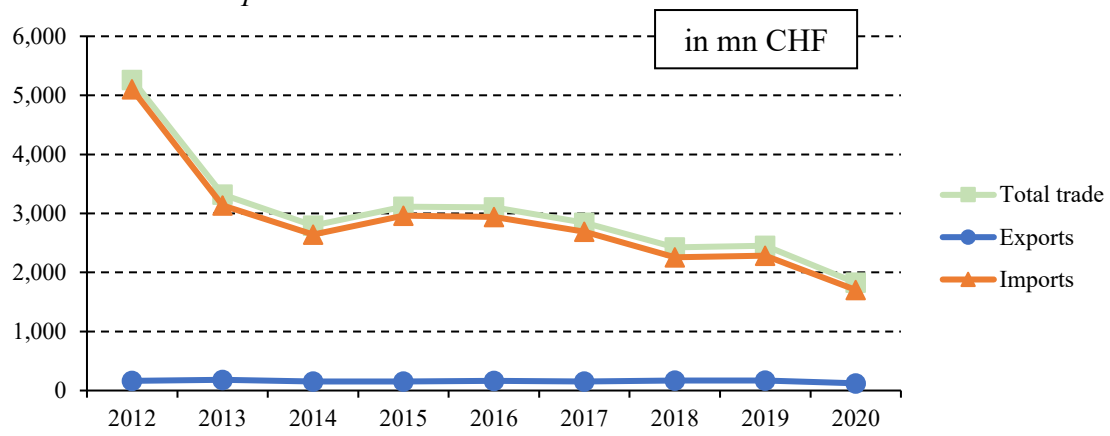
Among the current members of the CPTPP, Peru is Switzerland's eight-most important trading partner (Appendix R). When looking at the balance of trade between the two nations in 2020, it becomes apparent that Peru is a net exporter while Switzerland is a net importer (Appendix J). Therefore, Switzerland being a net importer leads to a trade deficit of approximately CHF 1.58 billion (Appendix J). The two countries have traded under an FTA negotiated through EFTA since 2011, which mainly focused on the economic relationship (EFTA, n.d.-e). Furthermore, the two countries have signed additional treaties (FDFA, 2022i), expanding their collaboration which adheres more to the definition of a modern FTA (Fontanelli, 2019). In addition, Peru is viewed as a priority for Switzerland, according to the SECO (2021c).

5.10.1. Development of Trade with Switzerland

Trade between Switzerland and Peru has experienced a trend of rapid decline from 2012 until 2020, shrinking by 65.28% (Figure 11). This trend can be explained by a reduction in Swiss imports of precious metals from Peru (SECO, 2022b). When looking at the goods traded, the most important Peruvian exports are precious metals (SECO, 2022b), followed by agricultural, forestry, fishery, and textile products (Appendix J). Switzerland's main exports are mostly pharmaceuticals, chemicals, machines, precision instruments, watches, and jewelry (Appendix Peru).

Figure 11

Total Trade 2 Composition CH-Peru 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Peru. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.10.2. Demographics

The total population of Peru is expected to grow by 9.28% to 36 million in 2030, according to the World Bank (2022), making it the fifth most growing out of the countries analyzed. Its working-age population is estimated to increase by 7.57%, from 22 million in 2020 to 23.6 million in 2030 (Appendix V). Therefore, Peru is the sixth most growing country in terms of absolute population among all current and potential CPTPP countries. Additionally, it will remain the tenth-largest country in terms of total labor (Appendix V).

5.11. People's Republic of China

The trade between China and Switzerland has greatly intensified over the past decades, making it Switzerland's most important trading partner out of all current and potential CPTPP members (Appendix U). As Switzerland imports more goods from China than exports, trade was imbalanced by around CHF 217 million in 2020 (Appendix K). After nine rounds of negotiations, a bilateral FTA has been in force since 2014, which focused on increasing the trade between the two countries (FDFA, 2022j). However, the treaty also includes provisions on environmental issues (SECO, 2013) that make this

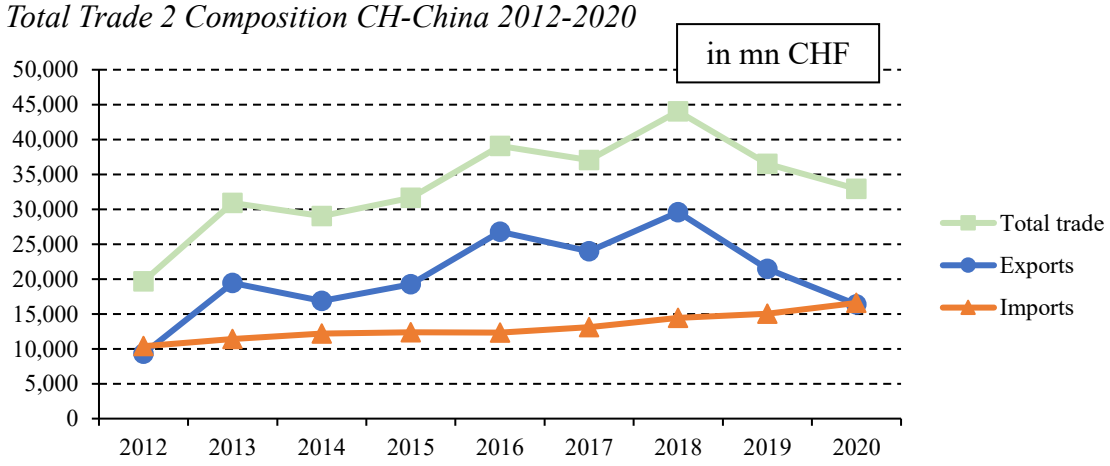
treaty adhere to the definition of a modern FTA (Fontanelli, 2019). Nevertheless, the agreement's re-negotiation is an issue Switzerland must face as there is growing resistance to it and the Swiss population would be able to hold a referendum (Vonplon & Gafafer, 2021).

5.11.1. Development of Trade with Switzerland

As China's relevance in the global economy has been growing (SECO, 2022b), trade with Switzerland has been on the rise and has increased by 67.35% from 2012 to 2020 (Figure 12). However, the graph shows that Swiss exports are highly volatile. This results from the price of precious metals like gold fluctuating significantly (SECO, 2022b). Switzerland's most important exported goods to China are pharmaceuticals, chemicals, precision instruments, watches, jewelry, machines, and precious metals (Appendix K). The most important goods exported from China to Switzerland are machines, textiles, pharmaceuticals, and chemicals (Appendix K).

Figure 12

Total Trade 2 Composition CH-China 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and China. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.11.2. Demographics

The World Bank (2022) estimates that the total population of the People's Republic of China will grow by 1.6% to 1,433.5 million by 2030. The country's working-age population is predicted to decline by 2.67%, from 990.6 million in 2020 to 965.7 million in 2030 (Appendix V). Thus, China is the country that will experience the most significant decline in its working-age population in absolute terms. Nevertheless, it will remain the largest country in terms of total working-age population among all analyzed countries (Appendix V).

5.12. Philippines

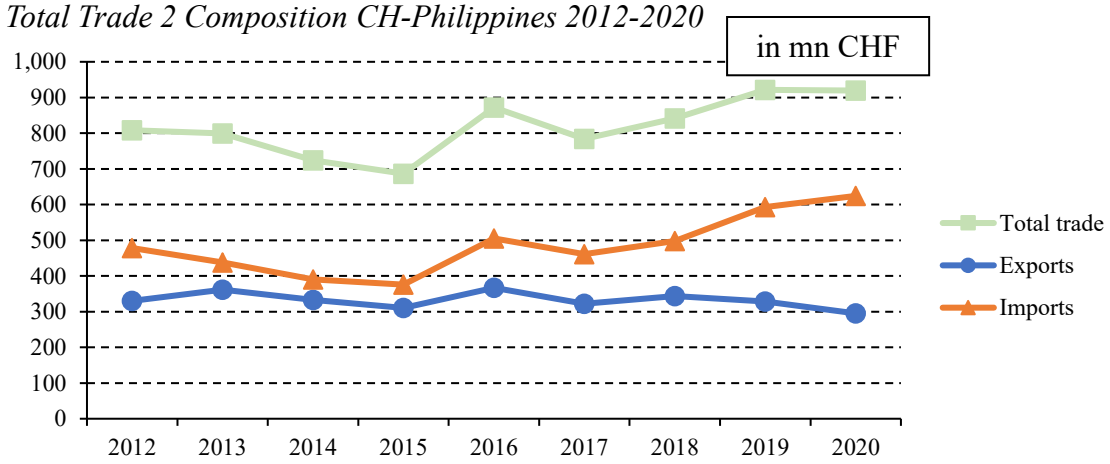
In terms of total trade volume among Switzerland's current and potential CPTPP trade partners, the Philippines is the third least important country (Appendix U). Presently, the Southeast Asian country fares a trade surplus of approximately CHF 150 million in its trade balance with Switzerland (Appendix L). Trade between the two countries is conducted under an FTA negotiated within EFTA, which entered into effect in 2018 (EFTA, n.d.-f). As this accord is concerned with following the principles of Foreign Policy Strategy 2020–23 of the Swiss Federation (FDFA, 2022k), it is classified as a modern FTA (Fontanelli, 2019). Additionally, this FTA is relevant as the Philippines is becoming an increasingly pertinent trading partner for Switzerland (FDFA, 2022l).

5.12.1. Development of Trade with Switzerland

The Philippines have become an increasingly relevant economic partner for Switzerland as trade has grown by 13.74% over the observed period (Figure 13). The increase in imports is explained by the growth in Switzerland's precious metal imports from the Philippines (SECO, 2022b). The most important goods exported by Switzerland are chemicals, pharmaceuticals, precision instruments, watches, and jewelry (Appendix L). For the Philippines, precious metals and machines are the main goods exported (Appendix L).

Figure 13

Total Trade 2 Composition CH-Philippines 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and the Philippines. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.12.2. Demographics

The Philippines' population is expected to grow by 12.88% to 123.7 million in 2030, according to the World Bank (2022). This makes it the fastest-growing country in terms of total population among the countries that have been analyzed. Moreover, the Philippines' working-age population is predicted to grow by 16.22%, from 71.9 million

in 2020 to 82.1 million in 2030, making it the fastest-growing country in relative terms (Appendix V). In addition, it will experience the second greatest absolute increase in the working-age population. Therefore, the Philippines will rise from the fifth to the fourth biggest country in terms of its labor force (Appendix V).

5.13. Singapore

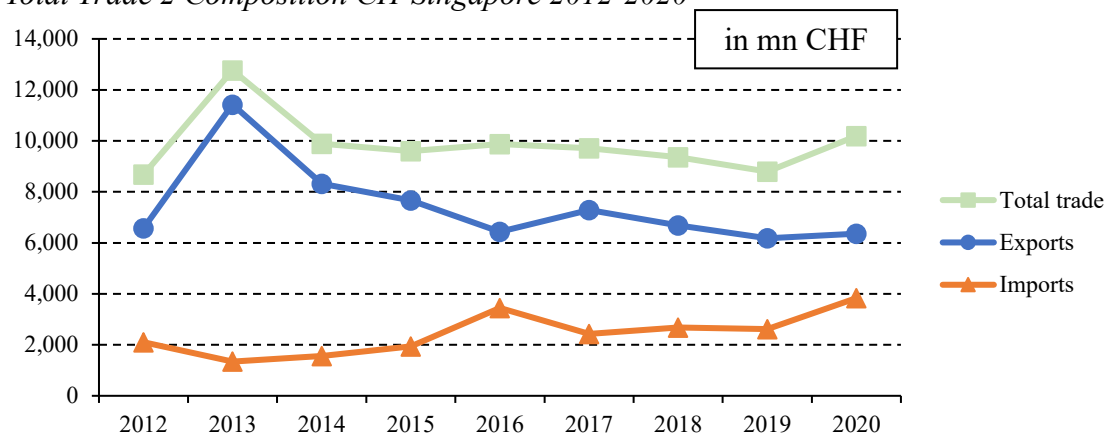
Singapore is the second-most important country for Switzerland among current CPTPP members (Appendix R). In 2020, the Swiss trade surplus in trade with Singapore amounted to around CHF 2.53 billion (Appendix M). After an FTA between EFTA and Singapore entered into force in 2003, the city-state and Switzerland began trading based on this treaty (FDFA, 2022m; EFTA, n.d.-g). The FTA included provisions mainly focused on deepening economic ties between the two contracting parties (EFTA, n.d.-h). Therefore, this treaty was not designed in conformity with the definition of a modern FTA (Fontanelli, 2019). Nevertheless, Switzerland and Singapore have been deepening their ties through additional treaties, such as a Declaration of Enhanced Partnership signed in 2014 (FDFA, 2022m).

5.13.1. Development of Trade with Switzerland

The bilateral trade volume between Switzerland and Singapore has increased by 17.43% over the observed period (Figure 14). However, the trend of Total Trade 2 indicates a declining tendency in trade between the two countries (Appendix M). When the trade of precious metals is disregarded and Total Trade 1 is analyzed, this decline is offset as trade has increased from 2012 to 2020 (SECO, 2022b). Both countries' most important traded goods are chemicals, pharmaceuticals, precious metals, precision instruments, watches, and jewelry (Appendix M).

Figure 14

Total Trade 2 Composition CH-Singapore 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Singapore. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.13.2. Demographics

The total population of Singapore is estimated to grow by 7.04% to 6.1 million in 2030 (The World Bank, 2022). However, its working-age population is projected to decrease by 6.15%, from around 4.23 million in 2020 to 3.97 million in 2030 (Appendix V). Thus, Singapore will experience a decline in this population group, putting it in the eleventh rank among all countries analyzed in terms of the absolute change in the working-age population. In addition, the country will retain its position as the 15th biggest country in terms of its labor pool (Appendix V).

5.14. Korea (Rep.)

The sixth most important country out of potential and current CPTPP members is Korea (Appendix U). As a net exporter of goods to South Korea, Switzerland exported around CHF 1.94 billion more than it imported (Appendix N). Switzerland and Korea have been trading based on an FTA negotiated within EFTA since 2006 (FDFA, 2022n; EFTA, n.d.-i). The main premises of the agreement were to foster trade between Korea and the EFTA states, making it an outdated FTA (Fontanelli, 2019). This gets elevated by an FTA signed between the EU and Korea in 2011 that achieved more favorable terms than the agreement Switzerland is a part of (Dudda, 2011). Like Japan, Korea does not see a revision of the agreement as one of its priorities, as Korea's trade volume with Switzerland is relatively low (Schneider-Schneiter, 2020).

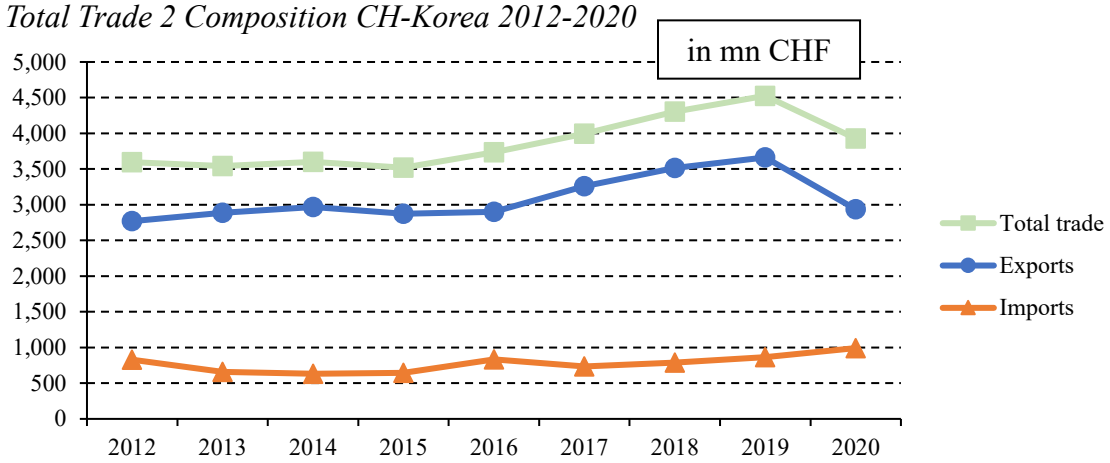
5.14.1. Development of Trade with Switzerland

Trade between Switzerland and Korea has grown by 9.16% over the observation period (Figure 15). However, it is important to note that imports of Korean cars and electronic goods via third countries are not considered in this growth figure (SECO,

2022b). The most important Swiss exports to Korea are pharmaceuticals, chemicals, precision instruments, watches, and machines (Appendix N). In addition, Switzerland exports agricultural, forestry, and fishery products to Korea, mostly cheese and other dairy products (SECO, 2022b; Dudda, 2011). The main Swiss imports from Korea are pharmaceuticals, chemicals, machines, vehicles, and precious metals (Appendix N).

Figure 15

Total Trade 2 Composition CH-Korea 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Korea (Rep.). Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.14.2. Demographics

The World Bank (2022) predicts that the Korean population is expected to decrease by 0.55% to 51.6 million until 2030, representing the third-largest decrease among analyzed countries in relative terms. In addition, its working-age population is expected to decline by 10.09%, from 36.9 million in 2020 to 33.4 million in 2030 (Appendix V). The Korean working-age population will experience the greatest relative and third highest decline in absolute terms. Nevertheless, it will remain the eighth biggest country in terms of labor pool among all current and potential CPTPP members (Appendix V).

5.15. Taiwan

The eighth most important trading partner among Switzerland's current and potential ones is Taiwan (Appendix U). Switzerland is a net exporter of goods to Taiwan, exporting roughly CHF 1.1 billion more to the East Asian Island (Appendix O). As a consequence of the One China principle, Switzerland does not recognize Taiwan as a country (FDFA, 2022o) and the Federal Council does not view an FTA with the country as one of its priorities (Imark, 2020). Nevertheless, the two countries have established collaborative ties under the Trade Office of Swiss Industries of Switzerland in Taiwan and the Cultural and Economic Delegation in Bern and Geneva (FDFA, 2022o). Although

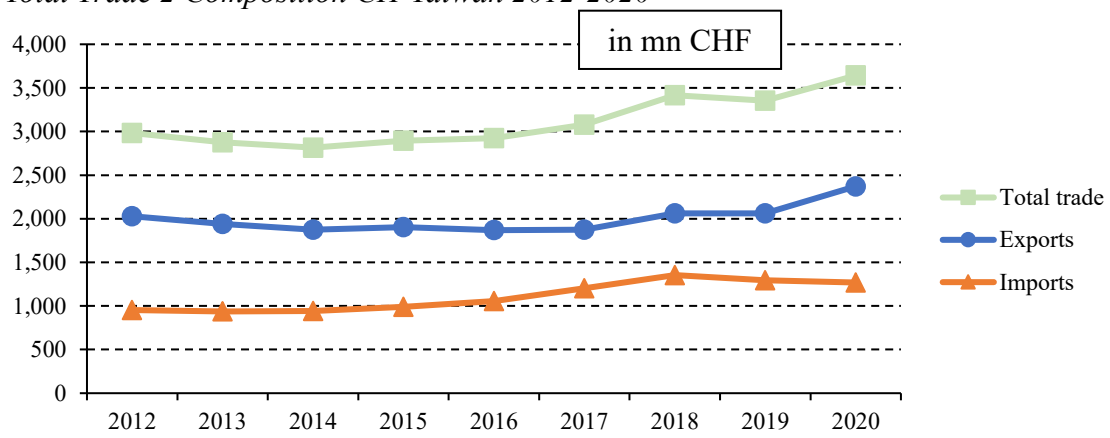
neither party has made steps towards negotiating an FTA, case studies have assessed the effects of such a treaty as highly beneficial to both nations (Ziltener, 2017; Settelen, 2022).

5.15.1. Development of Trade with Switzerland

The total volume of trade between Taiwan and Switzerland has increased by 22.16% from 2012 to 2020 (Figure 16). The trading trend between the two countries is growing as Taiwan has become an increasingly relevant trading partner for Switzerland (SECO, 2022b). The most relevant Swiss exports to Taiwan are pharmaceuticals, chemicals, precision instruments, watches, jewelry, precious metals, and machines (Appendix O). For Taiwan, machines, precision instruments, watches, jewelry, vehicles, and metals are the most important exports to Switzerland (Appendix O).

Figure 16

Total Trade 2 Composition CH-Taiwan 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Taiwan. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.15.2. Demographics

Taiwan's population is estimated to decline by 1.11% to 23.3 million in 2030 (National Development Council, 2021). This represents the second-biggest decline in total population in relative terms. Moreover, Taiwanese authorities expect the working-age population to decrease by 10%, from 16.5 million in 2020 to 15.1 million in 2030 (Appendix V). Therefore, the country will experience the second greatest decline in relative and the fifth largest in absolute terms of the working-age population. In addition, Taiwan's labor pool is going to fall from the 12th to the 13th biggest among the analyzed countries (Appendix V).

5.16. Thailand

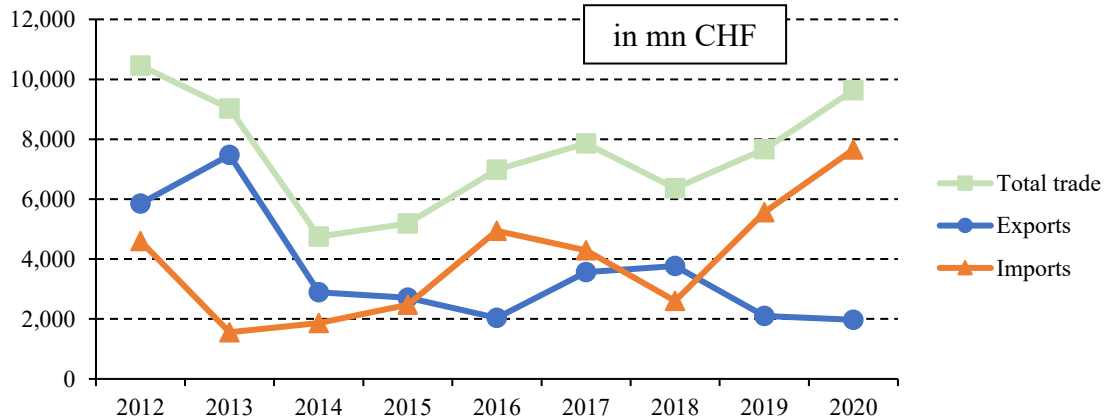
Out of all current and potential CPTPP members, Thailand is one of the most relevant partners of Switzerland in terms of trade volume (Appendix U). In 2020, Switzerland was a net importer of goods from Thailand, faring a trade deficit of around CHF 5.68 billion (Appendix P). Talks on negotiating an FTA between Thailand and EFTA were launched in 2005 (EFTA, n.d.-j). As these talks did not come to fruition, they have been put on hold since 2006 (EFTA, n.d.-j). However, the FDFA (2022p) wrote that talks aimed at re-igniting the negotiations between EFTA and Thailand had started again in 2020. The dialog between the two parties is active as they last held a meeting in March 2022 (EFTA, 2022).

5.16.1. Development of Trade with Switzerland

Trade between Thailand and Switzerland has declined by 7.89% over the eight years between 2012 and 2020 (Figure 17). The Total Trade 2 between the two countries is highly volatile due to precious metals and gems having a significant effect on the volume (SECO, 2022b). Therefore, Total Trade 1 should be consulted when looking at their balance of trade (SECO, 2022b). The most important goods exported by Switzerland are precious metals, pharmaceuticals, chemicals, precision instruments, watches, jewelry, and machines (Appendix P). Thailand's most important exports to Switzerland were precious metals, making up 88.4% of Swiss imports (Appendix P).

Figure 17

Total Trade 2 Composition CH-Thailand 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Thailand. Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.16.2. Demographics

The World Bank (2022) expects the Thai population to increase by 0.78% to 70.3 million in 2030. However, its working-age population is estimated to decline by 5.42%, from 49.1 million in 2020 to 46.5 million in 2030 (Appendix V). Thus, Thailand is expected to experience the fifth-biggest relative and the fourth biggest absolute decline in its labor pool. Nevertheless, the country is expected to retain its position as the seventh-largest country in terms of working-age population among current and potential CPTPP members (Appendix V).

5.17. Vietnam

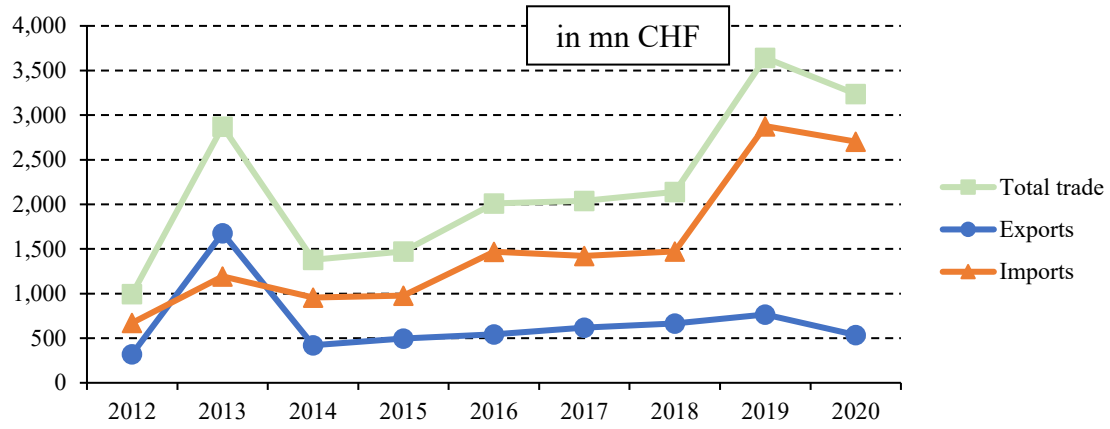
In 2020, Vietnam was Switzerland's ninth-most important trade partner in terms of volume (Appendix R). Vietnam was a net exporter of goods to Switzerland in 2020, exporting around CHF 2.17 billion more than it imported (Appendix Q). Negotiations surrounding the creation of an FTA between Vietnam and EFTA have been going on since 2012 (FDFA, 2022q). So far, 16 rounds of negotiations have been held between the potential contractual partners and there have been no signs of these talks breaking down (EFTA, n.d.-k). According to Atteslander and Schnurrenberger (2021), the conclusion of this agreement is urgent, as other entities such as the EU already have an FTA with Vietnam, which could lead to a competitive disadvantage for Swiss companies. Moreover, Vietnam is one of the SECOs' priority countries in their economic development cooperation (SECO, 2021c).

5.17.1. Development of Trade with Switzerland

Between 2012 and 2020, trade between Vietnam and Switzerland increased by a total of 225.7% (Figure 18). This significant growth can be partly explained by the country's ascent to a global manufacturing hub, partly caused by the US-China trade war (Nguyen, 2022). For Switzerland, pharmaceuticals, chemicals, machines, precision instruments, watches, and jewelry are the most important goods exported (Appendix Q). Vietnam's most important exports to Switzerland are precision instruments, watches, jewelry, textiles, machines, agricultural, forestry, and fishery products (Appendix Q).

Figure 18

Total Trade 2 Composition CH-Vietnam 2012-2020



Note: Data on Imports, Exports, and Total Trade between Switzerland and Korea (Rep.). Own illustration based on *Swiss-Impex*, by FOCBS (n.d.).

5.17.2. Demographics

Vietnam's total population is estimated to grow by 7.01% to 104.2 million in 2030 (The World Bank, 2022). Its working-age population is expected to increase by 3.79%, from 67.4 million in 2020 to 69.6 million in 2030 (Appendix V). Although the country's labor pool will only grow the eight most in relative terms, it represents the fourth largest absolute change among all analyzed countries. Furthermore, Vietnam will rise from the sixth-largest country regarding its working-age population to the fifth largest (Appendix V).

6. Forecasting Opportunity Costs for Switzerland

In this section of the thesis, the results of calculating the OC in the form of lost trade will be outlaid. First, a benchmark scenario for the development of trade will be shown. After that, four potential outcomes for Total Trade 2 will be drawn up, indicating hypothetical future trade volumes for Switzerland. The basic assumptions used to create the forecasts assume that the trend of trade between Switzerland and the countries analyzed will resume as in the past. Furthermore, trade is assumed to behave linearly and an entry into the CPTPP for Switzerland is considered to impact trade positively. Therefore, if trade with a country grows, the FTA will increase said trade. If trade decreases between Switzerland and an analyzed country, it is assumed to decline less than without the FTA.

In addition, the growth rate derived from the report of the Petri and Plummer (2019, p. 9) was only created to explain the change in global exports but will be applied to both imports and exports of Switzerland. Furthermore, the growth of exports within the agreement is assumed to be equally distributed among all agreement members.

Lastly, industries that will benefit and lose from a potential Swiss entry into CPTPP will be shown for all four scenarios. This is done through the assumption of linearity of the Swiss balance of trade from 2020 to 2030, meaning that the kinds of goods traded as well as the ratio of imports and exports to Total Trade 2 will remain consistent. The volume of trade of Switzerland with countries like Indonesia, the People's Republic of China, and Vietnam has experienced significantly higher growth over the past eight years. Therefore, an additional forecast which excludes these countries has been made as their growth rates might be exaggerated.

6.1. Scenario 1

The first scenario chosen to assess potential OC for Switzerland is that of current CPTPP members. The calculations aim to show the reader how trade might evolve between 2020 and 2030, as substantial growth could indicate an increase in the relevance of the agreement. When making this forecast, the countries taken into account were Australia, Brunei Darussalam, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Vietnam.

6.1.1. Assessment of Feasibility

This scenario represents the status quo that is currently present, with only current CPTPP members being taken into account. Therefore, it can be said that the following forecasts illustrate what Switzerland is potentially missing out on in terms of volume

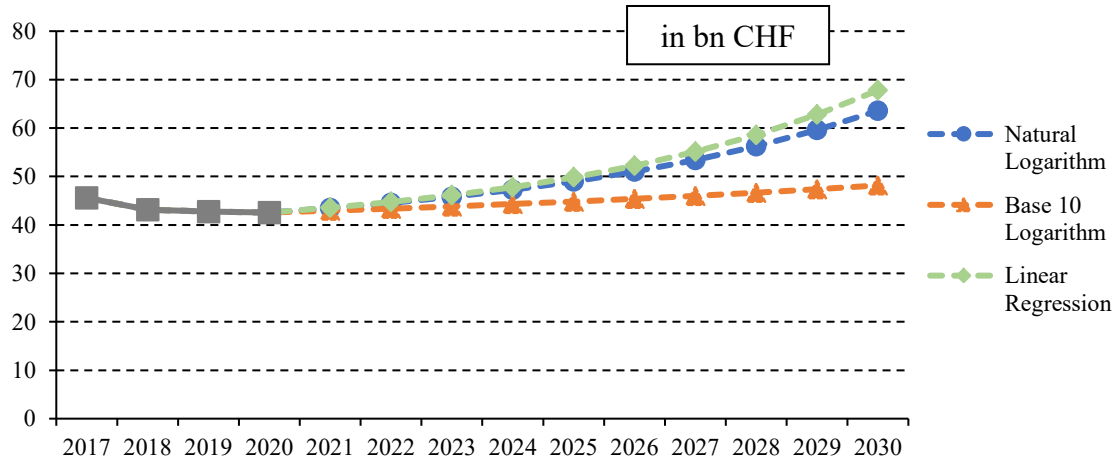
traded at the moment. However, this prognosis neglects the fact that the CPTPP is a flexible RTA to which countries might apply at any moment in time (Kane, 2021). This is shown by the current list of applicants to the agreement, including China, Ecuador, Taiwan, and the UK (Schott, 2022). In addition, South Korea and Thailand have voiced interest in joining the agreement (Schott, 2022).

6.1.2. Estimate of Swiss Trade Development without CPTPP Membership

As presented in figure 19, the trade balance between Switzerland and the current members of the CPTPP is expected to grow from around CHF 42.5 billion to CHF 67.8 billion when using the slope gained from a LR (Appendix W, Table 28). This roughly equates to a 59.53% increase in the volume of trade for Switzerland. The scenario includes the natural and Log 10 mentioned in Section 3.2.1. The result of the calculations of the LN equates to an increase in the trade volume of 49.65% to approximately CHF 63.6 billion (Appendix W, Table 26). The Log 10 leads to the most conservative scenario, only seeing an increase in the volume traded of 13.18% to CHF 48.1 billion (Appendix W, Table 27). What is important to note from the three calculations is that the trade volume between Switzerland and Vietnam is expected to grow significantly (Appendix W).

Figure 19

Development of Total Trade 2 CH 2017-2030 - Scenario 1



Note: Forecast of the Total Trade 2 of Switzerland with current CPTPP members from 2017 to 2030 without membership; Scenario 1. Illustration based on own calculations (Appendix W).

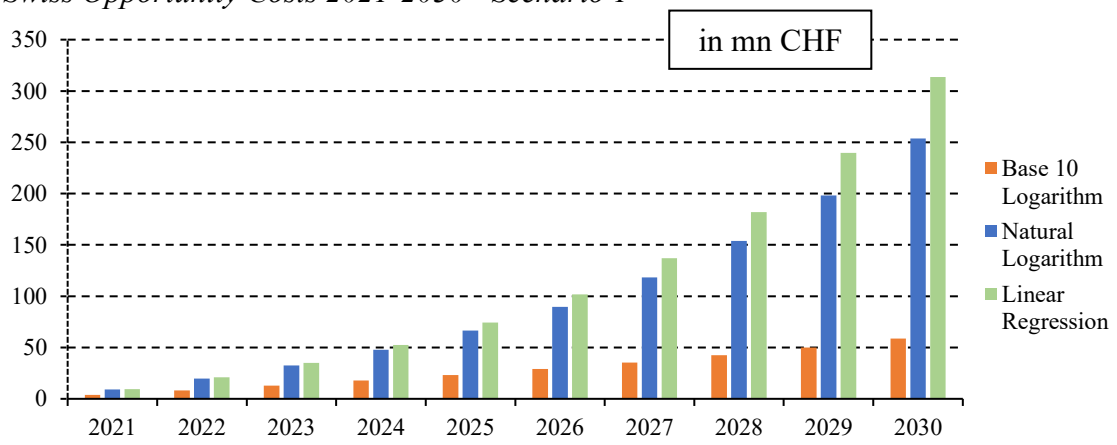
6.1.3. Estimate of Lost Trade

The development of the OC that arise from lost trade that Switzerland could have gained when entering into the CPTPP can be seen in figure 20. The OC have been derived as a function of the growth of trade multiplied by an additional growth rate. Therefore,

the higher the growth rate, the larger the OC that result from the growth rate multiplied by the growth resulting from the RTA. Thus, the total OC that result from this scenario range from CHF 281.6 million (Log 10) to CHF 1,166.1 million (LR) over the estimation period (Appendix W). The third forecast created by the LN equates to costs totaling approximately CHF 989.6 million.

Figure 20

Swiss Opportunity Costs 2021-2030 - Scenario 1



Note: Estimation of the OC of Switzerland not being a member of the CPTPP with current CPTPP members from 2021 to 2030; Scenario 1. Illustration based on own calculations (Appendix W).

6.1.4. Trade Volume Relevance of Countries

Within the first forecast of the LN, a clear shift in the relevance of trading partners is expected to occur. Thus, Vietnam is expected to become Switzerland's most important trading partner in terms of volume. After that, Japan, Singapore, Canada, and Australia are expected to be the Swiss' four next most important partners in 2030 (Appendix W, Table 26). The LR shows the same result as its growth rates are similar to the LN (Appendix W, Table 28). Lastly, the Log 10 shows a different outcome as it significantly lowers the higher growth generated from the preliminary estimate of the LR (Appendix W, Table 27). Therefore, Japan is expected to remain Switzerland's most important trading partner, followed by Singapore, Vietnam, Canada, and Australia.

6.1.5. Sectorial Winners and Losers

If Switzerland had entered into the CPTPP, the impact on different economic sectors of this scenario can be seen in Appendix AA (Table 38). The sectors that are expected to grow more as a result of a Swiss membership are the Pharmaceutical, chemical, and metals sectors, as the amount of additional exports is greater than the increase in imports. Therefore, the biggest winner of a Swiss CPTPP entry is assumed to be the Pharmaceutical and Chemical industry. Industries in which Swiss companies will

lose are precision instruments, watches, jewelry, textiles, precious metals, machine making, agricultural, forestry, fishery, and vehicle manufacturing. However, Switzerland does not have a substantial textile and vehicle industry which means that the growth of these imports can be viewed as net welfare positive impact. Nevertheless, the overall impact of the CPTPP on the Swiss balance of exports is negative and assumed to amount to a negative impact of around CHF 421.7 million (Appendix AA, Table 38).

When excluding Vietnam from the calculations, the treaty's impact on net exports becomes positive (Appendix AA, Table 39). Other industries that would gain more exports than imports from the CPTPP are precision instruments, watches, jewelry, and machine makers.

6.2. Scenario 2

The second scenario created to analyze the effects of the CPTPP on the Swiss economy includes all current CPTPP members and China. To be comparable to the first scenario, it explores the same timeframe.

6.2.1. Assessment of Feasibility

Similar to Scenario 1, this prognosis includes the current CPTPP members and the People's Republic of China. As the country is currently an applicant to this RTA, it can be said that the potential for a Chinese membership cannot be neglected (Schott, 2022). In addition, this outlook represents the dynamic nature of the CPTPP. Nevertheless, certain members might have objections to a Chinese membership in the agreement due to ongoing political clashes with Australia, Canada, Japan, and Vietnam (Channer & Willson, 2021). In addition, China has not been a member of the CPTPP from 2020 to this day. Thus, the effects a Chinese membership would have had on the Swiss volume of trade are more ambiguous.

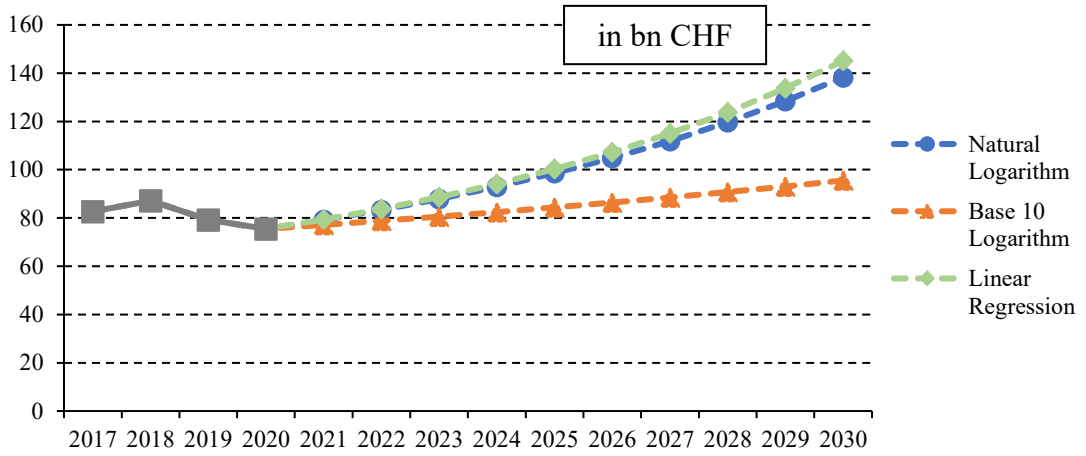
6.2.2. Estimate of Swiss Trade Development without CPTPP Membership

China becoming a member of the CPTPP in this scenario has significant implications for the trade volume of Switzerland (Figure 21). When applying LR, Total Trade 2 is estimated to grow from approximately CHF 75.5 billion in 2020 to CHF 145.1 billion in 2030 (Appendix X, Table 31). The volume of trade is projected to grow by 92.18% over the ten-year estimation period. Furthermore, the natural and Log 10s have been applied to the growth rates in the first scenario. Applying the LN increases the Swiss trade volume by 83.18% to roughly CHF 138.3 billion (Appendix X, Table 29). The conservative Log 10 forecasts an increase of 26.6% until 2030 to approximately CHF 95.6 billion (Appendix X, Table 30). As stated in the previous scenario, the volume of

trade grows significantly less in the Log 10 as the growing trade volume of both China and Vietnam gets flattened significantly more (Appendix X).

Figure 21

Development of Total Trade 2 CH 2017-2030 - Scenario 2



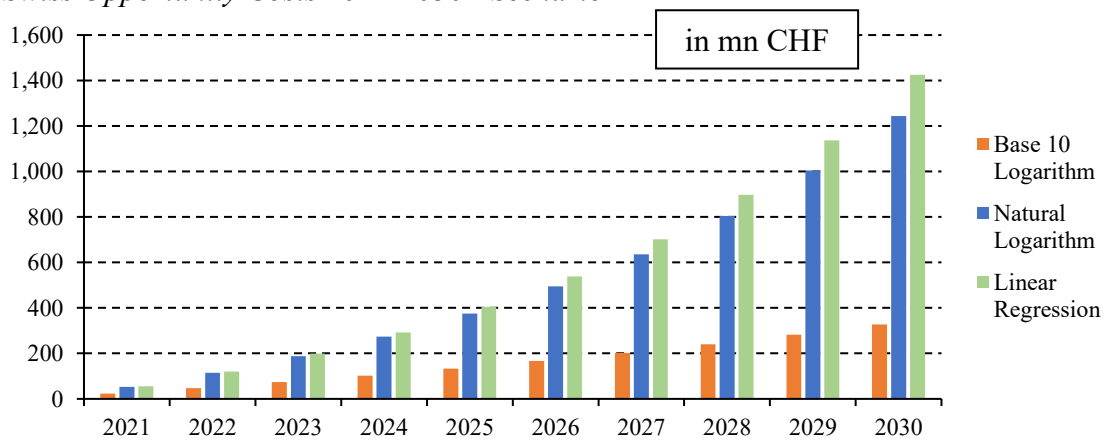
Note: Forecast of the Total Trade 2 of Switzerland with current CPTPP members from 2017 to 2030 without membership; Scenario 2. Illustration based on own calculations (Appendix X).

6.2.3. Estimate of Lost Trade

Figure 22 shows the OC that arise as a result of the lost trade of Switzerland that are estimated to occur due to the country not being a member of the CPTPP. The range of the OC that have been forecasted for this scenario lies between CHF 1,599.5 million and CHF 5,772.5 million from 2021 to 2030 (Appendix X). Applying the additional growth onto the LN results in an estimated loss of CHF 5,187.5 million in the volume traded for the same period (Appendix X).

Figure 22

Swiss Opportunity Costs 2021-2030 - Scenario 2



Note: Estimation of the OC of Switzerland not being a member of the CPTPP with current CPTPP members from 2021 to 2030; Scenario 2. Illustration based on own calculations (Appendix X).

6.2.4. Trade Volume Relevance of Countries

The inclusion of China represents an increase in the relevance of the volume of trade for Switzerland with the members of the CPTPP. Therefore, China would become Switzerland's most important trading partner among CPTPP members in all three forecasts from 2020 to 2030. Like scenario one, Vietnam gains significance when applying a LN and LR (Appendix X, Tables 29 & 31). It is ranked as the second most important in terms of trade volume, followed by Japan, Singapore, and Canada (Appendix X, Tables 29 & 31). The Log 10 shows a different outcome in the relevance of trade volume, with Japan remaining the second most important trading partner, followed by Singapore, Vietnam, and Canada (Appendix X, Table 30).

6.2.5. Sectorial Winners and Losers

With the inclusion of China in the second scenario, the impact of the treaty is different (Appendix BB, Table 40). The sectors that will gain or lose from a Swiss entry into the CPTPP in this forecast are similar to the first. However, the sector involved in the trade of precious metals would gain from China being included in the treaty. In addition, the sectors in which Switzerland is assumed to lose the most would be textiles and machine making. Overall, this scenario would lead to Swiss imports growing more than export which means that Swiss net exports would be negatively impacted by around CHF 918.7 million (Appendix BB, Table 40).

When excluding the strongly growing economies of China and Vietnam, Swiss exports are forecasted to increase by CHF 61.2 million more than without the CPTPP (Appendix BB, Table 41). The industries for precision instruments, watchmaking, jewelry, and machines would become beneficiaries of this, while the sector involved with precious metals would become a net loser.

6.3. Scenario 3

The third forecast that has been made includes five additional countries that could potentially join the CPTPP. These countries are Indonesia, the Philippines, Taiwan, Thailand, and Korea (Rep.).

6.3.1. Assessment of Feasibility

Expanding the CPTPP to the nations mentioned in Section 6.3 would significantly increase the welfare created through the treaty (Petri & Plummer, 2019). So far, Taiwan is the only country in this scenario that has applied to join the CPTPP (Schott, 2022). In addition, Thailand and Korea (Rep.) have voiced interest in joining the RTA (Schott, 2022). Therefore, three out of the five countries are actively seeking the possibility of

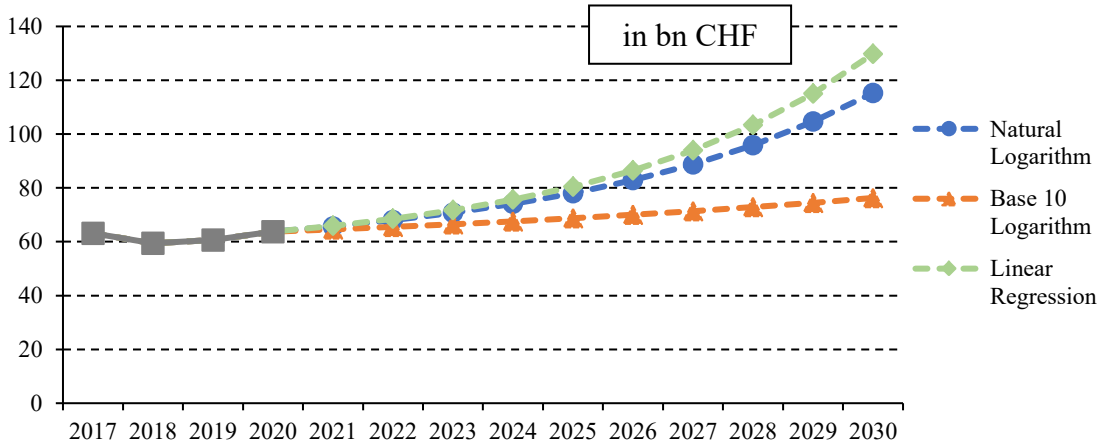
joining this RTA. Moreover, the Philippines and Indonesia have conducted informal studies on what it would take to accede to the trade pact showing interest in the agreement (Hayden & Heine, 2022). Similar to Scenario 2, the effects of these countries' entry would have become more ambiguous over time as their impact on the volume of trade in Switzerland becomes more complex.

6.3.2. Estimate of Swiss Trade Development without CPTPP Membership

If the CPTPP had expanded to the size that was assumed in this scenario, its impact on the trade balance of Switzerland would have been estimated to be drastic (Figure 23). The LR formula predicts an increase of 103.45% from approximately CHF 63.8 billion to CHF 129.8 billion (Appendix Y, Table 34). The LN trade between Switzerland is estimated to grow by 80.56% to CHF 115.2 billion (Appendix Y, Table 32). When analyzing the forecast of the Log 10, it is projected that the volume of trade with the countries analyzed will increase by roughly 19.59% to CHF 76.3 billion by 2030 (Appendix Y, Table 33). What is curious about the development of trade in this scenario is Indonesia's significant influence on the Total Trade 2 with Switzerland.

Figure 23

Development of Total Trade 2 CH 2017-2030 - Scenario 3



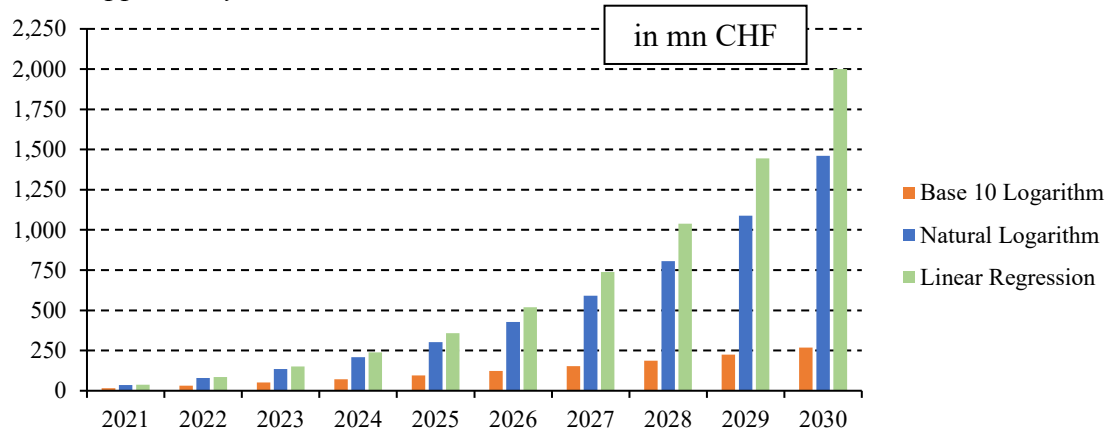
Note: Forecast of the Total Trade 2 of Switzerland with current CPTPP members from 2017 to 2030 without membership; Scenario 3. Illustration based on own calculations (Appendix Y).

6.3.3. Estimate of Lost Trade

The Swiss OC arising from the scenario from 2021 to 2030 can be seen in figure 24. Therefore, the costs of not being a member of the CPTPP during this period range from CHF 1,220.8 million in the Log 10 to CHF 6,610 in the LR's forecast (Appendix Y, Tables 33 & 34). Using the LN, Switzerland is estimated to face OC of CHF 5,133.3 million over the ten years analyzed (Appendix Y, Table 32).

Figure 24

Swiss Opportunity Costs 2021-2030 - Scenario 3



Note: Estimation of the OC of Switzerland not being a member of the CPTPP with current CPTPP members from 2021 to 2030; Scenario 3. Illustration based on own calculations (Appendix Y).

6.3.4. Trade Volume Relevance of Countries

With the inclusion of Indonesia, the Philippines, Taiwan, Thailand, and Korea (Rep.) into this scenario, more rapidly growing economies would become members of the CPTPP. This can be seen by the shift in the relevance of the country of Indonesia, which is forecasted to become the most relevant trading partner in terms of volume in both the LN and the LR, followed by Vietnam, Japan, Thailand, and Singapore (Appendix Y, Tables 32 & 34). The conservative Log 10 sees Japan as Switzerland's most important trading partner, followed by Singapore, Thailand, Indonesia, and Vietnam (Appendix Y, Table 33). However, all forecasts show that both Indonesia and Vietnam are predicted to become significantly more relevant for Switzerland in terms of their respective volumes of trade.

6.3.5. Sectorial Winners and Losers

When looking at the impact of this scenario on the flow of trade for different sectors of the Swiss economy, the sectors that would gain or lose would remain the same as in Scenario 1 (Appendix CC, Table 42). However, the Indonesian membership in the treaty led the industry of precious metals to become the industry expected to create most of the additional imports to Switzerland. This is followed by the textile industry, precision instrument manufacturers, watchmakers, jewelry makers, and vehicle manufacturers (Appendix CC, Table 42). The overall impact of this treaty on the Swiss balance of trade is assumed to be negative by CHF 2,703 million more imports than exports (Appendix CC, Table 42).

The exclusion of Indonesia and Vietnam as outliers leads to Swiss exports growing more than imports for the remaining 14 countries in the CPTPP. Therefore, exports are forecasted to increase by CHF 124.5 million more than imports, with the distribution of this increase being similar to the first two alternative scenarios (Appendix CC, Table 43).

6.4. Scenario 4

The fourth and last forecast includes all of the additional countries to the CPTPP from scenarios 2 and 3. Therefore, it aims to estimate the impact that all 17 countries analyzed would have on Swiss trade.

6.4.1. Assessment of Feasibility

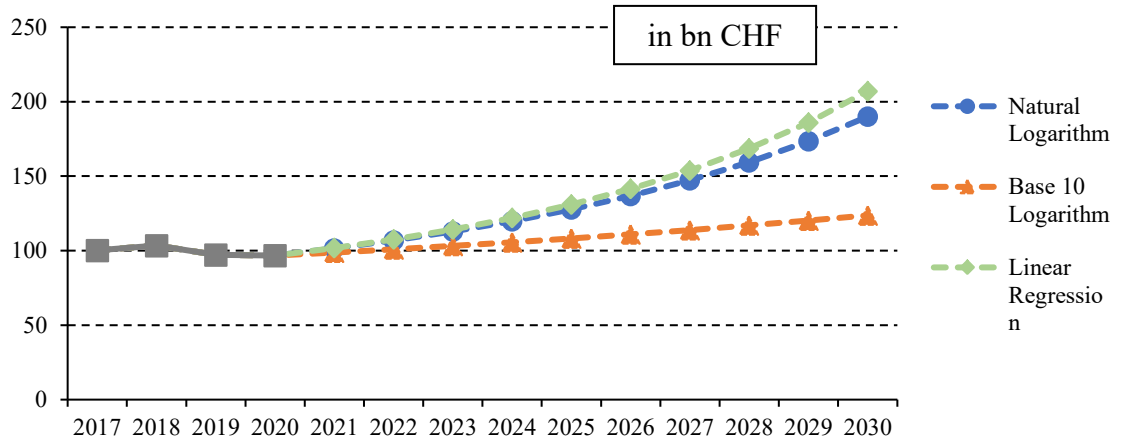
The combination of all of the countries from both alternative scenarios leads to the creation of the biggest scenario. However, it can be said that this is the most unrealistic of the four potential scenarios that could occur. This is due to China and Taiwan being expected to join the RTA. As hostilities in the region rise and both Taiwan and the People's Republic of China have applied to the agreement, they would need to make concessions to not interfere with the other parties' membership if they become a member themselves (Kawase, 2021). Like the other two scenarios that add additional countries to the current CPTPP, this scenario makes assumptions based on past data. In addition, it makes estimates on the development of trade with the most countries analyzed and assumes that the impact on the growth of the balance of trade for Switzerland will be the most significant.

6.4.2. Estimate of Swiss Trade Development without CPTPP Membership

Expanding the CPTPP to 17 member states would mean that the treaties' impact on the global and Swiss economies would be more significant over the estimation period (Figure 25). As per that, the LR forecast predicts that Total Trade 2 for Switzerland would increase by 114.17%, from CHF 96.7 billion to CHF 207.1 billion (Appendix Z, Table 37). Trade between Switzerland and the countries analyzed is estimated to grow by 96.48% to CHF 190 billion under the application of a LN (Appendix Z, Table 35). Applying the same calculations in the Log 10 results in a projected increase of the trade volume of 27.92% to CHF 123.7 billion (Appendix Z, Table 36). As with the other two alternative scenarios, the trade balance with Indonesia and Vietnam is expected to grow the most between 2020 and 2030.

Figure 25

Development of Total Trade 2 CH 2017-2030 - Scenario 4



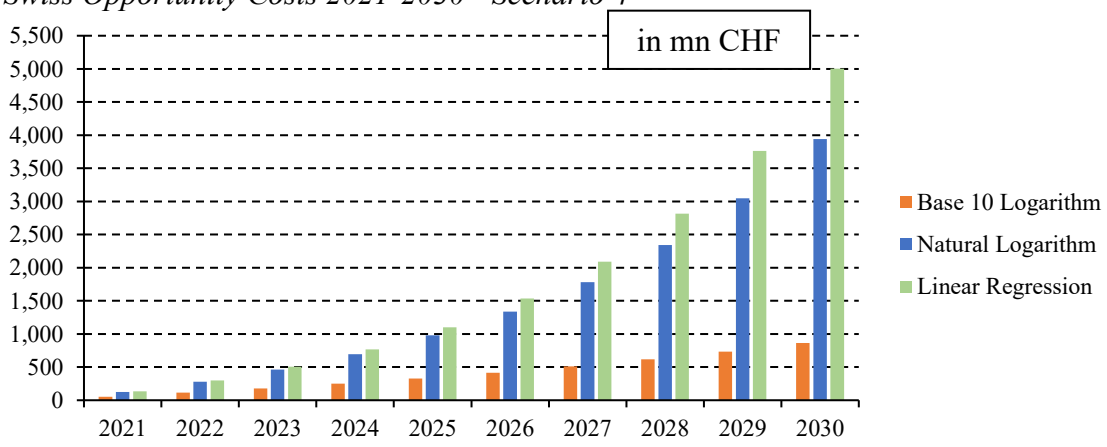
Note: Forecast of the Total Trade 2 of Switzerland with current CPTPP members from 2017 to 2030 without membership; Scenario 4. Illustration based on own calculations (Appendix Z).

6.4.3. Estimate of Lost Trade

The last scenario poses OC for Switzerland, as shown in Figure 26. The costs resulting from not being a member of the CPTPP in the forecasting period range from CHF 4,064.9 million (Log 10) to CHF 18,005.4 million (LR (Appendix Z, Tables 36 & 37). Like in the other two Scenarios, the LN leads to a forecast between the other two figures, amounting to CHF 14,980.1 million from 2021 to 2030 (Appendix Z, Table 35).

Figure 26

Swiss Opportunity Costs 2021-2030 - Scenario 4



Note: Estimation of the OC of Switzerland not being a member of the CPTPP with current CPTPP members from 2021 to 2030; Scenario 4. Illustration based on own calculations (Appendix Z).

6.4.4. Trade Volume Relevance of Countries

As with the previous scenarios, the LN indicates a clear shift in the relevance of the analyzed countries from 2020 to 2030 (Appendix Z, Table 35). China will remain

Switzerland's most important trading partner, followed by Indonesia, Vietnam, Japan, and Thailand (Appendix Z, Table 35). The LR leads to the same ranking when analyzing the countries according to their predicted trade volume in 2030 (Appendix Z, Table 37). When ranking the countries according to the results of the Log 10, China remains the most important trading partner, followed by Japan. Singapore, Thailand, and Indonesia (Appendix Z, Table 36).

6.4.5. Sectorial Winners and Losers

Combining all potential member states of the CPTPP analyzed the treaty's impact in the case of a Swiss membership can be seen in Appendix DD (Table 44). Therefore, this treaty would be a net positive for the pharmaceutical, chemical, and metal industries. However, the precious metal, textile, vehicle manufacturing, machine, agricultural, forestry, fishery, precision instrument, watchmaking, and jewelry industries would lose from a Swiss CPTPP membership (Appendix DD, Table 44). The impact of the RTA on the Swiss balance of trade is assumed to be negative as imports would rise by roughly CHF 4,953.2 million more than exports.

Excluding the three growth markets of China, Indonesia, and Vietnam, this scenario would forecast a positive effect on the Swiss balance of trade, with exports growing by around CHF 98.9 million more than imports (Appendix DD, Table 45). The industries profiting the most are the pharmaceutical, chemical, precision instrument, watchmaking, jewelry, and machinery sectors. The precious metals, agriculture, forestry, and fishery sectors are assumed to lose the most from a Swiss membership.

7. Discussion

This part of the thesis concerns itself with analyzing the findings from Sections 5 and 6 and will answer the three research questions drawn up in the introduction. To answer these questions, the results of calculations, the most reliable method of calculating growth, will be determined and shown again.

7.1. The Opportunity Costs for Switzerland

To answer the first question, four different scenarios were drawn up to make forecasts on how trade might behave from 2020 to 2030 (Appendix W, X, Y & Z). Three different calculative approaches were utilized, using a LR, natural, and Log 10 (Section 3.3). Over all scenarios and calculative approaches, the OC in the form of lost trade range from around CHF 281.6 million to CHF 18,005.4 million (Appendix W & Z). This spread mainly results from a Log 10 and is elevated by including more countries in the three alternative scenarios. However, these alternative scenarios 2, 3, and 4 assume that one or more countries were part of the CPTPP in 2020 and were not members. Nevertheless, these findings can still be used to assess the impact of one of the potential members joining in the future.

Therefore, Scenario 1 is assumed to be the most realistic estimate of OC that Switzerland will fare over the 10-year forecasting period (Section 6.1.3). The lost trade ranges between CHF 281.6 million and CHF 1,166.1 million within this scenario. However, the forecasting method backed by the most academic literature, the LN, estimates that Switzerland will lose approximately CHF 989.6 million of trade volume (Appendix W, Table 26). These OC are equivalent to 0.173% of the annual trade volume of Switzerland in 2020 (Appendix EE, Table 47). The costs that are forecasted for the year 2020 amount to CHF 253.8 million, representing a share of 0.044% of the trade volume of Switzerland (Appendix EE, Table 47). Therefore, the effects that a non-membership of Switzerland in the CPTPP has on the Total Trade 2 is noticeable, and the loss of trade is significant.

7.2. Winners and Losers

The previously described OC were assigned to the different goods exported or imported to Switzerland, as shown in table 1. It shows that around CHF 283.9 million (28.7%) will be carried by exporters and CHF 705.7 million (71.3%) by importers. Therefore, the Swiss net exports are estimated to be negatively impacted by the FTA, decreasing by around CHF 421.7 million.

Table 1

Scenario 1 – Impact on Swiss Industries 2021-2030 – All Countries

Industry	OC of Exports	OC of Imports	Net Exports/Imports
Pharmaceutical and Chemical Products	128'172'040	29'086'089	99'085'951
Metals (non-precious)	8'369'977	28'843	8'341'134
Optics/medical instruments	529'322	562'964	-33'642
Vehicles	800'810	7'395'911	-6'595'101
Agricultural, Forestry, and Fishery products	11'318'388	50'267'147	-38'948'759
Various Goods	13'701'863	53'796'285	-40'094'423
Machines	58'111'146	105'404'962	-47'293'816
Precious Metals	19'809'240	76'180'454	-56'371'214
Textiles	0	135'945'423	-135'945'423
Precision instruments, Watches, Jewelry	43'126'842	246'982'061	-203'855'219
Total	**283'939'627**	**705'650'140**	**-421'710'513**

Note: Estimate of the lost trade per industrial sector if Switzerland was a CPTPP member from 2021 to 2030. Illustration based on own calculations (Excel: Winners & Losers Results).

The industries expected to profit from an entry into the CPTPP are the pharmaceutical, chemical, and metal industries (Table 1), exporting approximately CHF 107.4 million more than they import over the forecasted period.

The sectors estimated to fare the most significant losses are those of precision instruments, watches, and Jewelry, leading to imports of around CHF 203.9 million higher than the additional exports (Table 1). This industry is followed by the textile industry, resulting in CHF 135.9 million additional imports to Switzerland, while the Swiss will not generate any exports in this category. In addition, Switzerland will lose notable net exports in the sectors of precious metals (CHF 56.4 million), machine making (CHF 47.3 million), agriculture, forestry, and fishery (CHF 38.9 million). Notably, the increase in the import of agricultural goods means that the interpellation of Scheider-Schneiter (2020) has been confirmed through the calculations conducted in this part of the Thesis.

Nevertheless, this analysis has also been conducted with the exclusion of Vietnam. This country had an average increase in the volume of trade with Switzerland of 20.23% per year from 2012 to 2020 (Appendix W, Table 26). The forecast for this scenario estimates Switzerland to gain roughly CHF 28.8 million more exports than imports from 2020 to 2030 (Table 2). Furthermore, the precision instruments, watches, jewelry, and machines industries are estimated to generate more exports than imports through a Swiss CPTPP membership.

Table 2

Scenario 1 – Impact on Swiss Industries 2021-2030 – Without Vietnam

Industry	OC of Exports	OC of Imports	Net Exports/Imports
Pharmaceutical and Chemical Products	82'172'789	29'086'089	53'086'700
Precision instruments, Watches, Jewelry	33'793'661	6'036'317	27'757'344
Machines	15'778'502	10'486'941	5'291'561
Metals (non-precious)	4'592'261	28'843	4'563'418
Optics/medical instruments	529'322	562'964	-33'642
Textiles	0	1'150'601	-1'150'601
Various Goods	8'257'507	11'111'259	-2'853'752
Vehicles	800'810	7'395'911	-6'595'101
Agricultural, Forestry, and Fishery products	7'096'235	21'061'603	-13'965'368
Precious Metals	19'809'240	57'084'521	-37'275'281
Total	**172'830'326**	**144'005'048**	**28'825'278**

Note: Estimate of the lost trade per industrial sector if Switzerland was a CPTPP member from 2021 to 2030 without Vietnam. Illustration based on own calculations (Excel: Winners & Losers Results).

However, as in the first analysis of which industries are going to gain and lose from a Swiss CPTPP membership, imports in the category of agriculture are expected to increase by roughly CHF 13.9 million more than exports. This further underlines previous findings surrounding the discussion of a Swiss CPTPP membership.

7.3. CPTPP Member Relevance for Switzerland

Three different quantitative measures were used to assess the most important countries among current CPTPP members. First, the forecast on the volume of trade was used to assess the importance of each country in terms of the amount they trade with Switzerland. Next, the countries were assessed based on their OC resulting from the volume of trade increasing if Switzerland joined the CPTPP. Lastly, an assessment of the development of the working-age population of each country from 2020 to 2030 was conducted to determine how this factor might change. These rankings will then be compared to the priority list of the SECO to find if this list could be modified.

In terms of absolute trade volume, the forecast expects Vietnam to become the most important trading partner out of all countries that have been analyzed (Table 3). It is followed by Japan, Singapore, Canada, and Australia, estimated to increase trade with Switzerland. The least important countries among the analyzed CPTPP members are Brunei Darussalam, New Zealand, Chile, Peru, Mexico, and Malaysia.

Table 3

Scenario 1 – Summary of all CPTPP Members

Country	Forecast Trade volume 2030	Lost Trade (OC)	Absolute change Working-age Population Change	Rank Volume	Rank Lost Trade	Rank Pop.
Australia	6'045'288'687	67'388'355	1'091'186	5	3	5
Brunei Darussalam	1'548'163	18'707	18'699	11	11	8
Canada	6'558'001'346	28'750'681	392'755	4	6	6
Chile	868'911'436	7'318'788	-263'766	9	9	10
Japan	15'052'226'593	95'417'126	-5'260'845	2	2	11
Malaysia	2'931'253'381	32'932'964	2'171'481	6	5	3
Mexico	1'517'807'746	22'963'476	8'943'722	7	7	1
New Zealand	254'358'147	937'700	85'722	10	10	7
Peru	1'025'045'012	22'755'791	1'661'556	8	8	4
Singapore	8'929'739'422	38'351'786	-260'186	3	4	9
Vietnam	20'633'111'387	672'754'393	2'543'160	1	1	2
Total	63'817'291'320	989'589'767	11'123'485			

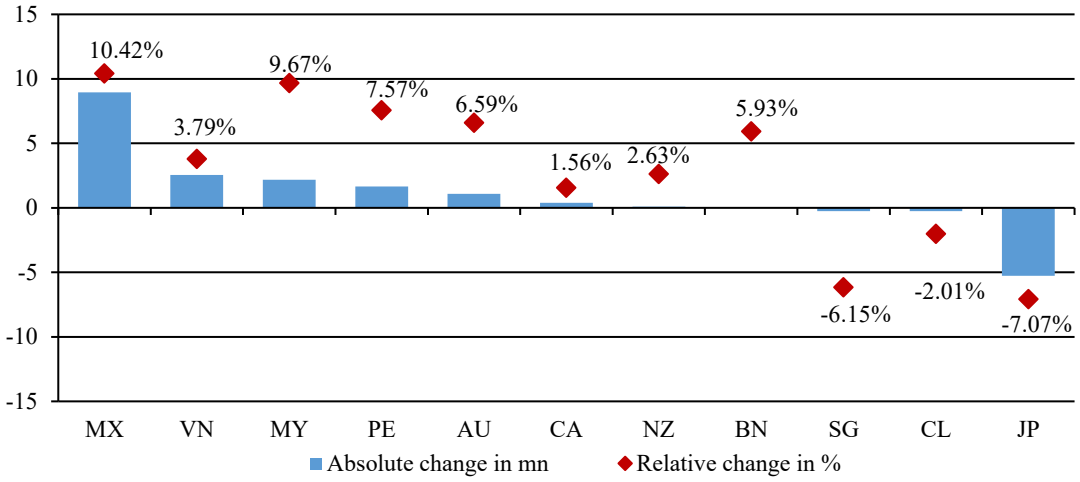
Note: Summary of the most important findings of the thesis. Illustration based on own calculations (Excel: Summary Tables).

Moving over to the OC in the form of lost trade, a similar picture emerges to the ranking of the trade volume. Therefore, Vietnam is also the country forecasted to result in Switzerland's most considerable OC, followed by Japan. However, Australia holds the third rank in OC, followed by Singapore, Malaysia, and Canada (Table 3).

When looking at the demographic change that will occur in the countries listed in Table 3, Mexico is the country that will gain the greatest amount of working-age population. Vietnam is the country that will grow the second most, followed by Malaysia, Peru, Australia, and Canada. The countries that will experience a labor decline are Japan, Chile, and Singapore meaning that the labor pool of these countries is expected to decline (Table 3). As shown in Figure 27, the countries expected to grow the most in absolute terms will also increase significantly in relative terms. Therefore, the importance of Mexico, Malaysia, Peru, and Australia is further elevated as their countries are forecasted to grow significantly until 2030 (Figure 27).

Figure 27

Working-age Population Change of CPTPP Members 2020-2030



Note: Absolute and Relative change of working-age population of CPTPP members from 2020 to 2030. Illustration based on own calculations (Appendix V).

7.3.1. Comparison with SECO Priority List

In order to compare and determine which countries from current CPTPP members would be the most important for Switzerland, table 3 will be used. Therefore, all three criteria are given equal weight, but the working-age population, as this thesis, gives more weight to the forecasts made. Thus, the change in the absolute working-age population will be weighted by 0.5. These three criteria are then averaged to find the most important countries in terms of their trade volume, OC, and working-age Population (Table 3).

When considering these three factors, the most important country for Switzerland is Vietnam, which will increase significantly in all three criteria. This makes it the most important country to target. This is because it factored the highest in terms of projected trade volume and OC and the second-most important in terms of working-age population change. Moreover, Japan is still a significantly important country as it ranks second in both total trade volume and lost trade. However, the demographic trend of Japan is the

second-worst among all CPTPP countries. Japan is followed by Australia, which is estimated to generate the third-highest OC for Switzerland. It is followed by Singapore, which is expected to still be highly relevant in trade volume and would generate the fourth-highest OC. The fifth-most important country is Malaysia which is forecasted to become more relevant in terms of volume traded. Moreover, the country is estimated to experience the third-most significant growth in its absolute working-age population (Table 3).

Moving over to the SECO priority list, the countries viewed as priorities are Colombia, Egypt, Ghana, Indonesia, Peru, South Africa, Tunisia, and Vietnam (SECO, 2021c). Therefore, it can be said that the prioritization of Vietnam overlaps and is viewed as the most critical target that should be tackled. In addition, Peru, which is the 8th most important country according to the analysis, also overlaps with the SECO's strategy (Table 3). A country that is neither on the SECO's list nor has ongoing negotiations regarding a bilateral FTA at this is Australia. Although the Australian government has commissioned a feasibility study of an FTA with EFTA, free trade between them and Switzerland seems far away.

Moreover, countries that already have an FTA with Switzerland, which should be renewed, include Japan, Korea, Canada, and Mexico (Atteslander & Baur, 2022). Furthermore, among applicants to the CPTPP, the People's Republic of China and Korea are countries that also have FTAs with Switzerland, which should be updated (Channer & Willson, 2021). Therefore, the CPTPP contains five highly relevant countries for Switzerland regarding the potential trade legislature that comes with the agreement. This means that Switzerland could efficiently surpass the re-negotiation of FTAs with countries that do not view the Swiss as their priority. In addition, the agreement would mean that Swiss exporters would gain better access to five new markets with which Switzerland has not agreed on an FTA yet (Appendix EE, Table 47).

8. Limitations

This part of the thesis aims to inform the reader about limitations that have appeared due to the methods chosen within Section 3. Most limitations surround the quality of data and underlying assumptions that have been made to assess the impact of a Swiss CPTPP membership on its balance of trade.

First, the calculations used to forecast the trade volumes rely on the assumption of continuous growth or decline. This means that past data was used to make statements about future developments. As the world is highly dynamic, it can be said that the past does not necessarily determine the future. In addition, the ratio of exports and imports, as well as the kinds of goods that are traded, are assumed to remain equal throughout the forecasted period. In reality, the kinds of goods traded might shift heavily. This shift can also occur when trade barriers between two nations are lowered, resulting in the volume of trade in goods with high tariffs imposed on their increase (Head & Ries, 1999).

In addition, the benchmark growth rate derived from the trade data provided by the FOCBS (n.d.) through a LR could be improved. The issue is that countries that have experienced significant growth in their balance of trade in relative terms over the benchmarking period are predicted to grow the same amount for the forecasted period. Specifically, Indonesia, Vietnam, and the People's Republic of China's growth rates are significantly larger than those of the other countries. This limits the findings of the OC as these countries are expected to generate the most costs.

Furthermore, the additional growth rate that was used in this thesis was provided by the Peterson institute (Petri & Plummer, 2019), which did not intend to be applied to Switzerland but rather as a case study for the People's Republic of China. Moreover, this rate is applied equally to all growth rates of trade between Switzerland and the analyzed countries. In addition, it is also applied to countries that already have FTAs in place with Switzerland, which might reduce the additional impact the CPTPP could have on their trade volume. This means that the paper assumes that the additional growth that countries will capture is equally distributed among every member state. The issue is that all countries are treated the same way, meaning that individual factors that affect the balance of trade between them and Switzerland are neglected.

Moreover, the distance factor of the gravity equation is neglected as it does not impact the forecast. Therefore, the impact of the significant geographic distance between Switzerland and all CPTPP members might impact the amount of additional growth that might be captured by Switzerland. Thus, the Total Trade 2 forecast, as well as the forecast

of the OC in the form of lost trade for Switzerland, might be inflated and overestimated due to the neglect of distance.

Additionally, Total Trade 2 was selected to calculate the volume of trade and the OC, respectively. The SECO (2022b) has used this metric to show what goods Switzerland trades with each country in its information sheets. However, Total Trade 1 might be more reliable when determining the impact of a new FTA on the economy. This means that this Total Trade could be more representative of the impact on value-adding industries. It is also more resilient to the fluctuations of commodity prices than the Total Trade 2, which is generally more volatile (SECO, 2022b). Nevertheless, Total Trade 2 can be helpful when trying to determine the impact of a treaty on the volume of trade.

Furthermore, the categorization of the goods traded in the analysis in Section 7.2, analyzing the winners and losers of the CPTPP, is limited. As only the main categories of traded goods were inserted into the formula, it is difficult to say which sub-industries might benefit or lose from the FTA. Thus, the analysis results of winners and losers are not exclusive but only indicate which industries might benefit or lose if trade composition remains constant.

Another limiting factor is that the individual companies that could profit from using an FTA do not always make use of these agreements (Legge & Lukaszuk, 2020). Legge and Lukaszuk (2020) have shown that the usage rate of an FTA is highly dependent on the goods traded with a respective nation. This is due to the rules of origin, which determine whether or not an FTA can be applied to imports or exports. In addition, this thesis neglected the impact of individual tariff reductions on each CPTPP member. Therefore, all countries were treated as if they had the same tariff reduction, resulting in ambiguity regarding the treaty's impact on certain goods traded. The respective gains or losses for different Swiss sectors might be further influenced by the amount individual tariffs would change under the CPTPP.

Lastly, the data used in this thesis violates the assumption of stationarity that must be present when dealing with time-series data (National Institute of Standards and Technology, n.d.). This is due to the mean, variance, and autocorrelation structure changing over time, such as in the total volume of trade of Indonesia, Malaysia, and Mexico. Here, the mean and slope of the LR are highly dependent on the base year selected. Therefore, the long-term growth rate of a country might be different from the results of the LR that has been used as the tool to forecast how Total Trade 2 might evolve in the future.

9. Recommendations

In the following Section, recommendations for Swiss policymakers and further research will be drawn up. This serves to inform the reader about actionable steps that could be taken in the future.

9.1. For Switzerland

First, this paper concludes that a CPTPP membership would benefit Switzerland in terms of deepening its ties with the strongly growing markets of Asia. This is important as the growth of these markets presents enormous potential for Swiss companies who might be at a disadvantage compared to companies from the EU. In addition, the direction of trade is trending upwards and is expected to increase significantly, as shown in Section 6.1.

Moreover, Swiss companies are already at a disadvantage when trading with CPTPP members like Japan or Korea. Other nations are catching up and even the playing field with new and better FTAs (Schneider-Schneiter, 2020). These FTAs include more significant reductions of tariffs on different goods such as agricultural products like Cheese. Therefore, not being able to renew existing FTAs means that Switzerland might be at risk of providing a competitive disadvantage to its companies due to higher tariffs. Although Switzerland could solve this issue by renewing the agreements on a bilateral basis, it seems unrealistic, as has been presented by Schneider-Schneiter (2020). Thus, the CPTPP presents a holistic solution to the difficulties faced by countries that do not see Switzerland as their priority in terms of trade (Kölling, 2022).

In addition, the OC that Switzerland is forecasted to face until 2030 mean that Swiss importers and exporters are estimated not to be able to trade as much as they potentially could. Amiti, Redding, and Weinstein (2019) have proven that the tariffs implemented by President Trump in 2018 were carried wholly by domestic consumers and importers. Therefore, it is expected that membership in the CPTPP could potentially lower domestic prices for goods imported from member states of the FTA.

However, domestic industries are expected to lose from a Swiss CPTPP membership as imports from CPTPP countries are estimated to increase more than exports (Appendix AA, Table 38). This makes a Swiss membership in the agreement significantly more difficult but not impossible (Schneider-Schneiter, 2020). What might be beneficial to an entry into the agreement is the resignation of the SECO director Ineichen-Fleisch, which will be followed by Helene Budliger Artieda (Wattenhofer, 2022). As she was previously working at the Swiss embassy in Thailand, she has gathered

experience within the region. Thus, Switzerland might become more open to entering the CPTPP as it reconsiders its options (Kölling, 2022).

Therefore, this thesis recommends that Switzerland further assess the potential of an entry into the CPTPP. The costs estimated to emerge as a result of not being a member of this agreement are significant enough to start the negotiation process to become a member of this free trade area. In addition, the ongoing free trade negotiations with Vietnam and Malaysia could be dealt with in a more holistic manner, which could save legal costs resulting from bilateral agreements negotiations (Amadeo, 2022).

9.2. For Further Research

It is recommended that further research in the area of forecasting the development of trade should be conducted to assess if an entry into new FTAs is feasible. First, it is recommended that more dynamic growth rate forecasts be created based on quantitative and qualitative factors.

The quantitative factors would include past developments in trade. In contrast, the qualitative factors would aim to project how trade might evolve differently from the past to create more accurate figures on the future development of the volume of trade. Additionally, the dataset used for the growth rate could be expanded to avoid the violation of the assumption of stationarity. This would benefit the discussion surrounding a Swiss entry into the CPTPP as these datasets should prove to be more accurate, although they might be more subjective.

In addition, these forecasts should consider the individuality of each potential FTA partner as trade relations are different from country to country. Significantly, the changes in tariffs that occur due to the entry into the CPTPP should be included in the growth rate calculation as a more significant decrease in tariffs could lead to a greater increase in trade.

Moreover, the distance factor of the gravity equation should also be included in the forecasts as closer proximity to trading partners is assumed to be beneficial to increased trade.

Furthermore, it is recommended that more forecasts based on the Total Trade 1 should be made to reduce the volatility within trade data that stems from fluctuating commodity prices. This should be combined with a closer analysis of the types of goods traded with CPTPP countries to give more insights into which specific industries might gain or lose from the agreement.

To conclude whether or not Swiss business leaders would welcome and actively use the CPTPPs' reduced tariffs, interviews should be conducted with these

representatives to gain information on their stances. This would serve to better understand if different economic actors within Switzerland would back this treaty. Therefore, this would serve as a qualitative way to estimate the usage rate of the CPTPP to predict how much the FTA would benefit Swiss exporters and imports.

10. Conclusion

This paper aimed to create the foundation for discussing a Swiss entry into the CPTPP based on quantitative data. Therefore, countries have been assessed in terms of their current standing regarding trade with Switzerland (Section 5). It was then expanded by four scenarios that forecast trade volume, OC in the form of lost trade, and the composition of OC in different goods traded (Section 6). Among these scenarios, the first one (Section 6.1) was the most representative as it only included countries already members of the CPTPP in 2020. The other three forecasts can explain how the calculations can be applied to more countries.

According to Scenario 1 (Section 6.1.3), Switzerland is estimated to lose around CHF 989.5 million of potential trade from 2020 to 2030. These costs are estimated to be carried mainly by importers and, therefore, by consumers as higher tariffs resulting from not being a member of the CPTPP result in increased prices (Section 9.1). However, an entry into the agreement would mean that domestic producers are expected to face higher competition. This is because imports to Switzerland would be larger than additional exports for precision instruments, watches, jewelry, textiles, precious metals, machines, agricultural, forestry, and fishery products (Section 7.2). In addition, it was found that the impact of the CPTPP on Switzerland's trade balance is expected to grow in the future as its member states of the agreement are becoming increasingly more important in terms of trade and working-age population (Section 7.3).

Therefore, this thesis found that it should strongly consider entering into this agreement to enable Switzerland to avoid the competitive disadvantages it faces now or in the future (Section 7). This is important as Switzerland is predicted to face growing challenges regarding free trade as other entities as the EU can negotiate better conditions for their FTAs, shown through the examples of Japan (Section 5.6) and Korea (Section 5.14). Therefore, the CPTPP has been found to be a potential solution to the problems stated in Section 1.2.

The forecasts made in Section 6 give insights into how Swiss trade with current and potential CPTPP members might behave from 2020 to 2030. However, future research could examine the following aspects based on the existing analysis (Section 9.2):

- Improve forecasting by further breaking down the data available for individual countries and expanding the inputs into the formula. Accounts for more complexity should be done using quantitative and qualitative factors.
- Conduct interviews to determine the potential usage rate of business if Switzerland becomes a member of the CPTPP

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Appendix

Appendix A: Data on Total Trade 2 – Australia 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	775'605'604	-	2'344'131'164	-	1'568'525'560	-	3'119'736'768	-	0
2013	729'290'495	-5.97%	2'296'532'170	-2.03%	1'567'241'675	-0.08%	3'025'822'665	-3.01%	1
2014	547'768'304	-24.89%	2'254'441'286	-1.83%	1'706'672'982	8.90%	2'802'209'590	-7.39%	2
2015	515'699'020	-5.85%	2'239'162'793	-0.68%	1'723'463'773	0.98%	2'754'861'813	-1.69%	3
2016	902'366'285	74.98%	2'393'477'627	6.89%	1'491'111'342	-13.48%	3'295'843'912	19.64%	4
2017	1'409'812'071	56.24%	2'694'351'395	12.57%	1'284'539'324	-13.85%	4'104'163'466	24.53%	5
2018	1'167'441'218	-17.19%	2'567'522'997	-4.71%	1'400'081'779	8.99%	3'734'964'215	-9.00%	6
2019	1'402'204'334	20.11%	2'111'419'397	-17.76%	709'215'063	-49.34%	3'513'623'731	-5.93%	7
2020	1'842'245'130	31.38%	2'137'448'737	1.23%	295'203'607	-58.38%	3'979'693'867	13.26%	8
Average/Regression	1'032'492'496	18.09%	2'337'609'730	-0.21%	1'305'117'234	-9.27%	3'370'102'225	4.34%	

Composition of bilateral trade (2020, Total 2)

Imports		Exports	
Traded Good	**Value in %**	**Traded Good**	**Value in %**
Precious Metals	89.20	Pharmaceutical and Chemical Products	49.80
Pharmaceutical and Chemical Products	3.10	Precision instruments, Watches, Jewelry	20.00
Agricultural, Forestry, and Fishery products	2.90	Machines	10.50
Precision instruments, Watches, Jewelry	2.10	Agricultural, Forestry, and Fishery products	8.70
Machines	0.90	Metals (non-precious)	3.80
Total	98.20	Total	92.80

Table 4: Total Trade 2 between Switzerland and Australia (FOCBS, n.d.; SECO, 2022b)

Appendix B: Data on Total Trade 2 – Brunei Darussalam 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total Trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	10'291'412	-	1'480'904	-	-8'810'508	-	11'772'316	-	0
2013	378'896	-96.32%	2'629'043	77.53%	2'250'147	-125.54%	3'007'939	-74.45%	1
2014	2'657'714	601.44%	17'508'192	565.95%	14'850'478	559.98%	20'165'906	570.42%	2
2015	2'508'812	-5.60%	8'254'662	-52.85%	5'745'850	-61.31%	10'763'474	-46.63%	3
2016	2'045'374	-18.47%	2'812'230	-65.93%	766'856	-86.65%	4'857'604	-54.87%	4
2017	2'248'967	9.95%	3'154'752	12.18%	905'785	18.12%	5'403'719	11.24%	5
2018	2'597'975	15.52%	3'012'671	-4.50%	414'696	-54.22%	5'610'646	3.83%	6
2019	19'303'093	643.01%	20'853'517	592.19%	1'550'424	273.87%	40'156'610	615.72%	7
2020	32'489	-99.83%	945'506	-95.47%	913'017	-41.11%	977'995	-97.56%	8
Average/Regression	4'673'859	2.49%	6'739'053	20.75%	2'065'194	-0.58%	11'412'912	4.79%	

Composition of bilateral trade

Imports			Exports		
Traded Good		**Value in %**	**Traded Good**		**Value in %**
Various Goods		100.00	Various Goods		100.00
	Total	100.00		Total	100.00

Table 5: Total Trade 2 between Switzerland and Brunei Darussalam (FOCBS, n.d.)

Appendix C: Data on Total Trade 2 – Canada 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	1'289'719'286	-	3'514'595'691	-	2'224'876'405	-	4'804'314'977	-	0
2013	2'725'156'832	111.30%	3'522'451'159	0.22%	797'294'327	-64.16%	6'247'607'991	30.04%	1
2014	1'477'606'075	-45.78%	3'428'345'360	-2.67%	1'950'739'285	144.67%	4'905'951'435	-21.47%	2
2015	1'028'234'301	-30.41%	3'508'782'957	2.35%	2'480'548'656	27.16%	4'537'017'258	-7.52%	3
2016	1'094'250'592	6.42%	3'470'020'028	-1.10%	2'375'769'436	-4.22%	4'564'270'620	0.60%	4
2017	1'901'485'756	73.77%	3'582'453'468	3.24%	1'680'967'712	-29.25%	5'483'939'224	20.15%	5
2018	1'916'432'334	0.79%	3'860'294'521	7.76%	1'943'862'187	15.64%	5'776'726'855	5.34%	6
2019	1'234'179'399	-35.60%	4'457'585'566	15.47%	3'223'406'167	65.82%	5'691'764'965	-1.47%	7
2020	1'771'545'441	43.54%	3'871'145'671	-13.16%	2'099'600'230	-34.86%	5'642'691'112	-0.86%	8
Average/Regression	1'604'290'002	-1.03%	3'690'630'491	2.45%	2'086'340'489	4.47%	5'294'920'493	1.52%	

Composition of bilateral trade (2020, Total 2)

Imports		Exports		
Traded Good	Value in %	Traded Good		Value in %
Vehicles	15.30	Pharmaceutical and Chemical Products		69.20
Pharmaceutical and Chemical Products	7.80	Agricultural, Forestry, and Fishery products		8.20
Machines	7.30	Precision instruments, Watches, Jewelry		7.30
Agricultural, Forestry, and Fishery products	2.60	Machines		6.00
Precision instruments, Watches, Jewelry	1.80	Vehicles		2.00
Total	34.80		Total	92.70

Table 6: Total Trade 2 between Switzerland and Canada (FOCBS, n.d.; SECO, 2022b)

Appendix D: Data on Total Trade 2 – Chile 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	1'101'241'840	-	269'609'291	-	-831'632'549	-	1'370'851'131	-	0
2013	1'020'507'851	-7.33%	290'563'014	7.77%	-729'944'837	-12.23%	1'311'070'865	-4.36%	1
2014	787'677'959	-22.82%	254'944'179	-12.26%	-532'733'780	-27.02%	1'042'622'138	-20.48%	2
2015	558'420'847	-29.11%	256'140'762	0.47%	-302'280'085	-43.26%	814'561'609	-21.87%	3
2016	519'821'448	-6.91%	287'734'487	12.33%	-232'086'961	-23.22%	807'555'935	-0.86%	4
2017	482'835'860	-7.12%	304'662'873	5.88%	-178'172'987	-23.23%	787'498'733	-2.48%	5
2018	542'012'539	12.26%	323'890'358	6.31%	-218'122'181	22.42%	865'902'897	9.96%	6
2019	744'098'501	37.28%	369'237'933	14.00%	-374'860'568	71.86%	1'113'336'434	28.58%	7
2020	791'118'300	6.32%	322'522'816	-12.65%	-468'595'484	25.01%	1'113'641'116	0.03%	8
Average/Regression	727'526'127	-3.99%	297'700'635	3.92%	-429'825'492	-6.55%	1'025'226'762	-2.43%	

Composition of bilateral trade (2020, Total 2)

Imports		Exports	
Traded Good	Value in %	Traded Good	Value in %
Precious Metals	93.90	Pharmaceutical and Chemical Products	55.70
Agricultural, Forestry, and Fishery products	5.60	Machines	18.80
Pharmaceutical and Chemical Products	0.20	Precision instruments, Watches, Jewelry	15.20
Machines	0.10	Metals (non-precious)	4.90
Precision instruments, Watches, Jewelry	0.10	Agricultural, Forestry, and Fishery products	2.90
Total	99.90	Total	97.50

Table 7: Total Trade 2 between Switzerland and Chile (FOCBS, n.d.; SECO, 2022b)

Appendix E: Data on Total Trade 2 – Indonesia 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	265'382'113	-	432'100'992	-	166'718'879	-	697'483'105	-	0
2013	295'549'616	11.37%	574'069'600	32.86%	278'519'984	67.06%	869'619'216	24.68%	1
2014	312'401'733	5.70%	616'444'778	7.38%	304'043'045	9.16%	928'846'511	6.81%	2
2015	1'311'096'400	319.68%	554'399'758	-10.06%	-756'696'642	-348.88%	1'865'496'158	100.84%	3
2016	2'355'529'232	79.66%	456'959'027	-17.58%	-1'898'570'205	150.90%	2'812'488'259	50.76%	4
2017	1'462'268'677	-37.92%	452'535'065	-0.97%	-1'009'733'612	-46.82%	1'914'803'742	-31.92%	5
2018	884'310'630	-39.52%	494'450'082	9.26%	-389'860'548	-61.39%	1'378'760'712	-27.99%	6
2019	979'057'234	10.71%	488'335'553	-1.24%	-490'721'681	25.87%	1'467'392'787	6.43%	7
2020	2'605'151'118	166.09%	498'454'603	2.07%	-2'106'696'515	329.31%	3'103'605'721	111.50%	8
Average/Regression	1'163'416'306	79.79%	507'527'718	-1.30%	-655'888'588	-130.38%	1'670'944'023	29.55%	

Composition of bilateral trade (2021, Total 2)

Imports		Exports		
Traded Good	Value in %	Traded Good		Value in %
Precious Metals	72.20	Pharmaceutical and Chemical Products		42.30
Textiles	13.60	Machines		20.60
Agricultural, Forestry, and Fishery products	3.40	Precision instruments, Watches, Jewelry		13.30
Machines	2.70	Metals (non-precious)		9.30
Various Goods	2.50	Agricultural, Forestry, and Fishery products		7.30
Total	94.40		Total	92.80

Table 8: Total Trade 2 between Switzerland and Indonesia (FOCBS, n.d.; SECO, 2022b)

Appendix F: Data on Total Trade 2 – Japan 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	4'730'507'745	-	7'170'550'686	-	2'440'042'941	-	11'901'058'431	-	0
2013	3'753'306'442	-20.66%	6'425'261'099	-10.39%	2'671'954'657	9.50%	10'178'567'541	-14.47%	1
2014	3'659'669'317	-2.49%	6'394'424'879	-0.48%	2'734'755'562	2.35%	10'054'094'196	-1.22%	2
2015	3'483'333'687	-4.82%	6'592'004'028	3.09%	3'108'670'341	13.67%	10'075'337'715	0.21%	3
2016	3'954'448'496	13.52%	7'510'953'173	13.94%	3'556'504'677	14.41%	11'465'401'669	13.80%	4
2017	5'994'608'646	51.59%	7'467'462'308	-0.58%	1'472'853'662	-58.59%	13'462'070'954	17.41%	5
2018	4'668'990'778	-22.11%	7'764'933'051	3.98%	3'095'942'273	110.20%	12'433'923'829	-7.64%	6
2019	4'526'369'402	-3.05%	8'136'035'299	4.78%	3'609'665'897	16.59%	12'662'404'701	1.84%	7
2020	4'989'214'387	10.23%	7'056'824'899	-13.26%	2'067'610'512	-42.72%	12'046'039'286	-4.87%	8
Average/Regression	4'417'827'656	2.78%	7'168'716'602	1.93%	2'750'888'947	0.28%	11'586'544'258	2.27%	

Composition of bilateral trade (2020, Total 2)

Imports		Exports	
Traded Good	Value in %	Traded Good	Value in %
Pharmaceutical and Chemical Products	36.70	Pharmaceutical and Chemical Products	52.90
Precious Metals	26.00	Precision instruments, Watches, Jewelry	30.00
Machines	12.20	Machines	6.90
Vehicles	10.70	Agricultural, Forestry, and Fishery products	3.80
Precision instruments, Watches, Jewelry	7.40	Metals (non-precious)	2.60
Total	93.00	Total	96.20

Table 9: Total Trade 2 between Switzerland and Japan (FOCBS, n.d.; SECO, 2022b)

Appendix G: Data on Total Trade 2 – Malaysia 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	555'769'422	-	1'160'637'872	-	604'868'450	-	1'716'407'294	-	0
2013	538'890'294	-3.04%	1'564'437'765	34.79%	1'025'547'471	69.55%	2'103'328'059	22.54%	1
2014	652'979'678	21.17%	1'747'903'358	11.73%	1'094'923'680	6.76%	2'400'883'036	14.15%	2
2015	621'052'204	-4.89%	1'676'672'746	-4.08%	1'055'620'542	-3.59%	2'297'724'950	-4.30%	3
2016	949'269'494	52.85%	1'495'008'014	-10.83%	545'738'520	-48.30%	2'444'277'508	6.38%	4
2017	1'505'128'955	58.56%	2'496'830'686	67.01%	991'701'731	81.72%	4'001'959'641	63.73%	5
2018	1'021'670'310	-32.12%	2'315'913'963	-7.25%	1'294'243'653	30.51%	3'337'584'273	-16.60%	6
2019	751'799'554	-26.41%	1'387'416'863	-40.09%	635'617'309	-50.89%	2'139'216'417	-35.91%	7
2020	749'481'660	-0.31%	1'172'839'988	-15.47%	423'358'328	-33.39%	1'922'321'648	-10.14%	8
Average/Regression	816'226'841	9.10%	1'668'629'028	2.12%	852'402'187	-4.30%	2'484'855'870	4.38%	

Composition of bilateral trade (2018 (prov.), Total 2)

Imports		Exports	
Traded Good	Value in %	Traded Good	Value in %
Precious metals	65.40	Precious metals	70.60
Machines	20.20	Machines	12.60
Optics/medical instruments	4.30	Pharmaceutical and Chemical Products	7.00
Pharmaceutical and Chemical Products	3.20	Precision instruments, Watches, Jewelry	3.60
Agricultural, Forestry, and Fishery products	1.70	Optics/medical instruments	2.30
Total	94.80	Total	96.10

Table 10: Total Trade 2 between Switzerland and Malaysia (FOCBS, n.d.; SECO, 2022b)

Appendix H: Data on Total Trade 2 – Mexico 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	1'377'866'975	-	1'366'679'437	-	-11'187'538	-	2'744'546'412	-	0
2013	1'831'279'386	32.91%	1'524'753'654	11.57%	-306'525'732	2639.89%	3'356'033'040	22.28%	1
2014	1'782'617'905	-2.66%	1'741'315'627	14.20%	-41'302'278	-86.53%	3'523'933'532	5.00%	2
2015	1'689'989'390	-5.20%	1'445'943'937	-16.96%	-244'045'453	490.88%	3'135'933'327	-11.01%	3
2016	968'312'483	-42.70%	1'346'515'543	-6.88%	378'203'060	-254.97%	2'314'828'026	-26.18%	4
2017	1'440'627'783	48.78%	1'367'934'569	1.59%	-72'693'214	-119.22%	2'808'562'352	21.33%	5
2018	1'264'032'695	-12.26%	1'449'901'149	5.99%	185'868'454	-355.69%	2'713'933'844	-3.37%	6
2019	933'183'952	-26.17%	1'438'972'218	-0.75%	505'788'266	172.12%	2'372'156'170	-12.59%	7
2020	1'031'218'953	10.51%	1'275'492'209	-11.36%	244'273'256	-51.70%	2'306'711'162	-2.76%	8
Average/Regression	1'368'792'169	-6.49%	1'439'723'149	-1.56%	70'930'980	608.49%	2'808'515'318	-4.04%	

Composition of bilateral trade (2020, Total 2)

Imports		Exports	
Traded Good	Value in %	Traded Good	Value in %
Precious Metals	42.50	Pharmaceutical and Chemical Products	51.40
Vehicles	17.40	Machines	19.60
Machines	13.60	Precision instruments, Watches, Jewelry	14.30
Precision instruments, Watches, Jewelry	10.10	Metals (non-precious)	7.10
Pharmaceutical and Chemical Products	7.70	Vehicles	3.20
Total	91.30	Total	95.60

Table 11: Total Trade 2 between Switzerland and Mexico (FOCBS, n.d.; SECO, 2022b)

Appendix I: Data on Total Trade 2 – New Zealand 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	83'106'926	-	257'444'049	-	174'337'123	-	340'550'975	-	0
2013	97'726'990	17.59%	226'164'508	-12.15%	128'437'518	-26.33%	323'891'498	-4.89%	1
2014	95'228'315	-2.56%	217'959'758	-3.63%	122'731'443	-4.44%	313'188'073	-3.30%	2
2015	95'426'955	0.21%	183'006'369	-16.04%	87'579'414	-28.64%	278'433'324	-11.10%	3
2016	96'724'468	1.36%	206'311'616	12.73%	109'587'148	25.13%	303'036'084	8.84%	4
2017	96'226'768	-0.51%	212'002'944	2.76%	115'776'176	5.65%	308'229'712	1.71%	5
2018	109'903'372	14.21%	220'932'303	4.21%	111'028'931	-4.10%	330'835'675	7.33%	6
2019	92'227'076	-16.08%	206'763'358	-6.41%	114'536'282	3.16%	298'990'434	-9.63%	7
2020	94'182'680	2.12%	190'883'018	-7.68%	96'700'338	-15.57%	285'065'698	-4.66%	8
Average/Regression	95'639'283	1.16%	213'496'436	-1.87%	117'857'153	-3.32%	309'135'719	-1.13%	

Composition of bilateral trade (2019, Total 2)

Imports		Exports		
Traded Good	Value in %	Traded Good		Value in %
Agricultural, Forestry, and Fishery products	65.30	Pharmaceutical and Chemical Products		48.60
Pharmaceutical and Chemical Products	14.00	Machines		16.60
Optics/medical instruments	3.50	Optics/medical instruments		10.70
Machines	3.30	Agricultural, Forestry, and Fishery products		10.10
Textiles	1.40	Precision instruments, Watches, Jewelry		5.80
Total	87.50		Total	91.80

Table 12: Total Trade 2 between Switzerland and New Zealand (FOCBS, n.d.; Ineichen, 2020)

Appendix J: Data on Total Trade 2 – Peru 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	5'101'234'692	-	162'119'307	-	-4'939'115'385	-	5'263'353'999	-	0
2013	3'137'393'944	-38.50%	181'737'377	12.10%	-2'955'656'567	-40.16%	3'319'131'321	-36.94%	1
2014	2'641'855'929	-15.79%	151'003'091	-16.91%	-2'490'852'838	-15.73%	2'792'859'020	-15.86%	2
2015	2'962'800'965	12.15%	150'920'667	-0.05%	-2'811'880'298	12.89%	3'113'721'632	11.49%	3
2016	2'937'866'231	-0.84%	163'779'931	8.52%	-2'774'086'300	-1.34%	3'101'646'162	-0.39%	4
2017	2'688'922'843	-8.47%	154'696'937	-5.55%	-2'534'225'906	-8.65%	2'843'619'780	-8.32%	5
2018	2'257'497'158	-16.04%	168'048'795	8.63%	-2'089'448'363	-17.55%	2'425'545'953	-14.70%	6
2019	2'282'767'921	1.12%	171'589'272	2.11%	-2'111'178'649	1.04%	2'454'357'193	1.19%	7
2020	1'704'481'841	-25.33%	122'749'712	-28.46%	-1'581'732'129	-25.08%	1'827'231'553	-25.55%	8
Average/Regression	2'857'202'392	-5.62%	158'516'121	-1.54%	-2'698'686'271	5.75%	3'015'718'513	-5.49%	

Composition of bilateral trade (2020, Total 1)

Imports		Exports	
Traded Good	Value in %	Traded Good	Value in %
Agricultural, Forestry, and Fishery products	90.50	Pharmaceutical and Chemical Products	54.80
Textiles	5.40	Machines	17.40
Machines	1.90	Precision instruments, Watches, Jewelry	16.70
Pharmaceutical and Chemical Products	0.90	Agricultural, Forestry, and Fishery products	5.30
Precision instruments, Watches, Jewelry	0.60	Metals (non-precious)	4.20
Total	99.30	Total	98.40

Table 13: Total Trade 2 between Switzerland and Peru (FOCBS, n.d.; SECO, 2022b)

Appendix K: Data on Total Trade 2 – People's Republic of China 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	10'377'814'158	-	9'307'091'190	-	-1'070'722'968	-	19'684'905'348	-	0
2013	11'430'578'599	10.14%	19'453'329'846	109.02%	8'022'751'247	-849.28%	30'883'908'445	56.89%	1
2014	12'172'168'034	6.49%	16'858'517'009	-13.34%	4'686'348'975	-41.59%	29'030'685'043	-6.00%	2
2015	12'392'223'590	1.81%	19'264'201'625	14.27%	6'871'978'035	46.64%	31'656'425'215	9.04%	3
2016	12'315'121'076	-0.62%	26'769'479'294	38.96%	14'454'358'218	110.34%	39'084'600'370	23.46%	4
2017	13'110'149'490	6.46%	23'964'069'711	-10.48%	10'853'920'221	-24.91%	37'074'219'201	-5.14%	5
2018	14'436'621'533	10.12%	29'586'646'568	23.46%	15'150'025'035	39.58%	44'023'268'101	18.74%	6
2019	15'050'500'615	4.25%	21'436'831'625	-27.55%	6'386'331'010	-57.85%	36'487'332'240	-17.12%	7
2020	16'580'531'790	10.17%	16'363'134'324	-23.67%	-217'397'466	-103.40%	32'943'666'114	-9.71%	8
Average/Regression	13'096'189'876	6.57%	20'333'700'132	11.52%	7'237'510'256	36.44%	33'429'890'009	8.91%	

Composition of bilateral trade (2020, Total 2)

Imports			Exports		
Traded Good		Value in %	Traded Good		Value in %
Machines		38.40	Pharmaceutical and Chemical Products		40.80
Textiles		24.10	Precision instruments, Watches, Jewelry		26.90
Pharmaceutical and Chemical Products		8.20	Machines		14.10
Precision instruments, Watches, Jewelry		7.80	Precious Metals		9.90
Various Goods		6.60	Metals (non-precious)		3.80
	Total	85.10		Total	95.50

Table 14: Total Trade 2 between Switzerland and the People's Republic of China (FOCBS, n.d.; SECO, 2022b)

Appendix L: Data on Total Trade 2 – Philippines 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	478'143'048	-	330'192'441	-	-147'950'607	-	808'335'489	-	0
2013	437'788'796	-8.44%	361'378'717	9.44%	-76'410'079	-48.35%	799'167'513	-1.13%	1
2014	390'488'810	-10.80%	333'074'510	-7.83%	-57'414'300	-24.86%	723'563'320	-9.46%	2
2015	375'695'330	-3.79%	310'779'326	-6.69%	-64'916'004	13.07%	686'474'656	-5.13%	3
2016	505'138'662	34.45%	366'739'863	18.01%	-138'398'799	113.20%	871'878'525	27.01%	4
2017	461'421'272	-8.65%	322'482'724	-12.07%	-138'938'548	0.39%	783'903'996	-10.09%	5
2018	497'901'870	7.91%	343'462'079	6.51%	-154'439'791	11.16%	841'363'949	7.33%	6
2019	592'805'317	19.06%	328'604'734	-4.33%	-264'200'583	71.07%	921'410'051	9.51%	7
2020	624'277'516	5.31%	295'132'293	-10.19%	-329'145'223	24.58%	919'409'809	-0.22%	8
Average/Regression	484'851'180	4.71%	332'427'410	-1.04%	-152'423'770	-17.53%	817'278'590	2.36%	

Composition of bilateral trade (2020, Total 2)

Imports		Exports	
Traded Good	Value in %	Traded Good	Value in %
Precious Metals	66.90	Pharmaceutical and Chemical Products	38.80
Machines	21.40	Machines	30.10
Precision instruments, Watches, Jewelry	3.40	Precision instruments, Watches, Jewelry	17.80
Textiles	2.50	Agricultural, Forestry, and Fishery products	6.20
Agricultural, Forestry, and Fishery products	2.30	Metals (non-precious)	4.70
Total	96.50	Total	97.60

Table 15: Total Trade 2 between Switzerland and the Philippines (FOCBS, n.d.; SECO, 2022b)

Appendix M: Data on Total Trade 2 – Singapore 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	2'101'579'119	-	6'574'895'965	-	4'473'316'846	-	8'676'475'084	-	0
2013	1'342'668'991	-36.11%	11'425'573'992	73.78%	10'082'905'001	125.40%	12'768'242'983	47.16%	1
2014	1'566'795'260	16.69%	8'319'425'802	-27.19%	6'752'630'542	-33.03%	9'886'221'062	-22.57%	2
2015	1'938'789'662	23.74%	7'660'920'237	-7.92%	5'722'130'575	-15.26%	9'599'709'899	-2.90%	3
2016	3'444'107'069	77.64%	6'436'023'044	-15.99%	2'991'915'975	-47.71%	9'880'130'113	2.92%	4
2017	2'428'120'097	-29.50%	7'289'657'765	13.26%	4'861'537'668	62.49%	9'717'777'862	-1.64%	5
2018	2'675'181'848	10.18%	6'682'354'407	-8.33%	4'007'172'559	-17.57%	9'357'536'255	-3.71%	6
2019	2'613'202'957	-2.32%	6'178'920'092	-7.53%	3'565'717'135	-11.02%	8'792'123'049	-6.04%	7
2020	3'831'444'913	46.62%	6'357'716'274	2.89%	2'526'271'361	-29.15%	10'189'161'187	15.89%	8
Average/Regression	2'437'987'768	10.66%	7'436'165'286	-5.13%	4'998'177'518	-12.55%	9'874'153'055	-1.31%	

Composition of bilateral trade (2020, Total 2)

Imports		Exports	
Traded Good	Value in %	Traded Good	Value in %
Pharmaceutical and Chemical Products	79.50	Pharmaceutical and Chemical Products	44.60
Precious Metals	9.30	Precious Metals	23.50
Precision instruments, Watches, Jewelry	7.80	Precision instruments, Watches, Jewelry	21.70
Machines	2.20	Machines	4.80
Metals (non-precious)	0.20	Metals (non-precious)	2.90
Total	99.00	Total	97.50

Table 16: Total Trade 2 between Switzerland and Singapore (FOCBS, n.d.; SECO, 2022b)

Appendix N: Data on Total Trade 2 – Korea (Rep.) 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	827'715'705	-	2'770'016'893	-	1'942'301'188	-	3'597'732'598	-	0
2013	657'251'601	-20.59%	2'885'346'344	4.16%	2'228'094'743	14.71%	3'542'597'945	-1.53%	1
2014	632'315'513	-3.79%	2'969'759'911	2.93%	2'337'444'398	4.91%	3'602'075'424	1.68%	2
2015	645'282'589	2.05%	2'873'551'061	-3.24%	2'228'268'472	-4.67%	3'518'833'650	-2.31%	3
2016	831'701'610	28.89%	2'901'030'671	0.96%	2'069'329'061	-7.13%	3'732'732'281	6.08%	4
2017	735'092'938	-11.62%	3'258'051'781	12.31%	2'522'958'843	21.92%	3'993'144'719	6.98%	5
2018	789'247'123	7.37%	3'516'522'882	7.93%	2'727'275'759	8.10%	4'305'770'005	7.83%	6
2019	863'598'587	9.42%	3'662'558'940	4.15%	2'798'960'353	2.63%	4'526'157'527	5.12%	7
2020	991'718'587	14.84%	2'935'542'029	-19.85%	1'943'823'442	-30.55%	3'927'260'616	-13.23%	8
Average/Regression	774'880'473	3.38%	3'085'820'057	2.69%	2'310'939'584	2.40%	3'860'700'529	2.85%	

Composition of bilateral trade (2020, Total 2)

Imports		Exports	
Traded Good	Value in %	Traded Good	Value in %
Pharmaceutical and Chemical Products	28.10	Pharmaceutical and Chemical Products	35.00
Machines	19.60	Precision instruments, Watches, Jewelry	34.20
Vehicles	17.10	Machines	15.30
Precious Metals	15.40	Metals (non-precious)	5.90
Precision instruments, Watches, Jewelry	8.10	Agricultural, Forestry, and Fishery products	3.90
Total	88.30	Total	94.30

Table 17: Total Trade 2 between Switzerland and Korea (Rep.) (FOCBS, n.d.; SECO, 2022b)

Appendix O: Data on Total Trade 2 – Taiwan 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	952'880'711	-	2'028'393'432	-	1'075'512'721	-	2'981'274'143	-	0
2013	936'888'483	-1.68%	1'940'344'043	-4.34%	1'003'455'560	-6.70%	2'877'232'526	-3.49%	1
2014	940'841'883	0.42%	1'874'306'143	-3.40%	933'464'260	-6.98%	2'815'148'026	-2.16%	2
2015	990'011'296	5.23%	1'903'421'381	1.55%	913'410'085	-2.15%	2'893'432'677	2.78%	3
2016	1'055'448'572	6.61%	1'869'005'402	-1.81%	813'556'830	-10.93%	2'924'453'974	1.07%	4
2017	1'202'181'704	13.90%	1'875'091'428	0.33%	672'909'724	-17.29%	3'077'273'132	5.23%	5
2018	1'353'812'735	12.61%	2'061'941'517	9.96%	708'128'782	5.23%	3'415'754'252	11.00%	6
2019	1'292'731'271	-4.51%	2'061'395'311	-0.03%	768'664'040	8.55%	3'354'126'582	-1.80%	7
2020	1'270'351'974	-1.73%	2'371'541'217	15.05%	1'101'189'243	43.26%	3'641'893'191	8.58%	8
Average/Regression	1'110'572'070	5.90%	1'998'382'208	1.71%	887'810'138	-2.00%	3'108'954'278	3.05%	

Composition of bilateral trade (2020, Total 2)

Imports		Exports	
Traded Good	Value in %	Traded Good	Value in %
Machines	42.70	Pharmaceutical and Chemical Products	34.10
Precision instruments, Watches, Jewelry	18.20	Precision instruments, Watches, Jewelry	26.10
Vehicles	14.50	Precious Metals	22.90
Metals (non-precious)	10.30	Machines	10.10
Pharmaceutical and Chemical Products	3.30	Metals (non-precious)	3.20
Total	89.00	Total	96.40

Table 18: Total Trade 2 between Switzerland and Taiwan (FOCBS, n.d.; SECO, 2022b)

Appendix P: Data on Total Trade 2 – Thailand 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	4'601'352'906	-	5'851'073'567	-	1'249'720'661	-	10'452'426'473	-	0
2013	1'557'854'034	-66.14%	7'469'226'086	27.66%	5'911'372'052	373.02%	9'027'080'120	-13.64%	1
2014	1'864'522'272	19.69%	2'887'065'859	-61.35%	1'022'543'587	-82.70%	4'751'588'131	-47.36%	2
2015	2'477'655'156	32.88%	2'714'243'822	-5.99%	236'588'666	-76.86%	5'191'898'978	9.27%	3
2016	4'946'806'580	99.66%	2'035'914'041	-24.99%	-2'910'892'539	-1330.36%	6'982'720'621	34.49%	4
2017	4'294'044'665	-13.20%	3'563'646'284	75.04%	-730'398'381	-74.91%	7'857'690'949	12.53%	5
2018	2'598'055'064	-39.50%	3'765'947'853	5.68%	1'167'892'789	-259.90%	6'364'002'917	-19.01%	6
2019	5'561'956'372	114.08%	2'102'103'713	-44.18%	-3'459'852'659	-396.25%	7'664'060'085	20.43%	7
2020	7'654'300'022	37.62%	1'973'732'445	-6.11%	-5'680'567'577	64.19%	9'628'032'467	25.63%	8
Average/Regression	3'950'727'452	9.96%	3'595'883'741	-8.26%	-354'843'711	-75.36%	7'546'611'193	-0.24%	

Composition of bilateral trade (2020, Total 2)

Imports		Exports	
Traded Good	Value in %	Traded Good	Value in %
Precious Metals	88.40	Precious Metals	59.80
Precision instruments, Watches, Jewelry	3.20	Pharmaceutical and Chemical Products	16.10
Machines	2.90	Precision instruments, Watches, Jewelry	10.20
Agricultural, Forestry, and Fishery products	1.90	Machines	9.00
Textiles	0.90	Metals (non-precious)	1.70
Total	97.30	Total	96.80

Table 19: Total Trade 2 between Switzerland and Thailand (FOCBS, n.d.; SECO, 2022b)

Appendix Q: Data on Total Trade 2 – Vietnam 2012-2020

Trade Total 2 (Swiss Perspective)

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	672'079'658	-	322'438'912	-	-349'640'746	-	994'518'570	-	0
2013	1'193'024'825	77.51%	1'677'638'923	420.30%	484'614'098	-238.60%	2'870'663'748	188.65%	1
2014	956'956'789	-19.79%	422'675'700	-74.81%	-534'281'089	-210.25%	1'379'632'489	-51.94%	2
2015	977'117'146	2.11%	496'004'451	17.35%	-481'112'695	-9.95%	1'473'121'597	6.78%	3
2016	1'467'954'885	50.23%	542'317'267	9.34%	-925'637'618	92.40%	2'010'272'152	36.46%	4
2017	1'422'231'575	-3.11%	617'393'363	13.84%	-804'838'212	-13.05%	2'039'624'938	1.46%	5
2018	1'473'974'074	3.64%	665'170'147	7.74%	-808'803'927	0.49%	2'139'144'221	4.88%	6
2019	2'876'900'234	95.18%	764'780'849	14.98%	-2'112'119'385	161.14%	3'641'681'083	70.24%	7
2020	2'704'196'858	-6.00%	534'966'702	-30.05%	-2'169'230'156	2.70%	3'239'163'560	-11.05%	8
Average/Regression	1'527'159'560	36.35%	671'487'368	-6.63%	-855'672'192	-75.99%	2'198'646'929	22.42%	

Composition of bilateral trade (2020, Total 2)

Imports		Exports	
Traded Good	Value in %	Traded Good	Value in %
Precision instruments, Watches, Jewelry	42.90	Pharmaceutical and Chemical Products	41.40
Textiles	24.00	Machines	38.10
Machines	16.90	Precision instruments, Watches, Jewelry	8.40
Agricultural, Forestry, and Fishery products	5.20	Agricultural, Forestry, and Fishery products	3.80
Precious Metals	3.40	Metals (non-precious)	3.40
Total	92.40	Total	95.10

Table 20: Total Trade 2 between Switzerland and Vietnam (FOCBS, n.d.; SECO, 2022b)

Appendix R: Scenario 1 – Trade Volume Relevance of Countries 2020 and 2030

Country	Trade Volume 2020	Rank 2020	Forecast Trade volume 2030	Rank 2030	Shift in rank
Australia	3'979'693'867	4	6'045'288'687	5	-1
Brunei Darussalam	977'995	11	1'548'163	11	-
Canada	5'642'691'112	3	6'558'001'346	4	-1
Chile	1'113'641'116	9	868'911'436	9	-
Japan	12'046'039'286	1	15'052'226'593	2	-1
Malaysia	1'922'321'648	7	2'931'253'381	6	+1
Mexico	2'306'711'162	6	1'517'807'746	7	-1
New Zealand	285'065'698	10	254'358'147	10	-
Peru	1'827'231'553	8	1'025'045'012	8	-
Singapore	10'189'161'187	2	8'929'739'422	3	-1
Vietnam	3'239'163'560	5	20'633'111'387	1	+4
Total	42'552'698'184		63'817'291'320		

Table 21: Scenario 1 – Trade Volume Relevance of Countries 2020 and 2030 (FOCBS, n.d.)

Appendix S: Scenario 2 – Trade Volume Relevance of Countries 2020 and 2030

Country	Trade Volume 2020	Rank 2020	Forecast Trade volume 2030	Rank 2030	Shift in rank
Australia	3'979'693'867	5	6'060'819'725	6	-1
Brunei Darussalam	977'995	12	1'899'965	12	-
Canada	5'642'691'112	4	6'564'136'137	5	-1
Chile	1'113'641'116	10	870'296'130	10	-
Japan	12'046'039'286	2	15'073'024'163	3	-1
Malaysia	1'922'321'648	8	2'938'851'590	7	+1
Mexico	2'306'711'162	7	1'521'924'690	8	-1
New Zealand	285'065'698	11	254'543'003	11	-
Peru	1'827'231'553	9	1'028'917'812	9	-
People's Republic of China	32'943'666'114	1	75'437'295'048	1	-
Singapore	10'189'161'187	3	8'937'259'008	4	-1
Vietnam	3'239'163'560	6	20'852'729'205	2	+4
Total	75'496'364'298		139'541'696'476		

Table 22: Scenario 2 – Trade Volume Relevance of Countries 2020 and 2030 (FOCBS, n.d.)

Appendix T: Scenario 3 – Trade Volume Relevance of Countries 2020 and 2030

Country	Trade Volume 2020	Rank 2020	Forecast Trade volume 2030	Rank 2030	Shift in rank
Australia	3'979'693'867	6	6'063'224'785	7	-1
Brunei Darussalam	977'995	16	1'553'200	16	-
Canada	5'642'691'112	4	6'565'085'336	6	-2
Chile	1'113'641'116	13	870'510'448	14	-1
Indonesia	3'103'605'721	9	31'864'434'142	1	+8
Japan	12'046'039'286	1	15'076'242'790	3	-2
Malaysia	1'922'321'648	11	2'940'028'225	10	+1
Mexico	2'306'711'162	10	1'522'562'267	11	-1
New Zealand	285'065'698	15	254'571'602	15	-
Peru	1'827'231'553	12	1'029'517'910	13	-1
Philippines	919'409'809	14	1'161'120'842	12	+2
Singapore	10'189'161'187	2	8'938'422'412	5	-3
South Korea	3'993'144'719	5	4'915'594'771	9	-4
Taiwan	3'641'893'191	7	9'403'445'747	4	+3
Thailand	9'628'032'467	3	5'199'342'021	8	-5
Vietnam	3'239'163'560	8	20'886'880'031	2	+6
Total	63'838'784'091		116'692'536'529		

Table 23: Scenario 3 – Trade Volume Relevance of Countries 2020 and 2030 (FOCBS, n.d.)

Appendix U: Scenario 4 – Trade Volume Relevance of Countries 2020 and 2030

Country	Trade Volume 2020	Rank 2020	Forecast Trade volume 2030	Rank 2030	Shift in rank
Australia	3'979'693'867	7	6'087'494'853	8	-1
Brunei Darussalam	977'995	17	1'560'018	17	-
Canada	5'642'691'112	5	6'574'651'916	7	-2
Chile	1'113'641'116	14	872'671'569	15	-1
Indonesia	3'103'605'721	10	32'511'853'908	2	+8
Japan	12'046'039'286	2	15'108'693'130	4	-2
Malaysia	1'922'321'648	12	2'951'902'159	11	+1
Mexico	2'306'711'162	11	1'528'996'926	12	-1
New Zealand	285'065'698	16	254'859'789	16	-
Peru	1'827'231'553	13	1'035'579'279	14	-1
People's Republic of China	32'943'666'114	1	76'079'360'156	1	-
Philippines	919'409'809	15	1'163'719'507	13	+2
Singapore	10'189'161'187	3	8'950'147'028	6	-3
South Korea	3'993'144'719	6	4'929'687'854	10	-4
Taiwan	3'641'893'191	8	9'405'655'711	5	+3
Thailand	9'628'032'467	4	5'213'300'647	9	-5
Vietnam	3'239'163'560	9	21'233'641'009	3	+6
Total	96'782'450'205		193'903'775'458		

Table 24: Scenario 4 – Trade Volume Relevance of Countries 2020 and 2030 (FOCBS, n.d.)

Appendix V: Working-Age Population Forecast 2020-2030

Country Name	2020	Rank labor pool 2020	2030	Rank labor pool 2030	Rank change labor	Relative change	Rank Relative change	Absolute change	Rank Absolute change
Indonesia	185'453'064	2	202'529'859	2	0	9.21%	4	17'076'795	1
Philippines	70'620'268	5	82'073'488	4	1	16.22%	1	11'453'220	2
Mexico	85'800'403	3	94'744'125	3	0	10.42%	2	8'943'722	3
Vietnam	67'105'172	6	69'648'332	5	1	3.79%	8	2'543'160	4
Malaysia	22'451'709	10	24'623'190	10	0	9.67%	3	2'171'481	5
Peru	21'953'512	11	23'615'068	11	0	7.57%	5	1'661'556	6
Australia	16'570'749	13	17'661'935	12	1	6.59%	6	1'091'186	7
Canada	25'150'346	9	25'543'101	9	0	1.56%	10	392'755	8
New Zealand	3'264'172	16	3'349'894	16	0	2.63%	9	85'722	9
Brunei Darussalam	315'451	17	334'150	17	0	5.93%	7	18'699	10
Singapore	4'227'243	15	3'967'057	15	0	-6.15%	14	-260'186	11
Chile	13'098'161	14	12'834'395	14	0	-2.01%	11	-263'766	12
Taiwan	16'810'243	12	15'129'623	13	-1	-10.00%	16	-1'680'619	13
Thailand	49'201'842	7	46'535'419	7	0	-5.42%	13	-2'666'423	14
Korea, Rep.	37'149'106	8	33'402'590	8	0	-10.09%	17	-3'746'516	15
Japan	74'437'254	4	69'176'409	6	-2	-7.07%	15	-5'260'845	16
China	992'164'305	1	965'705'122	1	0	-2.67%	12	-26'459'183	17
Total	1'685'773'000		1'690'873'759			0.30%		5'100'760	

Table 25: Working-Age Population Forecast 2020-2030 (The World Bank, 2022; National Development Council, 2021)

Appendix W: Scenario 1 – Forecast of Trade Volume and OC

Natural Logarithm (LN)

				Benchmark	Scenario 1	OC	Total OC	
Country	Avg. Growth rate	Add. Growth	2020	2030	2030	2030	2021-2030	Rank of volume 2030
Australia	4.25%	0.024%	3'979'693'867	6'031'474'549	6'045'288'687	13'814'138	67'388'355	5
Brunei Darussalam	4.67%	0.026%	977'995	1'544'285	1'548'163	3'878	18'707	11
Canada	1.51%	0.008%	5'642'691'112	6'552'537'153	6'558'001'346	5'464'193	28'750'681	4
Chile	-2.46%	-0.014%	1'113'641'116	867'678'794	868'911'436	1'232'642	7'318'788	9
Japan	2.24%	0.013%	12'046'039'286	15'033'709'447	15'052'226'593	18'517'146	95'417'126	2
Malaysia	4.29%	0.024%	1'922'321'648	2'924'495'259	2'931'253'381	6'758'122	32'932'964	6
Mexico	-4.12%	-0.023%	2'306'711'162	1'514'146'360	1'517'807'746	3'661'385	22'963'476	7
New Zealand	-1.14%	-0.006%	285'065'698	254'193'468	254'358'147	164'679	937'700	10
Peru	-5.65%	-0.032%	1'827'231'553	1'021'603'869	1'025'045'012	3'441'143	22'755'791	8
Singapore	-1.32%	-0.007%	10'189'161'187	8'923'041'276	8'929'739'422	6'698'147	38'351'786	3
Vietnam	20.23%	0.114%	3'239'163'560	20'439'101'645	20'633'111'387	194'009'742	672'754'393	1
		Total	42'552'698'184	63'563'526'105	63'817'291'320	253'765'215	989'589'767	

Table 26: Scenario 1 – Forecast of Trade Volume and OC LN (Based on own calculations in attached Excel)

LOG10

				Benchmark	Scenario 1	OC	Total OC	
Country	Avg. Growth rate	Add. Growth	2020	2030	2030	2030	2021-2030	Rank of volume 2030
Australia	1.84%	0.010%	3'979'693'867	4'777'446'115	4'782'307'441	4'861'326	25'332'665	5
Brunei Darussalam	2.03%	0.011%	977'995	1'195'672	1'197'009	1'337	6'931	11
Canada	0.65%	0.004%	5'642'691'112	6'022'840'627	6'025'039'861	2'199'234	11'862'366	4
Chile	-1.07%	-0.006%	1'113'641'116	1'000'012'914	1'000'620'972	608'057	3'454'939	9
Japan	0.97%	0.005%	12'046'039'286	13'270'736'868	13'277'922'576	7'185'708	38'397'595	1
Malaysia	1.86%	0.010%	1'922'321'648	2'311'565'525	2'313'939'245	2'373'720	12'363'541	6
Mexico	-1.79%	-0.010%	2'306'711'162	1'925'470'199	1'927'443'030	1'972'831	11'464'339	7
New Zealand	-0.49%	-0.003%	285'065'698	271'266'142	271'341'957	75'816	423'253	10
Peru	-2.45%	-0.014%	1'827'231'553	1'425'371'647	1'427'386'702	2'015'055	11'959'838	8
Singapore	-0.57%	-0.003%	10'189'161'187	9'620'681'879	9'623'794'162	3'112'284	17'415'798	2
Vietnam	8.78%	0.049%	3'239'163'560	7'518'068'755	7'552'245'190	34'176'434	148'934'405	3
		Total	42'552'698'184	48'144'656'344	48'203'238'145	58'581'802	281'615'671	

Table 27: Scenario 1 – Forecast of Trade Volume and OC Log 10 (Based on own calculations in attached Excel)

Linear Regression (LR)

				Benchmark	Scenario 1	OC	Total OC	
Country	**Avg. Growth rate**	**Add. Growth**	**2020**	**2030**	**2030**	**2030**	**2021-2030**	**Rank of volume 2030**
Australia	4.34%	0.024%	3'979'693'867	6'084'572'679	6'098'796'313	14'223'634	69'218'174	5
Brunei Darussalam	4.79%	0.027%	977'995	1'560'733	1'564'742	4'009	19'279	11
Canada	1.52%	0.009%	5'642'691'112	6'559'899'590	6'565'410'722	5'511'132	28'988'156	4
Chile	-2.43%	-0.014%	1'113'641'116	870'362'743	871'583'698	1'220'954	7'242'362	9
Japan	2.27%	0.013%	12'046'039'286	15'070'928'520	15'089'696'478	18'767'959	96'640'794	2
Malaysia	4.38%	0.025%	1'922'321'648	2'950'719'502	2'957'680'365	6'960'863	33'837'458	6
Mexico	-4.04%	-0.023%	2'306'711'162	1'527'434'618	1'531'049'798	3'615'180	22'609'456	7
New Zealand	-1.13%	-0.006%	285'065'698	254'359'874	254'523'714	163'840	932'737	10
Peru	-5.49%	-0.031%	1'827'231'553	1'038'683'310	1'042'079'220	3'395'910	22'332'443	8
Singapore	-1.31%	-0.007%	10'189'161'187	8'930'865'040	8'937'524'471	6'659'431	38'119'850	3
Vietnam	22.42%	0.126%	3'239'163'560	24'484'482'683	24'737'550'165	253'067'482	846'179'644	1
		Total	42'552'698'184	67'773'869'292	68'087'459'686	313'590'394	**1'166'120'354**	

Table 28: Scenario 1 – Forecast of Trade Volume and OC LR (Based on own calculations in attached Excel)

Appendix X: Scenario 2 – Forecast of Trade Volume and OC

Natural Logarithm (LN)

Country	Avg. Growth rate	Add. Growth	2020	Benchmark 2030	Scenario 2 2030	OC 2030	Total OC 2021-2030	Rank of volume 2030
Australia	4.25%	0.051%	3'979'693'867	6'031'474'549	6'060'819'725	29'345'176	143'101'450	6
Brunei Darussalam	4.67%	0.056%	1'196'861	1'889'881	1'899'965	10'084	48'619	12
Canada	1.51%	0.018%	5'642'691'112	6'552'537'153	6'564'136'137	11'598'984	61'021'510	5
Chile	-2.46%	-0.029%	1'113'641'116	867'678'794	870'296'130	2'617'336	15'536'480	10
Japan	2.24%	0.027%	12'046'039'286	15'033'709'447	15'073'024'163	39'314'716	202'544'929	3
Malaysia	4.29%	0.051%	1'922'321'648	2'924'495'259	2'938'851'590	14'356'331	69'934'784	7
Mexico	-4.12%	-0.049%	2'306'711'162	1'514'146'360	1'521'924'690	7'778'329	48'762'580	8
New Zealand	-1.14%	-0.014%	285'065'698	254'193'468	254'543'003	349'535	1'990'071	11
Peru	-5.65%	-0.067%	1'827'231'553	1'021'603'869	1'028'917'812	7'313'943	48'335'392	9
People's Republic of China	8.54%	0.102%	32'943'666'114	74'733'690'591	75'437'295'048	703'604'457	3'082'075'431	1
Singapore	-1.32%	-0.016%	10'189'161'187	8'923'041'276	8'937'259'008	14'217'732	81'396'358	4
Vietnam	20.23%	0.241%	3'239'163'560	20'439'101'645	20'852'729'205	413'627'560	1'432'748'058	2
		Total	75'496'583'164	138'297'562'292	139'541'696'476	1'244'134'184	5'187'495'663	

Table 29: Scenario 2 – Forecast of Trade Volume and OC LN (Based on own calculations in Excel: Total Trade 2 dev. CH)

LOG10

Country	Avg. Growth rate	Add. Growth	2020	Benchmark 2030	Scenario 2 2030	OC 2030	Total OC 2021-2030	Rank of volume 2030
Australia	1.84%	0.022%	3'979'693'867	4'777'446'115	4'787'766'334	10'320'219	53'770'417	6
Brunei Darussalam	2.03%	0.024%	1'196'861	1'463'252	1'466'726	3'474	18'004	12
Canada	0.65%	0.008%	5'642'691'112	6'022'840'627	6'027'507'894	4'667'267	25'173'071	5
Chile	-1.07%	-0.013%	1'113'641'116	1'000'012'914	1'001'303'507	1'290'592	7'332'287	10
Japan	0.97%	0.012%	12'046'039'286	13'270'736'868	13'285'987'906	15'251'038	81'488'265	2
Malaysia	1.86%	0.022%	1'922'321'648	2'311'565'525	2'316'604'773	5'039'248	26'242'596	7
Mexico	-1.79%	-0.021%	2'306'711'162	1'925'470'199	1'929'658'381	4'188'182	24'333'645	8
New Zealand	-0.49%	-0.006%	285'065'698	271'266'142	271'427'033	160'891	898'155	11
Peru	-2.45%	-0.029%	1'827'231'553	1'425'371'647	1'429'650'307	4'278'660	25'388'544	9
People's Republic of China	3.71%	0.044%	32'943'666'114	47'409'056'024	47'611'461'974	202'405'950	1'001'377'005	1
Singapore	-0.57%	-0.007%	10'189'161'187	9'620'681'879	9'627'286'703	6'604'824	36'957'411	3
Vietnam	8.78%	0.105%	3'239'163'560	7'518'068'755	7'590'751'801	72'683'046	316'535'260	4
		Total	75'496'583'164	95'553'979'948	95'880'873'339	326'893'391	1'599'514'660	

Table 30: Scenario 2 – Forecast of Trade Volume and OC Log 10 (Based on own calculations in Excel: Total Trade 2 dev. CH)

Linear Regression (LR)

				Benchmark	Scenario 2	OC	Total OC	
Country	**Avg. Growth rate**	**Add. Growth**	**2020**	**2030**	**2030**	**2030**	**2021-2030**	**Rank of volume 2030**
Australia	4.34%	0.052%	3'979'693'867	6'084'572'679	6'114'788'463	30'215'784	146'989'660	6
Brunei Darussalam	4.79%	0.057%	1'196'861	1'910'010	1'920'433	10'423	50'107	12
Canada	1.52%	0.018%	5'642'691'112	6'559'899'590	6'571'598'249	11'698'659	61'525'667	5
Chile	-2.43%	-0.029%	1'113'641'116	870'362'743	872'955'239	2'592'496	15'374'152	10
Japan	2.27%	0.027%	12'046'039'286	15'070'928'520	15'110'776'023	39'847'503	205'143'427	3
Malaysia	4.38%	0.052%	1'922'321'648	2'950'719'502	2'965'506'875	14'787'373	71'856'781	7
Mexico	-4.04%	-0.048%	2'306'711'162	1'527'434'618	1'535'114'590	7'679'972	48'010'068	8
New Zealand	-1.13%	-0.014%	285'065'698	254'359'874	254'707'629	347'755	1'979'537	11
Peru	-5.49%	-0.065%	1'827'231'553	1'038'683'310	1'045'900'754	7'217'444	47'434'774	9
People's Republic of China	8.91%	0.106%	32'943'666'114	77'355'754'111	78'113'544'317	757'790'206	3'290'475'488	1
Singapore	-1.31%	-0.016%	10'189'161'187	8'930'865'040	8'945'000'558	14'135'518	80'903'974	4
Vietnam	22.42%	0.267%	3'239'163'560	24'484'482'683	25'024'249'386	539'766'703	1'802'755'425	2
		Total	75'496'583'164	145'129'972'680	146'556'062'515	1'426'089'835	**5'772'499'060**	

Table 31: Scenario 2 – Forecast of Trade Volume and OC LR (Based on own calculations in Excel: Total Trade 2 dev. CH)

Appendix Y: Scenario 3 – Forecast of Trade Volume and OC

Natural Logarithm (LN)

				Benchmark	Scenario 3	OC	Total OC	
Country	Avg. Growth rate	Add. Growth	2020	2030	2030	2030	2021-2030	Rank of volume 2030
Australia	4.25%	0.055%	3'979'693'867	6'031'474'549	6'063'224'785	31'750'236	154'821'225	7
Brunei Darussalam	4.67%	0.060%	977'995	1'544'285	1'553'200	8'915	42'983	16
Canada	1.51%	0.019%	5'642'691'112	6'552'537'153	6'565'085'336	12'548'183	66'013'796	6
Chile	-2.46%	-0.032%	1'113'641'116	867'678'794	870'510'448	2'831'655	16'808'019	14
Indonesia	25.89%	0.334%	3'103'605'721	31'031'584'089	31'864'434'142	832'850'053	2'635'420'687	1
Japan	2.24%	0.029%	12'046'039'286	15'033'709'447	15'076'242'790	42'533'343	219'120'217	3
Malaysia	4.29%	0.055%	1'922'321'648	2'924'495'259	2'940'028'225	15'532'967	75'662'415	10
Mexico	-4.12%	-0.053%	2'306'711'162	1'514'146'360	1'522'562'267	8'415'906	52'755'966	11
New Zealand	-1.14%	-0.015%	285'065'698	254'193'468	254'571'602	378'134	2'152'859	15
Peru	-5.65%	-0.073%	1'827'231'553	1'021'603'869	1'029'517'910	7'914'041	52'296'108	13
Philippines	2.33%	0.030%	919'409'809	1'157'715'019	1'161'120'842	3'405'823	17'500'835	12
Singapore	-1.32%	-0.017%	10'189'161'187	8'923'041'276	8'938'422'412	15'381'136	88'055'066	5
Taiwan	3.01%	0.039%	3'641'893'191	4'897'136'378	4'915'594'771	18'458'393	93'082'433	9
Thailand	-0.24%	-0.003%	9'628'032'467	9'400'543'318	9'403'445'747	2'902'428	16'077'807	4
South Korea	2.81%	0.036%	3'927'260'616	5'181'056'269	5'199'342'021	18'285'752	92'714'325	8
Vietnam	20.23%	0.261%	3'239'163'560	20'439'101'645	20'886'880'031	447'778'386	1'550'780'626	2
		Total	63'772'899'988	115'231'561'178	116'692'536'529	1'460'975'352	5'133'305'367	

Table 32: Scenario 3 – Forecast of Trade Volume and OC LN (Based on own calculations in Excel: Total Trade 2 dev. CH)

LOG10

				Benchmark	Scenario 3	OC	Total OC	
Country	Avg. Growth rate	Add. Growth	2020	2030	2030	2030	2021-2030	Rank of volume 2030
Australia	1.84%	0.024%	3'979'693'867	4'777'446'115	4'788'611'046	11'164'931	58'170'051	7
Brunei Darussalam	2.03%	0.026%	977'995	1'195'672	1'198'743	3'071	15'916	16
Canada	0.65%	0.008%	5'642'691'112	6'022'840'627	6'027'889'653	5'049'026	27'231'850	6
Chile	-1.07%	-0.014%	1'113'641'116	1'000'012'914	1'001'409'097	1'396'183	7'932'054	14
Indonesia	11.24%	0.145%	3'103'605'721	9'008'247'380	9'126'351'187	118'103'807	486'549'752	4
Japan	0.97%	0.013%	12'046'039'286	13'270'736'868	13'287'235'594	16'498'726	88'153'602	1
Malaysia	1.86%	0.024%	1'922'321'648	2'311'565'525	2'317'017'241	5'451'716	28'389'848	10
Mexico	-1.79%	-0.023%	2'306'711'162	1'925'470'199	1'930'001'187	4'530'988	26'324'645	11
New Zealand	-0.49%	-0.006%	285'065'698	271'266'142	271'440'191	174'050	971'606	15
Peru	-2.45%	-0.032%	1'827'231'553	1'425'371'647	1'430'000'659	4'629'012	27'466'389	12
Philippines	1.01%	0.013%	919'409'809	1'016'862'952	1'018'178'115	1'315'163	7'018'838	13
Singapore	-0.57%	-0.007%	10'189'161'187	9'620'681'879	9'627'826'922	7'145'043	39'979'876	2
Taiwan	1.31%	0.017%	3'641'893'191	4'146'221'195	4'153'115'758	6'894'562	36'482'464	9
Thailand	-0.10%	-0.001%	9'628'032'467	9'528'633'554	9'529'909'410	1'275'856	7'038'968	3
South Korea	1.22%	0.016%	3'927'260'616	4'433'613'080	4'440'509'405	6'896'325	36'582'356	8
Vietnam	8.78%	0.113%	3'239'163'560	7'518'068'755	7'596'722'553	78'653'798	342'503'862	5
		Total	63'772'899'988	76'278'234'505	76'547'416'761	269'182'256	1'220'812'077	

Table 33: Scenario 3 – Forecast of Trade Volume and OC Log 10 (Based on own calculations in Excel: Total Trade 2 dev. CH)

Linear Regression (LR)

				Benchmark	Scenario 3	OC	Total OC	
Country	**Avg. Growth rate**	**Add. Growth**	**2020**	**2030**	**2030**	**2030**	**2021-2030**	**Rank of volume 2030**
Australia	4.34%	0.056%	3'979'693'867	6'084'572'679	6'117'264'996	32'692'317	159'028'295	7
Brunei Darussalam	4.79%	0.062%	977'995	1'560'733	1'569'948	9'215	44'298	16
Canada	1.52%	0.020%	5'642'691'112	6'559'899'590	6'572'555'612	12'656'021	66'559'222	6
Chile	-2.43%	-0.031%	1'113'641'116	870'362'743	873'167'520	2'804'776	16'632'392	14
Indonesia	29.55%	0.381%	3'103'605'721	41'332'008'869	42'563'982'481	1'231'973'612	3'700'919'516	1
Japan	2.27%	0.029%	12'046'039'286	15'070'928'520	15'114'038'315	43'109'795	221'931'527	3
Malaysia	4.38%	0.056%	1'922'321'648	2'950'719'502	2'966'718'899	15'999'397	77'742'034	10
Mexico	-4.04%	-0.052%	2'306'711'162	1'527'434'618	1'535'744'071	8'309'453	51'941'700	11
New Zealand	-1.13%	-0.015%	285'065'698	254'359'874	254'736'082	376'207	2'141'463	15
Peru	-5.49%	-0.071%	1'827'231'553	1'038'683'310	1'046'492'874	7'809'564	51'321'458	13
Philippines	2.36%	0.030%	919'409'809	1'160'817'653	1'164'271'852	3'454'199	17'735'737	12
Singapore	-1.31%	-0.017%	10'189'161'187	8'930'865'040	8'946'157'229	15'292'188	87'522'380	5
Taiwan	3.05%	0.039%	3'641'893'191	4'918'872'727	4'937'686'636	18'813'909	94'755'922	9
Thailand	-0.24%	-0.003%	9'628'032'467	9'400'811'849	9'403'710'888	2'899'039	16'058'896	4
South Korea	2.85%	0.037%	3'927'260'616	5'201'166'592	5'219'776'806	18'610'214	94'255'223	8
Vietnam	22.42%	0.289%	3'239'163'560	24'484'482'683	25'068'853'078	584'370'394	1'951'381'870	2
		Total	63'772'899'988	129'787'546'981	131'786'727'284	1'999'180'303	**6'609'971'935**	

Table 34: Scenario 3 – Forecast of Trade Volume and OC LR (Based on own calculations in Excel: Total Trade 2 dev. CH)

Appendix Z: Scenario 4 – Forecast of Trade Volume and OC

Natural Logarithm (LN)

				Benchmark	Scenario 4	OC	Total OC	
Country	Avg. Growth rate	Add. Growth	2020	2030	2030	2030	2021-2030	Rank of volume 2030
Australia	4.25%	0.096%	3'979'693'867	6'031'474'549	6'087'494'853	56'020'304	273'016'876	8
Brunei Darussalam	4.67%	0.106%	977'995	1'544'285	1'560'018	15'733	75'807	17
Canada	1.51%	0.034%	5'642'691'112	6'552'537'153	6'574'651'916	22'114'763	116'317'237	7
Chile	-2.46%	-0.056%	1'113'641'116	867'678'794	872'671'569	4'992'775	29'624'322	15
Indonesia	25.89%	0.588%	3'103'605'721	31'031'584'089	32'511'853'908	1'480'269'819	4'675'253'272	2
Japan	2.24%	0.051%	12'046'039'286	15'033'709'447	15'108'693'130	74'983'683	386'176'338	4
Malaysia	4.29%	0.097%	1'922'321'648	2'924'495'259	2'951'902'159	27'406'900	133'427'159	11
Mexico	-4.12%	-0.094%	2'306'711'162	1'514'146'360	1'528'996'926	14'850'566	93'028'243	12
New Zealand	-1.14%	-0.026%	285'065'698	254'193'468	254'859'789	666'321	3'792'959	16
Peru	-5.65%	-0.128%	1'827'231'553	1'021'603'869	1'035'579'279	13'975'410	92'258'489	14
People's Republic of China	8.54%	0.194%	32'943'666'114	74'733'690'591	76'079'360'156	1'345'669'565	5'888'232'973	1
Philippines	2.33%	0.053%	919'409'809	1'157'715'019	1'163'719'507	6'004'489	30'844'208	13
Singapore	-1.32%	-0.030%	10'189'161'187	8'923'041'276	8'950'147'028	27'105'752	155'145'675	6
Taiwan	3.01%	0.068%	3'641'893'191	4'897'136'378	4'929'687'854	32'551'476	164'084'924	10
Thailand	-0.24%	-0.005%	9'628'032'467	9'400'543'318	9'405'655'711	5'112'392	28'318'752	5
South Korea	2.81%	0.064%	3'927'260'616	5'181'056'269	5'213'300'647	32'244'378	163'426'596	9
Vietnam	20.23%	0.459%	3'239'163'560	20'439'101'645	21'233'641'009	794'539'364	2'747'045'545	3
		Total	96'716'566'102	189'965'251'769	193'903'775'458	3'938'523'690	14'980'069'376	

Table 35: Scenario 4 – Forecast of Trade Volume and OC LN (Based on own calculations in Excel: Total Trade 2 dev. CH)

LOG10

				Benchmark	Scenario 4	OC	Total OC	
Country	**Avg. Growth rate**	**Add. Growth**	**2020**	**2030**	**2030**	**2030**	**2021-2030**	**Rank of volume 2030**
Australia	1.84%	0.042%	3'979'693'867	4'777'446'115	4'797'125'894	19'679'779	102'506'637	8
Brunei Darussalam	2.03%	0.046%	977'995	1'195'672	1'201'086	5'414	28'048	17
Canada	0.65%	0.015%	5'642'691'112	6'022'840'627	6'031'735'691	8'895'064	47'970'865	7
Chile	-1.07%	-0.024%	1'113'641'116	1'000'012'914	1'002'473'093	2'460'179	13'974'598	15
Indonesia	11.24%	0.255%	3'103'605'721	9'008'247'380	9'217'187'861	208'940'482	859'737'421	5
Japan	0.97%	0.022%	12'046'039'286	13'270'736'868	13'299'807'336	29'070'468	155'303'502	2
Malaysia	1.86%	0.042%	1'922'321'648	2'311'565'525	2'321'175'019	9'609'494	50'028'537	11
Mexico	-1.79%	-0.041%	2'306'711'162	1'925'470'199	1'933'456'754	7'986'555	46'388'275	12
New Zealand	-0.49%	-0.011%	285'065'698	271'266'142	271'572'751	306'609	1'711'475	16
Peru	-2.45%	-0.056%	1'827'231'553	1'425'371'647	1'433'533'480	8'161'832	48'409'652	13
People's Republic of China	3.71%	0.084%	32'943'666'114	47'409'056'024	47'795'357'975	386'301'951	1'910'150'980	1
Philippines	1.01%	0.023%	919'409'809	1'016'862'952	1'019'180'286	2'317'333	12'365'494	14
Singapore	-0.57%	-0.013%	10'189'161'187	9'620'681'879	9'633'269'163	12'587'285	70'425'738	3
Taiwan	1.31%	0.030%	3'641'893'191	4'146'221'195	4'158'371'039	12'149'844	64'278'815	10
Thailand	-0.10%	-0.002%	9'628'032'467	9'528'633'554	9'530'880'736	2'247'182	12'397'639	4
South Korea	1.22%	0.028%	3'927'260'616	4'433'613'080	4'445'765'583	12'152'503	64'453'197	9
Vietnam	8.78%	0.200%	3'239'163'560	7'518'068'755	7'657'092'005	139'023'250	604'780'842	6
		Total	96'716'566'102	123'687'290'530	124'549'185'752	861'895'223	**4'064'911'714**	

Table 36: Scenario 4 – Forecast of Trade Volume and OC Log 10 (Based on own calculations in Excel: Total Trade 2 dev. CH)

Linear Regression (LR)

				Benchmark	Scenario 4	OC	Total OC	
Country	**Avg. Growth rate**	**Add. Growth**	**2020**	**2030**	**2030**	**2030**	**2021-2030**	**Rank of volume 2030**
Australia	4.34%	0.098%	3'979'693'867	6'084'572'679	6'142'257'341	57'684'662	280'443'276	8
Brunei Darussalam	4.79%	0.109%	1'196'861	1'910'010	1'929'912	19'902	95'614	17
Canada	1.52%	0.034%	5'642'691'112	6'559'899'590	6'582'204'516	22'304'926	117'278'678	7
Chile	-2.43%	-0.055%	1'113'641'116	870'362'743	875'308'057	4'945'314	29'314'518	15
Indonesia	29.55%	0.671%	3'103'605'721	41'332'008'869	43'523'848'594	2'191'839'725	6'571'442'029	2
Japan	2.27%	0.051%	12'046'039'286	15'070'928'520	15'146'929'264	76'000'745	391'133'886	4
Malaysia	4.38%	0.099%	1'922'321'648	2'950'719'502	2'978'950'456	28'230'954	137'098'212	11
Mexico	-4.04%	-0.092%	2'306'711'162	1'527'434'618	1'542'096'747	14'662'130	91'590'142	12
New Zealand	-1.13%	-0.026%	285'065'698	254'359'874	255'022'799	662'924	3'772'874	16
Peru	-5.49%	-0.125%	1'827'231'553	1'038'683'310	1'052'473'152	13'789'843	90'534'922	14
People's Republic of China	8.91%	0.202%	32'943'666'114	77'355'754'111	78'805'279'669	1'449'525'558	6'287'123'560	1
Philippines	2.36%	0.054%	919'409'809	1'160'817'653	1'166'907'499	6'089'846	31'258'461	13
Singapore	-1.31%	-0.030%	10'189'161'187	8'930'865'040	8'957'813'936	26'948'896	154'206'735	6
Taiwan	3.05%	0.069%	3'641'893'191	4'918'872'727	4'952'051'787	33'179'061	167'037'178	10
Thailand	-0.24%	-0.005%	9'628'032'467	9'400'811'849	9'405'918'271	5'106'422	28'285'440	5
South Korea	2.85%	0.065%	3'927'260'616	5'201'166'592	5'233'983'660	32'817'068	166'144'667	9
Vietnam	22.42%	0.509%	3'239'163'560	24'484'482'683	25'522'076'897	1'037'594'214	3'458'669'614	3
		Total	96'716'784'968	207'143'650'370	212'145'052'559	5'001'402'189	**18'005'429'806**	

Table 37: Scenario 4 – Forecast of Trade Volume and OC LR (Based on own calculations in Excel: Total Trade 2 dev. CH)

Appendix AA: Scenario 1 – Impact on Swiss Industries 2021-2030

Industry	OC of Exports	OC of Imports	Net Exports/Imports
Pharmaceutical and Chemical Products	128'172'040	29'086'089	99'085'951
Metals (non-precious)	8'369'977	28'843	8'341'134
Optics/medical instruments	529'322	562'964	-33'642
Vehicles	800'810	7'395'911	-6'595'101
Agricultural, Forestry, and Fishery products	11'318'388	50'267'147	-38'948'759
Various Goods	13'701'863	53'796'285	-40'094'423
Machines	58'111'146	105'404'962	-47'293'816
Precious Metals	19'809'240	76'180'454	-56'371'214
Textiles	0	135'945'423	-135'945'423
Precision instruments, Watches, Jewelry	43'126'842	246'982'061	-203'855'219
Total	**283'939'627**	**705'650'140**	**-421'710'513**

Table 38: Scenario 1 – Impact on Swiss Industries 2021-2030 – All Countries (Based on own calculations in Excel: Winners & Losers Results)

Industry	OC of Exports	OC of Imports	Net Exports/Imports
Pharmaceutical and Chemical Products	82'172'789	29'086'089	53'086'700
Precision instruments, Watches, Jewelry	33'793'661	6'036'317	27'757'344
Machines	15'778'502	10'486'941	5'291'561
Metals (non-precious)	4'592'261	28'843	4'563'418
Optics/medical instruments	529'322	562'964	-33'642
Textiles	0	1'150'601	-1'150'601
Various Goods	8'257'507	11'111'259	-2'853'752
Vehicles	800'810	7'395'911	-6'595'101
Agricultural, Forestry, and Fishery products	7'096'235	21'061'603	-13'965'368
Precious Metals	19'809'240	57'084'521	-37'275'281
Total	**172'830'326**	**144'005'048**	**28'825'278**

Table 39: Scenario 1 – Impact on Swiss Industries 2021-2030 – Without Vietnam (Based on own calculations in Excel: Winners & Losers Results)

Appendix BB: Scenario 2 – Impact on Swiss Industries 2021-2030

Industry	OC of Exports	OC of Imports	Net Exports/Imports
Pharmaceutical and Chemical Products	897'002'146	188'938'441	708'063'705
Metals (non-precious)	75'968'061	61'215	75'906'846
Precious Metals	193'615'185	161'875'658	31'739'526
Optics/medical instruments	1'123'958	1'195'469	-71'511
Vehicles	1'700'093	15'700'471	-14'000'377
Agricultural, Forestry, and Fishery products	24'057'353	106'933'346	-82'875'994
Precision instruments, Watches, Jewelry	503'420'863	646'944'725	-143'523'862
Various Goods	98'023'386	448'001'340	-349'977'954
Machines	339'507'289	820'072'642	-480'565'353
Textiles	0	663'354'024	-663'354'024
Total	**2'134'418'333**	**3'053'077'330**	**-918'658'997**

Table 40: Scenario 2 – Impact on Swiss Industries 2021-2030 – All Countries (Based on own calculations in Excel: Winners & Losers Results)

Industry	OC of Exports	OC of Imports	Net Exports/Imports
Pharmaceutical and Chemical Products	174'444'434	61'739'456	112'704'978
Precision instruments, Watches, Jewelry	71'740'648	12'814'496	58'926'152
Machines	33'500'095	22'264'592	11'235'503
Metals (non-precious)	9'749'759	61'215	9'688'544
Optics/medical instruments	1'123'958	1'195'469	-71'511
Textiles	0	2'443'974	-2'443'974
Various Goods	17'539'605	23'586'582	-6'046'977
Vehicles	1'700'093	15'700'471	-14'000'377
Agricultural, Forestry, and Fishery products	15'065'539	44'735'034	-29'669'495
Precious Metals	42'059'222	121'207'531	-79'148'309
Total	**366'923'354**	**305'748'821**	**61'174'533**

Table 41: Scenario 2 – Impact on Swiss Industries 2021-2030 – Without the People's Republic of China (Based on own calculations in Excel: Winners & Losers Results)

Appendix CC: Scenario 3 – Impact on Swiss Industries 2021-2030

Industry	OC of Exports	OC of Imports	Net Exports/Imports
Pharmaceutical and Chemical Products	521'431'307	74'441'839	446'989'468
Metals (non-precious)	64'967'862	3'410'497	61'557'366
Optics/medical instruments	1'215'995	1'293'375	-77'380
Various Goods	1'839'252	25'696'953	-23'857'700
Machines	239'729'265	323'979'683	-84'250'418
Agricultural, Forestry, and Fishery products	59'980'551	191'452'335	-131'471'785
Vehicles	68'363'438	310'167'354	-241'803'916
Precision instruments, Watches, Jewelry	196'278'058	577'891'307	-381'613'249
Textiles	0	614'628'411	-614'628'411
Precious Metals	61'354'253	1'795'183'632	-1'733'829'379
Total	**1'215'159'981**	**3'918'145'386**	**-2'702'985'405**

Table 42: Scenario 3 – Impact on Swiss Industries 2021-2030 - All Countries (Based on own calculations in Excel: Winners & Losers Results)

Industry	OC of Exports	OC of Imports	Net Exports/Imports
Pharmaceutical and Chemical Products	236'357'727	74'441'839	161'915'887
Precision instruments, Watches, Jewelry	118'470'129	22'482'087	95'988'042
Metals (non-precious)	16'896'425	3'410'497	13'485'929
Machines	54'955'458	45'453'821	9'501'637
Optics/medical instruments	1'215'995	1'293'375	-77'380
Textiles	0	3'056'351	-3'056'351
Vehicles	25'338'690	32'588'305	-7'249'615
Various Goods	1'839'252	25'696'953	-23'857'700
Agricultural, Forestry, and Fishery products	19'349'867	48'916'602	-29'566'735
Precious Metals	61'354'253	153'986'429	-92'632'176
Total	**535'777'796**	**411'326'258**	**124'451'538**

Table 43: Scenario 3 – Impact on Swiss Industries 2021-2030 – Without Indonesia and Vietnam (Based on own calculations in Excel: Winners & Losers Results)

Appendix DD: Scenario 4 – Impact on Swiss Industries 2021-2030

Industry	OC of Exports	OC of Imports	Net Exports/Imports
Pharmaceutical and Chemical Products	2'089'813'514	372'685'467	1'717'128'046
Metals (non-precious)	223'850'176	1'134'118	222'716'059
Optics/medical instruments	2'144'099	2'280'766	-136'666
Various Goods	3'242'054	38'455'611	-35'213'558
Precision instruments, Watches, Jewelry	1'113'456'696	1'249'465'188	-136'008'493
Agricultural, Forestry, and Fishery products	106'182'151	341'014'504	-234'832'353
Machines	830'432'963	1'694'587'444	-864'154'481
Vehicles	250'302'268	1'184'478'041	-934'175'772
Textiles	0	1'804'693'498	-1'804'693'498
Precious Metals	394'023'485	3'277'827'334	-2'883'803'849
Total	**5'013'447'405**	**9'966'621'971**	**-4'953'174'566**

Table 44: Scenario 4 – Impact on Swiss Industries 2021-2030 – All Countries (Based on own calculations in Excel: Winners & Losers Results)

Industry	OC of Exports	OC of Imports	Net Exports/Imports
Pharmaceutical and Chemical Products	391'095'283	129'674'785	261'420'498
Precision instruments, Watches, Jewelry	188'740'015	34'459'392	154'280'623
Machines	90'516'820	63'050'831	27'465'989
Metals (non-precious)	27'455'729	1'134'118	26'321'611
Optics/medical instruments	2'144'099	2'280'766	-136'666
Textiles	0	6'357'723	-6'357'723
Vehicles	42'397'896	55'145'784	-12'747'888
Various Goods	3'242'054	38'455'611	-35'213'558
Agricultural, Forestry, and Fishery products	34'128'468	88'330'981	-54'202'513
Precious Metals	104'479'366	366'447'864	-261'968'498
Total	**884'199'730**	**785'337'855**	**98'861'875**

Table 45: Scenario 4 – Impact on Swiss Industries 2021-2030 – Without Indonesia, the People's Republic of China, and Vietnam (Based on own calculations in Excel: Winners & Losers Results)

Appendix EE: Scenario 1 – Ratio of OC to Total Trade 2 Switzerland

	Imports		Exports		Net Exports/Imports		Total trade		
	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Value (CHF)	Change in %	Lin. Regression Slope
2012	277'543'670'513	-	292'958'202'718	-	15'414'532'205	-	570'501'873'231	-	0
2013	298'394'295'613	7.51%	332'137'247'227	13.37%	33'742'951'614	118.90%	630'531'542'840	10.52%	1
2014	252'504'857'611	-15.38%	285'178'883'379	-14.14%	32'674'025'768	-3.17%	537'683'740'990	-14.73%	2
2015	243'771'931'917	-3.46%	279'154'845'287	-2.11%	35'382'913'370	8.29%	522'926'777'204	-2.74%	3
2016	266'137'159'877	9.17%	298'408'001'181	6.90%	32'270'841'304	-8.80%	564'545'161'058	7.96%	4
2017	265'571'542'294	-0.21%	294'893'856'892	-1.18%	29'322'314'598	-9.14%	560'465'399'186	-0.72%	5
2018	273'389'090'124	2.94%	303'885'759'540	3.05%	30'496'669'416	4.00%	577'274'849'664	3.00%	6
2019	276'058'116'020	0.98%	311'976'706'436	2.66%	35'918'590'416	17.78%	588'034'822'456	1.86%	7
2020	273'766'959'560	-0.83%	299'461'579'904	-4.01%	25'694'620'344	-28.46%	573'228'539'464	-2.52%	8
Average	269'681'958'170	-0.11%	299'783'898'063	0.11%	30'101'939'893	4.03%	569'465'856'233	0.000401%	

Table 46: Total Trade 2 Switzerland between 2012 and 2020 (FOCBS, n.d.)

Scenario 1: Ratio of CPTPP OC and Trade volume to Switzerlands Total trade LN

Total Trade Switzerland (TTS) 2020	Forecast Total Trade CPTPP- Switzerland 2030	Ratio of TTS	OC 2020-2030	Ratio of TTS	OC 2030	Ratio of TTS
573'228'539'464	63'817'291'320	11.133%	989'589'767	0.173%	253'765'215	0.044%

Table 47: Scenario 1 – Ratio of OC to Total Trade 2 Switzerland (Based on own calculations in Excel: Trade Volume Relevance 2020)