Switzerland's gains from trade with Europe

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In this paper I look at the size of Switzerland's gains from trade through the lens of the workhorse model of modern trade theory. The model finds that most of Switzerland's gains from trade originate from the EU and that realistic changes in the degree of trade integration with EU countries may have non-trivial – but at same time not excessively large – effects on Swiss per-capita incomes. The model also suggests that further trade integration with third countries, such as China and India, tends to increase Swiss welfare, but is unlikely to be able to compensate for possible losses stemming from deteriorating trade relations with European countries.

JEL codes: F10, F11, F14
Key words: gains from trade, Switzerland, Europe, development accounting

1 Introduction

Switzerland is a very open country. In 2015, total exports made up 63% of the country's GDP, while imports ran at 51% of GDP. For comparison, the OECD median shares were 45% and 40%, respectively, and the US shares were 13% and 17%. Given these numbers, it is natural to ask how important a contributor international trade is to Swiss welfare. In a previous paper (Hepenstrick, 2016), I attempted to answer this question using one of the standard models of modern trade theory. In the present paper, I extend the results with a particular focus on trade with European countries. This focus on Europe is warranted by the fact that Europe is by far Switzerland's most important trading partner; in 2015, about 60% of all Swiss exports went to a European country, while about 70% of imports came from Europe. Additionally, relations with the European Union (EU) are currently in a state of flux and it is therefore important to ask what one may expect for Swiss welfare as a result of how trade relations with the EU evolve in the future.

To assess how important a particular trade relation or a particular level of trade costs is for Swiss welfare, one needs to compare the per-capita income for the status quo to a counterfactual situation under which the trade relation does not exist, or under which trade costs are at a different level. For such a comparison, a structural model is indispensable. In the present paper, I adapt the Ricardian trade model of Eaton and Kortum (2002) (henceforth EK). This is a widely

1 The views expressed in this paper are those of the author and do not necessarily represent those of the SNB. I thank Reto Foellmi for his very helpful discussion at the 2016 Aussenwirtschaft Workshop and Daniel Honerkamp for valuable comments and suggestions.

used standard model of modern trade theory. Moreover, the quantification of this model follows a very standard procedure. Indeed, one could say that I use an "off-the-shelf" model. This has the big advantage that the results cannot be massaged in any particular direction, since this would be easily detectable in modeling and quantification decisions that deviate from the often-used standard procedure. Put differently, the present paper takes an a priori agnostic approach and simply asks what the workhorse model of international trade theory has to say about Switzerland's gains from European trade. I hope that these results provide a good departure point for a broader discussion of possible additional channels or Switzerland-specific effects that may have to be taken into consideration as well.

The present paper is not the first look at Switzerland's gains from trade. In particular, Egger et al. (2009) measured the increase of imported product varieties over time, and Mohler (2011) translated these increases into welfare effects. Two studies commissioned by the State Secretariat for Economic Affairs (SECO) (BAKBASEL, 2015; Ecoplan, 2015) specifically focused on Bilateral Agreements I between Switzerland and the EU and tried to assess the welfare implications of a cancellation of the agreements without any substitute agreements. Finally, in Hepenstrick (2016), I looked at Switzerland's overall gains from trade and where these gains originate from.

Section 2 briefly sketches the EK model with a particular focus on the determinants of a country's per-capita income. It also discusses how general the results I find are likely to be. Section 3 first outlines how the model is quantified. In a second step, the quantification results are discussed by providing an overview of Switzerland's estimated trade costs and how they compare to trade costs for other countries. Section 4 then performs a first counterfactual experiment – it uses the model to assess the effects of moving to autarky on Swiss per-capita income. This radical experiment will serve as a benchmark to judge the size of the effects of more realistic experiments with a focus on European trade that are performed in Section 5. Section 6 provides some concluding thoughts on the implications of the findings presented in this paper.

2 The EK model

I use the quantitative Ricardian trade model of Eaton and Kortum (2002). The model specification and estimation is exactly the same as in Hepenstrick (2016), which is why, in what follows, I describe the model in words only and refer the interested reader to that paper and the references therein for technical details.

2.1 Why countries trade

The EK model features many countries that use many different intermediate goods to produce a final consumption good. In principle, each country can produce each good. However, buyers compare prices internationally and source from whomever can deliver a good at the lowest price. Whenever a foreign producer offers a particular good at a price below the one offered by the domestic producers, buyers will source the good abroad, which generates international trade.

2.2 The equilibrium and the determinants of a country's per-capita income

In the EK model, a country is characterized by a set of exogenous features: the local state of technology, its capital stock, its average human capital endowment, its population size and its degree of integration into the global trade network. Given these exogenous differences, countries produce goods and exchange them in the global trade network. In equilibrium, trade patterns are such that each good in each country is sourced from whichever country offers the lowest price. Wages and interest rates adjust such that in every country, resources are fully utilized. This in turn determines, in combination with the local price level, how much of the consumption good the local representative agent can buy and thus a country's real per-capita income.

In this model, there are two important determinants of per-capita income. The first is the capital stock, human capital and the local state of technology. These variables determine how much a country can produce, even under autarky. The higher these variables, the more a country can produce and therefore the higher its per-capita income. The second determinant is a country's integration into the global trade network. If a country is well integrated, that is, trade costs when exchanging goods with other countries are low, it benefits in two ways. First, a country can leverage the fact that it is especially productive in a particular industry, because it can specialize in this industry and supply many foreign countries with the corresponding good. Second, a well-integrated country can benefit from other countries' good technologies and endowments by importing the goods which foreign countries can produce particularly well. The lower the trade costs, the stronger these two effects and thus the higher a country's per-capita income.

2.3 Generality beyond the EK model

As discussed above, international trade in the EK model emerges because of Ricardian specialization – each country specializes in producing the goods in which it has a comparative advantage. However, there are of course other reasons why countries engage in international trade. In particular, countries may trade the same good in both directions because of the love for variety motive; even within a given category of goods, there are varieties that differ by source country or even by individual producer. When buyers derive utility from consuming a broader set of varieties, this generates an alternative reason for the emergence of international trade.

Later on, I will perform quantitative experiments with the EK model. One may ask how robust the conclusions drawn from these experiments are with respect to allowing for different reasons for the emergence of international trade. Arkolakis et al. (2012) show that the effects of international trade on per-capita incomes are similar for a surprisingly large class of models. Melitz and Redding (2015), in contrast, show that once one moves away from this set of models, the effects can change by quantitatively relevant amounts. The present paper uses a standard implementation of the EK model that belongs to the class described by Arkolakis et al. (2012). Note that a standard implementation of a model that allows for love for variety would equally belong to this class. In this sense, the results presented in the following can be read as robust to the exact model used, given that a standard implementation is used. Put differently, if an applied researcher is asked to assess Switzerland's gains from trade, she'd most likely pick an off-the-shelf model and would therefore find effects that are quantitatively similar to those presented here, no matter what exact type of model she uses.

3 Quantifying the EK model

3.1 The quantification approach

To work with the model, I need to quantify the exogenous elements. I use a sample of 86 countries for the year 2003, which together produce about 90% of global GDP. Details on the sample and the data can be found in Hepenstrick (2016).

Some elements of the model can be directly read from the data: population sizes, human capital, and capital stocks. Other elements are unobserved: local states of technology and trade costs. However, given the model structure and the observed

exogenous elements, I can solve for the unique set of technologies and trade costs that yields exactly the trade pattern that I observe in the data.

3.2 Some details on Switzerland's estimated trade costs

Given that counterfactual changes to trade costs will play a central role in the remainder of this paper, it is worthwhile to spend some time describing the trade costs that are backed-out from the data and the model in the way just outlined above. For this, some background is helpful. The model yields the following equation governing the intensity of trade between an exporting country i and an importing country n:

$$\log x_{ni} = -\theta \log d_{ni} + \log S_i - \log S_n.$$

The measure of the intensity of trade between two countries, $\log x_{ni}$, depends on the exporter's and importer's country effects, $\log S_i$ and $\log S_n$, and a so-called bilateral resistance term, $-\theta \log d_{ni}$.

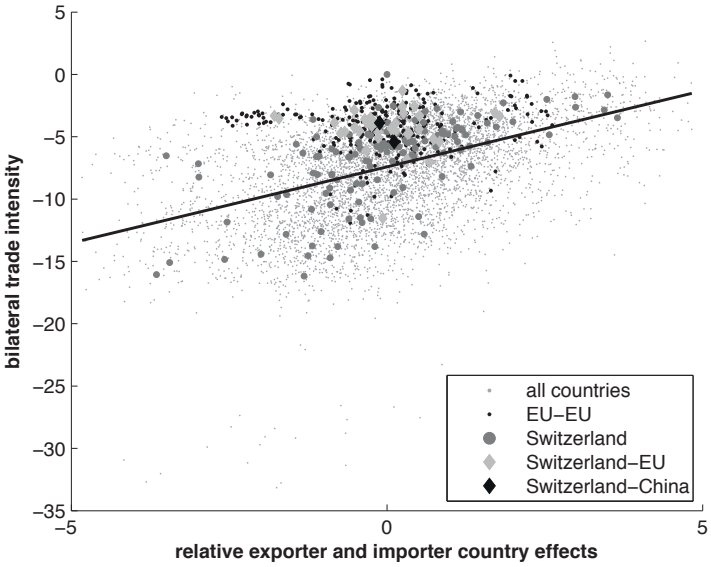
A large and rich country has a high production. It therefore tends to export a lot, which is why its country effect enters positively when it is the exporter. At the same time, having a high production implies that relatively little needs to be imported, which is why the country effect enters negatively when a country is the importer. Figure 1 plots in grey for each bilateral trade relation the relative country effects, $\log S_i - \log S_n$, on the x-axis against the intensity of trade on the y-axis.

Clearly, country-pairs with higher relative country effects tend to trade more, as shown by the black regression line. However, for given relative country effects, there is still considerable heterogeneity, which represents the bilateral resistance. Bilateral resistance governs how much or how little two countries trade given the country effects of the exporter and the importer. As such, bilateral resistance reflects a broad notion of trade costs. The vertical distance of a particular bilateral trade flow from the regression line measures bilateral resistance relative to the global average. The further above (below) the regression line, the more (less) intense a trade relation is given relative country effects. Thus, looking at a specific country's – or country group's – bilateral resistance terms allows us to already draw some conclusions about that country's – or country group's – trade costs.

The small black dots in Figure 1 are bilateral trade relations between EU countries. Almost all of them are above the regression line, suggesting that EU countries tend to trade more intensively with each other than the global average.

Put differently, trade costs among EU countries must be relatively low compared to the global average. The large grey circles represent all Swiss bilateral trade relations. The majority of them are above the regression line, suggesting that, in general, Switzerland tends to have lower trade costs than the global average. Finally, the light grey diamonds are the trade relations between Switzerland and EU countries. Almost all the light gray diamonds are above the regression line and the mass tends to be further up than the large gray circles, suggesting that Switzerland has particularly low trade costs with EU countries. (For later reference, I also plotted Swiss flows to and from China in black.)

Figure 1: Bilateral trade and the exporter and importer effects



Having established that Switzerland has relatively low trade costs, the natural question that arises is, why? Some progress towards answering this question can be made by looking at the details of the operationalization of trade costs that followed Waugh (2010): bilateral trade costs are modeled as a function of the distance between the two trading partners and of whether the countries speak the same language or share a common border. Moreover, trade costs feature an exporter-specific effect, that is, some exporters have lower trade costs with all their trading partners irrespective of distance, language or borders. This exporter-specific effect may capture infrastructure, bureaucratic procedures, tariffs, and other institutional aspects. Finally, there are some remaining unexplained country-pair specificities.

Looking at the estimation results, it turns out that the exporter effect is quantitatively very important in the sense that it alone can already reproduce about 60% of the global variation in trade costs. The countries with the lowest exporter effects are Singapore, China, the Netherlands, Belgium and Luxembourg, and Germany. These are particularly successful exporters in the sense that they export more than what the features of their trading partners, their geographical location, and their language alone would suggest. Looking at Switzerland, one finds that it has the 20th lowest exporter effect. It is therefore still a more successful exporter than the median country, but a non-negligible part of the fact that most blue circles in Figure 1 are above the regression line comes from the simple fact that Switzerland is centrally located in Europe. The countries with the highest exporter effects – that is, the least successful exporters – are a number of poor African countries.

Finally, it is illustrative to consider the absolute levels of estimated trade costs. Table 1 provides some summary statistics. Trade costs are expressed relative to the costs of supplying a good domestically. Put differently, domestic trade costs are normalized to 1. Subtracting 1 from the trade costs reported yields an ad valorem equivalent of trade costs. Looking at the first column, we see that EU countries are, on average, better integrated than the global average (5.9 vs 7.3). Switzerland is on average better integrated than the average EU country, and equally well integrated with the world as the United States. Germany, in turn, has on average somewhat lower trade costs than Switzerland.

The second column considers specifically trade costs with EU countries. The trade costs of these countries among themselves are found to be lower than the global average of trade costs with EU countries. Switzerland's trade costs with EU countries are slightly higher than those among EU countries, and somewhat lower than the trade costs of the United States with EU countries. Note that the 2.7 for Switzerland corresponds to the often-cited estimate for average trade costs among OECD countries in Anderson and Van Wincoop (2004). Germany, finally, has the lowest average trade cost with the other EU countries, at 2.0.

Table 1: Summary statistics on trade costs

	Average trade costs with	
	all countries	EU countries
All countries	7.3	5.9
EU countries	5.9	2.6
Switzerland	4.5	2.7
Germany	4.1	2.0
USA	4.5	3.2

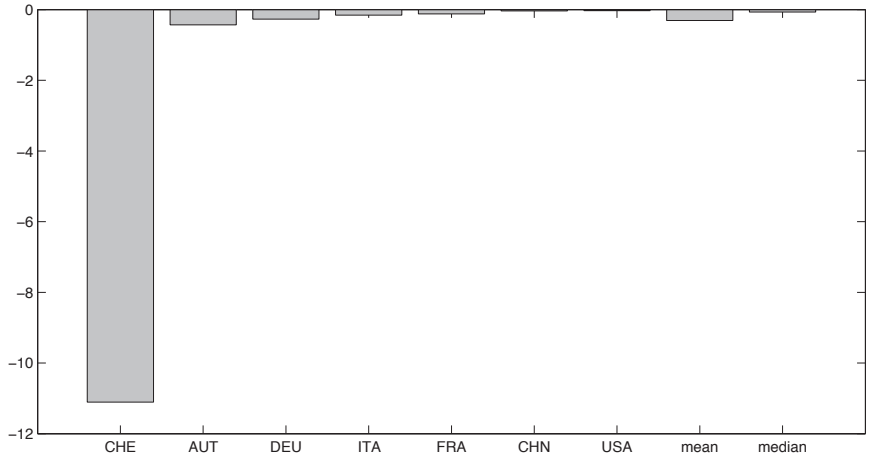
4 A first counterfactual experiment: Moving to autarky

As a start and to fix ideas, I consider a classical counterfactual experiment: by how much would Swiss per-capita income change if Switzerland moved to autarky?

4.1 Moving to autarky lowers Swiss per-capita income by 11% in the model

To answer this question, I use the quantified model discussed above and set all the trade costs between Switzerland and its trading partners to infinity. This has the immediate effect that Swiss producers always offer the lowest prices for every good in Switzerland, so that in the new equilibrium all goods are sourced locally and Switzerland moves to autarky. Figure 2 presents the change in real per-capita income in Switzerland and in a number of important partner countries under this counterfactual situation.

Figure 2: Change in per-capita incomes if Switzerland moved to autarky



Clearly, the only country that is materially affected is Switzerland, with a decline in real per- capita income of 11%. This decline can be attributed to two channels: first, losing the ability to import from abroad increases the Swiss price level and thus weighs on real per-capita income; and second, losing the ability to export lowers demand for Swiss production factors, their remuneration, and thus per-capita income.

4.2 Is a decline of 11% large or small?

At first sight, a decline of 11% may appear to be relatively small given the radical nature of the counterfactual experiment. Several comments are in order. First, it is important to note that I make steady-state comparisons. I compare the status quo with a counterfactual situation that emerges once all the necessary reallocations of labor and capital across sectors have been completed. While it appears likely that this transition phase could be very disorderly, the model considered here cannot say anything about the transition process. Second, the result is in line with a general formula derived in Arkolakis et al. (2012):

$$\text{gains from trade} = (\text{home share})^{-1/\varkappa},$$

where the home share is the share of total domestic demand for tradables that is satisfied by local producers, and $\varkappa$ is a parameter. For Switzerland, the home share is about 50%. Thus, the model used here has an implicit $\varkappa$ of 6.5. One could of course use smaller values of $\varkappa$ to generate larger gains from being able to trade. Looking at the literature, the lowest plausible value for $\varkappa$ is in the range of 3. If we plug $\varkappa = 3$ into the formula, we get gains from being able to trade of 25%, which is about twice the baseline estimate just presented. Remember that these results are fairly general in the sense that the formula above applies to a large class of models, among them all modern off-the-shelf models of quantitative trade theory.

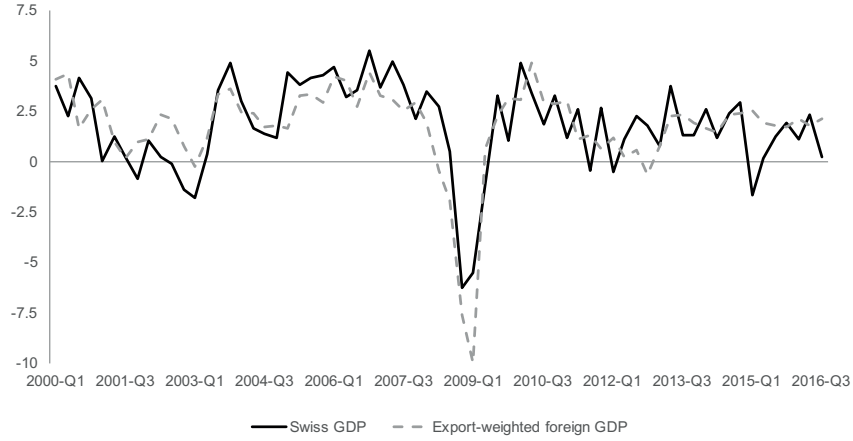
Still, even with an extreme value of $\varkappa$ the gains from trade (or losses from moving to autarky) appear quite limited bearing in mind that according to the Penn World Tables, Dutch, German, and French per-capita incomes in 2014 were 15%, 20%, and 30% below that of Switzerland, respectively. If Switzerland moved to autarky, in the long run, Swiss per-capita income would still be higher than that of France. This finding of relatively modest gains from trade is consistent with the findings in Waugh (2010) and Hepenstrick and tarasov (2015) that only about 10%-20% of the global variation in per-capita incomes can be attributed to differing trade costs.

4.3 The role of trade for income volatility versus income level

One important reason why these numbers may appear small from an intuitive point of view can be seen in Figure 3. The solid line is Swiss GDP growth and the dashed line growth of export-weighted foreign GDP. Clearly, the two lines move very much in synch; in fact, export-weighted foreign GDP can explain about 60% of quarterly growth of Swiss GDP. Put differently, foreign countries

are very important contributors to the *volatility* of Swiss income, but not so much to the *level* of income.

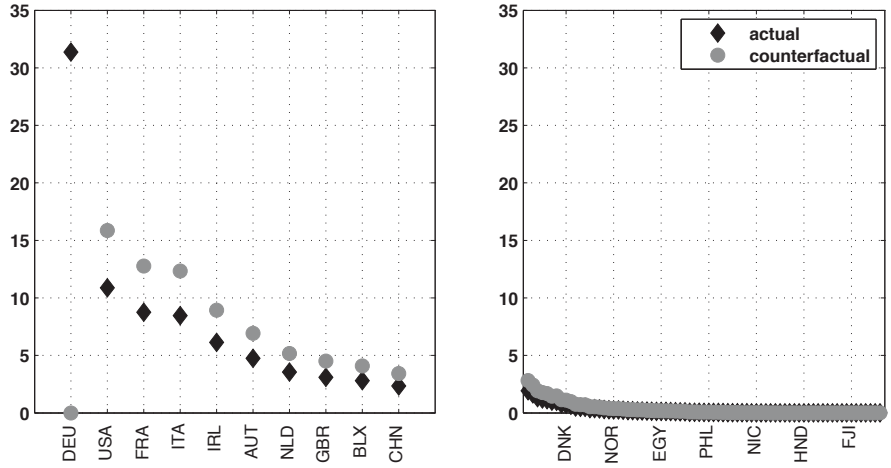
Figure 3: Foreign demand as an important contributor to the Swiss business cycle



4.4 Locating the gains from trade

Having established that the Swiss gains from trade are in the order of 11% according to the model, the next question that arises is which trading partners contribute how much to the gains. To answer this question, I continue with a small version of the autarky experiment: instead of setting all bilateral trade costs to infinity, I only set the trade costs with one trading partner at a time to infinity. I start with Germany, Switzerland's most important trading partner. If bilateral trade costs with Germany are set to infinity, Switzerland stops importing German goods and Germany stops importing Swiss goods. In the new equilibrium, most goods that have previously been sourced from Germany, are now sourced from other trading partners. Only a small share of the goods will be newly produced in Switzerland itself. This can be seen from Figure 4, which plots in black the actual Swiss import shares and in grey the counterfactual import shares. The ten most important trading partners are shown in the left-hand panel, and the remaining partners are displayed in the right-hand panel.

Figure 4: Change in import shares when trade with Germany is ruled out



In the counterfactual experiment, Germany's import share falls from more than 30% to zero, while the shares of Switzerland's other major trading partners increase by about 5 percentage points each, picking up some of the slack. The Swiss home share – that is, the share of Swiss demand for tradables that is satisfied by Swiss producers – increases from 51% to 61%, and Swiss per-capita income falls by 2.9% under this counterfactual situation. This is a significant part of the 11% total gains identified above.

Table 2 presents the changes in per-capita income when the experiment is repeated with other major trading partners of Switzerland. The gains from being able to trade with particular countries become small quite quickly. According to the model, for example, if all trade with China and Hong Kong were to be prohibited, Swiss per-capita income would decrease by a mere 0.3% in the new steady state. However, considering an experiment where all trade with EU countries is inhibited, Swiss per-capita income would decrease by about 7% according to the model. This suggests that a large part of Switzerland's gains from trade come from being able to trade with EU countries.

Table 2: Changes in per-capita income when trade with a particular country is ruled out

	% change in real per-capita income
Germany	-2.9
United States	-0.8
Italy	-0.8
France	-0.7
Ireland	-0.4
Austria	-0.4
United Kingdom	-0.3
China and Hong Kong	-0.3
The Netherlands	-0.2
Belgium and Luxembourg	-0.2
EU	-6.8

5 Some further experiments

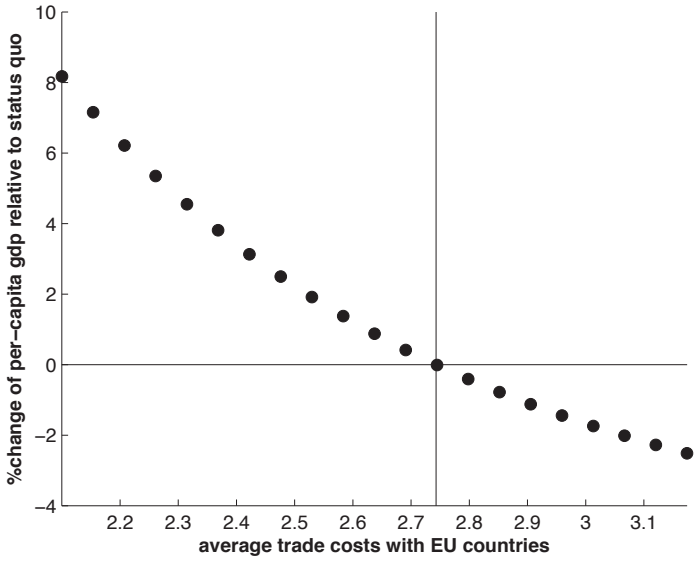
Having just established that a large part of Switzerland's gains from trade comes from EU countries, I look at these countries in somewhat more depth in the current section. The previous experiments were quite radical and unrealistic in the sense that they set bilateral trade costs to infinity, and thus fully stopped trade. In the following, I consider the effect of smaller and probably more realistic changes in trade costs on Swiss per-capita incomes.

5.1 Changing the degree of integration with EU countries

As discussed above, average trade costs between Switzerland and EU countries are 2.7. We have also seen that the country that is best integrated with the other EU countries is Germany, with average trade costs of 2.0. The United States, in contrast, features average trade costs with EU countries of 3.2. When experimenting with finite changes to Switzerland's trade integration with the EU, these two countries probably provide sensible bounds for how much better or worse integration could be.

Figure 5 reports on the y-axis the percentage change of Swiss per-capita income when all trade costs between Switzerland and the EU are proportionally changed.[2] The x-axis presents the corresponding average trade costs with EU countries. Increasing trade costs with the EU lowers Swiss per-capita income. If trade costs are increased so much that Switzerland is on average only as well integrated with the EU as the United States is, Swiss welfare would decrease by about 2.5%. Decreasing trade costs, in contrast, leads to higher Swiss per-capita income according to the model. In fact, if we consider a situation where trade costs with the EU have been lowered so far that average trade costs with EU countries is the same as Germany's trade costs with these countries, Swiss per-capita income rises by a bit more than 8% according to the model.

Figure 5: Varying the degree of integration with EU countries



Another illustrative experiment considers the effect of a further trade integration among EU countries, assuming that trade costs among EU countries fall by 20%. The first two entries in Table 3 reports the results. Two possibilities are considered. In the first, Switzerland participates in the trade integration, that is, it keeps trade costs constant relative to the EU countries. In the second, Switzerland does not participate, that is, absolute Swiss trade costs remain constant. If the EU

2 If trade costs between a country i and n are represented by dni a 10% decrease would be computed as $0.9 \times (d_{ni} - 1) + 1$. I subtract 1 before multiplying to ensure that bilateral trade costs do not fall below 1, which are the costs for trading domestically.

integrates further, but Switzerland does not participate, Swiss per-capita income falls only slightly (-0.2%). However, there is a large upside from participating: if Switzerland simultaneously lowers trade costs such that its trade costs remain constant relative to intra-EU trade costs, Swiss per-capita income increases by 3.5% according to the model.

Table 3: Some further counterfactual experiments

20% trade cost reduction among EU countries	
Switzerland participates	+3.5%
Switzerland does not participate	-0.2%
Unilateral 20% reduction of import costs from EU	+1.6%
20% reduction of trade costs with China	+0.3%
Unilateral 4.2% reduction of import costs from EU	+0.3%

In order to reap this 3.5% increase, of course, two things are necessary: first, there needs to be an intra-EU trade integration; and second, Switzerland and the EU must agree on the measures that ultimately lower trade costs. If these conditions are not met, Switzerland can still take unilateral action; in particular, it could take measures to lower import costs. I therefore simulate a situation whereby Switzerland lowers all trade costs for imports from the EU by 20%. This increases Swiss per-capita income by 1.6% (third entry in Table 3), which corresponds to about half the effect obtained when Switzerland participates in an EU-wide trade liberalization.

5.2 Lowering trade costs with China

A next experiment considers the effect of changes in trade costs with China. Going back to Figure 1, we see that the trade intensity between Switzerland and China is relatively high (green dots are above the regression line), which suggests that trade costs with China are relatively low, at least in the global context. Out of all Swiss import relations, the trade costs for the flow from China to Switzerland is in fact the 11th lowest. For exports, the trade costs for the flow from Switzerland to China are the 55th lowest. A further reduction of these costs by 20% would lead to a 0.3% increase of Swiss per-capita income. Note that a similar gain could be achieved by unilaterally reducing the import costs of goods coming from the EU by 4.2% (last two entries of Table 3).

6 Concluding thoughts

6.1 Most gains from trade originate in the EU

The EU is Switzerland's most important trading partner, with 54% of all Swiss exports going to the EU and 73% of all imports coming from the EU in 2015. Correspondingly, I have found that most gains from trade in Switzerland come from the EU. The welfare loss associated with stopping trade with the EU is about 65% of the loss that is associated with Switzerland moving fully to autarky.

Lowering trade costs with the EU – Switzerland's main trading partner – leads to significant welfare gains, while increasing trade costs leads to non-negligible losses. According to the model, the effects of a very significant trade liberalization with China are pale in comparison to the effects of relatively small changes in the degree of integration with the EU. In other words, the model suggests that it is unlikely that Switzerland could fully compensate for deteriorating trade relations with the EU by a deepening of relations with other major countries such as China or India.

6.2 Size of the gains from trade

The gains from trade estimated with the EK model are not huge in the sense that trade liberalizations are unlikely to be a panacea against all kinds of economic problems. One reason why the gains may appear disappointingly small is that our intuition about the relevance of international trade is mainly driven by the cyclical comovement of the global and the Swiss economies. We have seen that the global business cycle is a very important driver of the Swiss business cycle. However, looking at the level instead of the volatility of Swiss per-capita income, the model tells us that international trade is a non-negligible contributor to Swiss welfare, but not the most important by far.

It may, of course, be that important channels were neglected. In particular, dynamic effects have been completely neglected in that capital stock, human capital and total factor productivity were taken as exogenously given. If the accumulation of these depends on trade, the gains from trade may be significantly larger. Therefore, the results presented should probably not be read as a definitive quantification of Switzerland's gains from trade, but rather as illustrating what orders of magnitudes are identified based on an off-the-shelf workhorse model of international trade. As such, the estimates provide a good and neutral starting point for a discussion of additional channels and Swiss specificities.

6.3 Comparing the gains from lower trade costs to estimates of the effects of structural reforms

Another area of economic analysis, where the empirically estimated effects often appear to be disappointingly small, is structural reforms. While policy-makers often argue that these reforms can cure all kind of economic illnesses, the empirical work finds effects on welfare that lie very much in the ballpark of the gains from realistic trade liberalizations identified above (see, for example, Chapter 3 of the April 2016 IMF *World Economic Outlook* for recent state-of-the-art estimates of the effects of structural reforms). In fact, the quantitative models used by policy institutions to make forecasts about the possible effects of reforms resemble the trade model used here in many ways. Also, the comparisons are most often steady-state comparisons and dynamic effects are not modeled (but are typically acknowledged as possibly being neglected).

This suggests that a policy analyst who argues for structural reforms based on the estimated gains in per-capita income should a priori also argue for lower trade costs. In fact, depending on the exact reform considered, it may even be that lowering trade costs has less adverse side-effects than a particular structural reform.

6.4 Even with small gains, a good reason is needed not to realize potential gains

Even if a policy-maker comes to the decision that the gains from lowering trade costs are rather small, she needs to have a good reason not to realize these potential gains. An example illustrates this: assume that there is a trade agreement that brings 0.1% of GDP. With a current Swiss GDP of about 640 billion Swiss francs (CHF), this corresponds to CHF640 million. These CHF640 million accrue every year and, if taxed at 10% for example, yield an additional annual revenue of CHF64 million, the present value of which should easily cover the negotiation expenses. And net of the negotiation expenses there are still almost CHF600 million of additional income that accrue to someone in Switzerland. A policy-maker needs to have a good reason to justify not collecting these gains from trade, however small they may be relative to GDP.

6.5 Distributional effects have been neglected in present analysis

One reason to leave potential gains on the table are distributional effects. The present analysis has fully remained in the representative agent framework and only

considered the effect on per-capita – i.e. average – income. While it has long been clear from a theoretical perspective that trade liberalizations have distributional effects, in policy advice and policy-making this has often been acknowledged only in a side note in combination with the remark that losers could, in principle, be compensated for their losses such that a Pareto improvement occurs.

A growing body of research, including a series of papers by Autor and Dorn (e.g. Autor et al., 2016), has convincingly demonstrated that international trade can have significant and long-lasting negative effects on certain demographic groups. These distributional effects need to be traded off against the positive average effects identified above when thinking about changes to the degree of a country's trade integration.

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