# Liberalizing the Swiss Meat Market with the EU: Welfare Effects and Impacts on Third Countries

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## 1. Introduction

The Swiss government has in past years increased its activities to sign bilateral free trade agreements (FTA). Negotiations for an FTA in the agri-food sector between Switzerland and the European Union (EU) have started in November of 2008. This article seeks to analyze the welfare effects of trade liberalization of the Swiss meat market with the EU. The focus is on the meat sector only because it is besides milk the most important branch of Swiss agriculture. Further, it is the most sensitive market; the majority of imports to Switzerland originate from outside the EU. The question is whether or not third country (non-EU) suppliers would be discriminated by such an agreement.

A multi-market multi-product trade policy model is developed to measure the welfare effects on the parties involved. The bilateral solution is compared to multilateral trade liberalization.

The organization of the paper is as follows: Section 2 discusses different concepts to measure welfare effects of FTAs and the interpretation of Article XXIV of the General Agreement on Tariffs and Trade (GATT). In Section 3, the multi-market multi-product partial equilibrium model of the meat market is outlined. Section 4 contains the results and Section 5 provides conclusions and implications.

## 2. Trade Creation and Trade Diversion: Interpretation of Article XXIV GATT

The most favored nation (MFN) clause in Article I of the GATT forbids member countries from pursuing discriminatory trade policies against one another. Preferential trade agreements such as FTAs or customs unions, which are a deviation from the MFN rule, are accommodated by Article XXIV GATT. The two most important obligations among treaty partners are to liberalize *"substantially all the trade"* and that *"duties and other regulations of commerce [...] shall not be higher or more restrictive"*. However, there are longstanding differences over what *"substantially all the trade"* means; if it is the percentage of tariff lines, the percentage of the value of trade – actual versus potential trade –, or the non-exclusion of entire sectors. Also, a number of economic and legal commentators have expressed the position that GATT Article XXIV is economically irrational. This follows from the central point that an agreement which covers all the trade can result in a higher degree of trade diversion, than one which covers only a portion of the trade (Mathis, 2002, p. 103). The question how the requirements of Article XXIV should be interpreted in light of economic theory has been a concern as well. A criterion for applying trade creation has not yet found a place in the Article (Mathis, 2002).

Trade creation and trade diversion were introduced by Viner (1950). Trade creation refers to the replacement of relatively high-cost production with lower-cost imports from the partner country while trade diversion refers to a switch in imports from a more efficient supplier in the rest of the world to a less efficient preference receiving partner country. In reality, an FTA has both effects and the resulting net welfare effect can be either positive or negative. However, even Viner's framework is incomplete. For example, his terms do not incorporate the possible effects from changes in world prices of goods traded with the rest of the world due to the formation of the customs union (Kowalczyk, 2000, p. 485). Kowalczyk proposes therefore a more complete approach to make a welfare statement about countries (FTA members and non-members) real income change composed of the terms of trade and volume of trade effects (see 3.4).

There are several indicators that tell whether the FTA might yield more trade creation or more trade diversion. Trade diversion is more likely to occur when a large part of imports of a now FTA member country used to originate from the rest of the world. This is the case for meat. For beef, Brazil is Switzerland's dominant supplier and for lamb Australia and New Zealand. Pork is imported exclusively from the EU but the quantity is rather small. Most poultry imports

originate in the EU as well, but Brazil has also a considerable share. In 2005 meat imports from the EU totaled 210 million Fr. of which 47% was poultry (127 million Fr.). Yet, the majority of meat imports originated from non-European countries (373 million Fr.). Trade creation is more likely to dominate if FTA members' tariffs are high before the formation of an FTA. Switzerland as well as the EU have for most meat categories rather high market access barriers in place, be it tariffs only or tariff rate quotas (TRQs). The highest barriers exist for beef.

Whether trade creation or trade diversion dominates is an empirical matter. The result depends critically on the underlying assumptions. HUFBAUER and BALDWIN (2006) analyzed the effects of a Swiss-US FTA. Their computable general equilibrium model (CGE) reveals that trade diversion seems strong in Switzerland's case. Swiss tariffs on agriculture are high, and the United States would become a preferred supplier alongside the European Union (HUFBAUER and BALDWIN, 2006, p. 236). The EU, Switzerland's most important trading partner, would probably not tolerate trade diversion away from traditional EU suppliers towards the preference gaining US. In addition, a Swiss-US FTA would put in jeopardy the existing Swiss-EU veterinary agreement due to divergent policies in the EU and the US on i.e. hormone treated beef.[1] The Federal Council decided in 2006 not to engage in free trade negotiations with the US.

Another trade liberalization option was assessed by MINSCH and MOSER (2006) who favor a Swiss-EU customs union. A customs union would eliminate tariff and non-tariff trade barriers between Switzerland and the EU. But, the report is silent on potential trade diversion effects of a customs union.

HAUSER and ZIMMERMANN (2001) note that the strong regional integration through bilateral agreements with the EU ensures that the Swiss industry with its large fraction of intra-industry trade can realize economies of scale in the enlarged market. However, multilateral trade liberalization gives the country certain independence. As a small country Switzerland doesn't have the same negotiation potential as large blocs to conclude preferential trade agreements. It is therefore in Switzerland's long-term interest to be committed to strengthen the multilateral trading system.

Trade diversion can also result from non-tariff barriers such as sanitary and phytosanitary measures or the rules of origin regulations in a bilateral agreement.[2]

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1 WTO Panel: European Communities – Measures Concerning Meat and Meat Products (Hormones) – Complaint by the United States (WT/DS26/R/USA).

2 In the Bilateral Agreements I Switzerland negotiated a duty free quota of 1'200 MT exports of dried boneless beef to the EU. But, the raw material (boneless beef) has to originate in the pan-European area. Yet, Swiss processors of dried meat have traditionally imported boneless beef from Latin America.

## 3. Partial Equilibrium Trade Model of the Meat Sector

The choice of a partial equilibrium model is motivated by the fact that very specific changes in trade policies (preferential trade agreement in the meat sector) on the markets for the four most important categories of meat (pork, beef, poultry, and lamb) are of interest. Another reason is the presence of specific as well as *ad valorem* tariffs that need to be modeled as such. CGE models like GTAP (Global Trade Analysis Project) use highly aggregated baseline data that can make it very difficult to estimate the impact a policy change has on specific products within the aggregation of the base data. They are useful for modeling linkages between broad product groups but not between specific products. Even though partial equilibrium models do not account for as many linkages between product groups as CGE models do, they can provide a transparent and focused analysis of how a limited number of products are affected by trade policies. Hertel (1992) found that in the case of a broad based shock, the results from a partial equilibrium model were very different from general equilibrium models with similar underlying assumptions; yet, the results in the case of a sector specific shock were very similar for that particular sector.

An FTA in the meat sector has consequences for production, consumption, and trade. Production is very much affected by the inter-linkages with the crops sector. In Switzerland border protection afforded to concentrated feeds such as grains, oilseeds and so on is by a factor two to three higher than for meat.[3] The model explicitly considers the input cost handicap (i.e. feed cost). The decline in input costs is modeled by an outward shift of the meat supply curve. In concentrated feed based meat production such as poultry and pork the input costs amount to 50% and 40%, respectively, of total production costs. Meat production based on roughage such as beef and lamb has feed costs that make up 20% and 10%, respectively, of total production costs.

Because meat markets across countries are linked, a multi-region model is required. Trade flows between Switzerland, the EU and the rest of the world in all possible directions are included in the model.

The study analyzes two market opening scenarios for the meat market. According to the *multilateral* scenario Switzerland, the EU and the rest of the world eliminate all tariff and non-tariff barriers (TRQ) in the meat market. In the *bilateral* scenario Switzerland and the EU liberalize meat markets bilaterally. The EU

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3   See also Schluep Campo, Jörin et al. (2004) for a description of the meat market liberalization in the WTO.

maintains its foreign trade regime for third country imports. Switzerland grants imports from the rest of the world market access through TRQs based on previous import quantities and at existing in-quota and out-of quota tariffs. The trade flows, the proveniences of imports, and the welfare effects are compared to the multilateral solution to deduce trade policy implications.

## 3.1 Assumptions

In the *multilateral* scenario it is assumed that worldwide liberalization will not only affect Swiss and EU prices but also world prices. For the future, one can expect higher commodity prices (OECD-FAO, 2007; FAPRI, 2008) than over the decade 1995–2005. The reasons are an increasing demand of newly industrialized countries and an increasing competition between food commodities and biofuel production.

In the *bilateral* scenario it is assumed that the tariff and quota removal between Switzerland and the EU will result in price adjustments mainly in the two countries. Further, it is assumed that the landed price in Switzerland for imports from the rest of the world, the lowest cost supplier, would adjust to the EU-price level.

The "Armington" assumption (ARMINGTON, 1969) allows treating products from different sources as different products and the impact from changes in tariffs that affect some, but not all trading partners, can be examined. It assumes that after the total demand for imports for a country has been determined, relative price changes among imports (caused for example, by a tariff change) determine the mix of imports by source. Without the Armington assumption, establishing the extent of trade diversion becomes an arbitrary or predetermined estimate.

The model assumes that competition is perfect. However, from experience there is a certain degree of imperfect competition observable in the market. This means that welfare effects under the assumption of perfect competition are under-estimated compared to a model where imperfect competition is explicitly included. For the bilateral and multilateral scenario the assumption of perfect competition is not false because competition increases when markets are opened up.

The CES functional form (constant elasticity of substitution) is chosen. Isoelastic functions are popular in agricultural trade models because substitution relationships within and between the different meat varieties can be modeled easily. The disadvantage is that only small deviations from the original equilibrium are robust. The CES functional form is applied to supply and demand equations.

### 3.2  Data and Software[4]

The analysis takes place at the wholesale level where domestic production and imports meet. At this level sufficient price and quantity data are available that discern between the four meat markets (pork, beef, poultry, and lamb) and between imports and domestic production. This way, also the problem of asymmetric price transmission that is associated with retail (consumer) prices can be avoided (Abdulai, 2002). Carcass weight price data (wholesale prices) for Switzerland and the EU were obtained from the Federal Office for Agriculture and represent averages of the years 2002–2004. World market meat prices were drawn from FAPRI data. All meat quantities are expressed in slaughter weight.[5] Production, consumption, and trade data were obtained from FAO. The traded quantities of the different meat varieties were determined by means of the FAO "World Agricultural Trade Matrix" software (Excel). 2003 data was used. Tariffs for Switzerland were extracted from *TARES*, for the EU from *TARIC*, and for the rest of the world it is assumed that there is no border protection[6]. Switzerland exclusively uses specific tariffs while the EU applies specific, *ad valorem* or complex tariffs[7]. The data and the analysis of multilateral meat trade liberalization described in Schluep Campo, Jörin et al. (2004) serve as a reference. The VORSIM modeling software (Roningen, undated) was used to implement the model. This software has the necessary macros in the background that calibrate the entered equations and link the different markets and regions. The model contains a definition, data, and equation sheet.

Tariffs, TRQs, and supply shifts that represent the cost cutting measures for the different meat categories are exogenous variables. Always endogenous is domestic wholesale demand (quantities). World market clearing prices are endogenous as well. They are set equal to domestic wholesale prices (i.e. the world market price for beef that is produced in the EU is equal to the wholesale price in the EU). Import prices that are calculated from world market prices plus tariffs are subsequently also endogenous. In the multilateral scenario all import

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4   A compilation of the data and the detailed model specification are available on demand from the authors.

5   Internationally traded meat is usually carved (deboned). For each kind of meat a different factor is used to convert traded meat quantities to slaughter weight.

6   This assumption is justified by the fact that the net exporters from the rest of the world have open markets and many net importers in the rest of the world do have small or zero tariff rates, at least within the quota.

7   Specific plus *ad valorem* tariffs.

quantities are endogenous. In the bilateral scenario imports from the rest of the world to Switzerland are exogenously set at the TRQ level.

### 3.3 Elasticities

Demand elasticities for Switzerland, the EU, and the rest of the world were drawn from existing studies (Schluep Campo, 2004; Rickertsen and von Cramon-Taubadel, 2003; Huang and Lin, 2000). A mechanism described in Schluep Campo (2004) and Roningen and Dixit (1986) was used to generate the domestic and import demand elasticities for pork, beef, poultry, and lamb of each region (Switzerland, EU, and rest of the world).

### 3.4 Basic Model

Following Roningen (1997), Huff and Roningen (2002), and Francois and Hall (1997) we define an import demand function characterizing the import of each of the four meat categories into any given region:

$$Q_{(k,i),r}^{M} = b_{(k,i),r} \prod_{k \in J} \prod_{r \in I} (P_{(k,i),r}^{M})^{\eta_{(k,i),r}} \prod_{k \in J} (P_{(k,i)}^{D})^{\eta_{(k,i)}} B_{(k,i),r}, \tag{1}$$

$$\text{where } i,r \in I = \{CH,EU,RW\}, \ k \in J = \{L,K,B,S\}$$

where $P$ and $Q$ denote prices and quantities, $i$ and $r$ stand for the importing and exporting regions of Switzerland *(CH)*, the European Union *(EU)*, and the rest of the world *(RW)*. The meat category $k$ encompasses poultry *(L)*, pork *(K)*, beef *(B)*, and lamb *(S)*. The set $I$ includes the indices for the three regions and the set $J$ the indices for the four meat categories. The exponents $D$ and $M$ denote domestic and imported goods. The price elasticities of demand for domestic and imported goods are denoted by $\eta$.

$Q_{(k,i),r}^{M}$ is the quantity of meat category $k$ imported from region $r$ into country $i$; $P_{(k,i),r}^{M}$ is the wholesale import price; $\eta_{(k,i),r}$ is the import demand elasticity; $b_{(k,i),r}$ is the calibrated intercept parameter; $B_{(k,i),r}$ is an exogenous shift variable (i.e. the use of hormones in beef production in a country); and $P_{(k,i)}^{D}$ is the domestic wholesale price for domestically produced meat of category $k$ in country $i$.

The wholesale demand for domestically produced meat is specified as follows:

$$Q_{(k,i)}^{D} = a_{(k,i)} \prod_{k \in J} (P_{(k,i)}^{D})^{\eta_{(k,i)}} \prod_{k \in J} \prod_{r \in I} (P_{(k,i),r}^{M})^{\eta_{(k,i),r}} A_{(k,i)}, \tag{2}$$

where $Q^D_{(k,i)}$ is the demand (quantity) for meat category $k$ produced in country $i$; $a_{(k,i)}$ is its calibrated intercept parameter; and $A_{(k,i)}$ is an exogenous shift variable (i.e. findings of antibiotic residues in poultry meat).

The wholesale supply of meat is expressed as:

$$Q^S_{(k,i)} = c_{(k,i)}(P^D_{(k,i)})^{\varepsilon_{(k,i)}} C_{(k,i)}, \tag{3}$$

where $Q^S_{(k,i)}$ is the supply (production) of meat of category $k$ in country $i$; $c_{(k,i)}$ is its calibrated intercept parameter; $\varepsilon_{(k,i)}$ is its elasticity of supply; and $C_{(k,i)}$ is an exogenous shift variable (i.e. changes in input costs).

The net trade of meat is derived from:

$$Q^X_{(k,i)} = Q^S_{(k,i)} - Q^D_{(k,i)}, \tag{4}$$

where $Q^X_{(k,i)}$ is the net trade of meat of category $k$ from country $i$. It is the difference between domestic supply and demand and can be either positive (net exports) or negative (net imports).

The wholesale import price of meat (tariff inclusive price) in the absence of TRQs is:

$$P^M_{(k,i),r} = P^T_{(k,i),r}(1 + tv_{(k,i),r}) + ts_{(k,i),r}, \tag{5}$$

where $P^T_{(k,i),r}$ is the trade (world market) price of meat category $k$ imported by country $i$ from country $r$; $tv_{(k,i),r}$ is the *ad valorem* and $ts_{(k,i),r}$ the specific tariff. The EU for example applies a complex tariff on beef imports while Switzerland exclusively uses specific tariffs.

If imports are administered by TRQs the import price is determined in a different manner:

$$P^M_{(k,i),r} = P^T_{(k,i),r} + tm_{(k,i),r}, \tag{6}$$

$$tm_{(k,i),r} = (1 - \mu_{(k,i)})kza_{(k,i),r} + (\mu_{(k,i)})akza_{(k,i),r}, \tag{7}$$

$$\mu_{(k,i)} = \left[ 1 + e^{\left( TRQ_{(k,i)} - \sum_{r \in I} Q^M_{(k,i),r} \right)} \right]^{-1}. \tag{8}$$

Equation (6) says that the import price is the trade (world market) price plus an import tariff. This import tariff $tm_{(k,i),r}$ is calculated by means of factor $\mu_{(k,i)}$. This factor results from the logistic function (Equation 8). If $\mu = 1$ meaning that actual imports exceed the TRQ, then the high out-of quota tariff *(akza)* is applied. If $\mu = 0$ the import tariff $tm_{(k,i),r}$ is equivalent to the lower in-quota tariff rate *(kza)*. This latter scenario occurs when imports are less than the TRQ quantity. For the vertical part of the TRQ the parameter $\mu$ lies between $0 < \mu < 1$. However, for a small range around the TRQ quantity the computed $\mu$ does not fully reflect the actual situation. When the sum of imports ($\Sigma Q^M$) is equivalent to the TRQ then $\mu = 0.5$ when it should be one. This can also be seen in Figure 1 where the TRQ is equal to 15,000 MT of beef and the tariff is only 5,398 Fr./MT (= 9,398 Fr./ MT import price) instead of 10,000 Fr./MT (= 14,000 Fr./MT import price). In the empirical model, if import quantities are in the critical range around the TRQ, the initial $\mu$ is calibrated such that the resulting tariff reflects the actual applied tariff. Since in the multilateral scenario all tariffs are abolished and in the bilateral scenario they are held constant for imports from the rest of the world, the results are not affected by the imprecision around the TRQ quantity. Further, the logistic function does not attain but approach zero. However, if one calculates tariffs and prices at the two-digit level after the comma, $\mu$ does equal zero for values less than the TRQ quantity, meaning that the in-quota tariff applies and an import price of 4,821 Fr./MT results (see Figure 1).

In Switzerland tariffs between the low in-quota and the high out-of quota tariff rate are possible due to TRQ auctioning (JOERIN and LENGWILER, 2004). The auction fee is added to the in-quota rate. From that perspective it makes sense to include the TRQ in a continuous manner in the model. This approach is further amenable to ready solution by the optimization techniques built into Excel solver (DEROSA and TRUEBLOOD, 2001; BANSE and GRETHE, 2006).
The world market clearing conditions are as follows:

$$Q^{WM}_{(k,i)} = \sum_{i \in I} Q^{X}_{(k,i)} = 0, \tag{9}$$

$$P^{WM}_{(k,i)} = P^{T}_{(k,i)} = P^{D}_{(k,i)}. \tag{10}$$

$Q^{WM}_{k,i}$ is the net world trade of meat category $k$ from country $i$ and has to equal zero across countries.[8] $P^{WM}_{k,i}$ is the world market clearing price which equals the

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8    This means that net exports are equal to the net imports.

**Figure 1: Import Price Determination with a TRQ, the Case of Beef**
**(TRQ = 15,000 MT, In-Quota Tariff = 795 Fr./MT**
**and Out-of-Quota Tariff = 10,000 Fr./MT)**
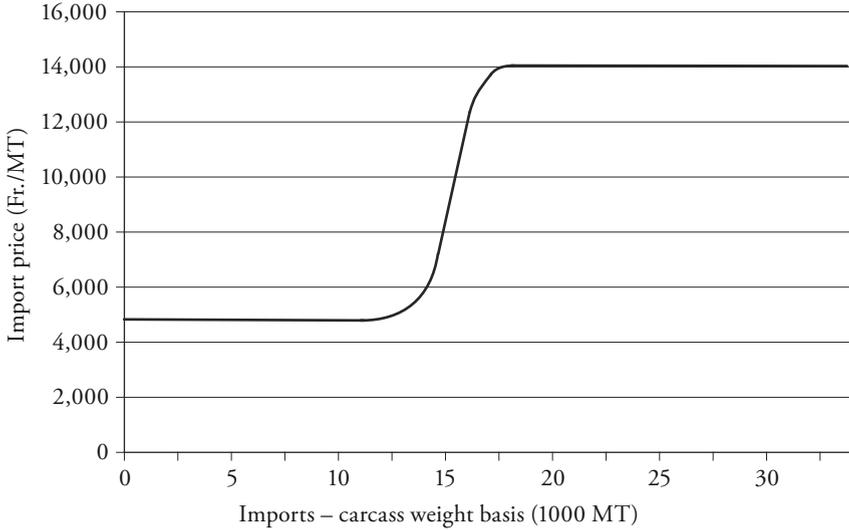


trade price $(P^T_{k,i})$ and the wholesale domestic price $(P^D_{k,i})$ for a given kind of meat. In the model itself, when a tariff or another exogenous variable is changed, new world market prices are calculated that feed into country/region equations, creating new world trade balances. This process iterates to a solution with a new set of world prices (giving new prices and quantities in country/region equations) and zero net world trade for each kind of meat.

The change in country $i$'s real income $(\Delta IN_i)$ is measured by:

$$\Delta IN_i = \sum_{r \in I} \{-Q^M_{(k,i),r}(P^{T^0}_{(k,i),r} - P^T_{(k,i),r}) + (P^M_{(k,i),r} - P^T_{(k,i),r})(Q^{M^0}_{(k,i),r} - Q^M_{(k,i),r})\}, \quad (11)$$

where $Q^M_{(k,i),r}$ is the initial quantity of meat category $k$ imported from region $r$ into country $i$; $P^M_{(k,i),r}$ is the import price (tariff inclusive), and $P^T_{(k,i),r}$ is the trade price. The prices and quantities that are denoted by $(^0)$ refer to the new equilibrium (bilateral or multilateral trade liberalization). The first term is the terms of trade effect as given by the inner product of imports and changes in tariff exclusive prices. The second term is the value of trade effect as given by the inner product of

the tariff wedge and the change in imports. Equation (11) applies whether county *i* is a member or non-member of the FTA. When the country is an FTA member, changes in $P^T$ and $Q^M$ are induced by changes in both foreign and country *i*'s tariffs, while in the case of a non-member (rest of the world) only the reform of foreign tariffs cause country *i*'s terms of trade and volume of trade to change.

### 3.5 Characteristic limitations

As it is the case for other partial equilibrium models also the meat market model has characteristic limitations. The *ceteris paribus* assumption simplifies the model. But, besides the agricultural input markets (i.e. crop sector) interactions with other sectors (i.e. dairy) are omitted. Results may be different when a larger group of goods would be considered. Second, the CES functional form has the disadvantage that only small deviations from the original equilibrium are robust (CES has long tails that diminish precision). Third, thanks to earlier analysis by the authors on meat demand in Switzerland it was possible to generate the required demand elasticity parameters in the model. However, measurement errors of elasticities and other structural parameters or flawed assumptions are translated to the model. Future work will attempt to relax the assumption of perfect competition because with TRQs in place for many agricultural commodities in Switzerland and in the EU imperfect competition is a reality.

## 4. Results

The results section discusses the worldwide welfare impacts of a Swiss-EU FTA versus multilateral trade liberalization in the meat sector. The question is if third countries that are not party to the agreement are discriminated. Further, the effects of an FTA on the Swiss meat market are analyzed.

   Multilateral and bilateral liberalization of the meat market lead to a reduction of the production of meat of all kinds in Switzerland (Table 1). Supply of Swiss meat is reduced more if market access is equally granted to all trading partners. In the bilateral scenario the supply reduction is smaller due to the continuation of the TRQ regime for imports from third country suppliers. In general, the decline of domestic supply is less severe for concentrated feed based meat such as poultry and pork than for roughage based beef and lamb. This is due to the higher reduction of the input cost handicap for concentrated feed based meat. With lower input costs farmers can produce more with the same budget. However, the loss in market share cannot be fully compensated.

Table 1: Meat Production by Switzerland (Carcass Weight)

| Meat | 2003 | Multilateral | | Bilateral | |
|---|---|---|---|---|---|
| | 1000 MT | 1000 MT | percent | 1000 MT | percent |
| Poultry | 56.269 | 48.780 | –13.3% | 49.642 | –11.8% |
| Pork | 229.567 | 201.433 | –12.3% | 207.191 | –9.7% |
| Beef | 136.728 | 107.200 | –21.6% | 110.250 | –19.4% |
| Lamb | 6.580 | 5.238 | –20.4% | 5.545 | –15.7% |
| Total supply | 429.144 | 362.651 | –15.5% | 372.628 | –13.2% |

In the bilateral scenario overall meat consumption in Switzerland increases by 7.7% and in the multilateral scenario by 16% (Table 2). These are moderate increases and compared to other European countries Swiss meat consumption is at the lower end. In a liberalized market Swiss meat consumption would still remain below the EU-15 level.

Beef consumption rises the most where to date import barriers are highest. The demand for imported meat augments sharply while the demand for Swiss meat shrinks. Absolute values of demand elasticities for imported meat are higher than for domestic meat. This means that when prices drop, import demand rises by more than what the demand for Swiss meat is reduced by.

What the model does not account for is cross-border shopping. A study by COOP (Anwander Phan Hui, 2006) estimates that cross-border meat purchases amount to about 600 million Fr. per year. This is equivalent to ten percent of the sales value of meat in Switzerland. This said, the imports calculated in the bilateral and multilateral scenario could be over-estimated.

Table 3 shows the wholesale prices in Switzerland, the EU, and the rest of the world. At the same time they represent world market or trade prices for a given kind of meat. In Switzerland the price decline is less pronounced under a bilateral scenario. Beef and lamb prices drop to a lesser extent than poultry and pork prices. The latter two decline more because of their higher initial input cost handicap that is substantially reduced by a parallel liberalization of agricultural input markets (i.e. concentrated feeds).

Because Switzerland is a small country the FTA has a marginal influence on prices in the EU and no effect in the rest of the world. Yet, in the multilateral scenario producer prices in the EU drop and increase in the rest of the world. This has to do with the fact that with multilateral free trade the EU and Switzerland have to remove trade barriers for meat also towards third country imports

Table 2: Meat Consumption and Imports by Switzerland (Carcass Weight)

| Meat | 2003 | Multilateral | | Bilateral | |
|---|---|---|---|---|---|
| | 1000 MT | 1000 MT | percent | 1000 MT | percent |
| **Poultry** | | | | | |
| CH consumption[a] | 55.330 | 47.372 | –14.4% | 48.257 | –12.8% |
| EU imports[b] | 59.068 | 89.688 | 51.8% | 90.258 | 52.8% |
| RW imports[c] | 19.448 | 29.245 | 50.4% | 19.448 | 0.0% |
| Total consumption[d] | 133.846 | 166.305 | 24.3% | 157.963 | 18.0% |
| Total imports | 78.516 | 118.933 | 51.5% | 109.706 | 39.7% |
| **Pork** | | | | | |
| CH consumption | 229.481 | 192.245 | –16.2% | 197.941 | –13.7% |
| EU imports | 18.155 | 59.782 | 229.3% | 62.174 | 242.5% |
| RW imports | 0.045 | 1.352 | 2904.4% | 0.045 | 0.0% |
| Total consumption | 247.681 | 253.379 | 2.3% | 260.160 | 5.0% |
| Total imports | 18.200 | 61.134 | 235.9% | 62.219 | 241.9% |
| **Beef** | | | | | |
| CH consumption | 134.486 | 100.607 | –27.8% | 103.267 | –24.6% |
| EU imports | 2.174 | 47.380 | 1179.1% | 38.504 | 1671.1% |
| RW imports | 13.556 | 50.120 | 269.7% | 13.556 | 0.0% |
| Total consumption | 150.216 | 198.107 | 31.9% | 155.327 | 3.4% |
| Total imports | 15.730 | 97.500 | 519.8% | 52.060 | 231.0% |
| **Lamb** | | | | | |
| CH consumption | 6.568 | 5.190 | –21.0% | 5.504 | –16.2% |
| EU imports | 2.326 | 3.320 | 42.7% | 4.026 | 73.1% |
| RW imports | 11.378 | 13.567 | 19.2% | 11.378 | 0.0% |
| Total consumption | 20.272 | 22.077 | 8.9% | 20.908 | 3.1% |
| Total imports | 13.704 | 16.887 | 23.2% | 15.404 | 12.4% |
| Overall consumption | 552.015 | 639.868 | 15.9% | 594.358 | 7.7% |
| Overall imports | 126.150 | 294.454 | 133.4% | 239.989 | 89.8% |

a    Switzerland (CH)
b    EU-25 (EU)
c    Rest of the world (RW)
d    Total consumption = CH + EU + RW

such as from Brazil or Australia. Because the EU is a large region, terms of trade effects occur.

Swiss meat exports are small (Table 4) and there are few indications about future import demand of the EU and third countries for Swiss meat. Due to these small initial export quantities the trade model reacts slowly to trade liberalization.

Table 3: Wholesale Prices in Switzerland, the EU and the Rest of the World

| Meat | 2003 | Multilateral | | Bilateral | |
|------|------|--------------|--|-----------|--|
|      | Fr./kg | Fr./kg | percent | Fr./kg | percent |
| Poultry | | | | | |
| CH | 3.97 | 2.00 | –49.6% | 2.05 | –48.4% |
| EU | 1.83 | 1.78 | –2.7% | 1.84 | 0.5% |
| RW | 1.40 | 1.42 | 1.4% | 1.40 | 0.0% |
| Pork | | | | | |
| CH | 4.42 | 2.47 | –44.1% | 2.55 | –42.3% |
| EU | 2.02 | 1.96 | –3.0% | 2.03 | 0.5% |
| RW | 1.60 | 1.61 | 0.6% | 1.60 | 0.0% |
| Beef | | | | | |
| CH | 7.88 | 4.63 | –41.2% | 4.79 | –39.2% |
| EU | 4.06 | 3.78 | –6.9% | 4.08 | 0.5% |
| RW | 2.40 | 2.50 | 4.2% | 2.40 | 0.0% |
| Lamb | | | | | |
| CH | 11.45 | 7.64 | –33.3% | 8.21 | –28.3% |
| EU | 7.40 | 7.26 | –1.9% | 7.41 | 0.1% |
| RW | 6.40 | 6.41 | 0.2% | 6.40 | 0.0% |

Table 4: Meat Exports by Switzerland (Carcass Weight)
and their Percentage of Domestic Production

| Meat | 2003 | | Multilateral | | Bilateral | |
|------|------|--|--------------|--|-----------|--|
|      | 1000 MT | percent | 1000 MT | percent | 1000 MT | percent |
| Poultry | 0.939 | 1.67% | 1.408 | 2.89% | 1.385 | 2.79% |
| Pork | 0.086 | 0.04% | 9.188 | 4.56% | 9.249 | 4.46% |
| Beef | 2.242 | 1.64% | 6.539 | 6.15% | 6.983 | 6.33% |
| Lamb | 0.012 | 0.18% | 0.048 | 0.92% | 0.041 | 0.74% |
| Total exports | 3.279 | 0.76% | 17.237 | 4.75% | 17.658 | 4.74% |

The question how exports of Swiss meat would fare following a bilateral FTA with the EU cannot be answered satisfactorily at this point. The EU would export more to Switzerland under an FTA than under multilateral free trade. However, for the EU the difference in their exports to Switzerland in the two scenarios would be small.

 The analysis of trade flows for Switzerland indicates that under a Swiss-EU FTA trade diversion slightly outweighs trade creation in the case of beef and lamb. Trade creation (Table 5) is defined here as the increase in imports from the EU in the bilateral scenario compared to the reference period. Third country imports to Switzerland remain at the TRQ level with an FTA in place. Trade diversion is defined here as the difference between imports from third countries in the multilateral compared to the bilateral scenario.

**Table 5: Change in Trade Flows with a Swiss-EU FTA in Place, Switzerland**

| Meat | Imports 2003 1000 MT | Trade creation 1000 MT | Trade diversion 1000 MT | Net balance 1000 MT | in % of 2003 |
|------|------|------|------|------|------|
| Poultry | 78.516 | 31.190 | 9.797 | 21.393 | 27.2% |
| Pork | 18.200 | 44.019 | 1.307 | 42.712 | 234.7% |
| Beef | 15.730 | 36.330 | 36.564 | −0.234 | 1.5% |
| Lamb | 13.704 | 1.700 | 2.189 | −0.489 | 3.6% |
| Total | 126.150 | 113.239 | 49.857 | 63.509 | 50.2% |

The reason for net trade diversion for beef and lamb is that historically roughage based meats have been predominantly imported from overseas (South America for beef, Australia and New Zealand for lamb). With a Swiss-EU FTA beef and lamb imports by Switzerland are diverted away from efficient third country suppliers towards the preference gaining EU. In the case of pork and poultry where most imports have always originated from the EU, the positive net effect of trade creation prevails. Overall, third country suppliers in the bilateral scenario are not worse off than before. Total net trade creation amounts to 50.2% compared to imports in the year 2003.

 Table 6 shows the real income changes under the two liberalization scenarios. For Switzerland and the EU the bilateral FTA scenario always yields lower income changes (except lamb in the EU) than multilateral free trade. The Swiss-EU FTA slightly negatively affects the rest of the world. There, the decline of import prices for Swiss meat cannot fully offset the negative effect due to higher import prices for EU meat (see Table 3) because Swiss exports are very small. However, the losses are negligible compared to GDP. With multilateral free trade the EU would win the most, especially because of the abolition of TRQs and high out-of quota tariffs for beef imports from the rest of the world. Worldwide

welfare effects are positive in both scenarios but by a factor 15 higher in the case of multilateral trade liberalization.

In the case of Switzerland the welfare effects between bilateral and multilateral trade liberalization are not that different. They are very close especially in the case of poultry and pork where Switzerland has traditionally imported these meats mainly from the EU. For beef and lamb differences are more pronounced; the main traditional suppliers are from overseas. The results also reflect that the losses to Swiss producers are by far offset by the gains to Swiss consumers in both trade liberalization scenarios.

**Table 6: Real Income Changes in Switzerland, the EU and the Rest of the World**

|                         | Multilateral Million Fr. | Bilateral Million Fr. |
|-------------------------|--------------------------|-----------------------|
| **Switzerland**         |                          |                       |
| Poultry                 | 149.6                    | 113.5                 |
| Pork                    | 140.2                    | 142.2                 |
| Beef                    | 568.8                    | 253.2                 |
| Lamb                    | 16.5                     | 8.7                   |
| Switzerland total       | 875.1                    | 517.6                 |
| **EU**                  |                          |                       |
| Poultry                 | 713.4                    | 1.9                   |
| Pork                    | 32.6                     | 7.4                   |
| Beef                    | 6,659.5                  | 37.8                  |
| Lamb                    | –4.5                     | 0.04                  |
| EU total                | 7,401                    | 47.1                  |
| **Rest of the world**   |                          |                       |
| Poultry                 | 47.8                     | –7.4                  |
| Pork                    | 71.6                     | –2.3                  |
| Beef                    | 162.1                    | –11.4                 |
| Lamb                    | 0.3                      | –0.02                 |
| Rest of the world total | 281.8                    | –21.1                 |
| **Worldwide Total**     | 8,557.9                  | 543.6                 |

Neither binding overhang, i.e. the gap between bound and applied MFN tariffs, nor changing specific tariffs do affect the results. Switzerland has in existing FTAs always reduced its agricultural tariffs starting from the applied rates.[9] In

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9   The legal texts on the existing preferential trade agreements of Switzerland, including tariff reduction schedules for agricultural products, can be viewed at www.efta.int.

the case of meat, Switzerland does not use variable levies. Hence, meat exports of the EU or the rest of the world to Switzerland do not face uncertainty in that respect. Non-tariff measures such as sanitary and phytosanitary restrictions are not considered in the model but can have large trade diversion effects.[10]

## 5. Conclusions and Implications

This article analyzes the impacts of multilateral versus bilateral trade liberalization between Switzerland and the EU in the meat sector. A multi-market multi-product partial equilibrium model is developed to measure the welfare effects on the three regions. It is evident that the removal of tariffs and TRQs between Switzerland and the EU results in noticeable net welfare gains for Switzerland that are not considerably smaller than the ones from multilateral free trade. The welfare changes suggest that there will be practically no effect on the EU, nor will the rest of the world be adversely affected. However, multilateral trade liberalization is still the first best solution.

The terms of trade and volume of trade approach put forward by KOWALC-ZYK (2000) allows us to make consistent statements about the worldwide welfare impacts of a preferential trade agreement such as a Swiss-EU FTA. It is a valuable alternative to VINER's framework (1950).

The results from the trade flow analysis in the Swiss meat market indicate that with a Swiss-EU FTA in place trade diversion slightly outweighs trade creation in the case of beef and lamb. This is due to the traditionally large import shares of these kinds of meat from overseas suppliers. However, the net overall trade creation effect in the Swiss meat market is large.

The FTA reduces distortions and trade barriers between Switzerland and the EU while they remain unchanged vis-à-vis third country suppliers. Yet, in the absence of an agreed definition rule for Article XXIV GATT, we cannot provide a concluding judgment whether or not the FTA in the meat sector would be in line with the requirements of Article XXIV. Countries that are not party to the FTA could argue that they lose market share and potential exports. Overall, our

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10  The EU has imposed an import ban on Brazilian beef on February 1 of 2008 because of insufficient animal health and traceability systems in many inspected properties in Brazil. As Switzerland has taken over EU regulations in that area, it also has placed a ban on imports from Brazil. From the Swiss perspective this has favored beef imports from the EU even without having an FTA in place.

assessment shows that a Swiss-EU FTA would be feasible. But, if third countries, the EU, and Switzerland (in case of a referendum) would in fact agree to it is a political question.

An FTA would certainly improve competition in Switzerland; companies could gain access to the EU market and get the opportunity to take advantage of economies of scale in the enlarged market.


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## SUMMARY

This article analyzes the welfare effects of multilateral versus bilateral trade liberalization between Switzerland and the EU in the meat sector. A multi-market multi-region partial equilibrium model is used. The removal of tariffs and tariff rate quotas between Switzerland and the EU results in noticeable net welfare gains for Switzerland. The impacts on the EU and on the rest of the world are minimal. However, multilateral trade liberalization is still first best.