Undoing Europe in a New Quantitative Trade Model*

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Abstract

Using gravity methods, we estimate the trade effects of various steps of European product market integration in 50 goods and services sectors. We also estimate parameters of sectoral productivity dispersion. We embed these results into the Ricardian general equilibrium trade model that gave rise to the gravity equation and simulate the effects of "undoing Europe". The theoretical model features intra- and international input-output linkages and reserves a critical role for non-tariff trade barriers. We show that the losses from European disintegration differ very strongly across EU members, from 24% of 2014 real income to 3% in UK. Putting an end to the single market accounts for the largest part of these losses, but Schengen- and Eurozone membership are quantitatively important as well. The end of fiscal transfers matters strongly for net recipients, but only slightly for net payers. Bootstrapping standard errors, we find that most general equilibrium outcomes are statistically significant at the 10% level. Proportional losses are more pronounced in more central EU members, while larger and richer countries tend to lose less.

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1 Introduction

After the collapse of the Soviet Union, the world has seen a rapid but complex process of economic integration. One of the major playgrounds for various integration initiatives has been Europe. From 1990 to 2014, the European Union expanded from 12 to 28 members. The European Single Market was established in 1993, the Schengen Agreement that ended formal border controls between many European countries entered into force in 1995, and the Eurozone was created in 1999. The resulting network is complex as some EU members opt out of the Schengenzone or the common currency, while several non-EU members take part in the Schengen agreement or, through membership in the European Economic Area, are de facto members of the Single Market.

However, the European project has come under serious stress. In this paper, we shed light on the heterogeneities amongst the EU partner countries which are crucial to understand their incentives. We use a multi-sector Ricardian trade model featuring all EU countries and their main extra-EU trade partners. We estimate the key parameters of the model as well as the trade cost effects of various integration steps using panel data covering the years 2000 to 2014 for 50 goods and services sectors. We then simulate counterfactual scenarios ranging from partial desintegration to a full-blown collapse of Europe.

The theoretical framework is of the type that Ottaviano (2014) has characterized as " New Quantitative Trade Model" (NQTM) and that Costinot and Rodriguez-Clare (2014) have recently reviewed. While the NQTMs themselves may not be all that new, the novelty resides in the fact that they all NQTMs give rise to a theoretical foundation of a gravity equation: an empirically very successful relationship linking observed bilateral trade flows to fundamentals such as trade costs, and the absorptive as well as productive capacities of countries. This is crucial for the structural estimation of model parameters and the associated uncertainty on exactly the data that defines the baseline. Moreover, NQTMs can be solved in discrete changes between the (observed) baseline equilibrium and the (simulated) counterfactual one. Besides obvious computational advantages, this property facilitates model calibration as constant parameters that could be measured only with substantial measurement error drop out from the system.

We go two steps further than the toolbox outlined in Costinot and Rodriguez-Clare (2014). First, we structurally estimate almost all relevant model parameters on the same data that describes our baseline. Second, we bootstrap standard errors for all endogenous outcome variables. We utilize the NQTM proposed by Caliendo and Parro (2015) which is a multi-sector version of the multi-country multi-goods stochastic technology Ricardian trade model of Eaton and Kortum (2002). Of particular relevance, the model accounts for the rich network of intra- and international input-output linkages that characterize trade in goods and services in Europe. We estimate the model on data provided by the WIOD project (Timmer et al. (2015)) for 50 sectors and 43 countries.

One advantage of the Ricardian setup is its tractability. In particular, we need to estimate only one structural parameter – the dispersion of productivity – per sector. Other popular frameworks, such as the one pioneered by Melitz (2003) would require to estimate two structural parameters per sector; see Felbermayr et al. (2015).[5] This is not feasible given the data we have. On top of this, we successfully estimate four policy parameters per sector measuring the average trade cost effects of the single market, the Schengen-Agreement, Eurozone membership, and free trade agreements with third parties.

Our approach is as follows: First, we use sectoral trade data to carry out an econometric ex

[5]For each sector, we would need the elasticity of substitution between product varieties and a parameter governing productivity dispersion; in the present setup we require only the latter.

post evaluation of the different integration steps. We identify the crucial parameter of sectoral productivity dispersion using information on tariffs. To obtain unbiased estimates, we exploit the panel nature of our data. Given the structure of the theoretical model, this step provides us with estimates of the trade costs effects of European integration.

Second, we use the general equilibrium model to simulate the effects of reversing the European integration steps measured in the first step. Using the estimated variance-covariance matrix of the econometric exercise, we bootstrap confidence intervals for the interesting endogenous variables such as welfare, value added, production, and trade.

Our gravity analysis shows that, *holding incomes and aggregate prices constant,* membership in the single market has boosted goods trade by about 63%, which corresponds to an average reduction of non-tariff trade costs of about 18%. In the area of services trade, the trade cost saving amount to about 50%. Membership in the Eurozone yields trade cost savings of about 2.5% in the area of goods and of about 8% in the area of services trade. The evaluation of the Schengen Agreement is more involved; how bilateral trade costs between two countries i and j are affected depends on whether the transit countries between i and j are Schengen countries. Accounting for this complication, we find that abolishing border controls at one border reduces trade costs by 2.5% for goods and by 4.2% for services. Finally, trade agreements with third countries also spur trade; their average non-tariff trade cost reducing effect lies between 2% for goods and 5% for services. We run the gravity analysis for all our 50 sectors separately and detect a large degree of heterogeneity.

In our counterfactual analysis we revert the trade cost savings brought about by various integration steps are reversed, but we hold everything else – in particular the description of technology – constant at the 2014 base year values. We simulate the general equilibrium consistent consequences of this reversion, We find that a complete elimination of all European integration steps would lower trade within the EU by some 40%; trade between 'old' and 'new' members would be more severely affected than trade within the group of 'old' and 'new' members. The domestic value added content in exports would go up between 5 and 7 percentage points, reflecting the fact that sourcing of foreign imports falls by more than overall trade. These effects are significant at least at the 10% level. The same patterns for general equilibrium trade effects do not hold for trade with non-EU countries. Due to substitution effects, trade with third parties may go up, but this effect is dampened and – in some cases reversed – by negative income effects. Moreover, third country effects are both statistically and quantitatively insignificant. In scenarios that involve a more partial breakdown of the EU – undoing of the Currency Union, the Schengen Agreement, etc. – trade effects are much smaller. The largest effects would be due to an undoing of the Single Market. Generally, manufacturing is more exposed than the services sector to a disintegration of Europe.

Turning to welfare effects, we find that a complete breakdown of the EU would generate substantial real per capita income losses for many EU member states. Smaller countries such as Luxembourg, Hungary or Ireland would lose 24%, 21% and 13% respectively; larger countries such as Germany, France or Italy would lose 5%, 4%, and 4%, respectively. The least exposed EU country is Great Britain (-3%). For All 28 member states we find substantial losses which are also highly statistically significant. The sign pattern is identical for more partial scenarios such as an end to the Euro or the Schengenzone, but magnitudes and statistical significance differ. Reintroducing tariffs equal to the EU's MFN tariffs (and allowing member states to collect the tariff income) could have a positive effect on real per capita income in several countries such as Cyprus or Portugal, but the effects are minuscule. Overall, the effects of the Single Market dominate strongly. Also, the undoing of transfers has a significant effect in several net receiving countries such as Hungary, or Greece, while the effect on the net paying countries is minor, and, due to terms-of-trade adjustments, sometimes close to zero.

A closer look at the losses reveals interesting patterns. We find that the percentage losses of status quo real per capita income in smaller EU members tend to be greater than in large ones, that poorer, more central, and more open EU members tend to lose more.

Our paper is related to several strands of literature. First, a large empirical literature estimates the trade effects of integration policies. However, existing studies do not always live up to state-of-the-art structural gravity modeling as laid out in Head and Mayer (2014) or in . For instance, they exclude services trade and internal trade flows or fail to minimize omitted variable bias. The same is true for the effect of the Euro on international trade; see Baldwin et al. (2008).[6] There is only a very small literature on the trade effects of the Schengen Agreement. Here, it is important to acknowledge that, unlike bilateral trade agreements, Schengen has a spatial dimension. Land-borne trade flows within Europe may cross one (e.g., France – Spain) or up to eight internal borders (e.g., Portugal – Finland). Hence, Schengen membership treats country pairs heterogeneously, depending on the number of internal Schengen borders to be crossed.[7]. To deal with this, we combine GIS data with information from Google Maps to count the number of Schengen borders crossed by truck (and ferry) along the shortest road distance between trading partners. This count variable is our measure of interest.

Our paper also relates to a large quantitative literature on the trade and welfare effects of product market integration. While the older literature used relatively complex theoretical models it paid relatively little attention to a close integration of parameter estimation, calibration, and simulation (Shoven and Whalley (1992)). Kehoe, T. (2005) argues that these models show poor ex post performance. Newer literature – started by the seminal contributions of Eaton and Kortum (2002) and Anderson and Van Wincoop (2003) and surveyed by Costinot and Rodriguez-Clare (2014) or Yotov et al. (2016) – uses more tractable frameworks (which we, following Ottaviano (2014), refer to as NQTMs) that feature a tighter connection between data and model. Kehoe et al. (2017) provides a critical review of these recent developments and points towards the need for further work.

Another strand of literature assesses the quantitative implications of European trade integration (or the lack thereof). Ottaviano (2014) uses a NQTT model to evaluate further European integration with respect to trade. While Mayer et al. (2017), the paper most closely related to ours, analyze the trade-related welfare losses that would occur in different scenarios if the European Union is dismantled. While we use a similar NQTT model to simulate trade-related welfare effects, this paper contributes to the literature by fully integrating the parameter estimation, the calibration and the scenario definition. The contribution is fourfold: (i) we obtain our the key model parameters – our policy estimates of the different EU integration agreements – for our simulation exercises from a structural gravity model that relies on exactly the same baseline data (same set of countries, sectoral decomposition and time period) as the simulation exercise; (ii) the definition of the scenarios of collapsing the various EU integration agreements are based on the economic analysis of those data, as we calculate trade cost changes in tariff and non-tariff barriers from our structural gravity estimates; (iii) we employ a rather simple general equilibrium framework but strong functional assumptions. As the model entails sectoral gravity equations, we can apply exact hat algebra; (iv) we make use of bootstrapping methods to quantify parameter uncertainty of our simulation exercise and thus provide confidence intervals for our estimates.

The rest of the paper is structured as follows. In Section 2 we lay out the theoretical structure of

[6]See Micco et al. (2003), Flam and Nordström (2006) Baldwin and Taglioni (2007), Bun and Klaassen (2017). Berger and Nitsch (2008), Bergin and Lin (2012) or Camarero et al. (2014).

[7]This feature is ignored in the small existing literature (Davis and Gift (2014), Chen and Novy (2011))

our framework. Section 3 explains our data and estimation strategy. Section 4 presents the results of the counterfactual analysis. Finally, Section 5 summarizes our approach and results.

2 Model

The model builds on Caliendo and Parro (2015) which provide a multi-sector version of the Eaton and Kortum (2002) gravity model with input-output linkages. Caliendo and Parro (2015) use tariff data to later identify the elasticity of substitution and then do counterfactual analysis by manipulating tariff levels. Other trade policy arrangements are not modeled explicitly. In contrast, we allow for variable non-tariff trade barriers, we add services trade, and we go for a structural estimation of the model.

2.1 Consumption and production

There are N countries indexed by i, n and J sectors indexed by j, k. The representative consumer's utility over final goods consumption C_n^j follows Cobb-Douglas preferences, with α_n^j denoting sectoral expenditure shares

$$u(C_n) = \prod_{j=1}^{J} {C_n^j}^{\alpha_n^j}, \tag{1}$$

with $\sum_j \alpha_n^j = 1$. Household income I_n comprises wage income and lump-sum tariff rebates. The labor force L_n of a country is mobile across sectors, i.e. $L_n = \sum_{j=1}^{J} L_n^j$, but not between countries.

In each sector j, a continuum of goods ω^j is produced with labor $l_n^j(\omega^j)$ and a composite intermediate input $m_n^{k,j}(\omega^j)$ of each source sector k according to the following production function:

$$q_n^j(\omega^j) = x_n^j(\omega^j)^{-\theta^j} \left[l_n^j(\omega^j)\right]^{\beta_n^j} \left[\prod_{k=1}^{J} m_n^{k,j}(\omega^j)^{\gamma_n^{k,j}}\right]^{(1-\beta_n^j)}, \tag{2}$$

where $\beta_n^j \geq 0$ is the value added share in sector j in country n and $\gamma_n^{k,j}$ denotes the cost share of source sector k in sector j's intermediate costs, with $\sum_{k=1}^{J} \gamma_n^{k,j} = 1$. It implies sectors are interrelated because sector j uses sector k's output as intermediate input, and vice versa. $x_n^j(\omega^j)$ is the inverse efficiency of good ω^j in sector j and country n. θ^j describes the dispersion of efficiencies in a sector j. A higher θ^j implies higher dispersion of productivities across goods ω^j. The dual cost c_n^j of an input bundle depends on a country's wage rate w_n and the price of the composite intermediate goods k country n has to pay

$$c_n^j = \Upsilon_n^j \, {w_n}^{\beta_n^j} \left[\prod_{k=1}^{J} {p_n^k}^{\gamma_n^{k,j}}\right]^{(1-\beta_n^j)}, \tag{3}$$

where Υ_n^j is a constant. Note that sectoral goods ω^j only differ in their efficiency $x_n^j(\omega^j)$. Consequently, we re-label goods with x_n^j.

Let κ_{in}^j denote trade costs of delivering good j from country i to country n. They consist of iceberg trade costs $d_{in}^j \geq 1$, with $d_{nn}^j = 1$, and ad-valorem tariffs $\tau_{in}^j \geq 0$ such that $\kappa_{in}^j = (1+\tau_{in}^j) d_{in}^j$. Following other gravity applications, we can model iceberg trade costs as a function of bilateral distance, FTAs (potentially several FTAs dummies for different treatment intensities) and other

observable trade cost proxies as $d_{in}^j = D_{in}{}^{\rho^j} e^{\delta^j \mathbf{Z}_{in}}$, where D_{in} is bilateral distance, and $\mathbf{Z}_{in}$ is a vector collecting dichotomous trade cost shifters (such as FTAs or other trade policies). Perfect competition and constant returns to scale imply that firms charge unit costs

$$p_{in}^j(x_i^j) = \kappa_{in}^j \left[x_i^j\right]^{\theta^j} c_i^j. \tag{4}$$

Label a particular intermediate good with the vector of efficiencies $x^j = (x_1^j, \ldots, x_N^j)$. Country n searches across all countries for the supplier with the lowest costs. Consequently, the price n pays for good x^j is

$$p_n^j(x^j) = \min_i \left\{ p_{in}^j(x_i^j); i = 1, \ldots, N \right\}. \tag{5}$$

Comparative advantage is introduced by assuming that countries differ in their productivity across sectors. The set of goods a country produces follows an exponential cumulative distribution function. The distribution of productivities is assumed to be independent across countries, sectors, and goods. The joint density of x^j is

$$\phi^j(x^j) = \left(\prod_{n=1}^N \lambda_n^j \right) \exp \left\{ - \sum_{n=1}^N \lambda_n^j x_n^j \right\}, \tag{6}$$

where λ_n^j shifts the location of the distribution, and thus, measures absolute advantage. In contrast, $\theta^j > 1$ indexes the productivity dispersion, and, hence, comparative advantage.

The composite intermediate good q_n^j in each sector j is produced with a Dixit-Stiglitz CES technology. Let η^j denote the elasticity of substitution and $r_n^j(x^j)$ the demand for intermediate good x^j. The sum of costs for all intermediate goods x^j are minimized subject to

$$\left[\int r_n^j(x^j)^{\frac{\eta^j - 1}{\eta^j}} \phi^j(x^j) dx^j \right]^{\frac{\eta^j}{\eta^j - 1}} \geq q_n^j. \tag{7}$$

As usual, demand for x^j depends on the variety's price relative to the sectoral price index $p_n^j = \left[\int p_n^j(x^j)^{(1-\eta^j)} \phi^j(x^j) dx^j \right]^{\frac{1}{1-\eta^j}}$:

$$r_n^j(x^j) = \left(\frac{p_n^j(x^j)}{p_n^j} \right)^{-\eta^j} q_n^j. \tag{8}$$

Note that $r_n^j(x^j)$ is the demand for intermediates of n from the respective lowest cost supplier of x^j. The composite intermediate good q_n^j is either used to produce intermediate input of each sector k or to produce the final consumption good.

2.2 Exports

Solving for the distribution of prices and integrating over the sets of goods where each country i is the lowest cost supplier to country n, we get the price of the composite intermediate good

$$p_n^j = A^j \left(\sum_{i=1}^N \lambda_i^j \left(c_i^j \kappa_{in}^j \right)^{\frac{-1}{\theta^j}} \right)^{-\theta^j}, \tag{9}$$

where $A^j = \Gamma \left[1 + \theta(1 - \eta_j) \right]^{\frac{1}{1-\eta_j}}$ is a constant. Prices are correlated across all sectors (via c_i^j). The strength of the correlation depends on the coefficients of the input-output table $\gamma_n^{k,j}$.

Similarly, a country n's expenditure share π_{in}^j for source country i's goods in sector j is

$$\pi_{in}^j = \frac{\lambda_i^j \left[c_i^j \kappa_{in}^j\right]^{\frac{-1}{\theta^j}}}{\sum_{i=1}^N \lambda_i^j \left[c_i^j \kappa_{in}^j\right]^{\frac{-1}{\theta^j}}}. \tag{10}$$

These shares apply to gross exports. Hence, gross exports follow the usual gravity equation.

2.3 General equilibrium

Let Y_n^j denote the value of gross production of varieties in sector j. For each county n and sector j, Y_n^j has to equal the value of demand for sectoral varieties from all countries $i = 1, \ldots, N$.[8] So, the goods market clearing conditions are given by

$$\begin{aligned} Y_n^j &= \sum_{i=1}^N \sum_{k=1}^J \frac{\pi_{ni}^j}{(1+\tau_{ni}^j)} \gamma_i^{j,k} (1-\beta_i^k) Y_i^k + \sum_{i=1}^N \frac{\pi_{ni}^j}{(1+\tau_{ni}^j)} \alpha_i^j I_i \\ &= \sum_{i=1}^N \frac{\pi_{ni}^j}{(1+\tau_{ni}^j)} \left(\sum_{k=1}^J \gamma_i^{j,k} (1-\beta_i^k) Y_i^k + \alpha_i^j I_i \right), \\ &= \sum_{i=1}^N \frac{\pi_{ni}^j}{(1+\tau_{ni}^j)} X_i^j, \end{aligned} \tag{11}$$

where national income consists of labor income, tariff rebates R_i and the (exogenous) trade surplus S_i, i.e. $I_i = w_i L_i + R_i - S_i$ and X_i^j is country i's expenditure on sector j goods. The first term on the right hand side gives demand of sectors k in all countries i for intermediate usage of sector j varieties produced in n, the second term final demand. Both intermediate and final demand are divided by $(1+\tau_{ni}^j)$ to convert them from CIF to FOB values. Tariff rebates are $R_i = \sum_{j=1}^J X_i^j \left(1 - \sum_{n=1}^N \frac{\pi_{ni}^j}{(1+\tau_{ni}^j)}\right)$.[9]

The model is closed with an income-equals-expenditure condition that takes into account trade imbalances for each country n. The value of total imports plus the trade surplus has to equal the value of total exports, which is equivalent to GDP Y_n:

$$\begin{aligned} &\sum_{j=1}^J \left(\sum_{k=1}^J \gamma_n^{j,k} (1-\beta_n^k) Y_n^k + \alpha_n^j I_n \right) \sum_{i=1}^N \frac{\pi_{in}^j}{(1+\tau_{in}^j)} + S_n = \sum_{j=1}^J Y_n^j \equiv Y_n, \\ &\sum_{j=1}^J \sum_{i=1}^N \frac{\pi_{in}^j}{(1+\tau_{in}^j)} X_n^j + S_n = \sum_{j=1}^J \sum_{i=1}^N \frac{\pi_{ni}^j}{(1+\tau_{ni}^j)} X_i^j \end{aligned} \tag{12}$$

[8] Our exposition differs from Caliendo and Parro (2015) in that they use total expenditure on composite goods instead of total production of varieties as endogenous variable. So in Caliendo and Parro (2015) the value of gross production comprises all foreign varieties that are bundled into the composite good without generation of value added. The value of production of sectoral varieties seems a more natural choice.

[9] Instead of the goods market clearing condition, one can also use the expenditure equation $X_i^j = \left(\sum_{k=1}^J \gamma_i^{j,k} (1-\beta_i^k)(F_i^k X_i^k + S_i^k) + \alpha_i^j I_i\right)$ as in Caliendo and Parro (2015).

2.4 Comparative Statics in General Equilibrium

The model is closed with a goods market clearing condition for all countries' composite goods from all sectors and an income equals expenditure condition for every country. Comparative statics with respect to trade policy changes affecting trade cost κ_{in}^{j} reveals the adjustment in gross and value added trade flows, wages, GDP, production and tariff income, in due consideration of general equilibrium effects running through changes in all countries relative competitiveness and demand spillovers. Trade along the value chain as featured in our model implies that a change in one country pair's bilateral trade cost affects every producer's effective production cost, albeit to a varying extent. Moreover, trade along the value chain implies that trade creation effects spill over to third countries not only through an changes in consumer demand, but also through changes in demand for intermediate goods.

In accordance with Dekle et al. (2008), we denote the relative (global) change in a variable from its initial level z to the counterfactual z' with $\hat{z} \equiv z'/z$. Moreover, let $\hat{\kappa}_{in}^{j} = \frac{1+\tau_{in}^{j'}}{1+\tau_{in}^{j}} e^{\delta^j (Z'_{in} - Z_{in})}$ denote the change in trade cost due to the dismantling of trade integration agreements. Then, we can solve for the counterfactual changes in all variables of interest using the following system of equations:[10]

$$\hat{c}_n^j = \hat{w}_n^{\beta_n^j} \left(\prod_{i=1}^{N} [\hat{p}_n^j]^{\gamma_n^{k,j}} \right)^{1-\beta_n^j}, \tag{13}$$

$$\hat{p}_n^j = \left(\sum_{i=1}^{N} \pi_{in}^j [\hat{\kappa}_{in}^j \hat{c}_i^j]^{-1/\theta^j} \right)^{-\theta^j}, \tag{14}$$

$$\hat{\pi}_{in}^j = \left(\frac{\hat{c}_i^j}{\hat{p}_n^j} \hat{\kappa}_{in}^j \right)^{-1/\theta^j}, \tag{15}$$

$$X_n^{j'} = \sum_{j=1}^{J} \gamma_n^{j,k} (1 - \beta_n^k) \left(\sum_{i=1}^{N} \frac{\pi_{ni}^{k'}}{1 + \tau_{ni}^{k'}} X_i^{k'} \right) + \alpha_n^j I'_n, \tag{16}$$

$$\frac{1}{Z} \sum_{j=1}^{J} F_n^{j'} X_n^{j'} + s_n = \frac{1}{Z} \sum_{j=1}^{J} \sum_{i=1}^{N} \frac{\pi_{ni}^{j'}}{1 + \tau_{ni}^{j'}} X_i^{j'}, \tag{17}$$

where $\hat{w}_n$ are wage changes, X_n^j are sectoral expenditure levels, $F_n^j \equiv \sum_{i=1}^{N} \frac{\pi_j^{in}}{(1+\tau_{in}^j)}$, $I'_n = \hat{w_n} w_n L_n + \sum_{j=1}^{J} X_n^{j'} (1 - F_n^{j'}) - S_n$, L_n denotes country n's labor force, and S_n is the (exogenously given) trade surplus. We fix $s_n \equiv S_n/Z$, where $Z \equiv \sum_n w_n L_n$ is global labor income, to make sure that the system is homogenous of degree zero in prices.

The shift in unit costs due to changes in input prices (i.e., wage and intermediate price changes) is laid out in equation (13). Trade cost changes directly affect the sectoral price index p_n^j, while changes in unit costs have an indirect effect (see equation (14)). Trade shares change as a reaction to changes in trade costs, unit costs and prices. The productivity dispersion θ^j indicates the intensity of the reaction. Higher θ^j's involve bigger trade changes. Goods market clearing in the new

[10] See also Caliendo and Parro (2015). Solving for counterfactual changes rather than levels strongly reduces the set of parameters and moments that have to be estimated or calibrated. In particular, no information on price levels, iceberg trade costs, or productivity levels is needed.

equilibrium is ensured by equation (16) and counterfactual income-equals-expenditure or balanced trade condition is given by equation (17). We can calculate welfare changes, namely changes in real income, as[11]

$$\hat{W}_n = \frac{\hat{I}_n}{\prod_{j=1}^{J} \left(\hat{p}_n^j\right)^{\alpha_n^j}}. \tag{18}$$

To solve the system of equations for multiple sectors, we again relate to Caliendo and Parro (2015), who extend the single-sector solution algorithm proposed by Alvarez and Lucas (2007). We start with an initial guess about a vector of wage changes. Using (13) and (14), it computes changes in prices, trade shares, expenditure levels, evaluates the trade balance condition (17), and updates the change in wages based on deviations in the trade balance.

The model provides static level effects on real income and trade. As dynamic effects of trade disintegration are not taken into account, it provides a lower bound for the potential effects of a dismantling of the European integration process. Contrary to a trade agreement, where effects would occur after a phase in[12], the effects of disintegration would potentially occur immediately.

3 Estimation

Using the equilibrium conditions of the model, we can obtain estimates of the model's unknowns using simple econometrics. Two sets of sector-specific parameters are needed: First, we need the dispersion of productivity, which, in this model, governs the elasticity of trade with respect to ad-valorem trade costs such as tariffs. Secondly, we need cost equivalents of NTM reductions that were achieved by specific trade agreements. Both these sets of parameters are frequently estimated in the gravity literature and hence we can build on well-established methods for the estimation of the elasticity of trade with respect to tariffs[13] and with respect to integration agreements.[14] With estimates of causal effects of trade agreements (EU, Euro, Schengen, and other RTAs) on sectoral trade flows at hand, the structural gravity model is used to back out the ad-valorem equivalent reductions in trade costs other than tariffs that were achieved with these agreements by tackling NTBs. These ad-valorem cost shifters for the different steps of European integration map one-to-one into model parameters and can thus be used to inform the policy variable in our various counterfactual analyses.

We also make use of the approximate normal distribution of the estimated parameters together with their estimated means and standard errors to draw bootstrap sets of all parameters. We then repeat the counterfactual analysis for all parameter draws to obtain standard errors for the model predictions reflecting the uncertainty from the estimation stage.

To simulate the effect of dismantling the steps of European integration or trade integration in general, we need comprehensive data. We structurally estimate θ and δ based on our gravity

[11] If $S_n \neq 0$, real income is different from real consumption. Therefore, one could use real consumption (i.e., real expenditure) as an alternative measure of welfare. In a static model, there is no fundamental rationale for $S_n \neq 0$, and one can defend both possibilities.

[12] This is particularly relevant for non-tariff trade costs. Evidence from existing FTAs shows that this phasing-in process usually takes between 10 and 12 years (see, e.g., Jung, 2012).

[13] For a discussion of the recent literature see Caliendo and Parro (2015), Head and Mayer (2014), or Bergstrand et al. (2013), Costinot et al. (2012) and Egger et al. (2012), Broda and Weinstein (2006)

[14] See, e.g., Head and Mayer (2014) and Egger et al. (2015) for recent examples.

framework. Data on the expenditure shares α, and the cost shares β and γ stem from input-output tables. Moreover, we need data on bilateral trade shares π, countries' total value added $w_n L_n$, and trade surpluses S.

3.1 Data

Our main data source is the World Input-Output Database (WIOD) described by Timmer et al. (2015). It provides sectoral production values, sectoral value added information and bilateral final and intermediate goods trade in producer and consumer prices, including service sectors. We can thus construct bilateral input-output tables and expenditure levels. The data capture 43 countries and the rest of the world (RoW) for the years 2000 to 2014. WIOD distinguishes 56 sectors. Since a number of sectors exhibits zero output in many countries, we aggregate the sectors into 50 industries. The aggregation concerns mostly services sectors; we keep the sectoral detail in the manufacturing and agricultural industries. We perfectly match WIOD data for 2014 on sectoral outputs, sectoral bilateral trade shares (aggregating intermediate and final goods trade), final goods expenditure shares, as well as intermediate cost shares. Moreover, we match the cross-section of tariffs in 2014.[15]

Bilateral preferential and MFN tariffs are taken from the World Integrated Trade Solutions (WITS-TRAINS) and the WTO's Integrated Database (IDB).[16] The tariff data and the WIOD trade data underlying the calibration of the model's observable moments are also used to estimate the trade elasticities for goods sectors - jointly with the ad-valorem equivalent changes in NTBs associated with the different steps European integration.

Data on RTA membership stem from the WTO.[17] Data on the membership in the European Union, the Euroarea and successive accession of countries to the Schengen Agreement stem from the European Commission.[18] We combine GIS data with information from Google Maps to obtain the count of the number of Schengen borders crossed by truck (and ferry) when moving from economic centers of i to n in year t. We use a combination of the shortest distance and travel time (see Felbermayr et al., 2017).

In our framework, the often bemoaned geometry of Europe is an advantage for econometric identification. It allows us to disentangle the different effects of the EU, the Eurozone, Schengen membership, and of other trade agreements with non-European countries (e.g., EU-Korea) by use of panel econometrics. The only strict subset to consider are EMU countries, which are at the same time also EU members. However, not all member states of the EU belong to Schengen or the EMU. Moreover, not all Eurozone members are part of Schengen and vice versa, plus they have ratified the agreement at different times. Third, some Schengen countries are not part of the EU. Hence,

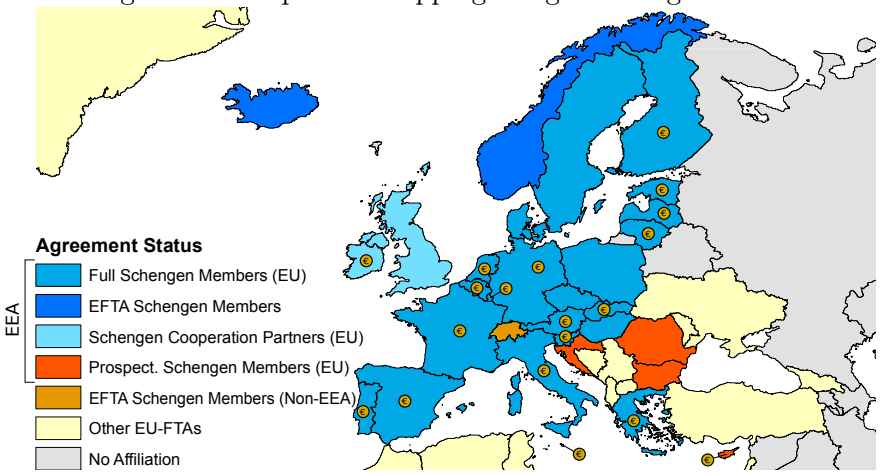
[15] We use the same approach as Aichele and Heiland (2016) to account for the fact that WIOD expenditure shares are in valued in "basic" (or "producer") prices, i.e., net of tariffs, while expenditure shares in the model are defined in "market" prices, i.e., including tariffs. Likewise, we use their approach to take care of changes in inventory that are part of the accounting system of WIOD but do not feature in our model.

[16] As tariffs are not available for every year and every pair within our time frame, we interpolate tariff levels forward and backward.

[17] The RTA gateway is accessible via `http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx`.

[18] Starting with seven countries in 1995, the agreement was joined by Italy and Austria in 1997, Greece in 2000, Denmark, Finland, Iceland, Norway, and Sweden in 2001, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia in 2007, Switzerland in 2008. The EU members Bulgaria, Croatia, Cyprus, Ireland, Romania and the United Kingdom do not participate in Schengen, while the non-EU countries Iceland, Norway, and Switzerland do.

Figure 1: Europe: Overlapping Integration Agreements



Note: The Euro icons mark whether a country is a member of the Eurozone. Data as of April 2017.

Schengen directly affects also outsiders to both Schengen and the EU (e.g., Turkey and Russia).[19] We take data on fiscal transfers of EU member states in 2014 from the European Commission (Table A7 in the Appendix).

The baseline data is available up to the year 2014. Hence, our comparative statics exercise compares the status-quo of 2014 with a hypothetical situation in which the EU integration steps are dissolved in that year.

3.2 Estimation of Model Parameters and Shocks

A key element of the simulation exercise is to distinguish the effects of integration steps and tariffs and to estimate their effects on non-tariff trade costs and the trade elasticity.

We estimate the vectors of sectoral trade costs θ and δ using a gravity regression following equation (10)

$$X_{in,t}^{j} = \exp\left[-\frac{1}{\theta^{j}}\ln(1+\tau_{in,t}^{j}) + \frac{\delta_{EU}}{\theta^{j}}EU_{in,t}^{j} + \frac{\delta_{Euro}}{\theta^{j}}Euro_{in,t}^{j} + \frac{\delta_{Schengen}}{\theta^{j}}Schengen_{in,t}^{j} + \frac{\delta_{RTA}}{\theta^{j}}RTA_{in,t}^{j} + \nu_{in} + \nu_{i,t} + \nu_{n,t}\right] + \varepsilon_{in,t}^{j} \tag{19}$$

where $X_{in,t}^{j}$ is the value of imports of country i to country n in sector j at time t, $1+\tau_{in,t}^{j}$ is an ad valorem tariff factor, and $1/\theta^{j} > 1$ is the sectoral trade elasticity. The terms $\nu_{i,t}$ and $\nu_{n,t}$ are year specific importer and exporter fixed effects and control for multilateral resistance. They account for the effects of third countries' trade costs on i's exporting and on n's importing behavior. These terms are generally unobserved and depend on bilateral trade costs between all

[19] While variable geometry helps with separately identifying the effects of overlapping integration steps, we need to keep in mind that the effects are identified through country pairs switching status; e.g., the EU coefficient reflects the effects of new members joining the EU in the period of observation (e.g., the 10 Middle and Eastern European countries, plus Romania, Bulgaria, and Croatia.)

trading partners worldwide. Moreover, they fully control for all exporter- and importer-specific time-varying determinants of trade (such as production or consumption). ν_{in} are bilateral country-pair fixed effects and $\varepsilon^{j}_{in,t}$ is a random disturbance.

The use of such a saturated model has several advantages. First, it provides some immunization against omitted variable bias as time-invariant bilateral or time-dependent country-level factors that affect trade are accounted for. Second, it frees us from approximating (or iteratively simulating) the multilateral resistance terms and from collecting sectoral output data (which are not always available in good quality). Third, the inclusion of bilateral fixed effects ν_{in} is a defense against possible endogeneity concerns. We are interested in unbiased estimates of $\frac{\delta_Z}{\theta^j}$, where $Z \equiv$ [EU, Euro, Schengen, other RTAs]. Contrary to the other integration measures, we do *not* define $\text{Schengen}^{j}_{in,t}$ as a binary variable taking value 1 if country i and country n have both ratified the Schengen Agreement. Such a definition mismeasures the treatment and misses systematic treatment heterogeneity: A land-borne trade flow in Europe from i to n may cross one, two, or up to eight internal Schengen borders. Moreover, the pair in may benefit from lower transit costs, even if i and/or n are outsiders to Schengen. Therefore, we use a count variable $\text{Schengen}^{j}_{in,t} = \{1, \ldots, 8\}$ registering the number of Schengen border crossings that land-borne trade between i and n involves. The selection of country pairs into integration agreements may not be random. However, joining a plurilateral agreement such as the EU or Schengen is not a pure bilateral decision. Thus, reverse causality may not be a major issue. Nonetheless, we include country-pair fixed effects ν_{in} to account for all time-invariant determinants that might jointly affect Z and $X^{j}_{in,t}$. This also addresses omitted variable bias and endogeneity in all policy variables Z (see, e.g., Baier and Bergstrand, 2007).

We estimate the model by Poisson Pseudo Maximum Likelihood (PPML) methods as recommended by Santos Silva and Tenreyro (2006) and Head and Mayer (2014). Standard errors allow for clustering at the country-pair level. Identification relies on time variation within country pairs with different exposure to mutual EU, EMU, or RTA membership and the number of Schengen borders relative to the total number of borders crossed (the latter is captured by ν_{in}).

3.3 Econometric Results

Our gravity results in Table (1) show that in an aggregated regression, goods trade has increased by 63% due to mutual EU membership, while services have increased by 79% between 2000 and 2014. The second strongest effect on goods is determined by the Eurozone with 9% and 16% for services. Each additional Schengen border increases goods trade by 9% and services by 7%, while other RTAs push goods by about 8% and services by 7%.[20] We estimate an trade elasticity for goods of -3.584.

For all determinants, we find substantial heterogeneity across the 22 goods (Table A2 in the Appendix) and 28 services sectors (Table A3 in the Appendix). A summary of results is provided in Table 2. The largest effects for the EU are sustained in Pharmaceutical Products & Preparations and Retail Trade; the Eurozone on Mining & Quarrying and Financial Services; RTAs on Pharmaceutical Products & Preparations and Architecture & Engineering; and Schengen on Fishing & Aquaculture and Postal & Courier. The largest trade elasticities can be sustained in Pharmaceutical Products & Preparations and Machinery & Equipment. Compared to the literature, we find very reasonable

[20] Other RTAs are identified only on agreements that entered into force in the 2000 to 2014 period. An overview of these RTAs can be found in Table A1 in the Appendix. Pre-EU accession treaties transit into EU membership at the point in time when the country entered the EU, or into an agreement between the EU and a third country or region (e.g. EU-Turkey). In both cases, identification comes from the first switch from no agreement to a bilateral treaty.

Table 1: The Impact of Eu Integration Steps on Bilateral Imports (2000 - 2014)

Dep. var.:	Bilateral Imports	
	Goods	Services
	(1)	(2)
Both EU	0.491***	0.580***
	(0.06)	(0.07)
Both Euro	0.085**	0.146**
	(0.04)	(0.06)
Schengen	0.084***	0.064***
	(0.01)	(0.02)
Other RTA	0.073	0.070
	(0.05)	(0.06)
Tariff	-3.584***	
	(0.95)	

Note: ***, **, * denote significance at the 1%, 5%, 10% levels, respectively. All models estimated using Poisson Pseudo Maximum Likelihood (PPML) methods. Robust standard errors (in parentheses) allow for clustering at the country-pair level. Pair as well as year specific importer and exporter fixed effects included but not reported. Number of observations: 27,735.

elasticities in all goods sectors, but four (Fishing & Aquaculture, Mining & Quarrying, Textiles, Wearing Apparel & Leather and Wood & Products of Wood and Cork). To proceed, we use the sectoral trade elasticities in the simulation exercise. We replace trade elasticities of the four sectors mentioned above by the aggregated goods elasticities (Table 1 column (2)).[21]

Our method does not generate trade elasticities for the services sectors since there are no tariffs or similar price shifters applicable. The literature has not yet found convincing ways to estimate those. Egger et al. (2012) are one exception, and we rely on their estimates. However, they do not allow for any variation within the services sector. [22] In robustness checks, we calculate trade elasticities on disaggregated 6-digit trade data.[23]

[21]This is necessary as we cannot violate the theory-imposed parameter constraint. Additionally, we later conduct robustness checks.

[22]Egger et al. (2012) exploit properties of a structural gravity model akin to ours to econometrically estimate the difference between the trade elasticity of goods and services, $\beta = \theta_G - \theta_S$. They find $\hat{beta} = 2.026$. Applying our own estimate $\hat{\theta}_G$, we find $\hat{\theta}_S = 1.559$. We use the t-value from Egger et al. (2012) (equal to 6.4035) to proxy the standard error of θ_S as 0.2435.

[23]More specifically, we run a gravity estimation on HS6 products obtained from CEPII's international trade database (BACI) that we relate to the 22 WIOD goods sectors (Table A6 in the Appendix). We replace sectoral elasticities with import-weighted mean elasticities over HS6 products within a WIOD sector – using only those HS6 products that satisfy our restriction on the tariff estimate. The sectoral variance-covariance matrix is adjusted by the standard errors calculated for the mean elasticities of import-weighted HS6 products within a WIOD sector. Services trade elasticities and their respective s.e. are again calculated based on Egger et al. (2012). We take the import-weighted mean of elasticity estimates and s.e. over all HS6 products. Again, we infer the coefficient of θ_S and the standard error from Egger et al. (2012) as described above.

Table 2: EU Integration Steps and Bilateral Imports (2000 - 2014)

Dep. var.:		Bilateral Imports				
Sector Description	**Sector**	**EU**	**Euro**	**Schengen**	**RTAs**	**Tariff**
Crops & Animals	1	0.755***	0.296*	0.153***	-0.002	-1.956**
Forestry & Logging	2	-0.134	0.403**	0.163***	-0.304*	-1.869
Fishing & Aquaculture	3	0.101	0.282	0.733***	-0.388	-3.584***
Mining & Quarrying	4	0.121	0.945***	0.030	-0.364*	-3.584***
Food, Beverages & Tobacco	5	0.480***	-0.154	0.129***	0.107	-1.634
Textiles, Apparel,Leather	6	0.344*	-0.001	0.043	-0.124	-3.584***
Wood & Cork	7	0.286**	0.123**	0.007	0.125	-3.584***
Paper	8	0.297***	0.067	0.031**	-0.081	-1.037
Recorded Media Reproduction	9	0.065	-0.224	0.067	-0.095	-2.042
Coke, Refined Petroleum	10	0.340**	0.253**	0.180***	0.021	-6.039***
Chemicals	11	0.672***	0.192**	0.070	0.093*	-3.776***
Pharmaceuticals	12	1.206***	-0.305***	0.338***	0.534***	-7.630*
Rubber & Plastics	13	0.696***	0.083**	0.151***	0.242***	-2.815***
Other non-Metallic Mineral	14	0.423***	0.196***	0.075***	0.134	-1.417*
Basic Metals	15	0.628***	0.146	0.130***	0.273***	-4.715***
Fabricated Metal	16	0.554***	0.123***	0.071***	0.250***	-1.841***
Electronics & Optical Products	17	0.417***	-0.209*	0.032	0.041	-5.731***
Electrical Equipment	18	0.829***	0.126	0.101***	0.305***	-6.424***
Machinery & Equipment	19	0.585***	-0.014	0.084***	0.156**	-7.509***
Motor Vehicles	20	0.753***	-0.060	0.152***	0.331***	-4.390***
Other Transport Equipment	21	0.461***	0.320*	-0.020	0.340***	-5.173**
Furniture & Other Manufacturing	22	0.061	0.064	0.110***	-0.267**	-3.416**
Electricity & Gas	23	0.810**	-0.197	0.039	0.516	1.559***
Water Supply	24	0.044	0.052	0.109**	-0.343*	1.559***
Sewerage & Waste	25	0.690***	0.002	-0.001	0.307	1.559***
Construction	26	0.867***	-0.053	0.047	0.377***	1.559***
Trade & Repair of Motor Vehicles	27	1.176***	0.033	0.482***	0.416**	1.559***
Wholesale Trade	28	1.031***	0.187***	0.172***	0.376***	1.559***
Retail Trade	29	1.208***	0.188	0.366***	0.516***	1.559***
Land Transport	30	0.629***	0.315***	-0.060*	-0.172*	1.559***
Water Transport	31	0.865***	-0.002	-0.016	0.215	1.559***
Air Transport	32	0.391**	-0.035	0.047	-0.236*	1.559***
Aux. Transportation Services	33	0.255**	-0.215**	0.093***	-0.233**	1.559***
Postal and Courier	34	0.567***	-0.414**	0.517***	0.609***	1.559***
Accommodation and Food	35	-0.243	0.296**	-0.165***	-0.313**	1.559***
Publishing	36	0.291*	-0.381***	-0.006	-0.206	1.559***
Media Services	37	0.303	0.124	-0.082	-0.117	1.559***
Telecommunications	38	0.213	0.251**	0.104***	-0.071	1.559***
Computer & Information Services	39	0.844***	0.202**	0.167***	-0.020	1.559***
Financial Services	40	0.785***	0.556***	-0.076	-0.036	1.559***
Insurance	41	-0.127	0.464***	-0.236*	-0.156	1.559***
Real Estate	42	0.540***	0.147	-0.013	0.035	1.559***
Legal and Accounting	43	0.322**	0.002	0.155***	0.112	1.559***
Business Services	44	1.075***	-0.031	0.069*	0.614***	1.559***
Research and Development	45	0.486***	0.271**	0.119***	0.055	1.559***
Admin. & Support Services	46	0.263*	0.226	0.124***	-0.214*	1.559***
Public & Social Services	47	0.390**	0.050	0.076	0.193	1.559***
Education	48	0.718***	0.097	0.150***	0.197**	1.559***
Human Health and Social Work	49	0.438*	0.212	0.192*	-0.020	1.559***
Other Services, Households	50	1.219	-0.379***	-0.026	-0.094	1.559***

Note: ***, **, * denote significance at the 1%, 5%, 10% levels, respectively. All models estimated using Poisson Pseudo Maximum Likelihood (PPML) methods. Robust standard errors (not reported) allow for clustering at the country-pair level. Pair as well as year specific importer and exporter fixed effects included but not reported. Number of observations vary between 23,085 and 27,735. Estimates for services sector trade elasticities are triangulated using results in Egger et al. (2012). In four sectors, sector level trade elasticities did not satisfy theoretical restrictions and were replaced by aggregate ones.

3.4 Bootstrapping standard errors

The estimation stage provides us not only with parameter estimates, but also with an (approximate) distribution of these values. We use the (approximate) normal distribution together with the

estimated covariance matrix of the parameters to obtain 1,000 draws of (50×5) parameter values. For the trade elasticity in the service sectors we draw 1,000 values from a normal distribution with $\mu = 1.559$ and $\sigma = 1.106$ corresponding to Egger et al. (2012)'s structural gravity estimates as explained above.

A few comments on this approach are in order. First, since we are estimating the gravity coefficients sector by sector, we are implicitly assuming that standard errors are uncorrelated across sectors. Secondly, drawing parameters from a normal distribution implies that with a certain probability we will always obtain some draws that violate the model-imposed parameter constraints, especially the constraint that $\theta > 0$. Dropping these (very few) draws comes at the cost of a small upward bias of the mean parameter estimate and a downward bias of the standard errors. Thirdly, we compute confidence intervals for the model outcomes based on an approximate normal distribution. Given that the model outcomes are highly non-linear functions of the parameters, this approximation is not innocuous. The distribution of model outcomes might be highly asymmetric even if the size of the underlying sample is large enough for the normal approximation to work well in the parameter estimation stage. Aichele et al. (2016a, 2017) describe alternative approaches to obtaining confidence intervals in similar situations.

4 Counterfactual Analysis

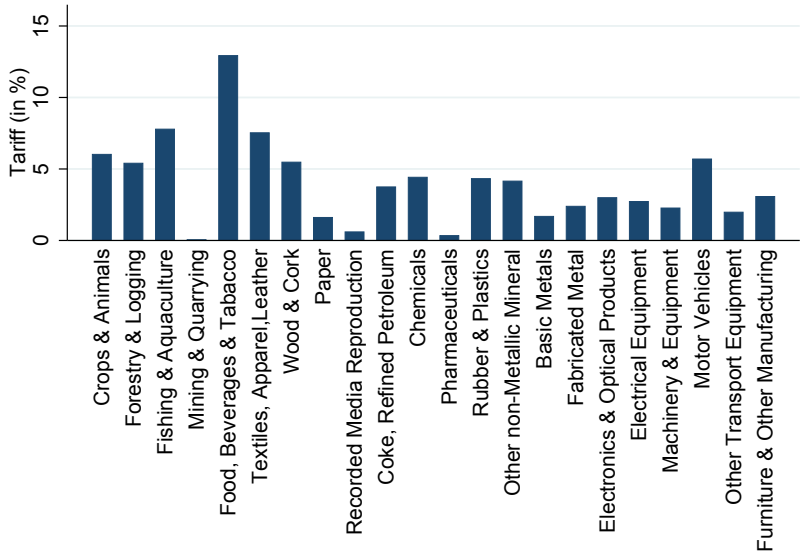
4.1 Scenarios

We now have paved the way to simulate the effect of resolving the integration of the European Union and trade integration in general equilibrium. The setup allows to explore different scenarios; from dissolving the Single Market, to breaking up other RTAs. Following the structural gravity estimations, we analyze the trade creation and diversion and welfare effects of a collapse of the various components of European integration. We describe predicted macroeconomic effects, such as welfare changes – measures by per capita income –, then we turn to the analysis of predicted sectoral gross and value added trade impacts. We end with a description of the simulated changes on real wages.

We look at seven different counterfactual scenarios: (1) Dismantling of the European Single Market, (2) collapse of the European Customs Union (tariff-free trade replaced by MFN tariffs), (3) dissolution of the Eurozone, (4) breakup of the Schengen Agreement, (5) dissolution of EU RTAs with third countries, (6) complete collapse of all European integration steps, (7) complete EU collapse including the termination of fiscal transfers.

Dissolution of the Customs Union (MFN tariffs). The European Customs Union is an essential component of the European Union and is binding for all its member states. It ensures a common external trade policy, with a common external MFN and/or preferential tariff on goods imports with third countries and free trade among EU member states. It addresses tariffs prevalent in goods trade, but does not tackle access or non-tariff barriers for services. The Customs Union preconditions that the European Commission negotiates for and on behalf of its members – including bilateral but also multilateral trade deals – who directly benefit from those. In this scenario, the European Customs Union with its common external tariff does no longer exist. EU members lose existing tariff preferences (currently zero tariffs) with each other. We assume that they apply most-favored nation tariffs to each other, as currently granted by the EU to third countries under the rules

Figure 2: Average EU tariffs



Note: The figure depicts trade-weighted averages of sectoral bilateral tariffs of the product-level MFN tariffs imposed by the EU in 2014.

of the World Trade Organization.[24] Figure 2 shows the sectoral trade-weighted MFN tariffs granted at the product-level by the EU to third-countries in 2014, which we use for the simulation exercise. While in this scenario, trade policy changes can be directly observed, in the other scenarios, the trade cost shocks have to be estimated.

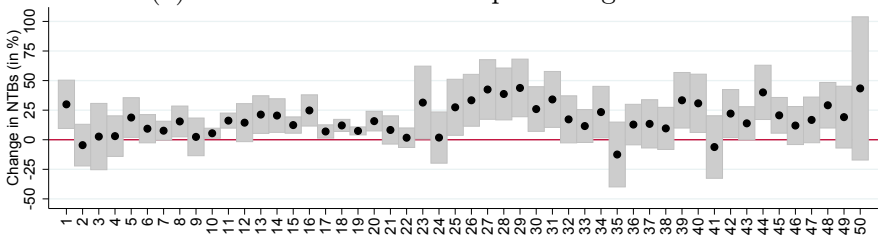
(a) Dissolution of the European Single Market. In 1951, Europe started out with the European Coal and Steel Community followed by the European Economic Community (1957) as a vehicle for economic reconstruction and peace. The objective of the Single European Act (1986) was to liberalize trade between its members and to create a single common market by 1992 with the aim of greater prosperity and economic efficiency for all. Liberalization was established gradually and took considerably longer for the services sectors.[25] The Single Market is at the heart of the European project and was formalized in the EMU (1992). It has removed and reduced barriers to intra-European trade in goods and services. To get access countries have to accept the four freedoms of the EU: free movement in goods, services, capital and labor within the boundaries of the EU. The depth of integration provided by the Single Market goes well beyond the tariff reductions of regular trade agreements as it addresses low behind-the-border non-tariff trade impediments. With its common regulatory framework (e.g., on competition), common regulatory rules and mutual recognition of each others standards and norms, the Single Market is designed to reduce trade costs (e.g., border inspection) and open up markets to facilitate trade and investment, driven by the belief of positive-sum returns for its member states. In this scenario, the European countries abolish the

[24]Note that in this case, EU countries would be able to set their own tariffs unrelated to each other, but they would also need to negotiate these individually with the WTO. Hence, we assume MFN tariffs of the EU at the current state in 2014.

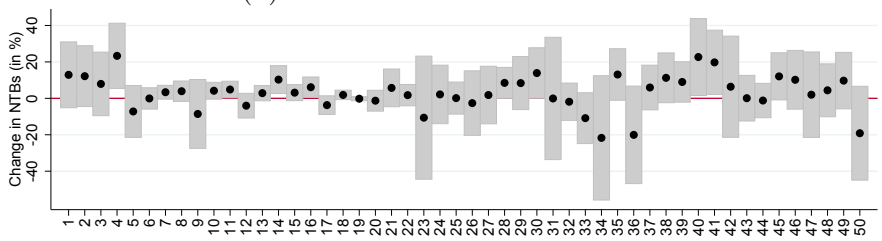
[25]While maritime transport was liberalized already in 1986, air transport in 1987 and road transport in 1992, banks enjoyed freedom of establishment since 1993, and the telecommunications market only in 1998.

Figure 3: Effects of Disintegration on Trade Costs

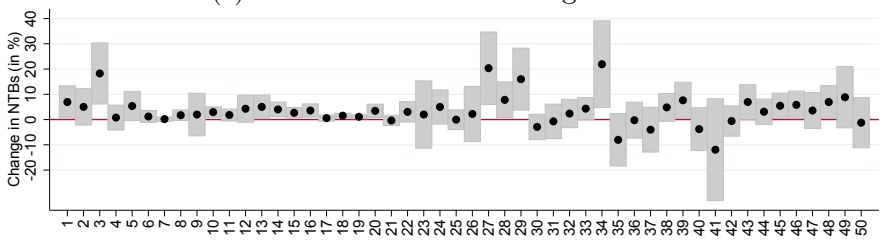
(a) Dissolution of the European Single Market



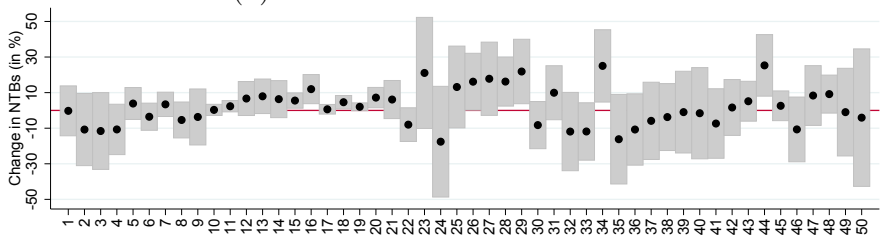
(b)Dissolution of the Euro Zone



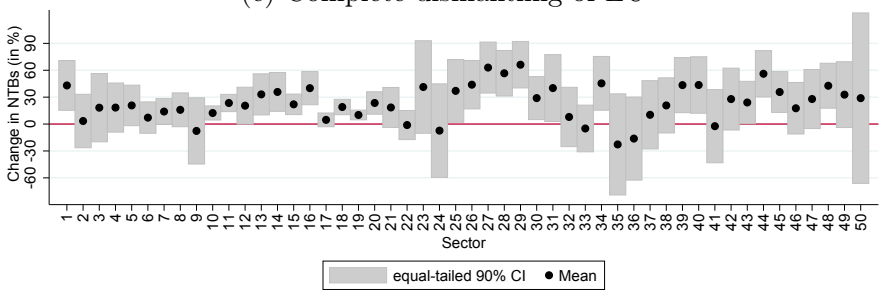
(c) Dissolution of the Schengen Zone



(d) Dissolution of the EU's RTAs



(e) Complete dismantling of EU



Note: The figures show the average increase in trade costs (as valorem tariff equivalents) by sector that would result from undoing the different integration steps. The estimates are based on the gravity estimates of policy measures and trade elasticities reported in Table NNN. Bootstrapped 90% confidence intervals.

Single Market. We reintroduce non-tariff barriers (NTBs) according to the sectoral trade costs on goods and services trade calculated from the gravity estimations; see the top panel in Figure 3.

(b) Dissolution of the Eurozone. A common currency has been the objective of the EU and its predecessors already since the 1960s. In 1993, the Maastricht Treaty entered into force with the aim of creating an economic and monetary union for all its members by the end of the millennium.[26] It has been driven by political ambition with economic gains as important side effects Baldwin et al. (2008). Formally established through the EMU in 1992, the formation of the monetary union was a longer process – preparations took more than a decade – until the exchange rates got fixed and the Euro was launched in 1999 in 12 EU countries in 2002 (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain). Slovenia entered in 2007, Cyprus and Malta in 2008, Slovakia in 2009, Estonia in 2011, Latvia in 2014 and Lithuania in 2015. In this scenario, we dissolve the monetary union. This affects only countries of the Eurozone and re-establishes transaction costs related to currency exchange between them. The expected additional NTBs are calculated from estimated Euro effects in the sectoral gravity equations are presented in Panel (b) of Figure 3.

(c) Dissolution of the Schengen Agreement. The Schengen Agreement, signed in 1985 and complemented by the Convention Implementing the Schengen Agreement in 1990, addresses various issues of cooperation between European states pursuing the broader goal of continental integration and a unified common market. Above all, it abolished border controls between signatories. First enforced on March 26th, 1995 by Belgium, France, Germany, Luxembourg, the Netherlands, Portugal, and Spain, the agreement has been joined by further European countries over the subsequent years. Today, the Schengen area comprises about 4.2 million square kilometers and more than 400 million citizens who can move freely across 26 member countries. In the Schengen scenario, we thus collapse the Schengen area and re-establish border controls at all Schengen-internal border posts. This not only affects the NTBs of Schengen members, but also those of geographically European countries' trade flows that pass through the Schengen area. The respective trade costs calculated from the sectoral gravity estimations; see Panel (c) in (Figure 3.

On top of this, trade between two Schengen outsiders (e.g., Romania and the UK) or between Schengen outsiders and insiders (e.g., Turkey and Germany) can also benefit from the agreement as it transits Schengen space. (see also Felbermayr et al., 2017).

(d) Dissolution of the EU's RTAs. Since the early 1990s, the world has experienced an unprecedented period of trade liberalization associated with a proliferation bilateral and plurilateral trade agreements. As of June 2017 (December 2014), the WTO reports that 291 (268) RTAs were in force. Against the backdrop of stagnating negotiations on the WTO's Doha Round, the EU has undertaken a change in its strategy and has negotiated and concluded numerous new bilateral RTAs as a result of the Global Europe Initiative. While the literature mutually agrees that RTAs promote bilateral trade among member states, there is still much debate about the actual size of the effects on members and outsiders, and on the welfare implications. Baier and Bergstrand (2007) found that RTAs increase aggregate goods trade of members about 100% after 10 to 15 years – five times the effect estimated using atheoretical gravity equations, while Anderson and Yotov (2016) found similar results also for disaggregated trade flows. Bergstrand et al. (2013) and Bergstrand et al. (2015) provide an analysis of general equilibrium comparative statics of trade flow changes due to an

[26]The UK and Denmark are excepted – even though Denmark has a fixed exchange rate policy with the Euro.

ex-post analysis of regional trade integration. Finally, Dai et al. (2014) estimate partial equilibrium trade diversion effects of trade agreements in a gravity framework. They find that members of a RTA trade 50% more, while countries that are not part of the agreement import 57% less due to the agreement (with a reduction of 21% on internal trade). These exemplary estimates show that RTAs substantially reduce trade barriers and behind-the-border trade impediments and thus play a significant role in increasing trade between partner countries, which is in turn associated with higher welfare. In this scenario, we take back all trade agreements in force between EU members and third countries (e.g., Switzerland, Turkey, Korea etc.) that were in force in 2014. NTBs are re-introduced between the countries concerned as shown in Panel (d) of Figure 3. Additionally, we re-introduce MFN tariffs between countries that previously enjoyed preferential tariff rates.

(e) Complete dismantling of the EU. If one of the above discussed European integration agreements collapses, this will send a strong political signal and set the dominoes falling. This scenarios thus considers the case that the above discussed integration agreements are taken back altogether. We reintroduce NTBs with respect to the Single Market, tariffs are set to MFN levels between current members of the EU, behind-the-border impediments related to the Eurozone or the Schengen Agreement are restored between current members, and all other RTAs of the EU with third countries are dissolved. Hence, this scenario simulates a world where the EU with all its trade-related integration agreements and other RTAs no longer exist. The related sectoral trade-costs of a complete collapse of the EU trade integration as calculated from the various integration steps in the gravity equation are depicted in Panel (e) of Figure 3.

Complete EU including Fiscal Transfers. The European Union uses a large-scale fiscal transfer system to foster economic and social cohesion of EU member states. The EU budget is financed by three main sources: Traditional (e.g., tariffs and sugar duties) and VAT-based resources (a standard percentage charged on the harmonized VAT base) account for about a quarter of the total EU budget. The largest share of EU budget is provided by a uniform percentage on each member state's gross national income, which bridges the gap between the agreed budget and the aforementioned budget sources. Although designed simply as a balancing system, the GNI contributions have become the largest source of revenue.[27] In all previous scenarios, fiscal transfers are implicitly included in S. They constitute one reason why income and expenditure diverge ($S \geq / \leq 0$) in our static world. In this scenario, we explicitly account for payments to and transfers from the EU budget. We assume that there will be no more net payments from any EU country to another if the EU is fully dismantled. These additional effects come on top of trade effects. We take NTB changes as in the previous scenario of a complete collapse of the EU (Panel (f) of Figure 3) but now also subtract fiscal transfers of EU member states (total expenditures – total own resources) from our model-consistent tariff incomes. We are thus in a situation where countries withhold their tariff income and subtract the corresponding amount from fiscal transfers (Table A7 in the Appendix).

4.2 Change in Gross Trade Flows

In this section we look at the changes in trade flows occurring in the six disintegration scenarios, starting with a description of the status quo. Table 3 shows aggregate trade flows between old EU

[27] Other rather small revenue sources include financing from non-EU member states that participate in particular EU programs (e.g., Norway or Switzerland), or fines on companies for breaching competition laws. These constitute usually less than 5% of the total budget.

members, new EU members, and non-EU countries, measured in gross terms (upper half) and in terms of value added (lower half). In 2014, old EU countries exported 6.3 tn. USD corresponding to 20% their total production value. About half of these exports were directed to fellow old (45%) and new EU countries (6%). Both shares are slightly larger (51%, respectively, 8%) on the importing side, implying that about 60% of imports (which in turn make up about 18% of total expenditure in these countries) come from (old and new) EU countries and are thus directly susceptible to cost increases caused by dismantling the integration agreements.

Exports to fellow EU countries are relatively more important for the new EU members, accounting for 19% (80%) of their total production (exports). A very similar pattern emerges on the expenditure (importing) side.

In terms of value added, old EU members exported 4.3 tn. USD in 2014, corresponding to 27% of the value added generated in these countries. Value added exports to other EU countries make up 12% of old EU countries' total value added. For new EU members, exported value added makes up a larger share of total value added (38%) and, likewise, a greater share goes to fellow EU countries (22%).

Greater gross trade shares with fellow European countries suggest that new EU members are more susceptible to increasing costs on intra-European trade flows, and suffer relatively more from a decline in production activity in the other EU countries. Moreover, as a larger share of their value added is consumed in other European countries, they are also more susceptible to negative spillover effects of declining income and consumption in the EU.

Table 3: Gross and Value Added Trade in the Baseline Year 2014 (in bn. USD)

Region	Output	Domestic sales	Exports to old EU	Exports to new EU	Exports to non-EU
old EU	31263	24929	2852	403	3071
new EU	3098	2239	452	141	266
non-EU	126637	111769	2322	255	10788

Region	Value added	Domestic absorption	Value added exports to old EU	Value added exports to new EU	Value added exports to non-EU
old EU	15900	11578	1635	222	2464
new EU	1396	871	243	59	222
non-EU	57486	47702	1720	183	7882

Note: Domestic sales (absorption) sums all group members' domestic consumption and does not include sales (value added exports) to other members of the same group. The difference between output (value added) and the sum of domestic sales (absorption) and (value added) exports is due to changes in the stock of inventory.

Table 4 show how these trade patterns would change in the different scenarios. We look first at the changes in total gross trade and production, before analyzing the value added effects. As for the welfare effects, the Single Market breakdown accounts for the lion's share of the changes caused by a complete dissolution of the EU agreements, followed by the Schengen Agreement; cp. also Table A8 in the Appendix. A dissolution of the Eurozone would have sizable effects on the old EU members trade patterns, but small and sometimes insignificant effects elsewhere. A joint collapse of all European agreements would drastically reduce the EU countries' trade. Their total exports are predicted to decline by 21-28%, where the collapse of the Single Market alone would lead to negative export growth of 14-19%. Trade flow changes are the consequences of two

effects; changes in competitiveness, reflecting in the trade shares π, and trade creation due changes in production and income across countries. Changes in competitiveness are driven by trade cost changes, which, thanks to the international input-output structure, potentially affect the cost of production in all sectors and countries. In our case, the strongest competitiveness effects occur, of course, in the European countries, for which the European integration agreements yielded the largest cost reductions. Besides these direct trade cost effects, relative competitiveness is also affected by general equilibrium adjustments in the cost of labor. Some of the negative competitiveness effects that dampen production tend to be offset by a reduction in wages reflecting smaller demand for labor.

Focusing on the Single Market breakdown scenario, direct losses of competitiveness, enhanced by output and demand reduction, are reflected in the collapse of trade within Europe (around 30%), which drives the overall export decline. Increased imports from non-EU countries make up only for a small portion of this decline (below 3%). Production is relocated to non-EU countries (column 1), stimulating exports from all regions to these countries (Column 5). Production relocation drives down relative wages in the European countries, making them more competitive outside Europe. This reflects in EU exports to non-EU countries increasing particularly strongly (2% and 3% compared to 1%). Within Europe, the new EU members are hit harder; production declines by 8%, compared to a decline of 3% in the old EU countries. The stronger effect of the trade cost increases on new EU countries is also indicated by the change in domestic consumption. Given higher cost of imports, production for the domestic market becomes relatively more attractive. In the EU countries, however, this effect is overcompensated by a sufficiently strong negative demand effect, especially in the new EU countries. Larger downward adjustments of wages in the new EU countries also explain why these countries exports to non-EU countries increase by more than for the old member states.

Dissolving the customs union has smaller but still statistically significant effects. Trade and output effects are less than one third of the effect of the Single Market breakdown, but are structure-wise very similar. Domestic sales, where gains in relative competitiveness are countervailed by a decline in demand, do not significantly change. This scenarios appears to, again, hurt new EU countries more. Old EU countries' trade is almost unaffected. Naturally, old EU countries, many of which are members of the Eurozone, are more strongly affected by a dissolution of the Eurozone. Exports to other old EU countries (in total) are predicted to decline by 3% (1%). New EU members are barely affected and so is the pattern of trade and production in the rest of the world.

A dissolution of the Schengen Agreement brings about sizable reductions in trade for all EU countries, whereby new EU countries' exports, imports, and total production are affected the most. In contrast to the previously discussed scenario, a dissolution of the Schengen Agreement also hurts EU countries trade with the rest of the world, as many shipments have to cross Schengen borders on the way to their final destination even if this lies outside Europe. Likewise, imports from non-EU countries decline. Within Europe, the Schengen agreement seems to benefit more the trade flows between the groups of old and new member countries, compared to trade flows within these groups. This is likely to due to the (imperfect) geographical clustering of old (new) member states in the western (eastern) part of Europe, which implies, that shipments between these groups cross more Schengen borders on average. New EU member are, again, affected more negatively, experiencing more than twice the decline in production compared to the old EU member states as well as a more sizable reduction in total exports. Moreover, in contrast to the old EU member states, domestic sales do not even partly make up for the decline in exports.

Dissolving the EU's trade agreements with non-EU countries also marginally reduces EU members' total trade, but has reverse effects on the trade patterns: Exports to non-EU member decrease

and intra-EU trade becomes relatively more attractive.[28]

Turning to the complete EU breakdown scenario, we find effects on production and trade that are structurally very similar to a collapse of the Single Market, but significantly larger. Trade among the EU countries would decline by 40-44%. The new EU countries lose the most, production is predicted to decline by 11% compared to 5% in the old EU countries. In contrast to the Single Market breakdown scenario, however, the EU countries' trade with the rest of the world does not make up for any of these losses. Neither imports nor exports from and to the non-EU countries experience significant positive growth effects, reflecting the negative consequences of the dissolution of the Schengen agreement and the EU's trade agreements for external trade. For the new EU countries, we even find a sizable and significant decline in imports from outside Europe of 3%.

Next, we include fiscal transfers explicitly in the the complete EU collapse scenario. Unsurprisingly, we find very similar effects to the baseline EU breakdown scenario. New EU member states lose the most with respect to exports from other European countries (between 43% and 45%), but trade of old EU economies within Europe drops similarly by 41% to 42%. Related to this, output falls between 5% in old EU members and 14% in new EU countries. The latter lose out an additional 3% if fiscal transfers are terminated in addition to all the EU integration steps they are involved in, as they trade less with old Europe but are mostly net beneficiaries from the budget reallocation within Europe. Interestingly trade with non-EU countries cannot compensate for the loss of intra-European trade. New EU members even lose 1% of exports with ROW, while old EU members show no significant growth of trade with the latter.

Given the prevalence of global value chains and the use of (foreign) intermediate goods in production, gross production and trade values are only partly informative about the value added effects of trade cost changes for the participating countries. Therefore, we additionally discuss changes in value added exports, focusing on the now well established concept of the "VAX-ratio," the ratio of value added exports relative to gross exports.[29] Stretching the terminology a bit, we also define a VAX-ratio of output as the ratio of total value added over total production. VAX-ratios can be seen as indicators for the aggregate importance of trade along the value chain. Going back to Table 4, both the old and the new EU countries started out with significantly smaller VAX-ratios of total exports than the rest of the world (68%, respectively, 61% compared to 73%). This is consistent with Europe's strong engagement in global value chains, which comes with high shares of foreign value added in these countries' exports. Moreover, the smaller VAX-ratios also reflect the intensive intra-European production network, as described in Aichele et al. (2016b). Production networks facilitate repeated back-and-forth trade of intermediate goods, inflating gross export values over their value added content. Comparing initial VAX-ratios of the old EU countries' exports across destinations, we find that these are significantly smaller for intra-European trade than for the trade with the rest of the world (57% compared to 80%).

Clearly, these aggregate measures depend also on the sectoral composition of trade flows. Both the foreign value added content and the extent of trade along the value chain vary greatly across sectors, being more important for complex manufacturing goods than for raw materials or services. As shown in Table 5, the VAX-ratio of total manufacturing exports ranges between 37% and 41% across the three country groups. In agriculture and services, in contrast, it ranges between 85 - 100%, and 110-137%, respectively. Manufacturing dominates intra-EU trade much more than trade

[28] Aichele et al. (2016b) discuss mirrored but structurally similar intra-EU preference erosion effects of the EU's agreements with outsiders in the context of a potential EU-USA trade agreement.

[29] This concept was introduced by (Johnson and Noguera, 2012). Aichele and Heiland (2016) show how the measure can be structurally derived within the present model framework.

Table 4: Changes in Aggregate Output, Gross Trade Flows (in %) and VAX-ratios (in %pts.)

Scenario					Exports to			
Region	Output		old EU		new EU		non-EU	
	gross (in %)	VAX (in %pts.)	gross (in %)	VAX (in %pts.)	gross (in %)	VAX (in %pts.)	gross (in %)	VAX (in %pts.)
Single Market								
old EU	**-3.40**	**0.33**	**-27.71**	**3.46**	**-30.64**	**3.95**	**1.75**	**-0.96**
new EU	**-7.54**	**0.66**	**-28.48**	**3.67**	**-29.05**	**5.42**	**2.74**	**-2.81**
Customs Union (MFN tariffs)								
old EU	**-0.84**	**0.29**	**-8.81**	**1.71**	**-9.70**	**2.01**	**0.50**	**-0.65**
new EU	**-1.81**	**0.53**	**-8.85**	**1.51**	**-9.70**	**2.83**	**0.66**	**-1.39**
Euro								
old EU	**-0.45**	**0.06**	**-2.82**	**0.88**	**-0.80**	0.10	0.05	**-0.14**
new EU	**-0.06**	0.01	**-0.57**	0.00	-0.07	**0.14**	0.05	**0.12**
Schengen								
old EU	**-0.72**	**0.10**	**-7.93**	**0.82**	**-10.62**	**1.75**	**-0.70**	**-3.24**
new EU	**-1.78**	**0.25**	**-9.96**	**1.62**	**-5.79**	**2.99**	-0.17	**-3.78**
other RTAs								
old EU	**-0.18**	-0.01	**0.35**	**-0.10**	**0.64**	-0.03	**-1.57**	**0.53**
new EU	**-0.24**	**0.03**	0.00	**0.15**	**0.28**	**0.24**	**-2.03**	**0.71**
Complete EU								
old EU	**-5.20**	**0.60**	**-40.78**	**4.85**	**-43.99**	**5.38**	-0.10	**-0.71**
new EU	**-10.74**	**1.15**	**-41.49**	**4.97**	**-39.54**	**7.99**	0.90	**-3.09**
Complete EU (incl. Transfers)								
old EU	**-5.34**	**0.60**	**-40.85**	**4.85**	**-45.17**	**5.07**	-0.16	**-0.69**
new EU	**-13.53**	**1.10**	**-42.60**	**4.76**	**-41.94**	**7.32**	**-1.08**	**-3.17**

Note: Bold characters indicate significance on the 10%-level based on 1,000 bootstrap replications and an approximate normal distribution. The full results can be found in Tables A8 and A9 in the Appendix.

with non-EU countries, contributing to the smaller VAX-ratios of aggregate intra-EU trade. Note, however, that this relationship between the VAX-ratios of intra-EU trade and trade with non-EU countries also holds at the sectoral level, implying that production networks and foreign input shares also play a important role.

Changes in the VAX-ratio may thus reflect adjustments in the sectoral composition of exports (production), the foreign value added content, and the intensity of back-and-forth trade. Table 4 displays the changes in these ratios for the different scenarios. A negative change implies that the value added equivalent of a specific trade flow or of output declined by more than the corresponding gross value.

Focusing first on the Single Market breakdown scenario, we find that for both new and old EU countries the VAX-ratios of output, domestic sales, and total exports increase (Table 4). For exports to non-EU countries, in contrast, we find that value added exports increase by less than the value of gross trade. This indicates that the value added changes are not as pronounced as the changes in gross measures. Total value added exports decreased by 4-5% points less than gross exports for old and new EU members, respectively, and increased by .2% points less for non-EU countries. Intuitively, bilateral value added exports are less dependent on the direct bilateral trade cost between a country pair, as those do not inhibit the value added that travels through different countries. In other words, while the reintroduction of trade barriers within Europe inhibits direct value added flows, it does not affect value added that is exported first to a non-EU country as an intermediate, processed there, and then exported to a (different) EU country. Likewise, the EU countries' gain in relative competitiveness in non-EU countries caused by the general equilibrium adjustment in wages that spurs exports does not equally benefit value added that travels through another EU country before reaching consumers in non-EU markets. The fact that double-counting also drives a wedge between value added exports and gross exports also adds to the "sluggishness" of value added flows, since more (less) trade means a greater (smaller) degree of inflation of gross values over their total (domestic plus foreign) value added content. As discussed above, the VAX-ratio is also affected by changes in the domestic trade share, which is positive for EU countries and negative non-EU countries. This exerts a force that countervails the above-described "sluggishness" of value added exports and can explain why the VAX-ratio of domestic sales increases in the EU countries. Table 6 shows that qualitatively similar changes in the VAX-ratios of EU countries' exports are also observed at the sectoral level.

Changes in the sectoral composition of exports and total production also add to these adjustments at the bilateral level. Table 6 shows for EU countries' exports that in the Single Market breakdown scenario, manufacturing is hit harder than services and agriculture as regards total export, despite the fact that the estimated trade cost changes are smaller. This owes, in parts, to an uneven impact of the general equilibrium changes in relative competitiveness: As labor cost are depressed in Europe, its competitiveness in third markets disproportionately benefits the sectors with large cost shares for labor; services and agriculture.[30] Manufacturing does not benefit from the decline in wages to a similar extent. Moreover, since manufacturing relies more on intermediate goods, which are largely sourced from fellow EU countries, it is subjected more to the positive trade cost shock. Accordingly, the growth in exports to non-EU markets is primarily driven by services and agriculture. As regards intra-EU trade, these differences in the production technology across sectors do not play out (on average), since all important competitors (namely, the European countries) are hit by structurally similar shocks and experience similar general adjustments in labor cost. On the part of non-EU countries we observe the opposite pattern; export growth to the EU

[30]See Figure A1 for median and 5-95%-ranges of the distribution of labor cost shares across countries for all 50 sectors.

countries and in total is driven by manufacturing, why exports to fellow non-EU countries, which exhibit similar labor cost adjustments, grow equally in all sectors.

EU (non-EU) countries' exports thus becomes less (more) manufacturing intensive, reinforcing the decline (increase) in VAX-ratio of aggregate exports. Table 7 (column 1) shows that similar changes occur to the sectoral structure of production. The single market breakdown brings about a shift in production away from manufacturing in Europe, and towards more manufacturing in non-EU countries. Accordingly, the VAX-ratio of aggregate production increases (decreases) in the EU (non-EU) countries.

In the Customs Union breakdown scenario, we find that the relative effect on manufacturing is even stronger (Table 6). As the reintroduction of tariffs – by design – affects only manufacturing and agriculture, we find a strong shift in the EU countries' sectoral production and export structure towards services; total manufacturing exports decline by 7-9% compared to an insignificant change in services exports. Services value added exports from EU countries, nevertheless, also take at hit, as shown by the changes in sector level VAX ratios of exports in Table 6. This is due to fact that are large fraction of services value added is indirectly exported through manufacturing. At the aggregate bilateral level, we find similar changes in VAX ratios as in the Single Market breakdown scenario (Table 4).

A dissolution of the Monetary Union appears to affect primarily the agricultural sector and to a lesser extend also services, where total exports decline by 9% and 1%, respectively (Table 6). Manufacturing is barely affected. This is in line with the disproportionally stronger trade cost effects of the common currency for these sectors (Figure 3) and, in contrast to the single market breakdown which has similar direct cost effects, small general equilibrium adjustments due to the fact that agriculture makes up a very small share of the economy. At the sector and the aggregate level, we find again an ameliorated response in value added trade of the directly affected (old EU) countries, compared to gross trade. For example, the decline in agricultural value added exports is only two thirds of the decline in the gross export value (6% instead of 9%), owing to the fact that a significant part of agricultural value added is exported indirectly through the manufacturing sector.

Terminating the Schengen Agreement would bring about changes in the sectoral pattern of total exports that are similar to the Single Market breakdown scenario; all sectors' exports take a sizable hit, especially manufacturing (Table 6). Value added trade effects, however, differ vastly, being more pronounced rather than sluggish in some cases. While direct manufacturing exports from the EU to the rest of the world decline as a result of the trade cost increases that also partly affect trade with outsiders, value added traveling through Schengen countries in the form of intermediates before being exported to the rest of the world embodied in a final good is subjected fully to the trade cost increases within the Schengen area. Value added exports from the EU countries' service and agricultural sectors to the rest of the world also decline, despite the increase in direct exports from these sectors. This can be attributed in part to the mechanism alluded to just above, and partly also to the decline in manufacturing exports that embody large amounts of value added from these sectors. Hence, total value added exports to the non-EU countries also decline at the bilateral level (Table 4).

In the scenario were EU dissolves all of its trade agreements with outsiders we also find that exports to the non-EU countries decline, particularly for manufacturing (Table 6). However, in contrast to a dissolution of the Schengen Agreement, EU-internal trade cost are unchanged and hence, value added exports that reach the rest of the world through other EU countries are not disproportionately affected. Moreover, value added traveling through non-EU countries that did not have a trade agreement with the EU to begin with are also not affected. Hence, total value added exports decline by less than their gross value counterparts. The aggregate change, however,

is entirely driven by the manufacturing sector. Services and agricultural value added exports decline by more than gross export flows.

In the complete EU breakdown scenario, we find again that the value added export changes experienced by the EU countries are smaller in absolute terms than their gross value counterparts, declining by 5-7% (5-8%) less than total (intra-EU) gross exports (Table 4). At the sectoral level we find that the sometimes countervailing forces exerted by the individual steps of European disintegration render some of the VAX-ratio changes small and insignificant. Given that most integration steps seem to have particularly favored manufacturing, a complete EU breakdown would unsurprisingly also affect this sector the most. Manufacturing exports within Europe would decline by up to 44% (Table 6). Manufacturing output in the old (new) EU countries is predicted to decline by 8% (15%), losing 0.9 percentage points (1.4 percentage points) of its share in total production (Table 7). This depresses value added exports from services and agriculture, which decline by more or little less than gross exports from these sectors. Despite the fact that part of this value added travels through countries that are unaffected by the trade cost changes. For manufacturing value added flows, in contrast, we find that the ameliorating force of value added flows' lesser dependence on direct bilateral trade cost plays out for intra-EU trade, where value added export changes are about 6% smaller in absolute value. For manufacturing exports to non-EU countries, this same force leads to a decline in the VAX-ratio since value added exports, in contrast to direct exports, also depend on the cost of intra-EU trade.

Finally, we look at the scenario that assumes a complete collapse of the EU including the termination of fiscal transfers. Trends are very similar to the previous scenario. Gross export changes of EU economies are smaller than their value added counterparts. Similar to the previous scenario, we find that countervailing forces of taking EU integration steps back leave some of the VAX-ratio changes small and insignificant at the sectoral level. Manufacturing is again most strongly affected by a complete collapse of the EU also if we include budget transfers explicitly. Within Europe, manufacturing exports would drop by 44% for old and new EU countries (Table 6), slightly more than under the previous scenario. We find that manufacturing output in the old (new) EU countries declines by 8% (17%), losing 0.8 percentage points (1.5 percentage points) of its share in total production (Table 7). Value added exports also fall for agriculture and services. Compared to the previous scenario gross changes in exports within Europe in agriculture and services lose between 0.2 and 1.75 percentage points. For non-EU countries, we find a decline in the VAX-ratios in all three sectors with EU countries since value added exports also depend on the cost of intra-EU trade. Gross exports with the EU are negatively affected only in manufacturing. They fall by 2.65% with old EU and 4.95% with new EU economies.

4.3 Change in Income per Capita

We can rank European integration steps according to their effects on real income per capita in the baseline year 2014. The collapse of the European integration steps hold heterogeneous effects across the 44 countries and regions. A regional breakdown of the effect on real income from a collapse of the EU integration steps relative to the status quo are shown in Table 8 and results are summarized in Figure 4.

If we dissolve the European Single Market, we find significant[31] and sizable negative income effects for the EU member states. The largest effects on income per capita relative to the status quo in the baseline year 2014 occur in the smallest economies: Luxembourg (-19.73%) and Malta

[31] Here and in what follows we determine significance based on a significance level of $\alpha = 10\%$.

Table 5: Trade Flows and VAX-Ratios in the Baseline Year 2014 (in bn. USD)

Exports to:		EU		non-EU	
Region	Sector	gross (bn. USD)	VAX (in %)	gross (bn. USD)	VAX (in %)
old EU	Agric.	130	68.8	62	118.6
	Manuf.	2154	33.3	1762	49.7
	Serv.	971	108.2	1247	121.6
new EU	Agric.	22	88.9	10	117.8
	Manuf.	414	30.5	152	53.1
	Serv.	156	100.0	103	124.8
non-EU	Agric.	361	110.6	1679	101.4
	Manuf.	1396	42.4	6720	40.1
	Serv.	820	111.1	2389	146.0

(-14.33%). Besides that most new EU members experience large reductions in income per capita, if the EU Single market is resolved. Our simulations predict the largest effects for Hungary (-10.64%), Czech Republic (-9.47%), Slovak Republic (-8.91%), Slovenia (-7.68%), Estonia (-7.75%), or Poland (5.93%). But long established small EU members, such as Austria, Belgium or Ireland also experience similar negative effects, with -6.17%, -8.20%, and -9.35%, respectively. The welfare effects on large EU economies, such as Germany (3.91%), France (2.91%), Italy (2.52%), or the UK (2.33%) are in comparison much smaller. Some third countries would see significant but small negative effects, like the United States (-0.02%, respectively), but several others could reap significant benefits from a collapse of the EU Single Market: Switzerland would see its income per capita increase by 0.49%, Taiwan by 0.30%, Korea by 0.24%, Turkey by 0.19% and China by 0.14%. Note that these numbers reflect the effect of a change in a stock variable (trade cost) on a flow variable (income). Hence, the predicted losses (or gains) occur repeatedly in the sense that every year (our period for measuring flow variables) following the collapse of an integration agreement, annual real income is smaller by a given percentage than if the agreement were still in place.

Removing the EU Customs Union and replacing tariffs on intra-EU trade flows by MFN tariffs leads to much smaller effects on income per capita compared to the previous scenario.[32] The biggest losses are experienced in Ireland (-0.68%), the Czech Republic (-0.42%) and the Netherlands (0.37%), while most other EU countries experience negligibly small negative effects relative to the status quo. Non-EU countries tend to slightly gain. Interestingly, a few EU countries (Cyprus, Malta, Portugal, Greece and the UK) also significantly gain. Such positive real income effects are not implausible, given that the re-introduction of tariffs, in contrast to the other steps of dismantling European integration, has a positive first-order effect on income.

In a scenario where we resolve only the Eurozone, we find clear negative effects on Eurozone members. Significant losses per annum range between -3.86% in Luxembourg and -0.25% in Italy. All Eurozone member countries are predicted to lose. All of them are statistically different from zero, with the exception of Greece. Outsiders to the monetary union, in particular the non-Euro European countries, tend to lose as well. While most other outsiders to the agreement remain largely unaffected relative to the status quo, we do find trade creating effects for Norway (0.22%),

[32]The reason might be that European MFN rates are already very low and thus play a minor role compared to low-behind the border barriers. Note also that the EU's current MFN rates might not be optimal for each and every of its members. In the case of a collapse of the Customs Union, each country could set their own "optimal" tariffs, which would have to be negotiated with the WTO. We here set MFN tariffs of the EU as prevalent in the year 2014.

Table 6: Changes in Sectoral Trade Flows and VAX ratios

Exports to:		EU		non-EU	
Scenario		gross	VAX	gross	VAX
Region	Sector	(in%)	(in %pts.)	(in%)	(in %pts.)
Single Market					
old EU	Agric.	**-19.46**	2.86	**4.00**	-2.17
	Manuf.	**-28.37**	**3.52**	**0.94**	**-1.23**
	Serv.	**-28.55**	3.55	**2.80**	**-1.42**
new EU	Agric.	**-19.21**	2.10	**5.46**	**-1.73**
	Manuf.	**-28.10**	**3.98**	**1.24**	**-4.10**
	Serv.	**-31.32**	**5.43**	**4.68**	**-3.35**
Customs Union (MFN tariffs)					
old EU	Agric.	**-8.79**	-1.25	**0.60**	**-1.28**
	Manuf.	**-12.64**	**2.27**	**0.42**	**-0.97**
	Serv.	**-0.69**	**-4.06**	**0.60**	**-0.50**
new EU	Agric.	**-9.88**	-0.69	**1.07**	**-1.81**
	Manuf.	**-12.23**	**1.85**	**0.42**	**-2.38**
	Serv.	**-0.51**	**-3.78**	**0.98**	**-0.93**
Euro					
old EU	Agric.	**-14.40**	**5.47**	**0.56**	**-3.20**
	Manuf.	-1.52	**1.18**	-0.17	**0.07**
	Serv.	**-3.31**	**1.14**	**0.33**	**-0.29**
new EU	Agric.	0.02	0.21	**0.20**	**0.27**
	Manuf.	-0.10	**-0.16**	0.07	**0.15**
	Serv.	**-1.44**	**0.77**	0.01	0.10
Schengen					
old EU	Agric.	**-7.38**	0.43	-0.85	**-4.97**
	Manuf.	**-8.09**	**1.37**	**-1.89**	**-2.60**
	Serv.	**-8.77**	1.00	**0.98**	**-4.52**
new EU	Agric.	**-7.24**	1.46	0.13	**-4.78**
	Manuf.	**-9.03**	**2.04**	**-1.94**	**-3.63**
	Serv.	**-9.02**	1.36	**2.41**	**-5.28**
Other RTAs					
old EU	Agric.	**-1.45**	**0.30**	2.14	**-2.51**
	Manuf.	**0.72**	**-0.04**	**-2.53**	**0.90**
	Serv.	**-0.11**	**0.27**	**-0.40**	**-0.33**
new EU	Agric.	**-0.79**	**0.45**	0.49	**-1.47**
	Manuf.	**0.21**	**0.26**	**-3.27**	**1.24**
	Serv.	**-0.18**	**0.28**	**-0.45**	**-0.45**
Complete EU					
old EU	Agric.	**-43.18**	5.54	**6.55**	**-8.69**
	Manuf.	**-43.68**	**5.63**	**-2.60**	**-0.42**
	Serv.	**-35.37**	0.46	**3.10**	**-2.56**
new EU	Agric.	**-32.21**	1.86	**7.51**	**-4.87**
	Manuf.	**-42.86**	**5.61**	**-2.42**	**-4.48**
	Serv.	**-37.39**	2.57	**5.14**	**-4.83**
Complete EU (incl. Transfers)					
old EU	Agric.	**-43.45**	5.54	**6.42**	**-8.69**
	Manuf.	**-43.88**	**5.60**	**-2.65**	**-0.39**
	Serv.	**-35.57**	0.42	**3.02**	**-2.54**
new EU	Agric.	**-33.96**	1.63	**5.60**	**-5.36**
	Manuf.	**-44.44**	**5.28**	**-4.95**	**-4.59**
	Serv.	**-38.35**	2.10	**3.94**	**-5.30**

Note: Bold characters indicate significance on the 10%-level based on 1,000 bootstrap replications and an approximate normal distribution. The full results can be found in Tables A10, A10, A10 and A10 in the Appendix.

Table 7: Changes in Sectoral Output and Sectoral Shares in Total Production

Scenario: Region	Sector	Baseline	Single Market	Customs Union	Euro	Schengen	Other RTAs	Complete EU	Complete EU incl. Transfers
		Output (in bn. USD)	Output change (in %)						
old EU	Agric.	684	**-2.85**	**-2.14**	**-1.92**	**-0.78**	**-0.60**	**-7.06**	**-7.30**
	Manuf.	7786	**-5.02**	**-2.47**	**-0.52**	**-1.48**	**-0.19**	**-8.28**	**-8.42**
	Serv.	22793	**-2.86**	**-0.25**	**-0.38**	**-0.46**	**-0.17**	**-4.09**	**-4.23**
new EU	Agric.	148	**-3.70**	**-2.09**	**0.27**	**-0.78**	**-0.37**	**-6.34**	**-9.36**
	Manuf.	1027	**-9.41**	**-4.05**	0.04	**-3.15**	**-0.33**	**-14.54**	**-17.43**
	Serv.	1923	**-6.84**	**-0.59**	**-0.14**	**-1.13**	**-0.18**	**-9.04**	**-11.77**
		Output share (in %)	Change in output share (in %pts.)						
old EU	Agric.	2.2	0.01	**-0.03**	**-0.03**	-0.00	-0.01	**-0.04**	**-0.05**
	Manuf.	24.9	**-0.42**	**-0.41**	-0.02	**-0.19**	-0.00	**-0.81**	**-0.81**
	Serv.	72.9	**0.40**	**0.44**	**0.05**	**0.19**	0.01	**0.85**	**0.85**
new EU	Agric.	4.8	**0.20**	-0.01	**0.02**	**0.05**	-0.01	**0.24**	**0.23**
	Manuf.	33.1	**-0.67**	**-0.76**	**0.03**	**-0.46**	**-0.03**	**-1.41**	**-1.50**
	Serv.	62.1	**0.47**	**0.77**	**-0.05**	**0.41**	**0.04**	**1.18**	**1.27**

Note: Bold characters indicate significance on the 10%-level based on 1,000 bootstrap replications and an approximate normal distribution. The full results can be found in Table in the Appendix.

Russia (0.08%) and Mexico (0.01%).

If we dismantle the Schengen Agreement, we find that this affects members to the agreement, but also all other geographically European countries negatively – except Romania, Malta and Luxembourg do not show an effect significantly different from zero. Effects range between -2.94% in Hungary to -0.44% in Russia. But, we also see small trade creation effects for countries far away from Europe, who would win if the Schengen Agreement is abolished. These are India and Mexico (both 0.01%), Indonesia (0.02%), China (0.03%), Taiwan and Korea (both 0.06%). We find substantial heterogeneity among geographically European countries. Peripheral and poorer countries to the agreement, such as Hungary, Estonia, Slovakia, Latvia, Lithuania, or the Czech Republic lose most from a breakdown of the Schengen Agreement. Smaller but richer economies (Austria, Netherlands, Portugal, Poland, Belgium, Slovenia, Switzerland and the Nordic countries) lose a significant share of their income due to their trade structure with other European countries; between -0.85% and -1.84%. At the lower end are large European economies, like Germany, France or Spain. Due to its geography, Greece has the smallest loss from Schengen with -0.63%. Geographically European countries that are outsiders to the agreement like Russia (-0.44%), Turkey (-0.63%), Great Britain (-0.46%), Ireland (0.96%) and Croatia (-0.98%) also lose income per capita, as they trade a lot with European countries and thus benefit from open borders.

In column (5), we look at a collapse of all RTAs which EU members have jointly signed with third countries and a reintroduction of NTBs and MFN tariffs. While Switzerland, Turkey and Korea (all partner countries to agreements with the EU) experience large losses in income per capita (-1.15%, -0.28%, and -0.27%, respectively), most EU countries experience small welfare losses of about -0.1 to -0.2% (Ireland has the highest loss with -0.34%). Cyprus and Norway show small positive effects that are not statistically different from zero, while some Asian counties currently not in any free trade agreement with the EU would gain from a dissolution of existing RTAs of the EU with third countries. This includes Taiwan (0.04%), China (0.02%), or Japan (0.01%).

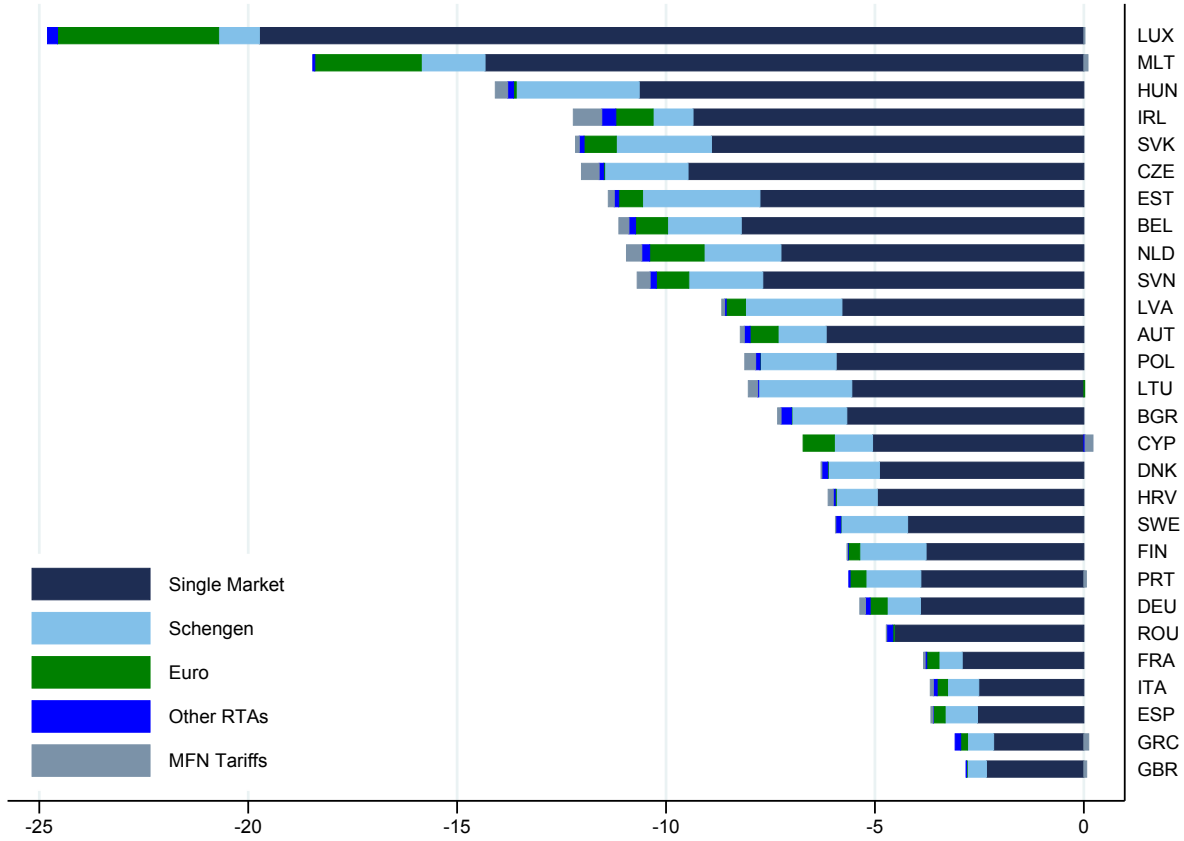
In a scenario with a complete collapse of all EU integration steps, we find that all members to the EU experience significant losses in income per capita, but heterogeneity exists across countries

Table 8: Changes in Income per Capita in %, Baseline Year 2014

Scenario:	Single Market (1)	Customs Union (2)	Euro (3)	Schengen (4)	Other RTAs (5)	All (6)	All w/ transfer (7)
AUS	0.01	-0.00	0.01	0.00	**0.00**	**0.02**	**0.02**
AUT**	**-6.17**	**-0.09**	**-0.67**	**-1.15**	**-0.14**	**-7.97**	**-7.91**
BEL**	**-8.20**	**-0.24**	**-0.77**	**-1.76**	-0.16	**-11.10**	**-11.47**
BGR*	**-5.67**	**-0.08**	-0.01	**-1.31**	**-0.25**	**-7.12**	**-11.57**
BRA	0.00	0.00	**-0.00**	-0.00	0.00	0.00	0.00
CAN	**0.03**	-0.00	0.01	0.00	-0.00	**0.06**	**0.06**
CHE	**0.49**	**0.05**	**-0.09**	**-0.85**	**-1.15**	**-2.00**	**-2.02**
CHN	**0.14**	**0.03**	0.01	**0.03**	**0.02**	**0.22**	**0.22**
CYP*	**-5.06**	**0.19**	**-0.75**	**-0.91**	0.03	**-6.05**	**-7.29**
CZE*	**-9.47**	**-0.42**	-0.02	**-2.00**	**-0.11**	**-11.97**	**-14.71**
DEU**	**-3.91**	**-0.13**	**-0.41**	**-0.80**	**-0.11**	**-5.22**	**-5.10**
DNK**	**-4.89**	-0.02	-0.01	**-1.23**	**-0.14**	**-6.35**	**-6.37**
ESP**	**-2.55**	**-0.05**	**-0.28**	**-0.78**	-0.01	**-3.56**	**-4.20**
EST*	**-7.75**	**-0.14**	**-0.57**	**-2.81**	**-0.11**	**-11.15**	**-14.01**
FIN**	**-3.78**	-0.01	**-0.28**	**-1.59**	-0.02	**-5.63**	**-5.60**
FRA**	**-2.91**	**-0.04**	**-0.29**	**-0.56**	-0.04	**-3.72**	**-3.72**
GBR**	**-2.33**	**0.07**	-0.02	**-0.46**	-0.01	**-2.71**	**-2.88**
GRC**	**-2.16**	**0.12**	-0.16	**-0.63**	**-0.13**	**-2.84**	**-5.83**
HRV*	**-4.94**	**-0.12**	-0.03	**-0.98**	**-0.05**	**-5.92**	**-6.85**
HUN*	**-10.64**	**-0.30**	-0.06	**-2.94**	**-0.14**	**-14.16**	**-20.82**
IDN	**0.06**	**0.02**	0.00	**0.02**	0.00	**0.10**	**0.10**
IND	**0.06**	**0.02**	0.01	**0.01**	0.01	**0.11**	**0.11**
IRL**	**-9.35**	**-0.68**	**-0.89**	**-0.96**	**-0.34**	**-12.31**	**-12.68**
ITA**	**-2.52**	**-0.07**	**-0.25**	**-0.75**	**-0.09**	**-3.56**	**-3.76**
JPN	**0.02**	**0.01**	**-0.01**	0.01	**0.01**	**0.04**	**0.04**
KOR	**0.24**	**0.06**	0.01	**0.06**	**-0.27**	0.06	0.05
LTU*	**-5.55**	**-0.22**	0.02	**-2.23**	-0.03	**-7.80**	**-12.72**
LUX**	**-19.73**	0.03	**-3.86**	-0.98	-0.24	**-23.26**	**-23.74**
LVA*	**-5.79**	**-0.07**	**-0.46**	**-2.31**	-0.04	**-8.33**	**-12.02**
MEX	**0.03**	**0.01**	**0.01**	**0.01**	-0.06	-0.02	-0.02
MLT*	**-14.33**	**0.10**	**-2.55**	-1.53	-0.05	**-17.81**	**-20.11**
NLD**	**-7.25**	**-0.37**	**-1.30**	**-1.84**	**-0.19**	**-10.90**	**-10.98**
NOR	0.08	**-0.02**	**0.22**	**-1.29**	0.49	-1.11	-1.13
POL*	**-5.93**	**-0.26**	-0.00	**-1.82**	**-0.11**	**-7.77**	**-11.83**
PRT**	**-3.90**	**0.06**	**-0.38**	**-1.31**	**-0.03**	**-5.26**	**-7.30**
ROU*	**-4.53**	-0.01	**-0.04**	-0.00	**-0.15**	**-4.65**	**-8.21**
ROW	**0.06**	**0.03**	0.01	0.03	0.00	**0.15**	**0.13**
RUS	0.04	**-0.01**	**0.08**	**-0.44**	-0.03	**-0.47**	**-0.50**
SVK*	**-8.91**	-0.09	**-0.77**	**-2.28**	**-0.11**	**-11.87**	**-14.34**
SVN*	**-7.68**	**-0.31**	**-0.78**	**-1.77**	**-0.15**	**-10.35**	**-13.25**
SWE**	**-4.22**	-0.01	-0.00	**-1.60**	**-0.12**	**-6.01**	**-5.75**
TUR	**0.19**	**0.08**	-0.01	**-0.63**	**-0.28**	**-0.83**	**-0.85**
TWN	**0.30**	**0.06**	0.00	**0.06**	**0.04**	**0.46**	**0.45**
USA	**-0.02**	**-0.00**	-0.00	**-0.02**	0.00	**-0.03**	**-0.03**

Note: ** Old EU member states, * New EU member states. Bold values are statistically different from zero at $\alpha = 10\%$ based on 1,000 bootstrap replications and an approximate normal distribution. The full results can be found in Tables A13 and A13 in the Appendix.

Figure 4: Change in Real Income in % for Various Scenarios, Baseline Year 2014



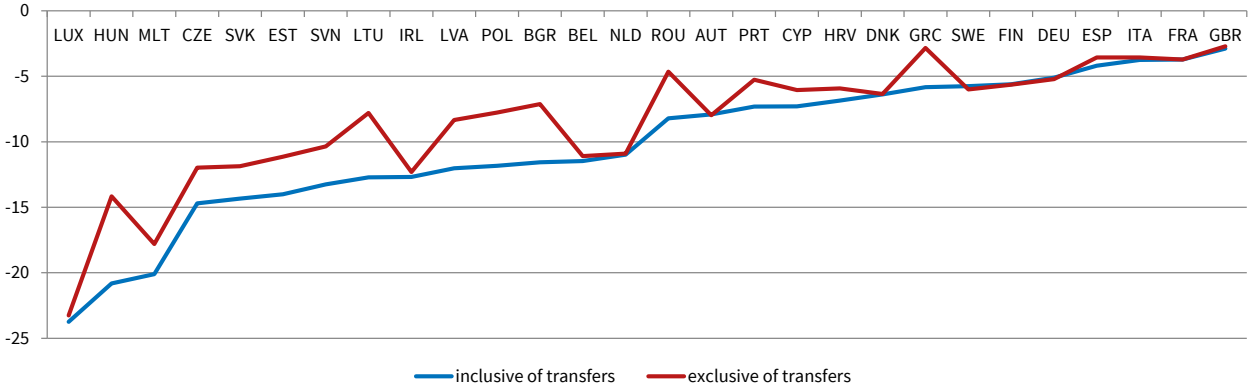
depending of their degree of integration and economic structure (compare column (6) of Table 8). Small economies like Luxembourg (-23.26%) and Malta (-17.81%), as well as new EU members (Hungary -14.16%, Czech Republic -11.97%, Slovakia -11.87%, Estonia -11.15%, Slovenia -10.35%, Lithuania -7.80%, or Latvia -8.33%) lose most, while established EU economies show a wider spread: Ireland -12.31% with the largest and the UK -2.71% with the smallest losses in income per capita relative to the status quo in 2014. Among the outsiders to the agreements, countries close to the EU such as Switzerland (-2.00%), Turkey (-0.83%), or Russia (-0.47%), who have a high degree of trade integration with EU countries, lose as well. The U.S. are also negatively affected (-0.03%). Nearly all Asian countries would experience positive changes in their income per capita from a collapse of all the European integration agreements, namely Taiwan (0.46%), China (0.22%), India (0.11%), Indonesia (0.10%) and Japan (0.04%). This is also true for Australia (0.02%) and Canada (0.06%).

Note that the results from simultaneously undoing all integration steps are not identical to the sum across partial dissolution scenarios. The reason simply is that there exist important complementarities between scenarios. For example, reinstating tariffs would be more costly in presence of the single market than without it, as the latter drives up trade volumes and the tax base.

Finally, we explicitly include fiscal transfers into the complete EU collapse scenario in column (7) of Table 8. This shows very similar effects in magnitude and significance to the complete EU collapse, but countries with net payments lose less, while net receiving economies show larger losses if transfers are terminated. While Sweden, Germany, Austria and Finland would have lower losses by 0.26 to 0.03 percentage points compared to the EU collapse scenario in column (6), the income

per capita loss of France would be the same. Eastern European economies and EU peripheral countries loose out the most. Hungary shows the largest effect when considering fiscal transfers with -20.82% income per capita losses – which is 6.66 percentage points higher than under the EU complete collapse scenario. This is followed by Lithuania with -12.72% (4.92 percentage points higher looses), and Bulgaria with -11.57% (4.45 percentage points higher losses). Greece would lose -5.83% of per capita GDP due to a collapse of the EU and the termination of fiscal flows – which is nearly 3% more than without the explicit inclusion of the budget transfers –, while the income per capita of Portugal would fall by -7.3% (2.04 percentage points more). All other old EU states loose more with the termination of the EU budget transfers, but relatively to the EU collapse scenario in column (6), losses are only slightly larger (between 0.02 and 0.64 percentage points). Losses in income per capita range between 23.74% in Luxembourg and -2.88% in the UK, all of them statistically significant for EU countries.

Figure 5: Change in Real Income in % for Single Market and Complete EU Collapse incl. Fiscal, Baseline Year 2014



Note: The figure depicts percentage changes in income per capita relative to the baseline year 2014. F The dashed lines are the 90%-confidence bounds based on 1,000 bootstrap replications and approximate normal distribution.

We show a ranking of percentage changes in income per capita including the 90%-confidence bounds based on our bootstrapping method in Figure 5.[33]

The share of each component in the total welfare loss or gain due to a EU collapse and its associated trade agreements is depicted in Figure 4. Overall, the breakdown of the EU single market has the largest share for member states, followed by the Schengen Agreement and the Eurozone. Generally, it appears to be true that the effect of a complete EU breakdown (Figure 5) is smaller than the sum of the effects of dissolving individual agreements as shown in Figure 4. This is due to the fact that summing over the individual effects ignores their dependence on a specific baseline. Since the effect of dissolving an individual agreement is stronger, the more integrated the affected countries are in the baseline equilibrium, any given individual disintegration step reduces the negative effect of the subsequent steps of disintegration.

4.4 Patterns of Heterogeneity in the EU28

Figure 6 shows how certain important country characteristics correlate with the simulated effects of a complete reversal of all European integration steps, including the end of fiscal transfers. The

[33]Rankings for the all scenarios including confidence intervals can be found in Figure A2 in the Appendix.

upper-left diagram examines the role of population as in 1995.[34] The graph shows a very clear positive correlation: smaller countries suffer more strongly from a dissolution of Europe, regardless of whether observations are population weighted or not. The weighted regression features a slope of 2.75, indicating that an in increase in population by 1% lowers the absolute size of the loss by 0.0275 percentage points. The regression has an R^2 of 0.45. The upper-right diagram looks at the role of per capita income. The correlation is very weak and statistically significant only when observations are weighted by population. In that case, the slope is equal to 4.98, and the adjusted R^2 is equal to 0.38. The lower-left diagram looks at the log of the weighted average distance from other EU members and finds a positive correlation. The slope of the fitted curve is equal to about 7.5 regardless of whether observations are weighted or not, and is statistically significant at the 5% level. So, more peripheral countries lose less from an end of Europe. Finally, the lower-right figure studies the relation of losses and openness, defined as the ratio of exports over GDP in %. The plot shows a strong and negative correlation. The slope of the regression is equal to -0.13 or -0.17, depending on weighting, and the R^2 always lies above 0.73. More open countries clearly suffer more from a collapse of Europe.

A simple population-weighted regression of the percentage losses on all four variables featuring in 6 explains almost 92% of the variation resulting from our simulations.[35] Except for population, all variables have a statistically significant partial effect on relative losses, with beta coefficients of 0.43 for log income per capita, 0.11 for log average distance, and -0.66 for openness.[36]

4.5 Changes in Real Wages

Next, we are interested in how real wages change if we break up the various trade integration agreements. It differs from real GDP, as it does not take tariff income into account. Results of simulated changes in percent are listed in Tables A14 and A14 in the Appendix.

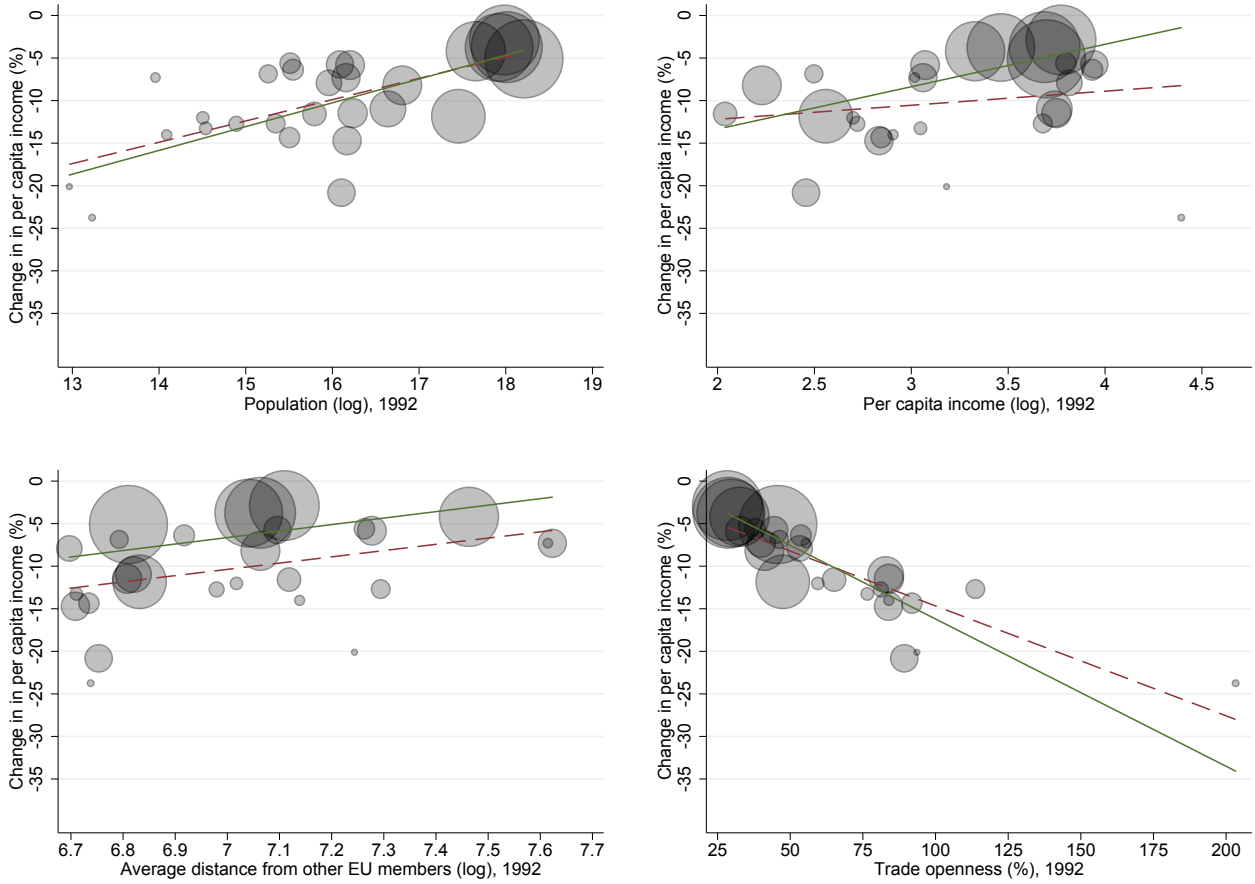
If we focus on European countries, the model predicts real wage changes with a complete collapse of the EU ranging between -19.21% in Luxembourg and -19.16% in Malta, followed by Hungary (-13.73%) and Slovakia (-12.57%), to -3.10% in the UK (not part of the Eurozone or the Schengen Agreement). All simulation estimates for EU countries are statistically significant from zero. Not surprisingly, we again find strong heterogeneity not only across countries, but also across scenarios. The predicted decrease in real wages for EU countries is mainly driven by a breakdown of the Single Market, while the second strongest source is the collapse of the Schengen Agreement, followed by the EU Customs Union (except Cyprus, Luxembourg and Malta show stronger effects from the Euro), the Euro and a minor share due to the dissolution of other EU trade agreements. Generally old EU members experience smaller losses than the new EU economies. Considering fiscal transfers explicitly with a complete EU collapse, we find that the effects of the UK and Italy remain the same, while Austria, Germany, Sweden, the Netherlands, France, Denmark and Finland lose out slightly more (between 0.05 and 0.01 percentage points) compared to the complete collapse in column (6). Eastern European and mostly small or peripheral EU countries now show similar to slightly lower effects on the real wage due to a collapse of the EU including fiscal transfers explicitly. The effects are smaller by 0.02 percentage points in Spain and Belgium up to 0.65 percentage points in Malta and Bulgaria and 0.71 percentage points in Hungary. Real wage losses range between 19.12% in Luxembourg and 2.86% in Greece and are statistically significant for all EU member states.

[34] 1995 is the first year in which data for all EU28 countries is available.

[35] Without weighting, the fit falls to about 88%.

[36] Beta coefficients measure the effect of a one standard deviation increase in the independent variable relative to one standard deviation of the dependent variable.

Figure 6: Correlating Losses and Country Characteristics: Size,the Level of Per Capita Income, Remoteness, and Openness



Note: The figures plot correlations between the simulated losses of a complete breakdown of European integration including the end of fiscal transfers (in % of base line real per capita income) and various characteristics of the 28 EU member sttes. The size of the population (in logs) as of 1992, income per capita in thousand US dollars (in logs) as of 2014, average distance (in km) to all other EU member states (in logs), and trade openness (exports relative to GDP, in %) in 1992. Size of circles denotes population size. Solid lines represent fitted population-weighted linear regressions; dashed lines represent fits of unweighted regressions. All slopes are statistically different from zero (at least at the 5% level) except the one for the unweighted regression on log per capita income.

Next, we look at third country effects. In a scenario which dismantles the European Single Market, the model predicts an increase in real wage changes only for Switzerland (0.29%), while the effects for all other countries are not statistically significantly different from zero. Replacing the EU Customs Union with MFN tariffs has positive effects on several outside countries (0.02% for China, Korea, Taiwan, ROW respectively; 0.04% for Switzerland and 0.07% for Turkey), while the real wages of Norway would drop (-0.02%). A breakup of the Euro area has nearly no effect on third countries, with the exception of Switzerland with -0.07%. A resolution of the Schengen Agreement would also affect the real wages of geographically European economies, such as Switzerland (-0.77%) which is part of Schengen, Turkey (-0.64%) and Russia (-0.44%). In a scenario which abolishes all other RTAs in force between the EU and third countries in 2014, the model predicts that countries with existing regional trade agreements, such as Mexico, Korea, Turkey and Switzerland lose between 0.14% and 1.41% of their real wages.[37]

[37]The simulation gives insignificant losses for Norway, which is currently part of the European Economic Area

4.6 Robustness

We analyze the robustness of our findings with regard to the choice of the baseline equilibrium and with regard to the estimation specification. Our robustness analysis focuses on real income effects.[38]

Brexit. First, we analyze how costly a complete EU collapse would be after the now seemingly unavoidable Brexit. To this end, we simulate first a new equilibrium where pre-EU trade barriers between the EU countries and the United Kingdom have been reestablished and the United Kingdom also leaves the EU's trade agreements with third countries. In a second step, we then analyze the welfare effects a complete EU breakdown conditional on Brexit having taken place. Our treatment of the United Kingdom in the first stage is the same as given to all EU countries in the complete EU breakdown scenario. Arguably, in view of the current discussion about different possible versions of the Brexit, our scenario is the hardest possible and should thus be viewed as an upper bound of the possible effects of Brexit on our analysis. Column (1) of Table A15 in the Appendix shows the effect of Brexit on real income by country. We find a sizable and negative effects for the United Kingdom (-2.3%), but also for the geographically close and/or small, open, service-oriented nations of Ireland (-4%), Luxembourg (-3.5%), and Malta (-4.5%). Column (2) shows the real income effects of a complete EU breakdown conditional on Brexit. Column (3) provides for comparison the corresponding real income effects of the scenario pre-Brexit, and Column (4) shows the difference between the two. For the European countries, a complete EU breakdown implies significantly smaller losses conditional on Brexit having taken place, albeit the relative importance of Brexit is very heterogeneous: For the United Kingdom, Brexit makes up 85% of the total losses of the EU collapse, for Ireland, this number stands at 30%. Brexit also accounts for substantial shares of the losses from a EU breakdown for the old EU members (5-12%), but for smaller shares of new EU members' losses (1-5%).

Alternative Elasticity Estimates. Columns (5) and (6) of Table A15 in the Appendix show welfare effects obtained with alternative sets of estimated trade elasticities. Column (6) is based on a calibration based on the aggregate elasticities shown in Table 1, applying identical elasticities and trade cost effects to all sectors. In Column (5), we use sectoral weighted averages of elasticities estimated at the product-level (HS6). Elasticities are shown in Table A6 in the Appendix. None of these variations in the sectoral elasticities leads to large changes in the magnitude of the welfare effects nor in the ranking of countries. These findings suggest that the model's results do not critically hinge on the level of aggregation chosen in the estimation stage, nor do they appear to be very sensitive to exact magnitude of the estimated elasticities and the sectoral heterogeneity.

5 Conclusion

In this paper we carry out a quantitative assessment of the trade and welfare effects of European integration. We use a New Quantitative Trade Model (NQTM) (Ottaviano (2014)) to simulate the general equilibrium effects of various milestones such as the introduction of the Euro, the creation of the Schengenzone, the Single Market, the Customs Union, and the conclusion of trade agreements with third parties.

between EFTA and the EU. The gains predicted by the model for China, India, Japan, Taiwan and the US are not statistically different from zero.

[38] More detailed results are available upon request.

The integration of parameter calibration and scenario definition based on the estimation of sector-level gravity equations allows to bootstrap confidence intervals for all endogenous variables. This makes one important component of uncertainty surrounding our results visible; however, in most cases, the confidence intervals are actually rather narrow. It is the task of future research to also quantify model uncertainty. To this end, models need to be appropriately nested; NQTMs offer a good platform to do this.

We find that the Single Market dominates the trade and welfare effects, but that the common currency and the Schengen Agreement have contributed significantly to growth in trade and welfare, too. We also find a very large degree of heterogeneity amongst EU member states: if Europe is undone, smaller, poorer, peripheral, and more open members would lose more than larger, richer, more central, and less open ones. For instance, after the complete dissolution of Europe, Hungarian real income exclusive of net transfers would be about 14% lower than in the status quo; inclusive of transfers that loss would be almost 21%. Occupying a middle ground, Germany would lose about 5.22% if transfers are continued, and only slightly less (5.10%) when transfers are discontinued. This is interesting, since it suggests that Germany's terms-of-trade actually improve due to the transfers as the pure fiscal amount is higher than the difference between the welfare damage net and gross of transfers. For some countries, such as Luxembourg, the positive terms-of-trade change triggered by the transfers seems to be even stronger than the negative transfer itself.

Our analysis can be improved on several dimensions. First, besides parameter and scenario uncertainty, model uncertainty should be accounted for, too. For instance, the quantitative role of key assumptions such as the mode of competition is still very much unclear. Making progress is not easy: we need nested models and we require much richer data than what we have used in this paper, but a more comprehensive grasp of the uncertainties involved is necessary to improve the credibility of quantitative trade models. Related to this, it is also important to move away from models that are 'exactly' identified to models that are 'overidentified' in the sense that the set of empirical moments exceeds the number of parameters to be estimated. Such free moments can be used to assess the validity of the model. A final avenue for further research relates to the estimation step: in this paper, we have estimated average treatment effects. However, for ex post assessments, it is absolutely possible to allow for heterogeneity between different countries or country groups.

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A Appendix

Table A1: RTAs Entered into Force: 2000 - 2014 (within WIOD Country Sample)

Country codes		year	Treaty
CHE	MEX	2001	EFTA - Mexico
EST	HUN	2001	Pre-EU Accession Treaties
MEX	NOR	2001	EFTA - Mexico
BGR	LTU	2002	Pre-EU Accession Treaties
CHE	HRV	2002	EFTA-Croatia (Pre-EU Accession) until 2012
CHN	IND	2002	Asia Pacific Trade Agreement (APTA) - Accession of China
CHN	KOR	2002	Asia Pacific Trade Agreement (APTA) - Accession of China
EST	BGR	2002	Pre-EU Accession Treaties
HRV	EU	2002	Pre-EU Accession Treaties
HRV	NOR	2002	EFTA-Croatia (Pre-EU Accession) until 2012
BGR	HRV	2003	Pre-EU Accession Treaties
CHN	IDN	2003	ASEAN - China
CZE	HRV	2003	Pre-EU Accession Treaties
HRV	POL	2003	Pre-EU Accession Treaties
HRV	ROU	2003	Pre-EU Accession Treaties
HRV	SVK	2003	Pre-EU Accession Treaties
HRV	TUR	2003	Croatia - Turkey (Pre-EU Accession)
HUN	HRV	2003	Pre-EU Accession Treaties
LVA	BGR	2003	Pre-EU Accession Treaties
AUS	USA	2005	United States - Australia
MEX	JPN	2005	Japan - Mexico
KOR	CHE	2006	EFTA - Korea, Republic of
NOR	KOR	2006	EFTA - Korea, Republic of
IDN	JPN	2008	Japan - Indonesia
CAN	NOR	2009	EFTA - Canada
CHE	CAN	2009	EFTA - Canada
CHE	JPN	2009	Japan - Switzerland
IDN	AUS	2010	ASEAN - Australia
IND	JPN	2011	India - Japan
KOR	EU	2011	EU - Korea, Republic of
KOR	USA	2012	Korea, Republic of - United States
CHE	CHN	2014	Switzerland - China
KOR	AUS	2014	Korea, Republic of - Australia

Table A2: EU Integration Steps and Bilateral Imports, Goods (2000 - 2014)

Dep. var.:	Bilateral Imports											
Sector Description	Sector	EU	s.e.	Euro	s.e.	Schengen	s.e.	RTAs	s.e.	Tariff	s.e.	Obs.
Crops & Animals	1	0.755***	(0.14)	0.296*	(0.17)	0.153***	(0.04)	-0.002	(0.13)	-1.956**	(0.80)	27735
Forestry & Logging	2	-0.134	(0.18)	0.403**	(0.16)	0.163***	(0.05)	-0.304*	(0.16)	-1.869	(2.15)	26490
Fishing & Aquaculture	3	0.101	(0.45)	0.282	(0.29)	0.733***	(0.15)	-0.388	(0.29)	.	.	25755
Mining & Quarrying	4	0.121	(0.29)	0.945***	(0.31)	0.030	(0.08)	-0.364*	(0.20)	.	.	27705
Food, Beverages & Tobacco	5	0.480***	(0.09)	-0.154	(0.10)	0.129***	(0.03)	0.107	(0.08)	-1.634	(1.24)	27735
Textiles, Apparel,Leather	6	0.344*	(0.18)	-0.001	(0.09)	0.043	(0.04)	-0.124	(0.12)	.	.	27735
Wood & Cork	7	0.286**	(0.12)	0.123**	(0.06)	0.007	(0.01)	0.125	(0.11)	.	.	27735
Paper	8	0.297***	(0.09)	0.067	(0.05)	0.031**	(0.01)	-0.081	(0.07)	-1.037	(0.94)	27735
Recorded Media Reproduction	9	0.065	(0.17)	-0.224	(0.14)	0.067	(0.09)	-0.095	(0.16)	-2.042	(1.64)	26520
Coke, Refined Petroleum	10	0.340**	(0.14)	0.253**	(0.12)	0.180***	(0.04)	0.021	(0.09)	-6.039***	(1.21)	26795
Chemicals	11	0.672***	(0.08)	0.192**	(0.09)	0.070	(0.05)	0.093*	(0.05)	-3.776***	(0.63)	27735
Pharmaceuticals	12	1.206***	(0.16)	-0.305***	(0.09)	0.338***	(0.09)	0.534***	(0.13)	-7.630*	(2.72)	26310
Rubber & Plastics	13	0.696***	(0.08)	0.083**	(0.04)	0.151***	(0.02)	0.242***	(0.07)	-2.815***	(1.07)	27735
Other non-Metallic Mineral	14	0.423***	(0.09)	0.196***	(0.05)	0.075***	(0.01)	0.134	(0.08)	-1.417*	(0.79)	27735
Basic Metals	15	0.628***	(0.10)	0.146	(0.10)	0.130***	(0.04)	0.273***	(0.07)	-4.715***	(0.97)	27735
Fabricated Metal	16	0.554***	(0.05)	0.123***	(0.04)	0.071***	(0.01)	0.250***	(0.03)	-1.841***	(0.62)	27090
Electronics & Optical Products	17	0.417***	(0.14)	-0.209*	(0.12)	0.032	(0.03)	0.041	(0.07)	-5.731***	(1.37)	27735
Electrical Equipment	18	0.829***	(0.13)	0.126	(0.08)	0.101***	(0.03)	0.305***	(0.11)	-6.424***	(0.94)	27090
Machinery & Equipment	19	0.585***	(0.08)	-0.014	(0.04)	0.084***	(0.02)	0.156**	(0.07)	-7.509***	(1.20)	27735
Motor Vehicles	20	0.753***	(0.13)	-0.060	(0.11)	0.152***	(0.05)	0.331***	(0.09)	-4.390***	(0.91)	27735
Other Transport Equipment	21	0.461***	(0.15)	0.320*	(0.17)	-0.020	(0.04)	0.340***	(0.11)	-5.173**	(2.18)	27090
Furniture & Other Manufacturing	22	0.061	(0.12)	0.064	(0.08)	0.110***	(0.04)	-0.267**	(0.11)	-3.416**	(1.38)	27735

Note: ***, **, * denote significance at the 1%, 5%, 10% levels, respectively. All models estimated using Poisson Pseudo Maximum Likelihood (PPML) methods. Robust standard errors (in parentheses) allow for clustering at the country-pair level. Pair as well as year specific importer and exporter fixed effects included but not reported.

Table A3: EU Integration Steps and Bilateral Imports, Services (2000 - 2014)

Dep. var.:	Bilateral Imports									
Sector Description	Sector	EU	s.e.	Euro	s.e.	Schengen	s.e.	other RTA	s.e.	Obs.
Electricity & Gas	23	0.810**	(0.36)	-0.197	(0.23)	0.039	(0.12)	0.516	(0.34)	27225
Water Supply	24	0.044	(0.19)	0.052	(0.15)	0.109**	(0.05)	-0.343*	(0.17)	23085
Sewerage & Waste	25	0.690***	(0.23)	0.002	(0.08)	-0.001	(0.04)	0.307	(0.23)	24435
Construction	26	0.867***	(0.17)	-0.053	(0.15)	0.047	(0.10)	0.377***	(0.14)	27210
Trade & Repair of Motor Vehicles	27	1.176***	(0.23)	0.033	(0.14)	0.482***	(0.07)	0.416**	(0.19)	25770
Wholesale Trade	28	1.031***	(0.11)	0.187***	(0.06)	0.172***	(0.04)	0.376***	(0.09)	27285
Retail Trade	29	1.208***	(0.17)	0.188	(0.13)	0.366***	(0.06)	0.516***	(0.14)	25740
Land Transport	30	0.629***	(0.11)	0.315***	(0.11)	-0.060*	(0.04)	-0.172*	(0.09)	27630
Water Transport	31	0.865***	(0.20)	-0.002	(0.27)	-0.016	(0.06)	0.215	(0.14)	27405
Air Transport	32	0.391**	(0.17)	-0.035	(0.09)	0.047	(0.05)	-0.236*	(0.14)	27735
Aux. Transportation Services	33	0.255**	(0.12)	-0.215**	(0.09)	0.093***	(0.03)	-0.233**	(0.10)	27525
Postal and Courier	34	0.567***	(0.21)	-0.414**	(0.17)	0.517***	(0.11)	0.609***	(0.17)	23475
Accommodation and Food	35	-0.243	(0.18)	0.296**	(0.12)	-0.165***	(0.06)	-0.313**	(0.15)	25455
Publishing	36	0.291*	(0.16)	-0.381***	(0.14)	-0.006	(0.06)	-0.206	(0.13)	24270
Media Services	37	0.303	(0.19)	0.124	(0.10)	-0.082	(0.06)	-0.117	(0.17)	24165
Telecommunications	38	0.213	(0.17)	0.251**	(0.11)	0.104***	(0.04)	-0.071	(0.16)	27720
Computer & Information Services	39	0.844***	(0.21)	0.202**	(0.09)	0.167***	(0.04)	-0.020	(0.20)	26955
Financial Services	40	0.785***	(0.25)	0.556***	(0.18)	-0.076	(0.06)	-0.036	(0.22)	27015
Insurance	41	-0.127	(0.22)	0.464***	(0.15)	-0.236*	(0.12)	-0.156	(0.15)	26370
Real Estate	42	0.540***	(0.18)	0.147	(0.27)	-0.013	(0.06)	0.035	(0.14)	23550
Legal and Accounting	43	0.322**	(0.13)	0.002	(0.12)	0.155***	(0.05)	0.112	(0.11)	24960
Business Services	44	1.075***	(0.08)	-0.031	(0.09)	0.069*	(0.04)	0.614***	(0.06)	25635
Research and Development	45	0.486***	(0.09)	0.271**	(0.11)	0.119***	(0.03)	0.055	(0.08)	24415
Admin. & Support Services	46	0.263*	(0.14)	0.226	(0.15)	0.124***	(0.03)	-0.214*	(0.12)	26910
Public & Social Services	47	0.390**	(0.18)	0.050	(0.21)	0.076	(0.06)	0.193	(0.16)	25770
Education	48	0.718***	(0.12)	0.097	(0.13)	0.150***	(0.04)	0.197**	(0.09)	25950
Human Health and Social Work	49	0.438*	(0.26)	0.212	(0.14)	0.192*	(0.10)	-0.020	(0.20)	26145
Other Services, Households	50	1.219	(0.92)	-0.379***	(0.14)	-0.026	(0.09)	-0.094	(0.30)	26880

Note: ***, **, * denote significance at the 1%, 5%, 10% levels, respectively. All models estimated using Poisson Pseudo Maximum Likelihood (PPML) methods. Robust standard errors (in parentheses) allow for clustering at the country-pair level. Pair as well as year specific importer and exporter fixed effects included but not reported.

Table A4: Income per Capita, Baseline Year 2014

	Income in mio. US $	Total population	Per capita income in tsd. US $	oldEU	newEU
Australia	1,390,300	23,464,086	59.25		
Austria	387,960	8,541,575	45.42	1	
Belgium	477,170	11,231,213	42.49	1	
Bulgaria	55,501	7,223,938	7.68		1
Brazil	2,296,500	206,100,000	11.14		
Canada	1,678,900	35,543,658	47.23		
Switzerland	610,070	8,188,649	74.50		
China	9,628,100	1,364,000,000	7.06		
Cyprus	23,603	1,153,658	20.46		1
Czech Republic	178,950	10525347	17.00		1
Germany	3,266,900	80,982,500	40.34	1	
Denmark	288,580	5,643,475	51.14	1	
Spain	1,297,700	46,480,882	27.92	1	
Estonia	24,031	1,314,545	18.28		1
Finland	243,720	5,461,512	44.63	1	
France	2,656,800	66,495,940	39.95	1	
United Kingdom	2,810,700	64,613,160	43.50	1	
Greece	234,990	10,892,413	21.57	1	
Croatia	51,489	4,238,389	12.15		1
Hungary	115,110	9,866,468	11.67		1
Indonesia	858,060	254,500,000	3.37		
India	2,053,700	1,295,000,000	1.59		
Ireland	182,830	4,617,225	39.60	1	
Italy	1,938,700	60,789,140	31.89	1	
Japan	4,593,600	127,100,000	36.13		
Korea, Rep.	1,233,000	50,423,955	24.45		
Lithuania	44,587	2,932,367	15.21		1
Luxembourg	44,998	556,319	80.89	1	
Latvia	29,656	1,993,782	14.87		1
Mexico	1,214,700	125,400,000	9.69		
Malta	10,299	427,364	24.10		1
Netherlands	708,620	16,865,008	42.02	1	
Norway	390,660	5,137,232	76.04		
Poland	490,750	38,011,735	12.91		1
Portugal	221,870	10,401,062	21.33	1	
Romania	184,870	19,908,979	9.29		1
Rest of World	11,014,000	2,717,000,000	4.05		
Russian Federation	1,611,100	143,800,000	11.20		
Slovak Republic	93,183	5,418,649	17.20		1
Slovenia	43,425	2,061,980	21.06		1
Sweden	500,950	9,696,110	51.67	1	
Turkey	732,890	77,523,788	9.45		
Taiwan	457,080				
United States	17,925,000	318,900,000	56.21		

Table A5: List of Sectors

Sector ID	Sectorname	ISIC Rev. 4
1	Crops & Animals	A01
2	Forestry & Logging	A02
3	Fishing & Aquaculture	A03
4	Mining & Quarrying	B
5	Food, Beverages & Tabacco	C10-C12
6	Textiles, Apparel,Leather	C13-C15
7	Wood & Cork	C16
8	Paper	C17
9	Recorded Media Reproduction	C18
10	Coke, Refined Petroleum	C19
11	Chemicals	C20
12	Pharmaceuticals	C21
13	Rubber & Plastics	C22
14	Other non-Metallic Mineral	C23
15	Basic Metals	C24
16	Fabricated Metal	C25
17	Electronics & Optical Products	C26
18	Electrical Equipment	C27
19	Machinery & Equipment	C28,C33
20	Motor Vehicles	C29
21	Other Transport Equipment	C30
22	Furniture & Other Manufacturing	C31_C32
23	Electricity & Gas	D35
24	Water Supply	E36
25	Sewerage & Waste	E37-E39
26	Construction	F
27	Trade & Repair of Motor Vehicles	G45
28	Wholesale Trade	G46
29	Retail Trade	G47
30	Land Transport	H49
31	Water Transport	H50
32	Air Transport	H51
33	Aux. Transportation Services	H52
34	Postal and Courier	H53
35	Accomodation and Food	I
36	Publishing	J58
37	Media Services	J59_J60
38	Telecommunications	J61
39	Computer & Information Services	J62_J63
40	Financial Services	K64
41	Insurance	K65_K66
42	Real Estate	L68
43	Legal and Accounting	M69_M70
44	Business Services	M71,M73-M75
45	Research and Development	M72
46	Admin. & Support Services	N
47	Public & Social Services	O84
48	Education	P85
49	Human Health and Social Work	Q
50	Other Serivces, Households	R-U

Figure A1: Distribution of labor cost shares across countries and sectors

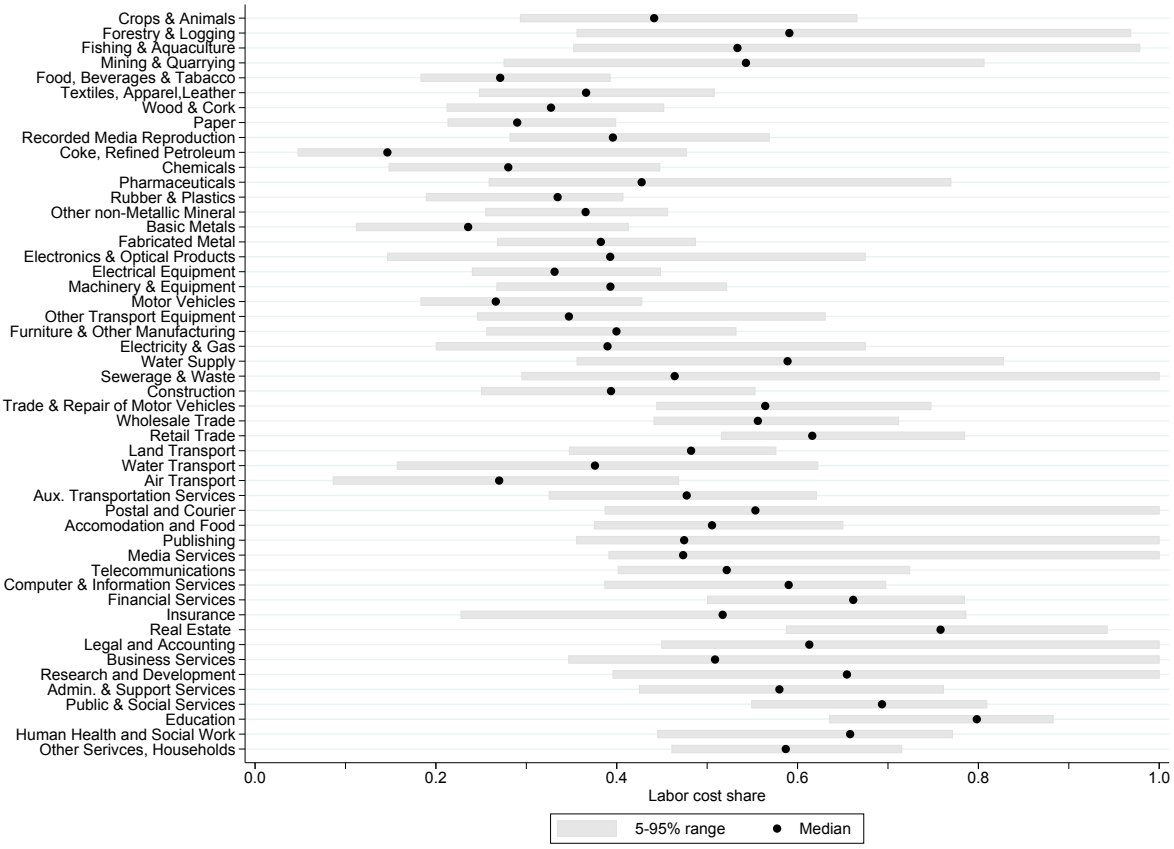


Table A6: Trade Elasticities Based on HS6 Product Categories

Sector ID	Elasticity	Standard Error
1	-4.24	1.66
2	-5.30	2.02
3	-5.98	3.46
4	-28.44	9.29
5	-3.06	1.14
6	-1.93	0.96
7	-2.36	1.05
8	-2.30	1.02
9	-2.27	0.92
10	-3.64	4.46
11	-3.08	1.81
12	-2.72	0.98
13	-1.68	0.79
14	-2.04	1.08
15	-4.20	2.63
16	-1.85	0.98
17	-2.43	1.20
18	-2.44	1.21
19	-2.49	1.49
20	-1.94	0.97
21	-3.52	2.32
22	-2.38	1.07
Average Goods	-3.72	1.79
Services	-1.69	2.09

Note: Trade elasticities stem from a gravity estimation on HS6 products obtained from CEPII's international trade database (BACI). Sectoral elasticities are import-weighted mean elasticities over HS6 products within a WIOD sector – using only those HS6 products that satisfy our restriction on the tariff estimate. Services trade elasticities and their respective s.e. are calculated based on Egger et al. (2012). We take import-weighted mean of elasticity estimates and s.e. over all HS6 products.

Table A7: Operating Budgetary Balance, Million Euro, 2010-2014

Country	Transfer
AUT	-1009.5
BEL	-1469.8
BGR	+1260.8
CYP	+29.5
CZE	+2597.0
DEU	-11901.2
DNK	-938.2
ESP	+3048.8
EST	+610.7
FIN	-604.8
FRA	-7169.7
GBR	-6425.8
GRC	+4653.6
HRV	+104.6
HUN	+4216.7
IRL	+435.3
ITA	-4756.4
LTU	+1459.6
LUX	-37.1
LVA	+792.5
MLT	+91.8
NLD	-2759.5
POL	+11477.0
PRT	+3652.3
ROU	+2678.2
SVK	+1281.0
SVN	+542.0
SWE	-1799.1

Source: European Commission.

Table A8: Changes in Aggregate Output and Gross Trade Flows (in %)

Scenario		Domestic	Exports to			
Region	Output	sales	old EU	new EU	non-EU	World
Single Market						
old EU	**-3.40**	**-0.81**	**-27.71**	**-30.64**	**1.75**	**-13.59**
	[-3.85, -2.95]	[-1.39, -0.24]	[-29.82, -25.60]	[-32.87, -28.41]	[1.30, 2.21]	[-14.54, -12.64]
new EU	**-7.54**	**-3.18**	**-28.48**	**-29.05**	**2.74**	**-18.90**
	[-8.47, -6.61]	[-4.30, -2.07]	[-30.60, -26.37]	[-31.33, -26.77]	[1.95, 3.53]	[-20.24, -17.56]
non-EU	**1.11**	**1.09**	**2.54**	0.89	**1.10**	**1.35**
	[0.96, 1.25]	[0.94, 1.24]	[1.97, 3.10]	[-0.18, 1.96]	[0.92, 1.28]	[1.21, 1.48]
Customs Union (MFN tariffs)						
old EU	**-0.84**	0.05	**-8.81**	**-9.70**	**0.50**	**-4.35**
	[-0.90, -0.79]	[-0.04, 0.14]	[-9.88, -7.75]	[-10.70, -8.71]	[0.37, 0.63]	[-4.84, -3.86]
new EU	**-1.81**	-0.19	**-8.85**	**-9.70**	**0.66**	**-6.04**
	[-1.97, -1.65]	[-0.42, 0.05]	[-9.72, -7.97]	[-10.82, -8.58]	[0.49, 0.84]	[-6.64, -5.44]
non-EU	**0.21**	**0.20**	**0.69**	**0.37**	**0.20**	**0.29**
	[0.19, 0.23]	[0.19, 0.22]	[0.53, 0.86]	[0.11, 0.63]	[0.19, 0.21]	[0.25, 0.33]
Euro						
old EU	**-0.45**	**-0.23**	**-2.82**	**-0.80**	0.05	**-1.30**
	[-0.62, -0.27]	[-0.36, -0.10]	[-4.11, -1.52]	[-1.04, -0.57]	[-0.12, 0.22]	[-1.85, -0.75]
new EU	**-0.06**	0.03	**-0.57**	-0.07	0.05	**-0.29**
	[-0.12, -0.00]	[-0.04, 0.10]	[-0.75, -0.39]	[-0.25, 0.11]	[-0.05, 0.16]	[-0.40, -0.18]
non-EU	**0.11**	**0.11**	0.04	**0.32**	**0.11**	**0.10**
	[0.06, 0.15]	[0.06, 0.16]	[-0.18, 0.25]	[0.13, 0.50]	[0.06, 0.16]	[0.04, 0.16]
Schengen						
old EU	**-0.72**	**0.26**	**-7.93**	**-10.62**	**-0.70**	**-4.59**
	[-0.94, -0.50]	[0.05, 0.47]	[-9.07, -6.79]	[-12.21, -9.03]	[-0.90, -0.50]	[-5.26, -3.92]
new EU	**-1.78**	-0.07	**-9.96**	**-5.79**	-0.17	**-6.24**
	[-2.23, -1.33]	[-0.47, 0.34]	[-11.41, -8.50]	[-6.78, -4.80]	[-0.47, 0.13]	[-7.18, -5.30]
non-EU	**0.26**	**0.28**	**-0.83**	**-1.01**	**0.35**	**0.12**
	[0.19, 0.33]	[0.20, 0.35]	[-1.12, -0.55]	[-1.44, -0.57]	[0.24, 0.46]	[0.05, 0.19]
other RTAs						
old EU	**-0.18**	**-0.09**	**0.35**	**0.64**	**-1.57**	**-0.56**
	[-0.25, -0.12]	[-0.15, -0.03]	[0.24, 0.47]	[0.53, 0.75]	[-1.83, -1.30]	[-0.69, -0.43]
new EU	**-0.24**	**-0.11**	0.00	**0.28**	**-2.03**	**-0.58**
	[-0.27, -0.21]	[-0.14, -0.08]	[-0.05, 0.06]	[0.21, 0.34]	[-2.29, -1.76]	[-0.65, -0.51]
non-EU	**0.05**	**0.09**	**-1.96**	**-3.11**	**0.09**	**-0.33**
	[0.02, 0.07]	[0.07, 0.12]	[-2.31, -1.62]	[-3.43, -2.79]	[0.03, 0.15]	[-0.37, -0.29]
Complete EU						
old EU	**-5.20**	**-1.13**	**-40.78**	**-43.99**	-0.10	**-21.24**
	[-5.77, -4.62]	[-1.92, -0.33]	[-43.24, -38.32]	[-46.36, -41.62]	[-0.60, 0.41]	[-22.41, -20.06]
new EU	**-10.74**	**-4.10**	**-41.49**	**-39.54**	0.90	**-28.03**
	[-11.82, -9.65]	[-5.53, -2.67]	[-43.73, -39.24]	[-41.98, -37.10]	[-0.01, 1.81]	[-29.49, -26.58]
non-EU	**1.63**	**1.67**	0.30	**-2.94**	**1.74**	**1.40**
	[1.44, 1.81]	[1.48, 1.87]	[-0.36, 0.96]	[-4.14, -1.74]	[1.50, 1.99]	[1.24, 1.56]
Complete EU (incl. Transfers)						
old EU	**-5.34**	**-1.28**	**-40.85**	**-45.17**	-0.16	**-21.37**
	[-5.92, -4.77]	[-2.07, -0.48]	[-43.31, -38.39]	[-47.51, -42.83]	[-0.67, 0.34]	[-22.54, -20.20]
new EU	**-13.53**	**-7.35**	**-42.60**	**-41.94**	**-1.08**	**-29.63**
	[-14.57, -12.49]	[-8.70, -6.01]	[-44.83, -40.37]	[-44.32, -39.57]	[-1.94, -0.22]	[-31.08, -28.18]
non-EU	**1.60**	**1.65**	0.22	**-5.11**	**1.73**	**1.34**
	[1.41, 1.78]	[1.46, 1.84]	[-0.44, 0.88]	[-6.26, -3.96]	[1.49, 1.97]	[1.18, 1.50]

Table A9: Changes in VAX-ratios (in % pts.)

Scenario		Domestic		Exports to		
Region	Output	absorption	old EU	new EU	non-EU	World
Single Market						
old EU	**0.33**	**0.37**	**3.46**	**3.95**	**-0.96**	**3.50**
	[0.28, 0.38]	[0.28, 0.45]	[2.97, 3.94]	[3.37, 4.54]	[-1.09, -0.82]	[3.20, 3.80]
new EU	**0.66**	**0.71**	**3.67**	**5.42**	**-2.81**	**4.71**
	[0.51, 0.82]	[0.52, 0.90]	[3.04, 4.31]	[4.47, 6.36]	[-3.14, -2.48]	[4.18, 5.24]
non-EU	**-0.09**	**-0.10**	**-1.32**	**-1.55**	**0.05**	**-0.22**
	[-0.11, -0.08]	[-0.11, -0.08]	[-1.48, -1.16]	[-1.83, -1.26]	[0.01, 0.09]	[-0.25, -0.19]
Customs Union (MFN tariffs)						
old EU	**0.29**	**0.37**	**1.71**	**2.01**	**-0.65**	**1.18**
	[0.28, 0.30]	[0.36, 0.39]	[1.51, 1.90]	[1.74, 2.27]	[-0.68, -0.62]	[1.02, 1.34]
new EU	**0.53**	**0.84**	**1.51**	**2.83**	**-1.39**	**1.56**
	[0.49, 0.58]	[0.77, 0.91]	[1.25, 1.77]	[2.41, 3.26]	[-1.47, -1.31]	[1.34, 1.78]
non-EU	**-0.03**	**-0.03**	**-0.17**	**0.09**	**-0.04**	**-0.06**
	[-0.03, -0.02]	[-0.03, -0.02]	[-0.22, -0.13]	[0.03, 0.15]	[-0.05, -0.03]	[-0.07, -0.05]
Euro						
old EU	**0.06**	0.01	**0.88**	0.10	**-0.14**	**0.48**
	[0.03, 0.09]	[-0.02, 0.04]	[0.47, 1.30]	[-0.03, 0.23]	[-0.21, -0.07]	[0.26, 0.70]
new EU	0.01	-0.01	0.00	**0.14**	**0.12**	**0.11**
	[-0.02, 0.03]	[-0.03, 0.01]	[-0.09, 0.10]	[0.00, 0.28]	[0.05, 0.19]	[0.04, 0.18]
non-EU	0.00	-0.00	**-0.16**	-0.01	**0.05**	0.01
	[-0.01, 0.01]	[-0.01, 0.00]	[-0.24, -0.07]	[-0.12, 0.10]	[0.03, 0.06]	[-0.01, 0.02]
Schengen						
old EU	**0.10**	**0.09**	**0.82**	**1.75**	**-3.24**	**-0.80**
	[0.06, 0.14]	[0.04, 0.14]	[0.49, 1.14]	[1.19, 2.32]	[-3.33, -3.16]	[-1.03, -0.58]
new EU	**0.25**	**0.19**	**1.62**	**2.99**	**-3.78**	0.38
	[0.14, 0.36]	[0.10, 0.28]	[1.09, 2.14]	[2.36, 3.62]	[-3.91, -3.65]	[-0.04, 0.80]
non-EU	**-0.05**	**-2.41**	**0.19**	0.17	**-3.06**	**-2.43**
	[-0.06, -0.03]	[-2.43, -2.40]	[0.08, 0.30]	[-0.00, 0.34]	[-3.09, -3.02]	[-2.45, -2.40]
other RTAs						
old EU	-0.01	0.00	**-0.10**	-0.03	**0.53**	**0.10**
	[-0.03, 0.02]	[-0.02, 0.02]	[-0.16, -0.03]	[-0.09, 0.03]	[0.43, 0.63]	[0.04, 0.15]
new EU	**0.03**	**0.03**	**0.15**	**0.24**	**0.71**	**0.15**
	[0.02, 0.04]	[0.02, 0.04]	[0.12, 0.19]	[0.19, 0.29]	[0.60, 0.81]	[0.12, 0.18]
non-EU	**0.01**	**0.02**	**0.51**	**1.04**	**0.04**	**0.14**
	[0.00, 0.02]	[0.01, 0.03]	[0.40, 0.62]	[0.93, 1.14]	[0.00, 0.07]	[0.11, 0.16]
Complete EU						
old EU	**0.60**	**0.80**	**4.85**	**5.38**	**-0.71**	**5.20**
	[0.54, 0.66]	[0.69, 0.92]	[4.33, 5.37]	[4.78, 5.97]	[-0.87, -0.54]	[4.85, 5.55]
new EU	**1.15**	**1.64**	**4.97**	**7.99**	**-3.09**	**6.62**
	[0.99, 1.32]	[1.38, 1.90]	[4.30, 5.65]	[6.97, 9.01]	[-3.41, -2.77]	[6.06, 7.19]
non-EU	**-0.12**	**-0.13**	**-0.82**	-0.29	0.05	**-0.11**
	[-0.15, -0.10]	[-0.15, -0.10]	[-1.03, -0.62]	[-0.66, 0.07]	[-0.02, 0.11]	[-0.16, -0.07]
Complete EU (incl. Transfers)						
old EU	**0.60**	**0.80**	**4.85**	**5.07**	**-0.69**	**5.20**
	[0.54, 0.66]	[0.68, 0.91]	[4.33, 5.37]	[4.48, 5.66]	[-0.85, -0.52]	[4.85, 5.56]
new EU	**1.10**	**1.44**	**4.76**	**7.32**	**-3.17**	**6.39**
	[0.94, 1.27]	[1.20, 1.68]	[4.08, 5.44]	[6.33, 8.31]	[-3.49, -2.85]	[5.83, 6.94]
non-EU	**-0.12**	**-0.12**	**-0.82**	**-0.57**	0.06	**-0.11**

Table A10: Changes in Sectoral Trade Flows and VAX ratios

Exports to:		EU		non-EU		World	
Scenario		gross	VAX	gross	VAX	gross	VAX
Region	Sector	(in%)	(in %pts.)	(in%)	(in %pts.)	(in%)	(in %pts.)
Single Market							
old EU	Agric.	**-19.46**	2.86	**4.00**	-2.17	**-11.90**	3.60
		[-32.71, -6.21]	[-1.95, 7.67]	[2.42, 5.58]	[-5.72, 1.38]	[-20.88, -2.93]	[-0.30, 7.51]
	Manuf.	**-28.37**	**3.52**	**0.94**	**-1.23**	**-15.19**	**3.82**
		[-30.85, -25.90]	[3.12, 3.91]	[0.28, 1.60]	[-1.33, -1.14]	[-16.50, -13.88]	[3.55, 4.10]
	Serv.	**-28.55**	3.55	**2.80**	**-1.42**	**-10.92**	1.51
		[-33.42, -23.68]	[-0.46, 7.55]	[2.12, 3.48]	[-1.79, -1.04]	[-12.92, -8.93]	[-0.00, 3.02]
new EU	Agric.	**-19.21**	2.10	**5.46**	**-1.73**	**-11.30**	2.21
		[-30.97, -7.46]	[-5.42, 9.62]	[3.34, 7.59]	[-3.45, -0.01]	[-19.20, -3.40]	[-2.81, 7.22]
	Manuf.	**-28.10**	**3.98**	**1.24**	**-4.10**	**-20.21**	**4.40**
		[-30.72, -25.48]	[3.61, 4.35]	[0.07, 2.42]	[-4.34, -3.87]	[-22.10, -18.31]	[4.06, 4.74]
	Serv.	**-31.32**	**5.43**	**4.68**	**-3.35**	**-17.01**	**3.41**
		[-35.64, -26.99]	[1.68, 9.17]	[3.45, 5.90]	[-4.11, -2.60]	[-19.35, -14.66]	[1.36, 5.47]
non-EU	Agric.	**-4.61**	**3.88**	**1.32**	**-0.12**	0.27	**0.56**
		[-7.30, -1.93]	[2.10, 5.67]	[1.13, 1.50]	[-0.22, -0.02]	[-0.21, 0.74]	[0.38, 0.75]
	Manuf.	**8.06**	**-2.20**	**1.15**	**0.12**	**2.34**	**-0.24**
		[7.08, 9.03]	[-2.34, -2.05]	[0.96, 1.34]	[0.11, 0.14]	[2.10, 2.57]	[-0.26, -0.22]
	Serv.	**-4.22**	**2.90**	**0.81**	**0.22**	**-0.48**	**1.02**
		[-5.24, -3.21]	[2.17, 3.62]	[0.62, 1.00]	[0.14, 0.30]	[-0.69, -0.26]	[0.79, 1.25]
Customs Union (MFN tariffs)							
old EU	Agric.	**-8.79**	-1.25	**0.60**	**-1.28**	**-5.77**	-0.06
		[-11.61, -5.97]	[-2.96, 0.46]	[0.31, 0.89]	[-1.46, -1.11]	[-7.71, -3.82]	[-1.44, 1.32]
	Manuf.	**-12.64**	**2.27**	**0.42**	**-0.97**	**-6.76**	**1.79**
		[-14.18, -11.10]	[2.12, 2.43]	[0.23, 0.61]	[-0.99, -0.95]	[-7.57, -5.96]	[1.65, 1.93]
	Serv.	**-0.69**	**-4.06**	**0.60**	**-0.50**	0.03	**-1.92**
		[-0.76, -0.62]	[-4.69, -3.43]	[0.46, 0.74]	[-0.57, -0.42]	[-0.05, 0.12]	[-2.19, -1.64]
new EU	Agric.	**-9.88**	-0.69	**1.07**	**-1.81**	**-6.37**	-0.42
		[-12.90, -6.86]	[-2.83, 1.46]	[0.64, 1.50]	[-2.12, -1.50]	[-8.39, -4.35]	[-1.92, 1.08]
	Manuf.	**-12.23**	**1.85**	**0.42**	**-2.38**	**-8.83**	**1.74**
		[-13.52, -10.95]	[1.72, 1.97]	[0.17, 0.68]	[-2.45, -2.31]	[-9.74, -7.92]	[1.61, 1.87]
	Serv.	**-0.51**	**-3.78**	**0.98**	**-0.93**	0.09	**-2.41**
		[-0.65, -0.36]	[-4.25, -3.32]	[0.73, 1.23]	[-1.05, -0.81]	[-0.08, 0.25]	[-2.69, -2.13]
non-EU	Agric.	**-1.79**	**1.63**	**0.26**	**-0.08**	**-0.10**	**0.22**
		[-2.08, -1.51]	[1.26, 2.00]	[0.24, 0.29]	[-0.09, -0.06]	[-0.14, -0.06]	[0.16, 0.28]
	Manuf.	**2.40**	**-0.47**	**0.21**	**-0.02**	**0.58**	**-0.08**
		[1.98, 2.81]	[-0.53, -0.41]	[0.19, 0.22]	[-0.02, -0.01]	[0.51, 0.66]	[-0.09, -0.07]
	Serv.	**-1.21**	**1.11**	**0.15**	-0.01	**-0.20**	**0.29**
		[-1.40, -1.01]	[0.90, 1.31]	[0.12, 0.18]	[-0.03, 0.01]	[-0.25, -0.15]	[0.23, 0.34]

Note: 90%-confidence bounds in brackets based on 1,000 bootstrap replications and approximate normal distribution.

Table A10: Changes in Sectoral Trade Flows and VAX ratios

Exports to:		EU		non-EU		World	
Scenario		gross	VAX	gross	VAX	gross	VAX
Region	Sector	(in%)	(in %pts.)	(in%)	(in %pts.)	(in%)	(in %pts.)
Euro							
old EU	Agric.	**-14.40**	**5.47**	**0.56**	**-3.20**	**-9.58**	**3.49**
		[-20.51, -8.30]	[2.98, 7.96]	[0.22, 0.90]	[-4.63, -1.76]	[-13.69, -5.47]	[1.47, 5.50]
	Manuf.	-1.52	**1.18**	-0.17	**0.07**	**-0.91**	**0.70**
		[-3.08, 0.04]	[0.97, 1.38]	[-0.37, 0.03]	[0.01, 0.13]	[-1.74, -0.08]	[0.54, 0.86]
	Serv.	**-3.31**	**1.14**	**0.33**	**-0.29**	**-1.26**	0.40
		[-4.72, -1.90]	[0.14, 2.15]	[0.15, 0.51]	[-0.42, -0.16]	[-1.86, -0.66]	[-0.06, 0.86]
new EU	Agric.	0.02	0.21	**0.20**	**0.27**	0.08	**0.24**
		[-0.49, 0.54]	[-0.12, 0.54]	[0.09, 0.31]	[0.07, 0.46]	[-0.26, 0.43]	[0.01, 0.47]
	Manuf.	-0.10	**-0.16**	0.07	**0.15**	-0.05	**-0.02**
		[-0.26, 0.06]	[-0.19, -0.14]	[-0.07, 0.22]	[0.09, 0.21]	[-0.15, 0.04]	[-0.04, -0.00]
	Serv.	**-1.44**	**0.77**	0.01	0.10	**-0.86**	**0.55**
		[-1.98, -0.90]	[0.36, 1.17]	[-0.11, 0.14]	[-0.00, 0.21]	[-1.21, -0.52]	[0.25, 0.84]
non-EU	Agric.	**1.96**	-0.66	**0.15**	0.05	**0.47**	-0.06
		[0.80, 3.12]	[-1.48, 0.16]	[0.06, 0.23]	[-0.01, 0.10]	[0.28, 0.66]	[-0.16, 0.03]
	Manuf.	0.02	**-0.45**	**0.11**	**0.06**	0.09	**-0.03**
		[-0.46, 0.50]	[-0.53, -0.37]	[0.06, 0.16]	[0.05, 0.07]	[-0.02, 0.21]	[-0.04, -0.02]
	Serv.	**-0.70**	0.23	**0.07**	**0.05**	**-0.12**	**0.13**
		[-1.03, -0.36]	[-0.04, 0.51]	[0.03, 0.11]	[0.02, 0.08]	[-0.20, -0.05]	[0.03, 0.22]
Schengen							
old EU	Agric.	**-7.38**	0.43	-0.85	**-4.97**	**-5.27**	-1.17
		[-11.74, -3.02]	[-1.12, 1.98]	[-1.98, 0.29]	[-5.75, -4.20]	[-8.56, -1.98]	[-2.69, 0.36]
	Manuf.	**-8.09**	**1.37**	**-1.89**	**-2.60**	**-5.30**	**-0.19**
		[-9.43, -6.74]	[1.19, 1.56]	[-2.21, -1.56]	[-2.69, -2.51]	[-6.14, -4.46]	[-0.35, -0.04]
	Serv.	**-8.77**	1.00	**0.98**	**-4.52**	**-3.29**	**-1.98**
		[-11.02, -6.53]	[-0.42, 2.42]	[0.53, 1.44]	[-4.87, -4.17]	[-4.44, -2.13]	[-2.77, -1.20]
new EU	Agric.	**-7.24**	1.46	0.13	**-4.78**	**-4.88**	-0.47
		[-11.04, -3.44]	[-1.01, 3.92]	[-0.68, 0.95]	[-5.28, -4.27]	[-7.64, -2.11]	[-2.37, 1.43]
	Manuf.	**-9.03**	**2.04**	**-1.94**	**-3.63**	**-7.13**	**0.69**
		[-10.69, -7.38]	[1.85, 2.24]	[-2.49, -1.40]	[-3.75, -3.50]	[-8.41, -5.84]	[0.50, 0.89]
	Serv.	**-9.02**	1.36	**2.41**	**-5.28**	**-4.47**	-1.02
		[-11.38, -6.66]	[-0.06, 2.78]	[1.93, 2.90]	[-5.69, -4.87]	[-6.00, -2.95]	[-2.08, 0.04]
non-EU	Agric.	**-1.75**	1.39	**0.48**	**-2.96**	0.09	**-2.16**
		[-3.41, -0.08]	[-0.07, 2.84]	[0.26, 0.71]	[-3.14, -2.78]	[-0.05, 0.22]	[-2.26, -2.06]
	Manuf.	**0.64**	-0.10	**0.41**	**-2.78**	**0.45**	**-2.30**
		[0.28, 0.99]	[-0.21, 0.00]	[0.30, 0.51]	[-2.79, -2.77]	[0.32, 0.57]	[-2.31, -2.28]
	Serv.	**-2.99**	**1.41**	**0.11**	**-3.18**	**-0.68**	**-2.08**
		[-3.62, -2.36]	[0.98, 1.84]	[0.03, 0.20]	[-3.24, -3.12]	[-0.82, -0.53]	[-2.21, -1.95]

Note: 90%-confidence bounds in brackets based on 1,000 bootstrap replications and approximate normal distribution.

Table A10: Changes in Sectoral Trade Flows and VAX ratios

Exports to:		EU		non-EU		World	
Scenario		gross	VAX	gross	VAX	gross	VAX
Region	Sector	(in%)	(in %pts.)	(in%)	(in %pts.)	(in%)	(in %pts.)
Other RTAs							
old EU	Agric.	**-1.45**	**0.30**	2.14	**-2.51**	**-0.29**	**-0.51**
		[-2.62, -0.27]	[0.23, 0.36]	[-0.24, 4.52]	[-4.74, -0.29]	[-0.53, -0.05]	[-0.89, -0.13]
	Manuf.	**0.72**	**-0.04**	**-2.53**	**0.90**	**-0.74**	**0.16**
		[0.56, 0.89]	[-0.06, -0.01]	[-2.88, -2.17]	[0.82, 0.98]	[-0.91, -0.56]	[0.12, 0.19]
	Serv.	**-0.11**	**0.27**	**-0.40**	**-0.33**	**-0.27**	-0.10
		[-0.19, -0.04]	[0.20, 0.34]	[-0.73, -0.07]	[-0.57, -0.10]	[-0.46, -0.09]	[-0.21, 0.02]
new EU	Agric.	**-0.79**	**0.45**	0.49	**-1.47**	**-0.38**	**-0.21**
		[-1.30, -0.29]	[0.31, 0.58]	[-0.59, 1.57]	[-2.39, -0.55]	[-0.58, -0.18]	[-0.36, -0.06]
	Manuf.	**0.21**	**0.26**	**-3.27**	**1.24**	**-0.73**	**0.22**
		[0.14, 0.28]	[0.24, 0.28]	[-3.64, -2.89]	[1.15, 1.33]	[-0.80, -0.65]	[0.21, 0.23]
	Serv.	**-0.18**	**0.28**	**-0.45**	**-0.45**	**-0.29**	-0.07
		[-0.26, -0.09]	[0.21, 0.35]	[-0.79, -0.12]	[-0.70, -0.20]	[-0.41, -0.16]	[-0.14, 0.01]
non-EU	Agric.	1.66	**-1.37**	-0.09	**0.23**	0.22	-0.05
		[-0.39, 3.72]	[-2.72, -0.02]	[-0.26, 0.08]	[0.06, 0.40]	[-0.01, 0.45]	[-0.15, 0.05]
	Manuf.	**-3.77**	**0.71**	**0.15**	-0.00	**-0.53**	**0.09**
		[-4.22, -3.31]	[0.63, 0.79]	[0.10, 0.20]	[-0.01, 0.00]	[-0.61, -0.44]	[0.08, 0.11]
	Serv.	**-0.84**	**-0.45**	**0.05**	**0.05**	**-0.18**	-0.01
		[-1.36, -0.33]	[-0.75, -0.15]	[0.02, 0.09]	[0.02, 0.08]	[-0.30, -0.05]	[-0.11, 0.09]
Complete EU							
old EU	Agric.	**-43.18**	5.54	**6.55**	**-8.69**	**-27.16**	5.51
		[-56.65, -29.70]	[-2.88, 13.97]	[2.36, 10.74]	[-11.61, -5.77]	[-36.74, -17.57]	[-0.68, 11.70]
	Manuf.	**-43.68**	**5.63**	**-2.60**	**-0.42**	**-25.19**	**6.39**
		[-46.59, -40.76]	[5.02, 6.24]	[-3.45, -1.74]	[-0.58, -0.26]	[-26.83, -23.55]	[5.97, 6.81]
	Serv.	**-35.37**	0.46	**3.10**	**-2.56**	**-13.74**	-0.23
		[-40.89, -29.85]	[-4.09, 5.02]	[2.04, 4.16]	[-3.19, -1.92]	[-16.15, -11.33]	[-2.02, 1.57]
new EU	Agric.	**-32.21**	1.86	**7.51**	**-4.87**	**-19.47**	1.82
		[-44.90, -19.51]	[-7.84, 11.57]	[3.91, 11.12]	[-6.51, -3.22]	[-28.29, -10.64]	[-4.40, 8.05]
	Manuf.	**-42.86**	**5.61**	**-2.42**	**-4.48**	**-31.99**	**6.60**
		[-45.65, -40.08]	[5.11, 6.11]	[-3.89, -0.95]	[-4.71, -4.24]	[-34.06, -29.92]	[6.13, 7.08]
	Serv.	**-37.39**	2.57	**5.14**	**-4.83**	**-20.48**	1.53
		[-41.96, -32.82]	[-1.48, 6.62]	[3.49, 6.79]	[-5.82, -3.84]	[-23.00, -17.95]	[-0.72, 3.79]
non-EU	Agric.	**-3.95**	**4.40**	**1.96**	-0.01	**0.91**	**0.75**
		[-7.04, -0.86]	[1.86, 6.94]	[1.62, 2.30]	[-0.24, 0.22]	[0.49, 1.34]	[0.53, 0.97]
	Manuf.	**5.68**	**-2.24**	**1.86**	**0.11**	**2.51**	**-0.28**
		[4.66, 6.71]	[-2.41, -2.07]	[1.61, 2.11]	[0.10, 0.13]	[2.24, 2.79]	[-0.31, -0.25]
	Serv.	**-8.01**	**3.94**	**1.26**	**0.31**	**-1.11**	**1.51**
		[-9.19, -6.84]	[3.02, 4.85]	[1.01, 1.52]	[0.19, 0.42]	[-1.39, -0.82]	[1.24, 1.77]

Note: 90%-confidence bounds in brackets based on 1,000 bootstrap replications and approximate normal distribution.

Table A10: Changes in Sectoral Trade Flows and VAX ratios

Exports to:		EU		non-EU		World	
Scenario		gross	VAX	gross	VAX	gross	VAX
Region	Sector	(in%)	(in %pts.)	(in%)	(in %pts.)	(in%)	(in %pts.)
Complete EU (incl. Tranfers)							
old EU	Agric.	**-43.45**	5.54	**6.42**	**-8.69**	**-27.38**	5.53
		[-56.86, -30.05]	[-2.88, 13.96]	[2.25, 10.59]	[-11.60, -5.77]	[-36.93, -17.84]	[-0.66, 11.71]
	Manuf.	**-43.88**	**5.60**	**-2.65**	**-0.39**	**-25.33**	**6.41**
		[-46.78, -40.98]	[5.00, 6.21]	[-3.51, -1.80]	[-0.55, -0.23]	[-26.96, -23.70]	[5.99, 6.83]
	Serv.	**-35.57**	0.42	**3.02**	**-2.54**	**-13.87**	-0.23
		[-41.05, -30.08]	[-4.11, 4.96]	[1.97, 4.07]	[-3.18, -1.91]	[-16.27, -11.47]	[-2.02, 1.56]
new EU	Agric.	**-33.96**	1.63	**5.60**	**-5.36**	**-21.27**	1.48
		[-46.53, -21.40]	[-8.20, 11.46]	[2.68, 8.52]	[-6.98, -3.74]	[-30.07, -12.48]	[-4.88, 7.84]
	Manuf.	**-44.44**	**5.28**	**-4.95**	**-4.59**	**-33.82**	**6.24**
		[-47.22, -41.66]	[4.77, 5.79]	[-6.35, -3.55]	[-4.82, -4.36]	[-35.91, -31.73]	[5.76, 6.72]
	Serv.	**-38.35**	2.10	**3.94**	**-5.30**	**-21.53**	1.05
		[-42.96, -33.74]	[-1.99, 6.18]	[2.58, 5.31]	[-6.21, -4.40]	[-24.15, -18.91]	[-1.26, 3.35]
non-EU	Agric.	**-4.50**	**4.53**	**1.95**	-0.01	**0.80**	**0.77**
		[-7.59, -1.41]	[1.97, 7.10]	[1.61, 2.29]	[-0.23, 0.22]	[0.38, 1.23]	[0.55, 1.00]
	Manuf.	**5.43**	**-2.25**	**1.85**	**0.13**	**2.47**	**-0.27**
		[4.41, 6.45]	[-2.42, -2.08]	[1.60, 2.10]	[0.11, 0.15]	[2.19, 2.74]	[-0.30, -0.24]
	Serv.	**-8.24**	**3.88**	**1.25**	**0.32**	**-1.18**	**1.52**
		[-9.41, -7.07]	[2.97, 4.80]	[0.99, 1.50]	[0.21, 0.43]	[-1.46, -0.90]	[1.25, 1.78]

Note: 90%-confidence bounds in brackets based on 1,000 bootstrap replications and approximate normal distribution.

Table : Changes in Sectoral Output and Sectoral Shares in Total Production

Scenario: Region	Sector	Baseline	Single Market	Customs Union	Euro	Schengen	Other RTAs	Complete EU	Complete EU incl. Transfers
		Output (in bn. USD)	Output change (in %)						
old EU	Agric.	684	**-2.85** [-4.60, -1.09]	**-2.14** [-2.25, -2.03]	**-1.92** [-2.62, -1.23]	**-0.78** [-1.10, -0.47]	**-0.60** [-1.00, -0.19]	**-7.06** [-8.50, -5.63]	**-7.30** [-8.73, -5.87]
	Manuf.	7786	**-5.02** [-5.60, -4.43]	**-2.47** [-2.56, -2.39]	**-0.52** [-0.80, -0.24]	**-1.48** [-1.81, -1.15]	**-0.19** [-0.33, -0.04]	**-8.28** [-9.01, -7.55]	**-8.42** [-9.15, -7.69]
	Serv.	22793	**-2.86** [-3.28, -2.44]	**-0.25** [-0.30, -0.19]	**-0.38** [-0.52, -0.23]	**-0.46** [-0.66, -0.27]	**-0.17** [-0.22, -0.12]	**-4.09** [-4.64, -3.54]	**-4.23** [-4.78, -3.68]
new EU	Agric.	148	**-3.70** [-5.05, -2.34]	**-2.09** [-2.39, -1.78]	**0.27** [0.03, 0.51]	**-0.78** [-1.16, -0.41]	**-0.37** [-0.53, -0.22]	**-6.34** [-7.95, -4.73]	**-9.36** [-10.76, -7.96]
	Manuf.	1027	**-9.41** [-10.60, -8.21]	**-4.05** [-4.35, -3.75]	0.04 [-0.06, 0.13]	**-3.15** [-3.86, -2.44]	**-0.33** [-0.37, -0.29]	**-14.54** [-15.84, -13.24]	**-17.43** [-18.72, -16.15]
	Serv.	1923	**-6.84** [-7.75, -5.93]	**-0.59** [-0.71, -0.48]	**-0.14** [-0.21, -0.07]	**-1.13** [-1.52, -0.73]	**-0.18** [-0.21, -0.15]	**-9.04** [-10.14, -7.95]	**-11.77** [-12.79, -10.74]
non-EU	Agric.	10839	**0.95** [0.76, 1.15]	**0.16** [0.14, 0.19]	**0.23** [0.16, 0.30]	**0.30** [0.22, 0.38]	**0.07** [0.05, 0.09]	**1.59** [1.38, 1.80]	**1.54** [1.33, 1.76]
	Manuf.	40904	**1.46** [1.28, 1.63]	**0.31** [0.28, 0.34]	**0.10** [0.04, 0.17]	**0.41** [0.32, 0.50]	0.01 [-0.03, 0.05]	**2.07** [1.84, 2.29]	**2.04** [1.81, 2.27]
	Serv.	74893	**0.94** [0.80, 1.07]	**0.16** [0.15, 0.18]	**0.09** [0.05, 0.13]	**0.17** [0.11, 0.22]	**0.06** [0.05, 0.08]	**1.39** [1.22, 1.56]	**1.36** [1.19, 1.53]
		Output share (in %)	Change in output share (in %pts.)						
old EU	Agric.	2.2	0.01 [-0.02, 0.05]	**-0.03** [-0.03, -0.03]	**-0.03** [-0.05, -0.02]	-0.00 [-0.01, 0.01]	-0.01 [-0.02, 0.00]	**-0.04** [-0.07, -0.01]	**-0.05** [-0.08, -0.02]
	Manuf.	24.9	**-0.42** [-0.48, -0.35]	**-0.41** [-0.42, -0.40]	-0.02 [-0.05, 0.01]	**-0.19** [-0.23, -0.15]	-0.00 [-0.02, 0.02]	**-0.81** [-0.90, -0.72]	**-0.81** [-0.90, -0.72]
	Serv.	72.9	**0.40** [0.34, 0.47]	**0.44** [0.43, 0.45]	**0.05** [0.02, 0.08]	**0.19** [0.15, 0.23]	0.01 [-0.01, 0.02]	**0.85** [0.77, 0.94]	**0.85** [0.77, 0.94]
new EU	Agric.	4.8	**0.20** [0.14, 0.26]	-0.01 [-0.03, 0.00]	**0.02** [0.01, 0.03]	**0.05** [0.03, 0.07]	-0.01 [-0.01, 0.00]	**0.24** [0.16, 0.31]	**0.23** [0.16, 0.30]
	Manuf.	33.1	**-0.67** [-0.87, -0.47]	**-0.76** [-0.81, -0.70]	**0.03** [0.01, 0.06]	**-0.46** [-0.59, -0.34]	**-0.03** [-0.04, -0.02]	**-1.41** [-1.63, -1.19]	**-1.50** [-1.71, -1.28]
	Serv.	62.1	**0.47** [0.29, 0.66]	**0.77** [0.72, 0.82]	**-0.05** [-0.07, -0.03]	**0.41** [0.30, 0.53]	**0.04** [0.03, 0.04]	**1.18** [0.97, 1.39]	**1.27** [1.06, 1.47]
non-EU	Agric.	8.6	**-0.01** [-0.02, -0.00]	**-0.00** [-0.01, -0.00]	**0.01** [0.01, 0.01]	**0.00** [0.00, 0.01]	**0.00** [0.00, 0.00]	-0.00 [-0.01, 0.01]	-0.00 [-0.01, 0.01]
	Manuf.	32.3	**0.11** [0.09, 0.13]	**0.03** [0.03, 0.04]	-0.00 [-0.01, 0.01]	**0.05** [0.04, 0.06]	**-0.01** [-0.02, -0.01]	**0.14** [0.12, 0.16]	**0.14** [0.12, 0.16]
	Serv.	59.1	**-0.10** [-0.12, -0.08]	**-0.03** [-0.03, -0.02]	**-0.01** [-0.02, -0.00]	**-0.05** [-0.06, -0.04]	**0.01** [0.00, 0.01]	**-0.14** [-0.16, -0.11]	**-0.14** [-0.16, -0.11]

Note: 90%-confidence bounds in brackets based on 1,000 bootstrap replications and approximate normal distribution.

Table : Changes in Aggregate Value Added and Value Added Trade Flows (in %)

Scenario		Domestic	Value added exports to			
Region	Value added	absorption	old EU	new EU	non-EU	World
Single Market						
old EU	**-3.07**	-0.45	**-24.25**	**-26.69**	**0.80**	**-10.09**
	[-3.50, -2.63]	[-1.08, 0.19]	[-26.22, -22.28]	[-28.64, -24.74]	[0.46, 1.14]	[-10.83, -9.36]
new EU	**-6.87**	**-2.47**	**-24.81**	**-23.63**	-0.07	**-14.19**
	[-7.74, -6.01]	[-3.67, -1.28]	[-26.65, -22.97]	[-25.67, -21.59]	[-0.67, 0.53]	[-15.17, -13.21]
non-EU	**1.02**	**0.99**	**1.22**	-0.66	**1.15**	**1.13**
	[0.88, 1.16]	[0.84, 1.14]	[0.76, 1.67]	[-1.66, 0.35]	[0.97, 1.33]	[1.00, 1.25]
Customs Union (MFN tariffs)						
old EU	**-0.56**	**0.42**	**-7.11**	**-7.69**	**-0.15**	**-3.17**
	[-0.61, -0.51]	[0.32, 0.52]	[-8.03, -6.18]	[-8.59, -6.79]	[-0.26, -0.05]	[-3.52, -2.82]
new EU	**-1.27**	**0.65**	**-7.33**	**-6.87**	**-0.72**	**-4.48**
	[-1.40, -1.15]	[0.36, 0.95]	[-8.08, -6.59]	[-8.03, -5.71]	[-0.83, -0.61]	[-4.93, -4.03]
non-EU	**0.18**	**0.17**	**0.52**	**0.46**	**0.16**	**0.23**
	[0.17, 0.20]	[0.16, 0.19]	[0.39, 0.65]	[0.24, 0.69]	[0.15, 0.18]	[0.20, 0.26]
Euro						
old EU	**-0.39**	**-0.22**	**-1.93**	**-0.70**	-0.09	**-0.82**
	[-0.54, -0.23]	[-0.37, -0.08]	[-2.93, -0.94]	[-0.91, -0.50]	[-0.20, 0.02]	[-1.18, -0.46]
new EU	**-0.06**	0.02	**-0.57**	0.07	**0.17**	**-0.18**
	[-0.11, -0.00]	[-0.05, 0.09]	[-0.75, -0.38]	[-0.05, 0.19]	[0.07, 0.27]	[-0.25, -0.12]
non-EU	**0.11**	**0.11**	-0.12	**0.31**	**0.15**	**0.11**
	[0.06, 0.15]	[0.07, 0.15]	[-0.28, 0.03]	[0.14, 0.48]	[0.10, 0.20]	[0.06, 0.16]
Schengen						
old EU	**-0.62**	**0.35**	**-7.11**	**-8.87**	**-3.94**	**-5.40**
	[-0.81, -0.43]	[0.13, 0.57]	[-8.09, -6.14]	[-10.09, -7.65]	[-4.10, -3.79]	[-5.88, -4.92]
new EU	**-1.53**	0.12	**-8.34**	**-2.80**	**-3.95**	**-5.86**
	[-1.91, -1.15]	[-0.31, 0.55]	[-9.47, -7.22]	[-3.47, -2.13]	[-4.19, -3.71]	[-6.46, -5.26]
non-EU	**0.21**	**-2.14**	**-0.65**	**-0.84**	**-2.70**	**-2.31**
	[0.15, 0.27]	[-2.20, -2.07]	[-0.88, -0.42]	[-1.23, -0.45]	[-2.79, -2.61]	[-2.36, -2.25]
other RTAs						
old EU	**-0.19**	**-0.09**	**0.25**	**0.61**	**-1.04**	**-0.46**
	[-0.24, -0.14]	[-0.14, -0.03]	[0.16, 0.35]	[0.51, 0.71]	[-1.21, -0.86]	[-0.55, -0.38]
new EU	**-0.21**	**-0.08**	**0.16**	**0.51**	**-1.32**	**-0.43**
	[-0.24, -0.18]	[-0.11, -0.04]	[0.08, 0.23]	[0.41, 0.61]	[-1.49, -1.15]	[-0.48, -0.38]
non-EU	**0.06**	**0.11**	**-1.45**	**-2.07**	**0.12**	**-0.19**
	[0.04, 0.07]	[0.09, 0.13]	[-1.70, -1.20]	[-2.31, -1.84]	[0.09, 0.16]	[-0.22, -0.16]
Complete EU						
old EU	**-4.59**	-0.32	**-35.93**	**-38.61**	**-0.80**	**-16.04**
	[-5.15, -4.04]	[-1.19, 0.54]	[-38.29, -33.57]	[-40.82, -36.40]	[-1.21, -0.40]	[-16.97, -15.11]
new EU	**-9.58**	**-2.46**	**-36.51**	**-31.55**	**-2.19**	**-21.41**
	[-10.61, -8.55]	[-4.04, -0.88]	[-38.57, -34.46]	[-34.09, -29.01]	[-2.93, -1.45]	[-22.54, -20.28]
non-EU	**1.50**	**1.55**	-0.53	**-3.24**	**1.79**	**1.29**
	[1.33, 1.68]	[1.36, 1.74]	[-1.07, 0.02]	[-4.36, -2.11]	[1.55, 2.02]	[1.15, 1.43]
Complete EU (incl. Transfers)						
old EU	**-4.74**	-0.48	**-36.00**	**-40.10**	**-0.85**	**-16.17**
	[-5.30, -4.19]	[-1.35, 0.39]	[-38.35, -33.64]	[-42.27, -37.93]	[-1.25, -0.45]	[-17.09, -15.24]
new EU	**-12.42**	**-5.91**	**-37.84**	**-34.62**	**-4.25**	**-23.24**
	[-13.40, -11.45]	[-7.38, -4.45]	[-39.89, -35.79]	[-37.09, -32.16]	[-4.93, -3.58]	[-24.37, -22.12]
non-EU	**1.47**	**1.53**	**-0.60**	**-5.68**	**1.79**	**1.23**
	[1.30, 1.65]	[1.34, 1.71]	[-1.14, -0.06]	[-6.74, -4.61]	[1.56, 2.02]	[1.09, 1.37]

Note: 90%-confidence bounds in brackets based on 1,000 bootstrap replications and an approximate normal distribution.

Table A13: Changes in Income per Capita in %, Baseline Year 2014

Scenario:	Income p.c. in thsd. US $	Single Market	Customs Union (MFN Tariffs)	Euro	Schengen	Other RTAs	EU Complete	EU Complete incl. Transfer
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
AUS	59.25	0.01	-0.00	0.01	0.00	**0.00**	**0.02**	**0.02**
		[-0.00, 0.03]	[-0.00, 0.00]	[-0.00, 0.01]	[-0.01, 0.01]	[0.00, 0.01]	[0.00, 0.04]	[0.00, 0.05]
AUT**	45.42	**-6.17**	**-0.09**	**-0.67**	**-1.15**	**-0.14**	**-7.97**	**-7.91**
		[-7.16, -5.17]	[-0.13, -0.06]	[-1.03, -0.31]	[-1.53, -0.77]	[-0.20, -0.08]	[-9.25, -6.69]	[-9.20, -6.63]
BEL**	42.49	**-8.20**	**-0.24**	**-0.77**	**-1.76**	-0.16	**-11.10**	**-11.47**
		[-9.57, -6.83]	[-0.37, -0.11]	[-1.31, -0.22]	[-2.40, -1.13]	[-0.33, 0.01]	[-12.89, -9.30]	[-13.26, -9.67]
BGR*	7.68	**-5.67**	**-0.08**	-0.01	**-1.31**	**-0.25**	**-7.12**	**-11.57**
		[-6.80, -4.55]	[-0.11, -0.05]	[-0.04, 0.01]	[-1.92, -0.71]	[-0.34, -0.15]	[-8.59, -5.64]	[-13.05, -10.09]
BRA	11.14	0.00	0.00	**-0.00**	-0.00	0.00	0.00	0.00
		[-0.01, 0.01]	[-0.00, 0.01]	[-0.00, -0.00]	[-0.01, 0.00]	[-0.00, 0.00]	[-0.01, 0.02]	[-0.01, 0.02]
CAN	47.23	**0.03**	-0.00	0.01	0.00	-0.00	**0.06**	**0.06**
		[0.02, 0.05]	[-0.01, 0.01]	[-0.00, 0.01]	[-0.01, 0.02]	[-0.01, 0.00]	[0.04, 0.09]	[0.04, 0.08]
CHE	74.50	**0.49**	**0.05**	**-0.09**	**-0.85**	**-1.15**	**-2.00**	**-2.02**
		[0.38, 0.59]	[0.03, 0.08]	[-0.13, -0.04]	[-1.28, -0.42]	[-1.77, -0.53]	[-2.84, -1.16]	[-2.86, -1.18]
CHN	7.06	**0.14**	**0.03**	0.01	**0.03**	**0.02**	**0.22**	**0.22**
		[0.12, 0.16]	[0.03, 0.04]	[-0.00, 0.02]	[0.02, 0.05]	[0.01, 0.02]	[0.20, 0.25]	[0.19, 0.25]
CYP*	20.46	**-5.06**	**0.19**	**-0.75**	**-0.91**	0.03	**-6.05**	**-7.29**
		[-6.44, -3.67]	[0.13, 0.25]	[-1.38, -0.12]	[-1.76, -0.07]	[-0.02, 0.07]	[-7.88, -4.23]	[-9.12, -5.46]
CZE*	17.00	**-9.47**	**-0.42**	-0.02	**-2.00**	**-0.11**	**-11.97**	**-14.71**
		[-11.06, -7.89]	[-0.52, -0.33]	[-0.11, 0.06]	[-2.63, -1.36]	[-0.15, -0.07]	[-13.91, -10.03]	[-16.67, -12.74]
DEU**	40.34	**-3.91**	**-0.13**	**-0.41**	**-0.80**	**-0.11**	**-5.22**	**-5.10**
		[-4.66, -3.16]	[-0.15, -0.12]	[-0.65, -0.16]	[-1.04, -0.55]	[-0.18, -0.04]	[-6.20, -4.24]	[-6.08, -4.12]
DNK**	51.14	**-4.89**	-0.02	-0.01	**-1.23**	**-0.14**	**-6.35**	**-6.37**
		[-5.77, -4.02]	[-0.10, 0.06]	[-0.03, 0.01]	[-1.61, -0.84]	[-0.23, -0.05]	[-7.47, -5.24]	[-7.49, -5.25]
ESP**	27.92	**-2.55**	**-0.05**	**-0.28**	**-0.78**	-0.01	**-3.56**	**-4.20**
		[-3.08, -2.01]	[-0.08, -0.02]	[-0.49, -0.07]	[-1.02, -0.53]	[-0.08, 0.06]	[-4.31, -2.80]	[-4.95, -3.44]
EST*	18.28	**-7.75**	**-0.14**	**-0.57**	**-2.81**	**-0.11**	**-11.15**	**-14.01**
		[-9.20, -6.30]	[-0.21, -0.08]	[-1.00, -0.14]	[-3.95, -1.67]	[-0.19, -0.02]	[-13.35, -8.94]	[-16.24, -11.79]
FIN**	44.63	**-3.78**	-0.01	**-0.28**	**-1.59**	-0.02	**-5.63**	**-5.60**
		[-4.55, -3.00]	[-0.02, 0.01]	[-0.47, -0.08]	[-2.17, -1.00]	[-0.08, 0.04]	[-6.86, -4.40]	[-6.83, -4.37]
FRA**	39.95	**-2.91**	**-0.04**	**-0.29**	**-0.56**	-0.04	**-3.72**	**-3.72**
		[-3.45, -2.37]	[-0.05, -0.03]	[-0.49, -0.09]	[-0.73, -0.39]	[-0.09, 0.01]	[-4.40, -3.03]	[-4.41, -3.03]
GBR**	43.50	**-2.33**	**0.07**	-0.02	**-0.46**	-0.01	**-2.71**	**-2.88**
		[-2.83, -1.83]	[0.05, 0.09]	[-0.03, 0.00]	[-0.66, -0.27]	[-0.08, 0.06]	[-3.33, -2.09]	[-3.49, -2.26]
GRC**	21.57	**-2.16**	**0.12**	-0.16	**-0.63**	**-0.13**	**-2.84**	**-5.83**
		[-2.81, -1.51]	[0.08, 0.16]	[-0.41, 0.08]	[-0.97, -0.28]	[-0.26, -0.01]	[-3.75, -1.92]	[-6.76, -4.90]
HRV*	12.15	**-4.94**	**-0.12**	-0.03	**-0.98**	**-0.05**	**-5.92**	**-6.85**
		[-5.94, -3.95]	[-0.15, -0.09]	[-0.05, 0.00]	[-1.38, -0.59]	[-0.08, -0.01]	[-7.17, -4.68]	[-8.10, -5.60]
HUN*	11.67	**-10.64**	**-0.30**	-0.06	**-2.94**	**-0.14**	**-14.16**	**-20.82**
		[-12.23, -9.05]	[-0.44, -0.15]	[-0.15, 0.02]	[-3.81, -2.08]	[-0.21, -0.08]	[-16.18, -12.14]	[-22.87, -18.77]
IDN	3.37	**0.06**	**0.02**	0.00	**0.02**	0.00	**0.10**	**0.10**
		[0.05, 0.07]	[0.01, 0.02]	[-0.00, 0.01]	[0.01, 0.03]	[-0.00, 0.01]	[0.08, 0.12]	[0.08, 0.12]
IND	1.59	**0.06**	**0.02**	0.01	**0.01**	0.01	**0.11**	**0.11**
		[0.05, 0.08]	[0.01, 0.02]	[-0.00, 0.01]	[0.00, 0.02]	[-0.00, 0.01]	[0.09, 0.13]	[0.09, 0.13]

Note: ** Old EU member states, * New EU member states. Bold values are statistically different from zero at $\alpha = 10\%$. 90%-confidence bounds in brackets based on 1,000 bootstrap replications and approximate normal distribution.

Table A13: Changes in Income per Capita in %, Baseline Year 2014, continued

Scenario:	Income p.c. in thsd. US $	Single Market (1)	Customs Union (MFN Tariffs) (2)	Euro (3)	Schengen (4)	Other RTAs (5)	EU Complete (6)	EU Complete incl. Transfer (7)
IRL**	39.60	**-9.35** [-11.25, -7.46]	**-0.68** [-1.09, -0.28]	**-0.89** [-1.62, -0.16]	**-0.96** [-1.50, -0.41]	**-0.34** [-0.45, -0.22]	**-12.31** [-14.64, -9.98]	**-12.68** [-15.02, -10.35]
ITA**	31.89	**-2.52** [-3.07, -1.96]	**-0.07** [-0.09, -0.06]	**-0.25** [-0.44, -0.06]	**-0.75** [-1.02, -0.47]	**-0.09** [-0.13, -0.05]	**-3.56** [-4.36, -2.77]	**-3.76** [-4.55, -2.96]
JPN	36.13	**0.02** [0.01, 0.03]	**0.01** [0.00, 0.01]	**-0.01** [-0.01, -0.00]	0.01 [-0.00, 0.01]	**0.01** [0.01, 0.01]	**0.04** [0.03, 0.06]	**0.04** [0.03, 0.06]
KOR	24.45	**0.24** [0.20, 0.27]	**0.06** [0.05, 0.06]	0.01 [-0.00, 0.03]	**0.06** [0.04, 0.08]	**-0.27** [-0.37, -0.18]	0.06 [-0.02, 0.14]	0.05 [-0.04, 0.13]
LTU*	15.21	**-5.55** [-6.84, -4.27]	**-0.22** [-0.28, -0.17]	0.02 [-0.01, 0.06]	**-2.23** [-3.03, -1.43]	-0.03 [-0.10, 0.05]	**-7.80** [-9.68, -5.93]	**-12.72** [-14.59, -10.86]
LUX**	80.89	**-19.73** [-24.10, -15.37]	0.03 [-0.03, 0.08]	**-3.86** [-5.42, -2.29]	-0.98 [-5.34, 3.39]	-0.24 [-1.22, 0.74]	**-23.26** [-28.65, -17.86]	**-23.74** [-29.17, -18.32]
LVA*	14.87	**-5.79** [-7.02, -4.56]	**-0.07** [-0.12, -0.01]	**-0.46** [-0.78, -0.14]	**-2.31** [-3.20, -1.42]	-0.04 [-0.12, 0.05]	**-8.33** [-10.19, -6.47]	**-12.02** [-13.88, -10.17]
MEX	9.69	**0.03** [0.02, 0.05]	**0.01** [0.00, 0.02]	**0.01** [0.00, 0.01]	**0.01** [0.00, 0.02]	-0.06 [-0.13, 0.01]	-0.02 [-0.09, 0.05]	-0.02 [-0.09, 0.05]
MLT*	24.10	**-14.33** [-18.12, -10.55]	**0.10** [0.04, 0.16]	**-2.55** [-4.33, -0.77]	-1.53 [-4.32, 1.27]	-0.05 [-0.27, 0.17]	**-17.81** [-22.24, -13.37]	**-20.11** [-24.68, -15.54]
NLD**	42.02	**-7.25** [-8.34, -6.16]	**-0.37** [-0.49, -0.24]	**-1.30** [-1.84, -0.76]	**-1.84** [-2.34, -1.34]	**-0.19** [-0.28, -0.10]	**-10.90** [-12.37, -9.44]	**-10.98** [-12.45, -9.50]
NOR	76.04	0.08 [-0.15, 0.31]	**-0.02** [-0.04, -0.01]	**0.22** [0.12, 0.32]	**-1.29** [-2.36, -0.21]	0.49 [-0.63, 1.62]	-1.11 [-2.59, 0.38]	-1.13 [-2.61, 0.36]
POL*	12.91	**-5.93** [-6.85, -5.00]	**-0.26** [-0.30, -0.22]	-0.00 [-0.03, 0.03]	**-1.82** [-2.23, -1.41]	**-0.11** [-0.15, -0.06]	**-7.77** [-8.96, -6.59]	**-11.83** [-13.01, -10.65]
PRT**	21.33	**-3.90** [-4.82, -2.98]	**0.06** [0.03, 0.09]	**-0.38** [-0.76, -0.00]	**-1.31** [-1.77, -0.86]	**-0.03** [-0.06, -0.00]	**-5.26** [-6.54, -3.99]	**-7.30** [-8.59, -6.02]
ROU*	9.29	**-4.53** [-5.44, -3.63]	-0.01 [-0.05, 0.03]	**-0.04** [-0.07, -0.00]	-0.00 [-0.06, 0.05]	**-0.15** [-0.20, -0.09]	**-4.65** [-5.62, -3.69]	**-8.21** [-9.18, -7.23]
ROW	4.05	**0.06** [0.02, 0.10]	**0.03** [0.02, 0.04]	0.01 [-0.00, 0.03]	0.03 [-0.01, 0.07]	0.00 [-0.01, 0.02]	**0.15** [0.08, 0.21]	**0.13** [0.06, 0.20]
RUS	11.20	0.04 [-0.04, 0.11]	**-0.01** [-0.02, -0.00]	**0.08** [0.05, 0.11]	**-0.44** [-0.60, -0.29]	-0.03 [-0.07, 0.00]	**-0.47** [-0.66, -0.28]	**-0.50** [-0.69, -0.31]
SVK*	17.20	**-8.91** [-10.45, -7.38]	-0.09 [-0.23, 0.05]	**-0.77** [-1.19, -0.35]	**-2.28** [-2.98, -1.58]	**-0.11** [-0.18, -0.05]	**-11.87** [-13.90, -9.85]	**-14.34** [-16.39, -12.29]
SVN*	21.06	**-7.68** [-8.96, -6.40]	**-0.31** [-0.39, -0.23]	**-0.78** [-1.22, -0.33]	**-1.77** [-2.29, -1.25]	**-0.15** [-0.23, -0.07]	**-10.35** [-12.00, -8.69]	**-13.25** [-14.93, -11.58]
SWE**	51.67	**-4.22** [-5.05, -3.39]	-0.01 [-0.02, 0.00]	-0.00 [-0.03, 0.02]	**-1.60** [-2.13, -1.07]	**-0.12** [-0.20, -0.03]	**-6.01** [-7.20, -4.81]	**-5.75** [-6.94, -4.55]
TUR	9.45	**0.19** [0.13, 0.24]	**0.08** [0.06, 0.11]	-0.01 [-0.03, 0.01]	**-0.63** [-0.82, -0.45]	**-0.28** [-0.49, -0.06]	**-0.83** [-1.17, -0.49]	**-0.85** [-1.19, -0.51]
TWN	19.51	**0.30** [0.24, 0.35]	**0.06** [0.06, 0.07]	0.00 [-0.02, 0.02]	**0.06** [0.03, 0.08]	**0.04** [0.03, 0.05]	**0.46** [0.39, 0.53]	**0.45** [0.38, 0.52]
USA	56.21	**-0.02** [-0.03, -0.01]	**-0.00** [-0.00, -0.00]	-0.00 [-0.00, 0.00]	**-0.02** [-0.02, -0.01]	0.00 [-0.00, 0.00]	**-0.03** [-0.05, -0.01]	**-0.03** [-0.05, -0.02]

Note: ** Old EU member states, * New EU member states. Bold values are statistically different from zero at $\alpha = 10\%$. 90%-confidence bounds in brackets based on 1,000 bootstrap replications and approximate normal distribution.

Table A14: Changes in Real Wage in %, Baseline Year 2014

Scenario:	Single Market	Customs Union (MFN Tariffs)	Euro	Schengen	Other RTAs	EU Complete	EU Complete incl. Transfers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
AUS	0.02	-0.00	0.00	-0.01	-0.00	0.03	0.02
	[-0.13, 0.17]	[-0.02, 0.01]	[-0.04, 0.05]	[-0.09, 0.08]	[-0.04, 0.04]	[-0.19, 0.24]	[-0.19, 0.23]
AUT**	**-5.93**	**-1.07**	**-0.64**	**-1.11**	**-0.15**	**-8.39**	**-8.44**
	[-6.44, -5.42]	[-1.17, -0.97]	[-0.86, -0.42]	[-1.35, -0.87]	[-0.20, -0.10]	[-9.06, -7.71]	[-9.11, -7.77]
BEL**	**-7.85**	**-1.35**	**-0.72**	**-1.67**	**-0.16**	**-11.31**	**-11.29**
	[-8.67, -7.03]	[-1.53, -1.16]	[-1.02, -0.43]	[-2.05, -1.29]	[-0.23, -0.09]	[-12.43, -10.19]	[-12.41, -10.17]
BGR*	**-5.95**	**-1.10**	-0.01	**-1.37**	**-0.27**	**-8.16**	**-7.51**
	[-6.70, -5.19]	[-1.17, -1.03]	[-0.06, 0.04]	[-1.71, -1.03]	[-0.33, -0.21]	[-9.17, -7.14]	[-8.58, -6.44]
BRA	0.01	0.01	0.00	0.00	-0.00	0.03	0.02
	[-0.13, 0.15]	[-0.02, 0.03]	[-0.04, 0.04]	[-0.07, 0.08]	[-0.03, 0.03]	[-0.17, 0.23]	[-0.18, 0.22]
CAN	0.02	0.00	0.01	-0.00	0.00	0.05	0.05
	[-0.12, 0.16]	[-0.01, 0.02]	[-0.03, 0.05]	[-0.09, 0.09]	[-0.04, 0.04]	[-0.16, 0.25]	[-0.16, 0.25]
CHE	**0.29**	**0.04**	**-0.07**	**-0.77**	**-1.41**	**-2.28**	**-2.29**
	[0.11, 0.47]	[0.01, 0.06]	[-0.13, -0.01]	[-1.03, -0.52]	[-1.80, -1.03]	[-2.78, -1.78]	[-2.79, -1.79]
CHN	0.04	**0.02**	-0.00	0.01	0.01	0.07	0.07
	[-0.13, 0.21]	[0.00, 0.03]	[-0.05, 0.05]	[-0.07, 0.09]	[-0.02, 0.04]	[-0.16, 0.31]	[-0.16, 0.30]
CYP*	**-5.34**	**-0.57**	**-0.80**	**-0.94**	0.02	**-6.91**	**-6.75**
	[-6.30, -4.38]	[-0.69, -0.45]	[-1.27, -0.33]	[-1.43, -0.45]	[-0.03, 0.06]	[-8.12, -5.70]	[-7.99, -5.51]
CZE*	**-8.47**	**-1.73**	-0.03	**-1.81**	**-0.14**	**-11.56**	**-11.40**
	[-9.18, -7.76]	[-1.86, -1.59]	[-0.13, 0.07]	[-2.18, -1.43]	[-0.18, -0.11]	[-12.53, -10.60]	[-12.38, -10.43]
DEU**	**-3.61**	**-0.69**	**-0.37**	**-0.75**	**-0.11**	**-5.18**	**-5.21**
	[-4.01, -3.22]	[-0.75, -0.64]	[-0.53, -0.22]	[-0.92, -0.59]	[-0.16, -0.06]	[-5.71, -4.64]	[-5.74, -4.68]
DNK**	**-4.53**	**-0.69**	-0.01	**-1.14**	**-0.16**	**-6.42**	**-6.43**
	[-5.16, -3.91]	[-0.82, -0.55]	[-0.06, 0.04]	[-1.44, -0.84]	[-0.23, -0.08]	[-7.32, -5.51]	[-7.33, -5.53]
ESP**	**-2.57**	**-0.58**	**-0.28**	**-0.79**	-0.02	**-3.93**	**-3.91**
	[-2.94, -2.20]	[-0.70, -0.47]	[-0.44, -0.12]	[-1.00, -0.58]	[-0.09, 0.05]	[-4.50, -3.36]	[-4.48, -3.33]
EST*	**-7.70**	**-1.29**	**-0.57**	**-2.85**	**-0.12**	**-11.87**	**-11.50**
	[-8.61, -6.79]	[-1.40, -1.19]	[-0.87, -0.26]	[-3.67, -2.03]	[-0.19, -0.06]	[-13.29, -10.45]	[-12.97, -10.04]
FIN**	**-3.77**	**-0.61**	**-0.27**	**-1.57**	-0.02	**-6.00**	**-6.01**
	[-4.15, -3.39]	[-0.66, -0.56]	[-0.41, -0.14]	[-1.92, -1.22]	[-0.07, 0.03]	[-6.59, -5.41]	[-6.60, -5.43]
FRA**	**-2.96**	**-0.55**	**-0.29**	**-0.56**	**-0.05**	**-4.14**	**-4.15**
	[-3.29, -2.62]	[-0.61, -0.48]	[-0.46, -0.13]	[-0.69, -0.43]	[-0.09, -0.02]	[-4.59, -3.69]	[-4.60, -3.70]
GBR**	**-2.37**	**-0.35**	-0.01	**-0.47**	-0.02	**-3.06**	**-3.06**
	[-2.77, -1.98]	[-0.39, -0.30]	[-0.05, 0.03]	[-0.66, -0.27]	[-0.08, 0.04]	[-3.57, -2.56]	[-3.57, -2.56]
GRC**	**-2.11**	**-0.32**	-0.17	**-0.62**	**-0.17**	**-3.10**	**-2.86**
	[-2.74, -1.49]	[-0.51, -0.13]	[-0.47, 0.12]	[-0.97, -0.26]	[-0.34, -0.00]	[-3.95, -2.25]	[-3.78, -1.95]
HRV*	**-5.04**	**-0.98**	-0.03	**-1.00**	**-0.05**	**-6.69**	**-6.66**
	[-5.73, -4.34]	[-1.05, -0.90]	[-0.08, 0.03]	[-1.29, -0.72]	[-0.09, -0.02]	[-7.59, -5.80]	[-7.56, -5.76]
HUN*	**-9.59**	**-1.78**	-0.06	**-2.68**	**-0.17**	**-13.73**	**-13.02**
	[-10.37, -8.82]	[-1.97, -1.59]	[-0.16, 0.04]	[-3.18, -2.18]	[-0.21, -0.13]	[-14.86, -12.60]	[-14.21, -11.83]
IDN	0.03	0.01	0.00	0.01	-0.00	0.05	0.05
	[-0.12, 0.17]	[-0.01, 0.03]	[-0.05, 0.05]	[-0.07, 0.10]	[-0.04, 0.04]	[-0.15, 0.26]	[-0.16, 0.25]
IND	0.03	0.01	0.00	0.01	0.01	0.05	0.06
	[-0.13, 0.19]	[-0.02, 0.04]	[-0.05, 0.05]	[-0.08, 0.10]	[-0.03, 0.05]	[-0.17, 0.28]	[-0.17, 0.28]

Note: ** Old EU member states, * New EU member states. Bold values are statistically different from zero at $\alpha = 10\%$. 90%-confidence bounds in brackets based on 1,000 bootstrap replications and approximate normal distribution.

Table A14: Changes in Real Wage in %, Baseline Year 2014, continued

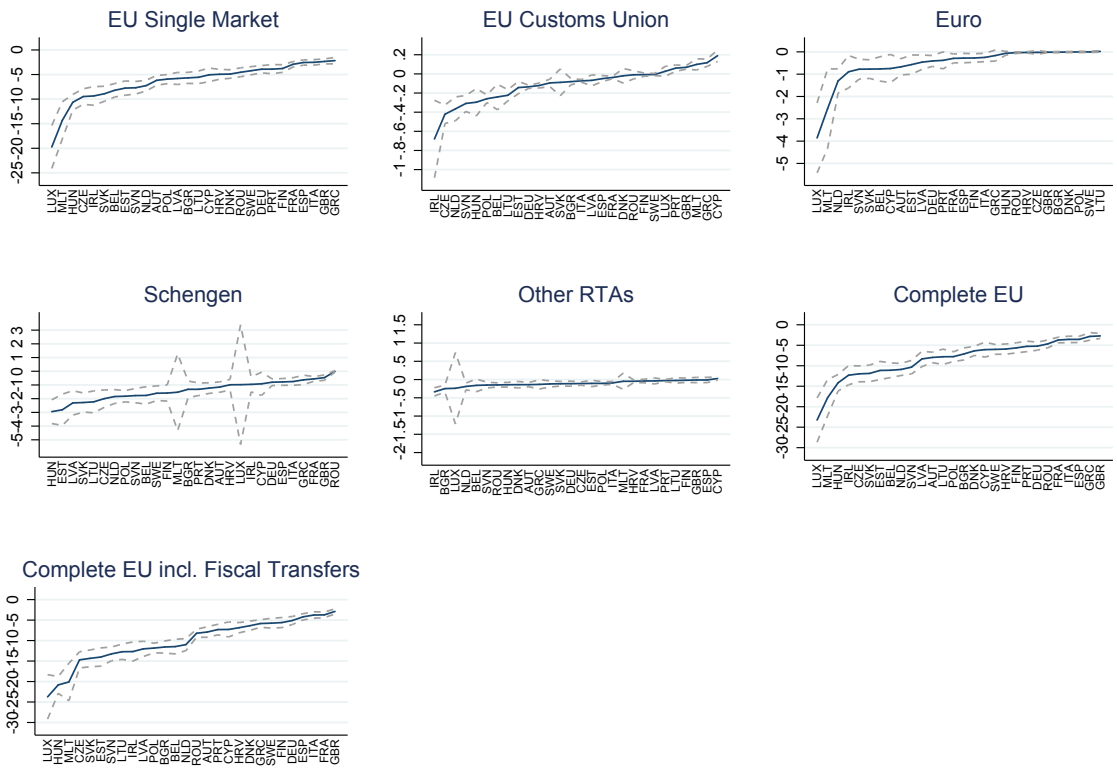
Scenario:	Single Market	Customs Union (MFN Tariffs)	Euro	Schengen	Other RTAs	EU Complete	EU Complete incl. Transfers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IRL**	**-7.49**	**-1.14**	**-0.77**	**-0.77**	**-0.23**	**-10.22**	**-10.18**
	[-8.39, -6.59]	[-1.41, -0.88]	[-1.13, -0.42]	[-1.06, -0.47]	[-0.30, -0.15]	[-11.40, -9.04]	[-11.36, -9.00]
ITA**	**-2.48**	**-0.50**	**-0.25**	**-0.73**	**-0.09**	**-3.78**	**-3.78**
	[-2.76, -2.19]	[-0.56, -0.45]	[-0.39, -0.11]	[-0.93, -0.54]	[-0.13, -0.06]	[-4.18, -3.37]	[-4.19, -3.38]
JPN	0.04	0.02	-0.01	0.01	0.02	0.07	0.07
	[-0.13, 0.21]	[-0.01, 0.04]	[-0.06, 0.04]	[-0.08, 0.10]	[-0.01, 0.05]	[-0.16, 0.31]	[-0.16, 0.31]
KOR	0.10	**0.02**	-0.00	0.03	**-0.34**	-0.21	-0.22
	[-0.07, 0.27]	[0.01, 0.04]	[-0.05, 0.05]	[-0.06, 0.11]	[-0.39, -0.29]	[-0.45, 0.03]	[-0.46, 0.01]
LTU*	**-5.49**	**-1.40**	0.01	**-2.18**	-0.04	**-8.52**	**-8.03**
	[-6.52, -4.45]	[-1.49, -1.30]	[-0.07, 0.08]	[-2.89, -1.48]	[-0.10, 0.01]	[-10.15, -6.88]	[-9.73, -6.33]
LUX**	**-15.37**	**-1.32**	**-2.53**	-1.04	**-0.27**	**-19.21**	**-19.12**
	[-17.11, -13.63]	[-1.37, -1.28]	[-3.35, -1.70]	[-2.62, 0.55]	[-0.54, -0.01]	[-21.14, -17.29]	[-21.06, -17.19]
LVA*	**-5.97**	**-1.21**	**-0.48**	**-2.38**	-0.05	**-9.40**	**-8.96**
	[-6.97, -4.96]	[-1.33, -1.09]	[-0.77, -0.20]	[-3.13, -1.62]	[-0.13, 0.03]	[-10.93, -7.87]	[-10.56, -7.36]
MEX	0.02	0.00	-0.00	0.01	**-0.14**	-0.11	-0.11
	[-0.13, 0.17]	[-0.01, 0.01]	[-0.04, 0.04]	[-0.08, 0.10]	[-0.26, -0.01]	[-0.34, 0.11]	[-0.34, 0.11]
MLT*	**-15.06**	**-0.66**	**-2.66**	**-1.55**	-0.08	**-19.16**	**-18.51**
	[-18.33, -11.79]	[-0.72, -0.61]	[-3.62, -1.71]	[-2.85, -0.26]	[-0.19, 0.02]	[-22.71, -15.62]	[-22.08, -14.94]
NLD**	**-5.93**	**-1.08**	**-0.96**	**-1.54**	**-0.16**	**-9.24**	**-9.26**
	[-6.79, -5.07]	[-1.25, -0.92]	[-1.38, -0.54]	[-1.91, -1.16]	[-0.25, -0.07]	[-10.27, -8.21]	[-10.28, -8.23]
NOR	-0.04	**-0.02**	0.10	-1.08	-0.40	-1.87	-1.89
	[-0.42, 0.33]	[-0.04, -0.01]	[-0.07, 0.27]	[-2.73, 0.57]	[-2.16, 1.35]	[-4.12, 0.37]	[-4.13, 0.35]
POL*	**-5.68**	**-1.07**	-0.01	**-1.74**	**-0.14**	**-7.98**	**-7.72**
	[-6.24, -5.12]	[-1.16, -0.97]	[-0.07, 0.06]	[-2.07, -1.40]	[-0.18, -0.09]	[-8.83, -7.13]	[-8.61, -6.83]
PRT**	**-4.01**	**-0.96**	**-0.40**	**-1.34**	-0.04	**-6.16**	**-5.99**
	[-4.69, -3.34]	[-1.08, -0.84]	[-0.72, -0.08]	[-1.71, -0.97]	[-0.09, 0.00]	[-7.07, -5.25]	[-6.92, -5.07]
ROU*	**-4.54**	**-0.87**	-0.04	-0.01	**-0.15**	**-5.31**	**-5.09**
	[-5.14, -3.95]	[-0.97, -0.77]	[-0.10, 0.02]	[-0.09, 0.07]	[-0.20, -0.10]	[-5.95, -4.67]	[-5.77, -4.40]
ROW	0.05	**0.02**	0.01	0.01	-0.00	0.13	0.10
	[-0.08, 0.18]	[0.00, 0.03]	[-0.03, 0.05]	[-0.07, 0.09]	[-0.05, 0.04]	[-0.06, 0.31]	[-0.08, 0.29]
RUS	-0.03	-0.02	0.05	**-0.44**	-0.03	**-0.55**	**-0.57**
	[-0.25, 0.18]	[-0.04, 0.00]	[-0.04, 0.14]	[-0.62, -0.26]	[-0.13, 0.07]	[-0.91, -0.19]	[-0.93, -0.21]
SVK*	**-8.54**	**-1.79**	**-0.75**	**-2.20**	**-0.26**	**-12.57**	**-12.40**
	[-9.44, -7.64]	[-1.98, -1.60]	[-1.06, -0.44]	[-2.72, -1.68]	[-0.31, -0.21]	[-13.74, -11.40]	[-13.58, -11.22]
SVN*	**-7.43**	**-1.45**	**-0.75**	**-1.73**	**-0.22**	**-10.85**	**-10.64**
	[-8.15, -6.71]	[-1.58, -1.31]	[-1.06, -0.44]	[-2.03, -1.42]	[-0.28, -0.16]	[-11.80, -9.89]	[-11.59, -9.69]
SWE**	**-4.08**	**-0.60**	-0.01	**-1.52**	**-0.13**	**-6.20**	**-6.23**
	[-4.55, -3.61]	[-0.63, -0.57]	[-0.07, 0.05]	[-1.88, -1.17]	[-0.24, -0.02]	[-6.93, -5.46]	[-6.96, -5.50]
TUR	0.12	**0.07**	-0.02	**-0.64**	**-0.77**	**-1.33**	**-1.35**
	[-0.09, 0.33]	[0.01, 0.12]	[-0.09, 0.06]	[-0.81, -0.46]	[-1.06, -0.47]	[-1.69, -0.97]	[-1.71, -1.00]
TWN	0.09	**0.02**	-0.01	0.01	0.03	0.14	0.14
	[-0.09, 0.26]	[0.01, 0.04]	[-0.06, 0.04]	[-0.07, 0.09]	[-0.00, 0.06]	[-0.10, 0.38]	[-0.10, 0.38]
USA	-0.00	-0.00	-0.00	-0.00	0.01	0.01	0.01
	[-0.13, 0.12]	[-0.02, 0.01]	[-0.04, 0.04]	[-0.08, 0.07]	[-0.02, 0.04]	[-0.17, 0.19]	[-0.17, 0.19]

Note: ** Old EU member states, * New EU member states. Bold values are statistically different from zero at $\alpha = 10\%$. 90%-confidence bounds in brackets based on 1,000 bootstrap replications and approximate normal distribution.

Table A15: Changes in Income per Capita in %, Robustness Analysis

Scenario:	Brexit (1)	EU complete post-Brexit (2)	EU complete pre-Brexit (3)	Difference (2)-(3) (%pts.) (4)	EU complete HS6 (5)	EU Complete Aggregate (6)
AUS	**0.01** [0.00, 0.01]	0.02 [-0.00, 0.04]	**0.02** [0.00, 0.04]	-0.00 [-0.01, 0.00]	**-0.06** [-0.12, -0.01]	0.04 [-0.04, 0.12]
AUT**	**-0.17** [-0.23, -0.12]	**-7.81** [-9.05, -6.57]	**-7.97** [-9.25, -6.69]	**0.16** [0.11, 0.21]	**-7.95** [-9.52, -6.37]	**-9.06** [-12.56, -5.56]
BEL**	**-0.87** [-1.10, -0.64]	**-10.32** [-11.97, -8.67]	**-11.10** [-12.89, -9.30]	**0.78** [0.58, 0.97]	**-10.26** [-12.19, -8.32]	**-12.95** [-16.76, -9.14]
BGR*	**-0.26** [-0.35, -0.18]	**-6.87** [-8.29, -5.45]	**-7.12** [-8.59, -5.64]	**0.24** [0.17, 0.32]	**-7.46** [-9.22, -5.70]	**-7.62** [-11.24, -3.99]
BRA	**0.00** [0.00, 0.01]	0.00 [-0.01, 0.02]	0.00 [-0.01, 0.02]	-0.00 [-0.00, 0.00]	**-0.05** [-0.09, -0.01]	0.01 [-0.06, 0.07]
CAN	**0.01** [0.01, 0.02]	**0.05** [0.03, 0.07]	**0.06** [0.04, 0.09]	**-0.01** [-0.02, -0.00]	-0.04 [-0.10, 0.01]	0.06 [-0.02, 0.14]
CHE	0.01 [-0.11, 0.12]	**-2.00** [-2.77, -1.24]	**-2.00** [-2.84, -1.16]	-0.00 [-0.12, 0.11]	**-2.23** [-3.16, -1.30]	**-1.79** [-3.30, -0.28]
CHN	**0.03** [0.03, 0.03]	**0.19** [0.17, 0.22]	**0.22** [0.20, 0.25]	**-0.03** [-0.04, -0.02]	**0.12** [0.07, 0.18]	**0.25** [0.17, 0.32]
CYP*	**-0.88** [-1.29, -0.47]	**-5.22** [-6.82, -3.63]	**-6.05** [-7.88, -4.23]	**0.83** [0.45, 1.21]	**-6.08** [-8.04, -4.12]	**-7.00** [-10.26, -3.74]
CZE*	**-0.38** [-0.49, -0.27]	**-11.63** [-13.50, -9.77]	**-11.97** [-13.91, -10.03]	**0.34** [0.25, 0.43]	**-11.68** [-13.87, -9.48]	**-12.31** [-16.61, -8.01]
DEU**	**-0.37** [-0.46, -0.28]	**-4.86** [-5.78, -3.95]	**-5.22** [-6.20, -4.24]	**0.35** [0.27, 0.44]	**-5.34** [-6.59, -4.08]	**-5.84** [-8.33, -3.36]
DNK**	**-0.54** [-0.69, -0.39]	**-5.84** [-6.86, -4.83]	**-6.35** [-7.47, -5.24]	**0.51** [0.37, 0.65]	**-6.20** [-7.51, -4.89]	**-6.86** [-9.59, -4.13]
ESP**	**-0.19** [-0.26, -0.13]	**-3.37** [-4.06, -2.67]	**-3.56** [-4.31, -2.80]	**0.19** [0.12, 0.25]	**-3.92** [-4.94, -2.90]	**-3.97** [-5.74, -2.19]
EST*	**-0.35** [-0.49, -0.21]	**-10.83** [-12.95, -8.72]	**-11.15** [-13.35, -8.94]	**0.31** [0.20, 0.43]	**-10.94** [-13.42, -8.46]	**-12.87** [-17.76, -7.98]
FIN**	**-0.28** [-0.36, -0.19]	**-5.37** [-6.54, -4.20]	**-5.63** [-6.86, -4.40]	**0.26** [0.18, 0.34]	**-5.77** [-7.27, -4.28]	**-6.43** [-9.10, -3.76]
FRA**	**-0.34** [-0.44, -0.23]	**-3.39** [-4.01, -2.77]	**-3.72** [-4.40, -3.03]	**0.33** [0.23, 0.42]	**-3.96** [-4.90, -3.01]	**-4.11** [-5.97, -2.25]
GBR**	**-2.28** [-2.78, -1.79]	**-0.44** [-0.65, -0.22]	**-2.71** [-3.33, -2.09]	**2.27** [1.78, 2.76]	**-3.09** [-3.94, -2.24]	**-3.07** [-4.64, -1.49]
GRC**	**-0.19** [-0.27, -0.11]	**-2.65** [-3.50, -1.79]	**-2.84** [-3.75, -1.92]	**0.19** [0.11, 0.26]	**-3.24** [-4.31, -2.18]	**-3.19** [-5.00, -1.38]
HRV*	**-0.20** [-0.28, -0.12]	**-5.73** [-6.94, -4.53]	**-5.92** [-7.17, -4.68]	**0.19** [0.11, 0.27]	**-6.27** [-7.77, -4.77]	**-6.45** [-9.51, -3.38]
HUN*	**-0.45** [-0.57, -0.33]	**-13.77** [-15.73, -11.81]	**-14.16** [-16.18, -12.14]	**0.39** [0.30, 0.49]	**-13.58** [-15.91, -11.24]	**-14.23** [-18.80, -9.66]
IDN	**0.01** [0.01, 0.01]	**0.09** [0.07, 0.11]	**0.10** [0.08, 0.12]	**-0.01** [-0.02, -0.01]	0.01 [-0.02, 0.04]	**0.10** [0.04, 0.15]
IND	**0.02** [0.01, 0.03]	**0.09** [0.07, 0.11]	**0.11** [0.09, 0.13]	**-0.02** [-0.03, -0.01]	0.04 [-0.00, 0.07]	**0.10** [0.05, 0.15]

Figure A2: Percentage Change in Income per Capita relative to Status Quo, Various Scenarios



Note: The figure depicts percentage changes in income per capita relative to the baseline year 2014. The dashed lines are the 90%-confidence bounds based on 1,000 bootstrap replications and approximate normal distribution.