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May, 2017

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ABSTRACT

We run simulations of current account rebalancing scenarios in the Euro Area and the European Union based on a closed multi-country input-output model. The spillover effects of domestic demand booms in the Northern European surplus countries are non-negligible, but not large. While they cannot on their own create a meaningful upswing in the former Southern European deficit countries, they could be an important element thereof. In particular, a Northern expansion can create the necessary policy space for a domestic demand-driven expansion in the European South by relaxing the balance of payments constraint. Then, a coordinated asymmetric expansion in the Euro Area could alleviate the unemployment crisis in the European South.

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Euro Area Imbalances: How Much Could an Expansion in the North Help the South?

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May 4, 2017

Abstract

We run simulations of current account rebalancing scenarios in the Euro Area and the European Union based on a closed multi-country input-output model. The spillover effects of domestic demand booms in the Northern European surplus countries are non-negligible, but not large. While they cannot on their own create a meaningful upswing in the former Southern European deficit countries, they could be an important element thereof. In particular, a Northern expansion can create the necessary policy space for a domestic demand-driven expansion in the European South by relaxing the balance of payments constraint. Then, a coordinated asymmetric expansion in the Euro Area could alleviate the unemployment crisis in the European South.

Keywords: Current Account Imbalances, Current Account Rebalancing, Euro Crisis, Euro Zone, Domestic Demand Expansion, European Union
JEL codes: F45, F32, F15

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1 Introduction

Two contrasting views on current account rebalancing have emerged with the inception of the euro crisis. The "Bundesbank" view, in line with most, but not all German commentators, denied that Germany, as the country with the largest surplus in absolute size, can contribute much to the stimulation of economic activity in Southern Europe (Bundesbank, 2010). Advocates of this view argue that spillover effects are rather small in magnitude.[1] The Southern European balance of payments problem, therefore, must be solved by internal devaluation of the Southern European economies. Proponents of the opposite idea, represented by what we call the "symmetric rebalancing" view, argued that rebalancing should involve a strong expansion in the North and a simultaneous contraction in the South.[2] This would ensure a stronger overall economic performance than the alternative, a Southern stand-alone contraction, which would lead to dismal GDP growth in the euro zone overall. In actual policy-making, the first view has prevailed. Spain, Portugal, Greece, Ireland, Italy, as well as several Central and Eastern European nations, have rebalanced their current accounts by contracting their final demand (and therefore imports) unilaterally through a series of austerity measures. The consequences were dire: GDP has still not reached pre-crisis levels in some of these countries, unemployment numbers have increased to record levels, emigration has risen markedly. Meanwhile, Germany was able to shift its exports to other sources of foreign demand outside of the Euro Area (EA), recording a record current account surplus in the process, and turning the Euro Area external balance from balanced to positive three percent of EA GDP. While the actual adjustment has followed a one-sided approach, the question remains to what extent surplus countries should expand their own economies to contribute to growth in the European South. To answer this normative question, it is best to first have an estimate of the spillover effects, i.e. how much the Northern economies *could* actually help. The purpose of the present paper is to predict spillover effects by simulating current account rebalancing scenarios for both the Euro Area and the European Union. We report results for the size of spillover effects of surplus countries' final demand on GDP, employment, and the trade balance for the EA11.[3]

We conclude that both contrasting views are partially correct. In general, the magnitude of the effect of additional cross-border trade flows depends on two factors, the size of the shock and the structure of international economic production. The Bundesbank argument prevails when it comes to the size of spillover effects resulting from minor shocks, which are indeed too miniscule to affect any individual Southern European country in a noticeable way. In this respect, the notion that Northern Europe and in particular Germany should run expansionary

[1] As Germany trades with a large number of countries, each bilateral trade flow is fairly small. A German expenditure boom, according to this argument, would diffuse in many directions and consequently the final effect on income and employment in individual countries in Southern Europe would be small.

[2] Reports by international institutions routinely emphasize the positive spillover effects of Germany's final demand on its trading partners in the euro area (e.g. IMF, 2015; EC, 2015).

[3] The EA11 is made up of the early euro member states minus tiny and exceptional Luxembourg: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Spain, and Portugal.

policies in the common European interest is misleading. The Bundesbank view still remains somewhat valid in the context of a large expansion among current account surplus countries. A German stand-alone expansion (a 14.3% of GDP exogenous shock to its final demand) that eliminates entirely the German current account surplus produces nominal GDP increases in the range of 1.3% in Greece to 2.7% in Italy.[4] The results of 10-20% shocks to exogenous final demand in the major surplus countries within the European Union are similar.[5] With a total increase in GDP of between 2.1% (Greece) and 4.1% (Italy), direct demand spillover effects, while non-negligible, are limited. The claim by advocates of the Bundesbank view, however, that Germany and other Northern countries cannot help the Southern European countries at all, is not entirely correct. With a finite willingness for transfers among Euro Area members, one can postulate an implicit political constraint for the Southern countries to run a balanced current account.[6] Despite its limited GDP effects, a Northern expansion yields an improvement in the trade balance of the Southern European nations (roughly 1% for both Spain and Italy). Based on a relaxation of the trade balance constraint, the Southern European countries may decide to expand on their own up to the point that would yield the original value of the trade balance, i.e. the South has the policy option to consume its trade balance gain in the form of GDP and employment growth. Since their domestic own multipliers are closer to 2 than 1, a domestic demand expansion in the South is highly effective in enlarging GDP and creating employment. For any individual Southern economy, the sizable negative effects of a domestic expansion on the trade balance are largely offset by the simultaneous expansion of all other EU Member States. In the case of an asymmetric, yet coordinated stimulus, the Bundesbank argument falls apart, and the symmetric rebalancing view is correct. With the correction of the demand deficiency in the Northern countries, the Southern countries can conduct a significant expansion that leads to roughly 10-12% cumulative nominal GDP growth in Spain and Italy.

The prediction of spillover effects calls for the use of an economic model that – at the very least – captures multiplier effects and global value chains. The input-output approach that we use for this article is well suited to this task. An input-output model represents a country's industrial structure in a matrix of inter-industry flows of intermediate goods. It can be used to predict the effects of an exogenous shock to final demand on income and employment (e.g. Leontief, 1986; Miller and Blair, 2009). A *multi-country* input-output model takes into account not only the structural relations between domestic industries but also the structural relations between industries in different countries.[7] With sufficient information on the inter-industry flows

[4] While our results rely on comparative statics, a dynamic interpretation of exogenous shock (14.3% of German GDP) would mean an 2.7% of GDP shock each year for five years.

[5] The selected shock sizes compress their surpluses to an absolute value of less than 1% of their GDP.

[6] With the exception of Italy, all countries whose government bond yields went up during the euro crisis had a large current account deficit, but not all of them had gone through a housing bubble or had high government debts and deficits.

[7] Our predictions complement existing ones derived from Dynamic Stochastic General Equilibrium (DSGE) models (in't Veld, 2013; Elekdag and Muir, 2014; IMF, 2015; BMWi, 2015b; Bundesbank, 2016; in't Veld, 2017). DSGE models are grounded in theory; they incorporate a wide range of behavioral details and emphasize forward-looking decision making by rational agents. The typical DSGE model relates aggregate quantities to one another (e.g. aggregate consumption) and has to be content with taking broad country groups as the unit of analysis (e.g.

of intermediate and final goods within and across countries, it can be used to predict spillover effects, that is, the response of economic variables in one country triggered by an exogenous increase in final demand in another country.[8] The World Input-Output Database (Timmer et al., 2015), the main data source of this article, facilitates the calibration of input-output models with 41 countries and 35 industries per country.[9]

EC (2012) uses the input-output model to predict spillover effects of Germany's final demand on the trade balances of individual countries in the euro area. Ederer and Reschenhofer (2016) use it to analyze the historical evolution of trade balances in the euro area from 1995 to 2011, and to predict the spillover effects of hypothetical final demand shocks in Germany on certain country groups (e.g. Western and Southern Europe). A limitation of these studies is that they rely on the *open* input-output model that treats final demand as entirely exogenous. As a consequence, typical Keynesian multiplier effects that raise consumption and investment are not possible in this basic model. In this article, we use the *closed* input-output model instead that endogenizes consumption and investment. The endogenous increase of these two expenditure categories in response to higher income represents an *induced effect* that strengthens the effects of final demand shocks. In our view, the latter model provides more realistic estimates of the size of direct demand spillover effects.

The article is structured as follows: Section 2.1 explains input-output analysis to the reader who is not familiar with the method, while Section 2.2 does so for the database. Section 3 presents the main results of the paper. The intricacies of the method used and the results are discussed Section 4. Section 5 concludes with policy implications.

2 Method and Data

2.1 Method

The input-output model can be used to investigate the extent to which changes in final demand, given the structural relations between industries, generate changes in other economic variables such as income and employment. This approach is known as *impact analysis*.[10] In this section we describe the assumptions and the intuition behind the input-output model used in this study; see Picek and Schröder (2016) for the mathematical representation.

The input-output model treats final demand as exogenous. It assumes that industries use inputs in *fixed proportions in the double sense*. The industries are assumed to use all inputs in

six regions of the world economy). The input-output model is capable of using granular data; its main advantage is the use of country-specific information on a low level of aggregation. A multi-country input-output model is capable of representing the industrial composition, the final demand composition, and the trade network of actual economies and their trading partners.

[8] While the ultimate goal of this article is the prediction of *aggregate* spillover effects by country, the unit of analysis is the industry and the structural relations are calibrated using disaggregated data.

[9] The WIOD covers 40 countries and includes a model for the rest of the world to fully account for global production.

[10] Miller and Blair (2009) describe the use of input-output models for impact analysis in greater detail.

fixed proportion to output (constant returns to scale), and they use all inputs in fixed proportion to each other (no factor substitution). In other words, the *technical coefficients*, which determine the quantities of inputs that are necessary to produce one unit of output, are held constant. The input-output model furthermore assumes that additional supply is always able to meet an exogenous increase in final demand – the economy operates below full capacity.

The *open* input-output model includes only direct and indirect effects of the final demand shock.[11] The *closed* input-output model recognizes that final demand is not entirely exogenous. Basic consumption theory predicts that higher household income causes higher consumption spending. A final demand shock will initiate additional production; additional production will require more labor input; the higher demand for labor services will increase labor income; and this will increase the amounts spent by households on consumption. In input-output economics, the endogenization of household consumption is known as closing the model with respect to households. This step can be likened to the addition of industry-specific Keynesian consumption functions to the input-output model.[12] The *total effect* of an exogenous increase in final demand is composed of the direct effect, the indirect effect, and the *induced consumption effect*.

One can go one step further and postulate that higher income not only generates additional consumption spending but also additional investment spending. The higher incomes earned in the car industry and in supporting industries might induce firms to increase their investment expenditure. In a theoretical ideal, investment expenditure would depend only on the availability of profitable investment opportunities and would be independent of current income. In the presence of capital market imperfections, many firms will be liquidity-constrained and they will tend to raise their investment expenditure as higher current income relaxes this constraint. With adaptive expectations, higher current income will raise the prospective yield of investment and the expectation of increased profits in future periods will induce investment in the current period. In an input-output model that is closed with respect to (households and) firms, the *total effect* of an exogenous increase in final demand is composed of the direct effect, the indirect effect, the induced consumption effect, and the *induced investment effect*. The induced investment effect represents the change in output/income/employment that arises from firms investing a fraction

[11] If the final demand for cars were to increase by 100 Euro, how much would gross output, income and employment in all industries increase in order to meet the new demand? If the car industry did not use any inputs (if the technical coefficients of this industry were zero), 100 euro worth of additional production in the car industry would be sufficient to satisfy the increase in final demand for cars. This is the *direct effect* of the final demand shock. But the car industry does use inputs from itself and from other industries, and the technical coefficients are not zero. The *indirect effect* represents a change in output/income/employment in industries that supply goods and services to the car industry. The increased output/income/employment in the rubber and plastics industry resulting from higher production in the car industry is an indirect effect of the change in the final demand for cars.

[12] The input-output model closed with respect to households treats the household sector as if it was an industry. The labor input requirements, which are given by wages and salaries in proportion to industry output, are treated as technical coefficients. The more labor-intensive is production, the higher is the fraction of income that turns into additional consumption spending, and the larger will be the induced effect. The consumption coefficients, which are given by household consumption spending on industry output in proportion to total household income, are treated as technical coefficients. The input-output model "freezes" household consumption behavior and regards it as part of the economy's structure. The Keynesian consumption functions are industry-specific in the sense that the labor input requirements and consumption coefficients are industry-specific.

of the additional profits earned in the car industry and in supporting industries.

The multi-country input-output model represents an extension of the single-region model that does not alter the basic ideas in any way. For instance, a multi-country model that has two countries (Germany, Spain) and two industries per country can be thought of as a single-region model that has four industries. Germany's final demand falls in part on the output of domestic industries, and in part on the output of foreign industries. If Germany's final demand increases, there are direct effects on output/income/employment in domestic and foreign industries. There are also indirect and induced effects in Germany and abroad as a result of increased intermediate goods demand by producers, induced consumption demand by households, and induced investment demand by producers. Thus, the *spillover effect* of Germany's final demand on Spain measures the increase in Spanish output/income/employment that arises as a result of direct, indirect, and induced effects in the world as a whole.[13]

2.2 Data: The World Input-Output Database

The data requirement of a closed multi-country input-output model is extensive. Fortunately, the WIOD makes available World-Input-Output-Tables (WIOT) for 35 industries and 41 regions (40 countries and a model for the rest of the world) from 1995-2011 (Timmer et al., 2015). These tables report the flows of goods and services from industries to intermediate and final users, broken down by country of origin and by country of destination. The tables provide all the information necessary to calibrate the open input-output model. To close the model and to compute employment effects, industry-level data on employment and labor compensation is required, which the WIOD makes available in the Socio-Economic Accounts (SEA).

The predicted spillover effects are based on the latest available data, which is from 2009. The WIOTs provide observations through 2011, but some of the auxiliary variables in the SEA that are needed to close the model are only available until 2009. Picek and Schröder (2016) use values from 1995 to 2009 to explore the temporal stability of the results as a way of gauging the extent to which the results generalize to today's situation. Indeed, the estimated spillover effects turn out to remain fairly stable over time.

3 Main rebalancing scenarios

Current account imbalances can be reduced in three ways. Firstly, only the debtor countries adjust by contracting their economy, while the creditor countries passively observe the process. Secondly, both types of countries contribute their share: Surplus countries increase and deficit countries cut their spending. Thirdly, only surplus countries expand, while deficit countries are passive. As discussed above, the European Union, and in particular the Euro Area, has seen

[13] In other words, Germany's final demand shock triggers demand for Spanish intermediate goods by producers in Germany, Spain, and the rest of the world as well as demand for Spanish final goods by end-users in Germany, Spain, and the rest of the world.

the first kind of adjustment with the result that barely any country in the Union still runs a current account deficit. It was highly successful in rebalancing the countries' current account balances to GDP, as shown in Table 1. However, this came at a high cost that involved austerity, permanent GDP losses and high unemployment for the former deficit countries. Up to this day, there has been no adjustment whatsoever from the surplus countries. In the first scenario, we therefore simulate an expansion of final demand in the surplus countries to achieve the necessary rebalancing. As a side effect of their economic boom, the trade balances of the remaining countries within the Euro Area and the EU-27 improve. Since a further trade balance adjustment of the former deficit countries (that are balanced or running small surpluses) is not necessary, it could in principle be used another way: These countries could increase their own final demand at home, expanding on a limited scale. They would seize to spend more once they reach the same trade balance in percent of GDP that they had before the former surplus countries expanded – now of course with a higher GDP and more employment. This is calculated in the second scenario. We run both simulations twice, once for an expansion of a more limited scope involving only the Euro Area, and once for the EU-27.

3.1 EU-27

3.1.1 Expansion in the surplus countries

Given the model, any scenario must answer the basic questions of who is to expand and by how much. Table 2 provides the current account balance criteria in the scoreboard of the Macroeconomic Imbalance Procedure (MIP) of the European Union, which is a three-year moving average of the current account balance in percent of GDP. Based on this metric, we identify six countries within the EU-28 that have systematically run current account surpluses of more than 4% of GDP: Denmark, Germany, Luxembourg, Malta, Netherlands, Slovenia, and Sweden.[14] As the panel in Table 2 shows, with the exception of Malta and Slovenia these countries have run high and persistent surpluses for almost a decade. For each of these countries, a reduction of their current account surplus can be achieved by means of a domestic demand expansion that boosts imports. Regarding the magnitude of the reduction, we assume a target value of zero percent, and therefore a sincere effort to eliminate the entire current account surplus of the MIP period 2013-2015. How much does final demand need to increase exogenously in order to reduce the imbalances? As a rule of thumb, for each of these countries *individually* an exogenous increase in final demand of 1% (of GDP) is accompanied by a reduction in the trade balance in terms of GDP of about two thirds of a percentage point. Accounting for some of the positive spillovers from an expansion of multiple countries instead of just one, we can roughly guess that the trade balance of each of the surplus countries will worsen by half a percentage point instead. Therefore, an approximate elimination of the current account surplus is achieved through the trade balance by

[14] Note that we slightly deviate from the politically agreed consensus ranges (6% for surpluses and -4% for deficits) in the European Commissions' framework that have been rightly criticized for their asymmetry of privileging surplus countries.

Table 1: Balance on current transactions with the rest of the world, in % of GDP, EU-28, 2007-2015

Country	**2015**	2014	2013	2012	2011	2010	2009	2008	2007
Belgium	1.35	0.81	1.00	1.42	0.11	3.57	0.96	1.39	4.01
Bulgaria	1.86	2.78	1.53	-1.28	0.34	-2.00	-11.52	-24.62	-26.59
Czech Republic	-2.01	-1.98	-1.13	-2.18	-4.55	-5.19	-3.87	-4.94	-4.70
Denmark	6.98	7.72	7.13	5.69	5.74	5.73	3.32	2.67	1.39
Germany	8.76	7.76	6.66	7.18	6.19	5.74	5.88	5.57	6.84
Estonia	1.98	1.08	0.18	-2.43	1.48	1.90	2.54	-8.77	-15.43
Ireland	4.45	3.61	3.09	-1.54	-1.16	-0.76	-4.14	-5.78	-6.07
Greece	-0.17	-2.95	-2.23	-4.23	-10.29	-11.34	-12.51	-15.85	-15.58
Spain	1.40	0.99	1.47	-0.44	-3.30	-3.88	-4.31	-9.22	-9.63
France	-1.48	-2.30	-2.64	-2.93	-2.23	-1.75	-1.61	-1.38	-1.06
Croatia	5.14	1.12	1.62	0.53	-0.63	-0.99	-4.93	-8.71	-7.05
Italy	2.19	1.84	0.88	-0.43	-3.08	-3.48	-1.94	-2.87	-1.45
Cyprus	-3.50	-4.57	-4.49	-5.65	-3.97	-10.68	-7.74	-15.65	-28.18
Latvia	-1.23	-1.98	-2.10	-3.54	-3.08	2.12	7.91	-12.72	-21.17
Lithuania	-1.53	3.92	1.42	-0.95	-3.83	-0.32	2.13	-13.16	-14.87
Luxembourg	5.56	5.51	5.68	6.06	6.18	6.79	7.34	7.67	9.84
Hungary	4.89	2.16	3.94	1.61	0.78	0.27	-0.81	-6.86	-7.27
Malta	9.85	3.40	3.57	1.29	-2.46	-4.66	-6.58	-1.05	-3.87
Netherlands	9.17	10.65	11.03	10.17	8.85	7.65	6.24	5.21	8.56
Austria	3.07	2.11	2.11	1.67	1.88	3.15	2.06	4.12	3.26
Poland	0.12	-1.29	-0.50	-3.29	-4.76	-4.84	-3.30	-6.46	-6.47
Portugal	-0.07	-0.02	0.73	-2.02	-5.46	-10.31	-10.06	-12.59	-10.02
Romania	-0.91	0.16	-0.61	-4.28	-4.39	-4.53	-4.07	-12.37	-12.70
Slovenia	7.02	6.50	3.85	2.10	-0.13	-0.58	-0.79	-5.25	-4.19
Slovakia	0.80	-0.78	0.69	0.25	-5.48	-4.77	-3.42	-6.58	-5.62
Finland	0.13	-1.17	-1.87	-1.89	-1.46	1.44	2.04	2.73	4.10
Sweden	4.93	4.18	5.48	6.48	6.05	6.66	6.71	8.54	8.99
United Kingdom	-5.16	-5.09	-4.49	-3.28	-1.69	-2.80	-3.04	-3.63	-2.51

Source: AMECO (European Commission macroeconomic database), Variable: UBCA
Legend: Current account balance of less than -4% of GDP (yellow background color) or more than 4% (red background)

expanding domestic demand by around twice the value of the current account balance in terms of GDP. Using this rule of thumb in Table 3, we can infer the required exogenous final demand shocks that form the basis for the simulation. In the case of Germany, a 7.73% of GDP surplus in the current account requires a 15.46% (of GDP) exogenous increase in final demand.[15]

Table 2: Three-year moving average of the current account balance, in % of GDP, EU-28, multiple years

Country	**2013-2015**	2012-2014	2011-2013	2010-2012	2009-2011	2008-2010	2007-2009
Belgium	1.05	1.08	0.84	1.70	1.55	1.97	2.12
Bulgaria	2.06	1.01	0.20	-0.98	-4.39	-12.72	-20.91
Czech Republic	-1.71	-1.76	-2.62	-3.97	-4.54	-4.67	-4.50
Denmark	7.28	6.85	6.19	5.72	4.93	3.91	2.46
Germany	7.73	7.20	6.68	6.37	5.94	5.73	6.09
Estonia	1.08	-0.39	-0.26	0.32	1.97	-1.44	-7.22
Ireland	3.72	1.72	0.13	-1.15	-2.02	-3.56	-5.33
Greece	-1.79	-3.14	-5.59	-8.62	-11.38	-13.23	-14.65
Spain	1.29	0.67	-0.76	-2.54	-3.83	-5.80	-7.72
France	-2.14	-2.62	-2.60	-2.30	-1.86	-1.58	-1.35
Croatia	2.63	1.09	0.51	-0.36	-2.18	-4.88	-6.90
Italy	1.64	0.76	-0.88	-2.33	-2.83	-2.76	-2.09
Cyprus	-4.19	-4.90	-4.70	-6.77	-7.46	-11.36	-17.19
Latvia	-1.77	-2.54	-2.91	-1.50	2.32	-0.90	-8.66
Lithuania	1.27	1.47	-1.12	-1.70	-0.67	-3.78	-8.63
Luxembourg	5.58	5.75	5.97	6.34	6.77	7.27	8.28
Hungary	3.67	2.57	2.11	0.89	0.08	-2.47	-4.98
Malta	5.61	2.75	0.80	-1.94	-4.57	-4.10	-3.83
Netherlands	10.29	10.62	10.02	8.89	7.58	6.37	6.67
Austria	2.43	1.96	1.89	2.23	2.37	3.11	3.15
Poland	-0.56	-1.69	-2.85	-4.30	-4.30	-4.86	-5.41
Portugal	0.21	-0.44	-2.25	-5.93	-8.61	-10.99	-10.89
Romania	-0.46	-1.58	-3.09	-4.40	-4.33	-6.99	-9.71
Slovenia	5.79	4.15	1.94	0.47	-0.50	-2.21	-3.41
Slovakia	0.24	0.05	-1.51	-3.34	-4.56	-4.92	-5.21
Finland	-0.97	-1.64	-1.74	-0.64	0.67	2.07	2.96
Sweden	4.87	5.38	6.00	6.40	6.47	7.31	8.08
United Kingdom	-4.91	-4.29	-3.16	-2.59	-2.51	-3.16	-3.06

Source: own calculations
Legend: Three-year moving average current account balance of less than -4% of GDP (yellow background color) or more than 4% (red background)

Obviously, these final demand expansions are rather large and appear to be politically infeasible at first glance. Nevertheless, two notes should be kept in mind when contemplating them. Firstly, we use a static model that gives any increase as a cumulative number. In reality, a final demand expansion need not happen over the time horizon of one year, but may be spread out dynamically over several years.[16] Secondly, these numbers simply show the massive imbalances that have built up over several years. In Germany, for instance, the first build-up of the surplus took a decade: From 1998 to 2007, Germany's cumulative per capita growth was second to last

[15] Note that final demand and GDP differ in magnitude by the trade balance and net income from abroad. For surplus countries, final demand is therefore slightly smaller than their GDP. Thus, a given demand increase in percent of GDP is slighly larger as a percentage number when expressed in percent of final demand.

[16] For example, an increase of the nominal growth rate of 3.7%, held steady for five years, translates to a 20% cumulative demand increase.

Table 3: Final demand shocks for the surplus countries expansion scenario, EU-27

Surplus Country	Current account surplus MIP 2013-2015	Expansion factor	FD shock
	in % of GDP		in % of GDP
Denmark	7.28	2	14.56
Luxembourg	5.58	2	11.16
Germany	7.73	2	15.46
Malta	5.61	2	11.22
Netherlands	10.29	2	20.58
Slovenia	5.79	2	11.58
Sweden	4.87	2	9.74

Note: Countries in bold are part of the Euro Area

among the eleven largest Euro Area economies. During that time, its relative size compared to other European economies shrinked markedly.

The main results of the simulation can be found in Table 4. Both for clarity of presentation and because of their significance during the Euro crisis, only the results for the eleven largest (old Member State) economies of the Euro Area are presented here in the text, while detailed results including other countries and nominal values are left to Table 10 in Appendix B. The interpretation of this scenario is straightforward: There are non-negligible spillover effects on the former deficit countries, but only because of the strong impulse of final demand shocks in the surplus countries. The Italian and Spanish GDP each expand endogenously by around 4%. Greece has the weakest spillover effect in terms of GDP of only 2.1%. The employment effects tend to be overwhelmingly proportional to the GDP effects: With the exception Greece and Italy, they are a bit smaller than the GDP effects. If one makes the (arguably audacious) assumption that the labor supply does not change either exogenously or endogenously, the employment column may be directly interpreted as the reduction in unemployment.[17] Overall, a bit less than half of the result is driven by the investment multipliers in the model (cross-country and domestic).[18] As Germany contributes more than the absolute majority of the exogenous shock, the changes in cross-border trade flows are highest for its immediate neighbors as well as the Central and Eastern European (CEE) countries that are part of the German production network.[19] In addition to

[17] Naturally, with an elastic labor supply the employment effects would be significantly reduced.

[18] We come to this conclusion by comparing a similar scenario in a closed model that contains only consumption multipliers to the present one with investment multipliers and consumption multipliers. Without the investment effects, the Italian and Spanish GDP would only expand slightly above 2%. The reference tables for the closed model without investment multipliers are omitted from the paper for brevity, but available from the authors on request.

[19] Among the "old" EU countries Belgium benefits the most (as it profits more from spillovers from the Nether-

the GDP and employment effects, the trade balances of the former deficit countries improve to an extent. Spain, Italy, Portugal and France roughly experience a favorable shift in their trade balance of around 1.1% of their GDP. It is the relaxation in the external constraint that connects the current scenario to the one in the next section.

Table 4: Surplus countries only expansion in the EU-27: Main results for EU-11

	GDP growth rate	**Employment growth**	**Trade balance to GDP**
	in %	**in % of labor force**	**Change of ratio in p.p.**
Austria	7.8	7.5	1.61
Belgium	7.9	7.0	1.93
Germany	29.6	27.4	-7.75
Spain	3.8	3.2	0.96
Finland	5.0	4.4	1.31
France	3.6	3.0	1.01
Greece	2.1	2.2	0.66
Ireland	5.7	4.6	1.34
Italy	4.1	4.3	0.91
Netherlands	31.0	30.0	-9.77
Portugal	3.6	3.5	1.01

Variables: GDP: Valued added growth rate (growth rate of GDP in basic prices)
Employment: Change in persons engaged (employed plus self-employed) divided by civilian labor force
Trade balance: Change in the ratio of Trade balance over GDP
Note: Countries in green are surplus countries, countries in red are former deficit countries

3.1.2 Coordinated asymmetric expansion in the EU27

The second scenario includes the surplus countries' expansion of the first scenario, but goes beyond it by including the remaining EU-27 countries.[20] The aim is a coordinated, yet asymmetric, expansion of all EU-27 countries. Given the expansion in the surplus countries, the trade balance of all remaining EU-27 countries has improved. It can be argued, however, that a further trade balance improvement of the remaining countries is not necessary since none of them (except Cyprus) run a sizable current account deficit as of today. Thus, instead of living with a more positive trade balance, all other Member States may expand their economy as well and "consume" the relaxation of their external constraint in the form of a higher GDP and employment. Naturally, their expansion is limited by their (now relaxed) external constraint and will therefore

lands), and Austria second, each with around 10% nominal GDP growth. In the CEE countries, the nominal GDP of the Czech Republic, Slovakia and Poland is raised by over 10%.

[20] As Croatia joined the EU only recently, it was not included as a separate country in the first version of the database. Thus, it is not part of the simulation. The United Kingdom, however, is part of the simulation as they had not formally left the European Union at the time of writing despite their obvious intention to leave.

occur on a much smaller scale than in the surplus countries – hence the asymmetry.[21] One way to view this scenario is to see it as an attempt to achieve the maximum for growth and employment in the European South and the rest of the Union, given a reduction of the surplus countries' current account balances. In this scenario, in addition to the surplus countries' expansion, twenty EU countries (that each do not have more than a 4% of GDP current account surplus) increase their final demand exogenously. For each of these countries, the size of their exogenous final demand shock in percent of GDP is set to three times the change in the trade balance to GDP that resulted from the "surplus countries only" scenario.[22] The number three arises again from the trade balance effects of final demand increases. The economies of Southern Europe (Italy, Spain, Greece, Portugal) trade less and are more domestically oriented than those of the surplus countries, which has an upside for this specific purpose. If they can expand their economies by the same relative amount as an internationally-oriented surplus country, more of it will remain within the country limits, leading to a higher "own multiplier" in GDP and employment (as shown in Table 9). Roughly, their trade balance in terms of GDP will only worsen by around one third of a percentage point per 1% (of GDP) final demand increase, given that other economies expand as well.[23]

The scenario results can be found in Table 5. Compared to the previous scenario, the most obvious change is the higher GDP and employment effects on the European South. Italy's GDP increases by 12.2% instead of 4.1%, while Spain's GDP expands by 12.8% instead of a mere 3.8%. As expected, their overall change in the trade balance is close to zero. Naturally, the trade balance of the surplus countries becomes a bit more postive compared to the previous scenario because they now experience (small) spillover effects from the South and the rest of the EU-27. While the trade balance to GDP changes do not precisely match the current account surplus derived from the MIP procedure 2013-15, they remain within one percentage point for the major surplus economies and the former deficit economies. Generally, almost all countries are still fairly closed economies when it comes to direct demand effects. Therefore, the large domestic GDP and employment effects in the Southern countries are mostly due to an increase in their own domestic demand. For each Southern European country, spillover effects from surplus countries plus those of the remaining EU-20 countries only rank a distant second in magnitude.[24] There is another, yet smaller, factor that contributes to the higher growth numbers for the Southern European economies in this scenario. Spain, Italy, France and Portugal have forged strong trade ties among each other, as shown in Table 9. Thus, any of these nations benefits individually

[21] Here, we assume that none of the countries either wishes to return to a current account deficit, or that external pressure makes them avoid that path.

[22] An example: For Italy, if the change in the trade balance in percent of GDP is 0.91 percentage points in the previous scenario (as seen in the last column of Table 4), then an exogenous domestic demand expansion of 2.73% of GDP is used for the current scenario.

[23] To keep the scenario specifications simple, we assume that all twenty EU countries expand equally at the same rate of three times their trade balance improvement, although it may not suit some of the non-Southern economies.

[24] In technical terms, the "own multiplier" (elasticity from a 1% exogenous domestic final demand change to x% of domestic GDP change) for each country is much larger than the spillover effect from other countries.

Table 5: Coordinated asymmetric expansion in the EU-27: Main results for EU-11

	GDP growth rate	Employment growth	Trade balance to GDP
	in %	in % of labor force	Change of ratio in p.p.
Austria	17.6	17.0	-1.13
Belgium	17.7	15.7	-1.36
Germany	32.9	30.3	-7.03
Spain	12.8	10.4	-0.02
Finland	13.3	11.7	-0.43
France	11.5	9.6	0.05
Greece	8.3	8.7	-0.04
Ireland	12.8	11.9	-1.34
Italy	12.2	12.5	-0.09
Netherlands	34.3	33.2	-8.78
Portugal	12.1	11.3	-0.10

Variables: GDP: Valued added growth rate (growth rate of GDP in basic prices)
Employment: Change in persons engaged (employed plus self-employed) divided by civilian labor force
Trade balance: Change in the ratio of Trade balance over GDP
Note: countries in green are surplus countries, countries in red are former deficit countries

from a regional expansion in the South through spillover effects.

3.2 Euro Area

As a common economic policy within the European Union may be confined to Euro Area Member States, the simulation exercise from the previous section is repeated in this section, but including only Euro Area countries. For the surplus countries, this means that Denmark and Sweden do not take part in the surplus countries expansion scenario. The shock sizes for the remaining countries which are part of the Euro Area remain the same as in Table 3. Results for the EU-11 are provided in Table 6. Similarly, EU countries that are not in the Eurozone are excluded from the second scenario, for which results are given in Table 7.[25] We refrain from a detailed commentary of the results because the order of magnitude is similar. The effects for the former deficit countries are generally a bit smaller since a small part of the exogenous shocks is lacking in the first scenario. For instance, the nominal Italian GDP is raised by 3.7% instead of 4.1% as Denmark and Sweden are left out of the surplus countries' expansion. Since the trade balance gains are more limited as a consequence as well, the coordinated expansion takes place with smaller shock sizes as well, shrinking the eventual output values further. If the EU Member

[25]The non-surplus countries that expand in the second scenario are Austria, Belgium, Cyprus, Spain, Estonia, Finland, France, Greece, Ireland, Italy, Lithuania, Luxembourg, Latvia, Malta, Portugal, Slovak Republic, and Slovenia.

States whose currency is not the Euro are left out of the coordinated expansion the nominal Italian GDP expands by 10.7% instead of 12.5%. Overall, it is fair to say that the exclusion of non-Euro economies for an expansion within the European Union do not alter the results significantly.[26]

Table 6: Surplus countries only expansion in the Euro Area, Main results for EU-11

	GDP growth rate	**Employment growth**	**Trade balance to GDP**
	in %	**in % of labor force**	**Change of ratio in p.p.**
Austria	7.3	7.0	1.51
Belgium	7.2	6.4	1.78
Germany	28.9	26.7	-7.90
Spain	3.5	2.9	0.87
Finland	3.7	3.3	1.00
France	3.3	2.8	0.92
Greece	1.9	1.9	0.60
Ireland	5.1	4.2	1.22
Italy	3.7	3.9	0.84
Netherlands	30.2	29.3	-10.01
Portugal	3.3	3.1	0.92

Variables: GDP: Valued added growth rate (growth rate of GDP in basic prices)
Employment: Change in persons engaged (employed plus self-employed) divided by civilian labor force
Trade balance: Change in the ratio of Trade balance over GDP
Note: countries in green are surplus countries, countries in red are former deficit countries

3.3 A German stand-alone expansion

Germany is the largest country in Europe (measured in terms of economic production) and the only European economy with a truly large surplus in absolute numbers even on the world-economy scale. Its reduction could on its own evaporate the Eurozone current account surplus. Thus, the result of a German stand-alone expansion as presented in Table 8 is interesting to see in its own right. It may serve as a reference scenario to understand how much of the total impulse from surplus countries actually arises from the largest European economy.[27] To gauge the German "dominance", we can compare the results of the German expansion to those of the

[26] If the largest non-Euro Members State of the EU, the United Kingdom, leaves the supranational body as planned and pursues its own economic policy, the numbers of the two scenario version (EU and EA) will move even closer together.

[27] The shock sizes are not precisly the same. In the stand-alone scenario, a 14.3% of GDP shock to final demand is enough to extinguish the German current account surplus. In the scenarios that include the other surplus countries as well, a slightly higher number is needed for the German shock to achieve the same target because the shocks from the remaining surplus countries raise German exports, therefore increasing the German current account and trade balance surplus even more.

Table 7: Coordinated asymmetric expansion in the Euro Area, Main results for EU-11

	GDP growth rate	Employment growth	Trade balance to GDP
	in %	in % of labor force	Change of ratio in p.p.
Austria	15.3	14.8	-1.31
Belgium	15.2	13.5	-1.53
Germany	30.9	28.6	-7.45
Spain	11.1	9.0	-0.17
Finland	9.7	8.5	-0.45
France	10.0	8.3	-0.11
Greece	7.1	7.5	-0.15
Ireland	10.4	9.5	-1.50
Italy	10.5	10.7	-0.23
Netherlands	32.2	31.1	-9.40
Portugal	10.4	9.7	-0.25

Variables: GDP: Valued added growth rate (growth rate of GDP in basic prices)
Employment: Change in persons engaged (employed plus self-employed) divided by civilian labor force
Trade balance: Change in the ratio of Trade balance over GDP
Note: Countries in green are surplus countries, countries in red are former deficit countries

Euro Area surplus countries and those of the European Union surplus countries. For major Southern European countries like Italy and Spain, over 70% of the GDP effect caused by the four surplus countries in the EA scenario, and about two thirds of the effect caused by the six surplus countries in the EU scenario, stems from the German contribution.

In this scenario, a German exogenous final demand shock of 14.3% of GDP gives rises to a strong German expansion of 26.2% of GDP. As before, the GDP effects on Southern Europe, while non-negligible, are not large given the fairly large shock size. Greek nominal GDP would be raised by 1.3%, Portuguese GDP by 2.3%, and the Italian and Spanish GDP by 2.7% and 2.5%, respectively. The employment growth numbers as a percentage of the labor force roughly fall in line with the GDP numbers – they are a bit higher in the Greek case (1.4%), and somewhat lower in Spain (2.1%).

4 Discussion

How realistic are the numerical predictions of the model? The simple input-ouput model operates under a set of strong assumptions that leave out a number of behavioral responses that could lead to different results. In the present section, we discuss the most relevant effects and their likely strength to get a rough idea about the robustness of the scenario results.

Expansion scepticism.—What to make of the argument that Germany and other economies

Table 8: A German stand-alone expansion (14.3% of GDP shock to Final Demand), Main results for EU-11

	GDP growth rate	Employment growth	Trade balance to GDP
	in %	in % of labor force	Change of ratio in p.p.
Austria	5.8	5.4	1.17
Belgium	4.0	3.5	1.02
Germany	26.2	23.5	-7.75
Spain	2.5	2.1	0.63
Finland	2.5	2.2	0.68
France	2.3	1.9	0.65
Greece	1.3	1.4	0.43
Ireland	3.5	2.8	0.86
Italy	2.7	2.8	0.61
Netherlands	4.5	4.0	1.28
Portugal	2.3	2.2	0.66

Variables: GDP: Valued added growth rate (growth rate of GDP in basic prices)
Employment: Change in persons engaged (employed plus self-employed) divided by civilian labor force
Trade balance: Change in the ratio of Trade balance over GDP
Note: Countries in green are surplus countries, countries in red are former deficit countries

in the North have no room for an expansion because they are already operating at full capacity and efforts to stimulate the economy would merely feed inflation but hardly inspire real growth? In regard to the largest economy in Europe, note that private and public investment in Germany is weak, and it has been weak for a long time (EC, 2015; BMWi, 2015a). The German economy is healthy in comparison with crisis-ridden countries in Southern Europe, but economic growth is low by its own historical standards. As of February 2017, 6.3 percent of the labor force is unemployed (2.76 million persons), and 8.4 percent is under-employed (3.76 million persons) according to the national employment agency's definition of under-employment. These numbers do not include refugees nor persons in subsidized short-time work nor discouraged persons who left the labor force. If large parts of the German economy were supply-constrained and unable to keep up with rising demand, inflation pressure would mount. That is not what we see. Inflation as measured by the OECD consumer price index stood at 0.5 percent in 2016 and is projected to be 1.4 percent in 2017. The fact that German officials and their advisers make reference to a "tight labor market and closed output gap" (IMF, 2015, p.13) only shows that definitions of full employment and potential output are fairly elastic and change over time. Recall that in the 1960s and early 1970s the unemployment rate routinely fell below one percent. One or two generations of Germans have not seen anything that resembles full employment as it was known then.

Price competitiveness channel.—A robust expansion of the German economy (or other surplus countries' economies) will exercise upward pressure on domestic wages and prices; as Germany loses price competitiveness and Southern Europe gains price competitiveness, Southern Europe's exports will increase to some extent and its imports will decrease to some extent. The input-output model excludes this price competitiveness channel, because the production technology is Leontief and the consumption coefficients are constant. Models that do incorporate a realignment of competitive positions and allow for factor substitution will yield greater spillover effects, ceteris paribus, provided that the critical elasticities condition is satisfied. In DSGE models the strength of the competitiveness channel is regulated by the choice of the elasticity of substitution, a parameter. We are not aware of DSGE-based studies which present, as a sensitivity test, the results of variations in the elasticity of substitution. In the model used in BMWi (2015b), the competitiveness channel accounts for 20 percent of the total spillover effect (on average in the euro area). In our assessment, the price competitiveness channel receives too much attention. It does not appear to be the case that relative price divergences within the euro area were the main drivers of the emerging current account imbalances before the crisis (Holinski et al., 2012; Gaulier and Vicard, 2012; Kang and Shambaugh, 2013; Storm and Naastepad, 2015; Storm and Naastepad, 2014; Schröder, 2016; Kang and Shambaugh, 2016); relative price adjustment in response to the crisis may do little to promote exports and stimulate growth in the South.

Capacity utilization.—The input-output model closed with respect to firms assumes that firms will mechanically raise investment expenditure in response to higher profits. Yet the current economic climate is so depressed that many European firms are operating well below their maximum capacity level. Many firms might meet the increase in demand for their products simply by operating at a higher degree of capacity utilization, without expanding capacity. In this case the induced investment effect will be smaller than assumed by the model.

Balance sheet recession.—The input-output model is a model of the real sector and it considers only the relations between flows of goods and services. It abstracts from macro-finance linkages and disregards the presence of stocks, in particular balance sheets. The legacy of the financial boom in the run-up to the global financial crisis is that today many European firms and households carry extremely high leverage and the debt-to-GDP ratios in many countries are at historically unprecedented levels (Schularick and Taylor, 2012). To the extent that firms and households use their income for debt service, rather than for consumption and investment, growth and employment will suffer (Fisher, 1933; Koo, 2008). As firms and households shift their attention to the repayment of debt, the model's consumption and investment coefficients will shrink and the multiplier process that is baked into the closed input-output model will lose some of its strength. The induced effects will be smaller as a result. These behavioural changes – balance sheets effects – have likely materialized after 2009, but the latest input-output table that could be used for this study is from 2009. Following this logic, the use of more recent data will tend to reduce the size of the induced effects and hence the size of the total spillover effects.

We had to use data from 2009 to compute the Leontief inverse (the production structure)

and the final demand composition (the consumption structure). Since the economic structure has certainly changed after 2009, it is natural to ask how these structural changes might have influenced the magnitude of spillover effects. Picek and Schröder (2016) investigate, as a robustness test, how the spillover effects of Germany's final demand on Southern Europe have changed over the 15-year period for which world input-output tables exist. It turns out that the predicted spillover effects are relatively stable over the period 1995-2009 even as producers changed their sourcing pattern and end-users changed their consumption pattern. In spite of sharp differences in the macroeconomic performance across euro member states, which was reflected in the observed divergence in domestic demand and the divergence in unit labor costs; in spite of the process of Eastern enlargement and the associated foreign direct investment flows and the re-organization of supply chains; in spite of the rise of China as the world's assembly line; the spillover effects of Germany's final demand on the Southern Europe remained remarkably stable. The astonishing stability of spillover effects over a 15-year period strengthens our confidence in the reported results. We hold that behavioral and structural change over the 7-year period after 2009 has not materially changed the magnitude of spillover effects.

Exchange rate channel.—Two further channels are merely mentioned here. A strong reaction of the nominal exchange rate towards third countries may have an effect on the international competitiveness particularly of Southern European products that are estimated to be more price sensitive than German products. Contrary to the cost competitiveness channel that changes rather slowly, movements in the exchange rate tend to be fast-paced at times, leading to a larger shock and thus a more likely effect on relative international cost competitiveness.

Real interest rate channel.—The final channel is the real-interest rate channel and its effect on demand. As surplus countries within EMU expand, a higher inflation rate in the North may lead the European Central Bank to either raise or not raise their interest rates. In any case, it would do so based on an area-wide average, leading to a rise in real interest rates in the Southern countries and a fall in the North. This destabilizing effect has been witnessed since the inception of the Euro Area and may have contributed significantly to the Euro crisis. Therefore, this effect could suppress some of the potential activity increase in the South, but depends very much on the reaction of the central bank.

Clearly, several behavioral responses are not present in the simple input-output model.[28] A number of these transmission channels may contribute to the likely non-linearities that have the potential to invalidate the results for large shock sizes. Further research should aim at incorporating more of these channels and setting up a model with them for the WIOD. As mentioned above, however, the input-output coefficients have not fluctuated wildly in the period 1995-2009. As the structure of the economy has remained fairly constant on average, we might hope that it would do so as well when large shocks are applied to it. While the model strictly speaking is only a prediction for direct demand spillover effects, the results of the present paper may, however, serve as a first prediction of the size of spillover effects as a whole, provided several

[28] In principle, however, several of them have already been included into more complex input-output models.

of these channels cancel each other out and/or are rather small in their effects even at fairly large shock sizes.

5 Policy implications

The present paper has two conclusions. Firstly, we predict how much the European North (countries with a current account surplus) can maximally help the European South by expanding their economies and thus eliminating their surpluses. The conclusion is that spillover effects are non-negligible, but not large. On its own, they cannot create an upswing in the European South. The shock size required for an elimination of the surpluses is large in absolute terms because a gap has accumulated over several years, but quite manageable when spread out dynamically over several years. Secondly, a coordinated, yet asymmetric expansion would be a way that can achieve a meaningful expansion in the European South. It relies on a simultaneous expansion of the surplus countries and the deficit countries, where the former relax the trade balance constraint of the latter. Politically, this would mean to leave the policy line of the failed austerity experiment back to the path briefly taken in 2009 when a set of recovery packages was instituted in a decentralized way across the European Union (Saha and von Weizsäcker, 2009; Watt and Nikolova, 2009).[29]

Secondly, our result that the own multipliers are much more significant for each economy than spillover effects indicates a general conclusion for policy design in the South: Successful policies that aim to restore growth and employment in the South must target economic activity in the deficit countries directly by spending the funds domestically. Among others, these policies include an improved Juncker Plan that ensures that Southern European countries are overrepresented and can adequately co-finance European funds, the monetary financing proposals for investment (Watt, 2015), EU-financed infrastructure investment in the South, increasing transfers within the budget of the EU as well as enlarging it (Dullien and Schwarzer, 2009), and potential new institutions such as a European unemployment insurance as long as they are open to internal Eurozone transfers (Claeys et al., 2014).

[29] for more details see European Parliament (2009)

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Appendix A Auxiliary Data Sources

Bundesbank Germany's trade in goods and services in euros from the section "Current account by country and group of countries".[30]

AMECO Civilian labor force (variable code NLCN), GDP at current market prices (UVGD), and final domestic demand excluding inventories at current prices (UUNF).[31]

Bundesagentur für Arbeit Unemployment rate and under-employment rate from the section "Arbeitsmarkt im Überblick - Die aktuellen Entwicklungen in Kürze".[32]

OECD Inflation (CPI) and inflation forecast.[33]

Appendix B Tables

[30] `http://www.bundesbank.de/Navigation/EN/Statistics/statistics.html` (accessed on August 15, 2015).
[31] `http://ec.europa.eu/economy_finance/db_indicators/ameco/index_en.htm` (accessed on August 15, 2015).
[32] `http://statistik.arbeitsagentur.de/Navigation/Statistik/Statistik-nach-Themen/Arbeitsmarkt-im-Ueberblick/Arbeitsmarkt-im-Ueberblick-Nav.html` (accessed on March 17, 2017).
[33] `https://data.oecd.org/price/inflation-cpi.htm` and `https://data.oecd.org/price/inflation-forecast.htm` (accessed on March 17, 2017).

Table 9: Effect of a one percent shock to final demand on GDP, employment, and the trade balance.

		AUT	BEL	DEU	DNK	ESP	FIN	FRA	GRC	IRL	ITA	NLD	PRT	SWE
AUT	GDP	1.037	0.012	0.027	0.007	0.006	0.007	0.005	0.003	0.010	0.010	0.012	0.007	0.007
	Employment	1.015	0.010	0.025	0.006	0.005	0.006	0.004	0.003	0.008	0.010	0.011	0.007	0.006
	Trade balance	-0.527	0.006	0.010	0.004	0.003	0.004	0.003	0.002	0.004	0.004	0.006	0.004	0.004
BEL	GDP	0.014	0.871	0.020	0.010	0.011	0.011	0.017	0.004	0.021	0.010	0.045	0.012	0.014
	Employment	0.013	0.775	0.018	0.009	0.009	0.010	0.015	0.004	0.014	0.011	0.038	0.011	0.011
	Trade balance	0.007	-0.556	0.008	0.005	0.006	0.006	0.008	0.003	0.011	0.004	0.023	0.006	0.007
DEU	GDP	0.162	0.117	1.172	0.089	0.054	0.056	0.056	0.031	0.106	0.063	0.141	0.058	0.063
	Employment	0.158	0.101	1.081	0.082	0.047	0.049	0.048	0.032	0.070	0.066	0.125	0.055	0.050
	Trade balance	0.073	0.058	-0.446	0.047	0.030	0.028	0.027	0.018	0.054	0.027	0.072	0.031	0.033
DNK	GDP	0.006	0.010	0.010	1.036	0.004	0.011	0.003	0.002	0.008	0.004	0.016	0.004	0.031
	Employment	0.005	0.009	0.009	0.950	0.003	0.009	0.003	0.002	0.006	0.004	0.015	0.004	0.025
	Trade balance	0.003	0.005	0.004	-0.435	0.002	0.005	0.002	0.001	0.004	0.002	0.008	0.002	0.014
ESP	GDP	0.028	0.052	0.039	0.027	1.492	0.025	0.039	0.011	0.062	0.035	0.050	0.131	0.027
	Employment	0.027	0.045	0.035	0.025	1.211	0.022	0.033	0.011	0.047	0.036	0.048	0.135	0.021
	Trade balance	0.015	0.026	0.016	0.015	-0.349	0.013	0.019	0.007	0.028	0.015	0.025	0.057	0.014
FIN	GDP	0.005	0.007	0.007	0.013	0.003	1.115	0.003	0.002	0.009	0.003	0.008	0.003	0.024
	Employment	0.005	0.006	0.006	0.012	0.002	0.986	0.002	0.002	0.007	0.003	0.007	0.003	0.019
	Trade balance	0.003	0.004	0.003	0.007	0.002	-0.412	0.001	0.001	0.004	0.001	0.004	0.002	0.011
FRA	GDP	0.046	0.119	0.071	0.037	0.070	0.033	1.422	0.015	0.077	0.062	0.072	0.075	0.042
	Employment	0.044	0.105	0.063	0.034	0.061	0.029	1.176	0.015	0.059	0.065	0.066	0.075	0.033
	Trade balance	0.024	0.057	0.028	0.021	0.036	0.017	-0.330	0.012	0.036	0.026	0.038	0.037	0.023
GRC	GDP	0.011	0.017	0.013	0.010	0.009	0.008	0.008	2.028	0.009	0.017	0.016	0.006	0.008
	Employment	0.011	0.014	0.012	0.010	0.008	0.007	0.007	2.072	0.006	0.018	0.015	0.006	0.006
	Trade balance	0.006	0.008	0.005	0.006	0.005	0.004	0.004	-0.364	0.005	0.007	0.008	0.004	0.004
IRL	GDP	0.004	0.008	0.005	0.005	0.004	0.004	0.003	0.002	0.674	0.004	0.008	0.006	0.004
	Employment	0.004	0.007	0.005	0.005	0.003	0.003	0.003	0.002	0.743	0.004	0.007	0.005	0.003
	Trade balance	0.002	0.004	0.002	0.003	0.002	0.002	0.002	0.001	-0.675	0.002	0.004	0.003	0.002
ITA	GDP	0.068	0.064	0.057	0.032	0.044	0.027	0.040	0.021	0.091	1.474	0.062	0.035	0.030
	Employment	0.069	0.055	0.052	0.029	0.038	0.024	0.034	0.022	0.069	1.454	0.055	0.035	0.024
	Trade balance	0.033	0.032	0.023	0.018	0.024	0.014	0.020	0.012	0.040	-0.358	0.032	0.019	0.017
NLD	GDP	0.016	0.068	0.028	0.021	0.012	0.017	0.013	0.006	0.028	0.011	0.888	0.014	0.019
	Employment	0.016	0.060	0.026	0.020	0.010	0.015	0.011	0.006	0.021	0.011	0.876	0.013	0.015
	Trade balance	0.008	0.032	0.011	0.011	0.006	0.008	0.006	0.004	0.013	0.005	-0.501	0.007	0.009
PRT	GDP	0.006	0.011	0.008	0.005	0.037	0.006	0.007	0.002	0.011	0.006	0.010	1.463	0.005
	Employment	0.006	0.009	0.008	0.005	0.032	0.005	0.006	0.002	0.009	0.006	0.010	1.288	0.004
	Trade balance	0.003	0.005	0.003	0.003	0.017	0.003	0.004	0.001	0.005	0.003	0.005	-0.436	0.003
SWE	GDP	0.010	0.015	0.012	0.048	0.005	0.042	0.005	0.003	0.012	0.005	0.015	0.006	0.980
	Employment	0.010	0.013	0.011	0.043	0.004	0.036	0.005	0.003	0.010	0.005	0.015	0.006	0.864
	Trade balance	0.005	0.007	0.005	0.024	0.003	0.021	0.003	0.002	0.006	0.002	0.007	0.003	-0.478

Notes: The columns show country r, the source of the shock. The rows show country s, the destination. The trade balance effect is the percentage point change of the trade balance in % of GDP ($\triangle TB$). The employment effect is expressed in percent of the civilian labor force – assuming the labor force remains constant it represents the percentage point reduction in the unemployment rate ($\triangle e^s/CLF^s \cdot 100$). The GDP effect is expressed as a percent growth rate ($\triangle v^s/v^s \cdot 100$).

Table 10: Current account surplus countries expansion, all countries, national currency

Country	GDP GR in%	VA GR in%	D_Emp/WAP	D_Emp/CLF	D_(TB/GDP) in%
Australia	2.353	2.357	1.556	1.975	0.434
Austria	7.940	7.804	5.712	7.501	1.614
Belgium	8.046	7.908	4.689	6.960	1.927
Bulgaria	5.655	5.629	4.019	NA	1.046
Brazil	2.073	2.060	NA	NA	0.533
Canada	2.062	2.066	1.380	1.763	0.488
China	3.820	3.820	NA	NA	0.555
Cyprus	3.053	3.043	2.160	NA	0.979
Czech Republic	9.945	9.885	7.010	9.814	1.976
Germany	30.570	29.615	22.171	27.368	-7.746
Denmark	27.558	26.371	19.882	24.480	-6.209
Spain	3.861	3.843	2.313	3.171	0.958
Estonia	6.520	6.522	4.380	NA	1.270
Finland	5.001	4.965	3.280	4.358	1.305
France	3.633	3.582	2.113	3.025	1.007
United Kingdom	4.613	4.623	3.031	4.026	1.208
Greece	2.091	2.088	1.449	2.151	0.663
Hungary	7.598	7.543	4.279	7.062	1.667
Indonesia	4.115	4.115	NA	NA	0.363
India	3.499	3.493	NA	NA	0.540
Ireland	5.708	5.677	3.350	4.629	1.337
Italy	4.105	4.079	2.687	4.254	0.914
Japan	1.960	1.960	1.368	1.677	0.397
Korea. Republic of	4.112	4.079	2.687	3.931	0.504
Lithuania	6.294	6.254	4.190	NA	1.171
Luxembourg	17.159	16.464	20.521	30.838	-8.550
Latvia	5.047	5.016	NA	NA	1.094
Mexico	1.976	1.978	1.278	NA	0.504
Malta	16.671	16.015	9.071	NA	-7.531
Netherlands	32.075	30.986	24.273	30.033	-9.770
Poland	8.514	8.469	4.862	7.674	1.597
Portugal	3.671	3.634	2.751	3.454	1.015
Romania	5.361	5.369	NA	NA	1.033
Russia	3.994	3.974	NA	NA	0.829
Slovak Republic	8.795	8.733	5.027	7.267	1.681
Slovenia	23.833	22.977	15.568	NA	-6.710
Sweden	18.534	17.764	12.419	15.398	-4.549
Turkey	4.689	4.679	2.064	4.085	0.908
Taiwan	3.966	3.958	NA	NA	0.531
United States	2.020	2.020	1.348	1.802	0.403

GDP GR in%: GDP growth rate (GDP in producer prices)
VA GR in %: Value added growth rate (GDP in basic prices)
D_Emp/WAP: Change in Employment over Working Age Population (15-64 years)
D_Emp/CLF: Change in Employment over Civilian Labor Force
D_(TB/GDP) in %: Change in (Trade Balance over GDP)

Table 11: Coordinated asymmetric expansion of EU-27, all countries, national currency

Country	GDP GR in%	VA GR in%	D_Emp/WAP	D_Emp/CLF	D_(TB/GDP) in%
Australia	3.547	3.552	2.355	2.990	0.647
Austria	18.098	17.632	12.969	17.029	-1.127
Belgium	18.144	17.710	10.552	15.661	-1.357
Bulgaria	13.711	13.501	9.586	NA	-0.841
Brazil	2.984	2.964	NA	NA	0.758
Canada	3.172	3.178	2.122	2.712	0.745
China	5.606	5.606	NA	NA	0.801
Cyprus	11.390	11.300	7.986	NA	-0.801
Czech Republic	21.542	21.181	14.798	20.718	-1.325
Germany	33.882	32.896	24.574	30.334	-7.032
Denmark	29.719	28.499	21.492	26.462	-5.578
Spain	12.938	12.828	7.602	10.423	-0.016
Estonia	15.397	14.973	10.022	NA	-0.971
Finland	13.574	13.260	8.792	11.684	-0.433
France	11.724	11.520	6.715	9.614	0.046
United Kingdom	13.416	13.231	9.280	12.325	-0.284
Greece	8.430	8.311	5.866	8.710	-0.037
Hungary	17.375	16.967	9.672	15.963	-1.256
Indonesia	6.066	6.066	NA	NA	0.530
India	5.025	5.013	NA	NA	0.770
Ireland	13.115	12.808	8.577	11.852	-1.337
Italy	12.415	12.242	7.903	12.515	-0.089
Japan	2.895	2.895	2.021	2.476	0.581
Korea. Republic of	6.104	6.055	3.996	5.847	0.738
Lithuania	14.475	14.224	9.568	NA	-0.870
Luxembourg	20.866	20.148	24.877	37.383	-7.756
Latvia	12.838	12.660	NA	NA	-0.630
Mexico	2.898	2.902	1.872	NA	0.739
Malta	-6.779	-5.979	-3.463	NA	16.390
Netherlands	35.477	34.349	26.796	33.154	-8.777
Poland	20.412	20.089	11.389	17.977	-0.697
Portugal	12.315	12.107	8.981	11.277	-0.097
Romania	14.581	14.478	NA	NA	-0.228
Russia	6.447	6.417	NA	NA	1.302
Slovak Republic	19.850	19.672	11.027	15.941	-1.012
Slovenia	27.651	26.765	18.208	NA	-5.911
Sweden	20.817	20.026	13.925	17.266	-3.897
Turkey	7.197	7.181	3.157	6.248	1.376
Taiwan	5.815	5.802	NA	NA	0.766
United States	3.050	3.050	2.036	2.721	0.608

GDP GR in%: GDP growth rate (GDP in producer prices)
VA GR in %: Value added growth rate (GDP in basic prices)
D_Emp/WAP: Change in Employment over Working Age Population (15-64 years)
D_Emp/CLF: Change in Employment over Civilian Labor Force
D_(TB/GDP) in %: Change in (Trade Balance over GDP)

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