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The article introduces a decomposition of trade flows that allows to measure expenditure-growth effects (changes in domestic and foreign final demand) and expenditure-switching effects (changes in the allocation of demand across domestic and foreign producers). The decomposition is applied to 11 euro members 1990-2014. Most countries, including Germany, recorded unfavorable expenditure-switching effects (demand shifted from domestic to foreign producers); expenditure switching was most unfavorable in Finland, France, and Italy. There is no correlation between unit labor cost growth and expenditure switching.

Keywords: competitiveness, euro area, external adjustment, expenditure switching, macroeconomic imbalances

JEL codes: F4 – Macroeconomic Aspects of International Trade and Finance; F41 – Open Economy Macroeconomics; F45 – Macroeconomic Issues of Monetary Unions

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> "Competitiveness will play a key role in redressing external imbalances on a sustainable basis. For the rebalancing process to be durable, it cannot be linked to expenditure reduction only, but also to a switch of expenditure away from imports and towards domestic production. ... The role of relative wages and prices is key" (Buti and Turrini, 2012, p.3).

1. Introduction

This article introduces a decomposition of trade flows to measure *expenditure-growth effects* and *expenditure-switching effects*. Expenditure-growth effects reflect changes in domestic and foreign final demand. Expenditure-switching effects reflect changes in the allocation of final demand across domestic and foreign producers. Standard balance-of-payment theory predicts that changes in international relative prices will induce economic economic units to switch their expenditure between producers in different countries. Empirical studies of trade elasticities employ econometric methods to estimate the size of this effect (e.g. Orcutt, 1950; Goldstein and Khan, 1985; Marquez, 2002; Imbs and Mejean, 2015). This article quantifies the expenditure-switching effect regardless of its varied causes, which are not limited to changes in relative prices. The decomposition does not yield point estimates of structural parameters but rather measures the extent of expenditure switching ex-post. The ex-post measure is the outcome of relative-price effects in accordance with the elasticity approach to the balance of payments (Bickerdike, 1920; Robinson, 1937), disproportionate income-expenditure effects in accordance with the multiplier and absorption approaches (Harrod, 1933; Machlup, 1943; Alexander, 1952), and non-price competitiveness effects (e.g. Fagerberg, 1988; Carlin et al., 2001).

The decomposition is applied to eleven members of the European Monetary Union (the EA11) in the period 1990-2014.[1] The euro period (1999-2007) is of particular interest, because the dispersion of current account balances increased markedly in the period leading up to the Great Recession. What factors have caused the current account imbalances to expand before the crisis and to contract during the crisis is the subject of ongoing debate. The notion of competitiveness – understood in the narrow sense of price competitiveness – has assumed center stage in it. Inside the euro area competitiveness dynamics are frequently gauged by the relative development of national price and cost indicators, and attention is paid in particular to the evolution of unit labor costs (ULC) from the introduction of the euro to the onset of the crisis. Over 1999-2007 labor costs were growing by more than 2.5 percent annually in Greece, Italy, Ireland, Portugal, and Spain but remained constant in Germany (table 1). The ULC divergence is said to have caused expenditure switching in favor of Germany and to the detriment of the deficit countries.

[1] The article studies macroeconomic developments in the early euro member states: Austria, Belgium, Germany, Greece, Finland, France, Ireland, Italy, Netherlands, Portugal, and Spain. Tiny and exceptional Luxembourg is excluded because its external account is dominated by financial transactions that may bear little relation to labor cost competitiveness.

Table 1: Trade, domestic expenditure, and unit labor cost growth 1999-2014

	AUT	BEL	DEU	ESP	FIN	FRA	GRC	IRL	ITA	NLD	PRT
1999-2007, mean percent growth											
Unit labor costs	0.7	1.5	0.0	3.1	1.1	1.7	3.5	3.2	2.5	2.0	2.6
Domestic expenditure	3.5	4.2	1.9	8.4	5.2	4.5	7.5	11.1	4.3	4.9	5.1
Export revenue	7.9	6.9	8.3	7.6	7.1	4.8	11.6	10.3	5.6	7.3	6.8
Import expenditure	6.8	7.0	7.0	9.9	8.6	6.6	11.1	10.6	7.4	6.9	6.0
2008-2014, mean percent growth											
Unit labor costs	2.5	2.2	2.2	0.1	3.3	1.9	0.0	-1.7	1.9	2.1	0.0
Domestic expenditure	2.6	2.9	2.4	-1.7	2.4	1.5	-4.9	-2.1	-0.3	0.8	-1.1
Export revenue	2.9	3.7	3.5	3.2	-0.1	2.5	2.0	4.5	1.6	3.9	3.9
Import expenditure	3.1	4.5	3.7	-0.6	1.9	2.7	-3.3	3.6	0.0	3.7	0.7

Source: AMECO (variable codes in brackets). Unit labor costs (PLCD) refer to the total economy. Domestic expenditure (UUNF) is measured in current euros. Export revenue (UXGS) and import expenditure (UMGS) cover goods and services and are measured in current euros.

This "ULC channel" is only part of the story because there are other variables than labor costs that determine competitiveness – when defined as the capacity for selling in international markets – and there are other variables than competitiveness that determine the trade balance.[2] Sales in world markets are influenced not only by price but also by non-price competitiveness factors (e.g. product quality, consumer taste, product innovations, the geographical and industrial specialization pattern). The trade balance, crucially, is a function not only of competitiveness but also of aggregate income and expenditure. The "expenditure channel" refers to the divergent expenditure dynamics and their corresponding effect on import demand. Expenditure growth was exceptionally low in Germany and Austria, and exceptionally high in "the boom-and-bust countries" Greece, Spain, and Ireland (table 1).

For a discussion of the euro area imbalances and a survey of the possible causes of the divergence in ULC and domestic expenditure, refer to Kang and Shambaugh (2013, pp.3-6) and Tressel et al. (2014, pp.6-9). This article simply measures to what extent expenditure-growth effects and expenditure-switching effects account for the evolution of trade flows, regardless of what forces have driven expenditure growth and regardless of what forces have driven inflation. It finds that most euro member states experienced unfavorable expenditure-switching effects, that is, a switch of expenditure away from domestic producers towards foreign producers. Germany's domestic expenditure growth was exceptionally low, a trade surplus could therefore emerge in spite of unfavorable expenditure-switching

[2]This broader definition corresponds to the OECD's definition: "Competitiveness is a measure of a country's advantage or disadvantage in selling its products in international markets." http://stats.oecd.org/glossary/detail.asp?ID=399 (accessed on March 7, 2015).

effects. Spain's expenditure boom transformed the mid-1990 surpluses into the 2007 deficit, and Spain's expenditure collapse accounts for the bulk of external adjustment since the crisis. The magnitude of unfavorable expenditure-switching effects was largest in Finland, France, and Italy; in surplus initially, these countries experienced a persistent decline in competitiveness and a deterioration of the trade balance. Greece experienced favorable expenditure-switching effects over the euro period (if anything Greece was gaining competitiveness), but failed to adjust to a deficit which existed long before the euro was created. Finally, there is no correlation between ULC growth and expenditure-switching effects. It will be argued that aggregate ULC indicators are rather poor measures of international competitiveness; that changes in aggregate ULC indicators are unlikely to bring about large expenditure-switching effects; and that external adjustment policies whose chief objective is wage moderation should not be regarded as expenditure-switching policies. Wage moderation is best regarded as expenditure-reducing policy.[3]

2. Related Literature

2.1. Domestic Expenditure and Relative Prices in the Euro Area

In European Commission reports it was recognized as early as 2006 that current accounts were mainly driven by relative expenditure growth: "The evolution of the current account mainly reflects relative developments in domestic and foreign demand (and, to a lesser extent, competitiveness developments)" (EC, 2006, p.41). Later EC reports arrive at the same conclusion (e.g. EC, 2009; EC, 2010). Gaulier and Vicard (2012) find that euro area current account dynamics over 1999-2007 are positively correlated with ULC growth and import growth, but not with export growth. There is hardly any correlation between exports and ULC (the "Euro Area Kaldor Paradox"). The empirical pattern, the authors conclude, carries the qualitative signature of a demand shock, rather than a competitiveness shock. Wyplosz (2013) analyzes similar correlations and reaches the same conclusion.

In addition to these hints from straightforward descriptive statistical analysis, there is evidence from time series econometric methods that is pointing in the same direction. A number of studies relate aggregate export and import flows to domestic income (or domestic expenditure), foreign income (or foreign expenditure), and various indicators of international relative prices/costs (e.g. Arghyrou and Chortareas, 2008; Comunale and Hessel, 2014; Christodoulopoulou and Tkačevs, 2015; Diaz-Sanchez and Varoudakis, 2015). The results indicate that the expenditure channel was statistically and quantitatively significant. Evidence in support of the ULC channel is much weaker.

[3] Harry Johnson (1958) defines expenditure-switching policies and expenditure-reducing policies. A sovereign country that strives to correct a trade deficit, which implies that aggregate income Y is lower than domestic expenditure $C + I + G$, can adopt expenditure-reducing policies (fiscal and monetary policy to reduce domestic expenditure in order to bring down imports) and expenditure-switching policies (exchange rate policy and commercial policy to encourage exports and discourage imports, given the level of domestic expenditure).

Yet the econometric literature on trade elasticities has moved away from the estimation of aggregate time series models towards the estimation of disaggregated models and the use of industry-level data. Aggregate price elasticities computed as weighted averages of industry-level point estimates are larger in magnitude than traditional trade elasticities derived from aggregate data. The former are two or three times larger than the latter (Imbs and Mejean, 2015, p.3). Imbs and Mejean attribute this difference to a heterogeneity bias. The time series studies cited above, it could be argued, are underestimating the ULC channel because they do not control for the heterogeneity bias.

ECB (2012) uses industry-level point estimates from three existing studies to compute aggregate price elasticities for 13 euro area countries. The results strongly support elasticity optimism. On the basis of these high elasticities one might draw the conclusion that the observed ULC divergence did engender large expenditure-switching effects which time series studies fail to capture. At the same time the elasticities reported in ECB (2012, table 4) appear to lack robustness. The underlying industry-level point estimates are taken from three different studies, so the table reports three sets of aggregate price elasticities. Of the correlation coefficients between the aggregate elasticities, one is positive (0.66) and two are *negative* (minus 0.28 and minus 0.26). The studies contradict rather than corroborate one another. If the evidence is not cumulating but pointing in different directions, it is best to avoid attaching too much confidence to a single point estimate and it is wise to approach the same research question through a variety of empirical methods.

2.2. Non-Price Competitiveness

Labor costs are but one variable which influences international competitiveness, and the "Kaldor Paradox" represents prima facie evidence that it is not the most important one (Kaldor, 1978). Kaldor observed that some countries were gaining (losing) world market shares while their relative ULC were rising (declining). More recent data, too, displays if anything a positive correlation between the evolution of export market shares and ULC growth (Fagerberg, 1996; Correa-Lopez and Domenech, 2012). Gaulier and Vicard (2012) highlight the absence of a correlation between export performance and ULC growth over 1999-2007 in the euro area. di Mauro et al. (2016) highlight the absence of a correlation between changes in export market shares and changes in export prices over 2000-2014 in a 14-country sample.

Kaldor attributed the "puzzling" market share gains to product quality upgrading. In empirical work the challenge is to operationalize product quality and other dimensions of non-price competitiveness. One approach, which circumvents direct measurement, is to posit a model that is able to lend a theoretical interpretation to regression residuals, or to estimated fixed effects. Benkovskis and Wörz (2014) interpret residuals as changes in consumer taste and product quality, and conclude that non-price competitiveness is more important for export performance than price. Another approach relies on direct measurement and estimates the relation between export performance and indicators of non-price competitiveness. Studies that emphasize innovation and technology as important

drivers of competitiveness use patent statistics, R&D expenditure, and investment shares as proxy variables (e.g. Fagerberg, 1988; Fagerberg, 1994; Carlin et al., 2001; Fagerberg et al., 2007). EC (2012) reviews recent literature on the drivers of export performance, and the factors considered include the degree of product differentiation, innovation, human capital, foreign direct investment, the quality of institutions, as well as a country's specialization in terms of product and destination markets. "Export performance appears to be only partly related to price competitiveness, leaving an important explanatory role for non-price competitiveness" (EC, 2012, p.29).

Chen et al. (2013) focus on differences in the composition of exports across euro area countries and present regression results which suggest that peripheral countries faced intensified competition from China while Germany benefited from strong foreign demand for machines and industrial equipment. The export composition also helps explain the export performance during the crisis period (Tressel and Wang, 2014). These results highlight the importance of structural differences between euro member states (Simonazzi et al., 2013).

This article does not refine econometric theory nor does it include new variables; it proposes an empirical approach that provides a new perspective on historical data. As a complement to the econometric estimation of trade elasticities, the trade ratio decomposition measures expenditure-switching effects ex-post.

3. Decomposing the Trade Ratio

The decomposition of identities is a flexible method to assess the quantitative significance of distinct components. The most common application is the decomposition of the ratio of government debt to GDP (e.g. Hall and Sargent, 2011). Mason and Jayadev (2014) decompose U.S. household debt. Burda and Hunt (2011) decompose Germany's GDP growth. This article decomposes the trade ratio.

The trade ratio TR is the value of exports $PX \cdot X$ over the value of imports $PM \cdot M$:

$$TR \equiv \frac{PX \cdot X}{PM \cdot M} \equiv R \cdot \frac{X}{M}. \tag{1}$$

X denotes real exports, PX a domestic-currency export price index, M real imports, and PM a domestic-currency import price index. The terms of trade are defined as $R \equiv PX/PM$.

Let DA denote real domestic expenditure (the same concept as absorption and domestic demand). The identity $M \equiv \frac{M}{DA} \cdot DA$ facilitates the interpretation of the home country's real imports as the product of *domestic import intensity*, $DMI \equiv \frac{M}{DA}$, and real domestic expenditure DA:

$$M \equiv DMI \cdot DA. \tag{2}$$

A change in DMI reflects expenditure switching by domestic residents; a change in DA is a growth effect.

In a two-country world, domestic exports are foreign imports. The identity $X \equiv \frac{X}{FA} \cdot FA$ facilitates the interpretation of the foreign country's real imports as the product of *foreign import intensity*, $FMI \equiv \frac{X}{FA}$, and real foreign expenditure FA:

$$X \equiv FMI \cdot FA. \tag{3}$$

A change in FMI reflects expenditure switching by foreign residents; a change in FA is a growth effect.

As a result, the trade ratio can be expressed as

$$TR \equiv R \cdot \frac{FMI}{DMI} \cdot \frac{FA}{DA} \equiv R \cdot RMI \cdot RA. \tag{4}$$

The advantage of this expression is that the contribution of the terms of trade R, the *relative import intensity* $RMI \equiv \frac{FMI}{DMI}$, and *relative expenditure* $RA \equiv \frac{FA}{DA}$ can be quantified.

Let the hat indicate the log-differential of a continuous-time variable: $\hat{Z} \equiv d\,log\,Z/dt$ ($\approx$ growth rate). The application of logarithms to equation (4) and differentiation with respect to time gives:

$$\hat{TR} \equiv \hat{R} + R\hat{MI} + \hat{RA}. \tag{5}$$

The trade ratio increases, ceteris paribus, if the terms of trade increase $\hat{R} > 0$, if foreign residents and/or domestic residents switch expenditure from away foreign producers towards domestic producers $R\hat{MI} > 0$, and if foreign expenditure grows faster than domestic expenditure $\hat{RA} > 0$.

Effective expenditure switching is defined as

$$\hat{ES} \equiv \hat{R} + R\hat{MI}. \tag{6}$$

An increase in the relative import intensity RMI, composed of real magnitudes, may not translate into effective switching if the terms of trade R counteract the increase. Values can decrease while volumes increase, and vice versa. $\hat{ES} > 0$ will be called *favorable* expenditure switching, and $\hat{ES} < 0$ *unfavorable* switching.

The decomposition

$$\hat{TR} \equiv \hat{ES} + \hat{RA} \tag{7}$$

can be plotted in two dimensions. The quadrants in figure 1 correspond to different combinations of expenditure-growth effects and expenditure-switching effects. Countries in the top half of the diagram, where domestic expenditure is growing slower than foreign expenditure ($\hat{RA} > 0$), will be called "laggards", and countries in the bottom half ($\hat{RA} < 0$) will be called "frontrunners". Countries in the right half of the diagram, where expenditure switching is favorable ($\hat{ES} > 0$), are gaining competitiveness, and countries in the left half ($\hat{ES} < 0$) are losing competitiveness. The two separable contributions may reinforce or counteract each other, and the net result will be an increase or decrease in the trade ratio. The diagonal locus ($\hat{TR} = 0$) separates the region in which the trade ratio is improving, the top-right triangle, from the region in which the trade ratio is deteriorating, the bottom-left triangle.

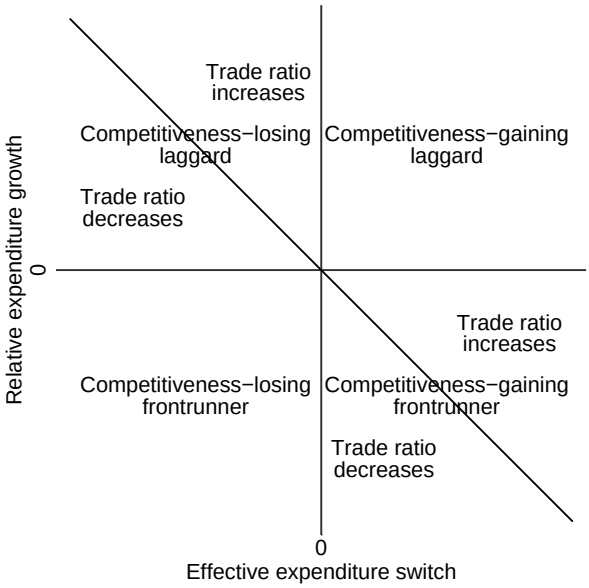


Figure 1: Classification scheme

4. Expenditure Switching in Theory

Effective expenditure switching is an observable variable that in theory is influenced by many factors. Basic demand theory suggests that domestic expenditure, foreign expenditure, relative prices, and non-price competitiveness factors are its principal determinants. Recall that the variable is composed of the terms of trade, the foreign import intensity, and the domestic import intensity ($\hat{ES} \equiv \hat{R} + F\hat{MI} - D\hat{MI}$). The elasticity of imports with respect to domestic expenditure can be understood as an estimable parameter. If it is larger than one, the domestic import intensity ($DMI \equiv \frac{M}{DA}$) will increase as domestic expenditure grows – unfavorable expenditure switching. If the elasticity of exports with respect to foreign expenditure is larger than one, the foreign import intensity ($FMI \equiv \frac{X}{FA}$) will increase as foreign expenditure grows – favorable switching. These are cases of expenditure growth-induced expenditure switching (in figure 1 they correspond to a mix of vertical and horizontal movements). Econometric evidence suggests that expenditure elasticities tend to be larger than one (Turunen et al., 2011; Chen et al., 2013; Comunale and Hessel, 2014; Christodoulopoulou and Tkačevs, 2015).[4]

If the Marshall-Lerner condition holds, a positive shock to R will induce so large a change

[4] Kennedy and Thirlwall (1979) emphasize that the import propensity varies across the expenditure categories $C+I+G$. Investment expenditure tends to induce the most imports, and government consumption the least. Bussière et al. (2013) find the same pattern. Since this article uses aggregate expenditure, the measured expenditure-switching effects will include the effects of changes in expenditure composition.

in traded quantities that expenditure switching will be unfavorable. This is a classic case of relative price-induced expenditure switching (in figure 1 it corresponds to a horizontal movement to the right). Note that even if elasticity optimism was warranted and the Marshall-Lerner condition was satisfied, *ULC pessimism* would remain a viable hypothesis. The "ULC elasticities" of export demand could be low even if the price elasticities were high, because ULC make up only a small fraction of total unit costs in manufacturing (Storm and Naastepad, 2015a; Storm and Naastepad, 2015b). For instance, assuming firms set the gross output price as a markup on unit costs and cost pass-through is complete, if the price elasticity of export demand is two and the share of labor costs in total unit costs is a quarter, then the elasticity of export demand with respect to ULC will be just one half. In other words, ULC pessimism and price elasticity optimism could co-exist.

A positive shock to domestic non-price competitiveness will raise exports, which unambiguously implies favorable switching, and a positive shock to foreign non-price competitiveness will raise imports, which unambiguously implies unfavorable switching (horizontal movements in figure 1).

A formal representation of the above propositions, which takes into account global value chains, is given in the appendix. Domestic and foreign expenditure, relative prices, and non-price competitiveness factors together generate the observed expenditure-switching effects.

5. Data

To foreshadow the main point of this section, real foreign expenditure (FA) of Austria, for example, is computed as a trade-weighted average of real domestic expenditure (DA) of Austria's trading partners. Germany is Austria's main trading partner, so Germany's DA gets a large weight in Austria's FA.

The extent of coverage is constrained by the availability of observations on real domestic expenditure. In order to capture every important EA11 trading partner, DA is constructed from real consumption (C) of the private sector and government and real gross fixed capital formation (I) of the private sector and government sourced from the United Nations National Accounts Main Aggregates Database. The database is chosen so as to maximize the coverage of trading partners, in particular to include emerging economies in East Asia and Eastern Europe. The last observation is 2014. Gross fixed capital formation is the preferred concept, as it captures actual expenditure flows and excludes inventory changes. The source variables are chain-weighted quantity indices with base year 2005. The non-additivity property of chain-weighted indices means that in general $C + I \neq DA$, and the inequality increases with the distance to the base year. Therefore DA is computed as follows:

$$\hat{DA}_{it} = s^C_{it} \cdot \hat{C}_{it} + s^I_{it} \cdot \hat{I}_{it}. \tag{8}$$

Domestic expenditure growth is a weighted sum of the growth rates of real consumption and real gross fixed capital formation. i indexes countries, t indexes time, and the hat

indicates the growth rate $\hat{Z}_t = (Z_t - Z_{t-1})/Z_{t-1}$ of any variable Z. The weights s_{it}^C and s_{it}^I are the shares of the respective expenditure component in domestic expenditure at time $t-1$ expressed in nominal domestic-currency units ($C^\$$, $I^\$$):

$$s_{it}^C = C_{it-1}^\$ / \left(C_{it-1}^\$ + I_{it-1}^\$\right) \quad \text{and} \quad s_{it}^I = I_{it-1}^\$ / \left(C_{it-1}^\$ + I_{it-1}^\$\right). \tag{9}$$

The level DA_{it} is derived from the growth rates $\hat{DA}_{it}$; the index is set to 100 in the year 2000.

The result is a data set that comprises up to 208 economies (ranging from 178 in 1990 to 208 in 2014), a vast extension of coverage compared to existing databases. The annual growth rate of DA in this data set and the annual growth rate of the same concept in the AMECO database (variable code OUNF) overlap for 928 observations in the period 1990-2014. The correlation coefficient between the two variables is 0.99 – the newly constructed variable achieves global coverage while faithfully reproducing the official counterpart.

The same aggregation method is used to compute foreign expenditure FA:

$$\hat{FA}_{it} = \sum_j w_{ijt} \cdot \hat{DA}_{jt}. \tag{10}$$

Foreign expenditure growth is a trade-weighted sum of the trading partners' real domestic expenditure growth. The sum is over all trading partners, indexed by j. The level FA_{it} is derived from the growth rates $\hat{FA}_{it}$; the index is set to 100 in the year 2000.

The weights w_{ijt} are the shares of bilateral merchandise exports of country i to country j in total merchandise exports of country i at time $t-1$ expressed in current dollars:

$$w_{ijt} = X_{ijt-1}^\$ / \sum_j X_{ijt-1}^\$ \tag{11}$$

The bilateral trade flows are sourced from the IMF's Direction of Trade Statistics. For every EA11 country, the number of trading partners that enter the foreign expenditure measure (the number of trading partners with non-missing observations on bilateral trade *and* real domestic expenditure) varies from 161 in 1990 to 189 in 2014.

The United Nations National Accounts Main Aggregates Database provides trade flows of goods and services in current domestic-currency values ($X^\$$ and $M^\$$) and as chain-weighted quantity indices with base year 2005 (X and M). The trade ratio is defined as $TR = X^\$/M^\$$, the terms of trade as $R = TR \cdot M/X$, the domestic import intensity as $DMI = M/DA$, and the foreign import intensity as $FMI = X/FA$.

6. Results

Before discussing the key results of the decomposition, summary statistics and line plots will help us become familiar with the newly constructed variables. Table 2 presents mean foreign expenditure growth and mean domestic expenditure growth by country and period. On average in the EA11 foreign expenditure grew by 2.2 percent annually in the

Table 2: Domestic and foreign expenditure growth by country and period, 1990-2014

	AUT	BEL	DEU	ESP	FIN	FRA	GRC	IRL	ITA	NLD	PRT	EA11	SD
1990-1998													
Foreign	2.1	2.3	2.3	2.2	2.2	2.4	1.9	2.3	2.5	2.1	2.0	2.2	0.2
Domestic	2.5	1.8	2.3	2.4	0.5	1.5	2.5	5.0	1.1	2.9	3.8	2.4	1.2
1999-2007													
Foreign	2.8	2.9	3.4	2.8	3.9	3.2	4.0	2.9	3.4	2.7	3.1	3.2	0.4
Domestic	1.7	1.9	0.9	4.6	2.9	2.6	4.3	6.5	1.6	2.3	1.7	2.8	1.6
2008-2014													
Foreign	0.9	0.9	1.3	0.9	1.7	1.2	0.4	0.9	1.1	0.9	0.5	1.0	0.3
Domestic	0.5	0.9	0.9	-2.3	0.0	0.5	-5.4	-1.6	-1.7	-0.4	-1.9	-1.0	1.8

Notes: The rows "Foreign" and "Domestic" show mean percent growth rates of real foreign expenditure and real domestic expenditure. Real foreign expenditure is a trade-weighted average of trading partners' real domestic expenditure. Cross-country variation in this measure stems entirely from variation in the geographical composition of merchandise exports. The column "EA11" reports the unweighted row means, and the column "SD" the standard deviation of the country-means about the unweighted row mean.

preparatory period (1990-1998), by 3.2 percent annually in the euro period (1999-2007), and by one percent annually in the crisis period (2008-2014). Within each period the cross-country variation in foreign expenditure growth was relatively small, that is, foreign expenditure growth was remarkably similar across countries. In quantitative terms, the standard deviation of the country-means about the period-mean is considerably lower for foreign expenditure growth than for domestic expenditure growth (the utmost right column). It is therefore the relatively large variation in domestic expenditure growth which accounts for most of the cross-country variation in relative expenditure growth.[5]

Figure 2 shows the evolution of the trade ratio and relative expenditure by country. The y-axis scales are country-specific in order to highlight the variation over time. A few points are worth noting. Austria and Germany's trade ratio tended to decrease in the early 1990s and during the crisis, when domestic expenditure growth outpaced foreign expenditure growth, and to increase otherwise. France and Italy's trade ratio increased in the early 1990s, peaked in 1996-1997 and deteriorated since then, while relative expenditure was increasing through almost the entire period. In Greece, the sharp crisis-induced improvement of the trade ratio dwarfs the quantitatively less significant changes until 2007, and the same is true for Portugal. In Finland, the Nordic financial crisis in the early 1990s

[5] Greece in the euro period recorded the largest absolute deviation of the country-mean (4.0 percent) from the EA11-mean (3.2 percent) in the sample. Greece unlike other EA11 countries maintains relatively strong trade ties with economies in South-Eastern Europe, and domestic demand growth in the region was high.

accounts for the sharp upward jump of the trade ratio and relative expenditure.

Figure 2 clearly brings out the expenditure booms in Spain 1995-2007 and Ireland 1994-2007. The Greek boom 1995-2007 does not stand out because the y-axis scale is forced to accommodate the deep expenditure collapse beginning in 2008. Weaker and shorter expenditure booms can be observed in Finland 1995-1999, France 1998-2000, Germany 1990-1992, Netherlands 1995-2000, Portugal 1990-1992, and Portugal 1996-2000. In each case real domestic expenditure growth exceeded three percent for at least three years. These booms tended to be associated with a deterioration of the trade ratio, but not necessarily so. The "Nokia boom" is a striking example of a boom over the course of which the trade balance did not deteriorate, and even improved. Between 1993 and 2000, Finland's exports were growing well beyond 10 percent annually in real terms on the back of a rapid expansion of the ICT industry, a welcome contribution to recovery from the Nordic financial crisis. Since around the turn of the century and along with Nokia's demise as the world's biggest manufacturer of mobile phones, the picture looks pretty bleak in the sense that Finland's trade ratio is deteriorating in spite of sluggish domestic expenditure growth.

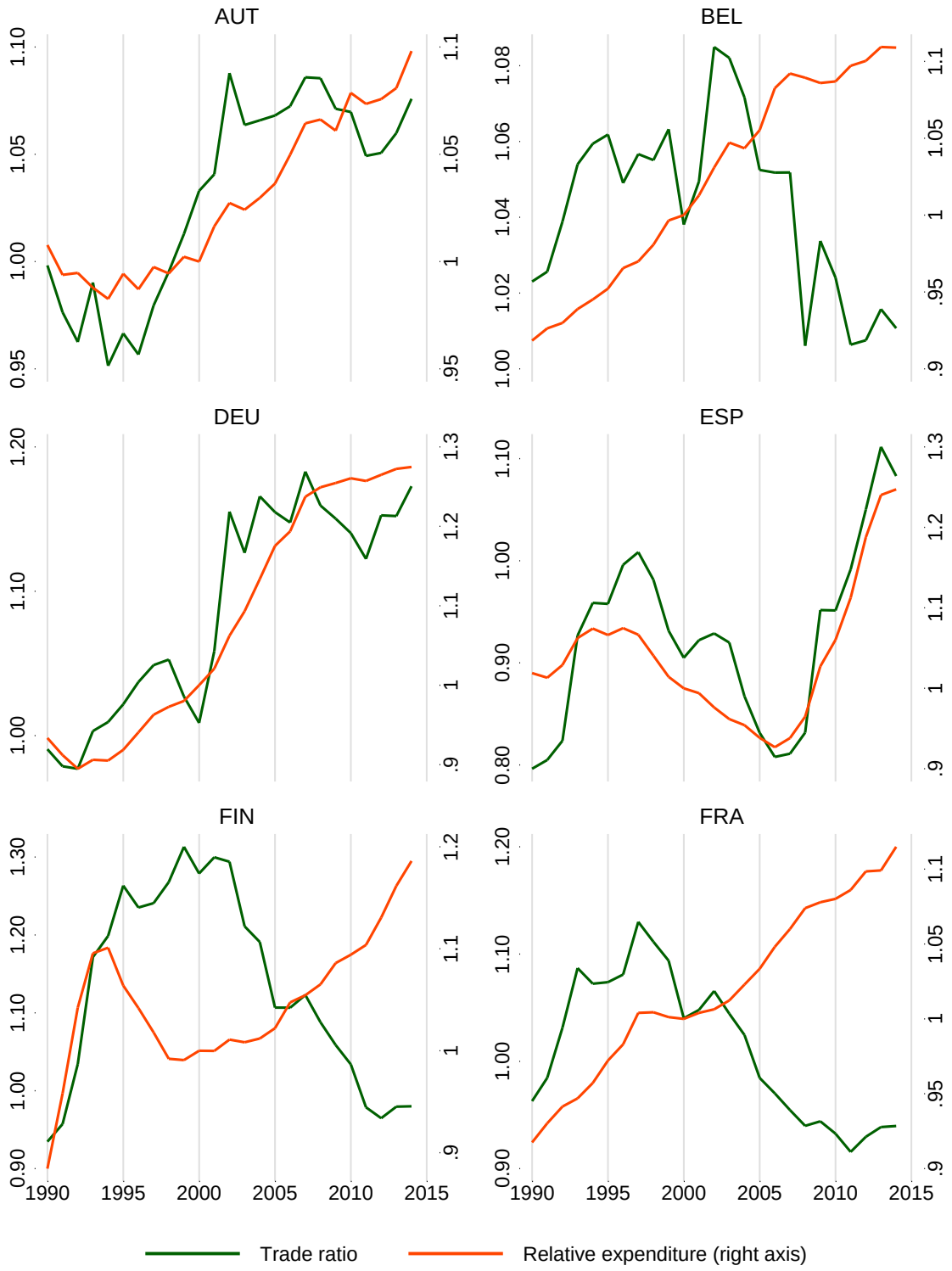
Figure 3 visualizes the key results of the trade ratio decomposition by period (table 3 in the appendix reports the underlying numbers).[6] The vertical axis in each graph shows the expenditure-growth effect over the whole period and the horizontal axis shows the expenditure-switching effect. The frontrunners are located in the bottom half of each graph ($\hat{RA} < 0$) and the laggards are in the top half ($\hat{RA} > 0$); countries located in the left half of each graph are losing competitiveness (expenditure switching is unfavorable $\hat{ES} < 0$) and countries in the right half are gaining competitiveness (expenditure switching is favorable $\hat{ES} > 0$).

First note that the number of competitiveness-losing laggards increased from one in the preparatory period (Belgium), to eight in the euro period, to nine in the crisis period. The points in the scatter plots tend to move toward the top-left quadrant over time. This trend in the direction of unfavorable expenditure-switching effects and positive expenditure-growth effects is consistent with the emergence of viable low-wage, high-growth competitors in East Asia and Eastern Europe.[7]

Focus on the euro period, the graph in the top right, and observe that the boom-and-bust countries Greece, Ireland, and Spain were frontrunners, while all other countries were laggards. Greece and Ireland recorded favorable expenditure-switching effects, while all other countries recorded unfavorable switching effects. Expenditure switching was the most unfavorable in Finland, France, and Italy whereas the countries that recorded huge trade deficits in 2007 – Spain, Greece, Ireland, and Portugal – experienced either favorable

[6] The decomposition was derived in continuous-time, but implemented with discrete-time variables. The discrete-time version gives rise to interaction terms, which are omitted from the reported results.

[7] This result resembles the result of Timmer et al. (2013) who introduce the concept "Global Value Chain (GVC) income". In advanced economies, the domestic value added content of manufacturing production tends to decline – a competitiveness loss – but the decline in shares does not necessarily imply a reduction of GVC income in absolute terms, because manufacturing demand and GVC income in the world as a whole are increasing.



Notes: The trade ratio is defined as the value of exports of goods and services over the value of imports of goods and services. Relative expenditure is defined as real foreign expenditure over real domestic expenditure (both variables are indices normalized to 100 in 2000). Rising relative expenditure indicates that trading partners' expenditure is growing faster than domestic expenditure.

Figure 2: Trade ratio and relative expenditure 1990-2014

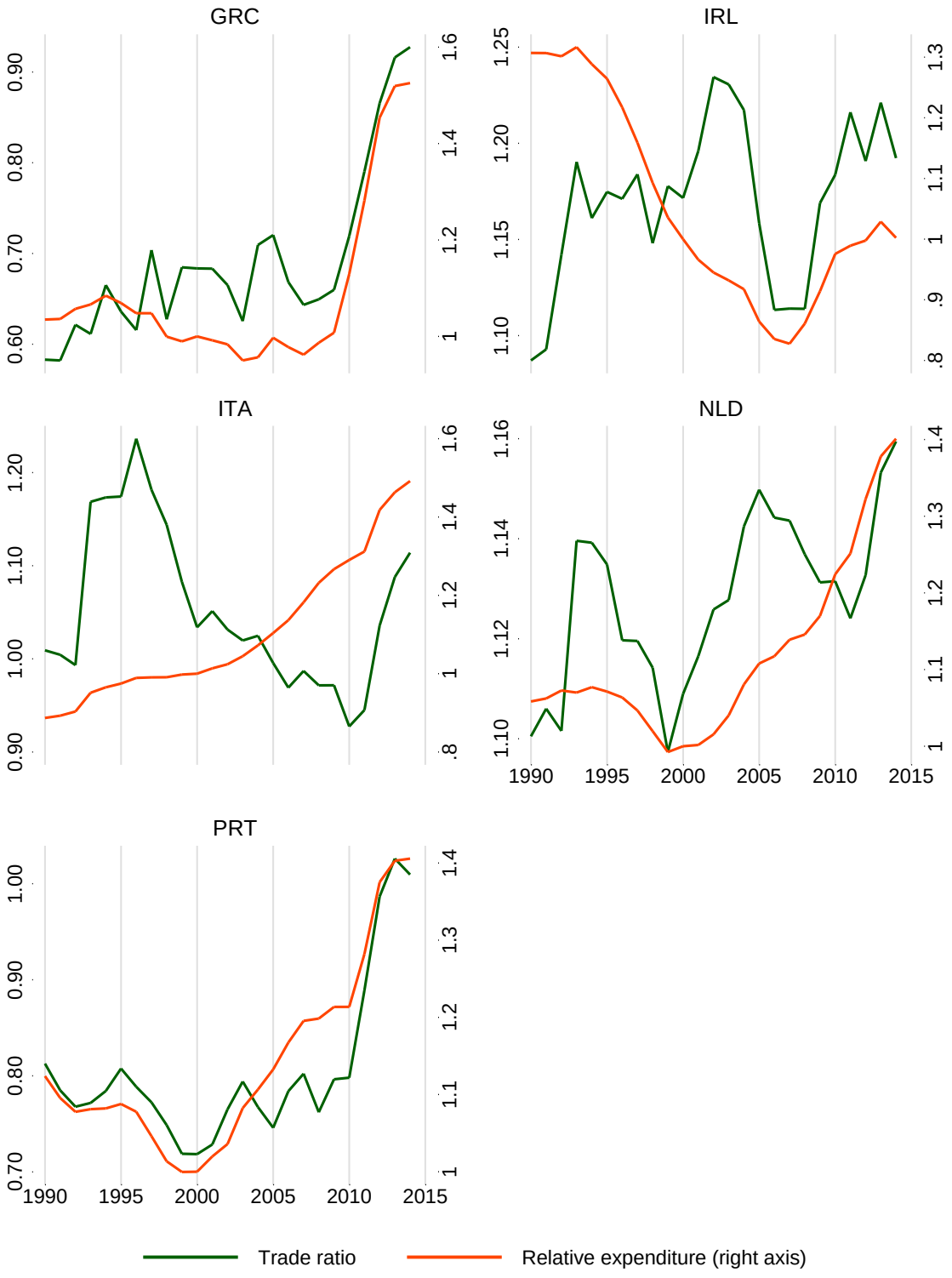
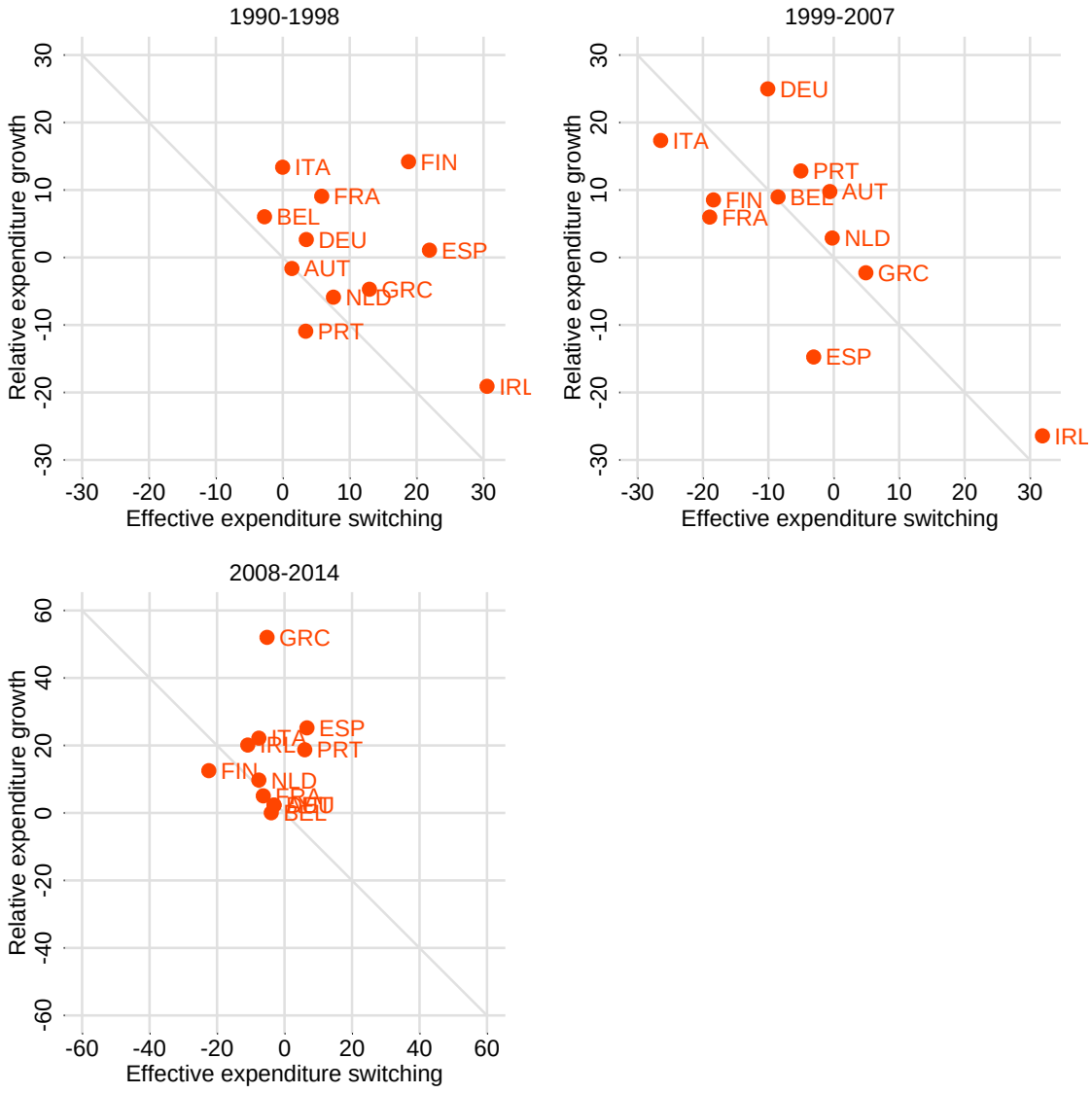


Figure 2 (continued)



Notes: Relative expenditure growth is real foreign expenditure growth in percent minus real domestic expenditure growth in percent; effective expenditure switching is the percent change in the terms of trade plus the percent change in the relative import intensity (defined in equation 6). Percent growth over a period, for instance 1999-2007, is calculated as $Z_{2007}/Z_{1998} \times 100 - 100$, where Z is the level of the variable of interest.

Figure 3: Expenditure-growth effects and expenditure-switching effects, scatter plots by period, 1990-2014

expenditure-switching effects (Ireland and Greece) or unfavorable switching effects of a lesser magnitude than Germany (Spain and Portugal). It follows that the extremely large pre-crisis trade deficits cannot be attributed to unfavorable expenditure-switching effects.

Focus on the crisis period, the graph in the bottom-left, and observe that Spain and Portugal were rebalancing to some extent through favorable expenditure switching, but the contribution from relative expenditure growth, that is, from the domestic expenditure collapse, was greater. Greece could not induce favorable expenditure switching, but its expenditure collapse was extraordinary deep, therefore its trade ratio improved.

Next follows a discussion of the four largest economies and Greece, for its prominence in the economic policy debate.

Germany

As figure 3 shows, the most extreme laggard in the euro period was Germany. Recall that Germany's macroeconomic performance was comparatively poor and unemployment high throughout the "sick-man period" from 1995 to 2005. Beginning in 1995, Germany's expenditure growth was persistently falling short of foreign expenditure growth. It is remarkable and a sign of the depth of the German slump that the level of real domestic expenditure in 2005 was 0.5 percent lower than in 2000. This exceptional slack in domestic expenditure, in particular over 2001-2005, accounts for the emergence of the trade surplus.

The role of weak domestic expenditure is widely recognized (e.g. IMF, 2015). At the same time attention often centers on the presumably competitiveness-boosting effects of the German wage moderation, which began in 1995 and which should have generated favorable expenditure-switching effects. What the decomposition shows is that Germany recorded unfavorable expenditure-switching effects both in the euro period and in the crisis period, in spite of the wage moderation. Germany therefore cannot be cited as a role model by proponents of the doctrine which regards the current account as the final target, expenditure switching as the intermediate target, the national wage level as the operational target, and labor market flexibilization and public sector wage moderation as the chief instruments of external adjustment policy in a currency union (as in e.g. Buti and Turrini, 2012). Germany embarked on a prolonged period of wage moderation, flexibilized labor markets, and reduced unemployment benefits – nevertheless expenditure switching was unfavorable.

Spain

The balance on goods and services was close to zero in 1997 because expenditure-switching had been favorable in the early 1990s. 1995 marks the beginning of the 13-year boom during which real domestic expenditure was growing at 4.3 percent annually. Foreign expenditure could not keep up with this pace. Relative expenditure growth accounts for a 15-percent decrease in the trade ratio in the euro period, while unfavorable expenditure switching effects account for another three-percent decrease. By 2007 the Spanish economy had developed a sizable trade deficit.

Domestic expenditure collapsed once the crisis hit. Favorable expenditure-switching

effects contributed to the shrinking of the trade deficit over 2008-2014 (an seven-percent increase in the trade ratio), but the contribution from expenditure growth was greater (a 25-percent increase in the trade ratio). Overall, expenditure-switching effects played a relatively minor role in the emergence and disappearance of the Spanish trade deficit. The expenditure boom produced a deficit and the collapse made it disappear.

The claim that Spain developed a competitiveness problem over 1999-2007 is justified if competitiveness is simply another word for relative ULC. But if competitiveness refers to a country's advantage or disadvantage for selling in international markets, the claim cannot be upheld. Spain's exports of goods and services were growing by 7.6 percent annually during the euro period, and they proved robust during the crisis (table 1). The country, quite simply, was on too high a growth path. The combination of large external deficits and high expenditure growth rates could have been manageable perhaps if investment had driven expenditure and the country's productive capacity had increased more rapidly, but productivity growth was poor and expenditure was driven by consumption and real estate investment, and these variables were driven by private debt. Expenditure adjustment was a question of time.[8]

France

Domestic expenditure growth was relatively weak in the early 1990s. The trade balance turned from a deficit in 1990 to a surplus that peaked in 1997. A small boom over 1998-2000 reduced the trade surplus. The surplus was shrinking and then turned into a deficit, for the first time in 2005, as a result of persistent unfavorable expenditure-switching effects. A small positive expenditure-growth effect and a larger unfavorable switching effect – this pattern carried over to the crisis period and the trade account deteriorated further. The French trajectory since the mid-1990s is characterized by persistent unfavorable expenditure-switching effects.

Italy

The Italian trade account was balanced in the early 1990s, and then domestic expenditure collapsed in the turmoil of the EMS crisis in 1993. The combined force of switching and growth effects implied that Italy ran sizable trade surpluses in the mid-1990s. Domestic expenditure was weak throughout the entire sample period, growing faster than foreign expenditure only in 1998, yet the domestic slack could not prevent the emergence of a trade deficit. It merely contained its size. The positive expenditure-growth effect could not compensate for the large and persistent unfavorable expenditure-switching effects that Italy experienced since the mid-1990s.

France and Italy do have competitiveness problems. Both countries entered the euro with trade surpluses which had emerged in the first half of the 1990s, and they experienced persistent unfavorable expenditure switching since then. Export growth rates were low, the lowest in the EA11 over the euro period (table 1). Economic stagnation averted a further

[8] The distinction between consumption and productive investment in the context of current account problems in a monetary union was made by Ingram (1973), and taken up by Giavazzi and Spaventa (2011).

deterioration of the external accounts since the onset of the crisis, but the problem of international competitiveness needs to be addressed in order to avoid balance of payments difficulties if and when growth picks up.

Greece

In figure 3 Greece and Ireland appear as healthy catch-up economies during the euro period – competitiveness-gaining frontrunners which balance high domestic growth rates with favorable expenditure switching. I will not comment on the Irish experience. The practice of transfer pricing and related schemes which allow multinational firms to benefit from the Irish tax code pose challenges to the interpretation of the Irish national accounts and balance-of-payments statistics. The first fact to appreciate with regard to Greece is that the country was continuously running trade deficits since 1960 (AMECO data for 1960-2014). The trade ratio's historical average is 0.66, that is, exports of goods and services paid for 66 percent of imports over 1960-2014. The last observation in the period, 0.93 in 2014, represents the highest value on record. The pre-crisis current account deficits can hardly be viewed as the result of a competitiveness problem newly acquired through ULC growth over 1999-2007.

The Greek trade balance, as opposed to the trade ratio, did deteriorate during the euro period, because the importance of trade has grown. The trade balance can be decomposed into the direction of trade and trade openness:

$$\frac{X^{\$} - M^{\$}}{Y^{\$}} \equiv \frac{X^{\$} - M^{\$}}{X^{\$} + M^{\$}} \cdot \frac{X^{\$} + M^{\$}}{Y^{\$}}. \tag{12}$$

The first fraction on the right-hand side is the direction of trade, and the second is the standard measure of openness. $Y^{\$}$ denotes GDP, $X^{\$}$ denotes exports of goods and services, and $M^{\$}$ denotes imports of goods and services, all measured in current domestic-currency units. On average over the preparatory period (1990-1998), the direction of trade was minus 0.23 and trade openness was 39 percent. By 2007 the direction of trade had hardly changed (it had moved slightly in favor of Greece to minus 0.21), but trade openness had increased to 58 percent. The ULC divergence, which allegedly caused a competitiveness problem, either did not influence the direction of trade, or counteracting factors concealed a systematic relation between the variables.

The size of the Greek current account deficit used to be contained by transfer payments and a positive balance on income account (Holinski et al., 2012; Kang and Shambaugh, 2013). The combined balance on the income and transfer accounts turned from plus 5.4 percent of GDP (the mean over 1990-1998) to minus 3.4 percent in 2007. The extremely large current account deficit in 2007, before the crisis and the ensuing expenditure collapse, can be explained to a large extent by the unfavorable developments on the income and transfer accounts which bear little relation to labor cost competitiveness.

The comments made above with regard to Spain apply equally to Greece. Greece can hardly be said to have developed a competitiveness problem over 1999-2007; it recorded the EA11's highest export growth rate during the period (table 1). The country was on

too high a growth path and expenditure adjustment was a question of time. In contrast to Spain, Greece did manage to increase labor productivity and catch-up to some extent, but it entered the euro with a huge trade deficit to begin with.[9]

6.1. Assessing the ULC Channel

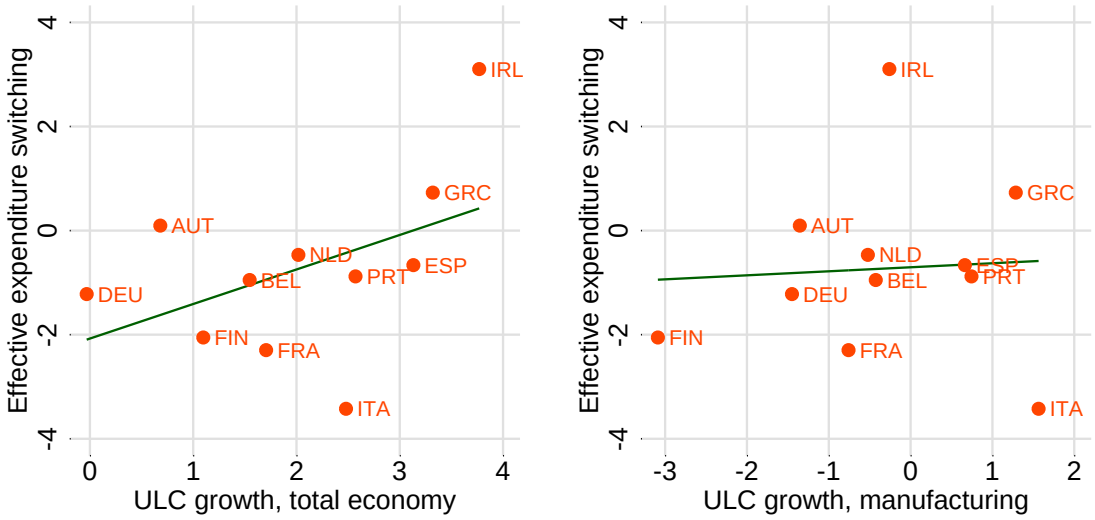
The trade ratio decomposition cannot identify causal mechanisms nor quantify causal effects. Cost advantages, product quality upgrades, product innovations, the pattern of product market specialization – the decomposition is silent about the sources of export growth and expenditure switching. Nevertheless, the decomposition creates an empirical record and a defensible proposition must be consistent with it.

There is no negative correlation between ULC growth and export growth (the aforementioned Euro Area Kaldor Paradox), nor is there one between ULC growth and expenditure switching (figure 4). Of course it can be maintained that a country's export performance is highly elastic with respect to ULC, but then a counteracting force would have to be at work, which compels the variables to appear unrelated on the surface. The alternative, short of additional econometric analysis, is to take the facts at face value: a sharp increase in ULC did not prevent Spain, for instance, from recording high export growth rates as well as expenditure-switching effects of the same magnitude as Germany. The prima facie evidence suggests that the observed ULC divergence did not influence export performance and expenditure switching very much. The euro area imbalance debate would benefit from a healthy dose of *ULC skepticism*.

What can explain the Kaldor Paradox and the absence of a correlation between ULC growth and expenditure switching? The validity of using conventional *aggregate* ULC indicators as measures of labor cost competitiveness can be questioned. Aggregate ULC increase when i) the labor costs in tradable goods industries increase, ii) the labor costs in non-tradable goods industries increase, iii) a country's industrial composition changes in favor of industries with relatively high labor costs. The evolution of aggregate ULC was driven to a large extent by compositional dynamics as well as labor cost increases in the non-tradable goods industries (Gaulier and Vicard, 2012; Felipe and Kumar, 2014). In other words, the changes that were observed over 1999-2007 bear little relation to changes in direct labor costs in exporting industries. If the aggregate ULC indicator is a rather poor measure of labor cost competitiveness, then policies that target this variable will not bring about the desired expenditure-switching effects and improvement in export performance.

EC (2014) uses disaggregated data to compute a new measure of labor cost competitiveness: industry-level ULC are computed in a first step, and then aggregated over industries. "The new measure does not point to large losses in competitiveness in vulnerable countries prior to 2006 (or 2007), ... a country can build external vulnerabilities without losing cost-competitiveness in each sector of specialisation" (EC, 2014, p. 38). The industries in

[9] The analysis by Kang and Shambaugh (2013) slices the data differently but is in broad agreement with the assessment in this section.



Notes: ULC are from AMECO (variable codes in brackets). By construction, ULC of the total economy (PLCD, left panel) include domestic industries which provide inputs to the export sector, but include many non-tradable goods and services as well. ULC of the manufacturing sector (PLCM, right panel) better capture tradable goods, but do not reflect labor cost developments in domestic industries which provide inputs to the manufacturing sector. Effective expenditure switching is defined in equation 6. The line represents the best fit by ordinary least squares.

Figure 4: The ULC channel over 1999-2007: ULC growth and expenditure-switching effects

the former deficit countries on average have hardly lost labor cost competitiveness relative to the respective industries in competitor countries.

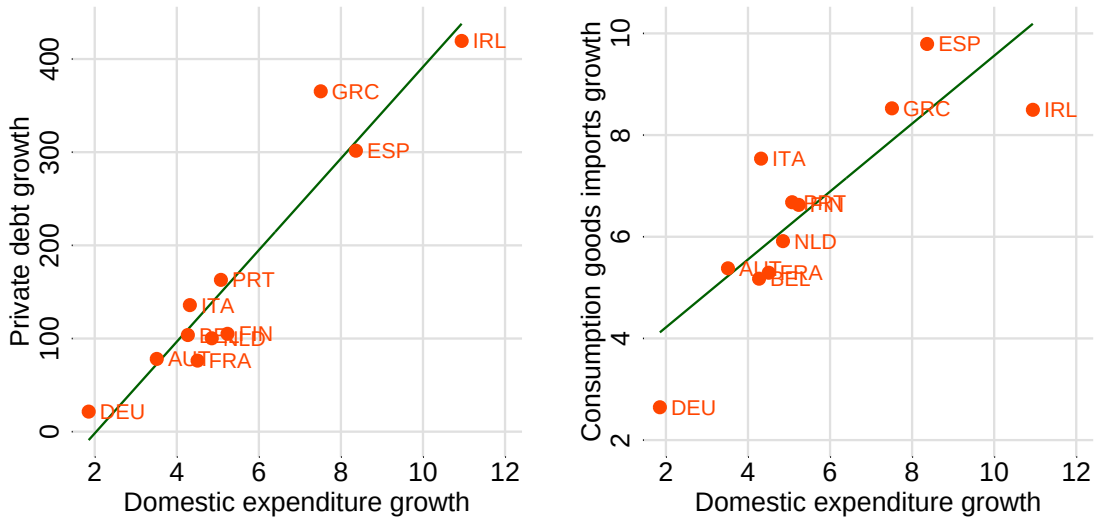
The distinction between the price elasticity of export demand and the ULC elasticity of export demand was already mentioned in section 4. ULC elasticities could be low even if price elasticities were high because labor costs make up only a small fraction of unit costs in manufacturing (Storm and Naastepad, 2015a; Storm and Naastepad, 2015b). The implication of this variant of *ULC pessimism* is that, even if direct labor costs within exporting industries changed relative to the same industries in competitor countries, the effects on export performance and expenditure switching would likely be small.

Changes in nominal exchange rates can bring about large swings in relative prices essentially overnight, but euro member states have no control over the euro exchange rate vis-à-vis other currencies. National commercial policy is not feasible either. In this context *internal devaluation* is supposed to facilitate external adjustment. A fiscal devaluation, that is, a revenue-neutral raise of taxes on consumption and reduction of taxes on production, can change relative prices by no more than a few percent. That leaves national wages as the operational target of external adjustment policy and labor market reforms as the policy instrument. The potential for success of the internal devaluation strategy depends crucially on the strength of the link between national wages and international competitiveness, on the extent to which wage moderation can induce expenditure switching. This link might not be so strong after all. If the wage moderation strategy has a limited capacity to improve international competitiveness, other policies need to fill the void. To develop new industries and attract foreign demand, governments in troubled countries might want to consider the use of industrial policy. Ideas that aim at a revival of industrial policy are laid out in Aghion et al. (2011), Aiginger (2013), Rodrik (2014), and Mazzucato et al. (2015).

6.2. Assessing the Expenditure Channel

The expenditure channel does stand out in simple scatter plots. The OECD publishes trade flows broken down by end-use category: manufacturing imports are classified as capital goods, consumption goods, and intermediate goods. Figure 5 visualizes the positive correlation between domestic expenditure and private debt as well as between domestic expenditure and imports for consumption purposes. Most countries tend to cluster around the median while Germany in the bottom-left and the boom-and-bust countries in the top-right stand out.

Figure 5 helps in the resolution of what appears to be a puzzle from the perspective of standard demand theory. Germany's improvement in cost competitiveness and its moderate income growth should have exercised a dampening effect on imports, but Germany's import expenditure was growing rapidly (table 1). Broken down by end-use category, the data reveal that growth of Germany's consumption goods imports was low indeed – 2.6 percent is an extremely low value in this sample – and growth of intermediate goods imports was high. While German firms were building production chains across borders (e.g. Marin, 2006; Simonazzi et al., 2013), German consumers were hardly increasing their spending.



Notes: Domestic expenditure in current euros from AMECO, mean growth in percent; consumption goods imports in current euros from OECD, mean growth in percent; gross debt of private sector in current euros from BIS, total growth in percent. Debt of the private sector (non-financial corporations, households, and non-profit institutions serving households) refers to the stock of outstanding loans and debt securities with both domestic and foreign counterparties. Total debt growth over 1999-2007 is calculated as $Z_{2007q4}/Z_{1998q4} \times 100 - 100$, where Z is the debt level. The line represents the best fit by ordinary least squares.

Figure 5: The expenditure channel over 1999-2007: Growth in private debt, domestic expenditure, and consumption goods imports

This article takes the observed expenditure dynamics as given and does not investigate their driving forces. The euro area imbalances, it may be noted, emerged in the era of financial globalization as financial innovation, integration, and deregulation set in motion a vast expansion of credit. Leverage ratios today are at historically unprecedented levels (Schularick and Taylor, 2012; Borio, 2014). The global activities of large European banks played a central role in the "global banking glut"; in particular British, French, German, and Swiss banks were expanding their balance sheets for cross-border lending on a large scale (Shin, 2012; Noeth and Sengupta, 2012).[10] With few impediments to the expansion of credit, *financial imbalances* capable of fueling unsustainable expenditure booms can easily emerge (Borio and Disyatat, 2011). The scatter plot that relates private debt to domestic expenditure merely illustrates that there might be merit to narratives which shift the attention away from labor markets and toward financial markets.

7. Conclusions

There is no correlation between ULC growth and export performance – the Kaldor Paradox – nor is there one between ULC growth and expenditure switching. While it is possible that confounding factors just happened to offset ULC-induced expenditure-switching effects, it stands to reason that a causal relation between the two variables is weak. Conventional ULC indicators do not seem to measure international competitiveness, broadly defined. Hence a reversal of the ULC divergence might not bring about large expenditure-switching effects, and reforms designed to engineer such a reversal should not be regarded as expenditure-switching policies. There can be little doubt that a reduction of money wages tends to exercise a dampening effect on nominal expenditure, thus measures that aim to reduce the wage level or moderate wage growth are best regarded as expenditure-reducing policies.

References

Aghion, P., J. Boulanger, and E. Cohen (2011). Rethinking Industrial Policy. Policy Brief 566, Bruegel.

Aiginger, K. (2013). A Southern Europe Strategy Based on Vision and Industrial Policy. *EKONOMIAZ 82*(01), 127–168.

Alexander, S. S. (1952, April). Effects of a Devaluation on a Trade Balance. *Staff Papers - International Monetary Fund 2*(2), 263–278.

Arghyrou, M. G. and G. Chortareas (2008). Current Account Imbalances and Real Exchange Rates in the Euro Area. *Review of International Economics 16*(4), 747–764.

[10] Waysand et al. (2010), Hale and Obstfeld (2014), and Hobza and Zeugner (2014) document with bilateral data the historically unprecedented rise in cross-border gross financial flows in the euro area.

Benkovskis, K. and J. Wörz (2014). What Drives the Market Share Changes? Price Versus Non-Price Factors. Working Paper 1640, European Central Bank.

Bickerdike, C. F. (1920, March). The Instability of Foreign Exchange. *The Economic Journal 30*(117), 118–122.

Borio, C. (2014, August). The Financial Cycle and Macroeconomics: What Have We Learnt? *Journal of Banking & Finance 45*, 182–198.

Borio, C. and P. Disyatat (2011). Global Imbalances and the Financial Crisis: Link or No Link? BIS Working Paper 346, Bank for International Settlements.

Burda, M. C. and J. Hunt (2011, April). What Explains the German Labor Market Miracle in the Great Recession? *Brookings Papers on Economic Activity*, 273–335.

Bussière, M., G. Callegari, F. Ghironi, G. Sestieri, and N. Yamano (2013, July). Estimating Trade Elasticities: Demand Composition and the Trade Collapse of 2008–2009. *American Economic Journal: Macroeconomics 5*(3), 118–151.

Buti, M. and A. Turrini (2012). Slow but Steady? Achievements and Shortcomings of Competitive Disinflation Within the Euro Area. ECFIN Economic Brief 16, European Commission, Directorate-General for Economic and Financial Affairs.

Carlin, W., A. Glyn, and J. Van Reenen (2001). Export Market Performance of OECD Countries: An Empirical Examination of the Role of Cost Competitiveness. *The Economic Journal 111*(468), 128–162.

Chen, R., G. M. Milesi-Ferretti, and T. Tressel (2013). External Imbalances in the Eurozone. *Economic Policy 28*(73), 101–142.

Christodoulopoulou, S. and O. Tkačevs (2015, August). Measuring the Effectiveness of Cost and Price Competitiveness in External Rebalancing of Euro Area Countries: What Do Alternative HCIs Tell Us? *Empirica*, 1–45.

Comunale, M. and J. Hessel (2014). Current Account Imbalances in the Euro Area: Competitiveness or Financial Cycle? DNB Working Paper 443, Netherlands Central Bank, Research Department.

Correa-Lopez, M. and R. Domenech (2012, December). The Internationalization of Spanish Firms. Working Paper 12/30, BBVA Research.

di Mauro, F., K. Benkovskis, S. D. Pinto, and M. Grazioli (2016, June). Fighting 'Currency Wars' with Blanks: The Limited Role of Exchange Rates in Export Competitiveness.

Diaz-Sanchez, J. L. and A. Varoudakis (2015, May). Tracking the Causes of Eurozone External Imbalances: New Evidence and Some Policy Implications. *International Economics and Economic Policy*, 1–28.

EC (2006). The EU Economy 2006 Review: Adjustment Dynamics in the Euro Area - Experiences and Challenges. European Economy 6, European Commission, Directorate-General for Economic and Financial Affairs.

EC (2009). Special Issue: Competitiveness Developments Within the Euro Area. Quarterly Report on the Euro Area 8(1), European Commission, Directorate-General for Economic and Financial Affairs, Brussels.

EC (2010). Surveillance of Intra-Euro-Area Competitiveness and Imbalances. European Economy 1/2010, European Commission, Directorate-General for Economic and Financial Affairs.

EC (2012). A Closer Look at Some Drivers of Trade Performance at Member State Level. Quarterly Report on the Euro Area 11(2), European Commission, Directorate-General for Economic and Financial Affairs, Brussels.

EC (2014, June). A Competitiveness Measure Based on Sector Unit Labour Costs. Quarterly Report on the Euro Area 13(2), European Commission, Directorate-General for Economic and Financial Affairs, Brussels.

ECB (2012, December). Competitiveness and External Imbalances within the Euro Area. Occasional Paper 139, European Central Bank.

Fagerberg, J. (1988, June). International Competitiveness. *The Economic Journal 98*(391), 355–374.

Fagerberg, J. (1994, September). Technology and International Differences in Growth Rates. *Journal of Economic Literature 32*(3), 1147–1175.

Fagerberg, J. (1996, September). Technology and Competitiveness. *Oxford Review of Economic Policy 12*(3), 39–51.

Fagerberg, J., M. Srholec, and M. Knell (2007, October). The Competitiveness of Nations: Why Some Countries Prosper While Others Fall Behind. *World Development 35*(10), 1595–1620.

Felipe, J. and U. Kumar (2014, October). Unit Labor Costs in the Eurozone: The Competitiveness Debate Again. *Review of Keynesian Economics 2*(4), 490–507.

Foster-McGregor, N. and R. Stehrer (2013, August). Value Added Content of Trade: A Comprehensive Approach. *Economics Letters 120*(2), 354–357.

Gaulier, G. and V. Vicard (2012). Current Account Imbalances in the Euro Area: Competitiveness or Demand Shock? Quarterly Selection of Articles 27, Banque de France.

Giavazzi, F. and L. Spaventa (2011). Why the Current Account May Matter in a Monetary Union. Lesson from the Financial Crisis in the Euro Area. In M. Beblavý (Ed.), *The Euro Area and the Financial Crisis*, pp. 199–221. Cambridge University Press.

Goldstein, M. and M. S. Khan (1985). Income and Price Effects in Foreign Trade. In Ronald W. Jones and Peter B. Kenen (Ed.), *Handbook of International Economics, Ch. 20*, Volume Volume 2, pp. 1041–1105. Elsevier.

Hale, G. and M. Obstfeld (2014, April). The Euro and The Geography of International Debt Flows. Working Paper 20033, National Bureau of Economic Research.

Hall, G. J. and T. J. Sargent (2011). Interest Rate Risk and Other Determinants of Post-WWII US Government Debt/GDP Dynamics. *American Economic Journal: Macroeconomics 3*(3), 192–214.

Harrod, R. (1933). *International Economics*. Cambridge University Press.

Hobza, A. and S. Zeugner (2014, November). Current Accounts and Financial Flows in the Euro Area. *Journal of International Money and Finance 48, Part B*, 291–313.

Holinski, N., C. Kool, and J. Muysken (2012, January). Persistent Macroeconomic Imbalances in the Euro Area: Causes and Consequences. *Federal Reserve Bank of St. Louis Review 94*(1).

Imbs, J. and I. Mejean (2015). Elasticity Optimism. *American Economic Journal: Macroeconomics 7*(3), 43–83.

IMF (2015, July). Germany: 2015 Selected Issues. Country Report 15/188, International Monetary Fund.

Ingram, J. C. (1973). The Case for European Monetary Integration. Essays in International Finance 98, International Finance Section, Princeton University.

Johnson, H. G. (1958). Towards a General Theory of the Balance of Payments. In *International Trade and Economic Growth*, pp. 153–168. Unwin Books.

Kaldor, N. (1978). The Effects of a Devaluation on Trade in Manufactures. In *Further Essays on Applied Economics*. New York: Holmes & Meier.

Kang, J. S. and J. C. Shambaugh (2013). The Evolution of Current Account Deficits in the Euro Area Periphery and the Baltics; Many Paths to the Same Endpoint. IMF Working Paper 13/169, International Monetary Fund.

Kennedy, C. and A. P. Thirlwall (1979, June). The Input-Output Formulation of the Foreign Trade Multiplier. *Australian Economic Papers 18*(32), 173.

Machlup, F. (1943). *International Trade and the National Income Multiplier*. New York: Augustus M. Kelley.

Marin, D. (2006). A New International Division of Labor in Europe: Outsourcing and Offshoring to Eastern Europe. *Journal of the European Economic Association 4*(2-3), 612–622.

Marquez, J. R. (2002). *Estimating Trade Elasticities*. Kluwer Academic Publishers.

Mason, J. W. and A. Jayadev (2014, July). Fisher Dynamics in US Household Debt, 1929-2011. *American Economic Journal: Macroeconomics 6*(3), 214–234.

Mazzucato, M., M. Cimoli, G. Dosi, J. E. Stiglitz, M. A. Landesmann, M. Pianta, R. Walz, and T. Page (2015, June). Which Industrial Policy Does Europe Need? *Intereconomics 50*(3), 120–155.

McCombie, J. S. L. and A. P. Thirlwall (1994). *Economic Growth and the Balance-of-Payments Constraint*. Palgrave Macmillan.

Noeth, B. J. and R. Sengupta (2012, November). Global European Banks and the Financial Crisis. Review 94(6), Federal Reserve Bank of St. Louis.

Orcutt, G. H. (1950, May). Measurement of Price Elasticities in International Trade. *The Review of Economics and Statistics 32*(2), 117–132.

Robinson, J. (1937). The Foreign Exchanges. In *Essays in the Theory of Employment*. Oxford: Blackwell.

Rodrik, D. (2014, September). Green Industrial Policy. *Oxford Review of Economic Policy 30*(3), 469–491.

Schularick, M. and A. M. Taylor (2012, April). Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870–2008. *American Economic Review 102*(2), 1029–1061.

Shin, H. S. (2012, July). Global Banking Glut and Loan Risk Premium. *IMF Economic Review 60*(2), 155–192.

Simonazzi, A., A. Ginzburg, and G. Nocella (2013, April). Economic Relations Between Germany and Southern Europe. *Cambridge Journal of Economics*.

Storm, S. and C. W. M. Naastepad (2015a, March). Crisis and Recovery in the German Economy: The Real Lessons. *Structural Change and Economic Dynamics 32*, 11–24.

Storm, S. and C. W. M. Naastepad (2015b, May). Europe's Hunger Games: Income Distribution, Cost Competitiveness and Crisis. *Cambridge Journal of Economics 39*(3), 959–986.

Thirlwall, A. P. (1979). The Balance of Payments Constraint as an Explanation of International Growth Rate Differences. *BNL Quarterly Review 32*(128), 45–53.

Thirlwall, A. P. (2011). Balance of Payments Constrained Growth Models: History and Overview. *PSL Quarterly Review 64*(259).

Timmer, M. P., B. Los, R. Stehrer, and G. J. de Vries (2013, October). Fragmentation, Incomes and Jobs: An Analysis of European Competitiveness. *Economic Policy 28*(76), 613–661.

Tressel, T. and S. Wang (2014). Rebalancing in the Euro Area and Cyclicality of Current Account Adjustments. IMF Working Paper 14/130, International Monetary Fund.

Tressel, T., S. Wang, J. S. Kang, J. C. Shambaugh, J. Decressin, and P. K. Brooks (2014). Adjustment in Euro Area Deficit Countries: Progress, Challenges, and Policies. IMF Staff Discussion Notes 14/7, International Monetary Fund.

Turunen, J., R. T. Harmsen, and T. Bayoumi (2011). Euro Area Export Performance and Competitiveness. IMF Working Paper 11/140, International Monetary Fund.

Waysand, C., K. Ross, and J. de Guzman (2010, December). European Financial Linkages: A New Look at Imbalances. IMF Working Paper WP/10/295, International Monetary Fund, Rochester, NY.

Wyplosz, C. (2013, October). The Eurozone Crisis and the Competitiveness Legend. *Asian Economic Papers 12*(3), 63–81.

A. Data

AMECO Annual Macroeconomic Database, European Commission, Directorate General for Economic and Financial Affairs.[11]

BIS Long Series on Credit to the Private Non-Financial Sector, Bank for International Settlements.[12]

IMF Direction of Trade Statistics, International Monetary Fund, Statistics Division.[13]

OECD Bilateral Trade Database by Industry and End-Use Category, Rev. 4, Structural Analysis Statistics, Organisation for Economic Co-operation and Development.[14]

[11] http://ec.europa.eu/economy_finance/db_indicators/ameco/index_en.htm (accessed April 28, 2016).
[12] http://www.bis.org/statistics/totcredit.htm (accessed March 1, 2015).
[13] http://www.imf.org/en/Data (accessed April 30, 2016).
[14] http://www.oecd.org/trade/bilateraltradeingoodsbyindustryandend-usecategory.htm (accessed March 7, 2015).

UN National Accounts Main Aggregates, United Nations Statistics Division.[15]

B. Expenditure Switching in Theory

Suppose that aggregate expenditure, relative price, and non-price competitiveness determine trade flows according to constant-elasticity demand functions:

$$\hat{X} = x_R \cdot \hat{R} + x_{FA} \cdot \hat{FA} + x_M \cdot \hat{M} + x_{DU} \cdot \hat{DU} \quad (13)$$

$$\hat{M} = m_R \cdot \hat{R} + m_{DA} \cdot \hat{DA} + m_X \cdot \hat{X} + m_{FU} \cdot \hat{FU}. \quad (14)$$

$\hat{DU}$ and $\hat{FU}$ denotes domestic and foreign non-price competitiveness, and the other variables were defined in section 3. The hat indicates the log-differential of a continuous-time variable, that is, $\hat{Z} \equiv d\,log\,Z/dt$ ($\approx$ growth rate). $x_R < 0$ is the elasticity of real exports wrt the terms of trade, $x_{FA} > 0$ the elasticity of real exports wrt real foreign expenditure, $0 < x_M < 1$ the elasticity of real exports wrt real imports, $x_{DU} > 0$ the elasticity of real exports wrt domestic non-price competitiveness, $m_R > 0$ the elasticity of real imports wrt the terms of trade, $m_{DA} > 0$ the elasticity of real imports wrt to real domestic expenditure, $0 < m_X < 1$ the elasticity of real imports wrt real exports, and $x_{DU} > 0$ the elasticity of real imports wrt foreign non-price competitiveness. To account for global value chains, exports appear as argument in the import demand function and imports appear as argument in the export demand function.[16] This partial analysis treats $\hat{R}$, $\hat{DA}$, $\hat{FA}$, $\hat{DU}$, and $\hat{FU}$ as exogenous variables.

Effective expenditure switching is composed of ex-post variables. If the demand functions (13) and (14) actually governed the observable variables, then shocks, parameter values, and exogenous variables would determine the sign and magnitude of expenditure switching. To understand what expenditure switch would measure, start from

$$\hat{ES} + \hat{RA} = \hat{R} + \hat{X} - \hat{M}, \quad (15)$$

substitute the demand functions into the equation, and solve for effective expenditure switching:

$$\begin{aligned} \hat{ES} = & \left(1 + \frac{(1-m_X)\cdot x_R - (1-x_M)\cdot m_R}{1 - m_X \cdot x_M}\right) \cdot \hat{R} + \\ & \left(\frac{(1-m_X)\cdot x_{FA}}{1 - m_X \cdot x_M} - 1\right) \cdot \hat{FA} + \left(1 - \frac{(1-x_M)\cdot m_{DA}}{1 - m_X \cdot x_M}\right) \cdot \hat{DA} + \\ & \frac{(1-m_X)\cdot x_{DU}}{1 - m_X \cdot x_M} \cdot \hat{DU} - \frac{(1-x_M)\cdot m_{FU}}{1 - m_X \cdot x_M} \cdot \hat{FU}. \end{aligned} \quad (16)$$

[15] http://unstats.un.org/unsd/snaama/Introduction.asp (accessed April 30, 2016).

[16] Across European economies the foreign value added content of aggregate exports varies roughly between 20 percent and 50 percent (Foster-McGregor and Stehrer, 2013).

A positive shock to R causes unfavorable effective switching if a *GVC-adjusted Marshall-Lerner condition* holds,

$$1 + \frac{(1 - m_X) \cdot x_R - (1 - x_M) \cdot m_R}{1 - m_X \cdot x_M} < 0, \tag{17}$$

and favorable switching otherwise. (Setting x_M and m_X to zero gives a traditional Marshall-Lerner condition.) A positive shock to FA causes favorable expenditure switching if

$$\frac{(1 - m_X) \cdot x_{FA}}{1 - m_X \cdot x_M} > 1, \tag{18}$$

and unfavorable switching otherwise. A positive shock to DA causes favorable expenditure switching if

$$\frac{(1 - x_M) \cdot m_{DA}}{1 - m_X \cdot x_M} < 1, \tag{19}$$

and unfavorable switching otherwise. A positive shock to DU unambiguously causes favorable switching

$$\frac{(1 - m_X) \cdot x_{DU}}{1 - m_X \cdot x_M} > 0, \tag{20}$$

and a positive shock to FU unambiguously causes unfavorable switching

$$\frac{(1 - x_M) \cdot m_{FU}}{1 - m_X \cdot x_M} > 0. \tag{21}$$

C. The BOP-Neutral Rate of Expenditure Growth

The nullcline ($\hat{TR} = 0$) can be related to the *balance of payments-constrained growth rate* (Thirlwall 1979).[17] Begin with

$$\hat{TR} \equiv \hat{R} + \hat{X} - \hat{M}, \tag{22}$$

substitute the demand functions into the equation, impose $\hat{TR} = 0$, and solve for $\hat{DA}$. The algorithm gives:

$$\begin{aligned} \hat{DA}^* \quad = \quad & \left[\left(1 + \frac{(1 - m_X) \cdot x_R - (1 - x_M) \cdot m_R}{1 - m_X \cdot x_M} \right) \cdot \hat{R} + \right. \\ & \frac{(1 - m_X) \cdot x_{FA}}{1 - m_X \cdot x_M} \cdot \hat{FA} + \\ & \left. \frac{(1 - m_X) \cdot x_{DU}}{1 - m_X \cdot x_M} \cdot \hat{DU} - \frac{(1 - x_M) \cdot m_{FU}}{1 - m_X \cdot x_M} \cdot \hat{FU} \right] \cdot \frac{1 - m_X \cdot x_M}{(1 - x_M) \cdot m_{DA}}. \end{aligned} \tag{23}$$

$\hat{DA}^*$ can be labeled the *BOP-neutral rate of expenditure growth.*

[17] McCombie and Thirlwall (1994) and Thirlwall (2011) discuss extensions of the original model.

The fraction that multiplies the large square bracket is positive. It implies that a positive shock to R raises the BOP-neutral rate if the GVC-adjusted Marshall-Lerner condition holds,

$$1 + \frac{(1 - m_X)\, x_R - (1 - x_M) \cdot m_R}{1 - m_X \cdot x_M} < 0, \tag{24}$$

and lowers it otherwise. A positive shock to FA unambiguously raises the BOP-neutral rate

$$\frac{(1 - m_X) \cdot x_{FA}}{1 - m_X \cdot x_M} > 0. \tag{25}$$

A positive shock to DU raises the BOP-neutral rate

$$\frac{(1 - m_X) \cdot x_{DU}}{1 - m_X \cdot x_M} > 0, \tag{26}$$

and a positive shock to FU lowers the BOP-neutral rate

$$\frac{(1 - x_M) \cdot m_{FU}}{1 - m_X \cdot x_M} > 0. \tag{27}$$

Thirlwall assumes $\hat{R} = 0$ in the long run, abstracts from global value chains x_M, $m_X = 0$, and does not explicitly model non-price competitiveness x_{DU}, $m_{FU} = 0$. Given these assumptions, the BOP-neutral rate simplifies to what may be termed the *expenditure variant of Thirwall's law*:

$$\hat{DA} = \frac{x_{FA}}{m_{DA}} \cdot \hat{FA}. \tag{28}$$

The formal equivalence between the equations and Thirwall's law does not engender the equivalence of their interpretations. Recall that the rationale for speaking of a BOP-constrained growth rate is that many developing countries a) are unable to place liabilities denominated in international means of payment and b) require imported capital goods to grow. The economy's growth rate is constrained by the quantity of capital goods imports which, in turn, is constrained by export revenues because only exports provide access to international means of payment. However, firms in the euro area can and did place liabilities denominated in dollars and euros, and euro area banks have access to the refinancing operations of the ECB as long as they command eligible collateral. The current international monetary system allows many countries to finance large external deficits for extended periods of time, and for this reason Thirlwall's law cannot be understood as explanation of the euro area growth experience. Equation (23) should not be interpreted as a growth prediction or growth explanation. If actual expenditure growth is lower than $\hat{DA}^*$, the trade ratio improves, and if actual expenditure growth is higher than $\hat{DA}^*$, the trade ratio deteriorates. Hence the label BOP-*neutral* rate of expenditure growth.

Table 3: Expenditure-growth effects and expenditure-switching effects by country and period, 1990-2014

	AUT	BEL	DEU	ESP	FIN	FRA	GRC	IRL	ITA	NLD	PRT	EA11
1990-1998, growth in percent												
$\hat{TR}$	-0.3	3.1	6.3	23.2	35.7	15.4	7.6	5.6	13.4	1.2	-7.9	9.4
$\hat{ES}$	1.4	-2.7	3.5	21.9	18.8	5.8	12.9	30.5	0.0	7.6	3.4	9.4
$\hat{RA}$	-1.6	6.0	2.7	1.1	14.2	9.1	-4.7	-19.1	13.4	-5.9	-10.9	0.4
$\hat{FA}$	17.9	20.0	19.7	19.1	18.8	20.6	15.8	19.5	21.8	18.2	17.1	19.0
$\hat{DA}$	19.9	13.2	16.6	17.8	4.1	10.6	21.6	47.7	7.4	25.6	31.5	19.6
1999-2007, growth in percent												
$\hat{TR}$	9.1	-0.3	12.4	-17.4	-11.4	-14.1	2.5	-3.0	-13.7	2.6	7.1	-2.4
$\hat{ES}$	-0.6	-8.5	-10.1	-3.1	-18.4	-19.0	4.9	31.9	-26.5	-0.2	-5.0	-5.0
$\hat{RA}$	9.8	9.0	25.0	-14.7	8.5	6.0	-2.3	-26.4	17.3	2.9	12.8	4.4
$\hat{FA}$	27.7	28.9	35.5	28.2	40.6	33.0	42.3	29.2	35.6	26.5	31.6	32.6
$\hat{DA}$	16.3	18.3	8.4	50.3	29.5	25.4	45.6	75.6	15.6	23.0	16.7	29.5
2008-2014, growth in percent												
$\hat{TR}$	-0.9	-3.9	-0.9	33.5	-12.7	-1.6	44.2	7.0	12.9	1.4	25.8	9.5
$\hat{ES}$	-3.1	-4.0	-3.1	6.6	-22.4	-6.3	-5.2	-10.9	-7.6	-7.6	6.0	-5.2
$\hat{RA}$	2.3	0.0	2.3	25.2	12.5	5.1	52.0	20.1	22.2	9.8	18.7	15.5
$\hat{FA}$	6.2	6.7	9.0	6.1	12.1	8.4	2.7	6.4	8.1	6.6	3.6	6.9
$\hat{DA}$	3.8	6.7	6.5	-15.3	-0.4	3.2	-32.4	-11.4	-11.5	-2.9	-12.7	-6.0

Notes: $\hat{TR}$ is the percent change in the trade ratio ($\approx$ nominal export growth minus nominal import growth in percent); $\hat{ES}$ is the expenditure-switching effect as defined by equation 6 in section 3 ($\approx$ percent change in the terms of trade plus the percent change in the relative import intensity); $\hat{RA}$ is the expenditure-growth effect ($\approx$ real foreign expenditure growth minus real domestic expenditure growth in percent); $\hat{FA}$ is real foreign expenditure growth in percent; $\hat{DA}$ is real domestic expenditure growth in percent. Percent growth over a period, for instance 1999-2007, is calculated as $Z_{2007}/Z_{1998} \times 100 - 100$, where Z is the level of the variable of interest. The column EA11 reports the unweighted row means.