

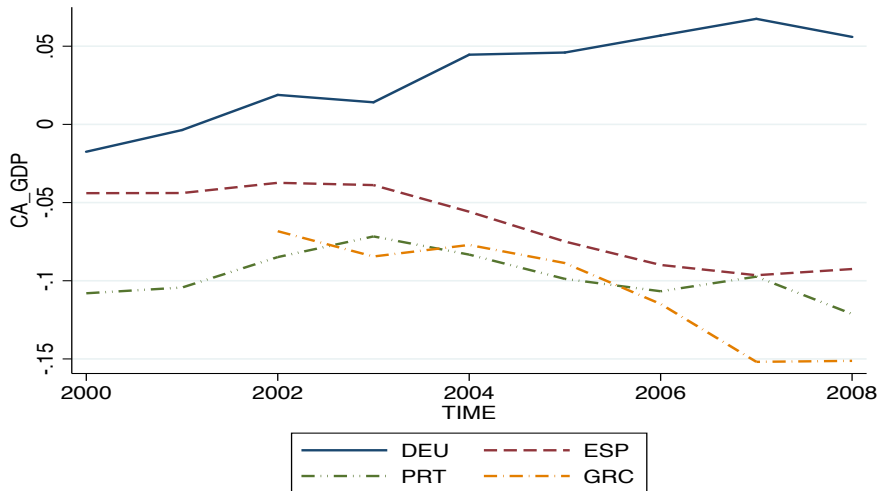
Asymmetric Trade Liberalizations and Current Account Dynamics

Alessandro Barattieri

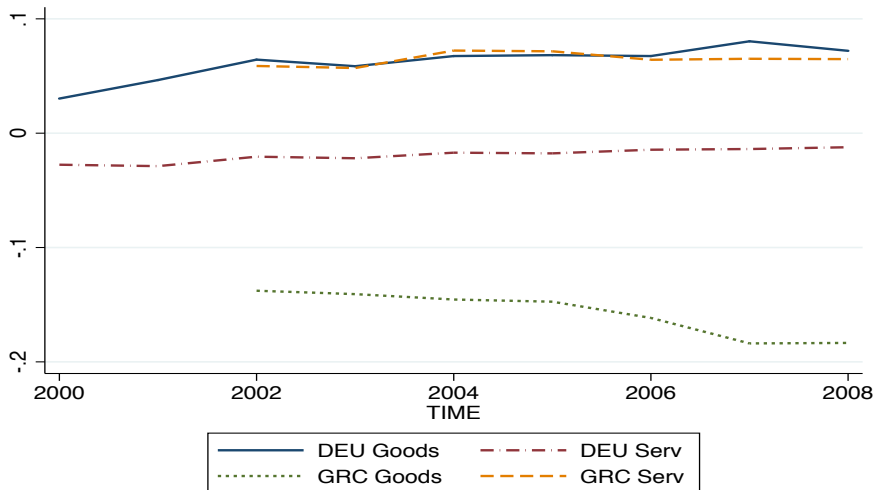
Collegio Carlo Alberto and ESG UQAM

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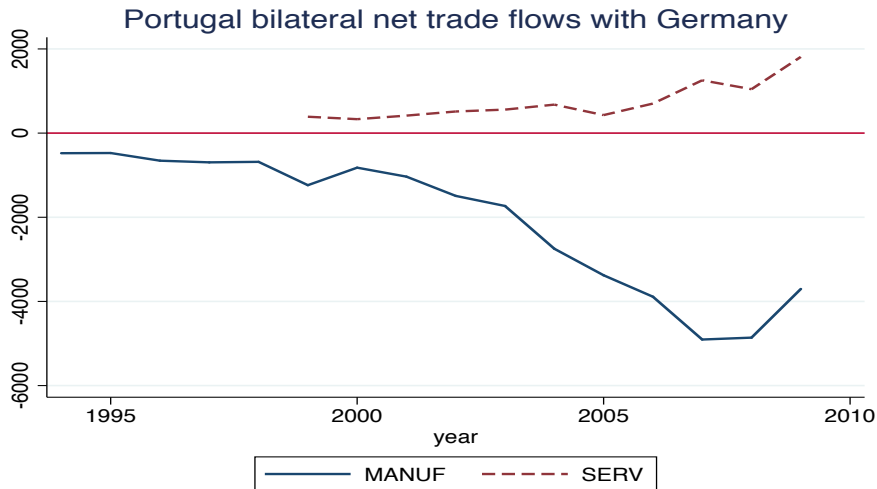
Motivation: Current Account Dynamics in Europe



Motivation: Inside European Current Accounts (I)



Motivation: Inside European Current Accounts (II)



Outline of the Presentation

- A simple model
- Empirical evidence
- A Quantitative Analysis of the German Surplus

A Simple Model (I)

Outline

- 2 Periods. 2 Countries. 2 Goods (endowment). Complete specialization.

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- Bond mkt clearing: $B_1 + B_1^* = 0$

A Simple Model (II)

Log-Linearized Model and Solution

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- I **solve analytically** for the current account of the Home Country (\hat{B}_1) in terms of the **trade costs** and the **endowments**.

$$\hat{B}_1 = -\eta \left(\hat{\tau}_1^h - \hat{\tau}_1^f \right) + \eta \left(\hat{\tau}_2^h - \hat{\tau}_2^f \right) + \nu \left(\hat{Y}_1^h - \hat{Y}_1^{f*} \right) - \nu \left(\hat{Y}_2^h - \hat{Y}_2^{f*} \right) \quad (1)$$

- η and ν are functions of the structural parameters of the model.

A Simple Model (II)

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- η and ν are functions of the structural parameters of the model.
- **Consumption smoothing drives current account dynamics**
- An **asymmetric trade liberalization** process for which $\left(\hat{\tau}_1^h - \hat{\tau}_1^f \right) < 0$ or $\left(\hat{\tau}_2^h - \hat{\tau}_2^f \right) > 0$ pushes **Home's CA toward surplus**.

A Simple Model (III)

The Parameter Values

Define: $s_h = \frac{1}{1+\tau^{1-\theta}}$, $s_f = \frac{\tau^{1-\theta}}{1+\tau^{1-\theta}}$, $\alpha_0 = \frac{s_h - s_f}{\beta} > 0$, $\alpha_1 = s_f s_h (\theta - 1) > 0$, $\alpha_2 = 2\alpha_1 + s_f > 0$

Then:

$$\eta = \frac{\frac{\alpha_0}{\alpha_2} + (\sigma - 1) \left[(s_h - s_f) \frac{\alpha_1}{\alpha_2} + s_f \right]}{(1 + \beta) \left[\frac{2}{\beta} + \frac{\alpha_0 \beta}{\alpha_2} \right] + (1 + \beta) \left[(\sigma - 1)(s_h - s_f) \frac{\alpha_0}{\alpha_2} \right]} > 0 \quad (2)$$

$$\nu = \frac{1 - \frac{s_f}{\alpha_2} - (\sigma - 1)(s_h - s_f) \frac{s_f}{\alpha_2}}{(1 + \beta) \left[\frac{2}{\beta} + \frac{\alpha_0 \beta}{\alpha_2} \right] + (1 + \beta) \left[(\sigma - 1)(s_h - s_f) \frac{\alpha_0}{\alpha_2} \right]} > 0 \quad (3)$$

Where: η is positive as long as $\sigma > 1 - \frac{\frac{\alpha_1}{\alpha_2}}{(s_h - s_f) \frac{\alpha_1}{\alpha_2} + s_f}$. ν is positive if $\theta > 1$ and $\sigma < 1 + \frac{2s_h(\theta-1)}{(s_h - s_f)}$.

Empirical Analysis - OECD Countries + BRICS (I)

Stage 1: the Constructed Home Bias Index

- **Structural gravity** for trade in services and manufacturing:

$$X_{ij}^k = \frac{Y_i^k E_j^k}{Y^k} \left(\frac{t_{ij}^k}{P_j \Pi_i} \right)^{1-\theta_k} \quad (4)$$

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- The **constructed home bias index** (CHB) is the ratio of realized internal trade relative to the frictionless case

$$CHB_{ik} = \frac{\frac{Y_i^k E_i^k}{Y^k} \left(\frac{t_{ii}^k}{P_i \Pi_i} \right)^{1-\theta_k}}{\frac{Y_i^k E_i^k}{Y^k}} = \left(\frac{t_{ii}^k}{P_i \Pi_i} \right)^{1-\theta_k}. \quad (5)$$

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- Using (4) and (5), I compute the CHB as:

$$CHB_{ik} = \left(\frac{t_{ii}^k}{P_i \Pi_i} \right)^{1-\theta_k} = \frac{X_{ii}^k Y^k}{Y_i^k E_i^k}. \quad (6)$$

Empirical Analysis - OECD Countries + BRICS (II)

Stage 2: Relative Trade Liberalization Measure

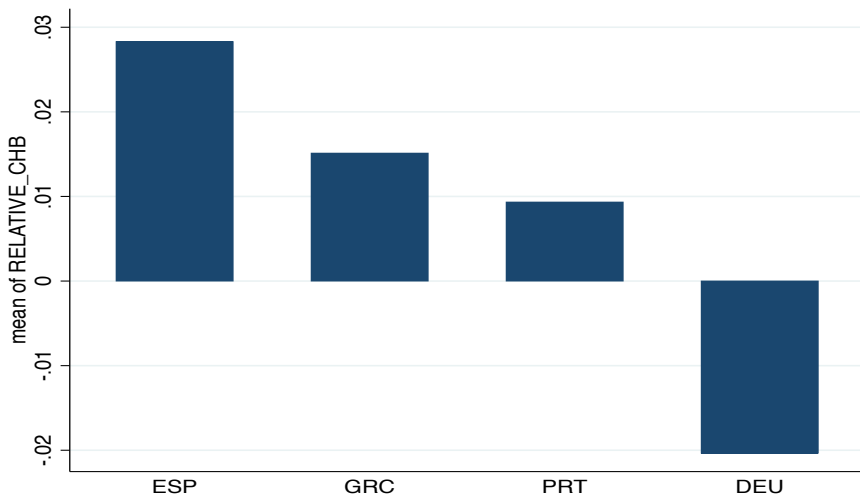
- I base the analysis on the CHB index introduced before. Using data for 24 OECD countries + BRICS.
- I divide the sample into “goods-oriented” and “service-oriented” countries. Then I define a measure of **relative trade liberalization** as:

$$(\hat{\tau}_t^h - \hat{\tau}_t^f) = \Delta \left[\sum_i \omega_i CHB_i^h \right]_t - \Delta CHB_{it}^f \quad (7)$$

- For Germany h is manufacturing, f services. For Spain h is services and f manufacturing.
- A **high relative trade liberalization**: country i CHB in the importing sector *decreased by more (or increased by less)* than the CHB of the trading countries in its the export sector.

Empirical Analysis - OECD Countries + BRICS (III)

Relative Trade Liberalization Measures, Selected Countries



Empirical Analysis - OECD Countries + BRICS (IV)

Stage 3: Current Account Dynamics

- Following (1), I evaluate the empirical merit of the model using the following specification:

$$\Delta \frac{CA}{GDP}_{it} = \eta_0 + \eta_1(\hat{\tau}_t^h - \hat{\tau}_t^f) + \sum_{s=1}^S \eta_{s+1}(\hat{\tau}_{t+s}^h - \hat{\tau}_{t+s}^f) + \psi Z_{it} + \delta_i + \delta_t + \epsilon_{it} \quad (8)$$

Empirical Analysis - OECD Countries + BRICS (IV)

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- Z_{it} : openness, growth, GDP and per capita GDP, and a proxy for financial development.
- Model predictions: i) $\eta_1 < 0$

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- Z_{it} : openness, growth, GDP and per capita GDP, and a proxy for financial development.
- Model predictions: i) $\eta_1 < 0$ ii) $\eta_s > 0$ and iii) $\eta_1 + \sum_{s=1}^S \eta_{s+1} = 0$

Empirical Analysis: OECD Countries + BRICS (V)

Regression Results

Dep. var: $\Delta \frac{CA}{GDP}_t$	(1)	(2)	(3)	(4)	(5)	(6-IV)
$(\hat{\tau}^h - \hat{\tau}^f)_t$	-4.906*** (0.918)		-5.826*** (0.960)	-4.478*** (1.025)	-4.103*** (1.173)	-1.324 (4.824)
$(\hat{\tau}^h - \hat{\tau}^f)_{t+1}$		2.477*** (0.953)	3.666*** (1.039)	3.912*** (1.024)	3.864*** (1.107)	10.386** (5.120)
$(\hat{\tau}^h - \hat{\tau}^f)_{t+2}$			1.928* (1.024)	2.524*** (0.955)	2.274** (1.023)	-5.675 (4.609)
$(\hat{\tau}^h - \hat{\tau}^f)_{t+3}$			0.609 (0.966)			
OPENNESS				0.906** (0.430)	3.949*** (1.497)	1.435** (0.590)
Real P.C. GDP				-0.096 (0.117)	-5.050 (4.287)	-0.216 (0.152)
Real GDP				0.233** (0.106)	5.123 (4.299)	0.322** (0.141)
GROWTH				-0.162*** (0.047)	-0.272*** (0.068)	-0.257** (0.111)
CREDIT				-0.004 (0.002)	-0.009 (0.006)	-0.004 (0.003)
Time + Country FE	No	No	No	No	Yes	No
N	433	404	346	369	369	329
Adj R-squared	0.060	0.014	0.117	0.139	0.135	0.094
P-value of Test						
$\eta_1 + \eta_2 + \eta_3 = 0$			0.87	0.24	0.31	0.62

Empirical Analysis: Developing Countries (I)

Set-up

- Sample of 13 developing countries (with tariff data from 1995-2012 that are: 1) highly **specialized** in the **export of agriculture** 2) specialized in the **import of manufacturing**.
- I build **relative trade liberalization measures** $\hat{\tau}_t^h - \hat{\tau}_t^f$ using tariff data on Agricultural ($\hat{\tau}_t^h$) and Manufacturing ($\hat{\tau}_t^f$) goods
- A **high relative trade liberalization**: country i tariff in the importing sector *decreased by more* (or *increased by less*) than the protection in its the export sector.

Empirical Analysis: Developing Countries (II)

Econometric results

Dep. var: $\Delta \frac{CA}{GDP}_t$	(1)	(2)	(3)	(4)
$(\hat{\tau}^h - \hat{\tau}^f)_t$	-0.372** (0.144)	-0.268* (0.138)	-0.272* (0.141)	-0.299* (0.156)
$(\hat{\tau}^h - \hat{\tau}^f)_{t+1}$		0.070 (0.143)	0.056 (0.147)	0.073 (0.164)
$(\hat{\tau}^h - \hat{\tau}^f)_{t+2}$		0.374** (0.151)	0.357** (0.156)	0.465*** (0.172)
$(\hat{\tau}^h - \hat{\tau}^f)_{t+3}$		-0.193 (0.162)	-0.220 (0.160)	0.018 (0.181)
ln(Real GDP)			0.078 (0.238)	11.284 (9.055)
ln(Real P.C. GDP)			-0.327 (0.461)	-6.275 (9.960)
Growth			-0.161** (0.067)	-0.188* (0.096)
Credit			-0.003 (0.017)	-0.041 (0.038)
Country FE	No	No	No	Yes
Year FE	No	No	No	Yes
R-squared	0.032	0.071	0.105	0.259
N	201	193	193	193
P-value of Test				
$\eta_1 + \eta_2 + \eta_3 + \eta_4 = 0$		0.96	0.83	0.55

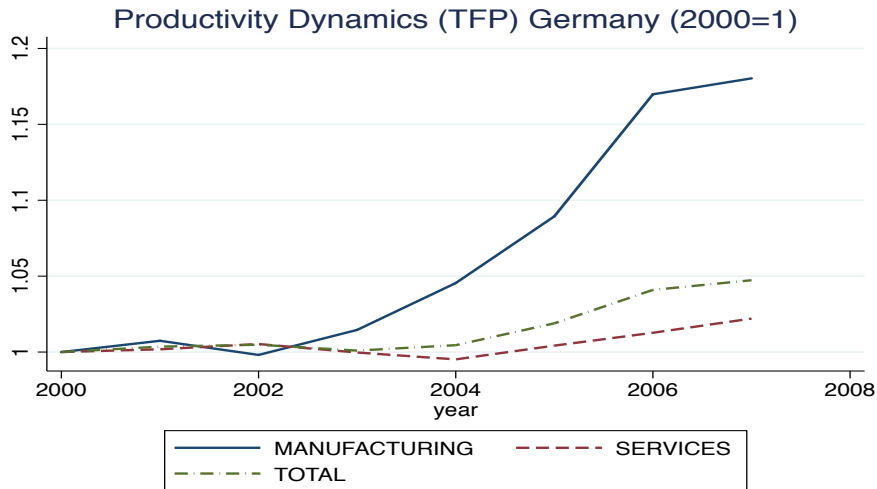
A Quantitative Analysis of the German Surplus (I)

A BKK-type Model with Trade Costs: Set-up

- Two Countries (1 and 2). Two intermediate goods (a and b). Complete specialization ($1 \rightarrow a, 2 \rightarrow b$)
- Intermediate output produced with capital and labor. Final output (consumption and investment) is a CES aggregate of a and b
- Infinite horizon utility maximization problem. Fixed Labor supply. Incomplete Markets.
- Exogenous iceberg trade costs (τ_1 and τ_2) and Productivity (A_1 and A_2)
- The model is solved as a nonlinear forward looking deterministic system using a Newton method (absence of aggregate uncertainty).

A Quantitative Analysis of the German Surplus (II)

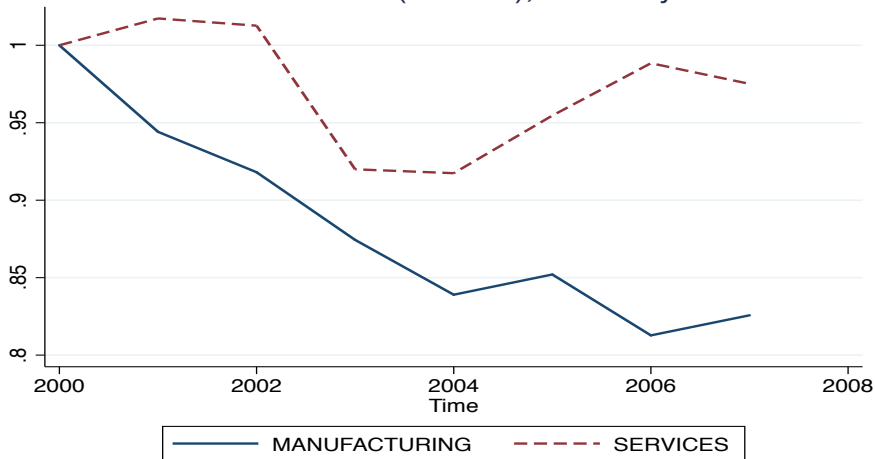
Asymmetric Productivity Dynamics: Germany (2000=1)



A Quantitative Analysis of the German Surplus (III)

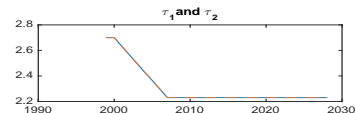
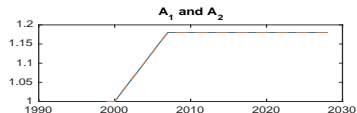
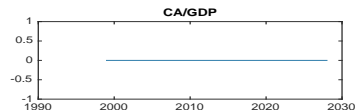
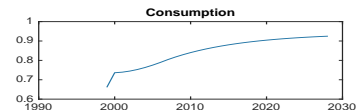
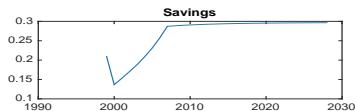
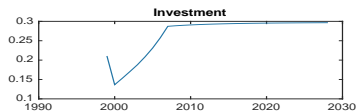
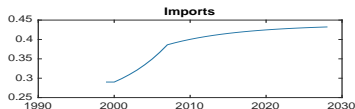
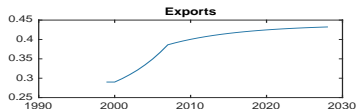
Asymmetric Trade Costs Dynamics: The CHB in Germany (2000=1)

CHB Index (2000=1), Germany



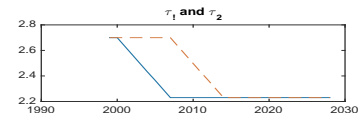
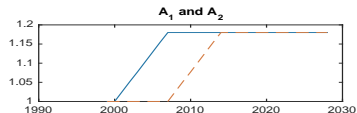
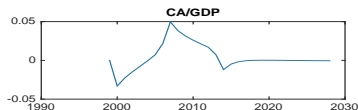
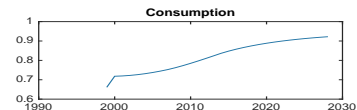
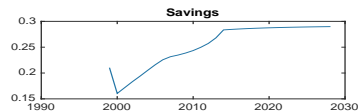
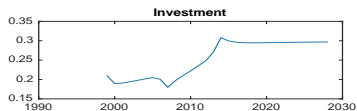
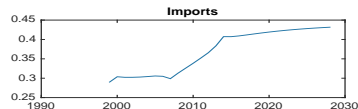
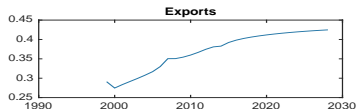
A Quantitative Analysis of the German Surplus (IV)

Selected Endogenous Variable Dynamics, Symmetric Trade Liberalization and Productivity Increase



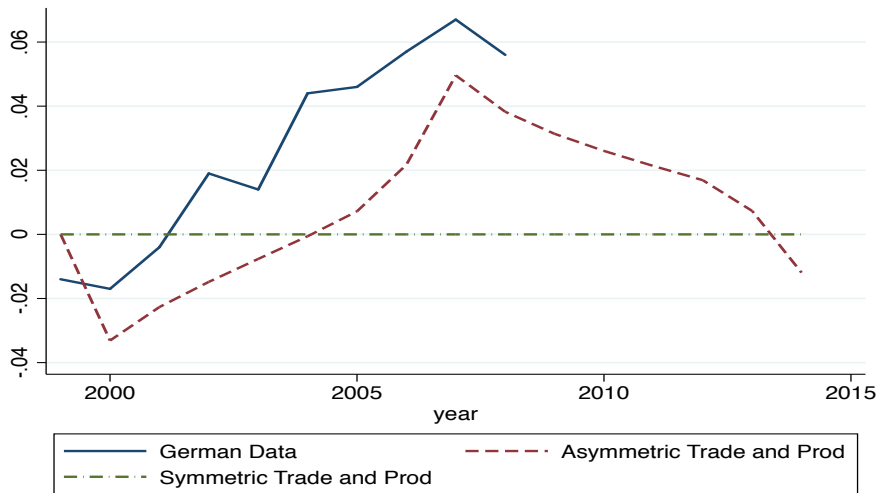
A Quantitative Analysis of the German Surplus (V)

Selected Endogenous Variable Dynamics, Asymmetric Trade Liberalization and Productivity Increase



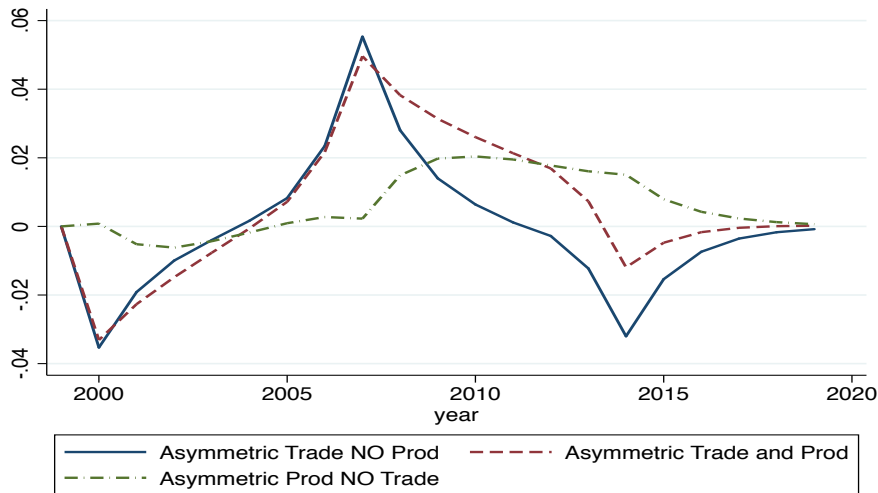
A Quantitative Analysis of the German Surplus (VI)

Trade Balance, German Data and Model



A Quantitative Analysis of the German Surplus (VII)

Trade Balance, Different Models



Concluding Remarks

- **Service trade liberalization possible further adjustment** margin for European rebalancing. Relatively neglected to date, relevant?
- However, the **link between the insight and economic policy can be subtle**: example of German tourism to Greece.
- Asymmetric liberalizations in trade can have significant effect for current account dynamics (potentially **relevant for preferential trade agreements?**).

For further suggestions, comments, complaints:
barattieri.alessandro@carloalberto.org
Thanks!