

Fiscal devaluation and Economic Activity in the EU

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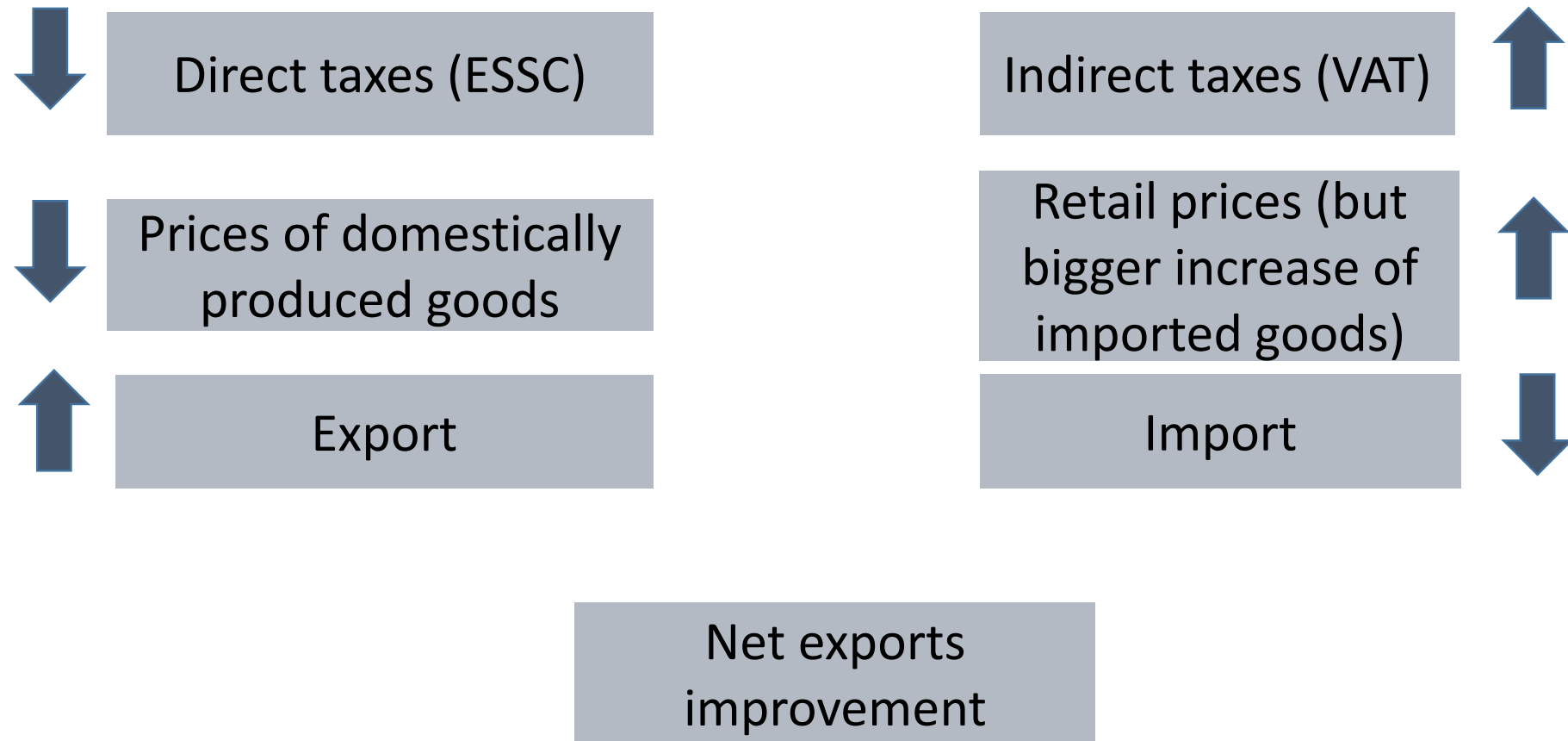
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Introduction 1/2

- **Fiscal devaluation (FD)** assumes the reduction of taxes on inputs, especially on labour, usually employers' social security contributions (ESSC), and offsetting increase in other taxes, notably value-added taxes (VAT) or property taxation.
- Fiscal devaluation has been considered as a policy tool aimed at restoring price competitiveness, especially in countries with the fixed exchange rate regime, like troubled Euro area countries.
- However, within last two decades FD was more frequently applied in the new EU member states with flexible exchange rates than Euro area countries.

Introduction 2/2

How does fiscal devaluation work?



Wage rigidities are crucial determinants of a magnitude and persistence of effects of FD as they affect a speed and scope of wage adjustments induced by an offsetting increase in VAT.

A majority of theoretical studies on FD applies DSGE models

The average magnitude of the effects of FD (cut of ESSC/GDP ratio by 1 pp. accompanied by an increase in VAT/GDP ratio also by 1 pp.) from the theoretical models.

Outcome variable	Magnitude of the effects	Source
GDP	0,46%	Annicchiarico B. et al. (2014); Bosca et al. 2013; EC (2013); Engler et al. (2013); Hohberger S. (2015); Lipinska A. and Thadden L. (2012); Orsini K. et al. (2015); Pereira et al. (2011); Pereira et al. (2014)
Employment	0,39%	Annicchiarico B. et al. (2014); Bosca et al. (2013); Langot, et al. (2012); Langot, et al. (2014); EC (2013); Bosca et al. (2013); Lipinska A. and Thadden L. (2012); Pereira et al. (2011); Pereira et al. (2014)
Nominal effective exchange rate	-0,56% (appreciation)	Annicchiarico B. et al. (2014); Bosca et al. (2013); Engler et al. (2013); Gomes S. et al. (2013); Hohberger S. (2015); Langot et al. (2014)
Net exports	0,67%	Bosca et al. (2013); Hohberger S. (2015); Gomes S. et al. (2013); EC (2013); Engler et al. (2013); Hohberger S. (2015); Orsini K. et al.(2015)

Many sources of non-linearities in DSGE models 2/7

Factor causing non-linearities	Mechanism	Source	Expected impact on the effects of FD	Verified empirically
Nominal upward wage rigidity	High upward nominal wage rigidity weakens and delays nominal wage adjustment after an increase in VAT	Lipińska A. and Thadden L. 2012	+	No
Price rigidity	High downward price rigidity delays pass-through of a cut of ESSC into final producers' prices	Gomes S. et al. 2013	-	No
Real wage elasticity of labour supply	High real wage elasticity of labour supply enables faster adjustment of the employment after a drop of real wages induced by an increase in VAT	Bosca et al. 2013	+	No
Trade openness	The higher price elasticity of export, the stronger effects of FD for export performance.	Engler et al. 2013	+	No
Exchange rate regime	The effects of FD are stronger among countries with fixed exchange rates or members of the monetary union	de Mooij R. i Kean M. 2013	+	Yes
Unilateral implementation of FD	Favourable for a country implementing FD provided it is not accompanied by similar FD in neighbouring countries	Engler et al. 2013	+	No
Social transfers	Generous social transfers decrease wage elasticity of labour supply => weaken effects of FD	Pereira et al. 2014	-	No

A literature review – main empirical findings

Model	Sample	Dependent variable	Measurement of FD	Unit	FD impact	Source
SVAR model	Portugal from 1995 to 2010, quarterly data	Net exports	Separate parameters for VAT and ESSC	Effective tax rates	Import decreases by 13,6 % and export increases by 8,4 %	Franco (2013)
Panel data model with fixed effects	OECD countries from 1965 to 2009	Net exports	Separate parameters for VAT and ESSC	Revenues as a % of GDP; statutory tax rates	Net exports improvement by 3,44 % of GDP	de Mooij and Keen (2013)
Pooled, cross sectional data model	EU – 15 countries from 1995 to 2009	Current account	A ratio between <i>implicit tax rates</i> ¹ of social security contributions and consumption	Implicit tax rates	Current account improvement by between 1,4% and 2,8 % of GDP	Bosca et al. (2013)

- Empirical studies confirmed a favourable impact of FD on net exports.
- The effects of FD are stronger in countries with fixed exchange rates (de Mooij R., Kean M. (2013) and Bosca et al. (2013)).

Our contribution to the literature

- Our sample (27 EU countries, 1995-2014) includes **the new EU member states** where the effects of FD have been so far hardly researched.
- We analyse the impact of FD not only on export performance, that other empirical studies deal with, but also on a **broader set of economic outcome variables** (GDP, employment and labour compensation per employee).
- Furthermore, in studying the impact of FD on export performance, we focus on **a share of domestic value added in export (VAX)**, which we find a more accurate indicator of export performance than net exports used in other papers.
- We analyse an impact of **trade openness** and some **labour market institutions** (wage bargaining system and generosity of unemployment benefits) on a the effects of FD.

Research hypothesis #1

I. Main channels through which FD affects economic performance

- **Hypothesis #1a.** Strengthened export activity is the most important channel through which FD boosts economic performance.
- **Hypothesis #1b.** FD enhances GDP growth rate.
- **Hypothesis #1c.** FD decreases labour costs (compensation per employee) and accelerates employment growth.

Methodology

The general specification of the models we used for verification of Hypotheses 1a-1c:

$$Y_{it} = \alpha_i + \beta FD_{it} + X_{it}\gamma + \varepsilon_{it}$$

where:

Y_{it} - a measure of economic performance:

- a share of domestic value-added in export (VAX_{it}),
- the net exports in percentage of GDP (NX_{it}),
- annual growth rates of real GDP (GDP_{it}),
- employment dynamics ($EMPL_{it}$)
- total labour compensation per employee dynamics ($WAGE_{it}$)

FD_{it} – a relation between ESSC and VAT revenues - **a decrease of the variable is interpreted as FD**

X_{it} – vector of control variables:

- cyclically adjusted primary balance ($CAPB_{it}$),
- output gap ($Output\ gap_{it}$),
- nominal effective exchange rate ($NEER_{it}$),
- unemployment rate ($Unemp_{it}$)

Main findings (#1)

Table 1. Panel data fixed effects models

	Fiscal devaluation (FE model)					Fiscal devaluation cyclically adjusted (FE model)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Value added in export (VAX)	NX	GDP	EMPL	WAGE	Value added in export (VAX)	NX	GDP	EMPL	WAGE
FD	-9.707*** (-7.66)	-5.166*** (-3.92)	-2.986*** (-2.80)	-3.980*** (-5.19)	7.391*** (6.54)					
Cyclical_FD						-9.461*** (-7.49)	-4.824*** (-3.65)	-2.771*** (-2.61)	-3.852*** (-5.17)	7.145*** (6.27)
Output gap	-0.103 (-1.60)	-0.408*** (-6.33)	0.980*** (18.53)	0.417*** (10.86)	0.412*** (6.47)	-0.0848 (-1.31)	-0.386*** (-5.90)	0.974*** (18.21)	0.403*** (10.65)	0.387*** (6.04)
NEER	0.0233** (2.39)	0.0157** (2.17)	-0.00514 (-0.86)	-0.00210 (-0.19)	-0.0388** (-2.06)	0.0231** (2.37)	0.0153** (2.10)	-0.00558 (-0.93)	-0.00202 (-0.19)	-0.0386** (-2.04)
CAPB	-0.0213 (-0.37)	0.0875 (1.46)	-0.0765 (-1.57)	0.0235 (0.68)	-0.0273 (-0.56)	-0.0187 (-0.32)	0.0805 (1.33)	-0.0641 (-1.32)	0.0292 (0.86)	-0.0288 (-0.59)
Unemp	0.177** (2.49)	0.266*** (3.61)	0.504*** (8.54)	-0.00234 (-0.06)	-0.109* (-1.71)	0.167** (2.36)	0.276*** (3.70)	0.480*** (8.06)	-0.0193 (-0.46)	-0.105 (-1.63)
N	473	457	478	484	362	473	446	465	471	362
r2	0.149	0.313	0.501	0.412	0.346	0.145	0.309	0.499	0.412	0.340

Numbers in parenthesis are t-statistics, stars denote coefficient estimates significance at 1%(***), 5%(**) and 10%(*) levels.

Research hypothesis #2

II. Factors causing non-linear FD effects for economic performance:

- **Hypothesis #2a.** An impact of FD on economic performance is stronger among countries with fixed exchange rates than those with the floating rates.
- **Hypothesis #2b.** The larger country's trade openness, the stronger FD enhances economic performance.
- **Hypothesis #2c.** Wage bargaining settings that foster high downward real wage rigidity (or low upward nominal wage rigidity) weakens an impact of FD on economic performance.
- **Hypothesis #2d.** Due to enhanced wage pressure exerted by generous unemployment benefit system, the effects of FD become weaker.

Methodology (#2)

The general specification of the models we used for verification of Hypotheses 2a-2d:

$$Y_{it} = \alpha_i + \beta FD_{it} + \vartheta FD_Z_{it} + \varphi Z_{it} + \mathbf{X}_{it}\boldsymbol{\gamma} + \varepsilon_{it}$$

where:

Z_{it} – variable measuring potential source of nonlinearity

- the Eurozone membership (*EURO*)
- trade openness of the economy (*OPEN*)
- wage bargaining: centralisation of wage bargaining (*CWB*) and predominant level at which wage bargaining takes place (*LEVEL*)
- generosity of unemployment benefit system: net replacement rates for workers earning an average salary in the economy (*NRR_single*) and one-earner couple with two children (*NRR_couple*)

FD_Z_{it} – interactive variable which is a product of FD_{it} and Z_{it}

The overall impact of fiscal devaluation on economic performance is defined by:

$$\frac{\partial Y_{it}}{\partial FD_{it}} = \beta + \vartheta Z_{it}$$

Main findings (#2a & #2b)

Table 3. Estimation results: Analysis of non-linear implications: Eurozone membership and openness of the economy

	Eurozone membership					Openness of the economy				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Value added in export (VAX)	NX	GDP	EMPL	WAGE	Value added in export (VAX)	NX	GDP	EMPL	WAGE
FD	-8.232*** (1.21)	-4.298*** (1.31)	-3.534*** (1.07)	-4.157*** (0.78)	7.226*** (1.14)	-3.269** (1.57)	0.901 (1.95)	-3.916** (1.86)	-5.257*** (1.36)	11.35*** (1.75)
FD*EURO	-2.864*** (0.95)	-2.393** (1.02)	0.197 (0.87)	-0.234 (0.61)	-0.398 (0.88)					
EURO	5.501*** (0.95)	3.860*** (1.03)	-1.760** (0.88)	-0.479 (0.61)	-0.780 (0.92)					
FD*OPEN						0.0162 (0.01)	0.00289 (0.02)	0.00244 (0.02)	0.0194 (0.01)	-0.0786*** (0.02)
OPEN						0.105*** (0.01)	0.101*** (0.02)	-0.0150 (0.02)	-0.0121 (0.01)	0.0154 (0.01)
N	473	457	478	484	362	458	443	464	469	362
r ²	0.260	0.345	0.523	0.423	0.368	0.553	0.534	0.508	0.422	0.439
F	22.14	31.89	69.48	47.05	27.93	75.16	67.08	63.59	45.43	37.49

Numbers in parenthesis are t-statistics, stars denote coefficient estimates significance at 1%(***), 5%(**) and 10%(*) levels.

Main findings (#2c)

Table 4. Analysis of non-linear (labour market) implications: Centralisation of wage bargaining and level at which wage bargaining takes place

	Centralisation of wage bargaining					The predominant level at which wage bargaining takes place				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Value added in export (VAX)	NX	GDP	EMPL	WAGE	Value added in export (VAX)	NX	GDP	EMPL	WAGE
FD	-17.25*** (2.22)	-10.61*** (2.34)	-2.617 (1.88)	-4.549*** (1.31)	14.95*** (1.84)	-17.70*** (2.22)	-8.420*** (2.36)	-1.698 (1.91)	-3.522*** (1.36)	15.11*** (1.88)
FD*CWB	3.090*** (0.69)	2.224*** (0.73)	-0.326 (0.59)	-0.00698 (0.41)	-2.819*** (0.55)					
CWB	-2.757*** (0.55)	-1.970*** (0.58)	0.475 (0.46)	0.270 (0.32)	2.897*** (0.44)					
FD*LEVEL						3.344*** (0.74)	1.492* (0.78)	-0.733 (0.63)	-0.386 (0.45)	-2.931*** (0.60)
LEVEL						-2.887*** (0.55)	-1.590*** (0.58)	0.815* (0.47)	0.556* (0.33)	2.890*** (0.44)
N	450	423	442	450	343	470	453	474	483	362
r ²	0.202	0.336	0.506	0.430	0.422	0.209	0.344	0.504	0.431	0.427
F	15.15	28.26	60.11	45.05	33.18	16.48	31.42	64.00	48.60	35.74

Numbers in parenthesis are t-statistics, stars denote coefficient estimates significance at 1%(***), 5%(**) and 10%(*) levels.

Main findings (#2d)

Table 5. Analysis of non-linear (labour market) implications: Unemployment benefits: single person and family

	Net replacement rate of unemployment benefits (single person)					Net replacement rate of unemployment benefits (family)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Value added in export (VAX)	NX	GDP	EMPL	WAGE	Value added in export (VAX)	NX	GDP	EMPL	WAGE
FD	-16.18*** (3.04)	-1.976 (3.32)	-7.228*** (2.71)	-10.97*** (1.84)	15.88*** (2.59)	-18.49*** (4.06)	-0.743 (4.33)	-5.357 (3.70)	-10.44*** (2.44)	19.53*** (3.39)
FD*NRR_Single	12.72** (5.29)	-6.850 (5.77)	7.927* (4.76)	13.04*** (3.21)	-16.43*** (4.55)					
NRR_Single	-23.23*** (6.08)	5.695 (6.69)	-4.977 (5.36)	-15.89*** (3.65)	18.99*** (5.51)					
FD*NRR_couple						15.01** (6.18)	-7.412 (6.58)	3.398 (5.66)	10.29*** (3.72)	-19.81*** (5.13)
NRR_Couple						-20.42*** (6.87)	3.450 (7.30)	-0.778 (6.04)	-11.65*** (4.14)	24.51*** (6.03)
N	466	440	458	464	362	466	440	458	464	362
r2	0.172	0.324	0.502	0.427	0.371	0.153	0.326	0.499	0.413	0.378
F	12.85	27.93	61.28	45.96	28.33	11.17	28.15	60.40	43.36	29.11

Numbers in parenthesis are t-statistics, stars denote coefficient estimates significance at 1%(***), 5%(**) and 10%(*) levels.

Research hypotheses #3

FD causes favourable spatial spill-overs for neighbouring countries' economic performance:

Hypothesis #3. Positive effects of FD on economic performance spills over into other countries principally through the export channel

Two offsetting effects:

- 'competitive effect' assumes that improved cost competitiveness resulting from FD in one country goes at the expense of the competitiveness of another country. It means that the more countries apply a discussed tax shift, the smaller would be their capability to boost economic performance (see e.g. de Mooji and Keen 2013; EC 2013).
- 'cooperative effect' states that FD in one country could be beneficial for neighbouring countries providing that they are sufficiently integrated within global value chains.

Methodology (#3)

Spatial panel model used for verification of Hypothesis 3:

$$Y_{it} = \alpha_i + \rho(WY)_{it} + \beta FD_{it} + \delta(WFD)_{it} + X_{it}\gamma + (WX)_{it}\theta + \varepsilon_{it}$$

where :

Y_{it} , FD_{it} , X_{it} and β - defined as in the previously described models,

W is an 27×27 weight matrix (inverse of driving distance between capitals of countries in the sample),

ρ is spatial autoregressive coefficient of the spatial lags of dependent variable $(WY)_{it}$

δ is the coefficient of spatial lags of fiscal devaluation measure $(WFD)_{it}$

θ vector containing the coefficients of spatial lags of $(WX)_{it}$

Methodology (#3)

Spatial panel models allow to decompose the impact of fiscal devaluations into three channels:

Local impact (channel A): the effects induced by FD in one country on performance of the country's economy;

Spatial impact (channel B) : externalities to neighboring countries; in case in which competitive effect exerts stronger impact than cooperative effect, one can expect that FD in one country would reduce economic performance in neighboring countries and *vice versa*.

Reverse inductions (channel C) : if FD in one country alters economic performance of neighboring states, this change may generate some induced effects (positive or negative) from the neighboring states to the country which implemented FD in the first place.

Main findings (#3)

Table 6. Spatial panel data models: All variables spatially lagged

Specification	Dependent variable:							
	VAX		NX		GDP		EMPL	
	Non spatial model	SDM panel with all variables spatially-lagged	Non spatial model	SDM panel with all variables spatially-lagged	Non spatial model	SDM panel with all variables spatially-lagged	Non spatial model	SDM panel with all variables spatially-lagged
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FD	-9.707*** (-7.66)	-2.985*** (-2.80)	-5.166*** (-3.92)	-2.926** (-2.92)	-2.986*** (-2.80)	-2.926** (-2.92)	-3.980*** (-5.19)	-4.073*** (0.83)
Output gap	-0.103 (-1.60)	0.980*** (18.53)	-0.408*** (-6.33)	0.225*** (0.08)	0.980*** (18.53)	0.225*** (0.08)	0.417*** (10.86)	0.238*** (0.05)
NEER	0.0233** (2.39)	-0.00514 (-0.86)	0.0157** (2.17)	0.032*** (0.00)	-0.00514 (-0.86)	0.032*** (0.00)	-0.00210 (-0.19)	0.010* (0.00)
ΔCAPB	-0.0213 (-0.37)	-0.0765 (-1.57)	0.0875 (1.46)	0.085 (0.06)	-0.0765 (-1.57)	0.085 (0.06)	0.0235 (0.68)	-0.006 (0.03)
Unemp	0.177** (2.49)	0.504*** (8.54)	0.266*** (3.61)	0.303*** (0.07)	0.504*** (8.54)	0.303*** (0.07)	-0.00234 (-0.06)	-0.193*** (0.05)
N	473	416	457	416	478	416	484	416
r ²	0.149	0.338	0.313	0.342	0.501	0.741	0.412	0.507
SDM vs Non-spatial FE	NA	157.9 (0.000)	NA	57.82 (0.000)	NA	442.36 (0.000)	NA	52.05 (0.000)
SDM vs SEM	NA	28.77 (0.000)	NA	51.94 (0.000)	NA	45.10 (0.000)	NA	21.82 (0.000)

* Estimates of spatially lagged dependent variables are not reported. Numbers in parentheses are t-statistics in case of non-spatial models and z-statistics for spatial models. Two bottom rows contain test statistics and p-values for testing the validity of SDM vs. SEM (Spatial Error Model) and SDM vs. non-spatial model specification. The tests are presented in Section 5. Stars denote coefficient estimates significance at 1% (***), 5% (**), 10% (*) levels.

Methodology (#3)

The point estimates of spatially lagged variables cannot be directly used to test the hypothesis of the existence of spatial spillovers. Following LeSage and Pace (2009), matrices of the partial derivative effects of the form have been constructed:

$$\frac{\partial Y}{\partial FD} = S(W) = \left(I_{NT} - \rho (I_T \otimes W) \right)^{-1} (I_{NT} \beta + (I_T \otimes W) \delta)$$

and the following three scalar summary measures have been calculated for the estimates' interpretation where :

Direct impact (Channel A+C): it measures the change in economic performance of the country due to changes in FD in the country.

Indirect impact (Channel B): it measures the spatial impact of FD described in **channel B**, namely the cumulated change in particular measure of economic activity in neighboring countries due to the change in FD in *i*-th country.

Total impact (Channel A+B+C): the sum of *Direct* and *Indirect impact*; it measures the aggregated impact of change in FD exerted through **channels A, B and C**.

Main findings (#3)

SDM panel with all variables spatially-lagged

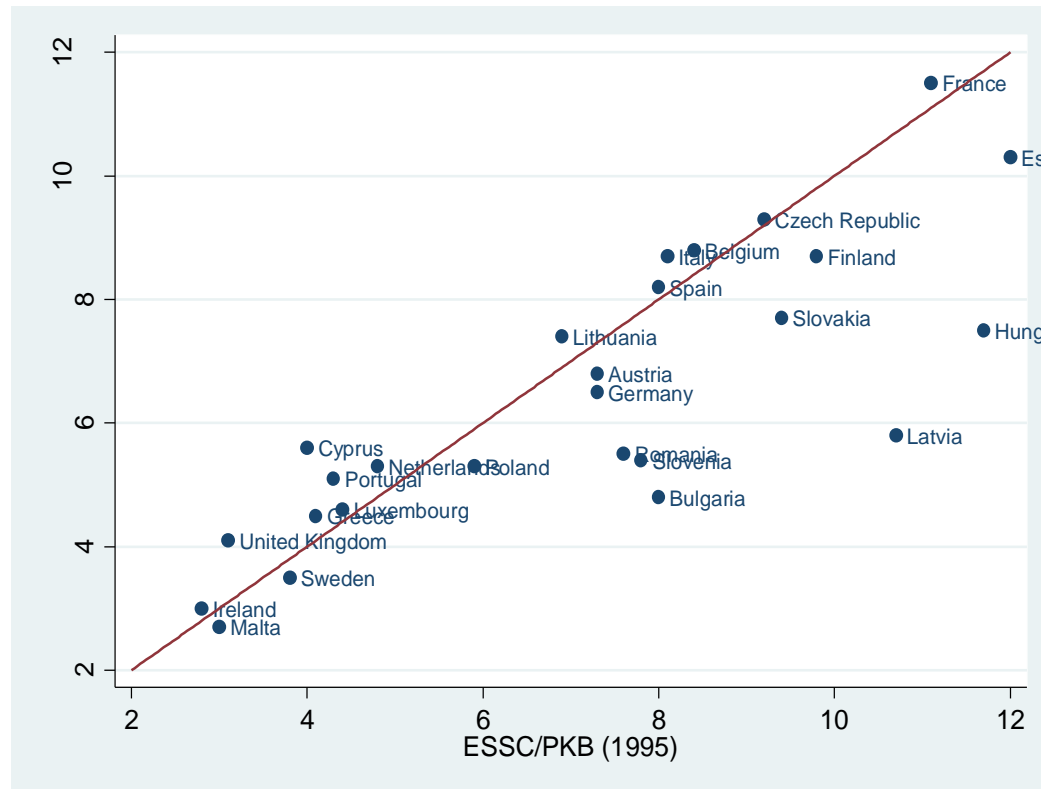
Dependent variable:

Specification	VAX			NX		
	Direct (1)	Indirect (2)	Total (3)	Direct (4)	Indirect (5)	Total (6)
FD	-4.759*** (1.17)	-23.078*** (4.60)	-27.837*** (4.59)	-2.737* (1.58)	-15.746*** (2.92)	-18.483*** (2.47)
Output gap	0.016 (0.06)	-0.165 (0.17)	-0.149 0.18	-0.215*** (0.081)	-0.271** (0.11)	-0.486*** (0.09)
NEER	0.0294*** (0.01)	0.190** (0.08)	0.220*** (0.08)	0.029*** (0.01)	0.192*** (0.04)	0.222*** .0450739
CAPB	0.006 (0.047)	0.222 (0.34)	0.228 (0.35)	0.084 (0.06)	-0.187 (0.19)	-0.103 (0.19)
Unemp	0.208*** (0.07)	-0.099 (0.34)	0.119 0.36	0.311*** (0.08)	0.120 (0.20)	0.431** (0.20)
	GDP			EMPL		
	Direct (7)	Indirect (8)	Total (9)	Direct (10)	Indirect (11)	Total (12)
FD	-3.356*** (0.95)	1.735 (3.72)	-1.620 (3.75)	-4.078*** (0.90)	2.208 (2.29)	-1.870 (2.17)
Output gap	0.673*** (0.05)	1.411*** (0.15)	2.083*** (0.15)	0.248 (0.05)	0.467*** (0.09)	0.715*** (0.09)
NEER	-0.007 (0.01)	0.056 (0.06)	0.049 (0.07)	0.012** (0.01)	0.066* (0.037)	0.078** (0.04)
CAPB	-0.195*** (0.04)	-0.252 (0.29)	-0.447 (0.30)	-0.006 (0.03)	0.118 (0.17)	0.112 (0.17)
Unemp	0.175*** (0.05)	2.811*** (0.29)	2.987*** (0.31)	-0.177*** (0.05)	0.684*** (0.17)	0.507*** (0.18)

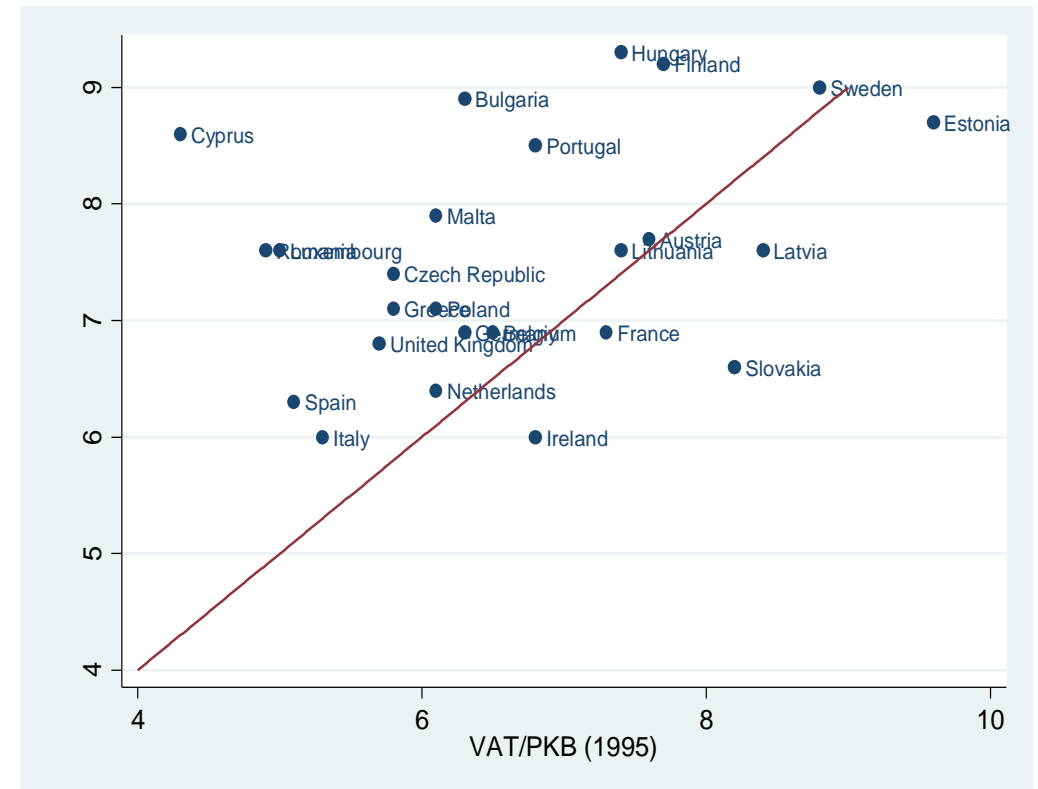
Thank you!

Some stylised facts (1/2)

Graph 1. Social security contribution paid by employers (ESSC/GDP) in the EU countries in 1995 and 2014

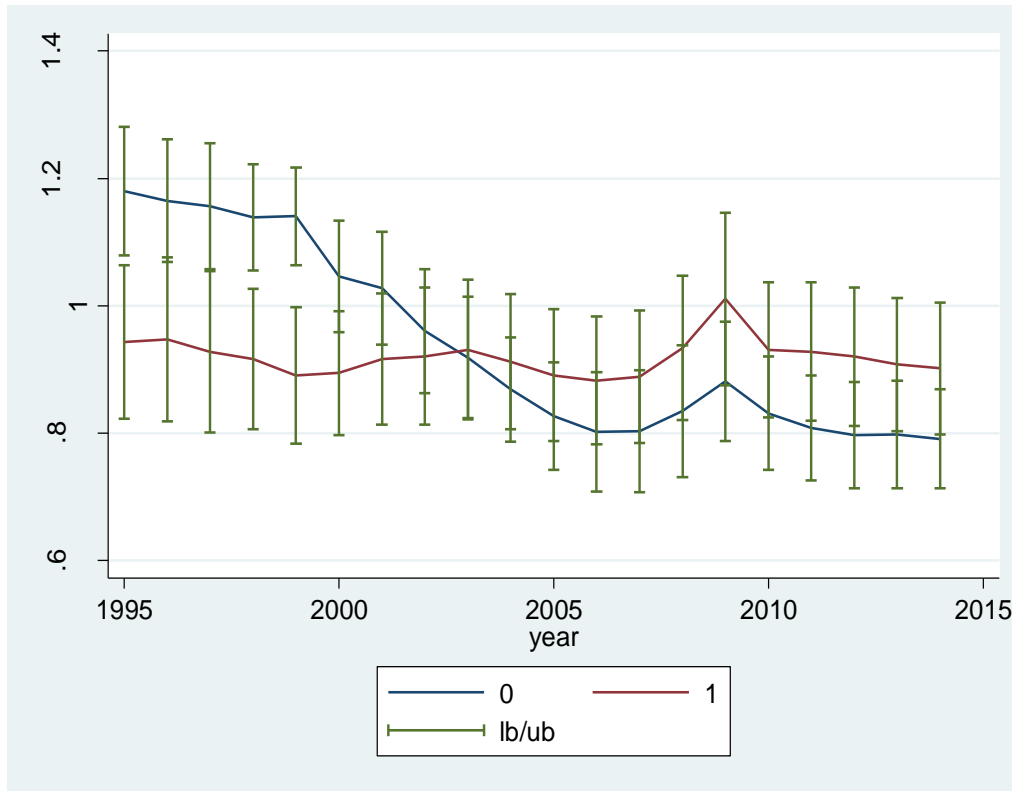


Graph 2. VAT revenues (VAT/GDP) in the EU countries in 1995 and 2014

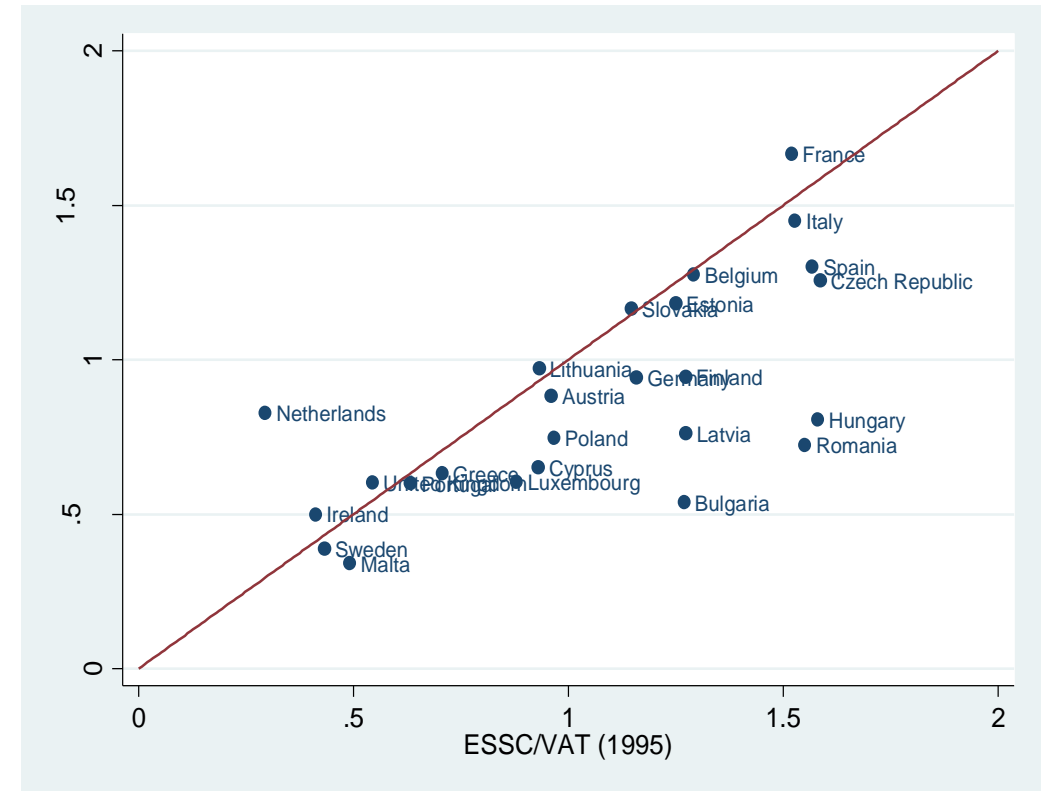


Some stylised facts (2/2)

Graph 3. An average ESSC/VAT ratio in the old (1) and new (0) EU member states.



Graph 4. ESSC/VAT ratio in the EU countries in 1995 and 2014.



Main findings (#1)

Table 2. Panel data fixed effects models with Discroll-Kraay and GMM estimators

	Discroll-Kraay estimator					GMM estimator				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Value added in export (VAX)	NX	GDP	EMPL	WAGE	Value added in export (VAX)	NX	GDP	EMPL	WAGE
FD	-9.707*** (-6.24)	-5.166** (-2.37)	-2.986* (-1.90)	-3.980*** (-3.31)	7.391*** (6.02)	-12.20*** (-7.34)	-8.974*** (-3.42)	-4.214** (-1.97)	-5.878*** (-5.06)	6.754*** (3.96)
Output gap	-0.103 (-0.87)	-0.408*** (-5.29)	0.980*** (3.96)	0.417*** (4.79)	0.412*** (3.47)	-0.0722 (-0.64)	-0.294* (-1.69)	0.124 (0.81)	0.442*** (5.80)	0.229** (1.99)
NEER	0.0233*** (3.60)	0.0157*** (3.29)	-0.00514 (-0.63)	-0.00210 (-0.15)	-0.0388** (-2.57)	0.0332*** (3.38)	0.0352** (2.23)	-0.0148 (-1.42)	0.0125 (0.59)	-0.100*** (-3.60)
CAPB	-0.0213 (-0.28)	0.0875 (1.54)	-0.0765 (-1.24)	0.0235 (0.48)	-0.0273 (-0.59)	-1.402*** (-4.02)	-1.807*** (-3.13)	0.952** (1.98)	-0.00948 (-0.05)	0.434 (1.25)
Unemp	0.177* (1.99)	0.266* (2.15)	0.504** (2.55)	-0.00234 (-0.04)	-0.109 (-1.16)	0.461*** (3.45)	0.663*** (2.89)	0.0234 (0.14)	0.243*** (2.91)	-0.330** (-2.36)
N	473	457	478	484	362	448	431	460	458	344
F (p value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000

Numbers in parenthesis are t-statistics, stars denote coefficient estimates significance at 1%(***), 5%(**) and 10%(*) levels.

- Application of Discroll-Kraay (col. 1-5) estimator leaves the results unaffected.
- GMM estimator (col. 6-10) returns somewhat higher estimates of FD effects for export performance, GDP and employment growth.
- Irrespective of the applied estimator the results yield support for Hypotheses 1a-1c and the differences between particular results are not significant. Because of that in following sections we present the results for FE estimator.