Greenwich Political Economy Research Centre

GPERC

Wage-led growth in the UK and Europe

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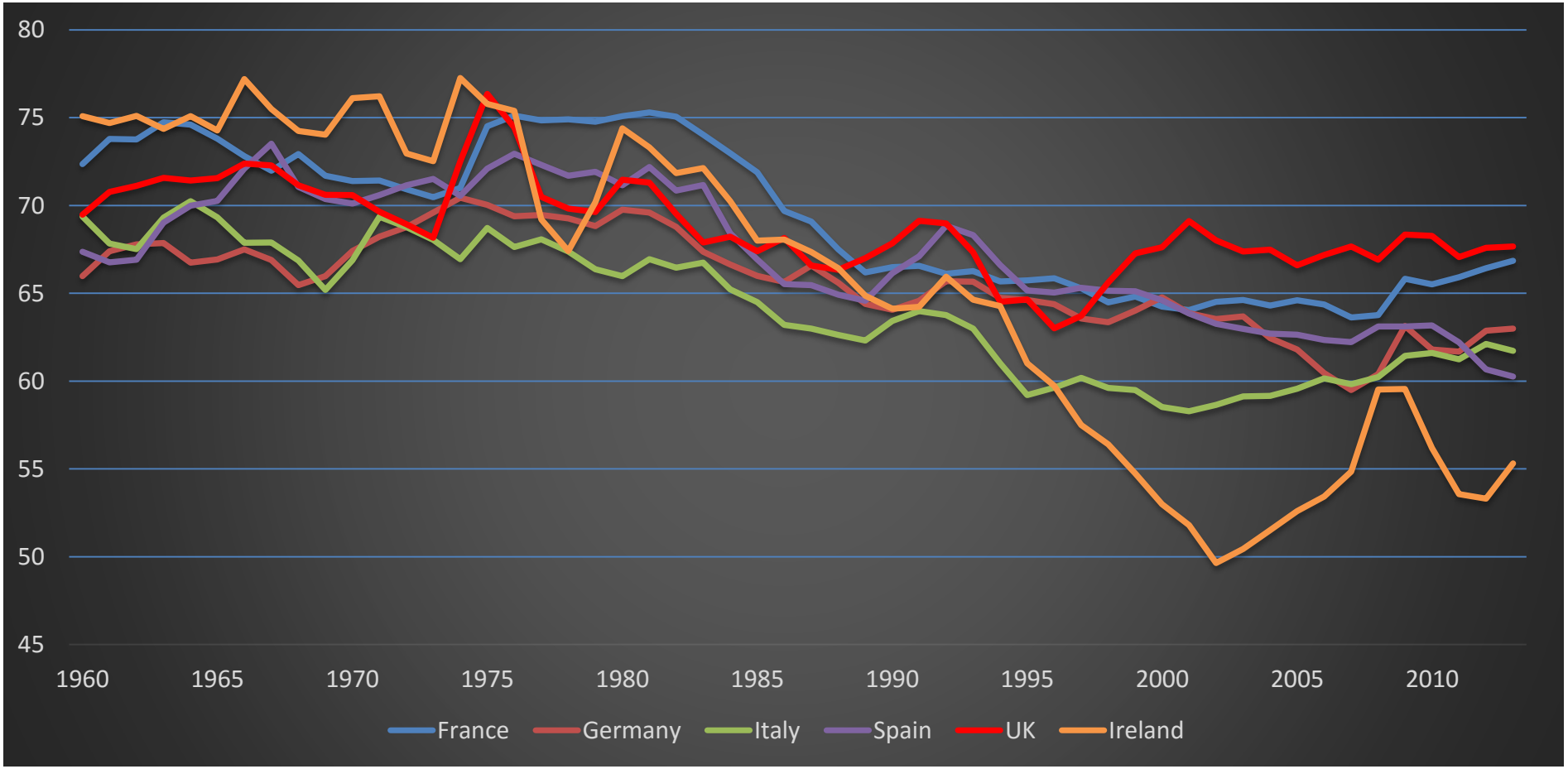
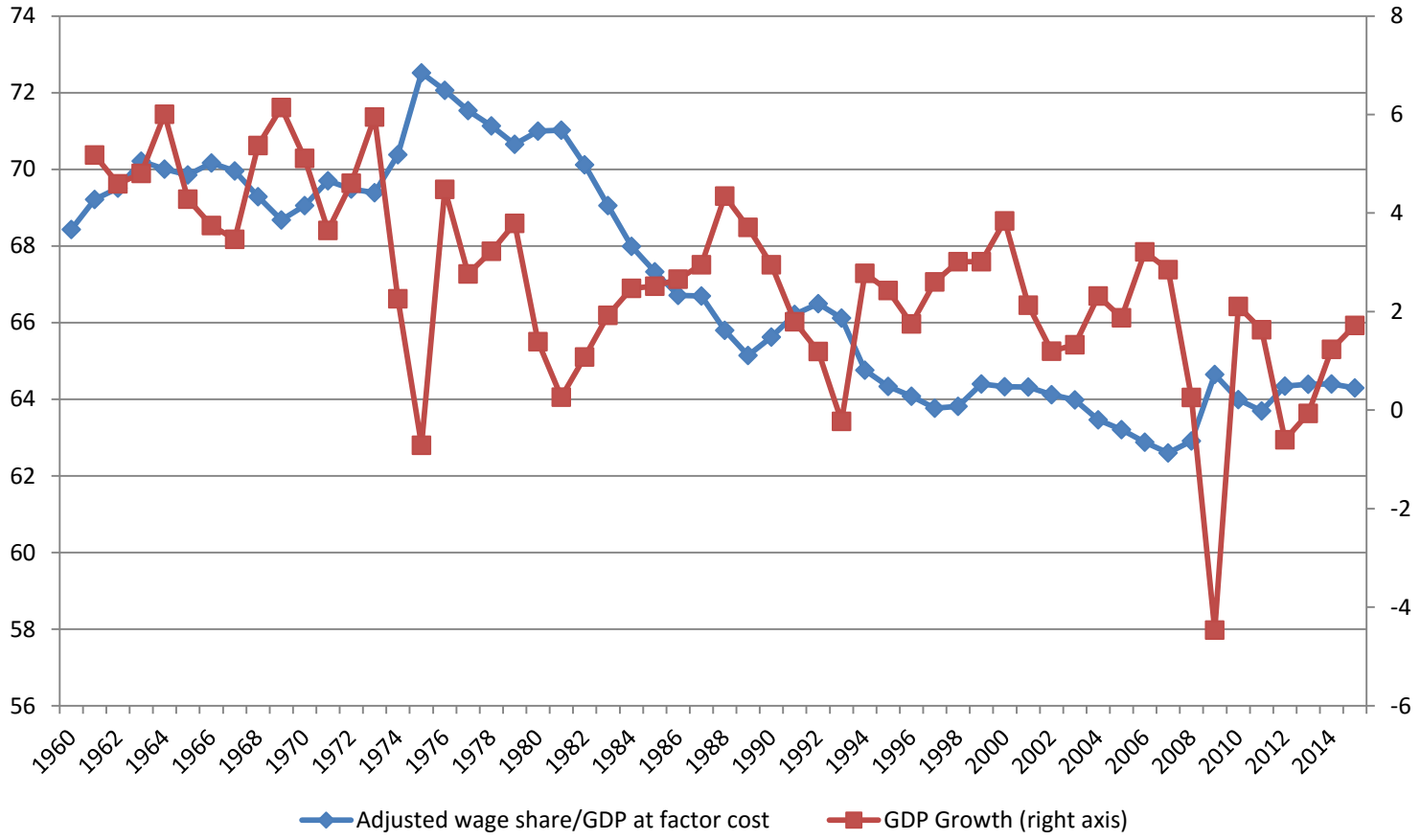
Outline

- What is the effect of rising inequality on growth?
  - Effects of the fall in the wage share in the UK and the EU15?
  - Onaran and Obst 2015
- Policy implications
  - The role of the UK in the EU
  - Policies for wage-led recovery
  - Onaran and Stockhammer 2016

Wage share (adjusted, ratio to GDP, 1960-2015)



Wage share vs. growth, EU15, 1960-2015



FT on Onaran and Galanis, 2012 ILO

Capital gobbles labour's share, but victory is empty

The big picture

Steve Johnson looks at the wider negative implications of falling wages

In 1958, Walter Reuther, a powerful US union leader was taken on a tour of a newly automated Ford Motor plant. "Aren't you worried about how you're going to collect union dues from all these machines?" he was asked by a (no doubt smug) company manager.

"The thought that occurred to me," Mr Reuther replied, "was how are you going to sell cars to these machines?"

Fifty-five years on, such a debate may be even more pertinent. In the innocent days of 1958, wages accounted for half of America's gross domestic product. Today, thanks to the onward march of globalisation and technology, labour's share of the pie has fallen inexorably to 42 per cent, a trend that has been repeated in many

labour's share of the pie than the US or UK.

Richard Lewis, head of global equities at Fidelity Worldwide Investment, who has studied this trend, believes it to be structural rather than cyclical, and therefore unlikely to reverse.

Mr Lewis says globalisation has "lowered the power of labour to bargain," resulting in de-unionisation and the "emasculation" of workers.

Simultaneously, companies have been able to optimise their tax regimes and can engage in both "financial expense" arbitrage (borrowing in the cheapest countries) and regulatory arbitrage.

Most importantly, however, he says globalisation and a move towards supranational corporate entities has made it possible for companies to consolidate their industries more effectively.

What all this means for the investment community is perhaps a little less clear-cut. Özlem Onaran and Giorgos Galanis, the authors of the paper, found the impact varied widely between countries.

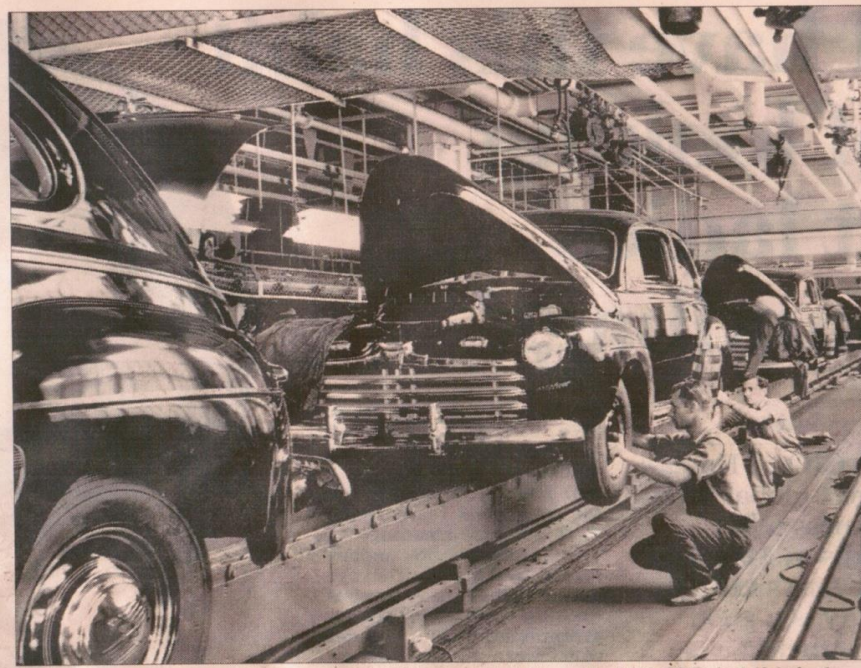
labour will continue to be squeezed.

Frances Hudson, global thematic strategist at Standard Life Investments, believes this geographic divide opens the way for relative value trades that favour companies in countries that are becoming more competitive.

To complicate matters further, the academics found the global effect of a squeeze on labour was negative, as the heightened export competitiveness enjoyed by countries with weak wage growth simply reduced the competitiveness of its trading partners – a form of "beggar thy neighbour". A one percentage point fall in labour's share was found to reduce global GDP by 0.36 points.

With this in mind, Mr Greenberg believes we may have to start thinking about a "post-growth" world. "The revenue numbers of the S&P 500 are basically stagnant. Is that going to reverse any time soon? I don't see how it can," he says.

Ms Hudson also wonders where growth will come from, given that the absence of wage inflation comes at a time of weak



In 1958, labour's share of economic output accounted for half of US GDP, but thanks to increasing globalisation and technology, this has fallen to 42%

right all along, and that capitalism ultimately sows the seeds of its own destruction, "when there is no consumer demand and it all falls over".

Mr Greenberg paints a picture of a bleak future with, barring a "mass uprising", "McJobs" increasingly the norm.

"One thing that does need to change is the idea of shareholder value being the only responsibility of a company," he says, alluding

to the 19th century Q ers, "who took respons ity for their employees communities. There w sense that you ha responsibility for societ

Mr Reuther would doubt have concurred.

Effect of income distribution on growth: Contesting theories

- Effect of increasing profit share (falling wage share, rising inequality) on growth?
- Mainstream/neoliberal
  - wage=cost
  - positive effect on investment
  - positive effect on exports
- Puzzle: Why is growth lower despite a rise in the profit share?
- Post-Keynesian/Post-Kaleckian
  - wages have a dual role
    - Cost item
    - Source of domestic demand
    - a general theory

Lower wages →

1. Lower domestic consumption
   - The poor consume more out of their income than the rich
   - Workers consume a higher proportion of their wages than the employers consume out of their profits

2. Positive effect on private investment but only partial
   – Investment depends on profitability, but also demand

3. higher foreign demand (Net exports=Exports-Imports)
   – labour costs ↓ → higher international competitiveness

- if total effect is -: lower wage share → lower growth, fewer jobs
  – the economy is wage-led
- if total effect is +: lower wage share → higher growth
  – the economy is profit-led (mainstream assumption)

...What happens when wage share↓?

- Estimate the effects on each component of aggregate demand
  - Consumption
  - Private Investment
  - Exports-Imports
- National multiplier
  - private demand changes → changes in
    - Investment
    - Consumption
    - Imports
- EU-wide effects of a simultaneous fall in the wage share
  - changes in trade partners' wage share → changes in
    - import prices
    - trade partners' GDP

Summary of the results

- Negative effect on consumption is larger than the positive effect on investment in the UK and other EU15 countries

→ Domestic economy (consumption + investment) is wage-led

- Net export effects on growth not too important in large economies, where exports and imports are only a small part of total demand

→ the UK, EU as a whole, and other large economies are wage-led

- Some small individual states have a profit-led regime in isolation- e.g. if Ireland or Austria is the only country to decrease labor share, it can grow, but if every country does the same, they all contract

...Summary of the results

- Fallacy of composition: firm vs. country; country vs. EU/world
- Lower wages→ lower growth, fewer jobs
- → reliance on debt-led consumption in the UK, Ireland, Southern EU
- Race to the bottom: a 1%-point fall in the wage share
  - UK GDP↓ by 0.2%; %; Irish GDP ↓ by 0.1%; EU15 GDP↓ by 0.3%;
- Conversely a wage-led recovery scenario:
  - increase the wage share by up to 5% points in the next 5 years:
  - UK GDP ↑ by 1%; Irish GDP ↑ by 0.3%; EU GDP ↑ by 1.5%;
- "Britain and the EU need a pay rise"
- A strong and stable recovery needs a pay rise!

Impact of wage-led growth on inflation?

- a 1%-point rise in the wage share →2%↑in prices in the UK and 1.4% rise in the EU15, 0.6% in Ireland.
- The risk now is deflation not inflation
- Pay rise to defeat deflation
- Bank of England and the ECB need a pay rise!
  - a nominal wage increase of 4% in the UK, 2.7% in Ireland (assuming 0.7% rise in productivity)

Impact of wage-led growth on investment and productivity

- Missing link between profits and private investment
- Increasing profits do not always lead to higher investment
  - Private investment is wage-led in the UK and 8 out of 15 EU MS
  - increasing demand → investment↑↑
- The non-financial companies' financial activities →private investment↓
  - Interest payments+dividends to shareholders as well as their financial revenues (Tori and Onaran, 2015)
- Inequality + Financialization →lower productivity & potential growth
- Higher productivity needs wage-led growth and regulating finance and corporate governance.

The role of the UK in the EU

- UK is a wage-led economy→
- High road labour market policies can be implemented unilaterally
- Impact on trade deficit?
  - Negligible: wage share ↑1%-point → trade deficit /GDP ↑0.19%-point
  - trade imbalance → industrial policy
- What if other EU MS continue low road, 'beggar thy neighbour' policies?
  - There is still an area of manoeuvre in a wage-led economy, albeit narrower
- The EU membership is an opportunity.
- Improve cooperation among pro-labour forces, lead high road labour market policies in the EU as opposed to current position of promoting low road policies.

UK is stronger in the EU if it leads high road policies

- The effects of high road policies are a stronger if implemented at the EU level.
  - effect on GDP is almost doubled
  - negative impact on trade balance is more negligible when our trade partners allow their wages and demand increase.
- Globalization is not a barrier to these policies.
- international competitiveness based on wage competition in a highly integrated global economy is counter-productive.
- Europe and the UK is one of the main beneficiaries of coordinated wage-led growth.
  - Hence potentially global policy leader
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Policy Implications (Onaran and Stockhammer 2016)

- Effects of wage-led recovery on employment however is modest, albeit positive.
- mobilize all the tools of policy with an aim to achieve full employment, ecological sustainability, and equality.
- a comprehensive and coordinated mix of wage policy, industrial policy, public investment in social and physical infrastructure
- Avoid beggar thy neighbour policies
- Coordination of wage bargaining systems to prevent a race to the bottom
- Productivity-oriented wage policy to stabilize effective demand

...Policy Implications

- 1.1. Pre-distributive policies
- policies targeting the top, middle, and bottom of the wage distribution.
  - Increase the bargaining power of labour via
    - reregulating the labour market
    - improving the union legislation,
    - increasing the coverage of collective bargaining
    - Eg: UK, if union density ↑ back to levels in 1980 (to 50% from 25%) →GDP pc ↑ by £440 (Onaran, Guschanski, Meadway, Martin 2015)
  - Close gender wage gaps (Onaran, Oyvat, Fotopoulou 2016)
  - sufficiently high minimum wages / living wage
  - regulating high/executive pay by enforcing pay ratios

... Policy Implications: Macro economic context

- Re-distribution: progressive taxation of income and wealth
- Bring the welfare state back
- Reverse financialisation; reregulate finance and corporate governance
- public investment in social and physical infrastructure
  - Physical infrastructure: **green** investment
  - Social infrastructure: **Purple** investment
    - create jobs in labour intensive services -education, child care, nursing homes, health, community and social services
    - improve pay and working conditions in these industries
    - socializing the invisible care
    - More jobs with lower Carbon emissions
- Shorter working time in parallel with the growth in productivity with wage compensation for the lower income groups.

Conclusion

- Recovery and sustainability needs green and purple public jobs for women and men with pay rise and shorter hours!

- Take care of full employment, decent pay for women and men, equality, and ecological sustainability, and the budget will take care of itself.

Sources:

- Onaran, O., Stockhammer, E. (2016) Progressive policies for wage-led growth in Europe. Policy Viewpoint.

http://www.feps-europe.eu/assets/627ba6ff-0195-4041-84e4-80791431f872/progressive-policies-pv-linkspdf.pdf

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- Onaran, O., Obst, T. (2015) The Empirical Case for a Wage-led Recovery. Policy Viewpoint n.7

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- Onaran, O., Obst, T. (2015) Wage-led growth in the EU15 Member States . The effects of income distribution on growth, investment, trade balance, and inflation. Technical Report.

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Appendices

The effects of a 1%-point decline in the wage share at the national level

	The effect of a 1%-point increase in the profit share in only one country on:					
	C/Y	I/Y	X/Y	M/Y	NX/Y	Private excess demand / Y
	A	*B*	*C*	*D*	*E(C-D)*	*F(A+B+E)*
Austria	-0.277	0.000	0.234	-0.161	0.396	0.119
Belgium	-0.151	0.206	0.000	-0.053	0.053	0.108
Denmark	-0.155	0.169	0.185	0.000	0.185	0.198
Finland	-0.243	0.000	0.074	0.000	0.074	-0.169
France	-0.324	0.101	0.062	-0.078	0.140	-0.083
Germany	-0.397	0.000	0.049	0.000	0.049	-0.348
Greece	-0.564	0.000	0.099	0.000	0.099	-0.465
Ireland	-0.229	0.161	0.000	-0.074	0.074	0.006
Italy	-0.410	0.156	0.050	-0.087	0.137	-0.117
Luxembourg	-0.153	0.000	0.000	0.000	0.000	-0.153
Netherlands	-0.322	0.078	0.000	-0.069	0.069	-0.175
Portugal	-0.402	0.000	0.000	-0.182	0.182	-0.219
Spain	-0.410	0.088	0.044	-0.068	0.113	-0.210
Sweden	-0.388	0.128	0.057	-0.056	0.113	-0.147
United Kingdom	-0.252	0.000	0.074	-0.066	0.140	-0.112

The effects of a 1%-point decline in the wage share at the European level

	Private excess demand / Y	Multiplier	% Change in aggregate demand (A*B)	The effect of a simultanous 1%-point increase in the profit share on % change in aggregate demand
	A	*B*	*C*	*D*
Austria	0.119	1.039	0.124	-0.185
Belgium	0.108	0.740	0.080	0.009
Denmark	0.198	1.246	0.247	0.107
Finland	-0.169	1.316	-0.222	-0.304
France	-0.083	1.559	-0.129	-0.228
Germany	-0.348	1.136	-0.395	-0.442
Greece	-0.465	1.984	-0.923	-1.027
Ireland	0.006	0.863	0.005	-0.066
Italy	-0.117	1.451	-0.170	-0.238
Luxembourg	-0.153	0.535	-0.082	-0.128
Netherlands	-0.175	0.820	-0.144	-0.191
Portugal	-0.219	1.546	-0.339	-0.477
Spain	-0.210	2.147	-0.450	-0.544
Sweden	-0.147	1.058	-0.155	-0.271
United Kingdom	-0.112	1.129	-0.126	-0.195
EU15*				**-0.298**

* Change in each country is multiplied by its share in EU15 GDP.

The effects of a differentiated increase in the wage share on growth, investment and net exports

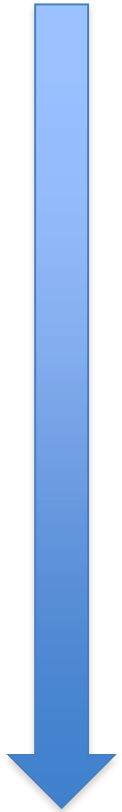
	Change in profit share	*% change in aggregate demand*	*Total effect on I /Y*	*Total effect on NX/Y*
	A	*B*	*C*	*D*
A	-3.00	1.147	0.431	-0.419
B	-1.00	0.269	-0.138	0.202
DK	-1.00	0.443	0.020	0.153
FIN	-5.00	1.489	0.647	-0.758
F	-5.00	1.120	-0.053	-0.753
D	-5.00	2.195	0.684	-0.913
GR	-5.00	5.123	2.358	-1.404
IRL	-3.00	0.332	-0.379	-0.052
I	-5.00	1.181	-0.409	-0.842
L	-5.00	0.641	0.167	-0.355
NL	-5.00	0.953	-0.225	-0.641
P	-5.00	2.375	0.895	-1.004
E	-5.00	2.713	1.024	-1.303
S	-5.00	1.275	-0.095	-0.812
UK	-5.00	0.959	0.144	-0.756
*EU15**		*1.511*	*0.245*	*-0.794*

Notes: A = Austria, B = Belgium, DK = Denmark, FIN = Finland, F = France, D = Germany, GR = Greece, IRL = Ireland, I = Italy, L = Luxembourg, NL = Netherlands, P = Portugal, E = Spain, S = Sweden, UK = United Kingdom

* Change in each country is multiplied by its share in EU15 GDP.

Average Growth Rates of GDP in EU15 Countries (percent)

	France	Germany	Italy	Spain	The UK	Ireland
1961-69	5.7	4.4	5.8	7.7	2.9	4.4
1970-79	4.1	3.3	4.0	3.9	2.4	4.7
1980-89	2.4	2.0	2.6	2.7	2.5	3.1
1990-99	2.0	2.2	1.5	2.7	2.7	7.0
2000-07	2.1	1.6	1.5	3.8	3.0	5.5
2008-2013	0.3	0.6	-1.4	-1.1	0.2	-1.1



Model

Dependent Variable	Specification	Theory
Consumption	$logC = c_0 + c_R logR + c_W logW$	• Keynesian Consumption Function • Elasticities give difference in MPC • Income is split into adjusted wages and profits
Investment	$logI = i_A + i_Y logY + i_\pi log\pi + i_r r$	• Accelerator effect • Profit share as a proxy • (profitability, internal finance) • Control variable real interest rate
Domestic Prices	$logP = p_0 + p_{ulc}\, log(ulc) + p_m log(Pm)$	• Stepwise Approach following • (Stockhammer et al. 2009) • Mark-up pricing model • Imperfectly competitive economy
Export Prices	$logP_x = px_0 + p_{ulc}\, log(ulc) + p_m log(P_m)$	
Exports	$logX = x_0 + x_{pxm}\, log(Px/Pm) + x_{Yrw}\, log(Yrw) + x_e log(E)$	
Imports	$logM = m_0 + m_{ppm} \log(P/Pm) + m_Y \log(Y) + m_e \log(E)$	

Consumption

$$logC = c_0 + c_R logR + c_W logW \qquad (1)$$

- Consumption (C) is estimated as a function of adjusted profits (R) and adjusted wages (W)

- The estimated elasticities are equivalent to the difference in marginal propensity to consume (MPC) out of profits and wages, and are expected to be negative

- It closely resembles standard Keynesian consumption functions except that income is split

- It illustrates a behavioural function

Investment

$$logI = i_A + i_Y logY + i_\pi log\pi + i_r r \qquad (2)$$

- i_A stands for autonomous investment
- Private investment depends positively on output (accelerator effect) and the profit share (as a proxy for expected profitability and available internal finance)
- Private investment depends negatively on the real long-term interest rate (cost factor)

Net Exports

- We model the effects of distribution on net exports using a stepwise approach following Stockhammer, Onaran and Ederer (2009);Onaran and Galanis (2014)
- Mark-up pricing model in an imperfectly competitive economy

$$logP = p_0 + p_{ulc}\ log(ulc) + p_m log(Pm) \quad (3)$$

$$logP_x = px_0 + p_{ulc}\ log(ulc) + p_m log(P_m) \quad (4)$$

$$logX = x_0 + x_{pxm}\ log(Px/Pm) + x_{Yrw}\ log(Yrw) + x_e log(E) \quad (5)$$

$$logM = m_0 + m_{ppm}\ \log(P/Pm) + m_Y \log(Y) + m_e \log(E) \quad (6)$$

Data

- Sample Period 1960-2013
- Source: AMECO Database, WDI, IMF
- Main Variables: C, I, Y, X, M, W, R in real terms
- Adjusted Wage Share: W/Y_f
  - Allocates a labour compensation for each self-employed equivalent to the average compensation of dependent employees
- Adjusted Profit Share: $(1 - ws)$

Estimation approach

- We apply a single equation approach to analyse the changes in the wage share on growth using OLS method
- Unit root tests suggest most variables to be integrated of order one (exception: profit share in some countries)
- We applied ECM wherever significant (Banerjee et al., 1998), otherwise we estimated specifications in difference form
- We start with general specifications (contemporaneous values and first lags) and keep statistically significant variables
- Wherever there is autocorrelation, either lagged dependent variable is kept or AR(1) included

Appendix A - Data Sources

Time-series data	Variable	Definition	Source [Variable construction]
Adjusted wage share	ws	*Compensation per employee as percentage of GDP at factor cost per person employed*	AMECO Database http://ec.europa.eu/
Adjusted profit share	π		$[\pi = 1 - ws]$
GDP in market prices (real)	Y	*Gross domestic product at 2010 market prices*	AMECO Database
GDP at factor costs (real)	Y_f	*Gross domestic product at market prices minus taxes on production and imports, plus subsidies*	AMECO Database
Private Consumption (real)	C	*Private final consumption expenditure at constant prices*	AMECO Database
Adjusted compensation of employees (real)	W		$[W = ws * Y_f]$
Adjusted gross operating surplus (real)	R		$[R = \pi * Y_f]$
Total Investment (real)	I_t	*Gross fixed capital formation at constant prices; total economy*	AMECO Database
Total investment (current prices)	I_{tcurr}	*Gross fixed capital formation at current prices; total economy*	AMECO Database
Private investment (current prices)	I_{pr}	*Gross fixed capital formation at current prices; private sector*	AMECO Database
Ratio of private to total investment	I_{ps}		$[I_{ps} = I_{pr}/I_{tcurr}]$
Private Investment (real)	I		$[I = I_t * I_{ps}]$
Real long-term interest rate	r	*Real long-term interest rates, deflator GDP*	AMECO Database
GDP Deflator	P	*Price deflator gross domestic product at market prices*	AMECO Database
Import price deflator	P_m	*Price deflator imports of goods and services*	AMECO Database
Export price deflator	P_x	*Price deflator exports of goods and services*	AMECO Database
Exports (real)	X	*Exports of goods and services at constant prices*	AMECO Database
Imports (real)	M	*Imports of goods and services at constant prices*	AMECO Database
Foreign GDP (real)	Y_{rw}	*GDP of the rest of the world*	World Bank World Development Indicators (WDI) http://data.worldbank.org [World GDP (in constant 2005 US$) - own GDP (in constant 2005 US$)]
Imports from country j to country i	M_{ji}	*Imports from country j to country i*	IMF, Direction of Trade Statistics, https://stats.ukdataservice.ac.uk//
Exchange Rate	E	*Average of local currency per dollar, euro, and yen*	WDI
Real unit labour costs	$rulc$		$[rulc = ws * Y_f/Y]$
Unit labour Costs	ulc		$[ulc = rulc * P]$
Total factor productivity	τ	*Total factor productivity: total economy*	AMECO Database

Notes: Private investment, real: For Luxembourg the data starts in 1990; for Belgium, Denmark, France, Ireland, Italy, Netherlands, Spain, and Sweden in 1970. We assume the ratio of private to total investment to stay constant for years where there is no data. Real long term interest rate: Data in Portugal starts in 1984, in Greece in 1972, in Ireland in 1970, in Spain in 1977, and in Luxembourg 1972. Imports from country j to country i: 1980-2012 for all countries.

Table F.1: Elasticities of C, I, M with respect to Y and the Multiplier

	e_{CY}	e_{IY}	e_{MY}	h	Multiplier
Austria	0.473	1.881	1.970	0.038	1.039
Belgium	0.373	1.334	1.649	-0.351	0.740
Denmark	0.517	2.929	1.868	0.197	1.246
Finland	0.492	2.067	1.854	0.240	1.316
France	0.499	2.214	1.940	0.358	1.559
Germany	0.348	1.810	2.010	0.120	1.136
Greece	0.427	2.293	1.268	0.496	1.984
Ireland	0.404	1.802	1.531	-0.158	0.863
Italy	0.550	1.722	1.970	0.311	1.451
Luxembourg	0.242	1.728	1.230	-0.870	0.535
Netherlands	0.448	0.985	1.589	-0.219	0.820
Portugal	0.457	2.119	1.547	0.353	1.546
Spain	0.575	2.720	2.443	0.534	2.147
Sweden	0.383	2.406	2.063	0.055	1.058
United Kingdom	0.548	1.076	1.823	0.115	1.129

Table. The Effects of a wage-led recovery scenario on Growth

	Increase in the wage share	% change in GDP
A	3	1.15
B	1	0.27
DK	1	0.44
FIN	5	1.49
F	5	1.12
D	5	2.20
GR	5	5.12
IRL	3	0.33
I	5	1.18
L	5	0.64
NL	5	0.95
P	5	2.38
E	5	2.71
S	5	1.28
UK	5	0.96
EU15 GDP		*1.51*

Three wage-led recovery scenarios

	Scenario 1 All countries going back to the peak wage share level		Scenario 2 Differentiated increase in the wage share in profit-led and wage-led countries		Scenario 3 Recovery to peak level in wage-led countries and differentiated increase in the wage share in profit-led countries	
	Change in profit share	The % Change in aggregate demand (including changes in Pm and Yrw)	Change in profit share	The % Change in aggregate demand (including changes in Pm and Yrw)	Change in profit share	The % Change in aggregate demand (including changes in Pm and Yrw)
A	-11.73	0.92	-3.00	1.15	-3.00	1.97
B	-4.17	0.29	-1.00	0.27	-3.00	0.35
DK	-6.09	-0.34	-1.00	0.44	-3.00	0.40
FIN	-10.25	2.94	-5.00	1.49	-10.25	2.90
F	-8.45	1.92	-5.00	1.12	-8.45	1.90
D	-7.44	3.34	-5.00	2.20	-7.44	3.32
GR	-7.13	7.43	-5.00	5.12	-7.13	7.41
IRL	-21.95	0.49	-3.00	0.33	-3.00	0.58
I	-6.35	1.67	-5.00	1.18	-6.35	1.65
L	-3.01	0.64	-5.00	0.64	-3.01	0.64
NL	-8.95	1.69	-5.00	0.95	-8.95	1.68
P	-18.28	7.53	-5.00	2.38	-18.28	7.51
E	-12.68	6.47	-5.00	2.71	-12.68	6.45
S	-7.49	2.11	-5.00	1.28	-7.49	2.02
UK	-8.69	1.70	-5.00	0.96	-8.69	1.65
EU15 GDP		*2.56*		*1.51*		*3.15*

Table 1. *Consumption: dependent variable dlog(C)*

	c	$dlog(R_t)$	$dlog(W_t)$	$dlog(C_t-1)$	$(AR1)$	*DW*	*R2*	Sample
A	0.005	0.160	0.616			2.369	0.527	1961-2013
	(1.567)	(4.394) ***	(6.024) ***					
B	0.007	0.148	0.483			2.241	0.590	1961-2013
	(2.963) ***	(3.832) ***	(7.506) ***					
DK	0.001	0.236	0.655			1.869	0.564	1961-2013
	(0.323)	(4.758) ***	(6.262) ***					
FIN	0.007	0.184	0.635			1.694	0.774	1961-2013
	(2.735) ***	(7.984) ***	(11.061) ***					
F	0.006	0.143	0.657			2.074	0.771	1961-2013
	(2.751) ***	(4.865) ***	(10.635) ***					
D	0.004	0.101	0.476	0.292		2.090	0.707	1962-2013
	(1.313)	(2.151) ***	(4.352) .***	(2.500) **				
GR	0.013	0.114	0.633			1.771	0.748	1961-2013
	(3.889) ***	(3.859) ***	(10.282) ***					
IRL	0.004	0.183	0.520			2.233	0.483	1961-2013
	(0.798)	(4.746) ***	(5.153) ***					
I	0.004	0.204	0.744			1.531	0.773	1961-2013
	(1.793) *	(4.713) ***	(9.447) ***					
L	0.016	0.103	0.350			1.741	0.350	1961-2013
	(4.087) ***	(3.451) ***	(4.920) ***					
NL	-0.004	0.149	0.582	0.376		1.876	0.813	1962-2013
	-(1.574)	(4.807) ***	(5.749) ***	(3.766) ***				
P	0.012	0.099	0.612			2.121	0.615	1961-2013
	(3.025) ***	(6.177) ***	(8.195) ***					
E	0.001	0.182	0.767			2.096	0.878	1961-2013
	(0.278)	(4.750) ***	(16.751) ***					
S	0.006	0.088	0.554			1.736	0.578	1961-2013
	(2.279) **	(2.788) ***	(7.891) ***					
UK	0.005	0.209	0.702		0.273	1.944	0.718	1962-2013
	(1.627)	(6.744) ***	(7.567) ***		(1.884) *			

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Table 2. *Private investment: dependent variable dlog(I)*

	c	$dlog(\pi_t - 1)$	$\log(\pi_t - 1)$	$dlog(Y_t)$	$dlog(I_t - 1)$	$dlog(r_t - 1)$	$dlogr_t$	$\log(I_t - 1)$	$\log(Y_t - 1)$	$(AR1)$	*DW*	*R2*	Sample
A	-0.025	0.110		1.881							2.018	0.526	1962-2013
	-(2.828) ***	(0.830)		(7.359) ***									
B	-0.632		0.239	2.387	0.234			-0.247	0.330		1.932	0.638	1963-2013
	-(4.595) ***		(2.290) **	(6.527) ***	(2.340) **			-(4.107) ***	(4.789) ***				
DK	-0.038	0.321		2.929		-0.008					1.883	0.751	1963-2013
	-(4.448) ***	(1.948) *		(11.168) ***		-(2.310) **							
FIN	-0.038	0.174		2.067						0.322	1.841	0.752	1963-2013
	-(3.451) ***	(1.588)		(9.138) ***						(2.186) **			
F	-0.032	0.155		2.214			-0.002			0.541	1.940	0.826	1963-2013
	-(4.221) ***	(1.646) *		(12.179) ***			-(1.300)			(4.616) ***			
D	-0.021	0.121		1.810						0.360	1.613	0.590	1963-2013
	-(2.196) **	(0.544)		(7.149) .***						(2.154) **			
GR	0.028		0.091	2.293						-0.265	2.017	0.625	1962-2013
	(0.513)		(1.518)	(9.862) ***						-(1.907) *			
IRL	-0.036	0.338		1.802							1.988	0.416	1963-2013
	-(1.976) *	(1.967) *		(5.004) ***									
I	-0.026	0.295		1.722		-0.003				0.331	1.944	0.636	1964-2013
	-(2.941) ***	(1.761) *		(7.841) ***		-(1.172)				(2.293) **			
L	-0.029	0.160		1.728							2.410	0.273	1963-2013
	-(1.420)	(0.675)		(4.172) ***									
NL	-0.392		0.130	2.681				-0.299	0.295		2.299	0.714	1961-2013
	-(2.762) ***		(3.030) ***	(9.527) ***				-(5.346) ***	(5.237) ***				
P	-0.042	0.024		2.119							2.026	0.485	1962-2013
	-(2.834) ***	(0.440)		(6.662) ***									
E	0.099		0.134	2.720						0.415	1.994	0.769	1962-2013
	(1.098)		(1.664) *	(9.443) ***						(3.297) ***			
S	0.119		0.159	2.406	0.269						1.794	0.729	1962-2013
	(1.759) *		(2.384) **	(9.892) ***	(3.437) ***								
UK	-0.474		0.134	2.283				-0.243	0.261		1.909	0.677	1961-2013
	-(1.815) *		(1.581)	(8.870) ***				-(3.527) ***	(3.220) ***				

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Table 3. *Price deflator: dependent variable dlog(P)*

	c	$dlog(ULC_t - 1)$	$\mathrm{dlog}\, ULC_t$	$dlog(P_t - 1)$	$dlog(Pm_t)$	$dlog(Pm_t - 1)$	$(AR1)$	DW	R2	Sample
A	0.005		0.286	0.453	0.146			1.920	0.851	1962-2012
	(2.433) **		(4.952) ***	(5.320) ***	(3.715) ***					
B	0.020	0.180			0.154	0.129	0.627	2.163	0.811	1962-2012
	(3.797) ***	(2.226) **			(5.036) ***	(4.333) ***	(4.829) ***			
DK	0.008	0.249		0.465		0.183		2.029	0.865	1962-2012
	(2.423) **	(2.698) ***		(4.037) ***		(5.266) ***				
FIN	0.009		0.388	0.249	0.220			1.890	0.842	1962-2012
	(2.511) **		(5.328) ***	(2.834) ***	(5.520) ***					
F	0.004	0.194		0.633		0.094		1.795	0.907	1962-2012
	(1.718) *	(1.624)		(4.635) ***		(3.580) ***				
D	0.017		0.382		0.006		0.699	2.091	0.834	1962-2012
	(4.333) ***		(7.351) ***		(0.290)		(6.577) ***			
GR	0.019	0.423			0.462			1.758	0.810	1962-2012
	(2.870) ***	(5.932) ***			(6.435) ***					
IRL	0.031	0.256			0.284		0.431	2.111	0.678	1962-2012
	(2.987) ***	(1.863) *			(3.744) ***		(2.490) **			
I	0.014	0.633			0.206			1.715	0.828	1962-2012
	(3.033) ***	(10.044) ***			(5.279) ***					
L	0.024		0.345	-0.482	0.523			1.715	0.479	1962-2012
	(4.180) ***		(3.284) ***	-(3.605) ***	(5.076) ***					
NL	0.007	0.255		0.448		0.152		1.997	0.801	1962-2012
	(2.492) **	(2.687) ***		(3.656) ***		(4.599) ***				
P	0.018	0.471			0.204	0.247		1.803	0.857	1962-2012
	(3.200) ***	(7.345) ***			(4.035) ***	(4.491) ***				
E	0.029		0.585		0.023		0.798	2.284	0.937	1962-2012
	(2.904) ***		(8.027) ***		(1.093)		(8.667) ***			
S	0.016	0.342			0.151	0.220	0.359	1.951	0.817	1962-2012
	(2.914) ***	(4.107) ***			(3.926) ***	(5.499) ***	(2.154) **			
UK	0.016	0.582			0.184			1.715	0.695	1962-2012
	(2.968) ***	(7.530) ***			(3.048) ***					

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Table 4. *Export price deflator: dependent variable dlog(Px)*

	c	$dlog\ (ULC_t - 1)$	$dlog\ (ULC_t)$	$dlog\ (PX_t - 1)$	$dlog\ (Pm_t)$	$dlog\ (Pm_t - 1)$	$log\ (PX_t\text{-}1)$	$log\ (ULC_t\text{-}1)$	$log\ (Pm_t\text{-}1)$	$(AR1)$	*DW*	*R2*	Sample
A	0.002		0.152		0.616						2.339	0.867	1961-2013
	(1.060)		(3.490) ***		(15.385) ***								
B	0.001		0.096		0.789						2.037	0.949	1961-2013
	(0.674)		(1.920) *		(26.133) ***								
DK	1.307		0.085		0.687		-0.643	0.223	0.385		2.045	0.916	1961-2013
	(4.828) ***		(1.031)		(15.211) ***		-(4.950) ***	(4.748) ***	(4.642) ***				
FIN	-0.003		0.185		0.776						1.569	0.879	1961-2013
	-(0.811)		(2.612) ***		(15.279) ***								
F	-0.002	0.248		0.142	0.528						1.875	0.956	1962-2013
	-(1.025)	(4.124) ***		(3.074) ***	(21.465) ***								
D	0.004	0.197		0.224	0.365						1.667	0.823	1962-2013
	(1.653) *	(3.122) ***		(3.227) ***	(11.266) ***								
GR	1.115		0.154		0.828		-0.511	0.192	0.297		1.880	0.914	1961-2013
	(3.237) ***		(1.631)		(12.355) ***		-(4.341) ***	(3.250) ***	(3.536) ***				
IRL	0.000		0.171		0.708						2.004	0.810	1961-2013
	(0.009)		(1.946) *		(10.398) ***								
I	0.000	0.185		0.539	0.210					-0.315	1.980	0.950	1963-2013
	(0.113)	(3.179) ***		(19.040) ***	(3.630) ***					-(2.029) **			
L	0.024		0.322			-0.001					1.800	0.076	1962-2013
	(2.389) **		(1.704) *			-(0.006)							
NL	0.002	0.370				0.229					2.008	0.171	1962-2013
	(0.251)	(1.823) *				(1.877) *							
P	0.280	-0.103		0.246	0.722	-0.251	-0.382	0.053	0.330		1.834	0.930	1962-2013
	(1.786) *	-(1.658) *		(1.845) *	(14.862) ***	-(2.301) **	-(4.404) ***	(1.971) **	(5.082) ***				
E	0.012	0.255		0.155	0.421					0.461	1.744	0.870	1963-2013
	(1.483)	(2.507) **		(1.716) *	(11.016) ***					(3.076) ***			
S	-0.002		0.172		0.716						1.928	0.877	1961-2013
	-(0.616)		(2.509) **		(16.126) ***								
UK	0.558		0.136		0.577		-0.486	0.101	0.377		1.667	0.928	1961-2013
	(3.051) ***		(2.084) **		(13.998) ***		-(4.725) ***	(3.172) ***	(4.975) ***				

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Table 5. *Exports: dependent variable dlog(X)*

	c	$dlog(Px/Pm)_{t-1}$	$dlog\ (Px/Pm)_t$	$dlog(Y_{rw_t})$	$dlog(e_t)$	$(AR1)$	DW	R2	Sample
A	-0.028		-1.728	2.314			1.778	0.676	1961-2013
	-(2.813) ***		-(5.717) ***	(9.008) ***					
B	-0.029		-0.185	2.315			1.876	0.669	1961-2013
	-(3.264) ***		-(0.728)	(10.045) ***					
DK	-0.004		-0.627	1.540			1.718	0.472	1961-2013
	-(0.483)		-(3.581) ***	(6.445) ***					
FIN	-0.068		-0.576	3.428		0.430	2.121	0.486	1962-2013
	-(3.074) ***		-(2.003) **	(6.415) ***		(3.077) ***			
F	-0.020		-0.439	2.155	0.158	0.371	2.194	0.725	1962-2013
	-(1.718) *		-(3.075) ***	(7.689) ***	(1.665) *	(2.684) ***			
D	-0.017	-0.379		2.136			2.022	0.372	1962-2013
	-(1.145)	-(1.876) *		(5.376) ***					
GR	-0.037	-0.729		2.917			1.664	0.305	1962-2013
	-(1.342)	-(1.805) *		(3.968) ***					
IRL	0.043		-0.178	1.041		0.351	1.896	0.189	1962-2013
	(2.223) **		-(0.903)	(2.155) **		(2.608) ***			
I	-0.053	-0.307		3.006			1.966	0.586	1962-2013
	-(3.811) ***	-(1.994) **		(8.285) ***					
L	-0.033	0.187		2.688		0.317	2.102	0.388	1963-2013
	-(1.621)	(0.789)		(4.893) ***		(2.064) **			
NL	-0.027		-0.290	2.445		0.559	2.194	0.725	1962-2013
	-(2.681) ***		-(1.318)	(10.955) ***		(4.761) ***			
P	-0.017	0.316		2.409		0.330	1.816	0.420	1963-2013
	-(0.799)	(1.354)		(4.401) ***		(2.383) **			
E	-0.012		-0.277	2.448			1.664	0.426	1961-2013
	-(0.815)		-(2.214) **	(6.029) ***					
S	-0.045		-0.508	2.715		0.497	2.037	0.575	1962-2013
	-(3.009) ***		-(2.915) ***	(7.877) ***		(3.832) ***			
UK	0.001		-0.518	1.174			1.562	0.453	1961-2013
	(0.152)		-(3.708) ***	(4.696) ***					

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Table 6. *Imports: dependent variable dlog(M)*

	c	$dlog\ (P/Pm)_t{-}1)$	$dlog\ (P/Pm)_t$	$dlog\ (Y_t)$	$dlog\ (Y_t-1)$	$dlog\ (m_t-1)$	$log\ (m_t-1)$	$log\ (P/Pm_t-1)$	$log\ (Y_t-1)$	$(AR1)$	*DW*	*R2*	Sample
A	-0.005	0.329		1.970							2.251	0.648	1962-2013
	-(0.701)	(1.786) *		(8.114) ***									
B	0.004	0.336		1.649						-0.272	2.131	0.692	1963-2013
	(0.668)	(3.790) ***		(8.360) ***						-(1.917) *			
DK	0.006		-0.152	1.868							2.004	0.618	1961-2013
	(0.907)		-(1.272)	(8.994) ***									
FIN	-0.007		-0.115	1.854							2.082	0.677	1961-2013
	-(0.886)		-(0.946)	(10.137) ***									
F	-0.001	0.296		1.940							2.008	0.725	1962-2013
	-(0.159)	(3.604) ***		(8.884) ***									
D	0.007		0.101	2.010						0.241	1.918	0.684	1963-2013
	(0.923)		(1.098)	(9.666) ***						(1.728) *			
GR	0.019		0.148	1.268							1.767	0.510	1961-2013
	(1.830) *		(0.772)	(6.884) ***									
IRL	-1.578		0.174	1.351		0.230	-0.527	0.163	0.807		2.091	0.559	1962-2013
	-(3.623) ***		(1.417)	(5.249) ***		(1.839) *	-(4.032) ***	(1.941) *	(3.909) ***				
I	0.000	0.195		2.829	-0.858						2.032	0.719	1962-2013
	-(0.010)	(2.236) **		(10.797) ***	-(3.394) ***								
L	0.010		-0.025	1.230							2.146	0.490	1961-2013
	(1.107)		-(0.168)	(6.925) ***									
NL	0.007	0.145		1.589							1.873	0.727	1962-2013
	(1.341)	(1.930) *		(9.536) ***									
P	-2.121		0.340	1.641			-0.555	0.411	0.858		1.636	0.551	1961-2013
	-(3.979) ***		(2.408) **	(5.161) ***			-(4.128) ***	(3.773) ***	(4.141) ***				
E	-0.009	0.225		2.443							1.581	0.649	1962-2013
	-(0.769)	(2.073) **		(8.171) ***									
S	-0.009	0.252		2.063							2.210	0.678	1962-2013
	-(1.317)	(2.808) ***		(9.993) ***									
UK	-4.300		-0.010	1.778			-0.594	0.098	1.083		2.114	0.798	1961-2013
	-(5.583) ***		-(0.184)	(11.126) ***			-(5.721) ***	(2.633) ***	(5.677) ***				

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Table C1. The marginal effect of a 1%-point increase in the profit share on net exports

	Exports								Imports					Sum
	$e(P)$	$\frac{1}{1-e(P)}$	$e(PX)$	$e(XP)$	$eX.rulc$	$rulc$	Y_f/Y	X/Y	$\frac{\partial X/Y}{\partial \pi}$	$e(M,P)$	$e(M,rulc)$	(M/Y)	$\frac{\partial M/Y}{\partial \pi}$	$\frac{\partial NX/Y}{\partial \pi}$
	A	B	C	D	E (B*C*D)	F	G	H	(-E*G*H/F)	J	K(A*B*J)	L	M(-K*G*L/F	I-M
A	0.524	2.099	0.152	-1.728	-0.551	0.599	0.874	0.291	0.234	0.329	0.361	0.306	-0.161	0.396
B	0.180	1.220	0.096	0.000	0.000	0.603	0.897	0.491	0.000	0.336	0.074	0.487	-0.053	0.053
DK	0.465	1.870	0.347	-0.627	-0.406	0.582	0.866	0.305	0.185	0.000	0.000	0.261	0.000	0.185
FIN	0.516	2.067	0.185	-0.576	-0.220	0.608	0.890	0.230	0.074	0.000	0.000	0.244	0.000	0.074
F	0.529	2.121	0.289	-0.439	-0.269	0.602	0.869	0.161	0.062	0.296	0.332	0.163	-0.078	0.140
D	0.382	1.617	0.253	-0.379	-0.155	0.600	0.913	0.207	0.049	0.000	0.000	0.195	0.000	0.049
GR	0.423	1.734	0.377	-0.729	-0.476	0.547	0.908	0.125	0.099	0.000	0.000	0.179	0.000	0.099
IRL	0.256	1.344	0.171	0.000	0.000	0.588	0.896	0.455	0.000	0.310	0.107	0.456	-0.074	0.074
I	0.633	2.723	0.235	-0.307	-0.196	0.586	0.913	0.165	0.050	0.195	0.336	0.165	-0.087	0.137
L	0.232	1.303	0.322	0.000	0.000	0.521	0.930	1.190	0.000	0.000	0.000	0.999	0.000	0.000
NL	0.461	1.855	0.370	0.000	0.000	0.634	0.916	0.428	0.000	0.145	0.124	0.385	-0.069	0.069
P	0.471	1.889	0.139	0.000	0.000	0.638	0.913	0.161	0.000	0.741	0.659	0.194	-0.182	0.182
E	0.585	2.410	0.301	-0.277	-0.201	0.614	0.913	0.149	0.044	0.225	0.318	0.144	-0.068	0.113
S	0.342	1.519	0.172	-0.508	-0.132	0.517	0.815	0.273	0.057	0.252	0.131	0.273	-0.056	0.113
UK	0.582	2.393	0.207	-0.518	-0.257	0.612	0.890	0.199	0.074	0.165	0.230	0.198	-0.066	0.140

Notes : A = Austria, B = Belgium, DK = Denmark, FIN = Finland, F = France, D = Germany, GR = Greece, IRL = Ireland, I = Italy, L = Luxembourg, NL = Netherlands, P = Portugal, E = Spain, S = Sweden, UK = United Kingdom

The marginal effect of a 1-% point increase in the profit share on exports (and imports) is -1*the effect of a 1%-point increase in the wage

Table D1. The total effect of an isolated 1% point increase in the profit share

	Total effect on I / Y	*Total effect on NX / Y*
Austria	0.046	0.321
Belgium	0.226	-0.011
Denmark	0.274	0.064
Finland	-0.097	0.175
France	0.049	0.181
Germany	-0.123	0.204
Greece	-0.425	0.309
Ireland	0.163	0.071
Italy	0.103	0.192
Luxembourg	-0.021	0.101
Netherlands	0.053	0.157
Portugal	-0.128	0.258
Spain	-0.155	0.271
Sweden	0.062	0.201
United Kingdom	-0.019	0.186

Table D2. The total effects of a simultaneous 1% point increase in the profit share on investment and net exports

	Total effect on I / Y	*Total effect on NX / Y*
Austria	-0.070	0.210
Belgium	0.208	-0.050
Denmark	0.214	0.020
Finland	-0.132	0.150
France	0.009	0.149
Germany	-0.138	0.181
Greece	-0.473	0.280
Ireland	0.141	0.038
Italy	0.081	0.168
Luxembourg	-0.033	0.071
Netherlands	0.045	0.128
Portugal	-0.180	0.200
Spain	-0.206	0.260
Sweden	0.012	0.156
United Kingdom	-0.029	0.149
*Average**	*-0.039*	*0.162*

* Change in each country is multiplied by its share in EU15 GDP.

Table D3. The effect of a 1% point increase in the wage share on annual inflation and nominal unit labour costs

	1% point increase in the wage share in isolation		1% point simultaneous increase in the wage share	Differentiated simultaneous increase in the wage share*
	ULC $\Delta logULC/\Delta ws$	*Annual inflation* $\Delta logP/\Delta ws$	*Annual inflation* $\Delta logP/\Delta ws$	*Annual inflation* $\Delta logP/\Delta ws$
Austria	3.062	1.603	1.652	1.008
Belgium	1.815	0.327	0.434	0.170
Denmark	2.785	1.296	1.374	0.335
Finland	3.025	1.562	1.637	1.626
France	3.059	1.617	1.681	1.674
Germany	2.461	0.939	1.036	1.028
Greece	2.877	1.217	1.293	1.288
Ireland	2.049	0.525	0.612	0.398
Italy	4.242	2.684	2.749	2.744
Luxembourg	2.325	0.541	0.605	0.592
Netherlands	2.680	1.235	1.282	1.276
Portugal	2.702	1.272	1.343	1.340
Spain	3.581	2.095	2.177	2.173
Sweden	2.396	0.818	0.911	0.887
United Kingc	3.477	2.025	2.092	2.085
Average	*2.836*	*1.317*	*1.392*	*1.242*

Notes: *The differentiated increase in Δws is based on the scenario illustrated in table 8 divided by 5 to report the annual change in Δws and its effects on annual inflation.

** Change in each country is multiplied by its share in EU15 GDP.

Comparison with literature

	Austria		Denmark		Finland		France		Germany		Italy		Luxembourg		Netherlands		Spain		Sweden		UK	
	DD	TD	DD	TD	DD	TD	DD	TD	DD	TD	DD	TD	DD	TD	DD	TD	DD	TD	DD	TD	DD	TD
Bowles & Boyer(1995)							W	P	W	P											W	W
Naastepad & Storm (2007)							W	W	W	W	W	W			W	W	W	W			W	W
Ederer & Stockhammer (2007)							W	P														
Hein & Vogel (2008)	W	P					W	W	W	W					P	P					W	W
Stockhammer & Ederer (2008)	W	P																				
Stockhammer et al. (2011)									W	W												
Stockhammer & Stehrer (2011)	W	…			W	…	W	…	W	…			W	…					W	…	P	…
Storm & Naastepad (2012)			W	W	W	W	W	W	W	W	W	W			W	W	W	W	W	W	W	W
Onaran & Galanis (2014)							W	W	W	W	W	W									W	W

Notes: DD: Domestic Demand; TD: Total Demand; W: Wage-led; P: Profit-led
Source: Hein (2014, pp. 302-303).

National Multiplier

$$H_{ii} = \frac{\partial C_i}{\partial Y_i} + \frac{\partial I_i}{\partial Y_i} - \frac{\partial M_i}{\partial Y_i} = e_{CYi}\frac{C_i}{Y_i} + e_{IYi}\frac{I_i}{Y_i} - e_{MYi}\frac{M_i}{Y_i}.$$

If the change in the profit share is isolated to a single country only, the total effects of a change in π_i on equilibrium aggregate demand =private excess demand (E_{ii}) * the standard multiplier:

$$\frac{dY_i/Y_i}{d\pi_i} = \frac{\left(\frac{\partial(C_i/Y)}{\partial\pi_i} + \frac{\partial(I_i/Y_i)}{\partial\pi_i} + \frac{\partial(NX_i/Y_i)}{\partial\pi_i}\right)}{1-\left(\frac{\partial C_i}{\partial Y_i} - \frac{\partial I_i}{\partial Y_i} + \frac{\partial M_i}{\partial Y_i}\right)} = \frac{E_{ii}}{1-H_{ii}}$$

$$1/(1-\left(\frac{\partial C_i}{\partial Y_i} - \frac{\partial I_i}{\partial Y_i} + \frac{\partial M_i}{\partial Y_i}\right))$$

The standard national multiplier and is expected to be positive for stability.

Foreign Sector

$$\frac{\partial\left(\frac{X}{Y}\right)}{\partial(ws)} = \left(\frac{\partial X}{\partial P_x}\frac{\partial P_x}{\partial(ulc)}\frac{\partial(ulc)}{\partial(rulc)}\frac{\partial(rulc)}{\partial(ws)}\right)\frac{X/Y}{rulc} = \left(e_{XP}, e_{Px}\frac{1}{1-e_P}\frac{Yf}{Y}\right)\frac{X/Y}{rulc}$$

$$\frac{\partial(M/Y)}{\partial(ws)} = \left(\frac{\partial M}{\partial P}\frac{\partial P}{\partial(ulc)}\frac{\partial(ulc)}{\partial(rulc)}\frac{\partial(rulc)}{\partial(ws)}\right)\frac{M/Y}{rulc} = \left(e_{MP}, e_{PULC}, \frac{1}{1-e_{PULC}}\frac{Y_f}{Y}\right)\frac{M/Y}{rulc}$$

National and global multiplier effects

$$\begin{bmatrix} \frac{dY_1}{Y_1} \\ \vdots \\ \frac{dY_n}{Y_n} \end{bmatrix} = E_{nxn} \begin{bmatrix} \delta\pi_1 \\ \vdots \\ \delta\pi_n \end{bmatrix} + H_{nxn} \begin{bmatrix} \frac{\delta Y_1}{Y_1} \\ \vdots \\ \frac{\delta Y_n}{Y_n} \end{bmatrix} + P_{nxn} \begin{bmatrix} \delta\pi_1 \\ \vdots \\ \delta\pi_n \end{bmatrix} + (W_{nxn}) \begin{bmatrix} \frac{\delta Y_1}{Y_1} \\ \vdots \\ \frac{\delta Y_n}{Y_n} \end{bmatrix}$$

E-Matrix

- Change in profit share in country j on private excess demand (C+I+NX) in country j

$$E_{nxn} = \begin{bmatrix} \dfrac{\frac{\delta C}{Y_1} + \frac{\delta I}{Y_1} + \frac{\delta NX}{Y_1}}{\delta \pi_1} & 0 & \cdots & 0 \\ 0 & \ddots & \vdots & \vdots \\ \vdots & \ddots & \ddots & \vdots \\ 0 & \cdots & \cdots & \dfrac{\frac{\delta C}{Y_n} + \frac{\delta I}{Y_n} + \frac{\delta NX}{Y_n}}{\delta \pi_n} \end{bmatrix}$$

H-Matrix

- Effect of an autonomous change in aggregate demand on C,I, and NX in each country and reflects the national multiplier effects

$$H_{nxn} = \begin{bmatrix} \frac{C_1}{\delta Y_1} + \frac{\delta I_1}{\delta Y_1} - \frac{\delta M_1}{\delta Y_1} & 0 & \cdots & 0 \\ 0 & \ddots & \cdots & \vdots \\ \vdots & & \ddots & \vdots \\ 0 & \cdots & \cdots & \frac{\delta C_n}{\delta Y_n} + \frac{\delta I_n}{\delta Y_n} - \frac{\delta M_n}{\delta Y_n} \end{bmatrix}$$

P-Matrix

- Shows the effects of a change in trade partner's profit share π_i on the next exports in each country

$$P_{nxn} = \begin{bmatrix} 0 & \frac{\partial\left(\frac{NX}{Y}\right)_1}{\partial\pi_2}\frac{M_{21}}{M_1} & \cdots & \frac{\partial\left(\frac{NX}{Y}\right)_1}{\partial\pi_n}\frac{M_{n1}}{M_1} \\ \frac{\partial\left(\frac{NX}{Y}\right)_2}{\partial\pi_1}\frac{M_{12}}{M_2} & 0 & & \\ \vdots & \ddots & \ddots & \vdots \\ \frac{\partial\left(\frac{NX}{Y}\right)_n}{\partial\pi_1}\frac{M_{1n}}{M_n} & \frac{\partial\left(\frac{NX}{Y}\right)_n}{\partial\pi_2}\frac{M_{2n}}{M_n} & \cdots & 0 \end{bmatrix}$$

- The diagonal elements of P are zero, the off-diagonal elements are calculated as:

$$P_{ij} = \frac{\partial\left(\frac{NX}{Y}\right)i}{\delta\pi_j}\frac{M_{ji}}{M_i} = (e_{Pxj}\frac{1}{1-e_p}\frac{Yf_j}{Y_j}\frac{1}{rulc_j})\frac{M_{ji}}{M_i}(e_{XPi}\frac{X_i}{Y_i} - e_{MPi}\frac{M_j}{Y_i}$$

W-Matrix

- W: Effect of a change in a trader partners GDP on exports of each country

$$W_{nxn} = \begin{bmatrix} 0 & e_{XYrw}\,1\frac{X_1}{Y_1}\frac{Y_2}{Y_w} & \cdots & e_{XYrw}\,1\frac{X_1}{Y_1}\frac{Y_n}{Y_w} \\ e_{XYrw}\,2\frac{X_2}{Y_2}\frac{Y_1}{Y_w} & 0 & & e_{XYrw}\,2\frac{X_2}{Y_2}\frac{Y_n}{Y_w} \\ \vdots & \ddots & \ddots & \vdots \\ e_{XYrw}\,n\frac{X_n}{Y_n}\frac{Y_1}{Y_w} & e_{XYrw}\,n\frac{X_n}{Y_n}\frac{Y_2}{Y_w} & \cdots & 0 \end{bmatrix}$$

Robustness Checks

- Different sample sizes (1960-2007) to take into account exceptional behaviour of data during crisis years
- Estimation with unadjusted wages (e.g. low consumption differential in Belgium or Denmark)
- Estimation of a seemingly unrelated regression model (SUR)
- However, results remain robust, EU15 still declines by 0.34% points indicating that Europe as a whole is wage-led

Further Effects

Effects on Investment

$$\frac{\Delta I/Y}{\Delta \pi} = \left[\left(\frac{\Delta Y/Y}{\Delta \pi} e_{IY} \frac{I}{Y}\right) + i_{\pi} \frac{I}{R}\right]$$

- Profit-led investment regime $\left(\frac{\Delta I/Y}{\Delta \pi} > 0\right)$
  - A strong partial effect of π and a weak partial effect of *Y* on *I*
- Wage-led investment regime $\left(\frac{\Delta I/Y}{\Delta \pi} < 0\right)$
  - Reverse constellation
- Calculated as the sum of ex-post multiplier indirect effect and direct partial profitability effect

Effects on Net Exports

$$\begin{bmatrix} \frac{\Delta NX/Y_1}{\Delta \pi_1} \\ \vdots \\ \frac{\Delta NX/Y_{15}}{\Delta \pi_{15}} \end{bmatrix} = (NX_{15x15} + P_{15x15}) \begin{bmatrix} \Delta \pi_1 \\ \vdots \\ \Delta \pi_{15} \end{bmatrix} + (W_{15x15} - M_{15x15}) \begin{bmatrix} \frac{\Delta Y/Y_1}{\Delta \pi_1} \\ \vdots \\ \frac{\Delta Y/Y_{15}}{\Delta \pi_{15}} \end{bmatrix}$$

$$M_{15x15} = \begin{bmatrix} \frac{\Delta M_1}{\Delta Y_1} & 0 & \cdots & 0 \\ 0 & \ddots & \cdots & \vdots \\ \vdots & \cdots & \ddots & \vdots \\ 0 & \cdots & \cdots & \frac{\Delta M_{15}}{\Delta Y_{15}} \end{bmatrix}$$

$$NX_{15x15} = \begin{bmatrix} \frac{\frac{\Delta NX}{Y_1}}{\Delta \pi_1} & 0 & \cdots & 0 \\ 0 & \ddots & \vdots & \vdots \\ \vdots & \ddots & \ddots & \vdots \\ 0 & \cdots & \cdots & \frac{\frac{\Delta NX}{Y_{15}}}{\Delta \pi_{15}} \end{bmatrix}$$

- Effect on profit-led countries theoretically ambiguous (positive effect on imports but also positive price competition effects)
- The total effect on net exports in wage-led countries will be positive and larger (fall in imports following lower growth)
- Total effect of a simultaneous change on trade balance is ambiguous in both the wage-led and profit-led economies (EU15 as a whole is wage-led)

Effects on Inflation

- Isolated Change in one country:

$$\frac{\Delta logP}{\Delta \pi} = -\left[\frac{\partial logP}{\partial logulc}\frac{\partial logulc}{\partial logrulc}\frac{\partial logrulc}{\partial logws}\right]\frac{1}{rulc} = -\left(e_{PULC}\ \frac{1}{1-e_{PULC}}\frac{Y_f}{Y}\right)\frac{1}{rulc}$$

- Simultaneous Change in π:

$$\begin{bmatrix}\frac{\Delta logP}{\Delta \pi_1}\\ \vdots \\ \frac{\Delta logP}{\Delta \pi_{15}}\end{bmatrix} = \left(DP_{15x15}\begin{bmatrix}\Delta\pi_1\\ \vdots\\ \Delta\pi_{15}\end{bmatrix} + PM_{15x15}\begin{bmatrix}0 & \Delta\pi_2 & \cdots & \Delta\pi_{15}\\ \Delta\pi_1 & \ddots & \cdots & \vdots\\ \vdots & \vdots & \ddots & \vdots\\ \Delta\pi_1 & \Delta\pi_2 & \cdots & 0\end{bmatrix}\begin{bmatrix}p_{m1}\\ \vdots\\ p_{m15}\end{bmatrix}\right)$$

$$DP_{15x15} = \begin{bmatrix}\frac{\Delta logP}{\Delta \pi_1} & 0 & \cdots & 0\\ 0 & \ddots & \cdots & \vdots\\ \vdots & \vdots & \ddots & \vdots\\ 0 & \cdots & \cdots & \frac{\Delta logP}{\Delta \pi_{15}}\end{bmatrix}$$

$$PM_{15x15} = \begin{bmatrix}0 & \frac{\Delta log(P_x)_2}{\Delta \pi_2}\frac{M_{21}}{M_1} & \cdots & \frac{\Delta log(P_x)_{15}}{\Delta \pi_{15}}\frac{M_{151}}{M_1}\\ \frac{\Delta log(P_x)_1}{\Delta \pi_1}\frac{M_{12}}{M_2} & 0 & \cdots & \vdots\\ \vdots & \vdots & \ddots & \vdots\\ \frac{\Delta log(P_x)_1}{\Delta \pi_1}\frac{M_{115}}{M_{15}} & \frac{\Delta log(P_x)_2}{\Delta \pi_2}\frac{M_{215}}{M_{15}} & \cdots & 0\end{bmatrix}$$

$$DP_{ii} = \frac{logP}{\Delta \pi}$$

$$PM_{ij} = \frac{\Delta log(P_x)_j}{\Delta \pi_j}\frac{M_{ji}}{M_i} = -(e_{Pxj}\ \frac{1}{1-e_{pj}}\frac{Yf_j}{Y_j}\frac{1}{rulc_j})\frac{M_{ji}}{M_i}$$