



Financialisation, Debt and Inequality – scenarios based on a stock flow consistent model - Preliminary results for D11.05

Presentation at the **FESSUD annual conference 2015: Impacts of Financialisation on Society, Environment, and Economy** 16.10.2015, Lisbon Daniel Detzer Berlin School of Economics and Law







Task of Deliverable D 11.05 Exerts of the DoW

- The central objective of this work package will be to explore the possible evolutions of financialisation, the financial sector and relevant policies over a 15 to 20 year time horizon.
- Two of the eight features characterizing financialisation are explored in task 5:
 - (v) 'financialisation is strongly associated with market mechanisms, complemented or even reinforced by policies that have underpinned rising inequality of incomes and of inequality more generally';
 - (vi) 'consumption has often been sustained by the extension of credit'
- The era of financialisation has generally been associated with rising inequality of income and wealth. The interplay between inequality and financial crisis will have been explored in WP3. [...] Using a stock-flow consistent approach, possible scenarios are explored arising from the pattern of savings imbalances between sectors and between countries.







How we approach the task

- In WP 3 we have conducted a range of country studies.
 - almost all countries were exposed to the same trends of increasing inequality
 - But the macroeconomic performance was quite different
 - Export led mercantilist
 - Debt led private demand boom
- SFC model to show how ,small differences' in institutional structures can lead to these differing results of the same trends
- Build our forecast exercise on these results







Content of the presentation

1. Introduction

- 2. (Financialisation, inequality, debt and economic growth)
- 3. (Macroeconomic regimes and international imbalances)
- 4. (Literature review on SFC models dealing with financialisation and inequality)
- 5. Model Structure
- 6. Modeling strategy and the baseline scenarios
- 7. Experiments
 - 1. (Scenario 1: Increased propensity to consume)
 - 2. Scenario 2: Changes in the functional distribution of income
 - 3. Scenario 3: Changes in the wage dispersion
 - 4. Scenario 4: Increase wage dispersion with strong financial regulation
 - 5. (Scenario ...)
- 8. Some preliminary conclusions / foresights







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MODEL STRUCTURE







Model Structure

- Stock Flow Consistent Model
- Euro area country
 - No exchange rate
 - No central bank
- Prices level is fixed
- Growth model
- 7 Sectors
- 2 assets + prodcutive capital stock







Model Structure – Balance Sheet Matrix

	Worker 1	Worker 2	Rentiers	Firms	Banks	Government	RoW	Sum
Deposits	+	+	+	+	-	+	+	0
Loans	-	-		-	+	-	-	0
Equities			+	-				0
fixed								
capital				+				+K
Net worth	-	-	-	-	0	-	-	-K
Sum	0	0	0	0	0	0	0	0







Model Structure –

This project is funded by the European Union under the 7th Research Framework programme (theme SSH) Grant Agreement nr 266800

Transaction Flow Matrix

	Worker 1	Worker 2	Rentiers	Firms		Firms		Banks	Gov.	RoW	Sum
				Cur.	Cap.						
Consumption	-C_W1	-C_W2	-C_R	+C					0		
Investment				+1	-1				0		
Gov. Cons.				+G			-G		0		
Exports				+Ex				-Ex	0		
Imports				-Im				+lm	0		
WB	+w1 * N1	+w2 * N2		-WB					0		
Depr. Allow.				-DA	+DA						
Taxes	-T_W1	-T_W2	-T_R	-T_F			+T		0		
Profits			+P_Fd	-P_F	+P_Fu				0		
Int. Loans	-	-		-		+	-	-	0		
Int. Deposits	+	+	+	+		-	+	+	0		
*Sum	Sav	Sav	Sav	0	Sav	0	Sav	Sav = - CA	erlin Id Lav		



Model Structure – Transaction Flow Matrix

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	Worker 1	Worker 2	Rentiers		Firms	Banks	Gov.	RoW	Sum
				Cur.	Cap.				
*Sum	Sav	Sav	Sav	0	Sav	0	Sav	Sav = - CA	
Changes in Stocks									
Loans	+ΔL_W1	+ΔL_W2			+∆L_F	+∆L	+ΔL_F	+ΔL_RoW	0
Deposits	-ΔD_W1	-∆D_W2	-ΔD_R		-ΔD_F	+∆D	-∆D_G	-∆D_RoW	0
Equities			-ΔEh_R*p_E		+∆Es_F*p_E				0
Sum	0	0	0	0	0	0	0	0	0







Model Structure – Production and employment

Production

(1) Y = Cons + I + G + Ex - Im

Employment

- (2) N = Y / pr
- (3) N_W1 = N * n_W1

(4)
$$N_W2 = N * (1 - n_W1)$$

- Cons = Consumption
- I = Gross investment
- G = Government expenditure
- N = Employment
- n = share in employment (ex)







Model Structure – Distribution

Functional Income Distribution

(1) WS = 1 - PS

(2)Pg_F = PS * Y

Wage distribution

- (3) WB = WS * Y
- (4) wa = WB / N
- (5) w_{Worker2} = wa * wm_{Worker2}

(6) $w_{Worker1} = (WB - N_{Worker2} * w_{Worker2}) / N_{Worker1}$

IPE Berlin Institute for International Political Economy Berlin WS = Wage Share PS = Profit Share (ex) Pg_F = Gross Profits WB = Wage Bill wa = average wage rate wm_{Worker 2} = wage multiple (ex) w = wage rate N = employment





Model Structure – Firms Profit Distribution

 $(1)Pg_F = PS * Y$ (2)inet_F = r_L(-1) * L_F(-1)- r_D(-1) * D_F(-1) $(3)T_F = max(t_F^*(Pg_F-inet_F-DA), 0)$ (4)P F = Pg F - inet F - DA - T F $(5)P Fd = max(P_F * (1-RR), 0)$ (6)DpS = P Fd / Es F(-1)(7)P Fu = P F - P Fd



IPE Berlin Institute for International Political Economy Berlin Pg_F = Gross Profits inet_F = net interest payments r_L = interest loans (ex) r_D = interest deposits (ex) L_F = outstanding loans $D_F = Deposits of firms$ T F = Sum of Taxes Firms t F = tax rate firms (ex)DA = Depreciation Allowances $P_F = net profits$ P Fd = distributed profits RR = retention ratio DpS = Dividend per share Es_F = number of outstanding shares P_Fu = undistributed profits





Model Structure – Capital stock

Capital S	tock
------------------	------

(1) K = K(-1) + I(-1) - DA(-1)

Depreciation

(2) DA = $\delta * K(-1)$

Utilization

(3) Yfc = K / COR

(4) u = Y / Yfc

Investment

(5) I = Inet + DA

(6) Inet = gr_K * K(-1)

(7) $gr_K = \beta 1 + \beta 2 * u(-1) + \beta 3 * PS(-1) - \beta 4 * r_L(-1) + \beta 5 * (P_Fu(-1) + DA(-1))/K(-1)$



IPE Berlin Institute for International Political Economy Berlin K = capital stock I = gross investement DA = depr. allow. = depreciation Yfc = Y at full capacity COR = Capital output ratio u = utilization rate Inet = net investment gr_K = growth of capital stock PS = profit share r_L = Loan rate P_Fu = retained profits





Model Structure – Firm Finance

External Finance Demand

(1) $exFD_F = I - P_Fu - DA$

Share issues

- (2) $E_issued = exFD_F / p_E(-1) * EFR$
- (3) Es_F = Es_F(-1) + E_issued

Bank Finance

(4) BankBalance_F = BankBalance_F(-1) - exFD_F + E_issued * p_E

exFD F = external finance demand I = gross investement DA = depr. allow. = depreciationP_Fu = retained profits E issued = number of shares issued $p_E = equity price$ EFR = equity finace ratio (ex) Es_F = equity supplied by firms (total number outstanding shares) Bankbalance = net balance with banks







Model Structure – Rentier Households

Income

(1) $Yg_R = D_R(-1) * r_D(-1) + Eh_R(-1) * DpS$

(2) T_R = max(t * (Yg_R) , 0)

 $(3) Yd_R = Yg_R - T_R$

Consumption

(4) $C_R = pc_R * Yd_R(-1) + pcV_R * V_R(-1)$

Wealth

(5) V_R = V_R(-1) + Yd_R - C_R + CG_E
(6) CG_E = (p_E - p_E(-1)) * Eh_R(-1)



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Yg = Gross income D = Deposits r_D = interest deposits (ex) Eh_R = total shares held DpS = Dividend per share T R = Taxes paid t = tax rate (ex)Yd = disposable income $C_R = consumption$ $pc_R = propensity to consume out$ of income pcV_R = propensity to consume out of wealth $CG_E = capital gains equity$ V_Re = expected wealth $gr_Y = GDP growth$



Model Structure – Rentier Households

Tobinesque portfolio distribution

(1) D_R/V_Re= θ0 + θ1 * r_D - θ2 * DpS/p_E(-1) + θ3 * Yd_R/V_Re

(2) p_E * Eh_R/V_Re = (1 - θ0) - θ1 * r_D + θ2 * DpS/p_E(-1) - θ3 * Yd_R/V_Re

Model equations

(3) Eh_R = Es_F

(5) D_R = V_R - p_E * Eh_R

(6) V_Re = V_R(-1) * (1+gr_Y(-1))



IPE Berlin Institute for International Political Economy Berlin D = Deposits r_D = interest deposits (ex) Eh_R = total shares held Es_F = total share outstandings DpS = Dividend per share p_E = price equity Yd = disposable income V_R = Wealth rentiers V_Re = expected wealth gr_Y = GDP growth



Model Structure – Worker 2 Households

Income

```
(1) Yg_W2 = w2 * N_W2 + D_W2(-1) * r_D(-1)
(2) T_W2 = max( t * (Yg_W2) , 0 )
(3) Yd_W2 = Yg_W2 - T_W2 - L_W2(-1) *r_L(-1)
Consumption
(4) C_W2 = pc_W2 * Yd_W2(-1) + ...
... pcV_W2 * V_W2(-1)
```

Wealth

(5)
$$V_W2 = V_W2(-1) + Yd_W2 - C_W2$$



Yg = Gross income
w = wage rate
N = employment
D = Deposits
r_D = interest on deposits (ex)
T_W2 = Taxes paid
t = tax rate (ex)
Yd = disposable income
L = Loans
r_L = interest on loans
C_W2 = consumption
pc_W2 = propensity to consume
out of income
pcV_W2 = propensity to consume
out of wealth





Model Structure – Worker 1 Households

Income

(2) T_W1 = max(t*(Yg_W1), 0)

Consumption

(5) Wealth

(5)
$$V_W1 = V_W1(-1) + Yd_W1 - C_W1$$



IPE Berlin Institute for International Political Economy Berlin

Yg = Gross income w = wage rate N = employment D = Depositsr_D = interest on deposits (ex) T_W1 = Taxes paid t = tax rate (ex)Yd = disposable income L = Loansr_L = interest on loans C W2 = consumption worker 2 C_W1 = consumption worker 1 pc_W1 = propensity to consume out of income pcV_W1 = propensity to consume out of wealth Imit = degree of emulation (ex)



Model Structure – Government

(1) G = G(-1) * (1 + gr_G) (2) gr_G = gr_Y(-1) + ... (0.03 - (def_Gov(-1) / Y(-1))) (3) T = T_W1 + T_W2 + T_R + T_F (4) def_Gov = G - T + L_Gov(-1) * r_L(-1) - ... D_Gov(-1) * r_D(-1) (5) V Gov = V Gov(-1) - def Gov G = government expenditure gr_G = expenditure growth gr_Y = GDP growth Y = GDP Def_Gov = Government deficit T = total tax revenues D = Deposits r_D = interest on deposits (ex) L = Loans r_L = interest on loans V_Gov = Wealth







Model Structure – Banks

(1) r_D = r

(2) r_L = r

(3) $L = L_F + L_W1 + L_W2 + L_Gov + L_RoW$

- D = Deposits
- r_D = interest on deposits (ex)
- L = Loans
- r_L = interest on loans (ex)
- (4) $D = D_F + D_W1 + D_W2 + D_R + D_Gov + D_RoW$

(5) $V_Banks = L - D = 0$







Model Structure – RoW

(1) Im = pIm * Y
(2) Ex = Ex(-1) * (1 + gRoW)
(3) CA = Ex - Im - r_D(-1) * D_RoW(-1) + r_L(-1) * L_RoW(-1)
(4) V RoW = V RoW(-1) - CA plm = propensity to import Y = GDP Ex = exports gRoW = growth rate RoW CA = current account $r_D = interest on deposits$ $r_L = interest on Loans$ L = Loans D = DepositsV = Wealth







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BASELINE AND EXPERIMENTS







Baseline and

experimentation strategy

- Creation of two baselines cases with same parameters except emulation
 - One case (baseline 1) without emulation effects (imit = 0)
 - Expected to tend to the export led mercantilist type of development
 - One case (baseline 2) with emulation (imit = 0.5)
 - Expected to tend to the debt led private demand type of development
- Expose both baselines to the same shocks
 - Increase in profit share from 0.4 to 0.5
 - Increase in wage dispersion from worker 2 wage rate 122% of worker 1 wage rate to 185%
 - Increase in wage dispersion from worker 2 wage rate 122% of worker 1 wage rate to 185% with financial constraint / regulation
- Comparison of the results to reflected on the impact of further increases in inequality







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INTRODUCING THE BASELINES







The Baselines compared

	Baseline 1: no emulation	Baseline 2: 50 % emulation		Baseline 1: no emulation	Baseline 2: 50 % emulation
GDP comp. to Baseline 1	100.0%	101.3%	Imports to GDP	30.0%	30.0%
			Exports to GDP	30.7%	30.3%
Capital Stock comp. to			Cons. Worker 1 to GDP	19.6%	20.1%
Baseline 1	100.0%	101.3%	Cons. Worker 2 to GDP	21.7%	21.7%
			Cons. Rentier to GDP to GDP	9.0%	9.0%
utilization rate	68.4%	68.4%			
Shares in GDP			Net financial wealth to GDP ratios		
Net Investment to GDP	10.2%	10.2%	Worker 1	23.1%	6.8%
Depreciation to GDP	14 1%	14.1%	Worker 2	114.2%	114.2%
Consumption to GDP	50.3%	50.8%	Rentier	108.5%	108.5%
Government expenditure to					
GDP	24.6%	24.6%	Firms	-127.8%	-127.8%
Gross Investment to GDP	24.4%	24.4%	Rest of the World	-29.4%	-13.1%
TradeBalance to GDP	0.7%	0.3%	Government	-88.7%	-88.7% 1
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EXPERIMENT 1: INCREASE IN THE PROFIT SHARE







Experiment 1: increase in the profit share

	Without Emulation			With En	nulation
	Baseline 1	higher profit share		Baseline 2	higher profit share
GDP compared to Baseline	100%	95.0%		100%	94.7%
Capital Stock compared to Baseline 1	100%	99.5%		100%	99.2%
utilization rate	68.4%	65.3%		68.4%	65.3%
Shares in GDP					
Net Investment	10.2%	10.7%		10.2%	10.7%
Depreciation	14.1%	14.8%		14.1%	14.8%
Consumption	50.3%	47.3%	>	50.7%	47.6%
Government expenditure	24.6%	24.9%		24.5%	24.8%
Gross Investment	24.4%	25.5%	>	24.3%	25.5%
TradeBalance	0.7%	2.3%	\sum	0.3%	2.0%
Political Economy Berlin				Ber	lin School of Economics and La



Experiment 1: increase in the profit share

	Without Emulation			With Em	mulation	
	Baseline 1	higher profit share		Baseline 2	higher profit share	
Cons. Worker 1	19.64%	16.36%		20.07%	16.72%	
Cons. Worker 2	21.71%	18.10%		21.71%	18.10%	
Cons. Rentier	8.98%	12.82%		8.98%	12.82%	
Net financial wealth to GDP ratios						
Worker 1	23.14%	19.30%		6.80%	5.70%	
Worker 2	114.25%	95.20%)	114.20%	95.20%	
Rentier	108.54%	158.60%		108.50%	158.60%	
Firms	-127.78%	-87.80%	>	-127.80%	-87.80%	
Rest of the World	-29.43%	-96.60%	>	-13.10%	-83.00%	
Government	-88.71%	-88.70%		-88.70%	-88.70%	
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Summary of the results for increased profit share

- qualitatively the same developments for both experiments
 - Slow down in growth for a sustained period and lower GDP level in the stready state
 - A shift of GDP composition away from consumption towards investment
 - Improvement in the trade balance
 - Improvement of financial balance of firms and rentiers, deterioration of workers and RoW
- Stronger negative effect in Baseline 2 scenario







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EXPERIMENT 2: INCREASE IN WAGE DISPERSION







Experiment 2: Increase in wage dispersion

	Without Emulation			With En	nulation
	Baseline 1	higher wage dispersion		Baseline 2	higher wage dispersion
GDP compared to Baseline	100%	98.8%		100%	110.7%
Capital Stock compared to Baseline 1	100%	98.8%		100%	110.7%
utilization rate	68.4%	68.4%		68.4%	68.4%
Shares in GDP					
Net Investment	10.2%	10.2%		10.2%	10.2%
Depreciation	14.1%	14.1%		14.1%	14.1%
Consumption	50.3%	49.9%		50.8%	53.7%
Government expenditure	24.6%	24.6%		24.6%	24.6%
Gross Investment	24.4%	24.4%		24.4%	24.4%
TradeBalance	0.7%	1.1%		0.3%	-2.6%
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Experiment 2: increase in wage dispersion

	Without Emulation			With En	mulation	
	Baseline 1	higher wage dispersion		Baseline 2	higher wage dispersion	
Cons. Worker 1	19.6%	15.3%		20.1%	19.0%	
Cons. Worker 2	21.7%	25.7%		21.7%	25.7%	
Cons. Rentier	9.0%	9.0%		9.0%	9.0%	
Net financial wealth to GDP ratios						
Worker 1	23.1%	18.0%		6.8%	-135.6%	
Worker 2	114.3%	135.0%		114.2%	135.0%	
Rentier	108.5%	108.5%		108.5%	108.5%	
Firms	-127.8%	-127.8%		-127.8%	-127.8%	
Rest of the World	-29.4%	-45.1%		-13.1%	108.5%	
Government	-88.7%	-88.7%		-88.7%	-88.7%	
Political Economy Berlin				Ber	lin School of Economics and La	



Summary results for increased wage dispersion

Without emulation

- Contractive effect, lower
 GDP level
- Reduced share of consumption in GDP
- Improved trade balance
- W2 balance improved
- W1 balance deteriorated
- RoW balance deteriorated

With emulation

- Expansionary effect, higher GDP level
- Increased share of consumption in GDP
- Deteriorating trade bal.
- W2 balance improved
- W1 balance becomes negative
- RoW balance improved







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EXPERIMENT 2.1: INCREASE IN WAGE DISPERSION IN BASELINE 2 WITH FINANCIAL CONSTRAINTS







Experiment 2.1: Increase in Wage dispersion in Baseline 2 with financial constraints

Changed consumption function of Worker 1 households

C_W1D = (1-imit) * pc_W1 * Yd_W1(-1) + imit * C_W2 + pcV_W1 * D_W1
 Consumption demanded defined as before

- (2) $C_W1 = z99 * C_W1D + z100 * (C_W1D (C_W1D Yd_W1(-1)) * L_W1(-1)/Yd_W1(-1)/PrudRat)$
- (3) z99 = 1 iff C_W1D < Yd_W1; else 0
- (4) z100 = 1 iff C_W1D > Yd_W1; else 0

if consumption below income \rightarrow Actual consumption = demanded consumption

if consumption above income \rightarrow Actual consumption = demanded consumption - penalty (depending on debt to income ratio and a prudential ratio)







Experiment 2.1: Increase in wage dispersion with financial constraints

Differences from Baseline 2 with financial constraints after an increase of wage dispersion







Experiment 2.1: Increase in wage dispersion with financial constraints

	Baseline 2	higher wage dispersion	higher wage dispersion - with financial regulation	
GDP compared to Baseline 2	100%	110.70%	99.87%	
Capital Stock compared to Baseline 2	100%	110.70%	99.87%	
utilization	68.39%	68.39%	68.39%	
Shares in GDP				
Net Investment	10.24%	10.24%	10.24%	
Depreciation	14.13%	14.13%	14.13%	
Consumption	50.76%	53.67%	50.69%	>
Government expenditure	24.56%	24.59%	24.59%	
Gross Investment	24.36%	24.36%	24.36%	
TradeBalance	0.32%	-2.62%	0.36%	\geq







Experiment 2.1: Increase in wage dispersion with financial constraints

	Baseline 2	higher wage dispersion	higher wage dispersion - with financial regulation	
Cons. Worker 1	20.1%	19.0%	16.1%	
Cons. Worker 2	21.7%	25.7%	25.7%	
Cons. Rentier	9.0%	9.0%	9.0%	
Net financial wealth to GDP ratios				
Worker 1	6.8%	-135.6%	-12.3%	
Worker 2	114.2%	135.0%	135.0%	
Rentier	108.5%	108.5%	108.5%	
Firms	-127.8%	-127.8%	-127.8%	
Rest of the World	-13.1%	108.5%	-14.7%	
Government	-88.7%	-88.7%	-88.7%	







Summary results for increased wage dispersion with financial constraint

Without financial constraints

- Expansionary effect, higher GDP level
- Increased share of consumption in GDP
- Deteriorating trade bal.
- W2 balance improved
- W1 balance becomes negative
- RoW balance improved

With financial constraints

- Initial expansionary effect, then contractive effect, lower GDP level
- Reduced share of consumption in GDP
- Improved trade balance
- W2 balance improved
- W1 balance becomes negative
- RoW balance deteriorated







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CONCLUSIONS AND FORESIGHTS







Conclusions / Foresight

- In the face of further increasing **functional income inequality** the model suggests
 - For each individual country a shift towards the export led mercantilist type of development
 - Contractive effects in the transitionary phase,
 - lower levels of GDP, lower utilization rate and
 - a relative shift of demand towards investment expenditure and exports
 - if world demand growth is unaffected by the slow down







Conclusions / Foresight II

- In the face of further increasing **personal and wage income inequality** the model suggests
 - For individual countries where emulation effects play an important role a tendency towards the **private debt led demand type** of development
 - Expansive effects in the transitionary phase,
 - a higher long run GDP level,
 - a relative shift of demand towards consumption,
 - deteriorating trade balance,
 - Potentially unsustainable debt accumulation in lower income household sector and deteriorating international investment position.
 - Each countries where emulation effects are only of minor importance or the access to debt for low income households is restricted (already high debt levels, prudential regulation, balance sheet recessions) a tendency towards the export led type of development
 - depressive effects in the transitionary phase,
 - a lower long run GDP level,
 - a relative shift of demand towards exports,
 - Improving trade balance,
 - High export dependence and improving international investment position







Conclusions / Foresight III

- Two potential scenarios for the Euro Area:
 - Scenario 1:
 - Sufficiently high number of countries can follow the private demand led type of development
 - Growth for a sustained period, also for export led countries, and balanced EA external accounts, but ...
 - » ... increasing debt balances within countries may lead to financial instability
 - » ... Imbalances within the Euro area will rise again
 - Scenario 2:
 - More countries follow or have to follow the export led type of development
 - Growth in the Euro Area will be weak, Euro area as a whole will turn export dependend and be a drag on world growth







Thank you for your attention



