Income inequality, household debt and current account imbalances

Jan Behringer

Macroeconomic Policy Institute (IMK) and University of Würzburg

Joint work with C. Belabed, T. Theobald and T. van Treeck

5th FMM International Summer School

Berlin, August 2015

Outline

I. Macroeconomic implications of income inequality

- Income inequality and macroeconomic instability in the United States

- Income inequality and macroeconomic instability in Germany

II. Income distribution and current account imbalances

- Introduction and literature

- Descriptive analysis/illustration of hypotheses

- Estimation methodology

- Estimation results

- Conclusion

Outline

**I. Macroeconomic implications of income inequality**

- Income inequality and macroeconomic instability in the United States

- Income inequality and macroeconomic instability in Germany

II. Income distribution and current account imbalances

- Introduction and literature

- Descriptive analysis/illustration of hypotheses

- Estimation methodology

- Estimation results

- Conclusion

Gini coefficients of income inequality, mid-1980s and late2000s

Gini coefficients of income inequality

Source: OECD Database on Household Income, Distribution and Poverty, own calculations
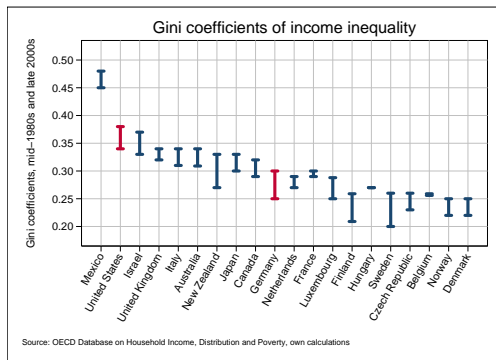
- Income inequality increased in most, but not all OECD countries
  - $\rightarrow$ Inequality has increased to a similar degree in the U.S. and Germany
  - $\rightarrow$ Strong increase in income inequality in New Zealand, Finland and Sweden
  - $\rightarrow$ Little change in income inequality in France, Hungary and Belgium
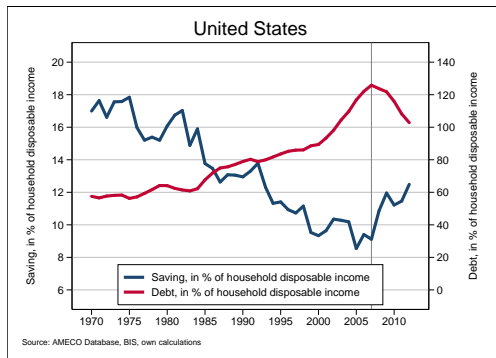
Personal and functional income distribution, USA, 1970-2012
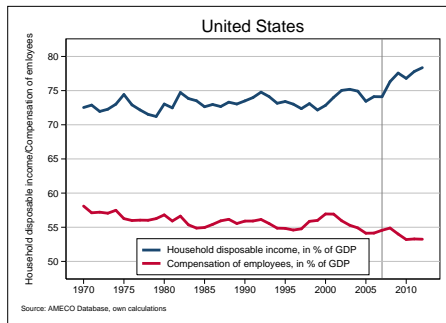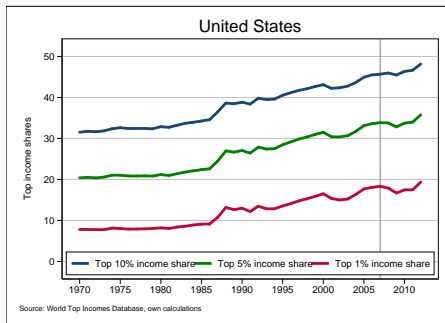
- In the United States, firms have payed rising and extremely high salaries to the new "working rich" (since the early 1980s)

    → Rising top-end household income inequality since early 1980s

    → Rather little change in functional income distribution since early 1980s

Household saving and debt, USA, 1970-2012

- United States post-1980: Debt-driven consumption and crisis
   - → Strong increase in household indebtedness prior to the Great Recession
    - → Strongly falling household saving rate prior to the Great Recession

A closer look at the United States

Income inequality, household debt and the saving rate -

What happened in the United States?

- Keynesian models would predict that higher income inequality leads to a higher household saving rate

- Mainstream theories of consumption are unable to explain the decline in the household saving rate and the rise in household debt in the United States

- With upward-looking status comparisons, there may be a negative link between personal inequality and the aggregate household saving rate ("expenditure cascades" model by Frank et al., 2010)

- This is not about eccentric luxury consumption, but basic middle class needs (private financing of important positional goods such as education, housing, health care, etc. in the United States)
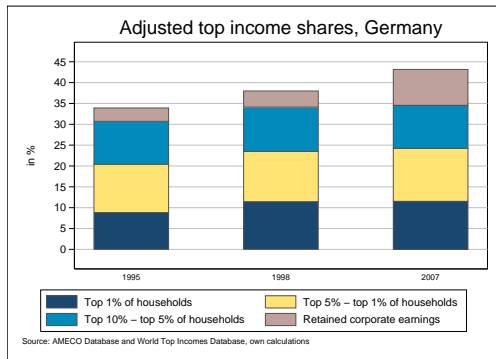
Personal and functional income distribution, DEU, 1970-2012
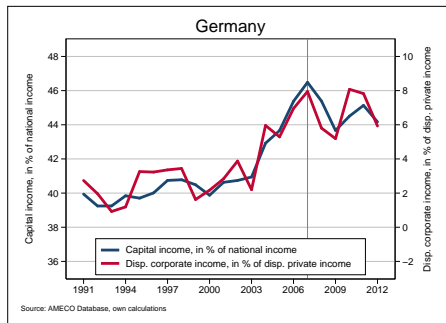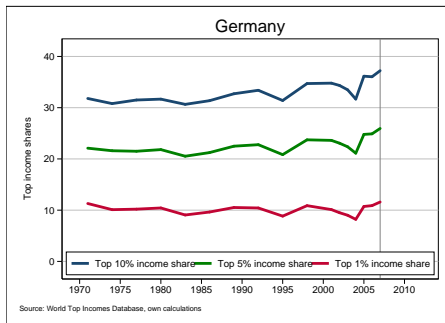
- In Germany, firms have accumulated financial assets with their retained profits (during the 1980s and 2000s)
    - → Top-end personal income inequality has not increased very much
    - → Strongly increasing capital income share

Top income shares adjusted to take account of retained corporate earnings

Adjusted top income shares, Germany

Source: AMECO Database and World Top Incomes Database, own calculations

- Trends in top household income shares are not directly comparable across countries
- In Germany, the corporate sector has been a persistent net saver since 2002
- Retained corporate profits are not counted as household disposable income
  → Top household income shares underestimate the rise in top-end inequality in Germany

Outline

I. Macroeconomic implications of income inequality

- Income inequality and macroeconomic instability in the United States

- Income inequality and macroeconomic instability in Germany

II. Income distribution and current account imbalances

- Introduction and literature

- Descriptive analysis/illustration of hypotheses

- Estimation methodology

- Estimation results

- Conclusion

Income inequality, household leverage and current account imbalances

- Keynesians often assume a positive link between personal inequality and the household saving rate because "the rich save more than the poor"

- With upward-looking status comparisons, there may be a negative link between personal inequality and the aggregate household saving rate ("expenditure cascades" model by Frank et al., 2010)

- Link between rising (top-end) income inequality and the decline in saving (and rise in household debt) prior to the Great Recession (e.g. Palley, 1994; Cynamon and Fazzari, 2008, 2014; Fitoussi and Stiglitz, 2009; Rajan, 2010; Kumhof and Rancière, 2010; Stockhammer, 2013; van Treeck, 2014)

The corporate veil: Functional income distribution and aggregate demand

- If households have a higher propensity to spend out of current income than firms, a falling wage share is linked to a decline in the consumption-to-GDP ratio (e.g. Kalecki, 1954; Kaldor, 1966)

- Existence of a corporate veil, i.e. consumers react differently to a rise in dividends than to an increase in corporate retained earnings (e.g. Feldstein and Fane, 1973; Poterba, 1991; Baker et al., 2007; Atkinson, 2009)

Introduction and literature

The current hype about top income shares ...

- Atkinson, Piketty and Saez (2011) distinguish between "U-shape" and "L-shape" countries in terms of top income shares

- Leigh (2007) recommends using top income shares when other measures of personal inequality (e.g. Gini coefficient) are not available

- Kumhof et al. (2012) use top income shares as a proxy of the distribution of income between "investors" and "workers"

... goes a bit too far

- Changes in Gini coefficient and top income shares can have very different macroeconomic implications (expenditure cascades)

- Sole focus on top income shares is misleading to the extent that the functional distribution has worsened more in the "L-shape" countries than in the "U-shape" countries

Hypothesis I

- Rising personal inequality leads to a decrease of the current account, ceteris paribus

- The further inequality rises towards the top of the income distribution, the stronger the effect on private household net lending and the current account

Hypothesis II

- The existence of the corporate veil affects the current account

- An increase in corporate net lending is not fully compensated by a simultaneous decrease in household net lending

Hypothesis III

- The joint effects of changes in personal and functional income distribution contribute to a significant degree to the explanation of the global current account imbalances

Personal and functional income distribution, 1980/3-2004/7
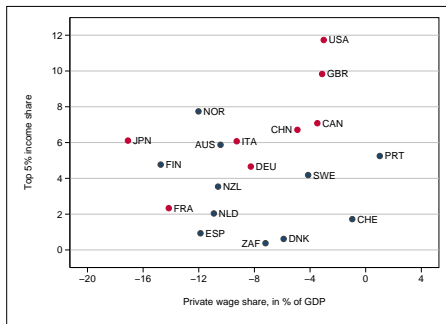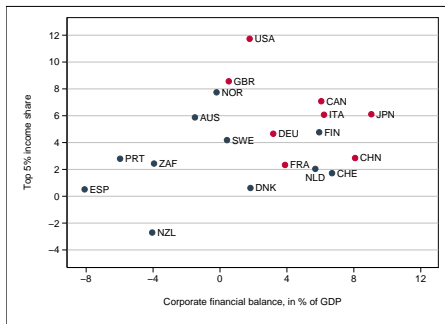
Source: World Top Incomes Database (WTID), AMECO Database and National accounts statistics (OECD), own calculations

- Current account deficit countries: Strong increase in top income shares, while the corporate financial balance (wage share) has increased (declined) less

- Current account surplus countries: Increase in top income shares relatively minor, while the corporate financial balance (wage share) has increased (declined) strongly

Illustration - Sectoral financial balances

Current account and corporate financial balance, 1980/3-2004/7
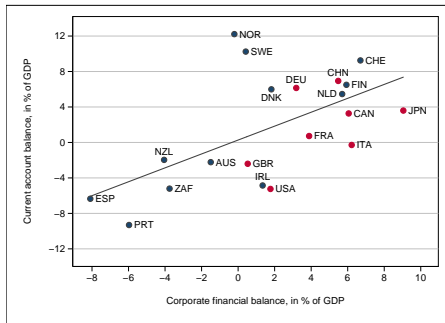
Household and corporate financial balance, 1980/3-2004/7
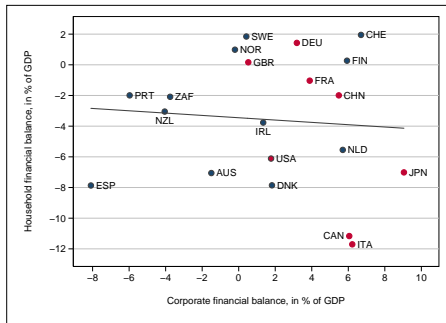
Source: AMECO Database and National accounts statistics (OECD), own calculations

- Corporate financial balance is positively related to the current account
- No systematic relationship between corporate and household financial balance

Current account regression specification

- We amend the approach developed by Chinn and Prasad (2003), Gruber and Kamin (2007), Chinn et al. (2007, 2011), Lee et al. (2008), Kumhof et al. (2012), Phillips et al. (2013) and estimate the following model

$$CA_{i,t} = \beta X_{i,t} + \gamma CORP_{i,t} + \delta INEQ_{i,t} + \varepsilon_{i,t} \tag{1}$$

- Cross-sectional demeaning: i indexes each country in the sample of J countries

$$\widetilde{X}_{i,t} = X_{i,t} - \frac{\sum_{i=1}^{J} \left(GDP_{i,t} * X_{i,t} \right)}{\sum_{i=1}^{J} GDP_{i,t}} \tag{2}$$

Estimation approach

- Model I (4-year non-overlapping averages): Pooled OLS with cluster-robust standard errors (CGER, 2008)

- Model II (annual data): Pooled GLS with panel-wide AR(1) correction (EBA, 2013)

- Countries: AUS, CAN, CHN, DNK, FIN, FRA, DEU, IRE, ITA, JPN, NLD, NZL, NOR, PRT, ZAF, ESP, SWE, CHE, GBR, USA

- Sample period: 1972-2007

Table I: Pooled OLS, 4-year non-overlapping averages, GDP-demeaning, 1972-2007

Regressor	(1.1)	(1.2)	(1.3)	(1.4)
Net foreign assets (% of GDP)	0.075***	0.068***	0.078***	0.070***
	(0.009)	(0.007)	(0.009)	(0.008)
Output per worker (rel. to top 3 economies)	0.013	-0.550	1.446	0.717
	(0.986)	(1.168)	(1.233)	(0.892)
Dependency ratio	-0.123	-0.244**	-0.174*	-0.273***
	(0.098)	(0.096)	(0.085)	(0.072)
Population growth	-1.667**	-2.496***	-1.628***	-2.215***
	(0.668)	(0.725)	(0.621)	(0.697)
Terms of trade gap*Trade openness	0.008***	0.006	0.008**	0.008*
	(0.002)	(0.004)	(0.003)	(0.004)
Private credit (% of GDP)	-0.060**	-0.060***	-0.054**	-0.055***
	(0.024)	(0.021)	(0.023)	(0.019)
Fiscal balance (% of GDP)	0.322***	0.432***	0.228***	0.333***
	(0.062)	(0.090)	(0.075)	(0.086)
Corporate balance (% of GDP)	-	0.448***	-	0.431***
		(0.126)		(0.118)
Top 1% income share	-	-	-0.380**	-0.328***
			(0.153)	(0.089)
Likelihood ratio (LR) test	-	49.36	14.93	68.10
p-value		0.000	0.000	0.000
Variance inflation factor (VIF)	1.60	1.57	1.58	1.57
Observations	162	128	156	126
Adjusted R-squared	0.579	0.738	0.618	0.772

Notes: Dependent variable is the current account balance in % of GDP. All regressions are estimated by POLS. Robust standard errors are reported in parantheses. All regressions include a constant term. *, ** and *** denotes significance at 10%, 5% and 1% levels, respectively.

Table II: Pooled OLS, 4-year non-overlapping averages, GDP-demeaning, 1972-2007

Regressor	(2.1)	(2.2)	(2.3)	(2.4)
Net foreign assets (% of GDP)	0.070***	0.070***	0.069***	0.071***
	(0.008)	(0.008)	(0.009)	(0.007)
Output per worker (rel. to top 3 economies)	0.717	0.170	-0.202	-1.277
	(0.892)	(0.818)	(0.778)	(1.052)
Dependency ratio	-0.273***	-0.286***	-0.352***	-0.321***
	(0.072)	(0.069)	(0.074)	(0.082)
Population growth	-2.215***	-2.086**	-2.828***	-2.161***
	(0.697)	(0.830)	(0.725)	(0.714)
Terms of trade gap*Trade openness	0.008*	0.008**	0.005	0.007*
	(0.004)	(0.003)	(0.005)	(0.004)
Private credit (% of GDP)	-0.055***	-0.054***	-0.051***	-0.060***
	(0.019)	(0.018)	(0.015)	(0.020)
Fiscal balance (% of GDP)	0.333***	0.334***	0.394***	0.351***
	(0.086)	(0.084)	(0.072)	(0.093)
Corporate balance (% of GDP)	0.431***	0.458***	0.407***	0.400***
	(0.118)	(0.114)	(0.095)	(0.123)
Top 1% income share	-0.328***	-	-	-
	(0.089)			
Top 5% income share	-	-0.228***	-	-
		(0.058)		
Top 10% income share	-	-	-0.178***	-
			(0.053)	
Gini coefficient	-	-	-	-0.136***
				(0.042)
Variance inflation factor (VIF)	1.57	1.53	1.59	1.81
Observations	126	123	123	128
Adjusted R-squared	0.772	0.785	0.800	0.756

Notes: Dependent variable is the current account balance in % of GDP. All regressions are estimated by POLS. Robust standard errors are reported in parantheses. All regressions include a constant term. *, ** and *** denotes significance at 10%, 5% and 1% levels, respectively.

Table III: Pooled OLS, 4-year non-overlapping averages, 1972-2007

| Regressor	(3.1)	(3.2)	(3.3)	(3.4)
Net foreign assets (% of GDP)	0.056***	0.057***	0.055***	0.056***
	(0.008)	(0.009)	(0.008)	(0.008)
Output per worker (rel. to top 3 economies)	-1.224	-1.610	-1.992*	-2.034
	(1.333)	(1.257)	(1.105)	(1.775)
Dependency ratio	-0.102	-0.111	-0.207**	-0.131
	(0.090)	(0.084)	(0.073)	(0.108)
Population growth	-1.687**	-1.220	-2.438***	-1.922**
	(0.741)	(0.797)	(0.636)	(0.759)
Terms of trade gap*Trade openness	0.006**	0.006**	0.003	0.005*
	(0.003)	(0.003)	(0.003)	(0.002)
Private credit (% of GDP)	-0.008	-0.004	-0.011	-0.013
	(0.009)	(0.008)	(0.010)	(0.008)
Fiscal balance (% of GDP)	-0.617***	-0.617***	-0.529***	-0.594***
	(0.130)	(0.130)	(0.111)	(0.132)
Corporate balance (% of GDP)	-0.499***	-0.460***	-0.519***	-0.514***
	(0.140)	(0.136)	(0.108)	(0.142)
Top 1% income share	-0.182	-	-	-
	(0.117)			
Top 5% income share	-	-0.171**	-	-
		(0.070)		
Top 10% income share	-	-	-0.125**	-
			(0.053)	
Gini coefficient	-	-	-	-0.042
				(0.079)
Variance inflation factor (VIF)	1.62	1.57	1.64	1.85
Observations	126	123	123	128
Adjusted R-squared	0.710	0.710	0.770	0.710

Notes: Dependent variable is the household financial balance in % of GDP. All regressions are estimated by POLS. Robust standard errors are reported in parantheses. All regressions include a constant term. *, ** and *** denotes significance at 10%, 5% and 1% levels, respectively.

Table IV: Pooled OLS, 4-year non-overlapping averages, 1972-2007

Regressor	(4.1)	(4.2)	(4.3)	(4.4)
Net foreign assets (% of GDP)	0.098***	0.096***	0.097***	0.097***
	(0.015)	(0.014)	(0.015)	(0.016)
Output per worker (rel. to top 3 economies)	-3.832*	-5.104**	-6.226**	-7.270**
	(1.896)	(1.786)	(2.214)	(2.860)
Dependency ratio	-0.279**	-0.314***	-0.443***	-0.397**
	(0.107)	(0.103)	(0.143)	(0.160)
Population growth	-0.026	-0.174	-1.170	-0.830
	(0.958)	(1.104)	(1.323)	(1.444)
Terms of trade gap*Trade openness	-0.003	-0.003	-0.006	-0.006*
	(0.003)	(0.003)	(0.004)	(0.004)
Private credit (% of GDP)	0.010	0.004	0.003	-0.009
	(0.017)	(0.015)	(0.017)	(0.017)
Fiscal balance (% of GDP)	0.655***	0.673***	0.741***	0.732***
	(0.090)	(0.088)	(0.126)	(0.130)
Corporate balance (% of GDP)	-0.051	-0.001	-0.049	-0.120
	(0.172)	(0.161)	(0.175)	(0.196)
Top 1% income share	-0.719***	-	-	-
	(0.193)			
Top 5% income share	-	-0.448***	-	-
		(0.114)		
Top 10% income share	-	-	-0.345***	-
			(0.098)	
Gini coefficient	-	-	-	-0.208*
				(0.106)
Variance inflation factor (VIF)	1.62	1.57	1.64	1.85
Observations	126	123	123	128
Adjusted R-squared	0.702	0.716	0.697	0.628

Notes: Dependent variable is the gross saving in % of GDP. All regressions are estimated by POLS. Robust standard errors are reported in parantheses. All regressions include a constant term. *, ** and *** denotes significance at 10%, 5% and 1% levels, respectively.

Contribution analysis
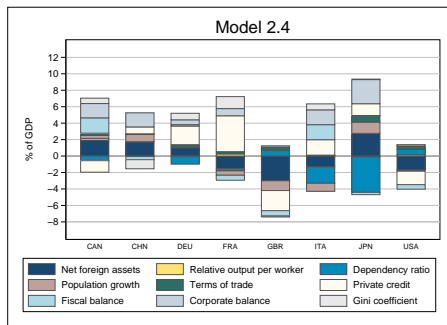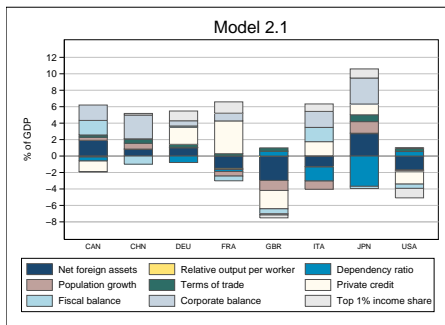
Notes: The figures show estimated contributions of the change in the explanatory variables to the change in the current account balance for the period 1980/3-2004/7 or the longest time span for which data are available. The estimated contributions are based on Model 2.1 and Model 2.4.

- Estimated contributions are based on regression results of Table II (POLS, 4-year non-overlapping averages, GDP-demeaning, 1972-2007)
- Large effects of corporate financial balance and top 1% income share
- Smaller effects of Gini coefficient

Table V: Pooled GLS, annual data, GDP-demeaning, 1972-2007

Regressor	(5.1)	(5.2)	(5.3)	(5.4)
L.Net foreign assets (% of GDP)	0.073***	0.077***	0.074***	0.075***
	(0.010)	(0.011)	(0.010)	(0.010)
L.NFA/Y*(Dummy if NFA/Y < -60%)	-0.056***	-0.060***	-0.053***	-0.054***
	(0.015)	(0.016)	(0.016)	(0.014)
L.Output per worker (rel. to top 3 economies)	-5.854***	-5.369***	-5.816***	-8.486***
	(2.025)	(2.075)	(2.028)	(2.116)
L.Relative output per worker*Capital openness	12.294***	11.101***	11.144***	13.728***
	(2.813)	(2.924)	(2.851)	(2.849)
Dependency ratio	-0.053	-0.075	-0.124**	-0.172***
	(0.061)	(0.064)	(0.061)	(0.061)
Population growth	-1.890***	-1.970***	-2.158***	-1.927***
	(0.370)	(0.405)	(0.379)	(0.366)
Reserve currency status	-2.866***	-2.515**	-2.295**	-2.683***
	(1.109)	(1.133)	(1.133)	(1.041)
Output gap	-0.368***	-0.362***	-0.323***	-0.375***
	(0.087)	(0.089)	(0.093)	(0.086)
Terms of trade gap*Trade openness	0.004***	0.004***	0.005***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Private credit (% of GDP)	-0.042***	-0.042***	-0.043***	-0.046***
	(0.008)	(0.008)	(0.008)	(0.007)
L.Fiscal balance (% of GDP)	0.161***	0.163***	0.182***	0.136***
	(0.049)	(0.050)	(0.051)	(0.049)
L.Corporate balance (% of GDP)	0.196***	0.195***	0.202***	0.163***
	(0.042)	(0.043)	(0.043)	(0.042)
Personal income inequality	-0.141*	-0.103**	-0.116***	-0.181***
	(0.074)	(0.050)	(0.042)	(0.040)
Observations	460	452	450	466
R-squared	0.484	0.482	0.504	0.510

Notes: Dependent variable is the current account balance in % of GDP. All regressions are estimated by PGLS with a panel-wide AR(1) correction. Heteroskedasticity-robust standard errors are reported in parantheses. All regressions include a constant term. L. denotes one year lag. *, ** and *** denotes significance at 10%, 5% and 1% levels, respectively. The top 1%, 5%, 10% income share, Gini coefficient is used as measure of personal income inequality in Model (5.1)-(5.4), respectively.

Table VI: Pooled GLS, annual data, 1972-2007

Regressor	(6.1)	(6.2)	(6.3)	(6.4)
L.Net foreign assets (% of GDP)	0.037***	0.046***	0.040***	0.040***
	(0.009)	(0.008)	(0.008)	(0.009)
L.NFA/Y*(Dummy if NFA/Y < -60%)	-0.004	-0.012	-0.004	-0.006
	(0.014)	(0.014)	(0.013)	(0.014)
L.Output per worker (rel. to top 3 economies)	-9.657***	-8.969***	-8.989***	-9.910***
	(1.517)	(1.503)	(1.532)	(1.715)
L.Relative output per worker*Capital openness	10.666***	9.398***	8.857***	10.678***
	(2.148)	(2.186)	(2.191)	(2.226)
Dependency ratio	0.047	0.011	-0.039	0.030
	(0.057)	(0.058)	(0.057)	(0.060)
Population growth	-0.975**	-0.762*	-1.390***	-1.038**
	(0.404)	(0.397)	(0.400)	(0.404)
Reserve currency status	-1.264	-0.128	-0.404	-0.950
	(1.064)	(1.080)	(1.018)	(1.023)
Output gap	-0.187***	-0.180***	-0.185***	-0.159**
	(0.071)	(0.069)	(0.070)	(0.071)
Terms of trade gap*Trade openness	-0.000	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Private credit (% of GDP)	-0.030***	-0.025***	-0.029***	-0.028***
	(0.007)	(0.006)	(0.006)	(0.006)
L.Fiscal balance (% of GDP)	-0.326***	-0.327***	-0.302***	-0.341***
	(0.047)	(0.047)	(0.046)	(0.047)
L.Corporate balance (% of GDP)	-0.308***	-0.296***	-0.328***	-0.322***
	(0.042)	(0.042)	(0.040)	(0.041)
Personal income inequality	0.029	-0.047	-0.057	-0.011
	(0.065)	(0.044)	(0.037)	(0.039)
Observations	463	455	453	469
R-squared	0.463	0.454	0.525	0.485

Notes: Dependent variable is the household financial balance in % of GDP. All regressions are estimated by PGLS with a panel-wide AR(1) correction. Heteroskedasticity-robust standard errors are reported in parentheses. All regressions include a constant term. L. denotes one year lag. *, ** and *** denotes significance at 10%, 5% and 1% levels, respectively. The top 1%, 5%, 10% income share, Gini coefficient is used as measure of personal income inequality in Model (6.1)-(6.4), respectively.

Table VII: Pooled GLS, annual data, 1972-2007

Regressor	(7.1)	(7.2)	(7.3)	(7.4)
L.Net foreign assets (% of GDP)	0.040***	0.047***	0.042***	0.041***
	(0.009)	(0.008)	(0.009)	(0.009)
L.NFA/Y*(Dummy if NFA/Y < -60%)	-0.005	-0.011	-0.004	-0.006
	(0.014)	(0.014)	(0.014)	(0.014)
L.Output per worker (rel. to top 3 economies)	-8.061***	-7.570***	-7.531***	-9.098***
	(1.486)	(1.449)	(1.500)	(1.758)
L.Relative output per worker*Capital openness	10.070***	8.634***	8.168***	10.771***
	(2.214)	(2.211)	(2.237)	(2.306)
Dependency ratio	-0.016	-0.042	-0.104*	-0.039
	(0.058)	(0.057)	(0.056)	(0.060)
Population growth	-1.305***	-0.906**	-1.713***	-1.353***
	(0.431)	(0.412)	(0.427)	(0.436)
Reserve currency status	-1.341	-0.165	-0.503	-1.466
	(1.111)	(1.110)	(1.059)	(1.069)
Output gap	-0.180**	-0.169**	-0.178**	-0.160**
	(0.073)	(0.070)	(0.073)	(0.073)
Terms of trade gap*Trade openness	-0.000	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Private credit (% of GDP)	-	-	-	-
L.Fiscal balance (% of GDP)	-0.383***	-0.372***	-0.365***	-0.392***
	(0.044)	(0.044)	(0.044)	(0.044)
L.Corporate balance (% of GDP)	-0.336***	-0.313***	-0.357***	-0.349***
	(0.042)	(0.041)	(0.041)	(0.041)
Personal income inequality	-0.080	-0.103**	-0.111***	-0.048
	(0.062)	(0.042)	(0.035)	(0.038)
Observations	464	456	454	470
R-squared	0.435	0.437	0.501	0.453

Notes: Dependent variable is the household financial balance in % of GDP. All regressions are estimated by PGLS with a panel-wide AR(1) correction. Heteroskedasticity-robust standard errors are reported in parantheses. All regressions include a constant term. L. denotes one year lag. *, ** and *** denotes significance at 10%, 5% and 1% levels, respectively. The top 1%, 5%, 10% income share, Gini coefficient is used as measure of personal income inequality in Model (7.1)-(7.4), respectively.

Table VIII: Pooled GLS, annual data, 1972-2007

Regressor	(8.1)	(8.2)	(8.3)	(8.4)
L.Net foreign assets (% of GDP)	0.089***	0.099***	0.094***	0.092***
	(0.013)	(0.013)	(0.013)	(0.014)
L.NFA/Y*(Dummy if NFA/Y < -60%)	-0.083***	-0.088***	-0.085***	-0.087***
	(0.017)	(0.018)	(0.018)	(0.018)
L.Output per worker (rel. to top 3 economies)	-16.839***	-16.140***	-19.684***	-22.070***
	(2.351)	(2.293)	(2.641)	(3.206)
L.Relative output per worker*Capital openness	22.875***	20.162***	24.374***	26.811***
	(3.204)	(3.171)	(3.529)	(3.950)
Dependency ratio	-0.067	-0.111	-0.121*	-0.141*
	(0.071)	(0.071)	(0.073)	(0.074)
Population growth	-0.577	-0.645	-0.840*	-0.586
	(0.451)	(0.464)	(0.476)	(0.464)
Reserve currency status	-2.916**	-1.976	-2.238*	-3.132**
	(1.280)	(1.272)	(1.337)	(1.341)
Output gap	0.353***	0.396***	0.360***	0.361***
	(0.069)	(0.070)	(0.076)	(0.068)
Terms of trade gap*Trade openness	0.003***	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Private credit (% of GDP)	-0.018**	-0.017**	-0.019**	-0.021***
	(0.007)	(0.007)	(0.008)	(0.007)
L.Fiscal balance (% of GDP)	0.305***	0.321***	0.331***	0.296***
	(0.048)	(0.048)	(0.052)	(0.048)
L.Corporate balance (% of GDP)	0.094**	0.097**	0.085*	0.064
	(0.045)	(0.046)	(0.049)	(0.046)
Personal income inequality	-0.282***	-0.226***	-0.190***	-0.180***
	(0.084)	(0.058)	(0.052)	(0.056)
Observations	460	452	450	466
R-squared	0.729	0.734	0.727	0.724

Notes: Dependent variable is gross saving in % of GDP. All regressions are estimated by PGLS with a panel-wide AR(1) correction. Heteroskedasticity-robust standard errors are reported in parantheses. All regressions include a constant term. L. denotes one year lag. *, ** and *** denotes significance at 10%, 5% and 1% levels, respectively. The top 1%, 5%, 10% income share, Gini coefficient is used as measure of personal income inequality in Model (8.1)-(8.4), respectively.

Overview

- We analyze potential links between income distribution and current account imbalances

  - How does rising (top-end) personal income inequality affect household saving and the current account?
  - How do shifts in the functional income distribution (profits or corporate income vs. wages or household income) affect the current account?

Main results

- An increase in personal income inequality leads to a decrease of the current account, ceteris paribus

- The explanatory power of top income shares is significantly higher than that of the Gini coefficient

- Consumers do not fully pierce the corporate veil, i.e. an increase in the corporate financial balance leads to an increase in the current account balance, ceteris paribus

- The joint effects of changes in personal and functional income distribution contribute to the explanation of the global current account imbalances observed prior to the Great Recession

The expenditure cascades model (Frank et al., 2010)

- Consumption demand of household i, C_i, depends on:
- its own income, Y_i $(+)$
- the consumption of households with a marginally higher income, C_{i+1} $(+)$

$$C_N = kY_N \qquad \text{for} \qquad i = N \tag{3}$$

$$C_i = \alpha kY_i + (1-\alpha)C_{i+1} \qquad \text{for} \qquad i = 1, ..., N-1; 0 < \alpha < 1 \tag{4}$$

- A rise in top income shares exerts downward pressure on the saving rates of all households below the top, but α depends on institutions
- A rise in the Gini may have little effect on the aggregate saving rate
- When firms retain their profits rather than passing them on to top income households, expenditure cascades may be weaker (the "corporate veil"), i.e., corporate governance institutions matter

Towards a renaissance of the relative income hypothesis?

The relative income hypothesis (James Duesenberry, Robert Frank)

- Higher (permanent) income inequality can lead to
    - Lower saving
    - Higher debt
    - (A higher labour supply)
- Households build consumption norms by looking at the consumption of other housholds just above them in the income distribution as a result of "positional concerns" (R. Frank)

Expenditure cascades?

- "Expenditure cascades" can start at the very top and go all the way down the income distribution (R. Frank)
- Strength of "expenditure cascades" depends on
    - where the shift in inequality occurs (top-middle-bottom)
    - norms and institutions

A closer look at Germany

Weak demand for credit due to specific nature of inequality

- Very strong increase in the Gini coefficient, but no increase of inequality at the very top (OECD, 2008, 2011)
  - Lower altitude of "expenditure cascades"
  - Strong decline in relative incomes at the bottom, where households are likely liquidity constraint
  - Increased middle class fear of status loss due to strongly declining incomes at the bottom (Groh-Samberg, 2009)

Weak demand for credit due to institutions/norms

- Specific German production and economic policy model reinforces fear of status loss and precautionary saving motive in a context of rising inequality
  - Firm-specific human capital and low female participation lead to higher risk of status loss in case of (male) unemployment (Carlin and Soskice, 2008)
  - Pension and labour market reforms of 2000s have increased income uncertainty (Deutsche Bundesbank, 2007)
  - No help to be expected from fiscal and monetary policy in case of unemployment (Hein and Truger, 2007; Fitoussi and Stiglitz, 2009)

A mechanical look at the "determinants" of private consumption

$$\frac{C}{Y} = (1 - s) * \frac{Y_{HH}}{Y} \qquad (5)$$
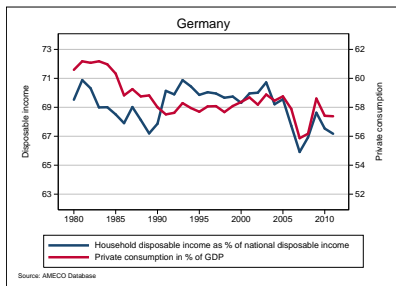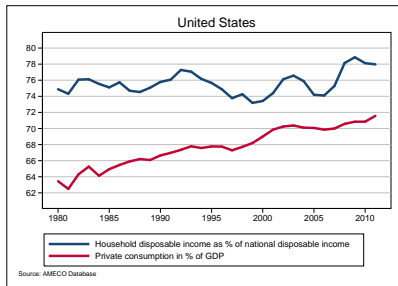
Source: AMECO Database, own calculations

- **United States:** Increase in C/Y "due to" decline in s, with Y_{HH}/Y constant
- **Germany:** Decrease in C/Y mainly "due to" decrease in Y_{HH}/Y, and to a lesser extent to increase in s

Two types of income inequality and corporate behaviour

- In the United States, firms have payed rising and extremely high salaries to the new "working rich" (since the early 1980s)

  → The "wage share" has remained roughly constant

  → Top-end personal income inequality has skyrocketted

- In Germany, firms have accumulated financial assets with their retained profits (during the 1980s and 2000s)

  → The "wage share" has fallen dramatically

  → Top-end personal income inequality has not increased very much

Illustration for the G7 countries - Canada

Top income shares, CAN, 1972-2007
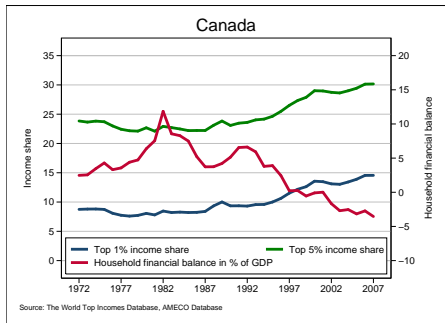
Wage share, CAN, 1972-2007
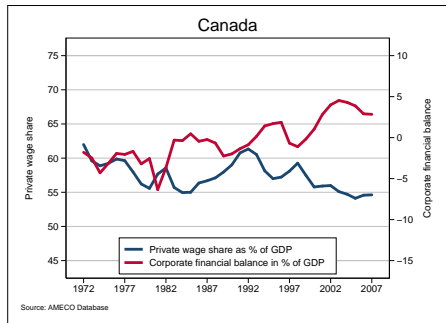
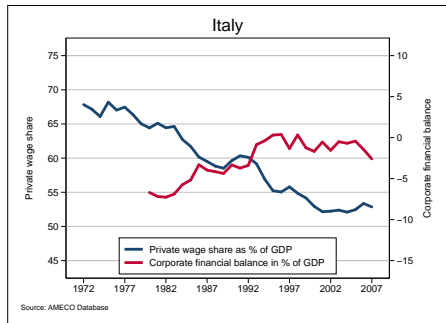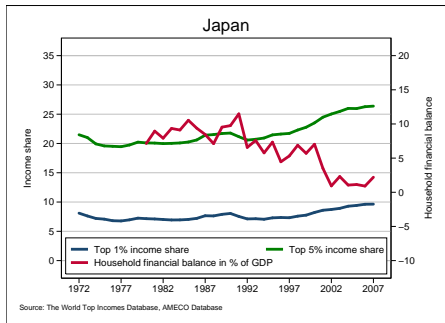Source: The World Top Incomes Database and AMECO Database, own calculations

- Rising top income shares and declining household financial balance since early 1980s
- Slightly falling wage share and slightly improving corporate financial balance since early 1980s

Illustration for the G7 countries - France

Top income shares, FRA, 1972-2007
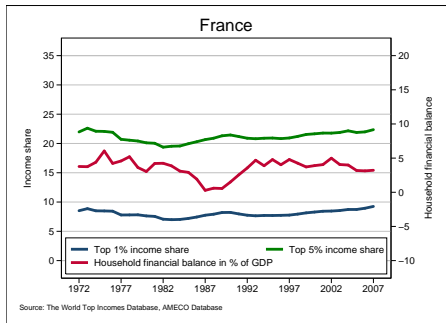
Wage share, FRA, 1972-2007
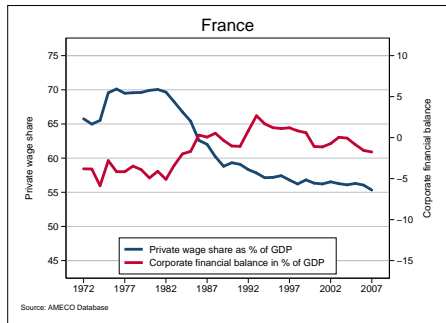
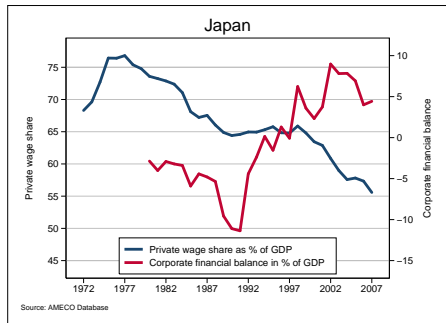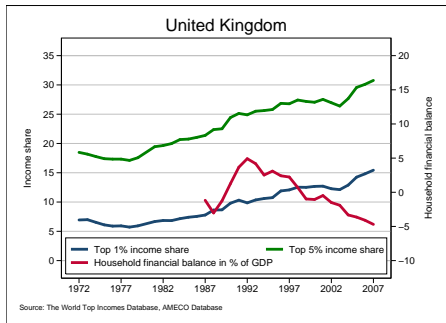Source: The World Top Incomes Database and AMECO Database, own calculations

- Constant top income shares and constant household financial balance since 1970
- Strongly falling wage share and strongly improving corporate financial balance since early 1980s

Illustration for the G7 countries - Germany

Top income shares, DEU, 1972-2007
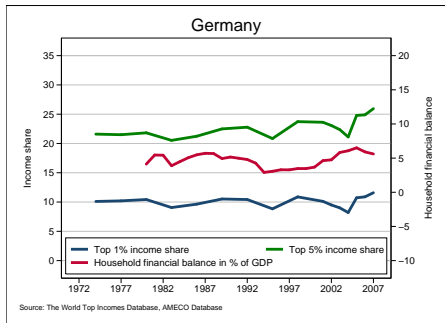
Wage share, DEU, 1972-2007
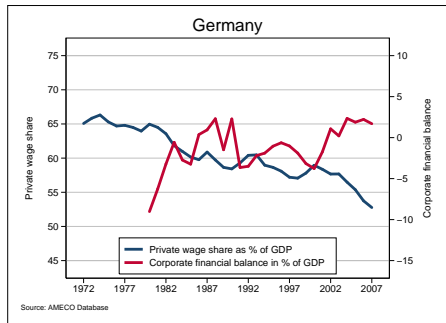
Source: The World Top Incomes Database and AMECO Database, own calculations

- Constant top income shares and constant household financial balance since 1980
- Strongly falling wage share and strongly improving corporate financial balance since early 1980s

Top income shares, ITA, 1975-2007
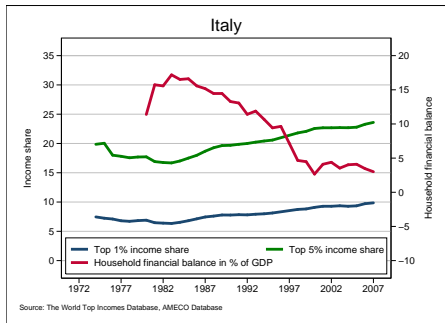
Wage share, ITA, 1972-2007

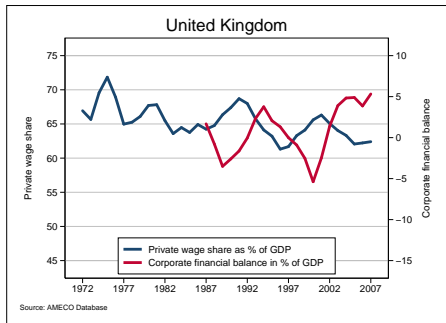Source: The World Top Incomes Database and AMECO Database, own calculations

- Rising top income shares and declining household financial balance since mid-1980s
- Strongly falling wage share and strongly improving corporate financial balance since early 1980s

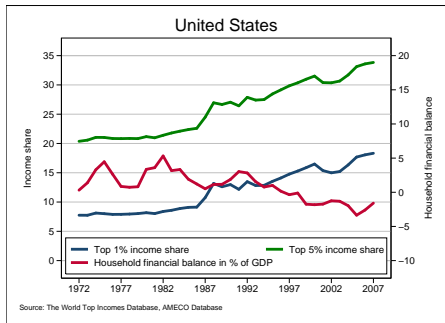## Top income shares, JPN, 1972-2007

Wage share, JPN, 1972-2007

Source: The World Top Incomes Database and AMECO Database, own calculations

- Rising top income shares and declining household financial balance since early 1990s
- Strongly falling wage share and strongly improving corporate financial balance since early 1980s

Illustration for the G7 countries - United Kingdom

Top income shares, GBR, 1972-2007

Wage share, GBR, 1972-2007

Source: The World Top Incomes Database and AMECO Database, own calculations
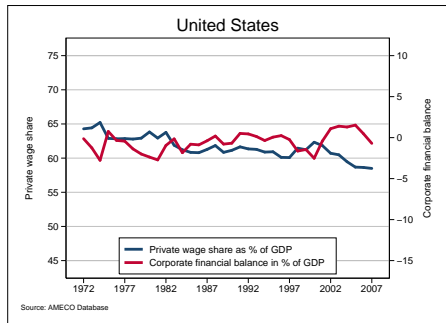
- Rising top income shares and declining household financial balance since 1990s
- Fluctuating wage share and negative correlation with corporate financial balance since mid-1980s

Illustration for the G7 countries - United States

Top income shares, USA, 1972-2007

Wage share, USA, 1972-2007

Source: The World Top Incomes Database and AMECO Database, own calculations

- Rising top income shares and declining household financial balance since early 1980s
- Slightly falling wage share and slightly improving corporate financial balance since early 1980s

Contribution analysis

| United States | Germany |
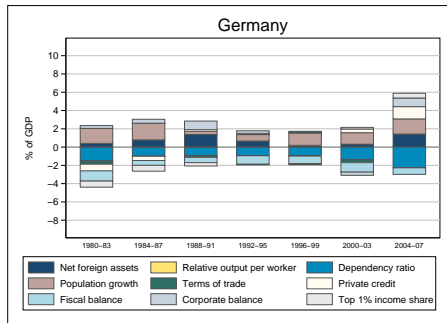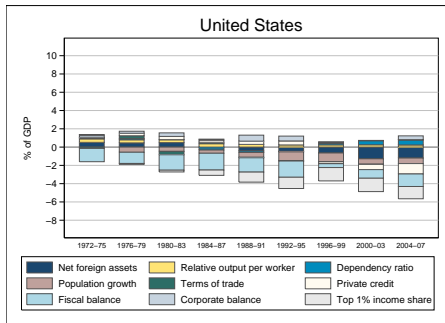
Notes: The figures show estimated contributions of the explanatory variables to the current account balance for the period 1972/5-2004/7 or the longest time span for which data are available. The estimated contributions are based on Model 2.1.

- Estimated contributions are based on regression results of Table II (POLS, 4-year non-overlapping averages, GDP-demeaning, 1972-2007)
- **United States:** Large effects of top 1% income share since the 1980s
- **Germany:** Large effect of the corporate financial balance in the 2000s