Post-Keynesian/Kaleckian demand-led growth models: the effect of distribution and gender equality on growth

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Core readings

Bhaduri, A. and Marglin, S. (1990). Unemployment and the real wage: the economic basis for contesting political ideologies. *Cambridge Journal of Economics*, 14(4): 375-93.

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Onaran, Ö, E Stockhammer, and L. Grafl (2011). "The finance-dominated growth regime, distribution, and aggregate demand in the US" *Cambridge Journal of Economics* 35(4):637-661

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Kalecki, M. (1954), *Theory of Economic Dynamics*, London: George Allen and Unwin, Ch 3-5

Kalecki, M. (1971), *Selected Essays on the Dynamics of the Capitalist Economy, 1933-70*, Cambridge, UK: Cambridge University Press. Ch 7-8 and Ch12

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.

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.

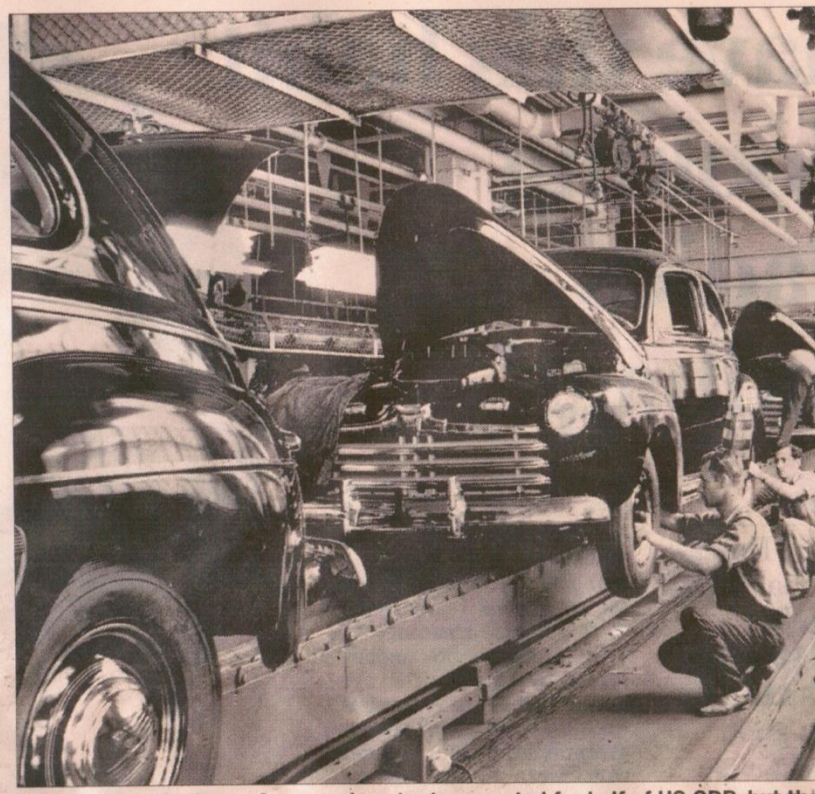
What all this means for the investment community is perhaps a little less clear-

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



In 1958, labour's share of economic output accounted for half of US GDP, but tha 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 ce ers, "who took ity for their en communities. sense that y responsibility f

Mr Reuther doubt have con

Outline

- Contesting theories
- Post-Keynesian/Post-Kaleckian and feminist theory on distribution and growth
- Empirical research
- Estimation Methodology
- Estimation results
- Policy implications

Income distribution: Glossary

- Personal income distribution
  - High vs. low income groups
- Functional income distribution
  - source of income - class
  - profit income (capital) vs. wage income (labor)
    - Value added (Y)=profit (R) + wage (W)
    - Profit: gross operating surplus
    - Wage: labour compensation
    - Wage share=wage/value added
    - Profit/value added=1- wage/value added
    - High profit share in income (high profitability)= low wage share
- Wage share vs. unit labor cost
- Wage share=(wage per employee*No of employees)/Value added
  =real unit labor cost
- Wage share=wage per employee/(Value added/No of employees)
  =wage per employee/productivity

Income Distribution

- Yf =GDP at factor cost
  =GDP-taxes on production & imports+subsidies
  =W+R
- W: Adjusted labour compensation
  - compensation per employee*Total employment
  - Particularly important for the DCs; informal, self-employed
- R: adjusted gross operating surplus =Yf-W
- π=Adjusted profit share= R/Yf
- Adjusted wage share=WS=W/Yf =1- π

Growth: neoclassical vs Keynes

- Growth was a central issue for classical economics
- But not for Neoclassicals, who focussed on allocation
- Keynesian-Neoclassical Synthesis: Keynesian short run and classical long run
- 1950 and 60s: development of neoclassical growth theory –Solow
  - savings determines investment
  - Assumes full employment
  - Supply-side economics
  - long run is independent of the short run
- New/Endogenous growth theory:
  - Technology is not exogenous but endogenous
  - a function of human capital, R&D expenditures, and other institutional factors
  - Increasing returns to scale or external effects of capital stock
  - But essentially also neoclassical; savings determines investment

Keynesian Criticisms against the Solow growth model

- Posits that long run is independent of the short run
- There are no ‘animal spirits’ in the long run. It effectively ignores demand-side problems.
- There is no role for institutions in influencing a country’s investment and growth path.

Effect of income distribution on growth: Contesting theories

- Effect of increasing profit share (falling wage share, rising inequality) on growth?
- Neoclassical
  - wage=cost
  - positive effect on investment
  - Positive effect on exports
- Puzzle: Why is growth lower despite a rise in the profit share?
- Keynes
  - Demand-led growth; excess capacity; involuntary unemployment
  - Inequality → negative effect on consumption (underconsumption)
  - Not much effect on investment (demand driven, animal spirits)
- Marx/Goodwin cycle
  - Large reserve army of labour; low wages→Realization crisis
  - Positive effect on investment
  - High growth, depleting the reserve army of labour: profit squeeze
- Post-Keynesian/Post-Kaleckian: Synthesis of Marx and Keynes

Post Keynesian/ post-Kaleckian growth

- Long run is a succession of short-run equilibria = no fundamental difference between short and long run
- Role of institutions
- I=S also at the centre of long run analysis.
- Animal spirits in the long run.
  - Note: there is no behavioural investment function in the Solow growth model.
- Saving rate depends on demand and income distribution
- Dual role of wages
  - Income distribution and demand-led growth
  - wage-led vs profit-led growth

The basic Kaleckian models and fundamental elements of modern capitalism

- “Goods and capital markets do not adhere to ideal perfect competition, but are rather characterized by oligopolistic and monopolistic elements.
- Prices are set via active cost-plus pricing,
- the mark-up on unit variable costs are affected by the degree of price competition among firms in the goods market, by overhead costs and by the bargaining power of trade unions in the labour market.
- Functional income distribution depends on distributional conflict, which primarily affects the mark-up,
- Labour supply is not a constraint to production, output, or growth,
- the system is characterized by involuntary unemployment, also in the long run.
- Excess capacity is the norm and the rate of capacity utilization is treated as an adjusting variable in the long run, too.
- The principle of effective demand applies to the short, medium and long run.
- Saving is not a precondition for investment, but rather adjusts to investment through income and growth effects in the long run.
- The model generates a paradox of saving also in the long run growth context.

Post-Keynesian/Post-Kaleckian models

- Wages are
  - Cost item: lower wages=
    - higher profitability
    - higher international competitiveness
  - Source of domestic demand
- Lower share of wages in national income (higher profit share) $\rightarrow$

1. lower domestic consumption
   - Marginal propensity to consume (mpc) out of wages >mpc out of profits
2. A positive partial effect on investment
   - Investment depends on profitability, but also demand
   - the sensitivity of investment to profits (partial)?
3. higher foreign demand (Net exports=Exports-Imports)
   - Unit labor costs $\downarrow \rightarrow$ higher international competitiveness
   - the sensitivity of net exports to unit labor costs; price elasticity of exports and imports; labour intensity of exports

…Post-Keynesian/Post-Kaleckian models

- Increase in the profit share: + & - effects on aggregate demand
  - if total effect is -: wage-led demand
    if total effect is +: profit-led demand
  - Bhaduri and Marglin (1990)
- a flexible/synthesis distribution and growth model
- '"Particular *models* such as that of 'cooperative capitalism' enunciated by the left Keynesian social democrats, the Marxian model of 'profit squeeze' or even the conservative model relying on 'supply-side' stimulus through high profitability and a low real wage... become particular *variants* of the theoretical framework presented here." (Bhaduri/Marglin 1990, p. 388)'
- social and historical framework determining the parameters
- An empirical research question?

Consumption (C)

$$C = c_0 + c_w W + (c_\pi) R$$

c_w marginal propensity to consume out of wages

c_π marginal propensity to consume out of profits

$$c_\pi < c_w$$

For a given total income, lower wage share
=lower consumption (higher saving)

All vars are in logs

Converting elasticities to marginal effects

- The estimations give us the elasticities. However we are interested in the marginal (not proportional) effect of a change in π (R/Y) on C as a ratio to Y in order to eventually sum up the effects across different components of demand (I & NX as a ratio to Y) and find as a response to a 1%-point increase in R/Y.

Converting elasticities to marginal effects

Note that in Equation 1 c_R is estimated for a given W.

$$c_R = \frac{\partial \log C}{\partial \log R}\Big|_W \cong \frac{\frac{\partial C}{C}}{\frac{\partial R}{R}}\Big|_W = \frac{\partial C}{\partial R}\frac{R}{C}\Big|_W \qquad \text{(C.4)}$$

$$c_W = \frac{\partial \log C}{\partial \log W}\Big|_R \cong \frac{\frac{\partial C}{C}}{\frac{\partial W}{W}}\Big|_R = \frac{\partial C}{\partial W}\frac{W}{C}\Big|_R \qquad \text{(C.5)}$$

Dividing and multiplying equations C.4 and C.5 by Y gives

$$c_R = \frac{\partial C/Y}{\partial R/Y}\frac{R}{C}\Big|_W \qquad \text{(C.6)}$$

$$c_W = \frac{\partial C/Y}{\partial W/Y}\frac{W}{C}\Big|_R \qquad \text{(C.7)}$$

Calculating the marginal effects gives (for a given level of W or R)

$$\frac{\partial C/Y}{\partial R/Y}\Big|_W = c_R\frac{C}{R}\Big|_W \qquad \text{(C.8)}$$

$$\frac{\partial C/Y}{\partial W/Y}\Big|_R = c_W\frac{C}{W}\Big|_R \qquad \text{(C.9)}$$

Converting elasticities to marginal effects

However, W/Y=1-R/Y;
hence for a given Y, i.e. prior to any multiplier effects, for an increase in R/Y, there is an equivalent fall in W/Y, ∂W/Y=-∂R/Y.
The aggregate effect of an increase of R/Y on C/Y :
effects from an increasing profit income
+
falling wage income for an initially constant Y:

$$\frac{\partial C/Y}{\partial R/Y} = c_R \frac{C}{R} - c_W \frac{C}{W} \qquad \text{(C.10)}$$

In converting the elasticities to the marginal effects, multiply the estimated elasticities of R and W by the mean values of C/R and C/W respectively for the whole sample.

Private Investment (I)

Note: not Total investment!!

Private Investment depends on

Profitability (profit share)

Demand (sales & production (output))

Capacity utilization : proxy Y (accelerator effect)

$$I = i_A + i_Y Y + i_\pi \pi$$

+Digression: I=f(profit rate)

Profit rate=R/K=(R/Y)(Y/Y*)(Y*/K)

Y*: full capacity output

Y*/K: full capacity capital productivity: technology: assume constant =assume 1

Y/Y*=capacity utilization

Problems in measuring Y*: trend growth??

Hence we simply use Y =accelerator effect in standard models

+Test if real interest rate is significant (mostly insign or has wrong sign; deleted if insign)

Converting elasticities to marginal effects

i_π is the elasticity of I with respect to π (R/Y):

$$i_\pi = \frac{\partial \log I}{\partial \log(R/Y)} \cong \frac{\frac{\partial I}{I}}{\frac{\partial (R/Y)}{(R/Y)}} = \frac{\partial I}{\partial (R/Y)} \frac{R/Y}{I}$$

Multiplying and dividing Equation D.4 by Y,

$$i_\pi = \frac{\partial I}{\partial (R/Y)} \frac{Y}{Y} \frac{R/Y}{I} = \frac{\partial I/Y}{\partial (R/Y)} \frac{R}{I}$$

Hence, the marginal effect of R/Y on I/Y is

$$\frac{\partial I/Y}{\partial (R/Y)} = i_\pi \frac{I}{R}.$$

Foreign sector

- stepwise approach
- domestic prices=f(nominal unit labor costs, import prices)
- export prices =f(nominal unit labor costs, import prices)
- Exports= f(export price/import price, Yrw)
- Imports=f(domestic price/import price, Y)

- X, M: exchange rate mostly insign

Converting elasticities to marginal effects

- real unit labor costs=wage share*GDP at factor cost/GDP
- Rulc=ws*Yf/Y
- Rulc= nominal unit labor costs/P=ulc/P
- ulc=P*rulc
- Log(rulc)=log(ulc)-log(P)
- Dlog(rulc)/dlog(ulc)=1-e_{Pulc}

$$\frac{\partial l(ulc)}{\partial l(rulc)} = \frac{1}{1-e_{pulc}}$$

$$\frac{\partial X/Y}{\partial(WS)} = \left(\frac{\partial \log X}{\partial \log P_x}\frac{\partial \log P_x}{\partial \log(ulc)}\frac{\partial \log(ulc)}{\partial \log(rulc)}\frac{\partial \log(rulc)}{\partial \log(ws)}\right)\frac{X/Y}{rulc}$$

$$= \left(e_{XP_x}e_{P_xULC}\frac{1}{1-e_{PULC}}\frac{Yf}{Y}\right)\frac{X/Y}{rulc}$$

The first part is elasticity of X to ws and then it is multiplied by X/Y / rulc to find marginal effect

- Similarly for M

$$\frac{\partial M/Y}{\partial(ws)} = \left(\frac{\partial \log M}{\partial \log P}\frac{\partial \log P}{\partial \log(ulc)}\frac{\partial \log(ulc)}{\partial \log(rulc)}\frac{\partial \log(rulc)}{\partial \log(ws)}\right)\frac{M/Y}{rulc}$$

$$= \left(e_{MP}e_{PULC}\frac{1}{1-e_{PULC}}\frac{Yf}{Y}\right)\frac{M/Y}{rulc}$$

Then $$\frac{\partial\left(\frac{NX}{Y}\right)}{\partial\pi} = \frac{\partial\left(\frac{X}{Y}\right)}{\partial\pi} - \frac{\partial\left(\frac{M}{Y}\right)}{\partial\pi}$$

The effect of a change in the profit share on total private demand

$$\frac{\partial Y}{\partial \pi} = (c_\pi - c_w)\frac{C/Y}{\pi} + i_\pi \frac{I/Y}{\pi} + \frac{\partial NX}{\partial \pi}$$

- Depends on the effect of distribution (π) on
  - consumption (-),
  - investment (+),
  - net exports(+)

- Negative: wage led
  - high consumption differentials (strong reaction of C to π),
  - low positive effect of an increase in π on I
  - Low positive effects on net exports , also depends on X/Y & M/Y

- Positive: profit led

National and global multiplier effects

- National multiplier
  - private demand changes → changes in
    - Investment
    - Consumption
    - imports
- Global effects of a simultaneous fall in the wage share
  - Effects of changes in trade partners' wage share via changes in
    - import prices
    - trade partners' GDP

Fallacy of composition: Inconsistency of the Macro vs. Micro rationale

- Firm vs. aggregate/national
- National vs. regional/global level
- Economic globalization may make small open economies more likely to be profit-led
- But political globalization →race to the bottom in labour share
  - international competitiveness effects are eliminated
  - makes economies more likely to be wage-led

National and Global Multiplier effects

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

$$E_{nxn} = \begin{bmatrix} \dfrac{\dfrac{\delta C}{Y}_1 + \dfrac{\delta I}{Y_1} + \dfrac{\delta NX}{Y}_1}{\delta \pi_1} & 0 & \cdots & 0 \\ 0 & \ddots & \vdots & \vdots \\ \vdots & \cdots & \ddots & \vdots \\ 0 & \cdots & \cdots & \dfrac{\dfrac{\delta C}{Y}_n + \dfrac{\delta I}{Y_n} + \dfrac{\delta NX}{Y}_n}{\delta \pi_n} \end{bmatrix}$$

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

The coefficient estimates in Tables 1, 2, and 6
give the elasticities of C, I, and M with respect to Y (e_{CY}, e_{IY}, e_{MY}).
For the elasticity of C with respect to Y, e_{CY},:
e_{CY} is calculated as $e_{CR}\pi + e_{CW}(1-\pi)$,
where e_{CR} and e_{CW} are the elasticity of C wrt R and W.
e_{CY} is a weighted average of the elasticities of C wrt R and W,
weights are the shares of R and W in Y (at sample mean).
Again the elasticities have to be converted into partial effects. e.g

$$e_{CY\,i} = \frac{\partial \log C_i}{\partial \log Y_i} \cong \frac{\frac{\partial C_i}{C_i}}{\frac{\partial Y_i}{Y_i}} = \frac{\partial C_i}{\partial Y_i}\frac{Y_i}{C_i} \qquad \text{(D.4)}$$

$$\frac{\partial C_i}{\partial Y_i} = e_{CY\,i}\frac{C_i}{Y_i} \qquad \text{(D.5)}$$

Finally $H_{ii} = \frac{\partial C_i}{\partial Y_i} + \frac{\partial I_i}{\partial Y_i} - \frac{\partial M_i}{\partial Y_i} = e_{CY\,i}\frac{C_i}{Y_i} + e_{YI\,i}\frac{I_i}{Y_i} - e_{MY\,i}\frac{M_i}{Y_i}$.

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.

$$P_{nxn} = \begin{bmatrix} 0 & \frac{\partial(\frac{NX}{Y})_1}{\partial \pi_2}\frac{M_{21}}{M_1} & \cdots & \frac{\partial(\frac{NX}{Y})_1}{\partial \pi_n}\frac{M_{n1}}{M_1} \\ \frac{\partial(\frac{NX}{Y})_2}{\delta \pi_1}\frac{M_{12}}{M_2} & 0 & \vdots & \frac{\partial(\frac{NX}{Y})_2}{\delta \pi_n}\frac{M_{n2}}{M_2} \\ \vdots & \cdots & \ddots & \vdots \\ \frac{\partial(\frac{NX}{Y})_n}{\delta \pi_1}\frac{M_{1n}}{M_n} & \frac{\partial(\frac{NX}{Y})_n}{\delta \pi_2}\frac{M_{2n}}{M_n} & \cdots & 0 \end{bmatrix}$$

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

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

Global Multiplier

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

$$\begin{bmatrix} \frac{\Delta Y_1}{Y_1} \\ \vdots \\ \frac{\Delta Y_n}{Y_n} \end{bmatrix} = (I_{nxn} - H_{nxn} - W_{nxn})^{-1} (E_{nxn} + P_{nxn}) \begin{bmatrix} \Delta\pi_1 \\ \vdots \\ \Delta\pi_n \end{bmatrix}$$

THE MODEL WITH GOVERNMENT

Consumption

$$logC = c_0 + c_R \log\left((1 - t_r)R\right) + c_W \log\left((1 - t_w)W + logB + logCTO\right))$$

- Consumption(C) is estimated as a function of adjusted after-tax profits((1-tr)R), adjusted after-tax wages((1-tw)W) and social benefits in cash/ other current transfers(B+CTO) which augment disposable income of HH

- If the regime is wage-led a more progressive tax system (taxes on capital increasing while those on labour decreasing) increases the impact on demand (Blecker, 2002)

Investment

$$logI = i_a + i_Y \log\left(Y_p\right) + i_\pi \log\left((1 - t_r)\pi\right) + i_g \log(G) + i_d \log\left(D/Y\right)$$

- Private investment depends positively on private output and the after-tax profit share

- Total Government expenditure enhances private investment through demand and crowding in effects (Commendatore, 2011; Seguino, 2012)
  - Alternative specification: disagregate G in social and physical infrastructure and other current spending

- Private investment depends negatively on public debt to GDP (crowding out) (Dutt, 2013; Tavani and Zamparelli, 2015)

Domestic and Export Prices, Exports, Imports

$$logP = p_0 + p_{ulc}\ log(ulc) + p_m log(Pm) + p_{tc} \log(1 + t_c)$$

$$logP_x = px_0 + p_{xulc}\, log(ulc) + p_{xm} log(P_{xm}) + p_{tcf} \log\,(1 + t_{cfi})$$

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

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

$G = \kappa_g Y$

Government

$$G = \kappa_g Y$$

$$T = t_w W + t_r R + t_c C$$

$$D = D_{-1} + G_{tot} + rD_{-1} - T$$

Post-Kaleckian Feminist Model: short run and long run Onaran, Oyvat, Fotopoulou 2018

Open economy with 2 sectors: "social sector" & the rest of the economy and male and female workers and capital

- Effect of income distribution (wages vs profits and male vs female wage gaps) on consumption, investment, and net exports
- Effect of public spending in physical vs social infrastructure

→Demand side effect in the short run and long run

→Long run supply side effect on productivity

  - wages, demand, public spending →productivity↑ → moderates the effect of wages on the profit share

- Demand and productivity affect employment of men and women

Gender equality and growth

- Equality is not only a desirable social goal in itself but may also contribute to economic growth and development via
  - Demand side effects on growth and investment: Short and long run
  - Supply side via effects on productivity: Long run
- Consumption ↑ as equality ↑
  - Not just the level but also composition of consumption may change
  - more income in the hands of women →household spending on children's education and health…↑
  - Social infrastructure=positive function of gender equality
- Private investment↑ as social infrastructure→productivity↑ & demand↑
  - Public + household spending in social infrastructure
- wage share↑ & gender gaps↓→ upward convergence & ↑equality
  - →higher growth in a wage-led economy
  - Wage-led growth = Equality-led growth

Estimation strategy

- Single equation approach
- Lag structure: contempraneous & 1 lag, keeping only significant vars with expected sign
- A kind of General to Specific but not Testing Down (which would be to drop most insignificant at a time untill all significant, but very sensitive to path and misses relevant specifications)
- Test cointegration

LR relation: $y_t = b * x_{t-1}$

Error: $y_{t-1} - b * x_{t-1}$

ECM: $\Delta y_t = a_0 + a_1 * \Delta x_t + a_2 * \Delta x_{t-1} + a_2 * \Delta y_{t-1} + c2(yt-1 - b*x_{t-1})$ → Error correction term, c2<0

ECM: $\Delta y_t = a_0\ a_1 * \Delta x_t + a_2 * \Delta x_{t-1} + a_2 * \Delta y_{t-1} + c_2 y_{t-1} + c_3 * x_{t-1}$

Long run coefficient: $b = -c_3/c_2$

- To test ECM We use the t-ratios reported by Banerjee *et al.* (1998) for the speed of adjustment coefficient (c2) to test the significance of cointegration.

if no cointegration, SR estimation in differences

- If SR: long run coefficient= Σcoeff. of lags/(1- Σ coeff of lagged dependent var)
- if WS (and π) stationary, then use level (check cointegration only between I&Y)
- Wherever there is autocorrelation, either the lagged dependent variable is kept, or an AR(1) term is added.

Empirical Literature

- Systems approach (VAR): Deals with simultaneity, weak in identifying effects on C and I (few if any control variables)
  - small effects (Onaran & Stockhammer 05, Korea, Turkey; Stockhammer & Onaran 04, US, UK, F;) or profit-led demand (Barbosa-Filho & Taylor 06, US; Flaschel & Proano 07)
- Single equation approach: Good in identifying effects, bad in dealing with endogeneity
  - estimate separate C, I, NX functions
    - Bowles & Boyer 95; Naastepad & Storm 07; Hein and Vogel 08: OECD6/8
  - estimate separate C, I, X, M, P functions
    - Oaran and Galanis 2012, Onaran et al 11, Stockhammer et al 09; Ederer & Sto. 07, Sto. & Ederer 08, Stochammer et al 11: G20, US, Eurozone, France, Austria, Germany respectively
    - US: +effects of financialization
- Most find wage-led private domestic demand regimes
  - Onaran and Galanis 12, Stockhammer et al09, Storm&Naastepad07, Hein&Vogel08, Stockhammer&Stehrer09

... Estimation strategy

- The single-equation approach allows for a flexible modelling of the individual behavioural equations.
- three issues, which may cause a bias in the estimations.
- 1. functional income distribution is assumed to be exogenous. Obviously this is not the case, e.g. lower growth and higher unemployment will have a negative effect on the wage share; however this works usually with a time lag. By assuming exogeneity, we are implying that the time lag of this effect is longer than one year. Endogenizing income distribution is not feasible in the absence of good instrumental variables and long time series data, which could allow for using own lags of the distribution variables as instruments.
- 2. the single equation approach fails to utilize the fact that consumption, investment and net exports add up to private demand.
- The main alternative, a VAR approach would require substantially simplifying the model as these models cannot handle more than five endogenous variables. Such simplification is likely to lead to misspecification of the behavioural functions. Furthermore the results of VAR estimations are more difficult to interpret. It is not possible to detect and decompose the precise economic relationships that lead to changes in demand in response to distribution. Nevertheless, the convenience of interpretation of the results of the single equation approach comes at the price of some potential bias because the system-dimension and endogeneity are ignored.

... Estimation strategy

- 3. the global effects are calculated based on the separately estimated effects for each country.
- Revised version: test Seemingly Unrelated Regression (correlated errors) estimated as a system of all equations for C (also for I, X, M, Px, P) for all countries with the selected equations (that survived the General to Specific based on individual country estimations!)
- however the correlation of the error terms across the country specific equations were not significant; thus we could not reject the hypothesis of independence.

Data

- annual, 1960/70-2007; AMECO, OECD, WB, ILO, MOSPI, UNIDO, China National Statistics Office, Molero Simarro 11, Lindenboim et al 11,
  - Link adjusted & unadjusted WS for Argentina 1970-92, 2006-07, South Africa 1970-88, 2005-07
  - Use mixed income for India and China
-

Consumption

	c	*t-value*	dlog(Rt)	*t-value*	dlog(Wt)	*t-value*	DW	R2	Sample						
Euro area-12	0.006	*3.110*	0.127	*3.716*	0.739	*15.406*	1.871	0.873	1961 2007						
Germany	0.007	*2.439*	0.091	*1.576*	0.714	*10.162*	1.954	0.713	1961 2007						
France	0.007	*3.153*	0.137	*4.717*	0.640	*10.770*	2.120	0.771	1961 2007						
Italy	0.008	*2.474*	0.167	*4.101*	0.711	*8.621*	1.515	0.705	1961 2007						
Australia	0.017	*4.394*	0.098	*3.295*	0.440	*5.463*	1.831	0.411	1961 2007						
	c	*t-value*	dlog(Rt)	*t-value*	dlog(Wt)	*t-value*	ar(1)	*t-value*	DW	R2	Sample				
UK	0.006	*1.501*	0.162	*5.200*	0.735	*6.852*	0.331	*2.173*	1.838	0.683	1962 2007				
Canada	0.007	*1.911*	0.160	*6.268*	0.659	*6.852*	0.411	*2.904*	1.935	0.725	1962 2007				
	c	*t-value*	dlog(Rt)	*t-value*	dlog(Wt)	*t-value*	dlog(Rt-1)	*t-value*	dlog(Wt-1)	*t-value*	dlog(Ct-1)	*t-value*	DW	R2	Sample
US	0.012	*4.048*	0.181	*4.968*	0.536	*6.509*	-0.114	*-2.523*	-0.140	*-1.389*	0.247	*1.517*	2.017	0.822	1962 2007
	c	*t-value*	dlog(Rt-1)	*t-value*	dlog(Wt-1)	*t-value*	DW	R2	Sample						
Japan	0.011	*2.256*	0.083	*2.103*	0.611	*6.747*	2.300	0.599	1962 2007						

	c	*t-value*	dlog(Rt)	*t-value*	dlog(Wt)	*t-value*	dlog(Rt-1)	*t-value*	dlog(Wt-1)	*t-value*	dlog(Ct-1)	*t-value*	DW	R2	Sample		
Turkey	0.008	*0.506*	0.328	*2.840*	0.316	*2.432*	0.088	*0.688*	0.275	*1.824*	-0.151	*-0.873*	1.803	0.320	1972 2006		
	c	*t-value*	dlog(Rt)	*t-value*	dlog(Wt)	*t-value*	DW	R2	Sample								
Korea	-0.004	*-0.411*	0.072	*3.820*	0.845	*7.603*	2.073	0.641	1971 2007								
Argentina	0.003	*0.575*	0.430	*7.927*	0.579	*13.903*	1.944	0.855	1971 2007								
	c	*t-value*	dlog(Rt)	*t-value*	dlog(Wt)	*t-value*	AR(1)	*t-value*	DW	R2	Sample						
Mexico	0.006	*1.263*	0.376	*7.625*	0.566	*17.015*	0.477	*3.021*	1.878	0.905	1972 2007						
	c	*t-value*	dlog(Rt)	*t-value*	dlog(Wt)	*t-value*	dlog(Rt-1)	*t-value*	dlog(Wt-1)	*t-value*	DW	R2	Sample				
China	-0.014	*-0.690*	0.443	*3.730*	0.400	*1.629*	-0.198	*-1.604*	0.375	*1.702*	2.020	0.593	1980 2007				
	c	*t-value*	dlog(Rt)	*t-value*	dlog(Wt)	*t-value*	dlog(Rt-1)	*t-value*	dlog(Wt-1)	*t-value*	dlog(Yat)	*t-value*	dlog(Yat-1)	*t-value*	DW	R2	Sample
India	0.003	*0.530*	0.123	*3.270*	0.586	*4.317*	0.028	*0.903*	0.158	*1.319*	-0.009	*-0.100*	-0.168	*-2.324*	1.894	0.809	1972 2007
	c	*t-value*	dlog(Rt)	*t-value*	dlog(Wt)	*t-value*	dlog(Yat)	*t-value*	DW	R2	Sample						
South Africa	0.009	*2.939*	0.312	*9.030*	0.785	*10.101*	-0.061	*-3.400*	1.926	0.781	1971 2007						

The effects of a 1%-point increase in the profit share

Wage led

	C/Y	I/Y	X/Y	M/Y	NX/Y	% change in total private excess demand
Euro zone-12	-0.439	0.299	0.057	0.000	0.057	-0.084
Germany	-0.501	0.376	0.096	0.000	0.096	-0.029
France	-0.305	0.088	0.036	-0.162	0.198	-0.020
Italy	-0.356	0.130	0.037	-0.089	0.126	-0.100
United Kingdom	-0.303	0.120	0.048	-0.110	0.158	-0.025
United States	-0.426	0.000	0.006	-0.031	0.037	-0.388
Japan	-0.353	0.284	0.028	-0.026	0.055	-0.014
Canada	-0.326	0.182	0.063	-0.203	0.266	0.122
Australia	-0.256	0.174	0.049	-0.223	0.272	0.190

The effects of a 1%-point increase in the profit share

	C/Y	I/Y	X/Y	M/Y	NX/Y	% change in total private excess demand
Turkey	-0.491	0.000	0.140	-0.144	0.283	-0.208
Mexico	-0.438	0.153	0.128	-0.253	0.381	0.096
Korea	-0.422	0.000	0.178	-0.181	0.359	-0.063
Argentina	-0.153	0.015	0.014	-0.178	0.192	0.054
China	-0.412	0.000	1.095	-0.891	1.986	1.574
India	-0.291	0.000	0.080	-0.230	0.310	0.018
South Africa	-0.145	0.129	0.000	-0.506	0.506	0.490

Table 10 Elasticities of C, I, and M with respect to Y

	e_{CY}	e_{YI}	e_{MY}	h	Multiplier
Euro area-12	0.551	1.020	2.035	0.371	1.590
Germany	0.516	0.913	1.911	0.071	1.076
France	0.494	2.050	1.963	0.280	1.388
Italy	0.539	2.610	2.136	0.422	1.730
United Kingdom	0.579	1.311	1.859	0.167	1.200
United States	0.387	3.105	1.996	0.519	2.080
Japan	0.464	1.840	1.136	0.584	2.407
Canada	0.499	1.780	1.505	0.176	1.214
Australia	0.324	2.021	1.886	0.291	1.410
Turkey	0.457	3.343	1.684	0.547	2.208
Mexico	0.471	1.406	2.591	0.097	1.108
Korea	0.725	2.509	2.265	0.452	1.824
Argentina	0.508	0.894	2.868	0.276	1.381
China	0.553	1.664	1.501	0.137	1.159
India	0.639	1.561	1.075	0.541	2.180
South Africa	0.632	1.176	1.199	0.214	1.272

$$h = e_{CY}\frac{C}{Y} + e_{YI}\frac{I}{Y} - e_{MY}\frac{M}{Y}$$

Summary of the multiplier effects at the national and global level

	The effect of a 1%-point increase in the profit share in only one country on private excess demand/Y	The effect of a 1%-point increase in the profit share in only one country on % change in aggregate demand (A*multiplier)	The effect of a simulataneous 1%-point increase in the profit share on the % change in aggregate demand (including effects of trade partners' export prices and GDP))
	A	B	D
Euro area-12	-0.084	-0.133	-0.245
United Kingdom	-0.025	-0.030	-0.214
United States	-0.388	-0.808	-0.921
Japan	-0.014	-0.034	-0.179
Canada	0.122	0.148	-0.269
Australia	0.190	0.268	0.172
Turkey	-0.208	-0.459	-0.717
Mexico	0.096	0.106	-0.111
Korea	-0.063	-0.115	-0.864
Argentina	0.054	0.075	-0.103
China	1.574	1.932	1.115
India	0.018	0.040	-0.027
South Africa	0.490	0.729	0.390

global GDP↓ by 0.36%

A wage-led recovery scenario (Onaran and Galanis 2012)

	Scenario 2	
	Change in profit share	The % change in aggregate demand (includes national and global multiplier effects, i.e. changes in Pm and Yrw)
Euro area-12	-11.05	2.36
United Kingdom	-7.83	1.91
United States	-6.31	6.15
Japan	-16.71	1.49
Canada	-3.00	2.84
Australia	-3.00	0.03
Turkey	-18.41	10.81
Mexico	-3.00	1.45
Korea	-8.64	7.46
Argentina	-3.00	1.27
China	-1.00	5.56
India	-3.00	0.43
South Africa	-1.00	1.93

Global GDP↑ by 3.05%

Source: Onaran and Galanis (2012)

Conclusion -1

- Domestic demand (consumption+investment) is wage-led (for both the developed and developing countries).
- Large/relatively closed economies are rather wage-led
  - ↑wage share : egalitarian; does not harm growth potential
- Global simulation: the limits of strategies of international competitiveness based on wage competition in a highly integrated global economy
- Some profit-led economies also contract as an outcome of race to the bottom (Canada, India, Mexico and Argentina)
- Macro – micro conflict/fallacy of composition : firm vs. aggregate & national vs. European/global
  - Globalization=race to the bottom in wage share→likelihood of wage-led regime↑
- Wage/macro policy coordination and avoid beggar thy neighbor policies
- Developing countries: Space for domestic-demand led & more equal growth
  - Alternative to pure export-led growth ; south-south cooperation
- Recovery led by domestic demand & ↑ in the wage share
- However: limits to increasing wage share and full employment in capitalism
  - Solution of the realization crisis →profit squeeze
  - But we are not there yet…

Policy mix:
public investment, progressive taxation, Increasing equality
Obst, Onaran, Nikolaidi 2017

- increase public investment by 1% of GDP
- + wage share by 1%
- + more progressive taxation (1% higher tax on capital and 1% lower tax on labour)
- The impact of wage policies is positive but small
- the overall stimulus becomes much stronger with fiscal expansion.
- The effects are stronger if policies are implemented simultaneously in all the EU countries.
- need for wage and fiscal policy coordination
- →6.7% higher GDP in the EU15, 4.5% higher GDP in the UK,

...Policy mix:
public investment, progressive taxation, Increasing equality
Obst, Onaran, Nikolaidi 2017

- Private investment increases by 2.3% as a ratio to GDP in the EU,

and by 0.9% in the UK

  - Public spending crowds in private investment, it does not crowd out
  - >Demand
  - >improved business environment
- Budget balance improves by 0.9% as a ratio to GDP in the EU, and 0.1% in the UK
- Impact on inflation is very modest
  - a 1%-point rise in the wage share →1.5% ↑in prices in the EU, and 2%↑in prices in the UK
-

Short-term demand vs. long run potential growth and productivity (Onaran, Oyvat, Fotopoulou 2018)

- Long Run: productivity increases when wages, demand and investment increase.
- Productivity needs investment but increasing profits does not always lead to higher private investment
  - Investment is more sensitive to demand and lower wages ->low demand
  - Investment is not profit-led in many countries (Obst, Onaran, Nikolaidi 2017)
- inequality→lower productivity & potential growth
- Low road labour market policies and low wages also lead to low productivity in LR
- High road labour market policies and high wages → high productivity in LR
- +Public spending →higher employment is feasible with higher wages

Conclusion -2

- Equitable and sustainable development needs green and purple public investment, progressive taxation and pay rise for both women and men!
- Advice:
- Take care of full employment, decent pay for women and men, equality, and ecological sustainability, and the budget will take care of itself.

Long run?
Michal Kalecki on
"Political Aspects of Full Employment," 1943

- "the maintenance of full employment would cause social and political changes which would give a new impetus to the opposition of the business leaders. Indeed, under a regime of permanent full employment, the 'sack' would cease to play its role as a 'disciplinary' measure. The social position of the boss would be undermined, and the self-assurance and class-consciousness of the working class would grow. ... It is true that profits would be higher under a regime of full employment than they are on the average under *laissez-faire*... But 'discipline in the factories' and 'political stability' are more appreciated than profits by business leaders. *Their class instinct tells them that lasting full employment is unsound from their point of view, and that unemployment is an integral part of the 'normal' capitalist system*."

- Laski citing Kalecki on Poland in the 1950s: "I would rather see people queue for goods than for jobs".

In the long run?

- Keynes: “in the long run we are all dead”
  - Short run unstable: save capitalism from capitalism itself
- Can policy save capitalism from capitalism itself?
- **Marx**: profit squeeze? Limits to capitalism?
- Kalecki: Full employment not consistent with capitalism
  - similar to Marx & Stiglitz?
- **Ecological economists** (e.g. Victor): Limits to growth?
  - Managing with lower growth?
    - shorter working hours?
      - » Keynes, 1930, “Economic Possibilities for our Grandchildren”: “Three-hour shifts or a fifteen-hour week may put off the problem for a great while.”
  - Green jobs
- **Feminist economics:** Care crisis and ecological crisis needs purple jobs
  - ➢ Social infrastructure (eg care): More labour intensive; more jobs with lower growth; way to solve also gender inequality crisis
- Synthesis and policy informed by multiple theories?

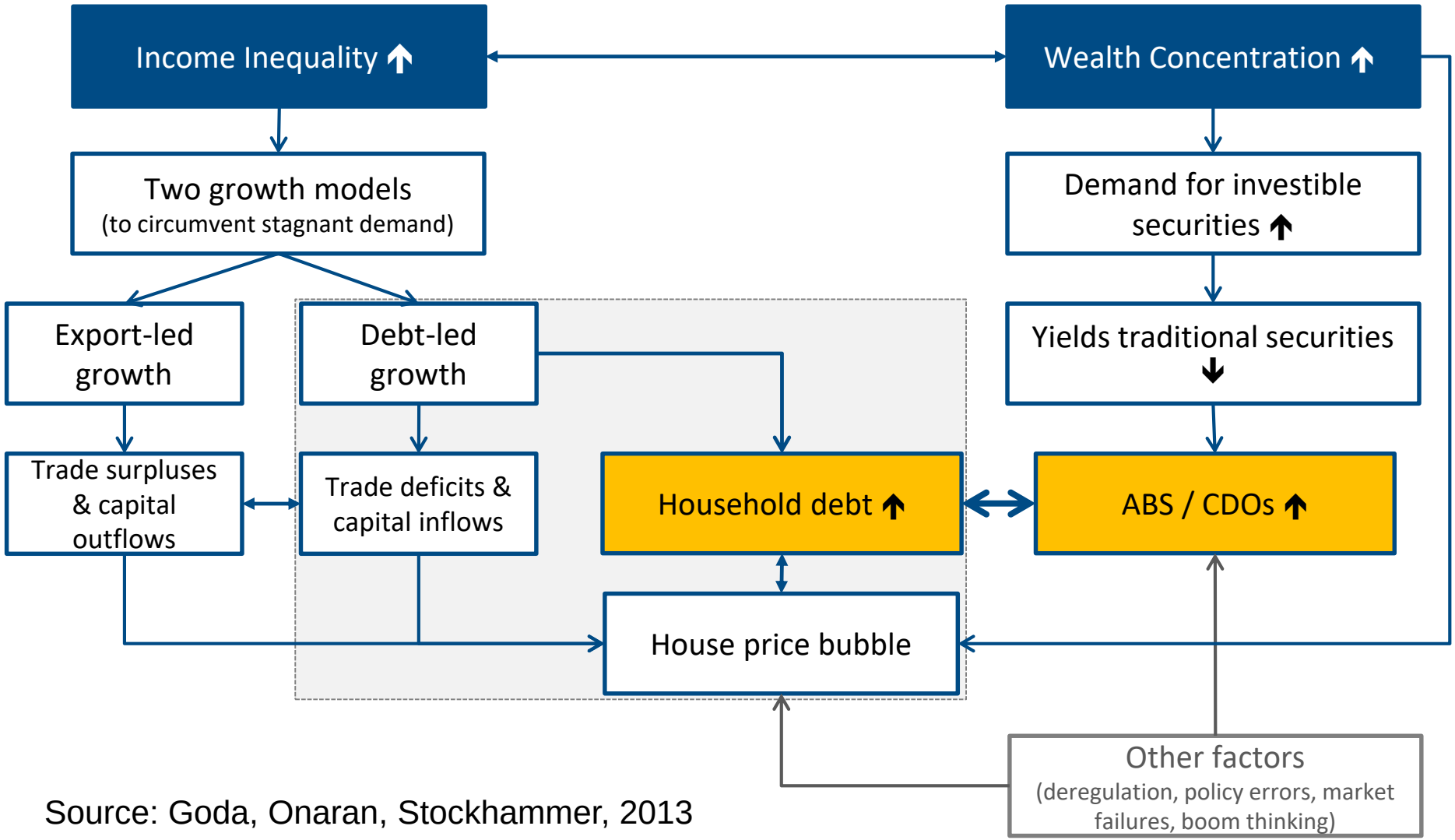
Planet earth has not traded with Mars but still grew despite declining wage share until the Great Recession. How?

- Potential crisis of aggregate demand deficiency
- The expected outcome should have been a stagnation of global demand and growth
- This was mainly circumvented by two distinct growth models
  - a root cause of the great recession

	Debt-led growth	*Export-led growth*
Center	**US, UK**, **Australia**, New Zealand	**Germany, Japan, Netherlands**, Norway, Sweden, Austria, Canada, Finland, Belgium, Denmark
Periphery	**Spain, Greece, Turkey, Portugal**, South Africa, Ireland, Hungary, Czech Rep., Slovakia, Estonia, Cyprus, Slovenia	**China**, Korea

Fragile → Great Recession 2008-2013

Distributional issues are at the very root of the recent crisis



Source: Goda, Onaran, Stockhammer, 2013

Appendix

Notes

- we checked the robustness of the results with respect to the adjusted wage share variable, since adjusting for the labour income of the self-employed is a challenge particularly for the developing countries. When the estimations are done using unadjusted wage share, the MPC differences are in general lower. This indicates that it is intuitively correct to adjust for the labour income of the self employed: MPC from unadjusted profit income is much higher compared to that out of adjusted profit income, since unadjusted profits incorporate self employed labour income with a relatively higher MPC. Nevertheless in most countries this does not lead to a change in the character of the regime. However in Korea, when unadjusted wages are used, the regime seems to be profit-led rather than wage-led primarily due to much lower MPC differences. In Mexico, the effect of the profit share on investment becomes insignificant, and therefore the regime seems to be wage-led rather than profit-led. Overall, these differences do not affect the global results.

Investment

	c	*t-value*	dlog(Yt)	*t-value*	dlog(πt)	*t-value*	dlog (It-1)	*t-value*	log (It-1)	*t-value*	log(Y_{t-1})	*t-value*	log(πt-1)	*t-value*	DW	R2	Sample
Euro area-12	-0.304	*-1.916*	2.238	*9.801*	-0.137	*-0.920*	0.088	*1.105*	-0.203	*-4.272*	0.207	*4.545*	0.093	*2.356*	1.820	0.865	1962 2007
Germany	-0.136	*-0.628*	1.805	*6.398*	0.058	*0.284*	0.183	*1.683*	-0.292	*-3.756*	0.266	*4.283*	0.172	*2.050*	1.829	0.748	1962 2007
	c	*t-value*	dlog(πt-1)	*t-value*	dlog(Yt)	*t-value*	ar(1)	*t-value*	DW	*R2*	Sample						
France	-0.027	*-2.654*	0.139	*1.657*	2.050	*10.505*	0.670	*5.569*	1.832	*0.822*	1963 2007						
	c	*t-value*	log(πt-1)	*t-value*	dlog(Yt)	*t-value*	dlog(Yt-1)	*t-value*	DW	*R2*	Sample						
Italy	0.229	*5.449*	0.241	*6.084*	2.094	*8.819*	0.516	*2.421*	2.524	*0.622*	1962 2007						
	c	*t-value*	log(πt-1)	*t-value*	dlog(Yt)	*t-value*	log (It-1)	*t-value*	log(Y_{t-1})	*t-value*	DW	*R2*	Sample				
UK	-1.143	*-2.500*	0.212	*2.513*	1.660	*5.429*	-0.350	*-3.392*	0.458	*3.278*	1.870	*0.593*	1961 2007				
	c	*t-value*	dlog(πt-1)	*t-value*	dlog(Yt)	*t-value*	dlog(Yt-1)	*t-value*	ar(1)	*t-value*	DW	*R2*	Sample				
US	-0.061	*-4.519*	0.077	*0.510*	2.738	*14.501*	0.367	*1.824*	0.612	*4.817*	1.697	*0.858*	1963 2007				
	c	*t-value*	dlog(πt)	*t-value*	dlog (It-1)	*t-value*	dlog(Yt)	*t-value*	dlog(Yt-1)	*t-value*	DW	*R2*	Sample				
Japan	-0.019	*-2.845*	0.185	*2.615*	0.485	*3.806*	1.982	*12.339*	-1.034	*-3.221*	2.126	*0.924*	1962 2007				
	c	*t-value*	dlog(πt-1)	*t-value*	dlog(Yt)	*t-value*	DW	*R2*	Sample								
Canada	-0.020	*-1.711*	0.318	*1.874*	1.780	*6.018*	1.593	*0.530*	1962 2007								
	c	*t-value*	dlog(πt)	*t-value*	dlog(Yt)	*t-value*	DW	*R2*	Sample								
Australia	-0.025	*-1.550*	0.256	*1.857*	2.021	*5.031*	1.821	*0.494*	1961 2007								

	c	*t-value*	log(πt)	*t-value*	dlog(Yt)	*t-value*	DW	*R2*	Sample									
Turkey	-0.056	*-0.547*	0.041	*0.294*	3.343	*6.456*	1.743	0.567	1971 2006									
	c	*t-value*	log(πt)	*t-value*	log(πt-1)	*t-value*	dlog(Yt)	*t-value*	dlog(Yt-1)	*t-value*	log (It-1)	*t-value*	log(Y_{t-1})	*t-value*	DW	R2	Sample	
Argentina	0.135	*0.111*	0.190	*2.596*	-0.147	*-2.165*	2.808	*19.169*	0.325	*2.001*	-0.164	*-3.138*	0.147	*1.895*	1.982	0.943	1972 2007	
	c	*t-value*	dlog(Yt)	*t-value*	dlog(πt)	*t-value*	dlog(πt-1)	*t-value*	dlog (It-1)	*t-value*	log (It-1)	*t-value*	log(Yt-1)	*t-value*	log(πt-1)	*t-value*	DW	*R2*	Sample
Mexico	-1.778	*-2.722*	3.336	*13.407*	-0.349	*-2.044*	-0.259	*-1.511*	-0.040	*-0.616*	-0.343	*-4.383*	0.482	*3.765*	0.170	1.973	2.506	0.923	1972 2007
	c	*t-value*	dlog(πt-1)	*t-value*	dlog(Yt)	*t-value*	dlog (Igt)	*t-value*	DW	*R2*	Sample							
Korea	-0.110	*-5.834*	-0.011	*-0.311*	2.509	*10.320*	0.186	*1.960*	1.589	0.816	1972 2007							
	c	*t-value*	dlog(πt)	*t-value*	dlog(Yt)	*t-value*	DW	*R2*	Sample									
China	-0.006	*-0.064*	0.030	*0.027*	1.664	*1.703*	1.823	0.126	1982 2007									
	c	*t-value*	dlog(πt)	*t-value*	dlog(Yt)	*t-value*	dlog (Igt-1)	*t-value*	DW	*R2*	Sample							
India	-0.018	*-0.682*	-0.164	*-1.190*	1.561	*3.856*	0.402	*2.868*	2.369	0.421	1972 2007							
	c	*t-value*	dlog(πt-1)	*t-value*	dlog(Yt)	*t-value*	dlog (It-1)	*t-value*	log (It-1)	*t-value*	log(Yt-1)	*t-value*	log(πt-1)	*t-value*	DW	*R2*	Sample	
South Africa	-2.249	*-1.290*	-0.283	*-1.917*	2.512	*6.178*	0.317	*2.795*	-0.343	*-4.659*	0.403	*3.796*	0.238	*1.709*	2.243	0.798	1972 2007	

Domestic Prices

	c	*t-value*	dlog(ULCt-1)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample				
Euro area-12	0.014	*3.518*	0.624	*7.846*	0.123	*2.915*	1.515	0.747	1962 2007				
Italy	0.018	*3.525*	0.604	*9.320*	0.202	*4.988*	1.731	0.827	1962 2007				
UK	0.018	*3.018*	0.568	*6.713*	0.190	*2.993*	2.039	0.691	1962 2007				
Japan	0.013	*3.227*	0.516	*6.833*	0.095	*3.100*	1.666	0.630	1962 2007				
Canada	0.016	*3.983*	0.459	*5.335*	0.257	*4.481*	1.447	0.678	1962 2007				
	c	*t-value*	dlog(ULCt)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample				
Germany	0.012	*8.103*	0.618	*16.023*	0.031	*1.428*	1.491	0.864	1961 2007				
	c	*t-value*	dlog(ULCt-1)	*t-value*	dlog(Pt-1)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample		
France	0.007	*2.360*	0.275	*2.141*	0.522	*3.394*	0.086	*3.281*	1.809	0.907	1962 2007		
	c	*t-value*	dlog(ULCt-1)	*t-value*	dlog(Pt-1)	*t-value*	dlog(Pmt)	*t-value*	dlog(Pmt-1)	*t-value*	DW	R2	Sample
US	0.009	*5.219*	0.211	*2.710*	0.429	*4.836*	0.109	*8.403*	0.044	*2.590*	1.745	0.951	1962 2007
	c	*t-value*	dlog(ULCt)	*t-value*	dlog(Pmt)	*t-value*	dlog(Pmt-1)	*t-value*	DW	R2	Sample		
Australia	0.016	*4.324*	0.624	*8.856*	-0.031	*-0.579*	0.150	*3.429*	1.976	0.814	1962 2007		

	c	*t-value*	dlog(ULCt)	*t-value*	dlog(Pt-1)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample		
Turkey	0.011	*0.643*	0.354	*5.402*	0.263	*4.280*	0.364	*7.124*	2.196	0.949	1972 2006		
	c	*t-value*	dlog(ULCt)	*t-value*	dlog(ULCt-1)	*t-value*	dlog(Pt-1)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample
Mexico	0.008	*0.884*	0.700	*8.642*	-0.265	*-2.136*	0.309	*2.875*	0.261	7.178	2.387	0.979	1972 2007
	c	*t-value*	dlog(ULCt)		dlog(Pmt)	*t-value*	dlog(Pmt-1)	*t-value*	DW	R2	Sample		
Korea	0.016	*3.026*	0.735	*10.508*	0.073	*1.709*	0.095	*2.685*	1.887	0.912	1972 2007		
	c	*t-value*	dlog(ULCt)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample				
Argentina	0.002	*0.162*	0.640	*17.025*	0.359	*9.597*	1.828	0.994	1971 2007				
China	0.010	*2.126*	0.832	*12.990*	0.022	*0.660*	1.289	0.883	1979 2007				
India	0.023	*5.114*	0.756	*12.205*	0.009	*0.401*	2.020	0.854	1971 2007				
South Africa	0.033	*2.611*	0.618	*5.634*	0.124	*1.946*	1.897	0.567	1971 2007				

Export Prices

	c	*t-value*	dlog(ULCt-1)	*t-value*	dlog(Pxt-1)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample						
Euro area-12	0.003	*1.670*	0.165	*3.141*	0.102	*2.504*	0.566	*27.168*	1.586	0.970	1962 2007						
Germany	0.004	*1.557*	0.216	*2.845*	0.214	*2.631*	0.355	*9.780*	1.719	0.813	1962 2007						
Italy	0.004	*0.960*	0.178	*2.616*	0.156	*2.695*	0.569	*19.040*	2.495	0.946	1962 2007						
	c	*t-value*	log(Pxt-1)	*t-value*	log(ULCt-1)	*t-value*	log(Pmt-1)	*t-value*	dlog(ULCt)	*t-value*	dlog(Pmt)	*t-value*	ar(1)	*t-value*	dw	r2	Sample
France	0.429	3.756	-0.663	-4.558	0.098	1.710	0.475	5.253	-0.117	-1.131	0.545	17.814	0.722	4.160	1.760	0.962	1962 2007
	c	*t-value*	log(Pxt-1)	*t-value*	log(ULCt-1)	*t-value*	log(Pmt-1)	*t-value*	dlog(ULCt)	*t-value*	dlog(Pmt)	*t-value*	dw	r2	Sample		
United Kingdom	0.043	1.592	-0.412	-3.895	0.061	2.120	0.342	*4.132*	0.179	*2.378*	0.575	*12.748*	1.600	0.924	1961 2007		
United States	0.374	3.479	-0.352	-3.238	0.049	1.973	0.223	*3.214*	0.397	*2.765*	0.489	*11.547*	1.929	0.913	1961 2007		
	c	*t-value*	dlog(ULCt)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample								
Japan	-0.012	*-4.226*	0.313	*5.610*	0.389	*16.889*	2.023	0.921	1961 2007								
Australia	0.014	*1.263*	0.374	*1.798*	0.316	*2.121*	1.625	0.352	1961 2007								
	c	*t-value*	dlog(ULCt)	*t-value*	dlog(ULCt-1)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample						
Canada	0.004	*0.632*	0.620	*3.209*	-0.472	*-2.712*	0.820	*8.822*	1.932	0.795	1962 2007						

	c	*t-value*	dlog(ULCt-1)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample		
Turkey	-0.013	*-0.395*	0.179	*1.827*	0.868	*9.972*	2.277	0.851	1972 2007		
	c	*t-value*	dlog(ULCt)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample		
Mexico	0.014	*0.830*	0.260	*2.514*	0.675	*9.619*	2.112	0.925	1971 2007		
Argentina	0.014	*0.913*	0.107	*2.858*	0.878	*23.456*	2.014	0.994	1971 2007		
China	-0.008	*-0.745*	0.315	*2.166*	1.035	*13.921*	1.771	0.904	1979 2007		
India	0.022	*1.259*	0.693	*2.879*	0.109	*1.322*	1.711	0.342	1971 2007		
	c	*t-value*	dlog(ULCt)	*t-value*	dlog(Pxt-1)	*t-value*	dlog(Pmt)	*t-value*	DW	R2	Sample
Korea	-0.013	*-1.578*	0.336	*2.911*	0.009	*0.127*	0.614	*9.198*	1.703	0.886	1972 2007
	c	*t-value*	dlog(ULCt)	*t-value*	dlog(Pmt)	*t-value*	ar(1)	*t-value*	DW	R2	Sample
South Africa	0.068	*1.660*	-0.529	*-1.516*	0.957	*6.374*	0.357	*1.995*	1.699	0.616	1972 2007

Exports

	c	*t-value*	dlog(Px/Pmt)	*t-value*	dlog(Xt-1)	*t-value*	dlog(Yrwt)	*t-value*	dlog(Et)	*t-value*	DW	R2	Sample
Euro area-12	-0.021	*-1.042*	-1.304	*-4.813*	0.161	*1.460*	1.884	*3.821*	0.141	*1.916*	1.683	0.643	1971 2007
France	-0.030	*-2.151*	-0.314	*-2.204*	0.265	*2.466*	2.065	*5.952*	0.172	*2.016*	1.765	0.601	1971 2007
	c	*t-value*	dlog((Px/Pm)t-1)	*t-value*	dlog(Yrwt)	*t-value*	DW	R2	Sample				
Germany	0.000	*0.002*	-0.428	*-1.967*	1.779	*2.911*	2.121	0.207	1971 2007				
	c	*t-value*	dlog(Px/Pmt)	*t-value*	dlog(Yrwt)	*t-value*	DW	R2	Sample				
Italy	-0.005	*-0.266*	-0.273	*-1.760*	1.554	*3.028*	1.863	0.308	1971 2007				
UK	0.011	*0.821*	-0.519	*-3.771*	1.057	*2.885*	1.636	0.443	1971 2007				
Japan	0.014	*0.617*	-0.428	*-4.039*	1.293	*1.984*	2.169	0.355	1971 2007				
Australia	0.036	*1.782*	-0.235	*-1.891*	0.472	*0.779*	1.944	0.095	1971 2007				
	c	*t-value*	dlog(Px/Pmt)	*t-value*	dlog(Yrwt)	*t-value*	dlog(Et-1)	*t-value*	ar(1)	*t-value*	DW	R2	Sample
US	-0.037	*-1.990*	-0.286	*-2.182*	2.935	*6.099*	0.113	*2.051*	0.517	*3.427*	2.315	0.727	1972 2007
	c	*t-value*	dlog((Px/Pm)t-1)	*t-value*	dlog(Xt-1)	*t-value*	dlog(Yrwt)	*t-value*	DW	R2	Sample		
Canada	-0.026	*-1.498*	-0.558	*-2.774*	0.172	*1.371*	2.056	*4.163*	1.648	0.495	1971 2007		

	c	*t-value*	dlog(RULCt-1)	*t-value*	dlog(Yrwt)	*t-value*	DW	R2	Sample								
Turkey	0.051	*0.794*	-0.557	*-1.903*	0.899	*0.488*	2.454	0.100	1972 2007								
	c	*t-value*	dlog(RULCt)	*t-value*	dlog(Yrwt)	*t-value*	ar(1)	*t-value*	DW	R2	Sample						
Mexico	0.005	*0.160*	-0.436	*-2.095*	2.395	*3.067*	0.463	*2.713*	1.912	0.382	1972 2007						
	c	*t-value*	log(Xt-1)	*t-value*	log(Px/Pmt-1)	*t-value*	log(Yrwt-1)	*t-value*	dlog(Px/Pmt)	*t-value*	dlog(Xt-1)	*t-value*	dlog(Yrwt)	*t-value*	DW	R2	Sample
Korea	-42.041	*-3.741*	-0.396	*-4.009*	-0.198	*-1.713*	1.510	*3.769*	0.256	*0.964*	0.082	*0.592*	3.213	*3.262*	1.616	0.586	1972 2007
	c	*t-value*	dlog(Px/Pmt)	*t-value*	dlog(Xt-1)	*t-value*	dlog(Yrwt)	*t-value*	DW	R2	Sample						
Argentina	-0.053	*-1.397*	-0.318	*-1.712*	0.091	*0.611*	3.433	*3.148*	1.715	0.257	1972 2007						
China	0.010	*0.195*	-1.175	*-3.200*	0.396	*2.556*	2.584	*1.742*	1.900	0.457	1980 2007						
India	0.084	*2.371*	-0.253	*-2.364*	0.185	*1.165*	-0.220	*-0.229*	1.899	0.177	1972 2007						
	c	*t-value*	dlog(Px/Pmt)	*t-value*	dlog(Yrwt)	*t-value*	DW	R2	Sample								
South Africa	-0.007	*-0.373*	-0.126	*-1.036*	1.101	*1.876*	1.457	0.096	1971 2007								

Imports

	c	*t-value*	dlog((P/Pm)t-1)	*t-value*	dlog(Yt)	*t-value*	DW	R2	Sample						
Euro area-12	-0.008	*-0.433*	0.236	*1.182*	2.035	*3.450*	1.537	0.329	1962 2007						
Italy	-0.008	*-0.759*	0.233	*2.390*	2.136	*6.818*	2.219	0.607	1962 2007						
Japan	0.010	*0.740*	0.255	*3.299*	1.136	*4.576*	1.835	0.499	1962 2007						
	c	*t-value*	dlog((P/Pm)t-1)	*t-value*	dlog(Yt)	*t-value*	ar(1)	*t-value*	DW	R2	Sample				
Germany	0.009	0.990	0.005	0.046	1.911	*7.083*	0.283	*1.848*	1.903	0.618	1963 2007				
	c	*t-value*	log(Mt-1)	*t-value*	log((P/Pm)t-1)	*t-value*	log(Yt-1)	*t-value*	dlog((P/Pm)t)	*t-value*	dlog(Yt)	*t-value*	DW	R2	Sample
France	-2.452	-4.565	-0.292	-3.932	0.140	*2.796*	0.573	*4.330*	0.069	*0.989*	2.923	*8.361*	2.166	0.782	1961 2007
United Kingdom	-2.954	-4.748	-0.414	-4.773	0.130	*3.178*	0.769	*4.814*	-0.024	*-0.388*	1.698	*8.584*	2.142	0.739	1961 2007
United States	-4.610	-4.639	-0.414	-4.422	0.177	*3.755*	0.826	*4.554*	0.132	*1.651*	2.341	*9.783*	1.905	0.787	1961 2007
	c	*t-value*	dlog(P/Pmt)	*t-value*	dlog(Yt)	*t-value*	DW	R2	Sample						
Australia	-0.017	*-0.823*	0.558	*2.964*	1.886	*3.576*	2.081	0.374	1961 2007						
	c	*t-value*	dlog(P/Pmt)	*t-value*	dlog(Yt)	*t-value*	dlog(Yt-1)	*t-value*	dlog(Mt-1)	*t-value*	DW	R2	Sample		
Canada	0.000	-0.008	0.356	*2.570*	2.503	*8.780*	-1.636	*-4.164*	0.424	*3.369*	2.218	0.675	1962 2007		

	c	*t-value*	dlog(RULCt-1)	*t-value*	dlog(Yrwt)	*t-value*	DW	R2	Sample								
Turkey	0.051	*0.794*	-0.557	*-1.903*	0.899	*0.488*	2.454	0.100	1972 2007								
	c	*t-value*	dlog(RULCt)	*t-value*	dlog(Yrwt)	*t-value*	ar(1)	*t-value*	DW	R2	Sample						
Mexico	0.005	*0.160*	-0.436	*-2.095*	2.395	*3.067*	0.463	*2.713*	1.912	0.382	1972 2007						
	c	*t-value*	log(Xt-1)	*t-value*	log(Px/Pmt-1)	*t-value*	log(Yrwt-1)	*t-value*	dlog(Px/Pmt)	*t-value*	dlog(Xt-1)	*t-value*	dlog(Yrwt)	*t-value*	DW	R2	Sample
Korea	-42.041	*-3.741*	-0.396	*-4.009*	-0.198	*-1.713*	1.510	*3.769*	0.256	*0.964*	0.082	*0.592*	3.213	*3.262*	1.616	0.586	1972 2007
	c	*t-value*	dlog(Px/Pmt)	*t-value*	dlog(Xt-1)	*t-value*	dlog(Yrwt)	*t-value*	DW	R2	Sample						
Argentina	-0.053	*-1.397*	-0.318	*-1.712*	0.091	*0.611*	3.433	*3.148*	1.715	0.257	1972 2007						
China	0.010	*0.195*	-1.175	*-3.200*	0.396	*2.556*	2.584	*1.742*	1.900	0.457	1980 2007						
India	0.084	*2.371*	-0.253	*-2.364*	0.185	*1.165*	-0.220	*-0.229*	1.899	0.177	1972 2007						
	c	*t-value*	dlog(Px/Pmt)	*t-value*	dlog(Yrwt)	*t-value*	DW	R2	Sample								
South Africa	-0.007	*-0.373*	-0.126	*-1.036*	1.101	*1.876*	1.457	0.096	1971 2007								

		Exports								Imports				Sum
									$\frac{\partial X/Y}{\partial \pi}$				$\frac{\partial M/Y}{\partial \pi}$	$\frac{\partial NX/Y}{\partial \pi}$
	eP.ULC	eULC.RULC	ePx.ULC	eX.Px	eX.RULC	RULC	Yf/Y	X/Y		eM.P	eM.RULC	M/Y		
	A	B	C	D	E (B*C*D)	F	G	H	I (-E*G*H/F)	J	K (A*B*J)	L	M (K*G*L/F)	I-M
Euro area	0.624	2.660	0.184	-1.304	-0.637	0.619	0.893	0.062	0.057	0.000	0.000	0.068	0.000	0.057
Germany	0.618	2.617	0.274	-0.428	-0.307	0.615	0.900	0.214	0.096	0.000	0.000	0.209	0.000	0.096
France	0.577	2.363	0.148	-0.428	-0.150	0.615	0.867	0.171	0.036	0.481	0.656	0.175	-0.162	0.198
Italy	0.604	2.527	0.211	-0.273	-0.146	0.623	0.909	0.174	0.037	0.233	0.356	0.172	-0.089	0.126
UK	0.568	2.316	0.148	-0.519	-0.178	0.643	0.885	0.195	0.048	0.313	0.412	0.195	-0.110	0.158
US	0.369	1.585	0.138	-0.286	-0.063	0.634	0.926	0.068	0.006	0.428	0.250	0.085	-0.031	0.037
Japan	0.516	2.066	0.313	-0.428	-0.276	0.673	0.933	0.074	0.028	0.255	0.271	0.070	-0.026	0.055
Canada	0.459	1.849	0.148	-0.558	-0.153	0.601	0.884	0.278	0.063	0.617	0.524	0.264	-0.203	0.266
Australia	0.624	2.661	0.374	-0.235	-0.234	0.597	0.904	0.140	0.049	0.558	0.926	0.159	-0.223	0.272

		Exports								Imports				Sum
									$\frac{\partial X/Y}{\partial \pi}$				$\frac{\partial M/Y}{\partial \pi}$	$\frac{\partial NX/Y}{\partial \pi}$
	ePₓ.ULC	eULC.RULC	ePₓ.ULC	eX.Pₓ	eX.RULC	RULC	Yf/Y	X/Y		eM.P	eM.RULC	M/Y		
	A	B	C	D	E (B*C*D)	F	G	H	I (-E*G*H/F)	J	K (A*B*J)	L	M (K*G*L/F)	I-M
Turkey	0.481	1.927	0.179	-1.613	-0.557	0.459	0.937	0.123	0.140	0.546	0.506	0.139	-0.144	0.283
Mexico	0.629	2.695	0.260	-0.621	-0.436	0.466	0.928	0.148	0.128	0.472	0.800	0.159	-0.253	0.381
Korea	0.735	3.779	0.336	-0.500	-0.636	0.753	0.891	0.237	0.178	0.216	0.600	0.255	-0.181	0.359
Argentina	0.640	2.780	0.107	-0.318	-0.095	0.507	0.975	0.079	0.014	0.745	1.327	0.070	-0.178	0.192
China	0.832	5.966	0.315	-1.945	-3.658	0.503	0.867	0.232	1.463	0.795	3.946	0.193	-1.311	2.774
India	0.756	4.106	0.693	-0.253	-0.718	0.753	0.914	0.091	0.080	0.546	1.695	0.112	-0.230	0.310
South Afri	0.618	2.620	0.000	0.000	0.000	0.624	0.921	0.237	0.000	1.002	1.624	0.211	-0.506	0.506

Two wage-led recovery scenarios

	Scenario 1		Scenario 2	
	Change in profit share to preserve the peak wage share	The % change in aggregate demand (includes national and global multiplier effects, i.e. changes in Pm and Yrw)	Change in profit share	The % change in aggregate demand (includes national and global multiplier effects, i.e. changes in Pm and Yrw)
Euro area-12	-11.05	2.49	-11.05	2.36
United Kingdom	-7.83	2.01	-7.83	1.91
United States	-6.31	6.47	-6.31	6.15
Japan	-16.71	1.77	-16.71	1.49
Canada	-7.73	2.44	-3.00	2.84
Australia	-9.02	-1.35	-3.00	0.03
Turkey	-18.41	11.22	-18.41	10.81
Mexico	-22.03	-0.56	-3.00	1.45
Korea	-8.64	7.60	-8.64	7.46
Argentina	-9.12	0.86	-3.00	1.27
China	-8.00	-7.44	-1.00	5.56
India	-15.96	0.05	-3.00	0.43
South Africa	-13.07	-6.29	-1.00	1.93

1. global GDP↑ by 2.81%

2. global GDP↑ by 3.05%