UNIVERSITY of GREENWICH

PEGFA | Institute of Political Economy, Governance, Finance and Accountability

Synthesizing Feminist and Post-Keynesian Economics for a Purple Green Red transition

Özlem Onaran

based on
Onaran, Oyvat 2022;
Onaran, Oyvat, Fotopoulou, 2022a,b, 2019

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Outline

- A Post-Keynesian/Kaleckian feminist macroeconomic model

- Macro-econometric analysis and policy simulations
  - the UK
  - 8 emerging economies

- Policy implications

Aim

- Multiple challenges
  - care needs in an aging society
  - climate change
  - inequalities with respect to class, gender, and race
  - technological change
- Public spending needs in
  - social infrastructure in the care economy
  - green economy
- A needs-based approach to fiscal policy
  - address both the care and ecological deficits, while tackling inequalities
  - avoid competition between needs
  - wealth taxation to ease the budgetary constraints

A Post-Keynesian/Kaleckian feminist macro model

- Different dimensions of inequalities
  - Functional income distribution, Post-Keynesian/Kaleckian

Bhaduri &Marglin,1990; Onaran&Galanis,2014; Onaran&Obst,2016; Onaran et al 2011; Stockhammer et al.,2009; Hein &Vogel 2008; Naastepad &Storm 2006; Stockhammer &Onaran,2004

  - Gender gaps: Feminist structuralist/Kaleckian

Braunstein et al. 2011, 2018; Seguino 2010, 2012; Ilkkaracan et al.,2015; Ilkkaracan &Kim2018; De Henau et al.2016; Antonopoulos et al.,2010; Pollitt et al 2017 ; Bargawi &Cozzi 2017;

  - Wealth concentration

Taylor etal2015,18; Petach&Tavani,2018; Palley2012,17; Ederer&Rehm2018, Zamparelli2016; Botta etal2019

- Demand and supply side interaction
  - Palley,1996,2012,13,14; Casetti,2003; Dutt, 2006,10,11,13, Naastepad, 2006; Setterfield, 2006; Hein &Tarassow,2010; Tavani &Zamparelli,2017
- Government spending and taxes
  - purple social infrastructure: Elson, 2017, Women's Budget Group, İlkkaracan 2013
  - green: Batini etal2021; Dafermos & Nikolaidi2019; Pollin etal,09,15,22;IRENA20; Wildauer etal22
  - wealth taxation compared with taxation of profit or wage income
    - Blecker,2002; Mott &Slattery,1994; Hein, 2018; Palley, 2009,13,14, You &Dutt,1996; Dutt,2013; Tavani &Zamparelli2017; Allain 2015; Ko,2018; Commendatore et al. 2011; Obst et al. 2017
- Employment effects not just output

A Post-Keynesian/Kaleckian feminist macro model

- Three Sectors of the economy
  - Care economy (social): health, social care, education, childcare (H)
  - rest of the market economy, (N)
  - unpaid domestic care sector

…Model: Demand side

- Consumption in care (H) & rest of the economy (N) functions of
  - after-tax female & male wage & profit income, wealth of 1% & 99%
- Private Investment function of
  - after-tax profit share, output, wealth of 1% & 99%, gov spending, public debt/GDP
- Exports: function of relative prices, Yworld, exchange rates
- Imports: function of relative prices, Y_N, exchange rates
- 3 types of government spending
  - Care: education, childcare, health, social care
  - Green: renewable energy (solar, wind, hydro, geothermal), energy efficiency (insulation, industry, grid), public transport (excluding air transport)(REEEPT), Onaran & Oyvat 22
  - Other infrastructure (GFCFC): e.g. social housing, schools, hospitals (I^G)
- Taxes are collected on wage and capital income, wealth, & C
- Debt/GDP depends on government spending, taxes and Y
- Unpaid domestic care function of
  - public and private household spending in care and demographic structure

…Model: Supply side

- Productivity (output/hour)
  - endogenous in the medium run in the rest of the economy
  - function of
    - wages, output, public spending, private investment, C_H, unpaid care
- labour force participation of women & men depend on
  - wages, social infrastructure, unpaid care
- Employment of men & women in hours
  - Determined by output and productivity
  - Subject to occupational segregation in N and H
    - Endogenous in Onaran & Oyvat 22

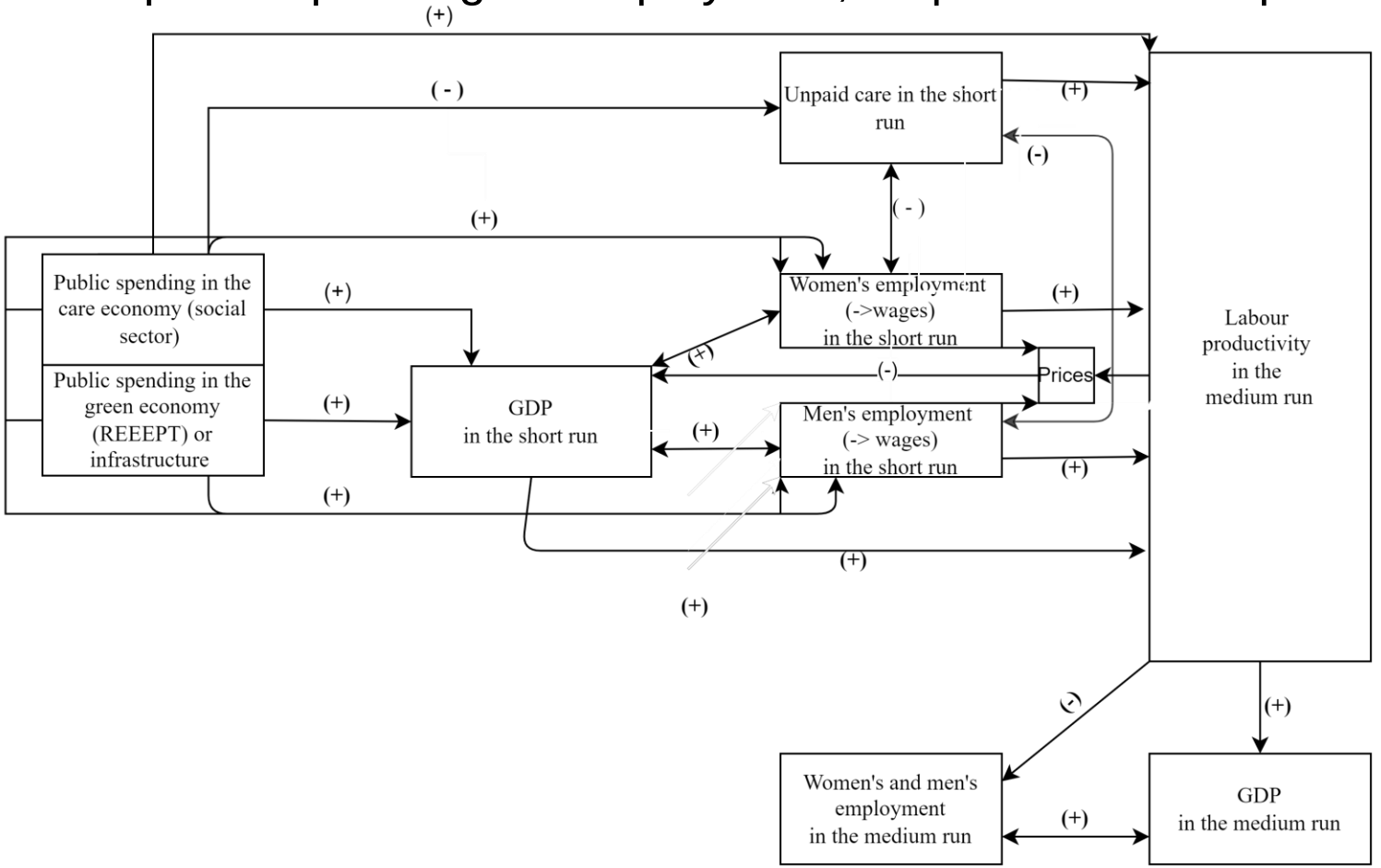
...Model: Employment

- Employment of men & women in hours
  - Determined by output and productivity
  - Subject to occupational segregation in N and H
    - Endogenous in Onaran & Oyvat 22

…Model: Distribution and price setting

- Prices: mark-up on unit labour costs and other input costs
  - Medium run: effects of wages on productivity and prices
- Wage bargaining: function of employment/labour force (of men & women and each other's wages)
  - Exogenous in Onaran et al 2022
- Wages, gender gap, taxes → functional income & wealth distribution
- Private net wealth (PW)
  - function of after tax female & male wage and profit income and its past value
- Wealth concentration=PW of top1%/PW

The effect of public spending on employment, output and labour productivity



Source: Onaran and Oyvat 2022

Estimation Methodology

- Onaran, Oyvat, and Fotopoulou 2019, 2022a, b
  - UK
  - Single equation estimations for C in H & N I, X, M, PW, PW1/PW
  - Panel fixed effects using 5 year averages for productivity
    - 18 sectors other than education, health, care
    - five year non-overlapping average of explanatory variables starting from 1970 and of the dependent variable starting from 1971
  - Instrumental Variables - GMM
    - IV: α, β in H and N, t_R, t_W, t_{PW}, G^H/Y, PW1/PW, Yworld, strike days/E, union density, capital account openness, in t, t-1, t-2, +sectoral VA in US, EU12 for productivity
  - Robustness check: OLS
    - Systems estimation: Seemingly Unrelated Regression for C in H & N
  - Data: EUKLEMS, AMECO, WWID, EC, ONS 1970-2016
- Onaran and Oyvat 2022, ITUC Project
  - REEE based on IO analysis in Pollin et al. (2015), PT: APTA (2020)
  - VAR, 8 emerging economies

What is the effect of an increase in public **social** infrastructure, UK?

- **Short run:**
  (+) consumption: demand from employees in H
  labour intensive, higher share of female employment
  – more income in the hands of women →C on education, health, care↑
  – gender equality ↑ → Social infrastructure ↑
  (+) investment: rising demand
  (-) effects of public debt/GDP on I: small
  Public debt/GDP: Direct + effect, but - effects through rising output
- **medium run:**
  - labour productivity in the rest of the economy↑ (G_H, C_H, Y↑)

  ⇒investment and net exports ↑
- **Employment of women and men**↑ both in the short and medium run
  - output effect is very strong and more than offsets the productivity effect (also strong)
  - high multiplier effects
  - Women's share of employment↑

Effects of increasing wages, closing gender gaps, UK

- Equality-led = Wage-led + gender equality-led
- 1%↑ wage in social sector →output↑ in both short (0.5%) & medium run (0.3%)
- 1%↓ gender pay gap in H→output↑ in both short (0.3%) & medium run (0.2%)
- 1%↑ wage in the rest of the economy →output↑ in short (0.2%) & medium run (0.1%)
- 1% ↓gender pay gap in N→output↑ in both short (0.1%) & medium run (0.03%)
  - Smaller than effects of w in H
- Consumption ↑; not just the level but also composition change
  - more income in the hands of women→C education,health, care↑ → productivity↑
- Private investment↑: w ↑ → profit share↓ →I↓ & wealth concentration↓ & demand↑ →I↑
  - productivity↑ in MR →I↑
- Net export effects small
- Impact on inflation modest: 1%-point↑ in wage share→2%↑in P, UK (1.5%↑ EU OON16)
- but output effects overall small, in MR strong productivity effects
- → Employment↑ in SR but in MR employment ↓
  - Etot ↓ 0.5% if w ↑ in N
  - if w ↑ in H, in MR Ef ↑ (0.02%) but Em ↓ (0.07%)
- Full employment requires public investment, in particular in the medium run

What are the effects of taxation, UK?

- tax rate on wealth↑
  - wealth concentration↓ →financialization and market concentration ↓ →Investment↑
  - very strong + impact on output, employment of women and men and the budget balance in both the short and medium run
  - Key for a needs-based fiscal policy to tackle multiple challenges
- An increase in the progressivity of income taxation
  - tax rate on profit income ↑
  - tax rate on wages ↓
  - output, employment of women and men↑, and public debt/GDP↓ in both the short and the medium run.
  - Because in the UK higher wages and equality lead to higher output
  - the UK economy is wage-led

Policy simulation

- Fiscal policy
  - government spending in **social purple** vs **physical green** infrastructure/GDP ↑ 1%-point
    - E.g. increasing employment, hiring nurses, social care workers, teachers or investing in renewable energy, energy efficiency, public transport
    - increasing wage rates: e.g. paying higher wages to care workers, nurses…
    - closing gender wage gap via upward convergence: e.g. increase the wage at the bottom of the scale more, enforce equal pay legislation →2%↑ in women's and 1%↑ in men's wages
- progressive income and wealth taxation
  - tax rate on wealth ↑ 1%-point (doubling of tax on wealth)
  - tax rate on profit income ↑ 1%-point
  - tax rate on wages ↓ 1%-point
- Labour market policies: Increase hourly real wage rate and close gender gaps via upward convergence in the rest of the economy

Policy simulation, UK

- higher output in both short run and medium run
  - output ↑ 10.9% in the UK (in medium run)
- A strong productivity effect of public spending
- Employment of both women & men↑ in short & medium run
  - E_{female} ↑ 9.6%, E_{male} ↑ 5.8% (in medium run)
- Improved public finance
  - public debt/GDP ↓ 10.3%-point (in medium run)
  - public spending is partly self-financing
  - taxing of wealth in particular and profits have a strong effect on tax revenues

Policy simulation: emerging economies

- Multiplier effects on GDP in most countries of all spending categories >1 (end of 5 years)
- A strong productivity effect of public spending
- Public spending is partly self-financing
- Repeated annual ↑ for 5 years in public spending in the care and green economy, and other infrastructure, country-specific required spending
  - Care economy: "high road" scenario
    - ILO 2020/Ilkkaracan and Kim, 2019
  - Green economy: low-carbon investment target to limit global warming to 1.5°
    - Bertram et al., 2021; McCollum, et al., 2018
- Employment rate (total employment/population 15+) after 5 years
  - >70% in Chile, Colombia, Indonesia, and South Korea,
  - ~50-60% in India, Philippines, Turkey, South Africa
  - but gender employment gaps: employment $rate_{women}$ <men

A purple green red new deal for a caring just transition

- Public investment
  - partly self-financing + progressive taxation of income and wealth, national investment banks, monetary policy, borrowing →needs-based fiscal policy
- Fiscal policy effects are very strong even when applied in a single country
  - Effects are stronger when coordinated across countries
  - Fiscal and labour market policies enhance each other
  - EU: Obst, Onaran, Nikolaidi, 2020; G20: Onaran 2016, Onaran and Galanis 2014
- Green and care jobs for redeployment from the fossil fuel-based sectors
- Purple and green are complementary: Care jobs→more jobs with lower CO2 emissions
  - labour intensive services
  - Redefine infrastructure and fiscal rule (Substantial effect on productivity)
- hiring and training policies going beyond the existing occupational segregation patterns
- recognize, reduce, redistribute unpaid care (Elson)
  - Universal free child care and social care
  - Equal incentives for both men and women regarding parental leave
- Shorter hours with wage compensation for the lower wage earners

  → gender equality in paid and unpaid work↑ Onaran & Calvert Jump 2021

Selected References

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Oyvat, C., Onaran, O., Tax wealth and profit income to fund social care and healthcare, Oct 2021, Policy Brief for Women's Budget Group

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Onaran, Ö. and Calvert Jump, R. 2022, A shorter working week as part of a green, caring economy", Women's Budget Group Feminist Green New Deal Policy Paper, Shorter-Working-Week-Report.pdf (wbg.org.uk).

Project report

Onaran and Oyvat, 2022 "The effects of public investment in the green and care economy on employment in emerging economies", funded by the International Trade Union Confederation (ITUC),,

- Appendix

Methodology: Onaran and Oyvat 2022

- 8 emerging economies: Chile, Colombia, India, Indonesia, Philippines, South Korea, South Africa, and Turkey
- Green economy –REEEPT
  - 50% allocated to renewable energy, Pollin et al. (2015)
    - equally among wind, solar, geothermal and hydropower.
  - 20% allocated to energy efficiency, Pollin et al. (2015)
    - 50% allocated to weather proofing/energy efficiency in buildings;
    - 25% allocated to industrial energy efficiency,
    - 25% allocated to grid upgrades.
  - 30% allocated to public transport, APTA (2020)
    - 10% allocated to investment in rail transport vehicles
    - 18% allocated to construction (infrastructure)
    - 72% allocated to the provision of the transport services
- an increase in spending in REEEPT by 1%-point as a ratio to GDP →
  - REEE based on IO analysis in Pollin et al. (2015), PT: APTA (2020)
  - manufacturing sub-industries 0.46%-point/GDP (Y^{MRE})
    - Sum of plastic, glass, cement, plaster, concrete, non-ferrous metals, fabricated metal, general purpose machinery, special purpose machinery, domestic appliances, electrical machinery and apparatus, electronic valves, tubes,, locomotives & rolling stock, other transport equipment
  - Construction: 0.33%-point/GDP (Y^{C})
  - transport services: 0.21%-point/GDP (Y^{PT})

…Methodology

$$X_t = \begin{bmatrix} \log(I_t^G) \\ \log Y_t^H \\ \log(Y_t) \\ \log(E_t^M) \\ \log(E_t^F) \end{bmatrix} \quad \text{or} \quad X_t = \begin{bmatrix} \log Y_t^C \\ \log Y_t^{PT} \\ \log Y_t^{MRE} \\ \log(Y_t) \\ \log(E_t^M) \\ \log(E_t^F) \end{bmatrix}$$

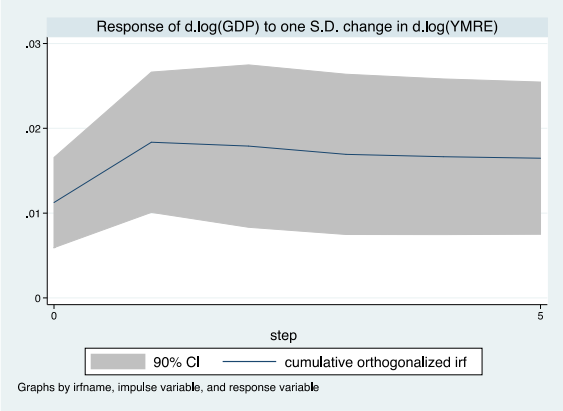
- VAR with Cholesky decomposition, one lag
- Estimation period 1972 (South Korea)-1994 (South Africa)→2018
- Alternatives:
  - total employment instead of employment of men and women
  - first differences
  - estimation period starting in 1980s (rather than 1970s)
  - alternative orders of public spending categories;
  - two or three lags
  - trend or other exogenous control variables (population (+15), informal economy/GDP, urbanization, real exchange rate, world GDP, trade openness/GDP, oil rent/GDPworld, mineral rent/GDPworld)

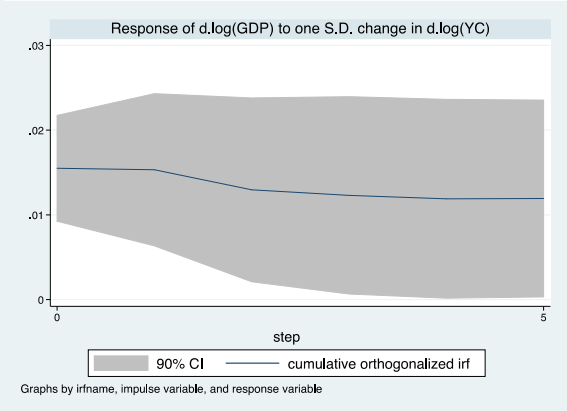
Summary: emerging economies

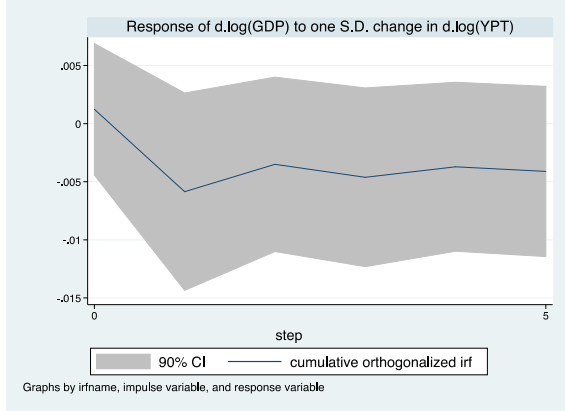
- higher output in both short run and medium run
  - multiplier effects on GDP in most countries in all spending categories >1 in the medium run (end of 5 years)
  - public physical infrastructure: 1.9 in Colombia - 4.6 in South Korea
    - Philippines 0.9, India insignificant
  - care spending: 1.6 in Turkey and South Africa - 4.5 in South Korea
    - Colombia and Philippines 0.2
  - green economy: 1.1 in South Korea - 4.5 in Turkey
    - sum of effects of sectors providing input to REEEPT
    - Philippines 0.4
  - composition and targeted nature of spending + differences in the import dependency or informality matter
- A strong productivity effect of public spending
- Public spending is partly self-financing

Cumulative Impulse Response Functions: GDP to REEEPT

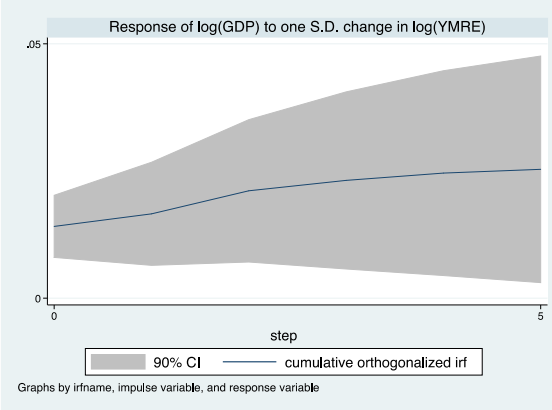
- South Korea

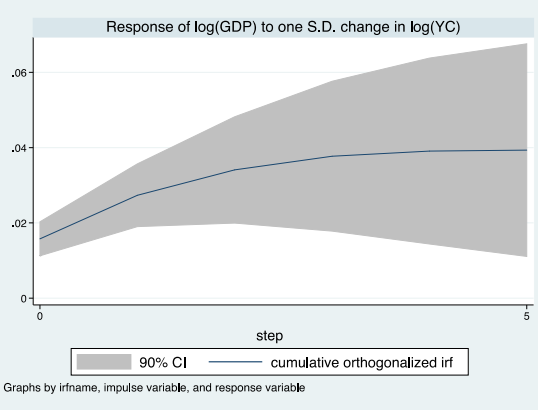


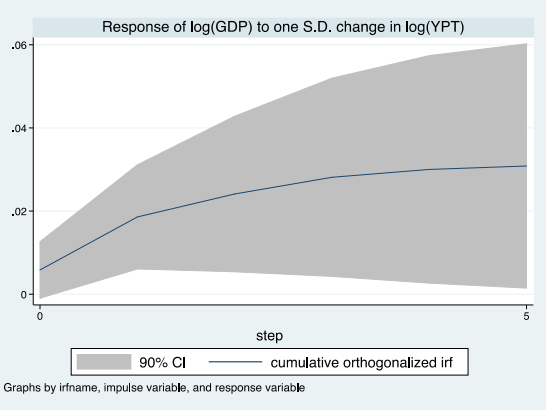




Turkey

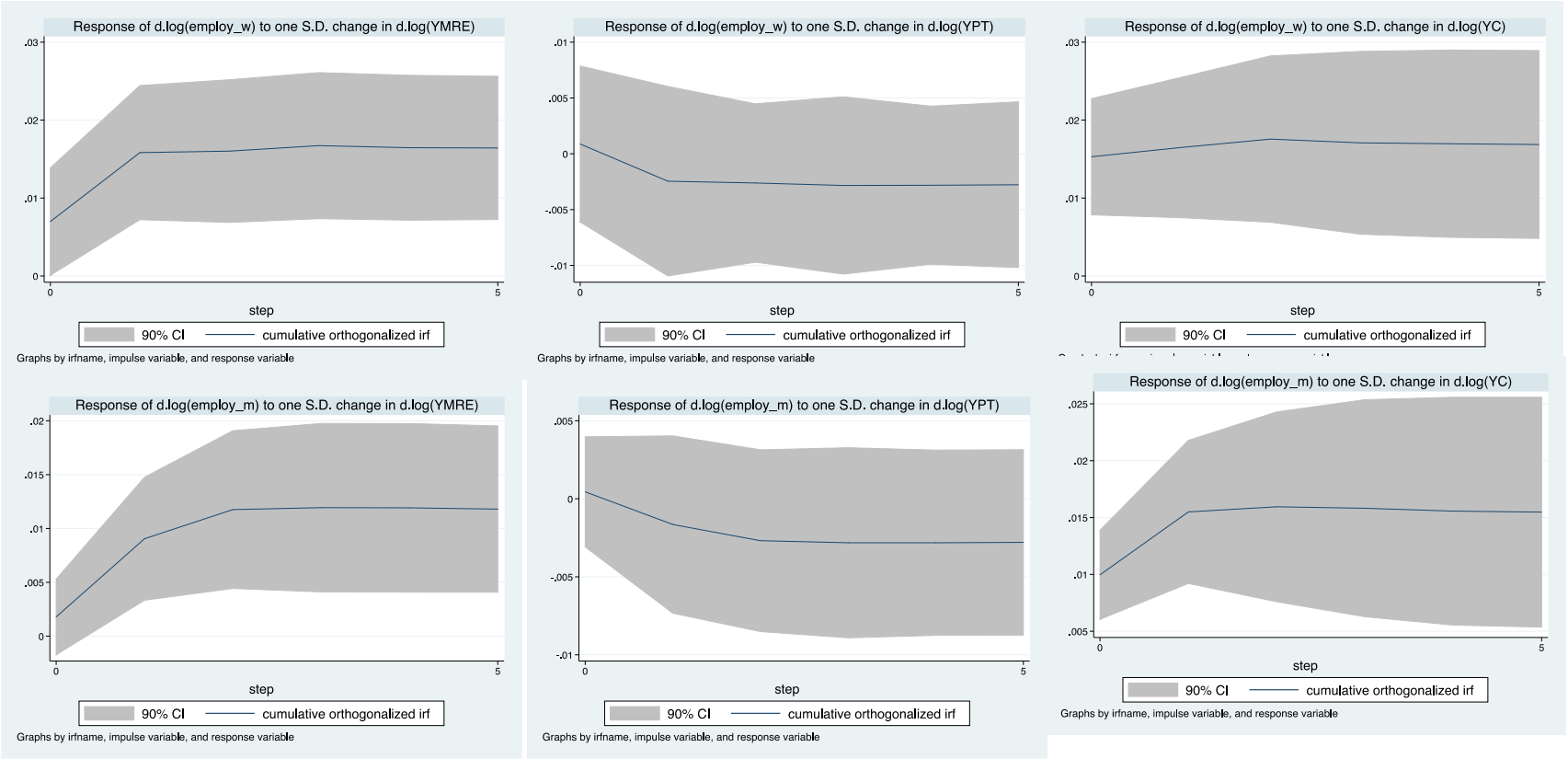


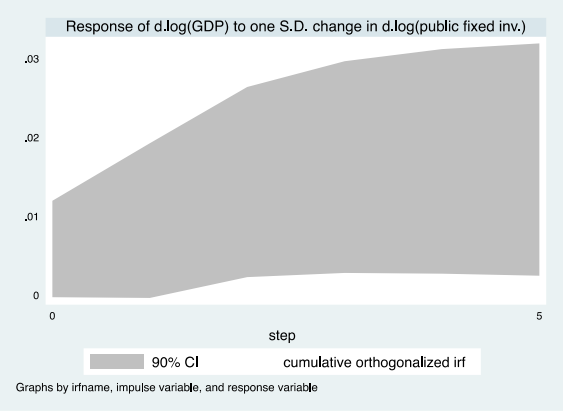


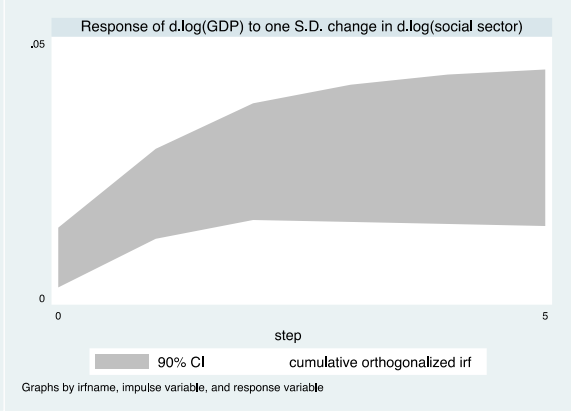


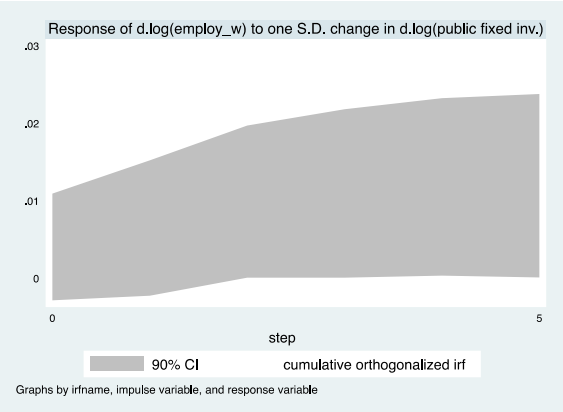
Cumulative Impulse Response Functions: employment to REEEPT

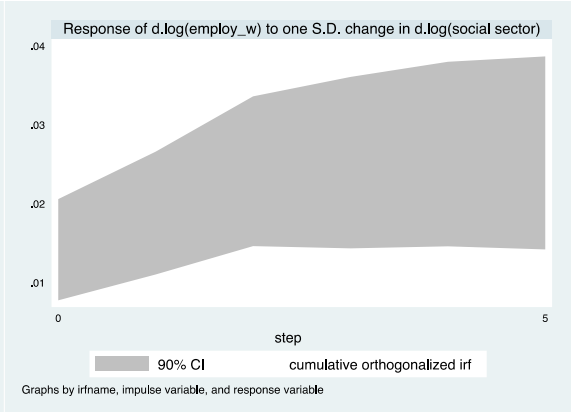
- South Korea

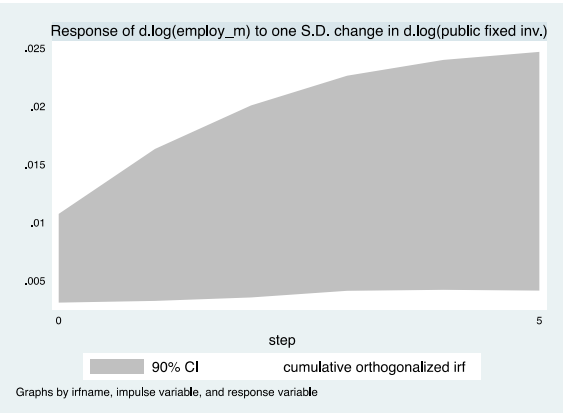


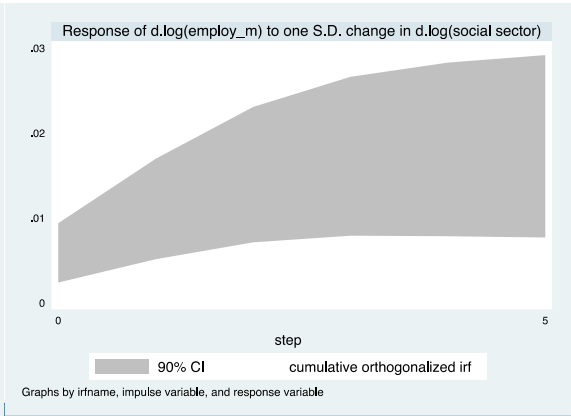










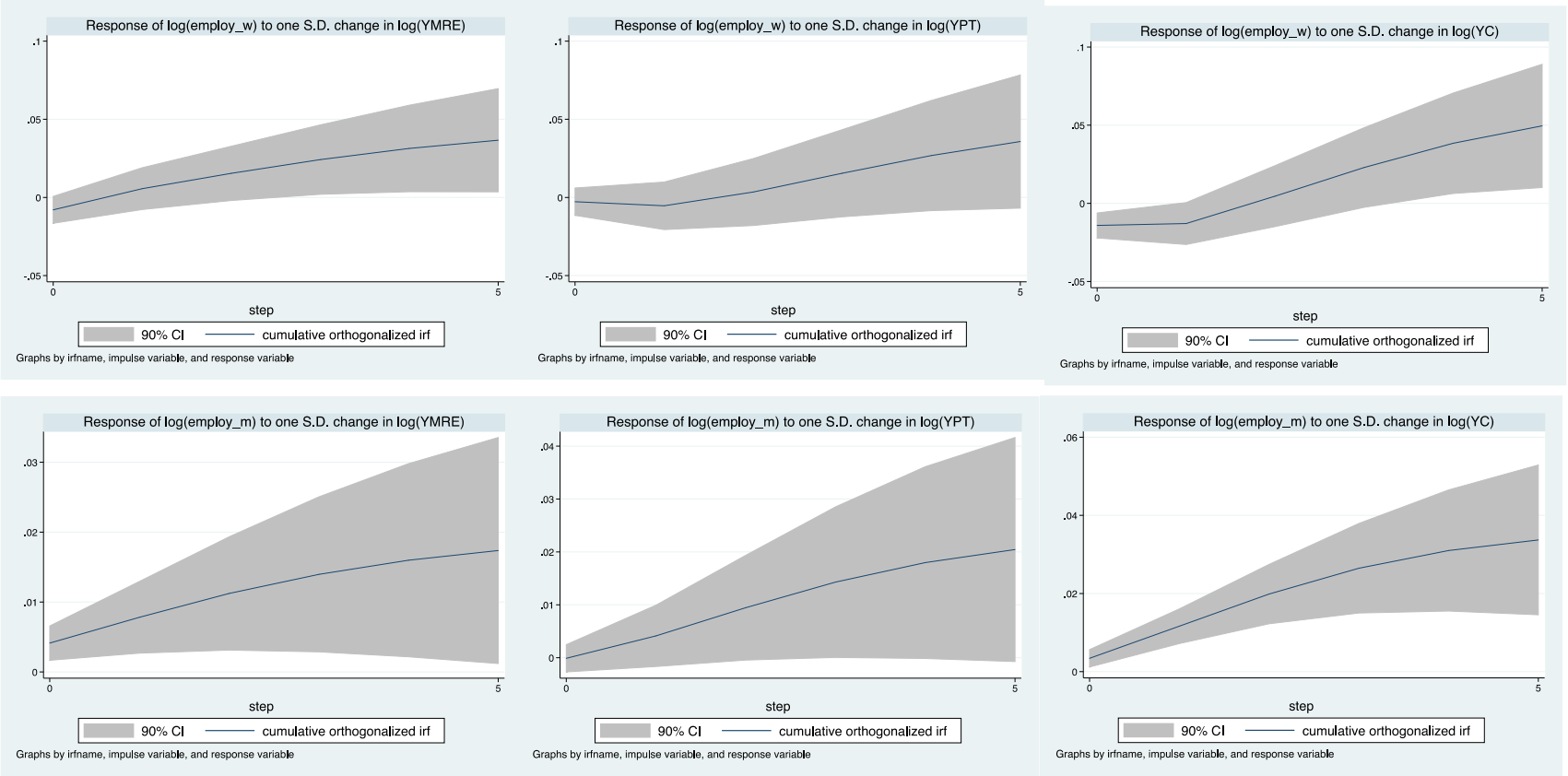


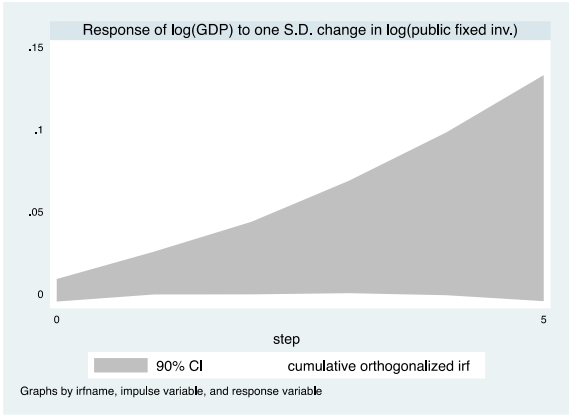
Cumulative impulse response functions: GDP and employment response to public spending in physical infrastructure and care

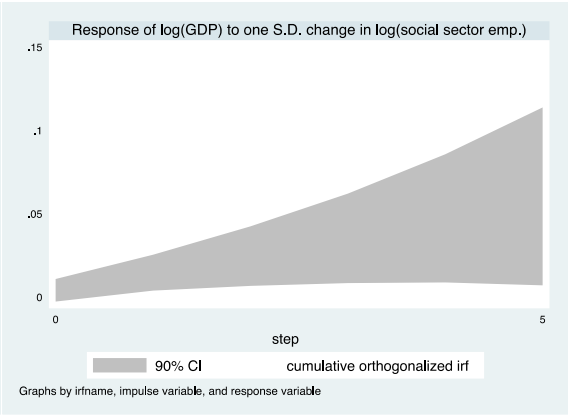
South Korea

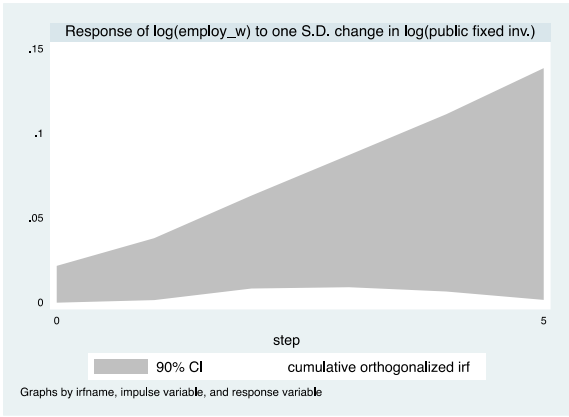
Cumulative Impulse Response Functions: employment to REEEPT

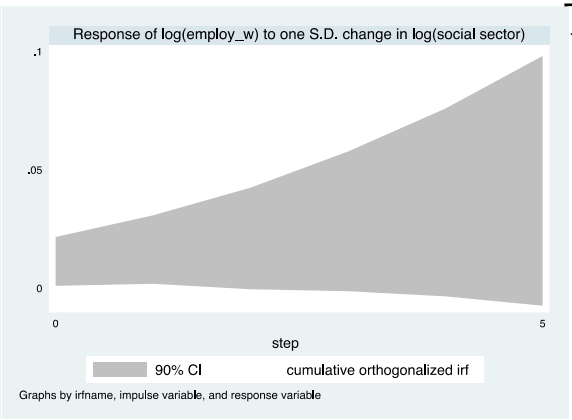
- Turkey

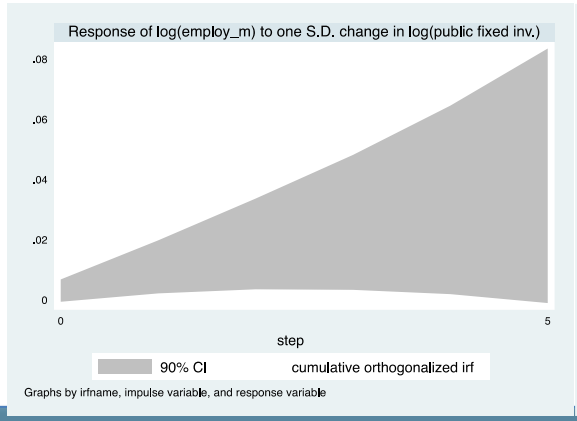


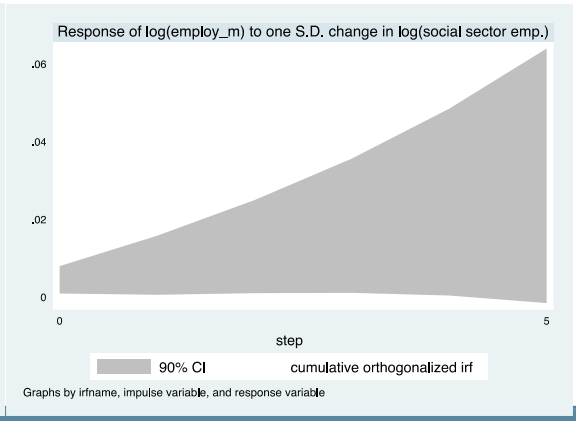








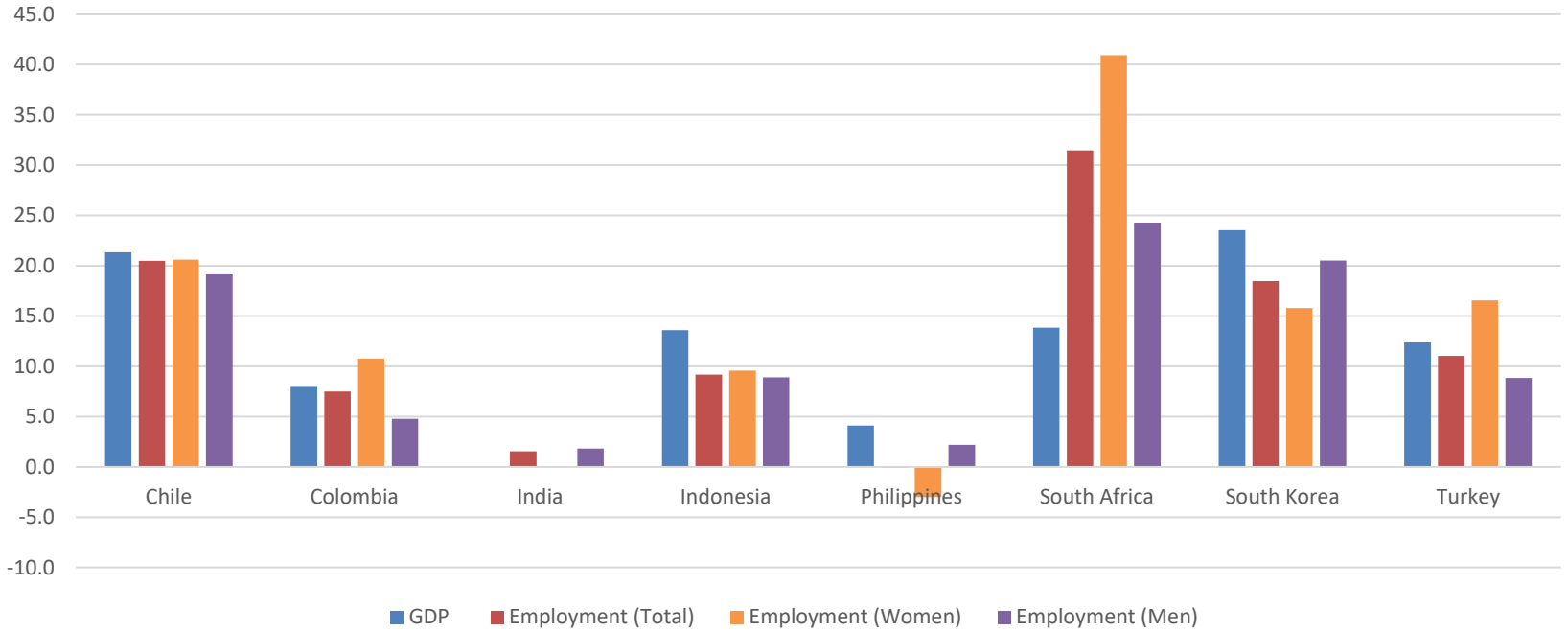




Cumulative impulse response functions: GDP and employment response to public spending in physical infrastructure and care

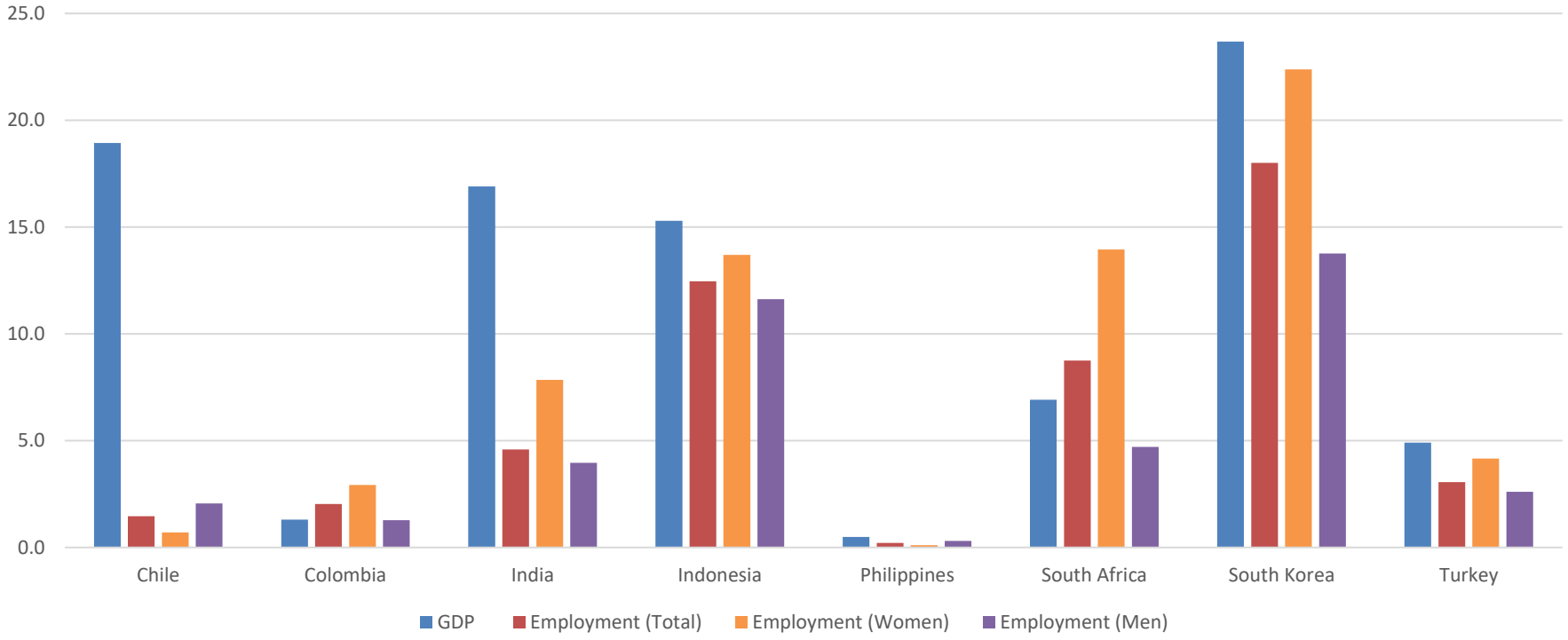
Turkey

The cumulative % change in GDP and employment (non-agricultural) at the end of five years in response to increasing spending in public physical infrastructure by 1%-point/GDP every year



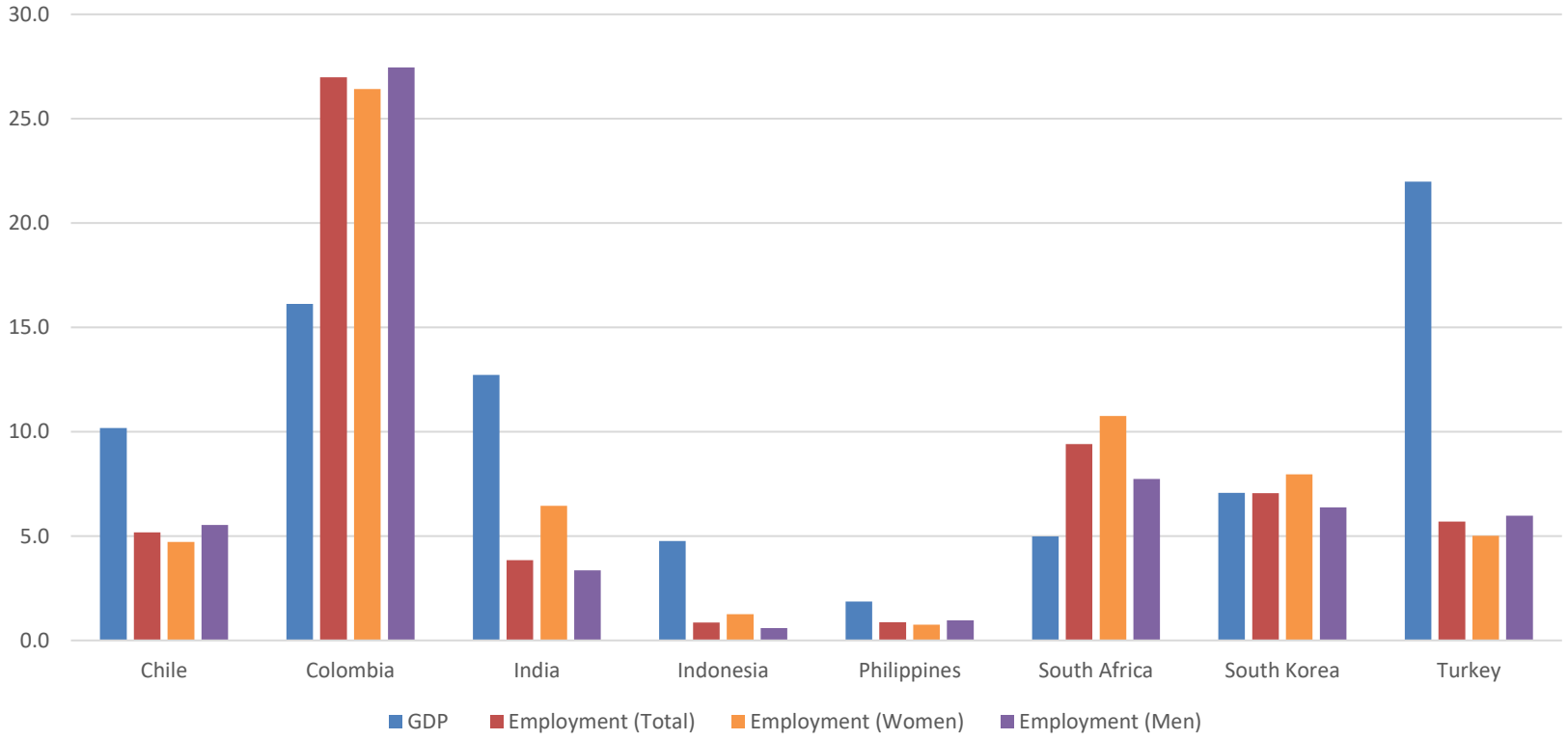
- GDP: 4.1% in Philippines - 23.5% in South Korea
- total employment: 1.5% in India - 31.5% in South Africa.
- in 6 countries employment of both men and women increase
- Chile, Colombia, Indonesia, South Africa, Turkey: %↑E_{women}>E_{men}
- the number of new jobs for women<men due to a low starting point
- importance of gender mainstreaming in assessing the employment impact

The cumulative % change in GDP and employment (non-agricultural) at the end of five years in response to increasing spending in care economy by 1%-point/GDP every year



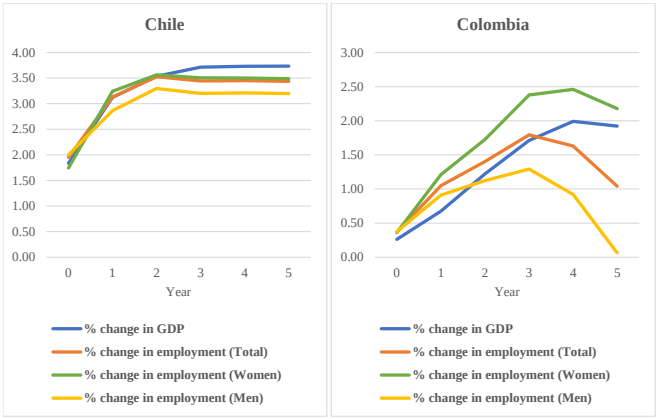
- GDP: 1.3% Colombia, 4.9% Turkey, 15.3% Indonesia, 16.9% India, 23.7% Korea
- Employment: 1.5% n Chile, 3.1% Turkey, 12.5% Indonesia, 4.6% India, 18.0% Korea
- jobs for both women and men, albeit at a faster rate for women.

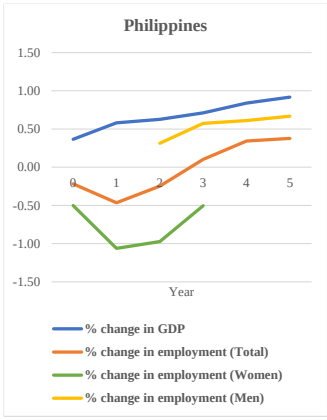
The cumulative % change in GDP and employment (non-agricultural) at the end of five years in response to increasing spending in the green economy (sum of effects of sectors providing input to REEEPT) by 1%-point/GDP annual

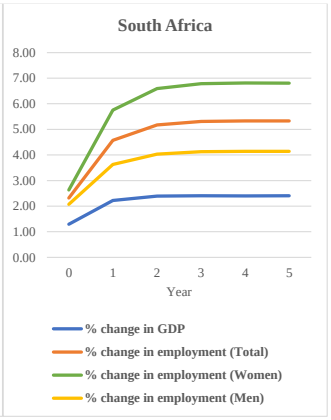


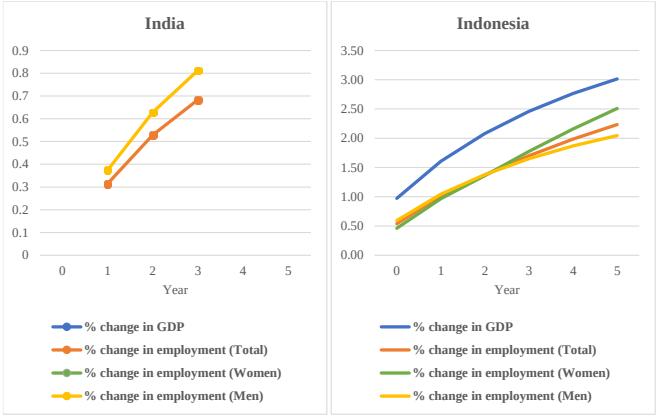
- GDP: 1.9% Philippines, 4.8% Indonesia, 12.7% India, 22.0% Turkey.
- total employment: 0.9% Philippines and Indonesia - 5.7% Turkey, 27% Colombia

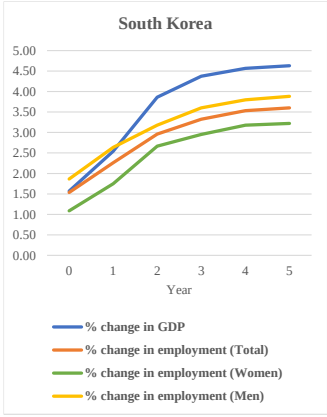
The cumulative % change in GDP, women's and men's and total employment (all in non-agricultural sector) in response to a 1%-point increase (one-off) in public GFCF as a ratio to GDP

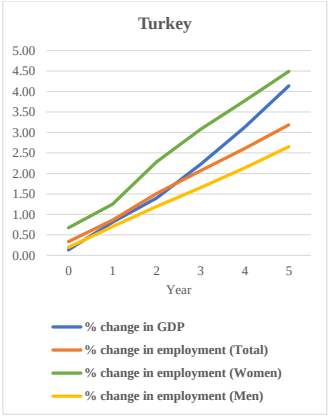




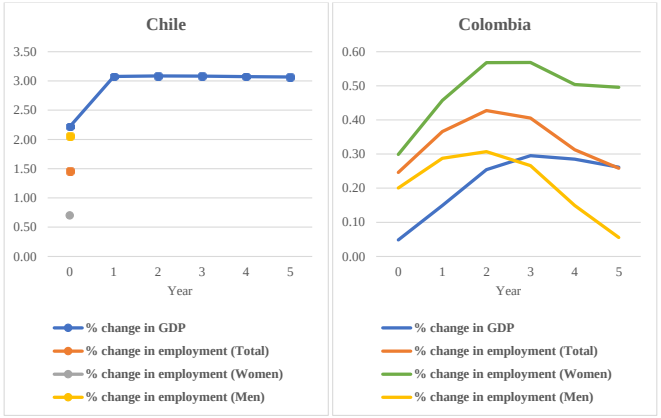


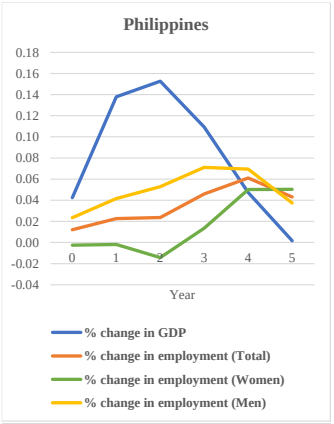


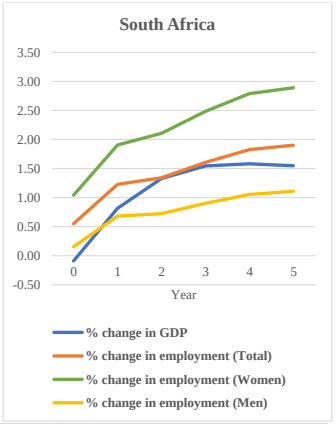


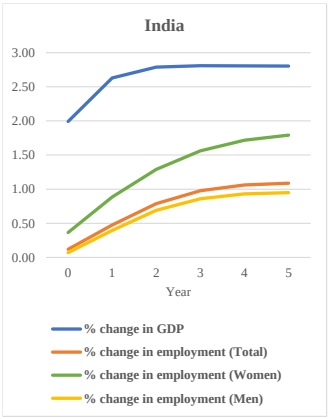


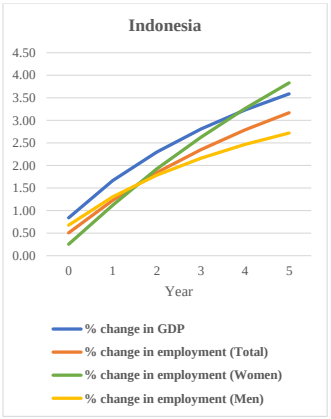
The cumulative % change in GDP, women's and men's and total employment (all in non-agricultural sector) in response to a 1%-point increase (one-off) in public spending in the care economy as a ratio to GDP

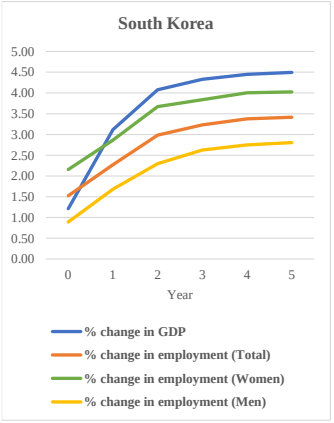


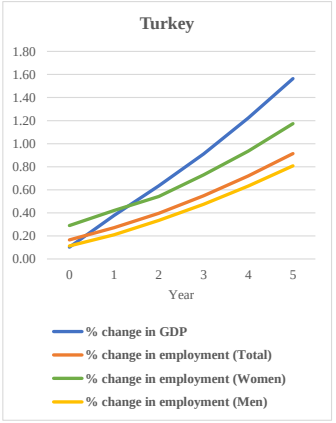




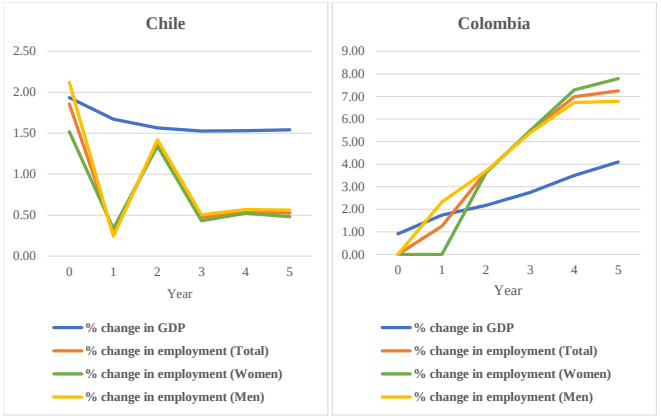


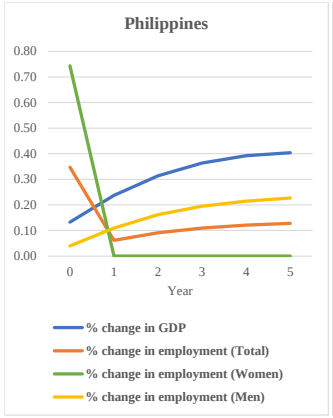


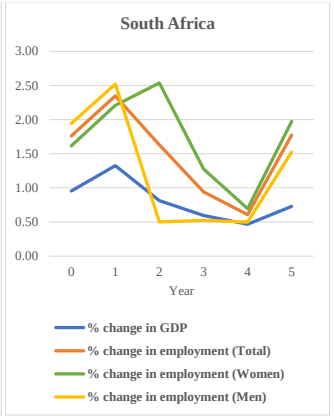


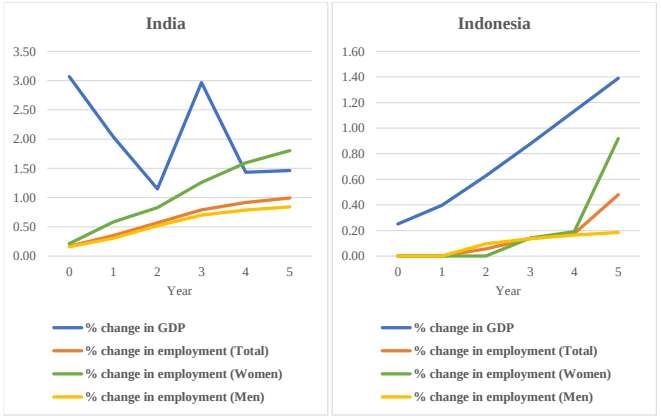


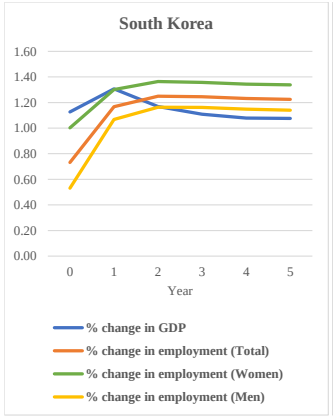
The cumulative % change in GDP, and women's and men's employment (and total employment, all in non-agricultural sector) in response to a 1%-point increase (one-off) in public spending in the green economy (REEEPT) as a ratio to GDP

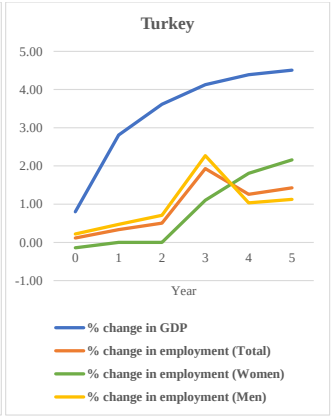






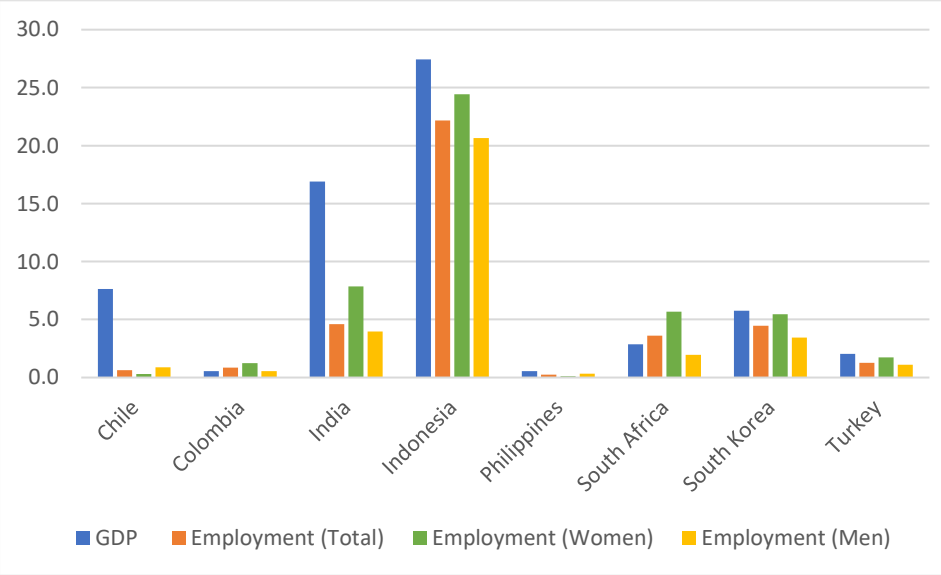




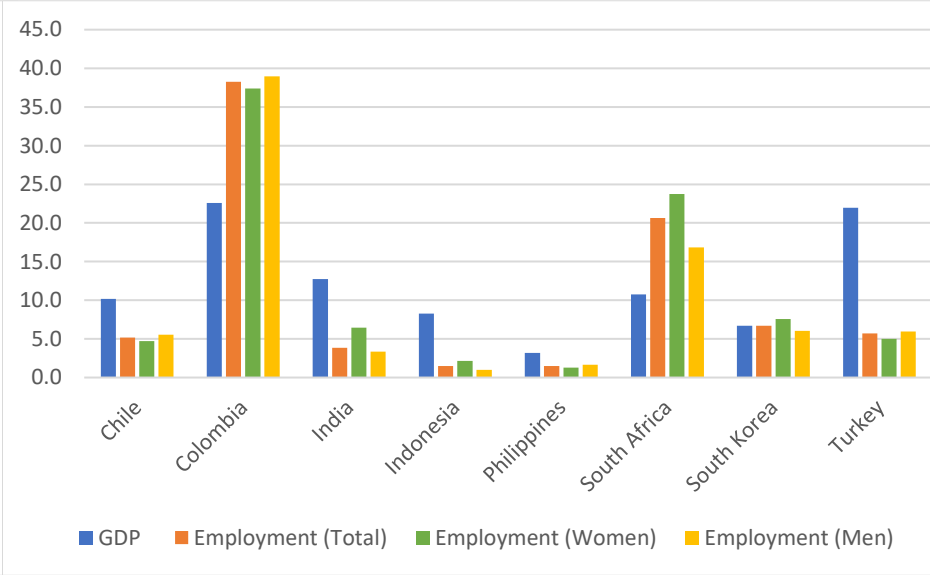


The cumulative % change in GDP and employment (total, women, and men, non-agricultural) and %-point change in the employment rate (total, women, and men) at the end of five years in response to the required additional investment targets in the care economy and green economy

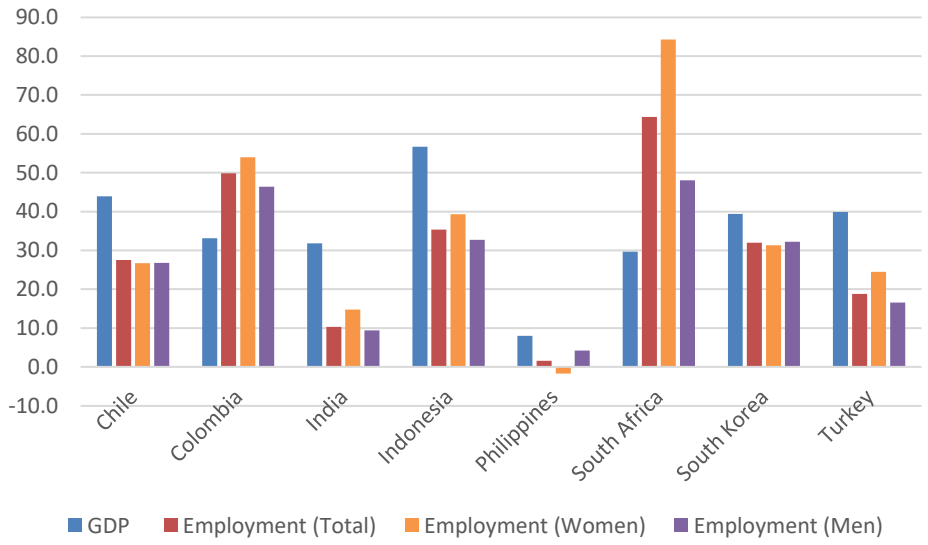
The effects of spending in the care economy



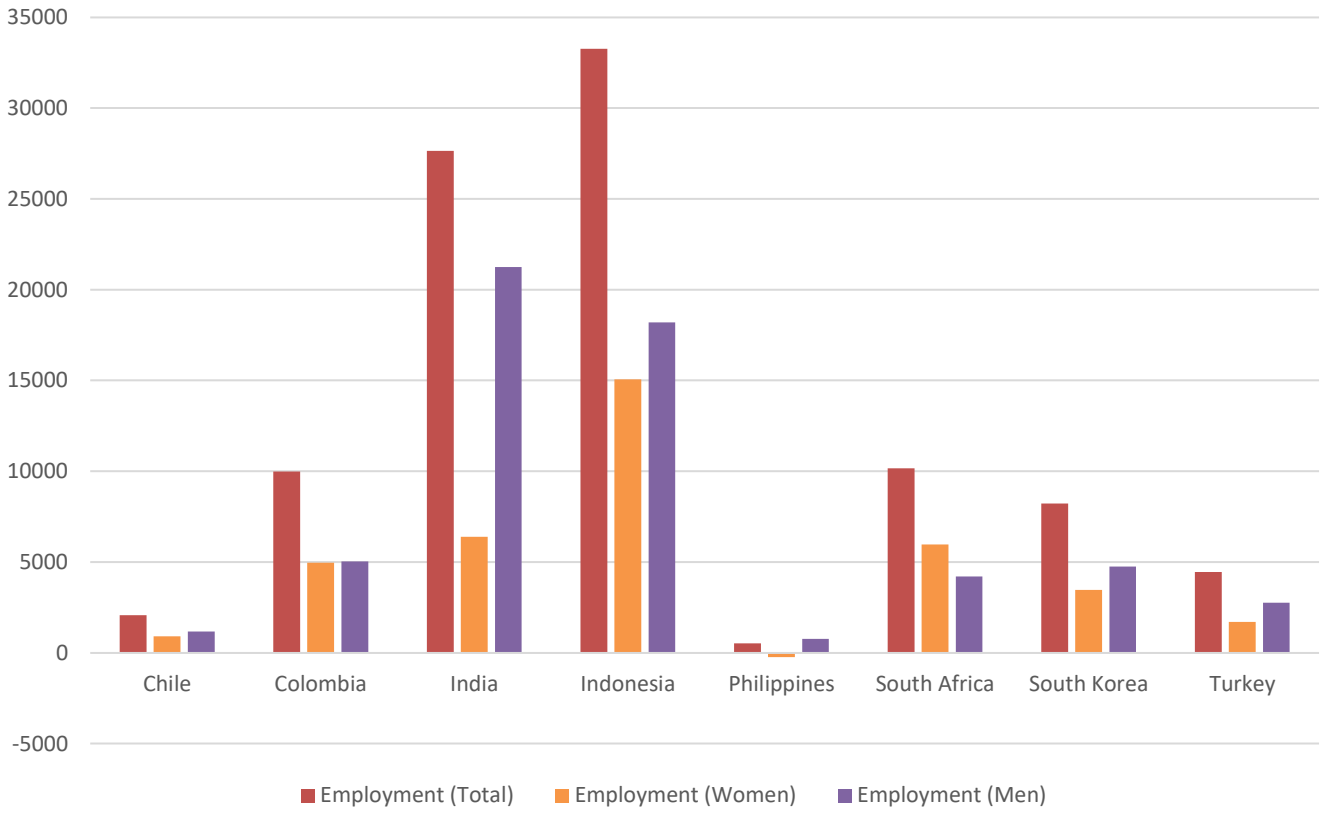
The effects of spending in the green economy (REEEPT)



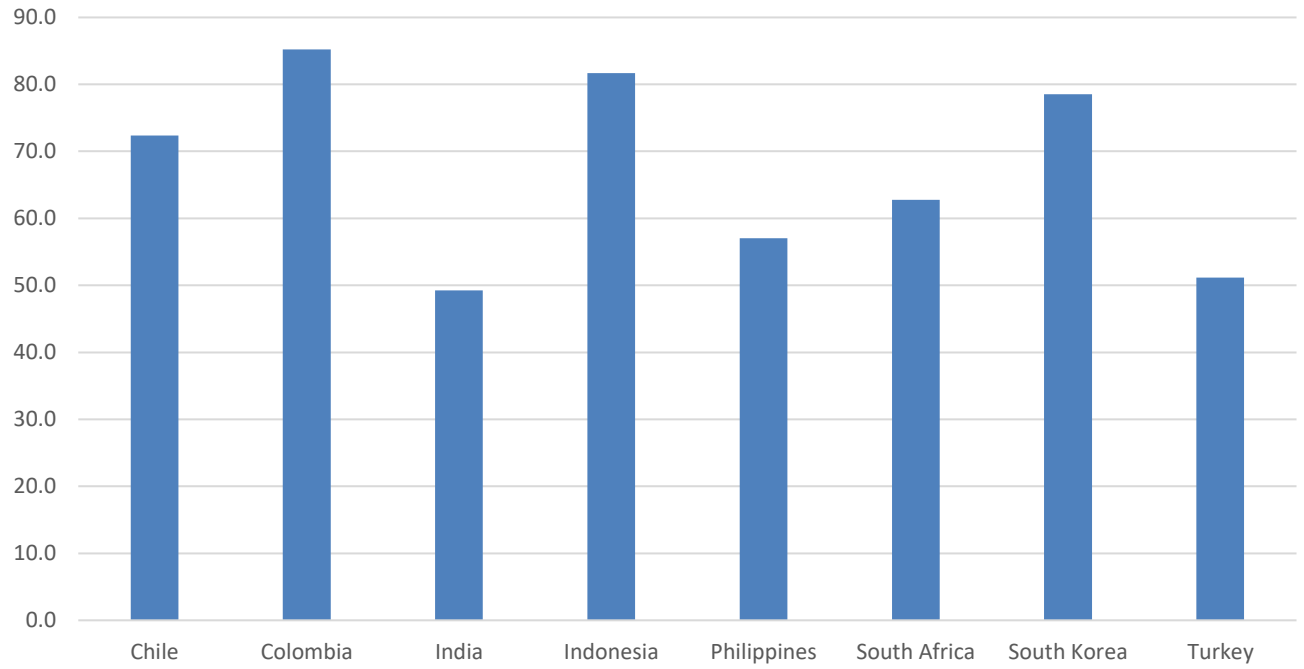
Policy mix combining public spending in the care and green economy, and other infrastructure: The sum of the cumulative % change in GDP and employment (total, women, and men, non-agricultural), at the end of five years in response to the required additional investment targets in the care economy and green economy and a 1%-point annual increase in public gross fixed capital formation/GDP



Policy mix combining public spending in the care and green economy, and other infrastructure: The sum of the number of new jobs (total, women and men, non-agricultural) at the end of five years in response to the required additional investment targets in the care economy and green economy and a 1%-point annual increase in public gross fixed capital formation/GDP



Policy mix combining public spending in the care and green economy, and other infrastructure: employment rate (total, as a ratio to 15+ population) at at the end of five years in response to the required additional investment targets in the care economy and green economy and a 1%-point annual increase in public gross fixed capital formation/GDP



- >70% in Chile, Colombia, Indonesia, and South Korea,
- ~50-60% in India, Philippines, Turkey, South Africa
- important gender employment gaps: employment $rate_{women}$ <men

What is the effect of an **increase in female and male wage rate**?

- General model: Dual role of wages →demand & cost
- Wages & gender gap → Income distribution → demand → output
- **Short-run:** (+) & (-) effects on aggregate demand

(+) consumption:

Marginal propensity to consume in H out of female wages>male w>profit

Marginal propensity to consume in N out of male & female w>profit

(-) investment: profit share↓→I↓ but demand↑→I↑

(-) net exports: the sensitivity of net exports to unit labor costs

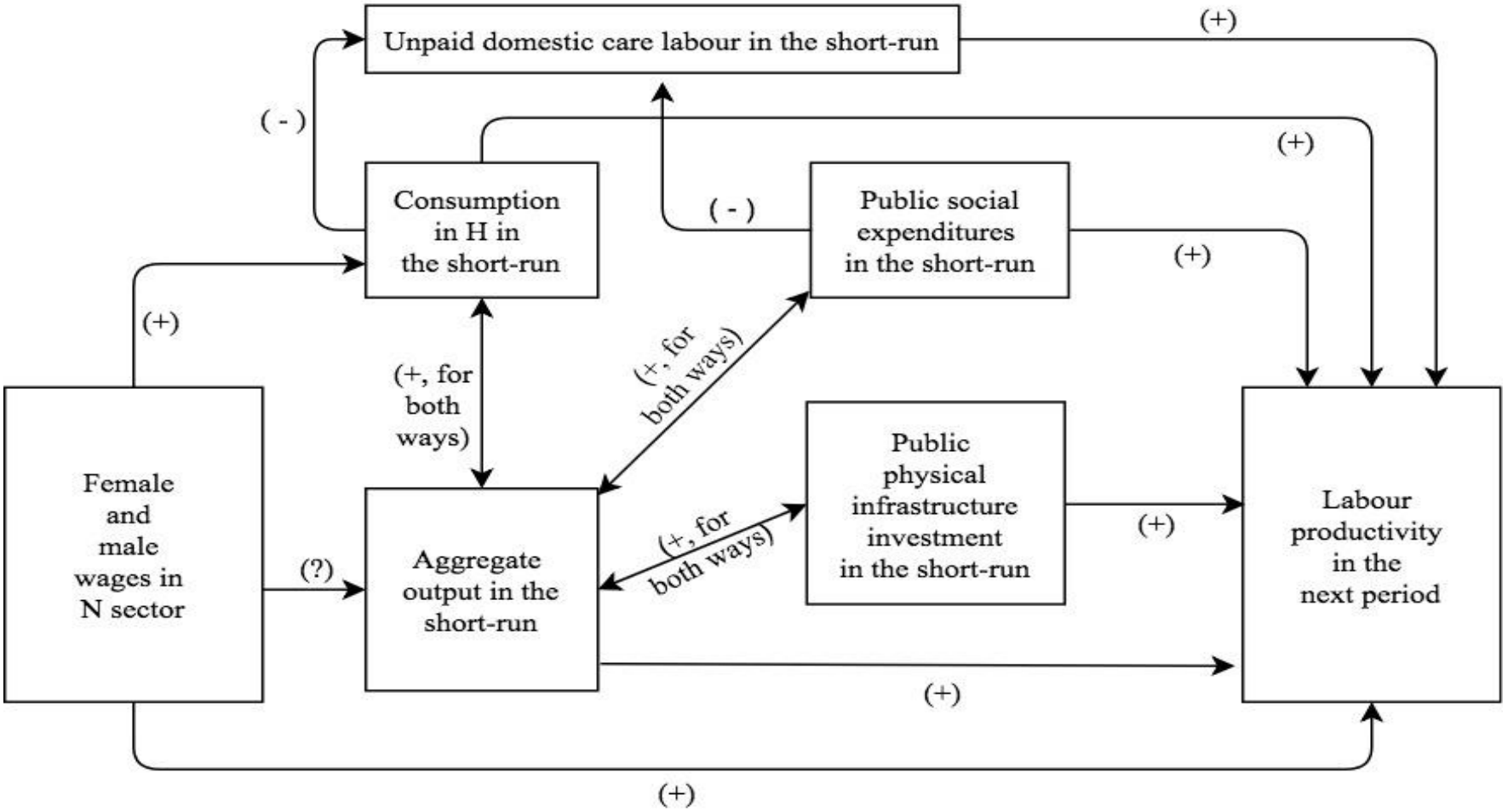
(price elasticity of exports & imports; labour intensity of exports)

- **medium run:** labour productivity↑: moderates the effect of wages on profits
- Total effect on demand is ambiguous in the short-run and medium-run
  - -: profit-led economy (mainstream policy assumption)
  - +: wage-led economy
- Gender equality led if female wages ↑ + gender gap ↓ →output↑
- Equality-led = Wage-led + gender equality-led

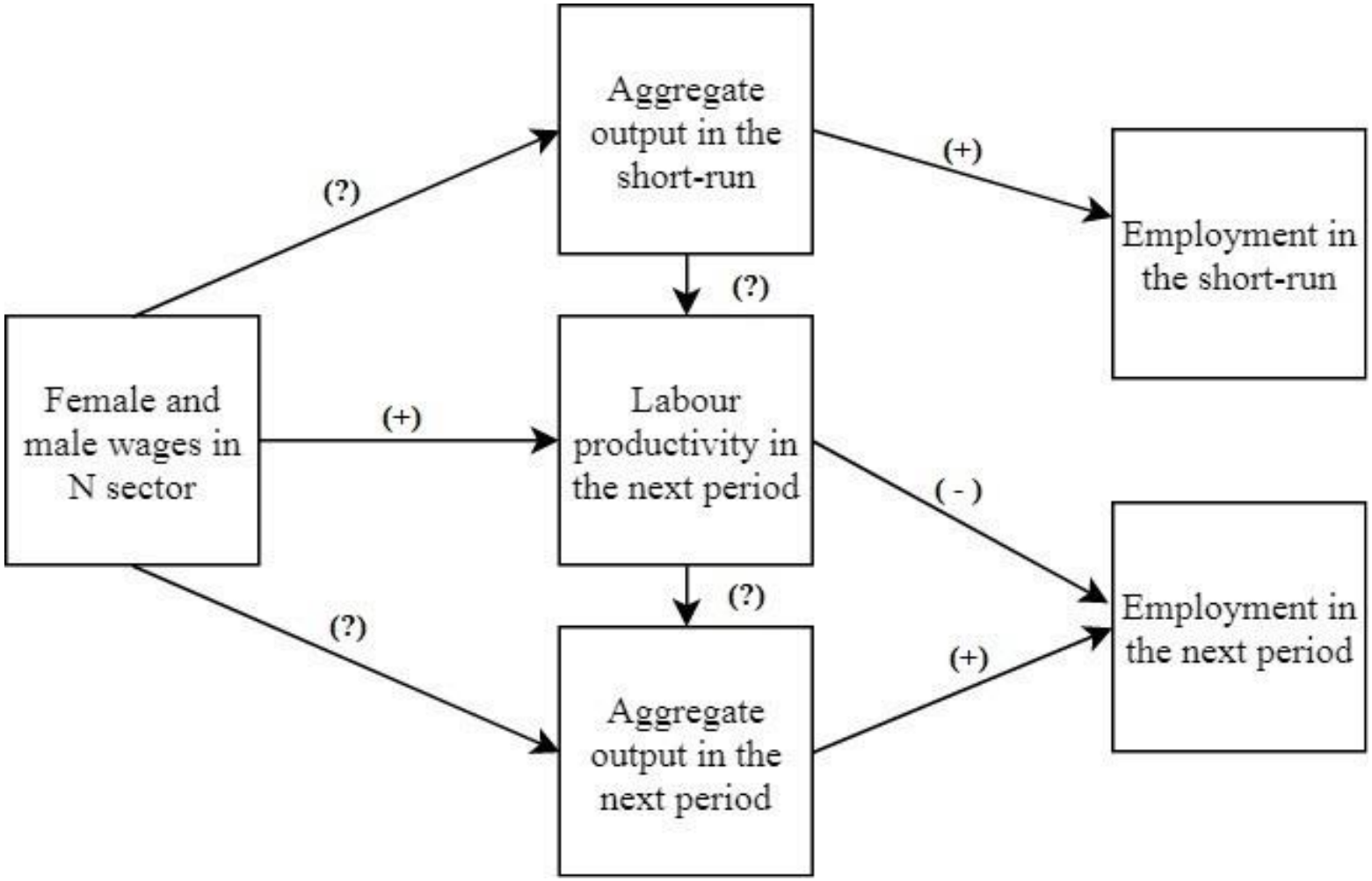
The demand regimes in the short-run

	Wage-led in the short run	**Profit-led in the short-run**
Female wage-led/ gender equality-led in the short-run	|Impact of w_t^{NF} & w_t^{NM} (constant α_t^N) on total consumption| > |Impact of w_t^{NF} & w_t^{NM} (constant α_t^N) on investment + net exports| & |Impact of w_t^{NF} on total consumption| > |Impact of w_t^{NF} on investment + net exports|	|Impact of w_t^{NF} & w_t^{NM} (constant α_t^N) on investment + net exports| > |Impact of w_t^{NF} & w_t^{NM} (constant α_t^N) on total consumption| > |Impact of w_t^{NF} on total consumption| > |Impact of w_t^{NF} on investment + net exports|
Gender inequality-led in the short-run	|Impact of w_t^{NF} & w_t^{NM} (constant α_t^N) on total consumption| > |Impact of w_t^{NF} & w_t^{NM} (constant α_t^N) on investment + net exports| > |Impact of w_t^{NF} on investment + net exports > |Impact of w_t^{NF} on total consumption|	|Impact of w_t^{NF} & w_t^{NM} (constant α_t^N) on total consumption| < |Impact of w_t^{NF} & w_t^{NM} (constant α_t^N) on investment + net exports| & |Impact of w_t^{NF} on total consumption| < |Impact of w_t^{NF} on investment + net exports|

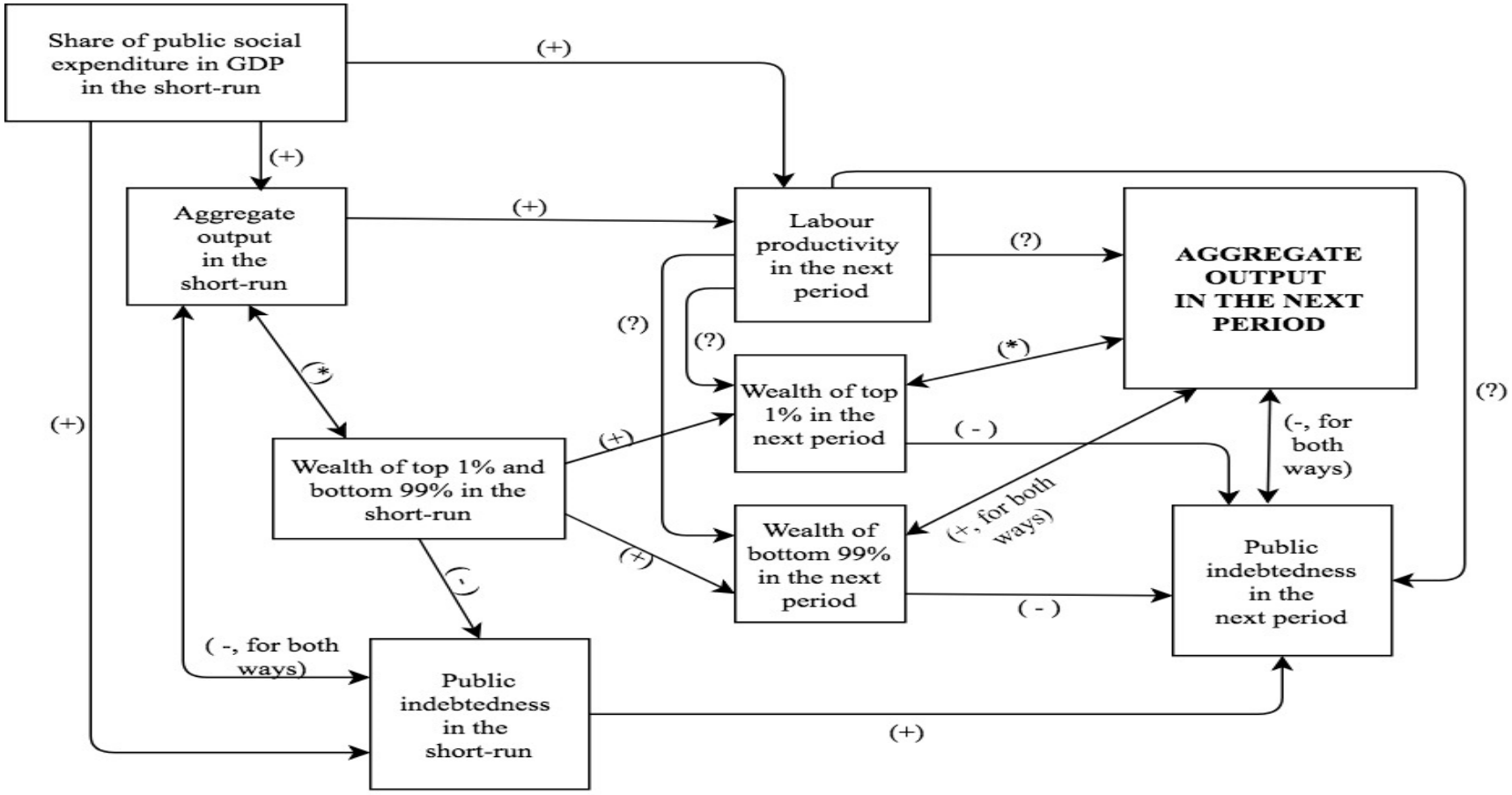
The effects of female and male wages in N on labour productivity in the next period



The impact of an increase in female and male wages on employment

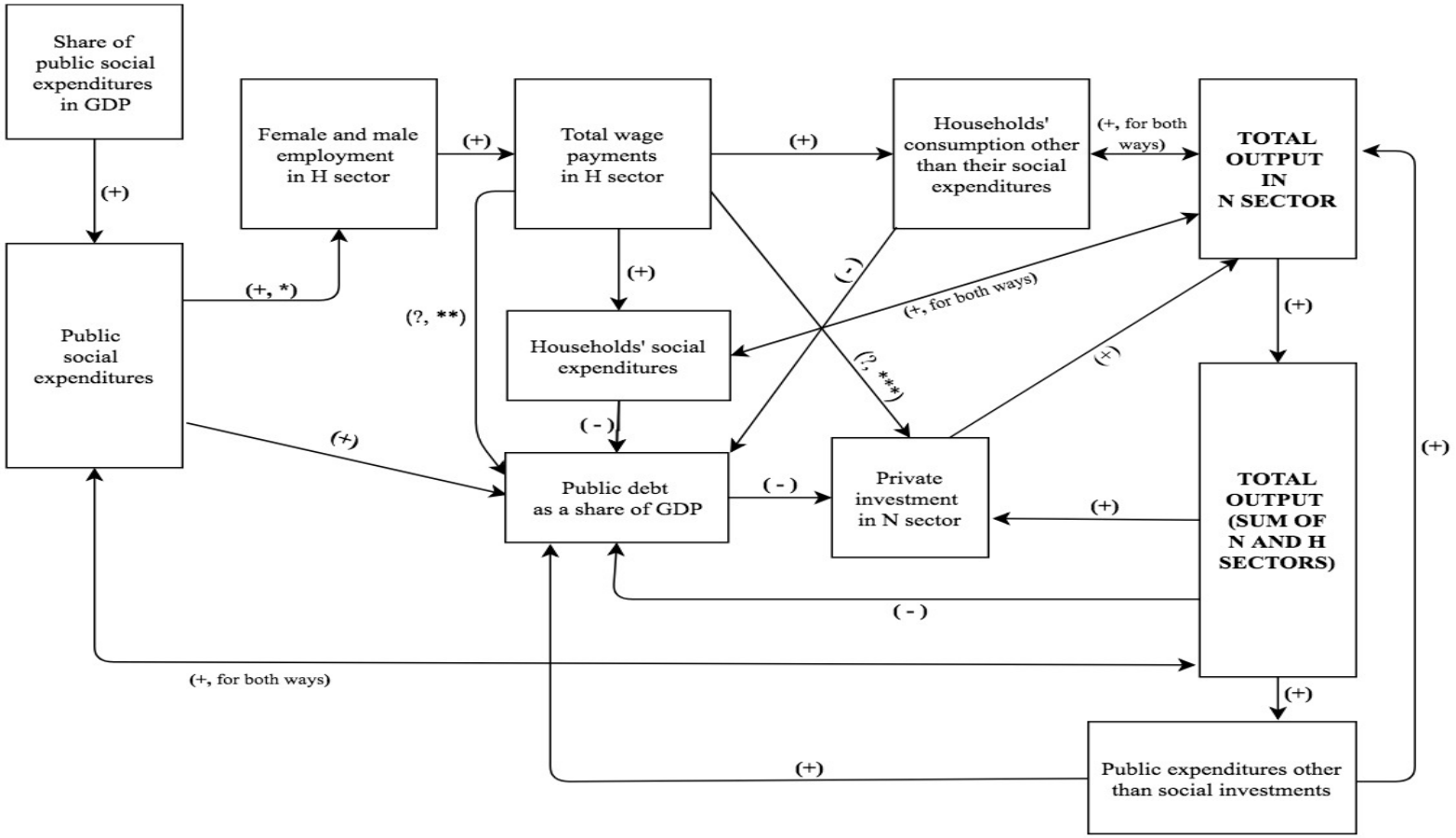


The effects of an increase in public social infrastructure investment on total output in the short and medium run



* The effects from the wealth of top 1% on aggregate output is ambiguous and the impact of aggregate output on the wealth of top 1% is positive.

Figure 4: The effects of an increase in public social infrastructure investment on total output in the short-run



* Based on Figure 1, the positive partial impact of public social expenditures is expected to be relatively larger for female employment compared to the partial impact from expenditures in N sector.
** The impact of total wage payments in H sector is through their impact on wage and wealth taxes.
*** The impact of total wage payments in H sector is through their impact on the wealth of top 1% and bottom 99%.

Figure 5: The effects of an increase in public social infrastructure investment on labour productivity in the next period

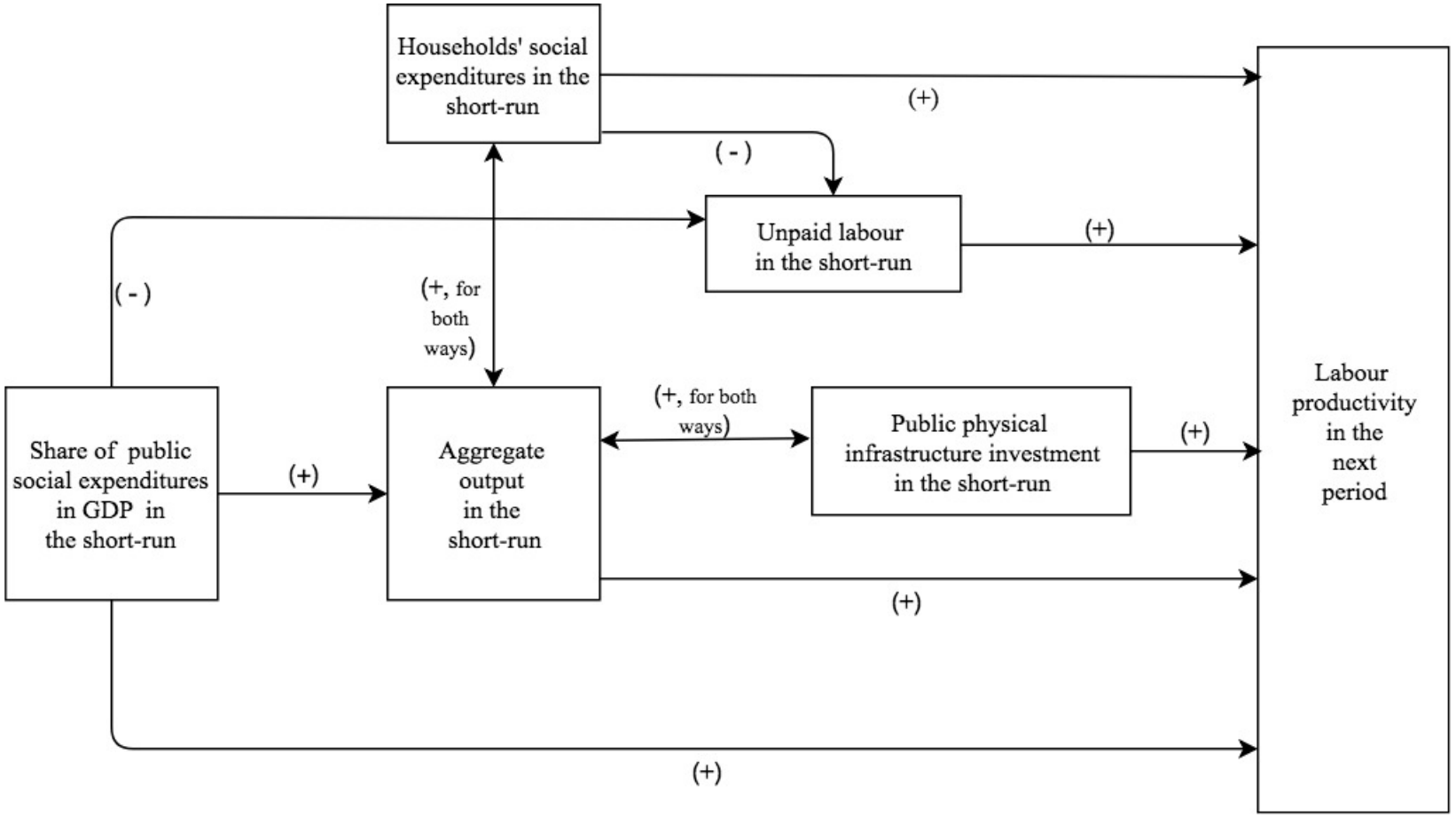


Figure 7: The effects of public social infrastructure investment on total employment in the short-run and in the next period

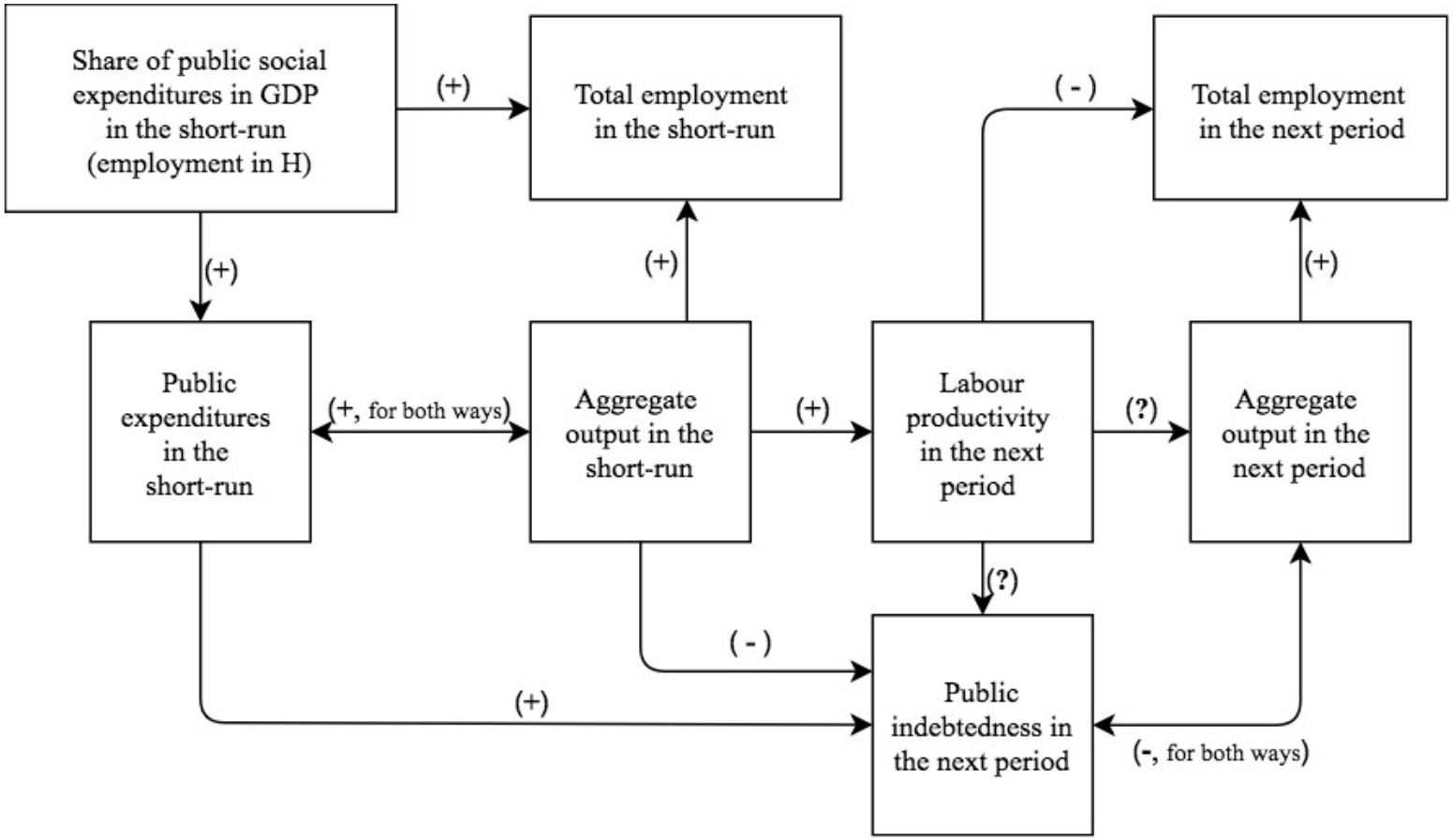
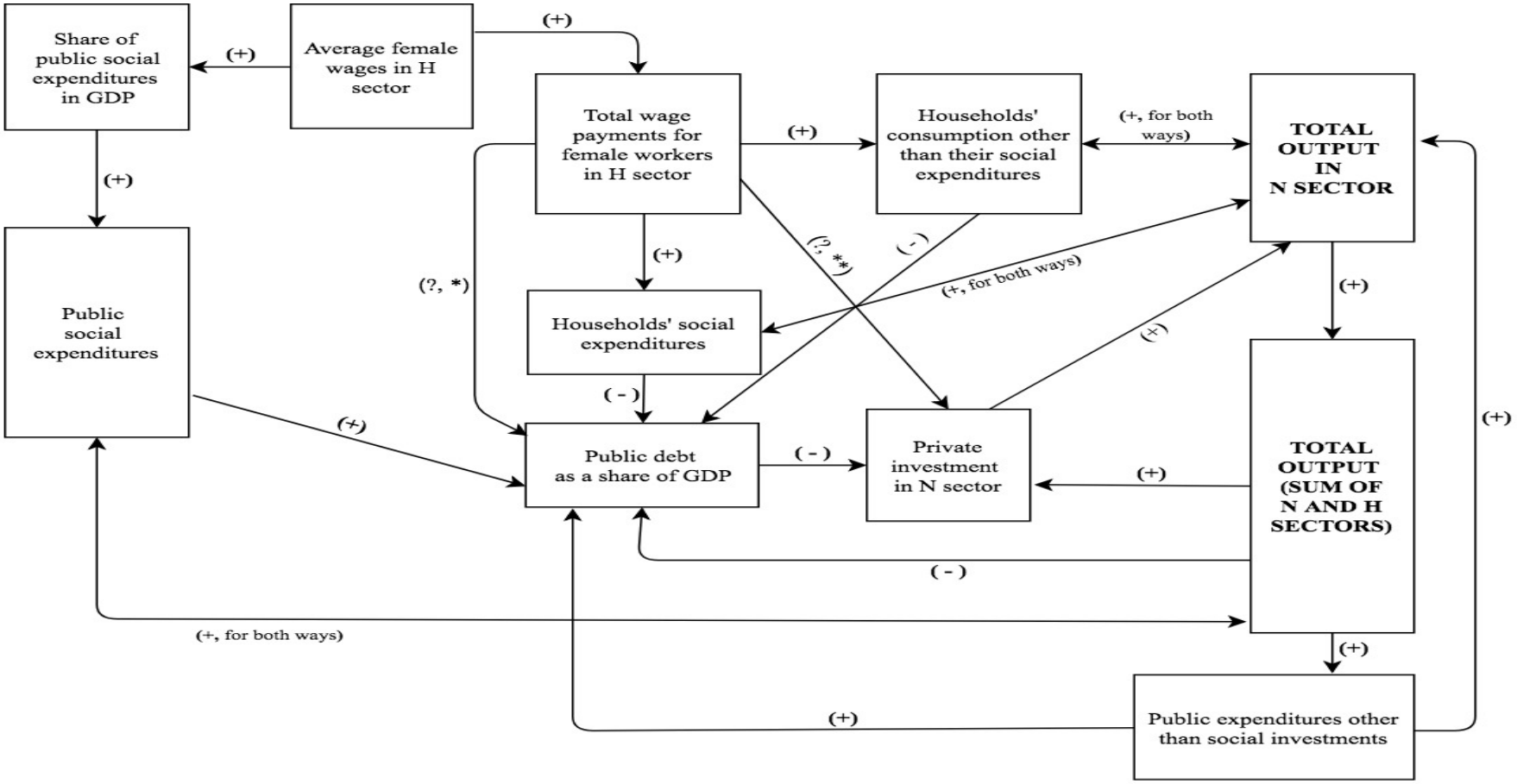


Figure 8: The effects of closing the gender wage gap in H on total output in the short-run



* The impact of total wage payments in H sector is through their impact on wage and wealth taxes.
** The impact of total wage payments in H sector is through their impact on the wealth of top 1% and bottom 99%.

The regimes and their conditions in the case of an increase in female and male wages in N with a constant gender wage gap

Case	Growth Regime	Condition
$\Psi_{tt}^{NF} > 0$	Wage-led in the short-run	$\left(\left\|\frac{\partial C_t^N}{\partial w_t^{NF}}\right\|_{Y_t,\alpha_t^N} + \left\|\frac{\partial C_t^H}{\partial w_t^{NF}}\right\|_{Y_t,\alpha_t^N}\right) > -\left(\left\|\frac{\partial I_t}{\partial w_t^{NF}}\right\|_{Y_t,\alpha_t^N} + \left\|\frac{\partial X_t}{\partial w_t^{NF}}\right\|_{Y_t,\alpha_t^N} - \left\|\frac{\partial M_t}{\partial w_t^{NF}}\right\|_{Y_t,\alpha_t^N}\right)$
$\Psi_{tt}^{NF} < 0$	Profit-led in the short-run	$\left(\left\|\frac{\partial C_t^N}{\partial w_t^{NF}}\right\|_{Y_t,\alpha_t^N} + \left\|\frac{\partial C_t^H}{\partial w_t^{NF}}\right\|_{Y_t,\alpha_t^N}\right) < -\left(\left\|\frac{\partial I_t}{\partial w_t^{NF}}\right\|_{Y_t,\alpha_t^N} + \left\|\frac{\partial X_t}{\partial w_t^{NF}}\right\|_{Y_t,\alpha_t^N} - \left\|\frac{\partial M_t}{\partial w_t^{NF}}\right\|_{Y_t,\alpha_t^N}\right)$
$(\Psi_{tt}^{NF} + \Psi_{t(t-1)}^{NF}) > 0$	Wage-led in the medium-run	Ambiguous due to effects on productivity
$(\Psi_{tt}^{NF} + \Psi_{t(t-1)}^{NF}) < 0$	Profit-led in the medium-run	Ambiguous due to effects on productivity

Table 1: IV-GMM and OLS results for consumption in N and H

	IV-GMM				*OLS*			
Dependent variable	$\Delta \log C^N_t$		$\Delta \log C^H_t$		$\Delta \log C^N_t$		$\Delta \log C^H_t$	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Constant	0.007	0.000	0.006	0.039	0.007	0.020	0.010	0.069
$\Delta \log(R_t(1-t^R_t))$	0.071	0.000	0.039	0.154	0.082	0.000	0.054	0.187
$\Delta \log(WB^F_t(1-t^W_t))$	0.192	0.000	0.183	0.100	0.154	0.040	0.319	0.212
$\Delta \log(WB^M_t(1-t^W_t))$	0.369	0.000	0.374	0.003	0.348	0.001	0.165	0.506
$\Delta \log(PW1_t(1-t^{PW}_t))$	0.001	0.943	-0.035	0.369	0.013	0.570	-0.064	0.283
$\Delta \log(PW99_t(1-t^{PW}_t))$	0.134	0.000	0.031	0.730	0.141	0.026	-0.046	0.779
R^2	0.749		0.077		0.759		0.121	
Kleibergen-Paap rk Wald F statistic for weak identification	18.21		18.21		-		-	
Hansen J overidentification test (p-value)	0.624		0.374		-		-	
Durbin-Wu-Hausman test for endogeneity (p-value)	0.017		0.884		-		-	
Sample	1973-2015		1973-2015		1973-2015		1973-2015	

Notes: Robust standard errors used. We use contemporaneous, one-year, and two-year lagged differences of log α^N, log t^R, log t^W, log β^N, log Y^{World}, Chinn-Ito capital account openness index and contemporaneous differences of log α^H, logarithm of strike days as a ratio to employment, logarithm of union members as a ratio to employment and log λ as instruments for all independent variables.

Table 2: IV-GMM and OLS results for private investment

	IV-GMM		*OLS*	
Dependent variable	$\Delta \log I_t$		$\Delta \log I_t$	
Variable	Coeff.	p-value	Coeff.	p-value
Constant	-0.022	0.000	-0.029	0.005
$\Delta \log(\pi_t(1-t^R_t))$	0.270	0.000	0.221	0.031
$\Delta \log Y_t$	1.040	0.001	1.995	0.001
$\Delta \log(PW1_t(1-t^{PW}_t))$	-0.102	0.000	-0.132	0.084
$\Delta \log(PW99_t(1-t^{PW}_t))$	0.612	0.000	0.328	0.038
$\Delta \log(D/Y)_t$	-0.237	0.000	-0.118	0.178
R^2	0.713		0.700	
Kleibergen-Paap rk Wald F statistic for weak identification	12.15		-	
Hansen J overidentification test (p-value)	0.515		-	
Durbin-Wu-Hausman test for endogeneity (p-value)	0.064		-	
Sample	1974-2015		1974-2015	

Notes: Robust standard errors used. We use contemporaneous, one-year and two-year lagged differences of log α^N; contemporaneous, one-year, two-year, 3-year lagged differences of log κ^H, log t^R, log t^W, log β^N, log Y^{World}, logarithm of strike days as a ratio to employment; one-year, two-year, 3-year lagged differences of log D/Y; contemporaneous differences of log α^H, log λ, logarithm of union members as a ratio to employment as instruments for all independent variables.

Table 3: IV-GMM and OLS results for exports

	IV-GMM		*OLS*	
Dependent variable	$\Delta \log X_t$		$\Delta \log X_t$	
Variable	Coeff.	p-value	Coeff.	p-value
Constant	-0.018	0.059	-0.019	0.055
$\Delta \log(\pi_t)$	0.305	0.008	0.126	0.302
$\Delta \log Y^{World}_t$	1.879	0.000	1.978	0.000
R^2	0.490		0.521	
Kleibergen-Paap rk Wald F statistic for weak identification	65.74		-	
Hansen J overidentification test (p-value)	0.337		-	
Durbin-Wu-Hausman test for endogeneity (p-value)	0.192		-	
Sample	1973-2016		1973-2016	

Notes: Robust standard errors used. We use one-year and two-year lagged differences of Chinn-Ito capital account openness index and one-year lagged difference of log Y^N for $\Delta \log \pi$.

Table 4: IV-GMM estimation results for imports

	IV-GMM		*OLS*	
Dependent variable	$\Delta \log M_t$		$\Delta \log M_t$	
Variable	Coeff.	p-value	Coeff.	p-value
Constant	0.001	0.751	0.008	0.237
$\Delta \log(\pi_t)$	-0.307	0.001	-0.224	0.080
$\Delta \log Y^N_t$	1.836	0.000	1.630	0.000
R^2	0.627		0.638	
Kleibergen-Paap rk Wald F statistic for weak identification	11.98		-	
Hansen J overidentification test (p-value)	0.295		-	
Durbin-Wu-Hausman test for endogeneity (p-value)	0.692		-	
Sample	1973-2015		1973-2015	

Notes: Robust standard errors used. We use contemporaneous, one-year and two-year lagged differences of log α^N , log β^N , log κ^H ,log Y^W , logarithm of strike days as a ratio to employment and Chinn-Ito capital account openness index as instruments for all independent variables.

Table 5: IV-GMM results for productivity in N

	IV-GMM		*OLS*	
Dependent variable	$logT_{it}$		$logT_{it}$	
Variable	Coeff.	p-value	Coeff.	p-value
$logY_{i(t-1)}$	0.141	0.297	0.253	0.005
$logI_{i(t-1)}/ E_{i(t-1)}$	-0.025	0.806	-0.104	0.091
$logw^F_{i(t-1)}$	0.650	0.000	0.603	0.000
$log\alpha_{i(t-1)}$	0.622	0.000	0.553	0.000
$log(G^H_{t-1}+C^H_{t-1})/N_{t-1}$	0.402	0.014	0.487	0.002
$log(I^G_{t-1})/N_{t-1}$	-0.069	0.336	-0.126	0.014
R-squared	0.913		0.917	
Kleibergen-Paap rk Wald F statistic for weak identification	7.509		-	
Hansen J overidentification test (p-value)	0.146		-	
Durbin-Wu-Hausman test for endogeneity (p-value)	0.217		-	
Number of observations	126		126	
Number of sectors	18		18	
Sample	1981-2015		1981-2015	

Notes: Both regressions include yearly fixed effects. The time indicator t refers to five-year nonoverlapping average of explanatory variables starting from 1980 and of the dependent variable starting from 1981. One-year lags of log Y, log I/E, log w^F, log α^N are instrumented by one-year lags of strike days as a a ratio to employment for six broad sectors, logarithms of sectoral value added in each of the eighteen sectors in the US, logarithms of sectoral value added in each of the eighteen sectors in the EU-12, logarithms of α^N for the UK; eleven year lags of log Y, log I/E, log w^F, log α.

Table 6: IV-GMM estimation results for private net wealth

	IV-GMM		*OLS*	
Dependent variable	$\Delta \log PW_t$		$\Delta \log PW_t$	
Variable	Coeff.	p-value	Coeff.	p-value
Constant	0.004	0.375	-0.002	0.828
$\Delta \log(WB^F_t(1-t^W_t))$	0.409	0.004	0.495	0.017
$\Delta \log(WB^M_t(1-t^W_t))$	0.396	0.009	0.428	0.072
$\Delta \log(R_t(1-t^R_t))$	0.191	0.000	0.214	0.001
$\Delta \log(PW_{t-1}(1-t^{PW}_{t-1}))$	0.369	0.000	0.331	0.002
R^2	0.629		0.640	
Kleibergen-Paap rk Wald F statistic for weak identification	7.538		-	
Hansen J overidentification test (p-value)	0.368		-	
Durbin-Wu-Hausman test for endogeneity (p-value)	0.177		-	
Sample	1973-2015		1973-2015	

Notes: Robust standard errors used. We use contemporaneous and one-year lagged differences of log α^N, log α^H; log β^N, log β^H; contemporaneous, one-year and two-year lagged differences of log t^R, log t^W, log Y^{World}, logarithm of strike days as a ratio to employment as instruments for all independent variables except the lagged difference of log $PW(1-t^{PW})$.

Table 7: IV-GMM estimation results for wealth distribution

	IV-GMM		*OLS*	
Dependent variable	$\log\lambda_t$		$\log\lambda_t$	
Variable	Coeff.	p-value	Coeff.	p-value
Constant	-0.048	0.779	-0.105	0.528
$\log(\pi_t(1-t^R_t))$	0.035	0.754	0.042	0.685
$\log t^{PW}_t$	-0.061	0.049	-0.057	0.074
$\log \lambda_{t-1}$	0.939	0.000	0.901	0.000
R^2	0.825		0.826	
Kleibergen-Paap rk Wald F statistic for weak identification	33.07		-	
Hansen J overidentification test (p-value)	0.858		-	
Durbin-Wu-Hausman test for endogeneity (p-value)	0.289		-	
Sample	1972-2015		1972-2015	

Notes: Robust standard errors used. We use contemporaneous $\log t^R$, $\log \beta^N$, logarithm of strike days as a ratio to employment, logarithm of union members as a ratio to employment and two-year lag of $\log \lambda_t$ as instruments for $\log(\pi_t(1-t^R_t))$ and $\log \lambda_{t-1}$.

The total (post-multiplier) effects of changes in wages and gender pay gap on the components of aggregate demand (as a ratio to GDP), GDP, employment and public debt/GDP

	%-point change in consumption in N /GDP	%-point change in consumption in H /GDP	%-point change in private investment /GDP	%-point change in exports /GDP	%-point change in imports in N /GDP	%-point change in public social infrastructure investment /GDP	%-point change in government current expenditure /GDP	%-point change in public physical infrastructure investment /GDP	% change in GDP	% change in total employment	% change in female employment	% change in male employment	%-point change in public debt /GDP
	$\Delta C^N/Y$	$\Delta C^H/Y$	$\Delta I/Y$	$\Delta X/Y$	$\Delta M/Y$	$\Delta G^H/Y$	$\Delta G^C/Y$	$\Delta I^G/Y$	$\Delta Y/Y$	$\Delta E/E$	$\Delta E^F/E^F$	$\Delta E^M/E^M$	$\Delta D/Y$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)(i)	(10)	(11)	(12)	(13)
A. The effects of a 1% increase in female and male wages in N													
SR (ii)	0.400	0.011	0.040	-0.084	0.209	0.026	0.022	0.006	0.213	0.224	0.230	0.219	-0.156
MR (ii)	0.081	0.000	0.008	-0.018	0.042	0.005	0.004	0.001	0.038	-0.641	-0.564	-0.704	-0.075
B. Closing gender pay gap in N by 1%: the effects of a 1% increase in only female wages in N (1% decline in $\alpha^{N)}$													
SR	0.137	0.004	0.021	-0.025	0.072	0.010	0.009	0.003	0.086	0.091	0.093	0.089	-0.061
MR	0.080	0.003	-0.003	-0.023	0.041	0.003	0.002	0.001	0.021	-0.049	-0.040	-0.055	-0.037
C. The effects of a 1% increase in female and male wages in H													
SR	0.336	0.050	0.249	0.000	0.239	0.160	0.065	0.019	0.640	0.673	0.691	0.660	-0.257
MR	0.064	0.041	0.212	0.054	0.094	0.140	0.049	0.014	0.480	-0.057	0.019	-0.118	-0.163
D. Closing gender pay gap in H by 1%: the effects of a 1% increase in only female wages in H (1% decline in $\alpha^{H)}$													
SR	0.229	0.036	0.170	0.000	0.164	0.107	0.044	0.013	0.436	0.459	0.471	0.449	-0.212
MR	0.044	0.030	0.145	0.037	0.065	0.094	0.033	0.010	0.328	-0.040	0.013	-0.081	-0.118
E: The effects of a 1% increase in female and male wages in both N and H (iii)													
SR	0.736	0.061	0.289	-0.084	0.447	0.186	0.087	0.025	0.852	0.898	0.921	0.879	-0.413
MR	0.145	0.041	0.221	0.036	0.136	0.145	0.053	0.016	0.519	-0.699	-0.545	-0.822	-0.239
F. Upward convergence: The effects of a 2% increase in female wages and 1% increase in male wages in both N and H (closing gender pay gaps by 1%; 1% decline in α^H (i) and α^N (iv))													
SR	1.101	0.102	0.479	-0.109	0.683	0.303	0.140	0.041	1.374	1.447	1.485	1.417	-0.686
MR	0.269	0.074	0.363	0.049	0.243	0.241	0.088	0.026	0.867	-0.787	-0.573	-0.959	-0.394

Notes :(i) Column (9)=(1)+(2)+(3)+(4)-(5)+(6)+(7)+(8). In each column, the effects in Appendices 2-3 are multiplied by the wage rate in the relevant sector and divided by Y.

(ii) SR: short-run. MR: medium-run, defined as the cumulative of the effects in the short-run and the period when productivity changes.

(iii) Sum of the effects in simulations (A) and (C)

Table 8. The total (post-multiplier) effects of changes in fiscal policies on the components of aggregate demand (as a ratio to GDP), GDP, employment and public debt/GDP

	%-point change in consumption in N/GDP	%-point change in consumption in H/GDP	%-point change in private investment /GDP	%-point change in exports /GDP	%-point change in imports in N /GDP	%-point change in public social infrastructure investment /GDP	%-point change in government current expenditure /GDP	%-point change in public physical infrastructure investment /GDP	% Change in GDP	% char tot emplo
	$\Delta C^N/Y$	$\Delta C^H/Y$	$\Delta I/Y$	$\Delta X/Y$	$\Delta M/Y$	$\Delta G^H/Y$	$\Delta G^C/Y$	$\Delta I^G/Y$	$\Delta Y/Y$	ΔE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)[i]	(1
A. The effects of a 1% increase in female and male wages in H										
SR	0.232	0.062	0.127	0.000	0.160	0.138	0.047	0.014	0.459	0.4
MR	0.067	0.056	0.138	0.066	0.082	0.135	0.045	0.013	0.438	-0.0
B. Closing gender pay gap in H by 1%: the effects of a 1% increase in only female wages in H (1% decline in α^H)										
SR	0.168	0.053	0.094	0.000	0.119	0.095	0.034	0.010	0.335	0.3
MR	0.048	0.048	0.105	0.048	0.063	0.093	0.033	0.010	0.322	-0.0
C. The effects of a 1%-point increase in public purple social infrastructure investment/GDP (κ^H) by increasing employment with constant wages										
SR (ii)	2.034	0.071	1.048	0.000	1.219	1.477	0.400	0.117	3.927	5.8
MR (ii)	0.699	0.022	1.054	0.506	0.563	1.442	0.371	0.109	3.639	1.5
D. The effects of a 1%-point increase in public green physical infrastructure investment/GDP (κ^G)										
SR	1.067	0.033	0.550	0.000	0.978	0.272	0.228	1.067	2.239	2.3
MR	1.025	0.028	0.658	0.092	0.973	0.298	0.249	1.073	2.449	1.8
E. The effects of a 1%-point increase in the tax rate on profit income (t^R)										
SR	-0.231	-0.007	-0.140	0.000	-0.139	-0.039	-0.032	-0.010	-0.318	-0.3
MR	-0.423	-0.010	-0.290	-0.019	-0.261	-0.078	-0.065	-0.019	-0.642	-0.5
F. The effects of a 1%-point increase in the tax rate on wealth (t^{PW})										
SR	0.256	0.010	0.552	0.000	0.302	0.084	0.070	0.021	0.692	0.7
MR	2.249	0.059	2.653	0.039	1.819	0.518	0.434	0.127	4.259	4.1
G. The effects of a 1%-point increase in the tax rate on wage income (t^W)										
SR	-1.207	-0.037	-0.443	0.000	-0.622	-0.173	-0.145	-0.043	-1.426	-1.5
MR	-1.469	-0.039	-0.779	-0.086	-0.819	-0.253	-0.212	-0.062	-2.081	-1.5
H. Progressive income tax: The effects of a 1%-point increase in the tax rate on profit income (t^R) and a 1%-point decrease in the tax rate on wages (t^W) (iii)										
SR	0.976	0.031	0.304	0.000	0.483	0.135	0.113	0.033	1.108	1.1
MR	1.047	0.030	0.489	0.067	0.558	0.175	0.147	0.043	1.439	0.9

Notes: (i) Column (9)=(1)+(2)+(3)+(4)-(5)+(6)+(7)+(8).

(ii) SR: short run. MR: medium-run, defined as the cumulative of the effects in the short-run and the next period when productivity in N changes endogenously.

(iii) The effects in simulations (E) minus (G)

The effects of policies

- Fiscal policy
  - government spending in **social** vs **physical** infrastructure↑
    - increasing E for a given wage rate
    - increasing wage rate for a given E
    - closing gender wage gap for a given E
  - Change tax rate on capital vs labour income and wealth
- Labour market policies
  - **Increase hourly real wage rate** of men and women in N &/or H
  - **close gender gaps** in N &/or H
    - Close gender gaps with constant male wage rate
    - Upward convergence

Summary of the results in the UK: public spending

- Strong positive effects of public **social** infrastructure on output and employment in both short and medium run, and on productivity
  - Public **social** infrastructure/GDP↑ 1%-point→
  - output↑ 3.6% in SR, 2.7% in MR
  - Employment of both women and men ↑ in both short & medium run
  - total E in MR ↑ 1.7%
  - Ef in MR ↑ 3.3%
  - Em in MR ↑ 0.4%
  - Public debt/GDP↓ 0.9%-point in SR, but ↑0.5%-point in MR
- Similar effects of public **physical** infrastructure on output and debt
  - But effects on Ef are smaller & similar to Em (in MR ↑ ~1.6%)

Summary of the results in the UK : taxation

- An increase in the progressivity of income taxation
  - tax rate on profit income ↑ 1%-point
  - tax rate on wages ↓ 1%-point
  - output, female and male employment↑, and public debt/GDP↓ in both the short and the medium-run.
- tax rate on wealth↑ 1%-point (doubling of t on wealth)
  - wealth concentration↓
  - the strongest + impact on output, employment and the budget
  - Output ↑ 0.9% in SR, 4.3% in MR
  - Ef and Em both ↑ ~ 0.9% in SR, 4% in MR
  - public debt/GDP↓ 4.3%-point in SR, 10.3%-point in MR

Gender and the economy: Feminist Economics

- gendered socialisation and asymmetric power relations between men and women
- Institutionally and historically-constructed gender-related norms, values, and behaviour
- Care work: Unpaid and invisible domestic female labour
  - unpaid activities amount to 70% of total world output valued at prevailing wages; 69% represents women's work (UNDP)
- Women's concentration in caring/nurturing work, both unpaid or paid service sector
- Women's educational achievements do not necessarily translate into labour market gains
- Occupational segregation and gender-based discriminatory practices reduce possible gains
- Gender pay gap almost 20% in the UK

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Structuralist features

- Real world structural features of the economy matter
  - the existence of excess capacity & involuntary unemployment
  - →demand matters
  - income distribution → demand
  - social norms → gendered behavioural differences
  - gendered occupational segregation
  - gender pay gaps
  - oligopolistic market structure and price setting by firms
  - labour intensity of exports

Fiscal Policies for an equality-led and sustainable development

- Public investment in social infrastructure
  - Universal public childcare, social care, health care, education
    - improve pay and working conditions in these industries
      - Adequate career prospects for care workers
    - Purple jobs for both men and women
    - Substantial effect on productivity
    - Redefine infrastructure and fiscal rule
    - More jobs with lower Carbon emissions
      - labour intensive services
      - Purple and green are complementary
      - Purple is the new green
- Public investment in physical infrastructure
  - Green investment in renewable energy, public transport, housing
- Impact on public budget –partly self-financing; there is money!

…Rebuilding an economy for all in the aftermath of the crisis

- Debt moratorium, restructuring/linking to income/cancellation
  - Secured and unsecured debt, utility, tax payments of households,
  - rent controls
  - SMEs
  - developing and emerging countries
    - Free vaccine for all
- Financial support for firms must come with conditionality/equity ownership
  - no workers are to be laid off; trade union representation
  - Ecological
  - No dividends, bonuses for CEOs, share buybacks
  - No tax evasion

What is public infrastructure investment?

- public investment is required
  - where benefits do not just accrue to individual users but have a public good character and accrue to society as a whole.
  - goods and services, access to which is seen as human right but private supply/profit motive leads to undersupply /privileged access
- Physical infrastructure: **green** investment; Ecological deficit
  - Public transport, renewable energy, housing
- Social infrastructure: education, child care, health and social care,
  - care deficit: both direct and indirect impact on productivity
    - Educated and healthy workforce
    - Female labour force participation↑
      - » socializing the invisible, unpaid domestic care work
      - » Elson: recognize, reduce, redistribute
      - » Ilkkaracan: **Purple** investment
    - Social security →more innovative and productive workers

…social infrastructure as investment

- UK Women's Budget Group:
- Currently, public spending in education, childcare, health and social care are considered as current spending as opposed to public infrastructure investment
- these should be redefined as infrastructure spending in the public budget

Gender-sensitive policy-making

- Equality is not only a desirable social goal in itself but may also contribute to economic development
- Complementarity between targets
  - gender equality
  - decent job creation
  - inclusive and sustainable development,
  - poverty alleviation
  - Ecological sustainability
  - Productive economy
- Complementing and not competing
- mobilize all the tools of economic policy

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There are alternative policies: optimism of the will

-
- a comprehensive mix of
  - fiscal and monetary policy
  - public investment in social and physical infrastructure
  - industrial policy
  - labour market policy
  - Financial regulation and corporate governance

... policies for an equality-led and sustainable development

- Technological change?
  - Shorter working time in parallel with the growth in productivity with wage compensation for the lower income groups.
  - Compared to the 19th century, we are all working part-time today.
  - More equal countries have shorter working hours. (Schor, 2010)
  - shortening of hours →higher hourly productivity
- shorter working hours → gender equality
  - Shorter hours with wage compensation → a narrowing of gender wage gaps.
  - should address daily care responsibilities, and work-life balance based on gender equality in the division of labour in the household;
    - e.g. daily working hours as opposed to more holidays or longer weekends.

Wage-led growth in the age of globalization?

- Inconsistency of the Macro vs. Micro rationale
  - Firm vs. aggregate/national
  - National vs. regional/global level
- the limits of strategies of international competitiveness based on wage competition in a highly integrated global economy
- 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: India, Argentina, Mexico, Canada: can grow out of wage moderation alone, but contracts in race to the bottom
- The world as a whole is wage-led, because we do not trade with Mars
- Globalization is not a barrier to wage-led development policies.

→ importance of wage and fiscal policy coordination

- Avoid beggar thy neighbour policies
- Space for domestic-demand led & more equal growth in the developing countries
- If developed economies do not cooperate: south-south cooperation
- Wage-led development is an option also in a single wage-led economy, but effects are stronger if coordinated ->BE POLICY LEADER