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The effects of the tax mix on inequality and growth

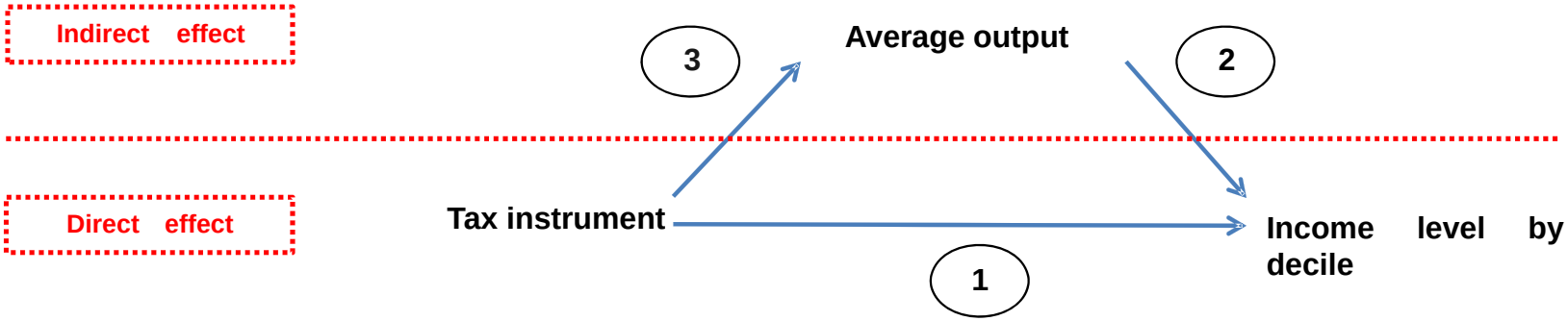
Oguzhan Akgun, Boris Cournède, Jean Marc Fournier

Public Economics Workstream
OECD Economics Department

The quality of public finance project

- The spending pillar:
  - Fournier, J.-M. and A. Johansson (2016), “The effect of the size and mix of public spending on growth and inequality,”
  - Reports on public investment (Fournier, 2016), trends in public finance (Bloch et al., 2016) and the literature (Johansson, 2016)
- The tax pillar:
  - Akgun, O., B. Cournède and D. Bartolini (2017), “The capacity of government to raise taxes,”
  - This paper on the effects of the tax mix on inequality and growth

Overall framework



- Distribution regressions estimate (1) and (2)
- Output regressions estimate (3)
- Simulations put together distribution and output regressions, yielding level effects by decile

Estimating effects on the income distribution

- Disposable income in a given quintile $y_{c,t}^{q}$ depends on average disposable income $y_{c,t}^{m}$, government size $S_{c,t-1}$ and tax structure $T_{c,t-1}$:

$$y_{c,t}^{q} = \alpha y_{c,t}^{m} + \delta_1 \Delta y_{c,t+1}^{m} + \delta_2 \Delta y_{c,t}^{m} + \delta_3 \Delta y_{c,t-1}^{m} + \beta_1 S_{c,t-1} + \cdots + \beta_2 T_{c,t-1} + u_c + v_t + \varepsilon_{c,t}$$

- Average and quintile income time series are non-stationary
- Average income is endogenous: following Phillips and Loretan (1991) and others leads and lags of $\Delta y_{c,t}^{m}$ is added
- The specification is parsimonious, because the number of observations of income by quintile is limited

Estimating effects on GDP

- Potential growth $\Delta y_{c,t}$ depends on lagged GDP $y_{c,t-1}$ (convergence term), production factors $(i_{c,t-1}, h_{c,t-1}, l_{c,t-1})$ and other controls:

$$\begin{aligned}\Delta y_{c,t} = \quad & \gamma y_{c,t-1} + \alpha_1 i_{c,t-1} + \alpha_2 h_{c,t-1} + \alpha_3 l_{c,t-1} + \delta_1 \Delta i_{c,t} + \cdots \\ & \delta_2 \Delta h_{c,t} + \delta_3 \Delta l_{c,t} + \alpha_4 m_{c,t-1} + \alpha_5 \pi_{c,t-1} + \alpha_6 d_{c,t-1} + \cdots \\ & \alpha_7 o_{c,t-1} + \alpha_8 q_{c,t-1} + \beta_1 S_{c,t-1} + \beta_2 T_{c,t-1} + u_c + v_t + \varepsilon_{c,t}\end{aligned}$$

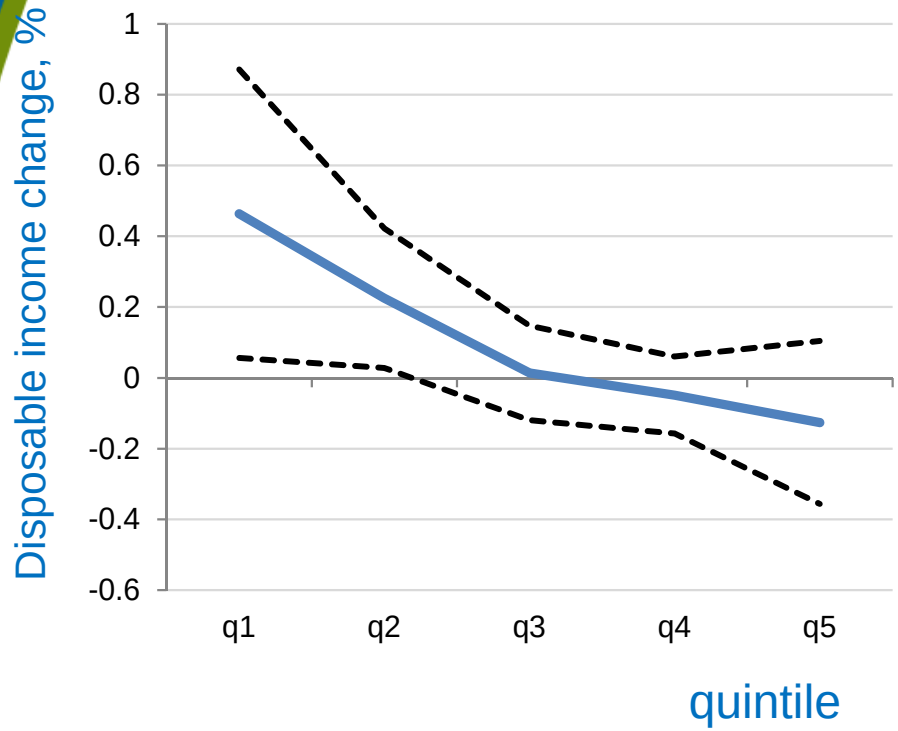
- The long-term link between GDP and production factors reflects the growth literature (e.g. Mankiw et al., 1992)
- The use of potential growth alleviates the risk that long-term effects may spuriously reflect cyclical co-movement
- A large set of controls are included to reduce the risk of omitted variable bias

INEQUALITY

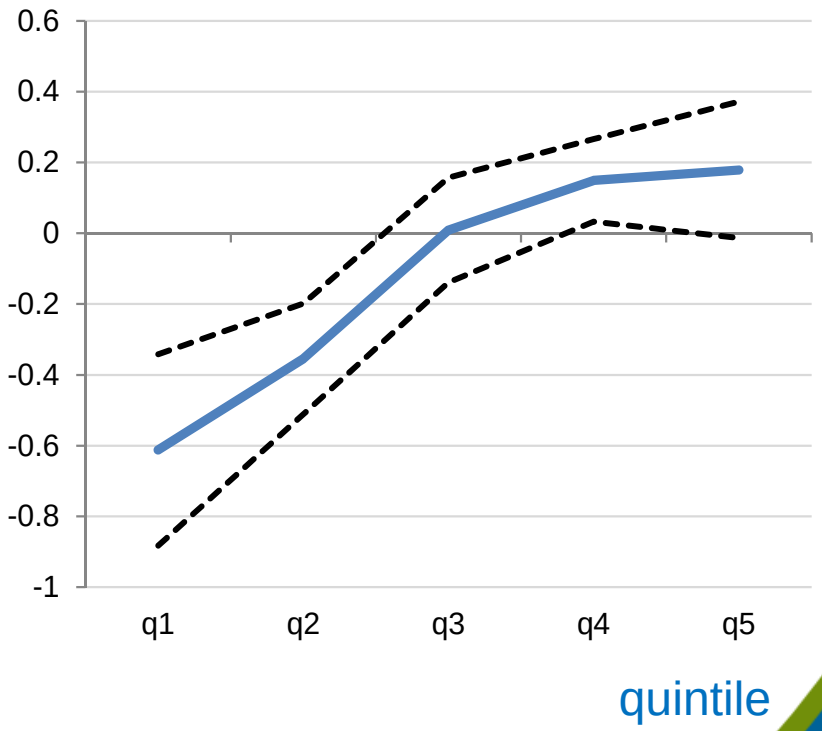
Inequality: effect of changes in tax wedges

Estimated long-term effect on disposable income of cutting the tax wedge by one pp, holding mean income constant, %

Tax wedge at 67% of mean income



Tax wedge at 167% of mean income



Note: Dashed lines show 90% confidence intervals.

Inequality: effect of changes in top PIT rates and environmental taxes

The effect of the top PIT rate on the income distribution

Dependent variable	$\ln(income^{q1})$	$\ln(income^{q2})$	$\ln(income^{q3})$	$\ln(income^{q4})$	$\ln(income^{q5})$
$\ln(income^{mean})_t$	1.13***	1.09***	1.03***	1.01***	0.93***
	(0.079)	(0.037)	(0.026)	(0.018)	(0.038)
Underlying	0.42***	0.15**	-0.084**	-0.087**	-0.077
primary spending	(0.14)	(0.058)	(0.041)	(0.039)	(0.064)
TMR use	7.15***	3.37***	2.09***	1.21***	-4.56***
	(2.10)	(0.83)	(0.51)	(0.40)	(0.86)

The effect of environmental taxes on the income distribution

Dependent variable	$\ln(income^{q1})$	$\ln(income^{q2})$	$\ln(income^{q3})$	$\ln(income^{q4})$	$\ln(income^{q5})$
$\ln(income^{mean})_t$	1.17***	1.00***	0.94***	0.96***	1.02***
	(0.098)	(0.045)	(0.030)	(0.018)	(0.049)
Underlying	0.15	0.033	-0.098**	-0.054	0.041
primary spending	(0.10)	(0.053)	(0.049)	(0.040)	(0.066)
Environmental taxes	-1.52	-1.82**	-1.76**	-1.35***	2.40**
as a share of GDP	(1.88)	(0.91)	(0.73)	(0.42)	(1.12)

Inequality: effect of changes in property taxes

The effect of property taxes on the income distribution

Dependent variable	ln(income^{q1})	ln(income^{q2})	ln(income^{q3})	ln(income^{q4})	ln(income^{q5})
Recurrent taxes	-1.93	-0.080	-0.36	-0.011	0.23
on immovable property	(2.51)	(1.43)	(1.07)	(0.78)	(1.60)
Recurrent taxes	4.29	4.19**	3.03**	1.13	-4.74**
on net wealth	(4.68)	(2.06)	(1.37)	(1.09)	(2.24)
Inheritance taxes	17.3**	8.35**	4.28	3.94	-12.0***
	(6.86)	(3.72)	(2.76)	(2.41)	(4.06)
Taxes on financial and	-0.75	-1.21	-0.53	-0.22	1.42
capital transactions	(2.67)	(1.42)	(1.04)	(0.66)	(1.49)
Non-recurrent taxes	-0.49	-1.61	-1.19	-0.76	1.70
on property	(2.32)	(1.09)	(0.80)	(0.60)	(1.18)

GROWTH

Growth: baseline estimates

Output effects of the tax structure

Dependent variable: Ln potential output per capita		
Ln potential output	-0.066***	-0.064***
per capita (lagged)	(0.014)	(0.015)
Government primary	-0.056***	
spending	(0.014)	
Total revenue to GDP ratio		0.0090
		(0.023)
VAT standard rate	-0.028	0.0066
	(0.042)	(0.041)
Effective marginal	-0.024*	-0.027*
CIT tax rate	(0.014)	(0.016)
Top marginal PIT rate	-0.012	-0.014*
	(0.0085)	(0.0083)

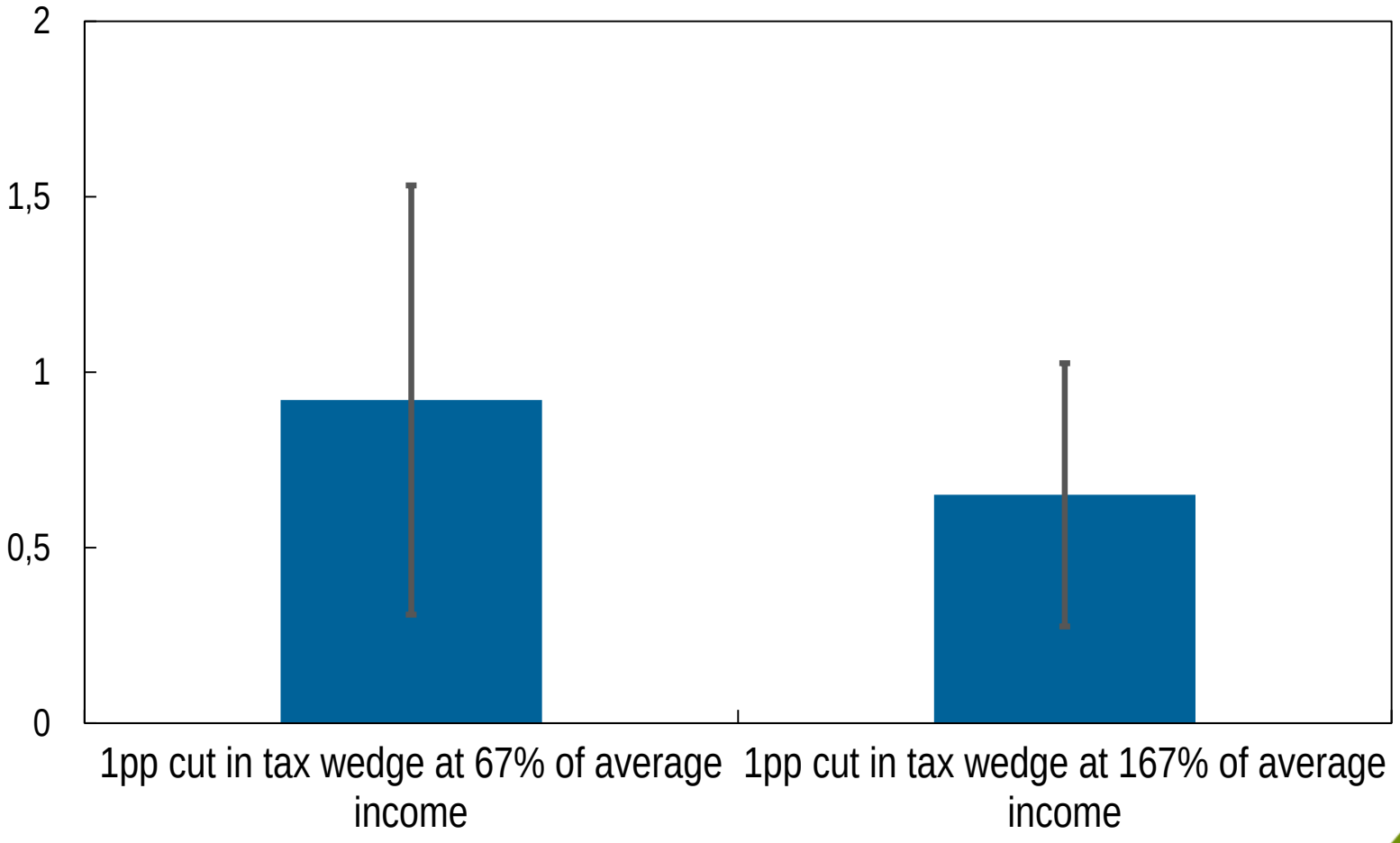
Growth: effect of changes in tax wedges

Output effects of the tax wedge

Dependent variable: Ln potential output per capita						
Ln potential output	-0.057***	-0.055***	-0.058***	-0.048***	-0.046***	-0.052***
per capita (lagged)	(0.011)	(0.011)	(0.011)	(0.014)	(0.014)	(0.014)
Government primary	-0.043***	-0.044***	-0.044***	-0.044***	-0.043***	-0.046***
spending	(0.012)	(0.012)	(0.013)	(0.013)	(0.013)	(0.015)
Marginal tax wedge at 67%	-0.045***	-0.050***		-0.048***	-0.053***	
of mean income	(0.014)	(0.014)		(0.014)	(0.015)	
Marginal tax wedge		0.015**			0.014**	
at mean income		(0.0068)			(0.0072)	
Marginal tax wedge at 167%	-0.028**	-0.036***		-0.022**	-0.029***	
of mean income	(0.012)	(0.012)		(0.011)	(0.011)	
Average tax wedge at 167%			-0.067***			-0.060***
of mean income			(0.017)			(0.018)
Effective marginal tax rate				0.0015	0.0053	-0.0027
of CIT				(0.014)	(0.014)	(0.015)
VAT standard rate				-0.029	-0.025	-0.032
				(0.042)	(0.041)	(0.042)

Output: the example of a cut in tax wedges (compensated to keep government size fixed)

Estimated long-term effect on average output, %



Note: Confidence bands show 90% confidence intervals.

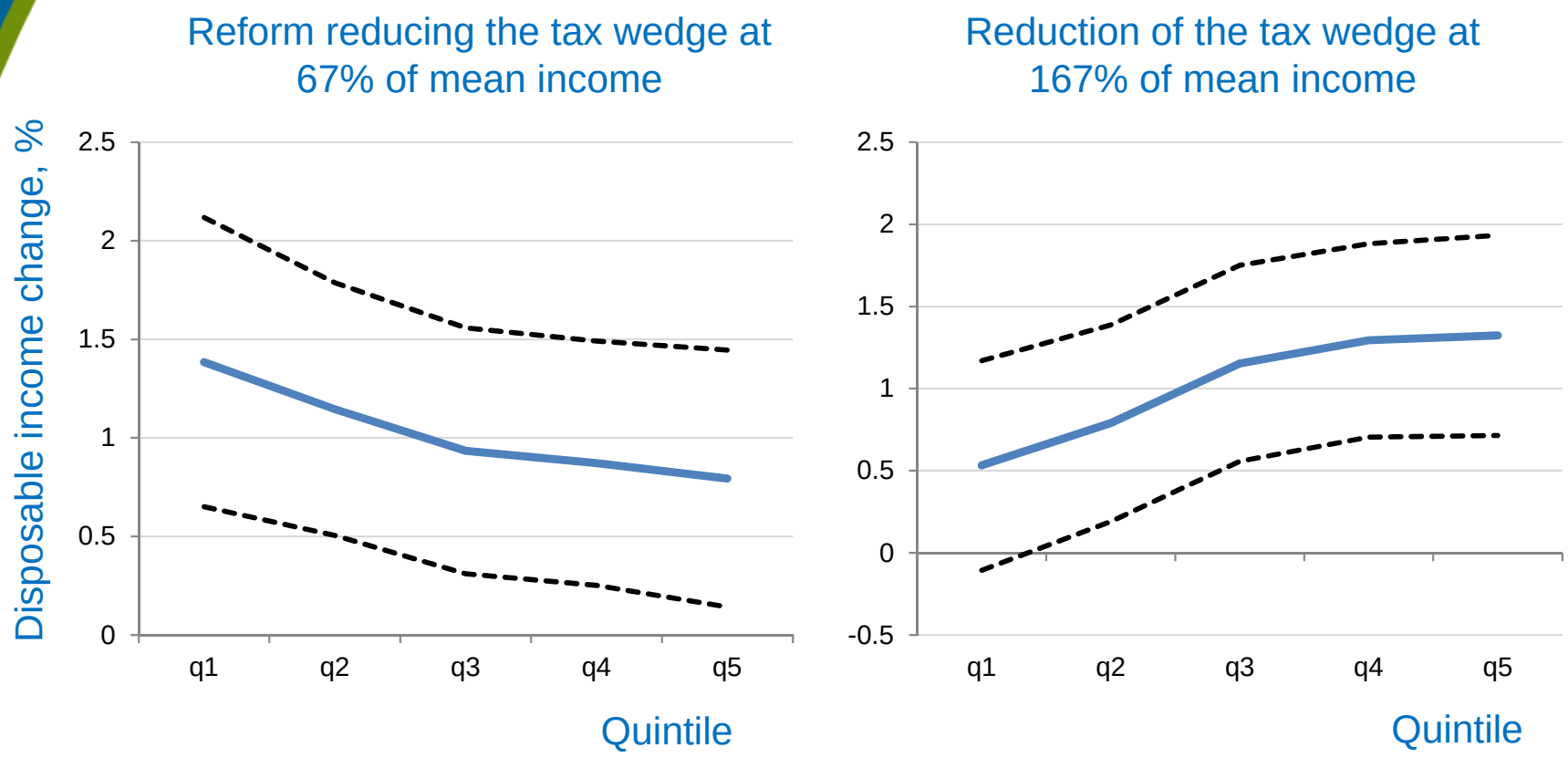
Growth: effect of changes in environmental and property taxes

Output effects of environmental and property taxes

Dependent variable: potential output per capita							
			Immovable property	Wealth	Inheritance	Capital Transactions	Other
Ln potential output per capita	-0.066***	-0.067***	-0.061***	-0.067***	-0.069***	-0.065***	-0.065***
	(0.016)	(0.016)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)
Government primary spending	-0.056***	-0.052***	-0.061***	-0.057***	-0.051***	-0.051***	-0.049***
	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)	(0.014)	(0.013)
PIT top marginal rate	-0.022*	-0.019	-0.016	-0.013	-0.020	-0.020	-0.019
	(0.013)	(0.013)	(0.013)	(0.012)	(0.013)	(0.014)	(0.014)
CIT effective marginal rate	-0.011	-0.012	-0.012	-0.014	-0.015*	-0.014	-0.014*
	(0.0085)	(0.0087)	(0.0082)	(0.0087)	(0.0084)	(0.0084)	(0.0083)
Property tax receipts		-0.14	-0.43***	0.15	-0.25*	-0.061	-0.16
(ratio to GDP)		(0.12)	(0.16)	(0.12)	(0.13)	(0.14)	(0.12)
Environmental tax receipts	0.046	0.065					
(ratio to GDP)	(0.16)	(0.16)					
Property tax item			0.98***	-1.31***	2.13***	-0.19	0.44**
			(0.30)	(0.44)	(0.77)	(0.30)	(0.22)

Overall effects of personal taxes

Output and inequality together: combined effects on disposable income



Note: The figure shows the effect of a one percentage point cut in the tax wedge. Dashed lines show 90% confidence intervals.

Conclusion

- A cut in the tax wedge in the lower half of the income distribution means lower income inequality and higher disposable income for everyone through the effect of higher output levels.
- Higher progressivity in the top of the distribution reduces relative disposable incomes at the higher end of the income distribution but increases the income in the bottom
- Higher inheritance and wealth taxes are linked with lower levels of disposable income inequality. Wealth taxes have negative output effects while inheritance taxes are associated with higher output
- There is evidence of an inequality enhancing effect of environmental taxes. They have no significant effect on output
- No evidence was found on an effect of VAT on distribution and output. CIT is associated with lower output

Thank you