Theoretical Foundations of Personal Income Tax
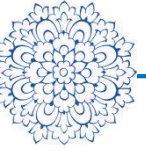
Mohammad Vesal

Personal Income Tax in the European Union

Summer School 2023

1 July 2023
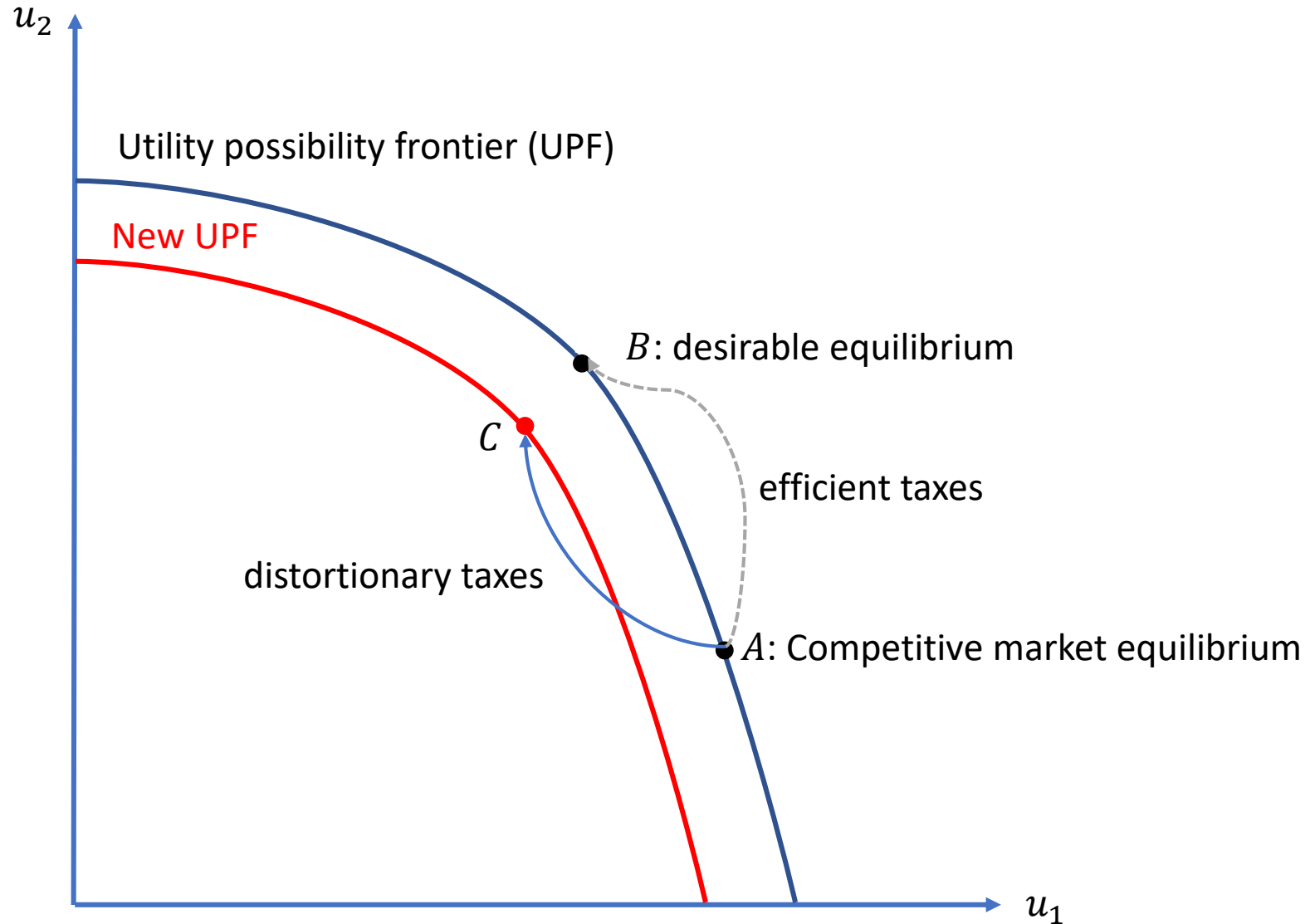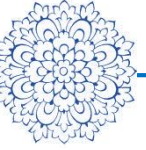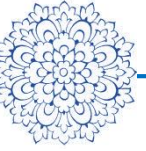
Role of government

- Remedying market failures
  - Public good provision
  - Correcting externalities
  - Stabilizing the economy

- Redistribution
  - Reducing income inequality
  - Protecting vulnerable groups

- Sources of financing: taxes, aid, resource rent, debt

Efficient taxes

- First fundamental welfare theorem
  - When markets are *complete* and all agents are *price takers*, the competitive equilibrium is pareto efficient.
  - Is the equilibrium desirable?

- Second fundamental welfare theorem
  - Any pareto efficient allocation can be reached as a competitive equilibrium with appropriate redistribution of initial endowments.
  - What are the instruments for redistribution?
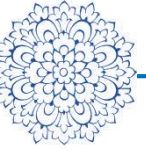
Efficient vs. distortionary taxes

Utility possibility frontier (UPF)

New UPF

B: desirable equilibrium

C

efficient taxes

distortionary taxes

A: Competitive market equilibrium

u_2

u_1
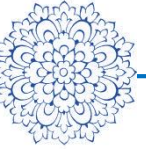
Costs of taxation

- Efficiency cost

  - Change of behavior

  - Distort business decisions

- Compliance cost

  - Understand, record, report, and pay taxes
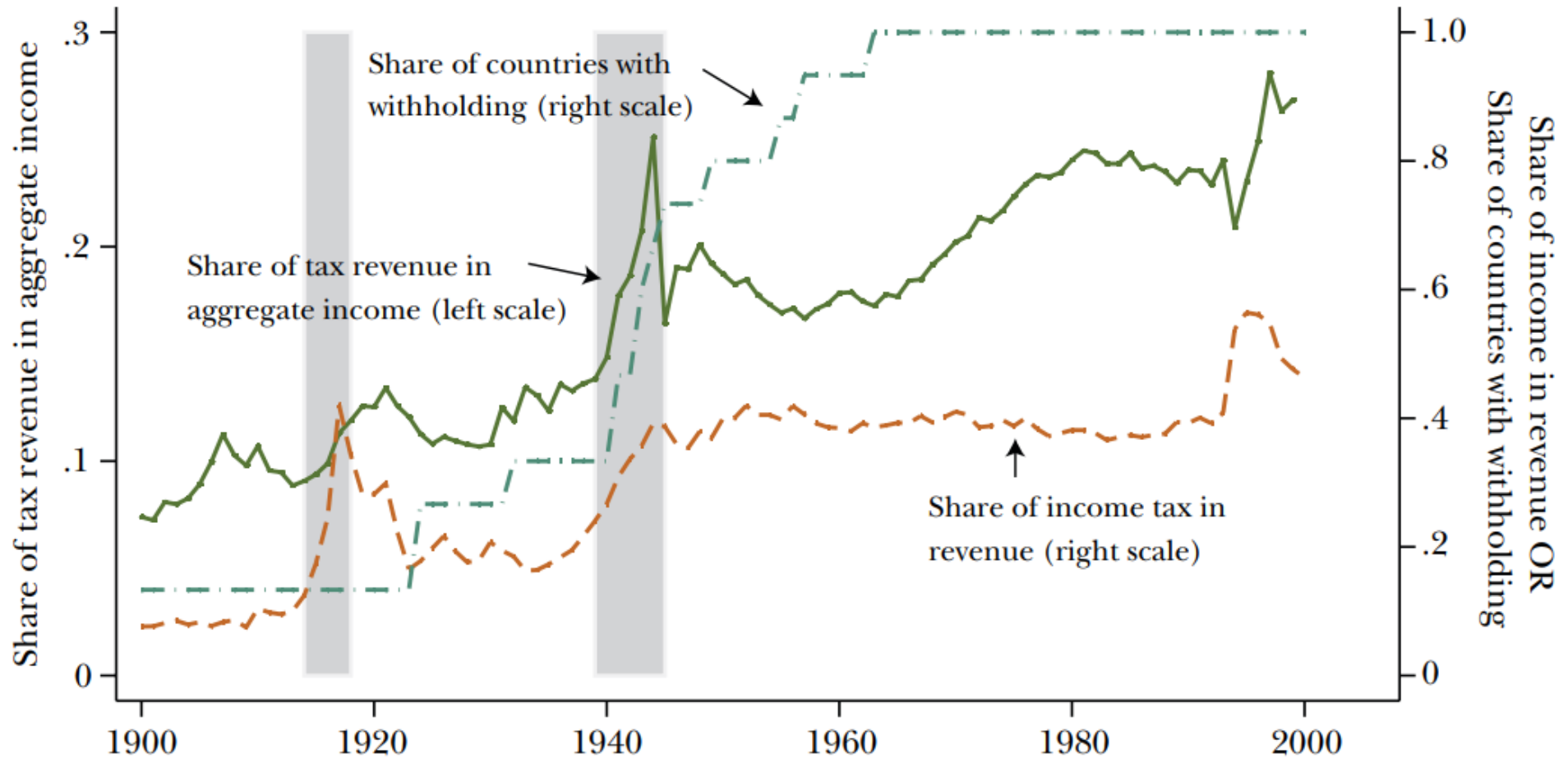
- Administrative cost
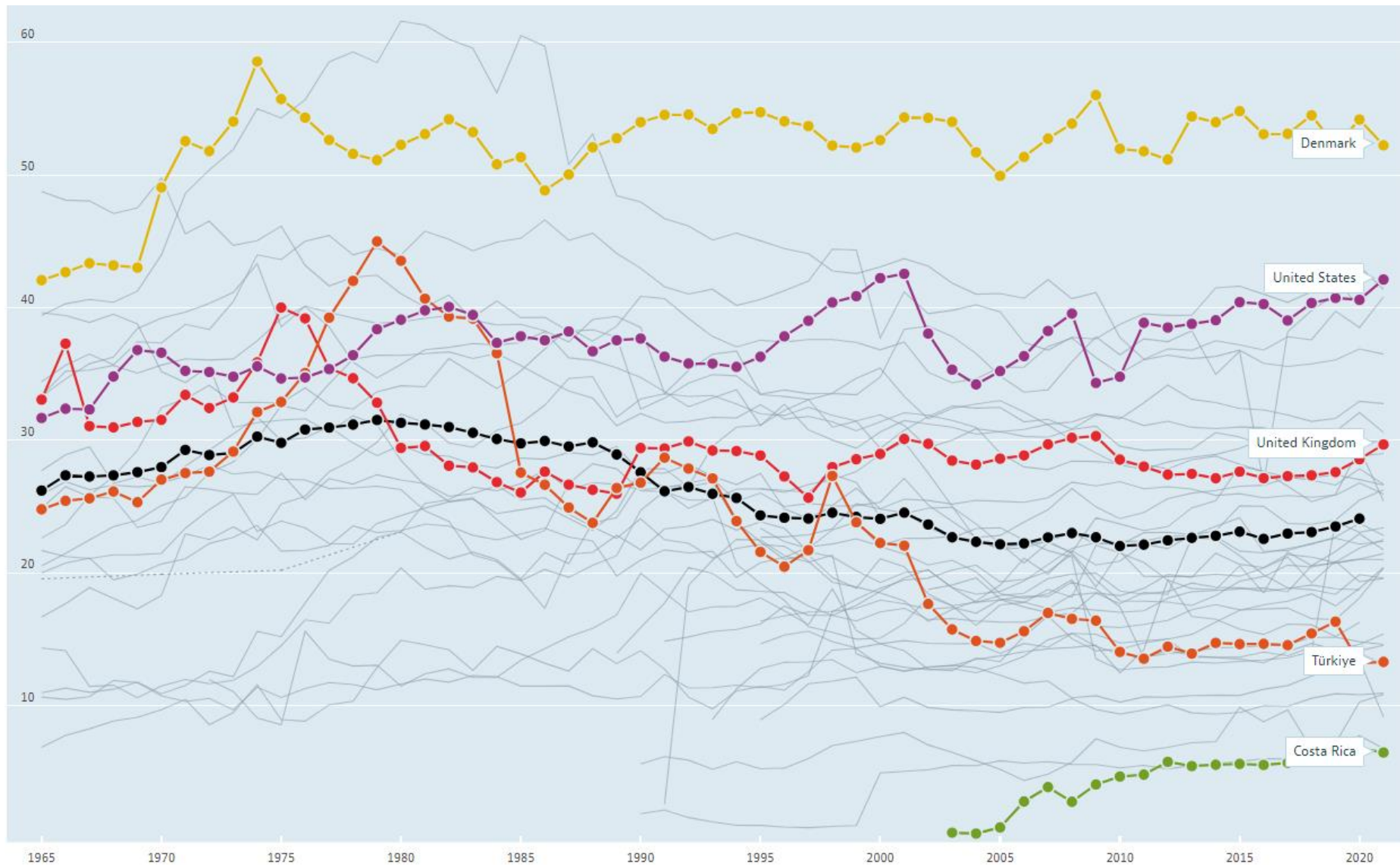
Tax and development, 2021

Source: World Development Indicators, accessed June 2023
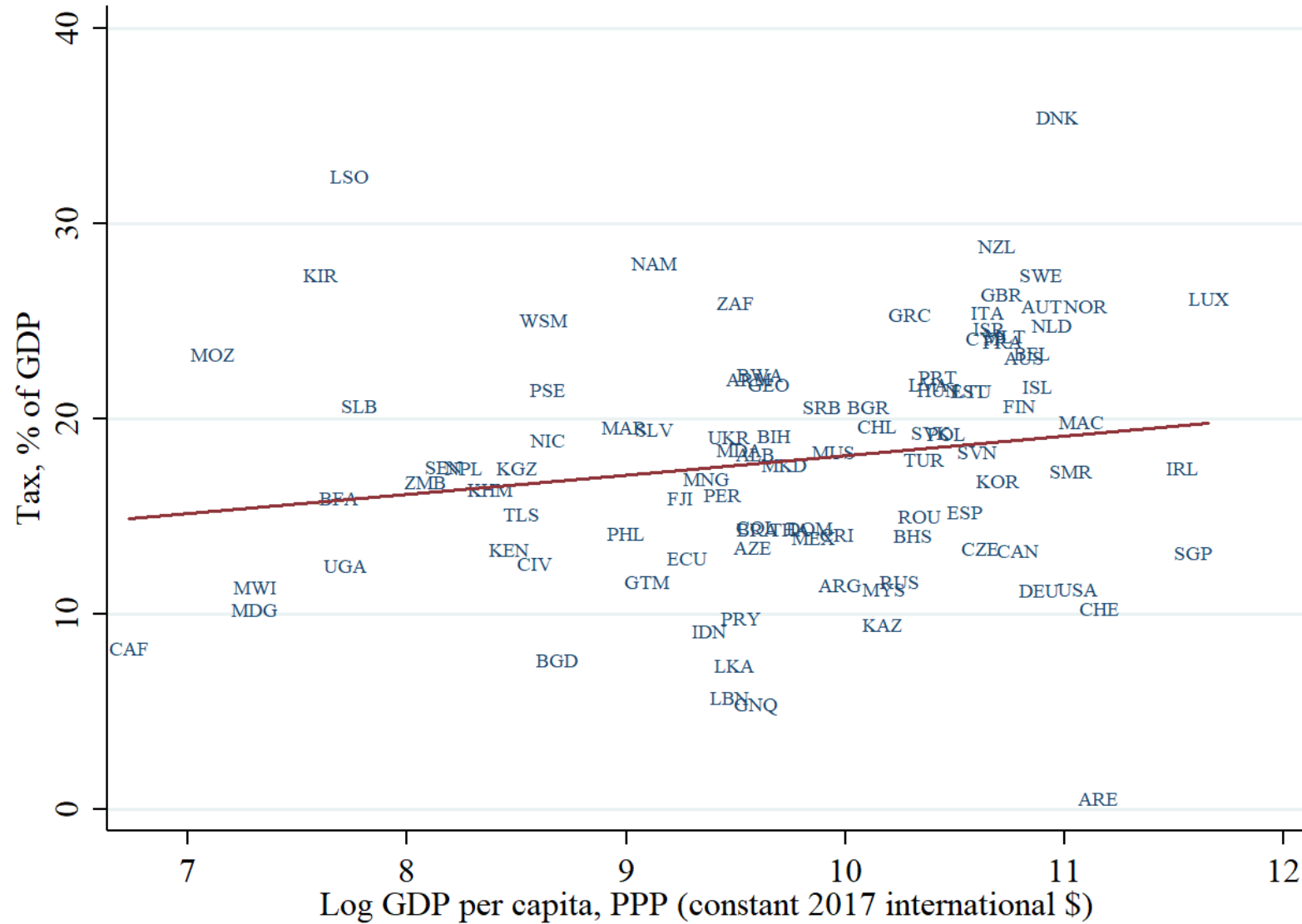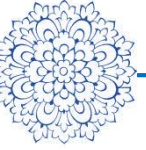
Role of income taxes

Evolution of Tax Revenue, Income Tax, and Tax Withholding in a Sample of 18 Countries

Source: Besley, Timothy, and Torsten Persson. 2014. "Why Do Developing Countries Tax So Little?" *Journal of Economic Perspectives*, 28 (4): 99-120.

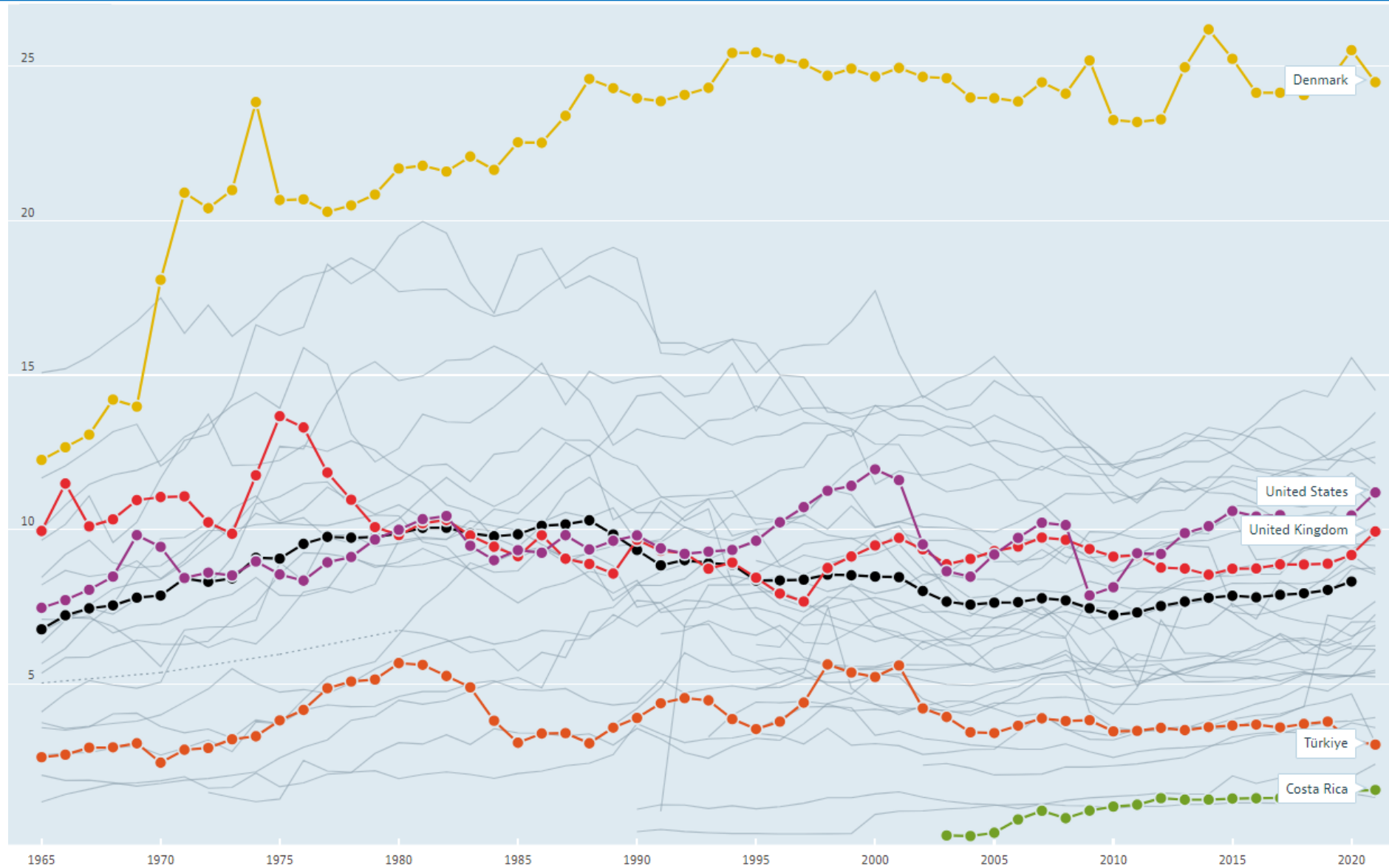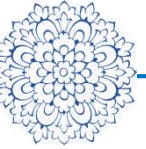# Share of PIT from tax revenue, OECD

Share of PIT from GDP, OECD

Composition of revenue across regions

Figure 1. Composition of Tax Revenue by Region, 2018 (Percent of GDP)

Legend: Indirect, Personal, Corporate, Property
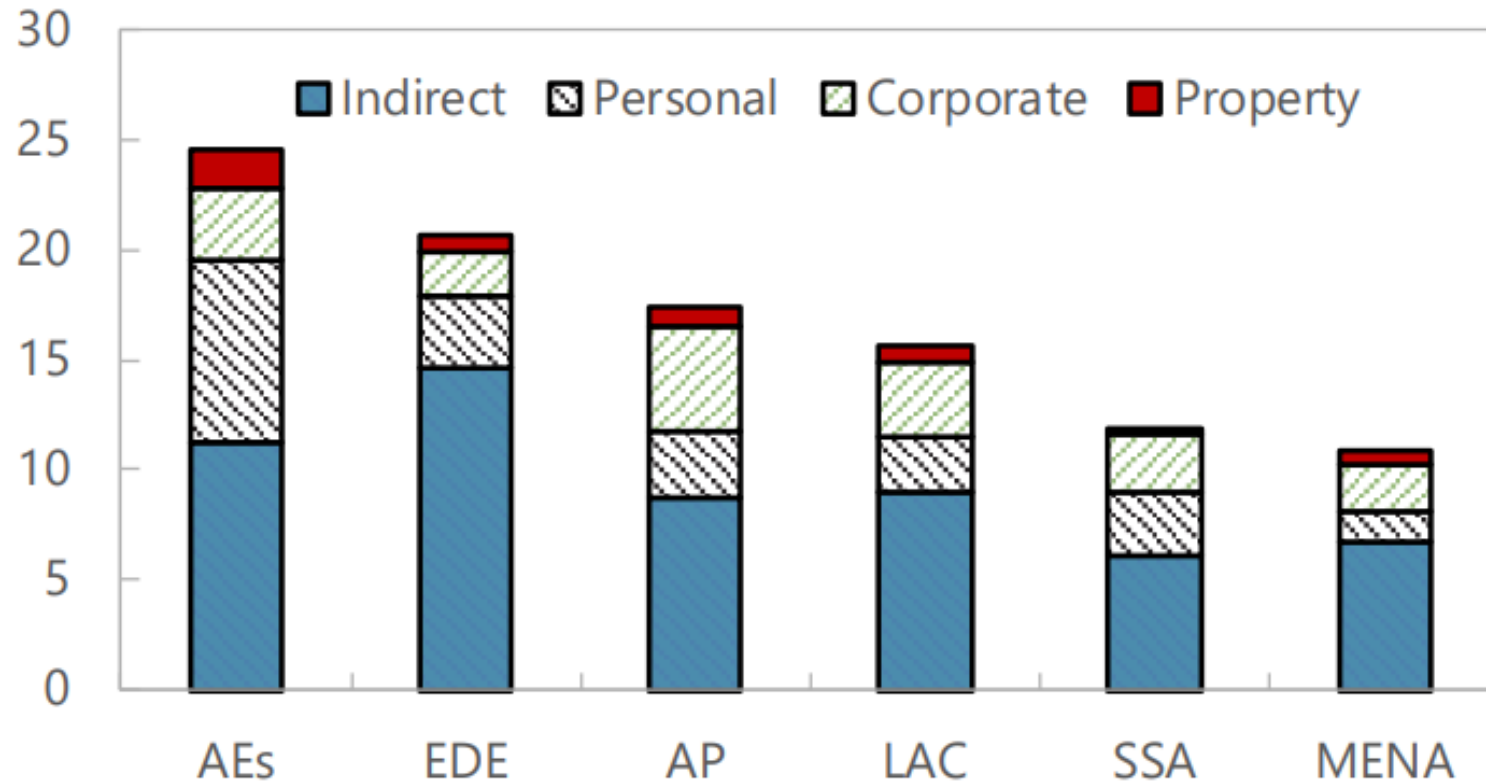
AEs = Advanced Economies (39)
EDE = Emerging and Developing Europe (12)
AP = Asia and Pacific (38)
LAC = Latin America and Caribbean (32)
SSA = Sub-Saharan Africa (49)
MENA = Middle East and North Africa (20)

Source: de Mooij, R. A. (2020). Tax Policy and Inclusive Growth. IMF Working Papers, 2020(271).

Contents

- Introduction

- What is personal income tax?

- Efficiency loss of taxation
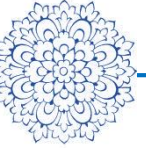
- Design of personal income tax

- Concluding remarks

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- Introduction

- **What is personal income tax?**

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What is personal income tax?

- A system of taxes and transfers that take into account all sources of income.

- Tax liability = Taxable income x Tax rate

- Defining taxable income is complicated.

- Often a number of tax rates.

- Treatment of various sources of income might be different.
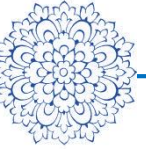
What is included?

- Wage and salary, commissions, business profits, interest income, rental income, …

- Transfer payments, gifts, inheritance, change in real value of assets

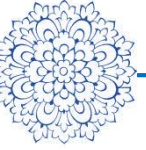- In-kind income: value of owner-occupied housing, free meals, …

Income Tax Base, the case of USA

- Income tax is assessed on adjusted gross income minus deductions and exemptions.

- Gross income: The total of an individual's various sources of income.

- Adjusted gross income (AGI): An individual's gross income minus certain adjustments.

- Taxable income: AGI - exemptions - deductions
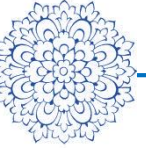
Adjustments to gross income

- Adjustments vary over time, but in the US as of 2009

  - Some contributions to retirement savings

  - Alimony paid to a former spouse

  - Health insurance premiums paid by the self-employed

  - One-half the payroll taxes paid by the self-employed

  - Educator expenses and interest paid on student loans

  - Contributions to Health Savings Accounts
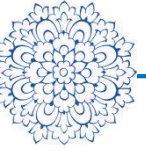
  - Expenses for job-related moves
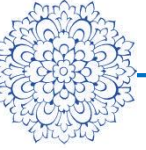
Exemptions and deductions from AGI

- Exemption: An amount tax payers subtract from AGI for dependent household members, self, and spouse.
  - Standard deduction: A fixed deduction that a taxpayer can take.
  - Itemized deduction: Taxpayer deducts all qualifying expenses.

- Deductible expenses include:
  - Medical and dental expenses exceeding 7.5% of AGI
  - Other taxes paid, such as state or local income tax
  - Interest paid on investments and home mortgages
  - Gifts to charity, Casualty and theft loss, Unreimbursed employee expenses
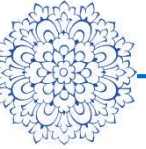
US Federal Tax rate schedule, 2012
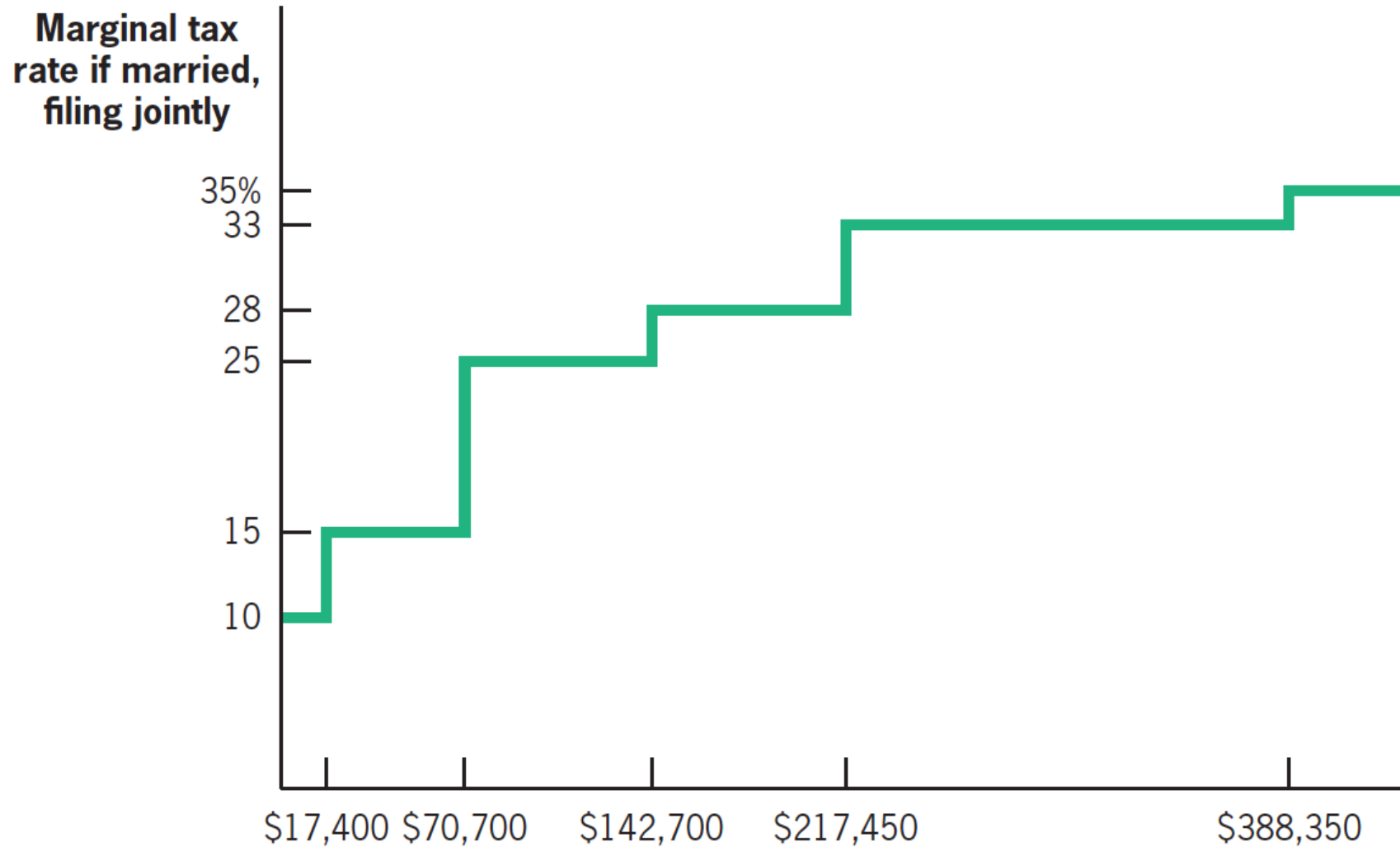
Final tax payment (refund)

- Tax on Taxable income minus
  - Tax credits: Amounts by which taxpayers are allowed to reduce the taxes they owe to the government through spending, for example, on child care.
  - Withholding: The subtraction of estimated taxes owed directly from a worker's earnings.

- Refund: The difference between the amount withheld from a worker's earnings and the taxes owed if the former is higher.

An example

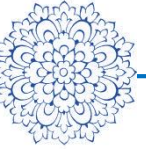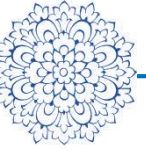|	
Gross income	$60,000
− Deductions	−2,000
= Adjusted gross income (AGI)	= 58,000
− Exemptions	−19,000
− Standard (or itemized) deduction	−11,900
= Taxable income	= 27,00
Find taxes owed from tax schedule	= 3,195
− Credits	= 3,000
= Total tax payment	= 195
− Withholding	−2,000
= Final payment (refund) due	= (1,805)

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- **Efficiency loss of taxation**

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- Concluding remarks

Behavioral responses to taxation

- Self-interested individuals seek to maximize their private benefits.
  - Taxes are a cost to the individual
  - Try to minimize tax liability

- Example: imposing an income tax
  - Real responses: individuals have an incentive to work less
  - Evasion responses: individuals have an incentive to report less than what they earned

- Evasion and avoidance
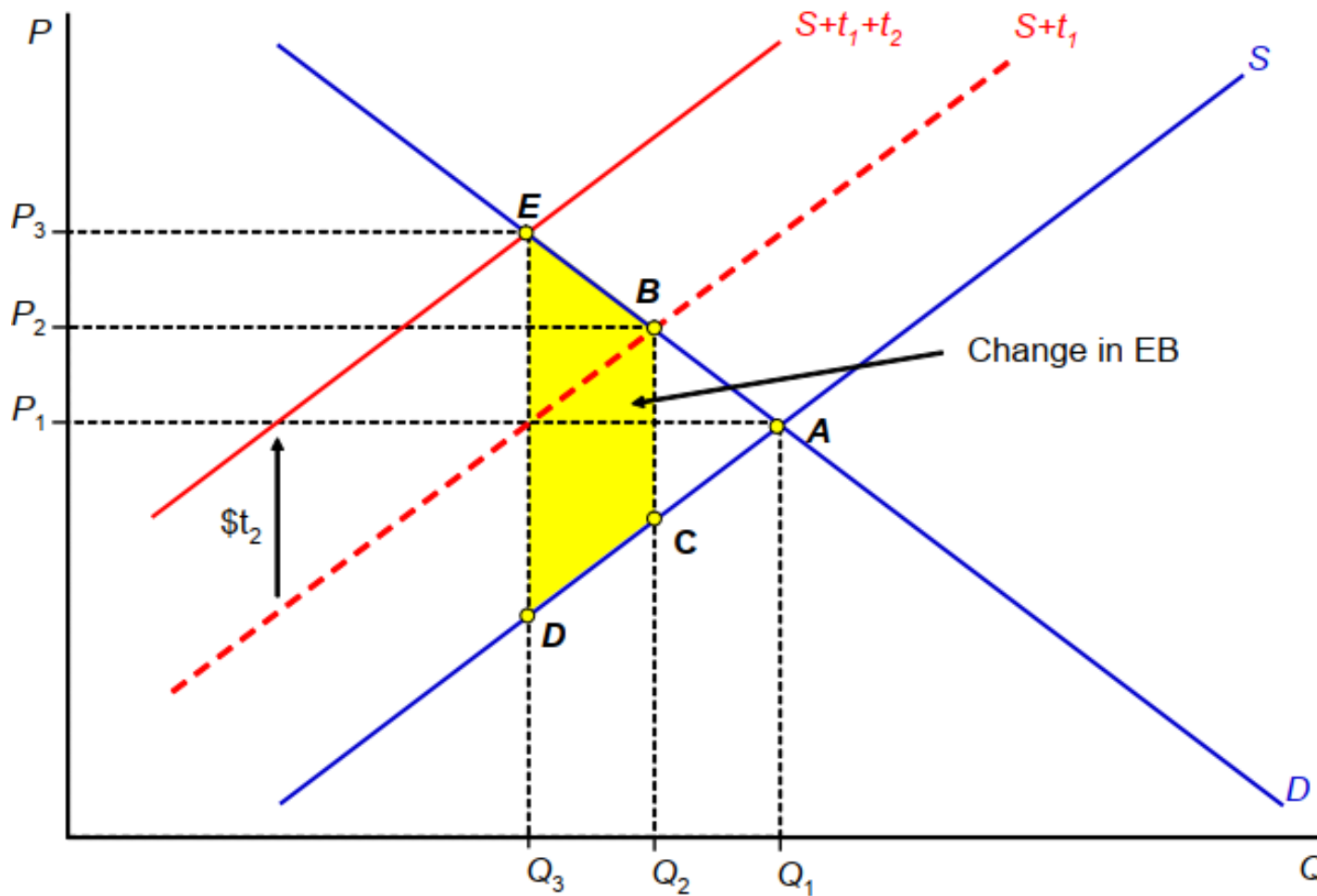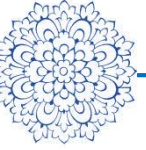
Deadweight loss of taxation
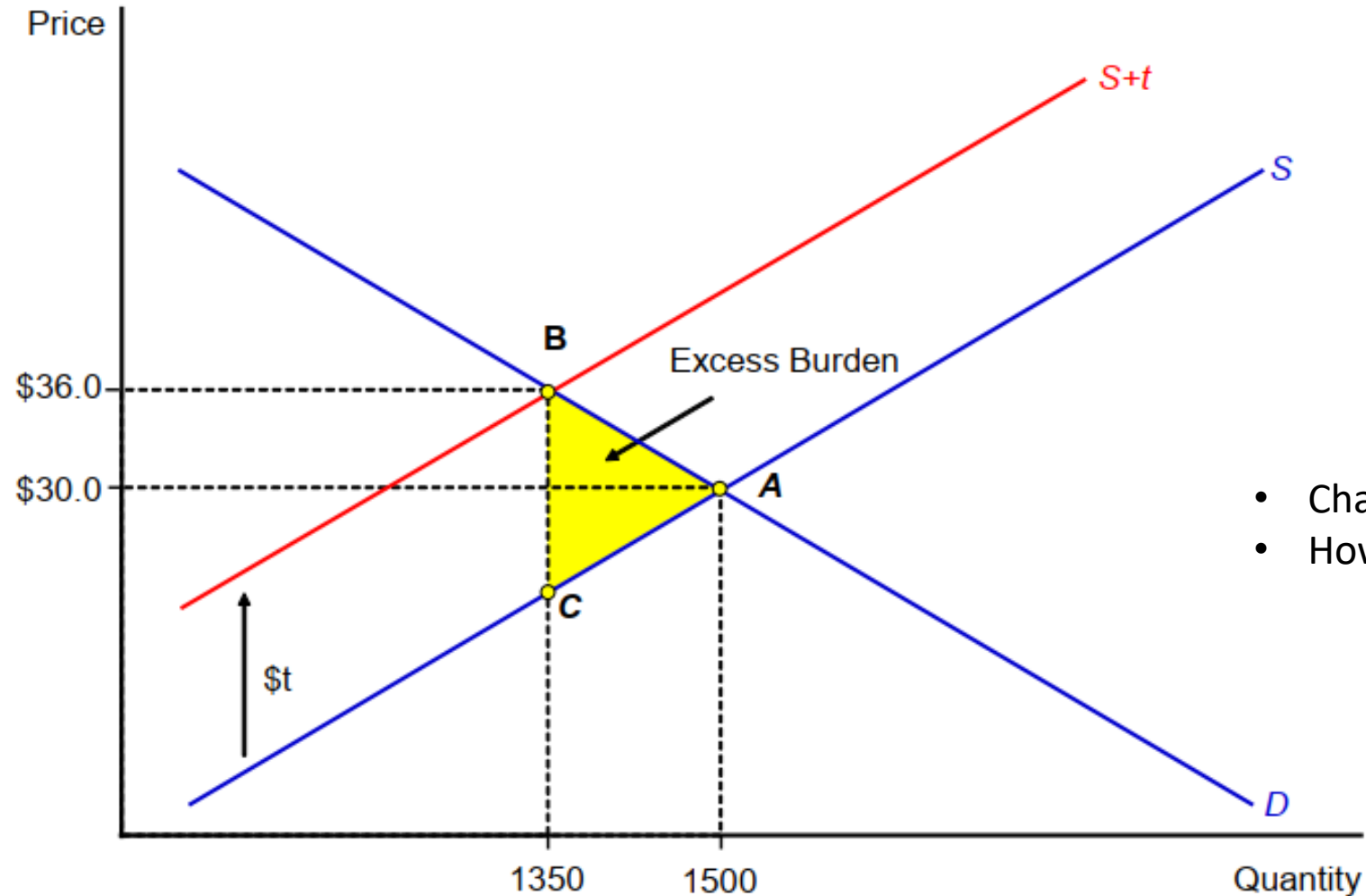
Area of triangle

$$\frac{1}{2}\, t \cdot \left(\frac{\Delta Q}{dt}\, \text{dt}\right)$$

- Change in quantity depends on elasticities
- How responsive are agents to taxes (prices)

Marginal DWL

Area of trapezoid

$$\frac{1}{2}(t + t + dt)\left(\frac{\Delta Q}{dt}dt\right)$$

$$\approx t\left(\frac{\Delta Q}{dt}dt\right)$$

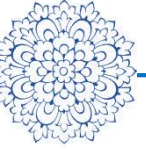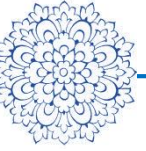Again elasticities matter, but EB is double the one before!

Contents

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Principles of optimal taxation

- Efficiency: minimize DWL
  - Responsiveness of the tax base
  - Existing tax rates
  - Existing distortions

- Fairness
  - Horizontal equity: similar treatment regardless of activity type
  - Vertical equity: progressivity to improve income inequality

- Simplicity: reduce compliance costs

- Feasibility and cost to the tax administrator

Progressive PIT

- Progressive: if average tax rate increases with taxable income.

- An increasing marginal tax rate often implies progressivity.
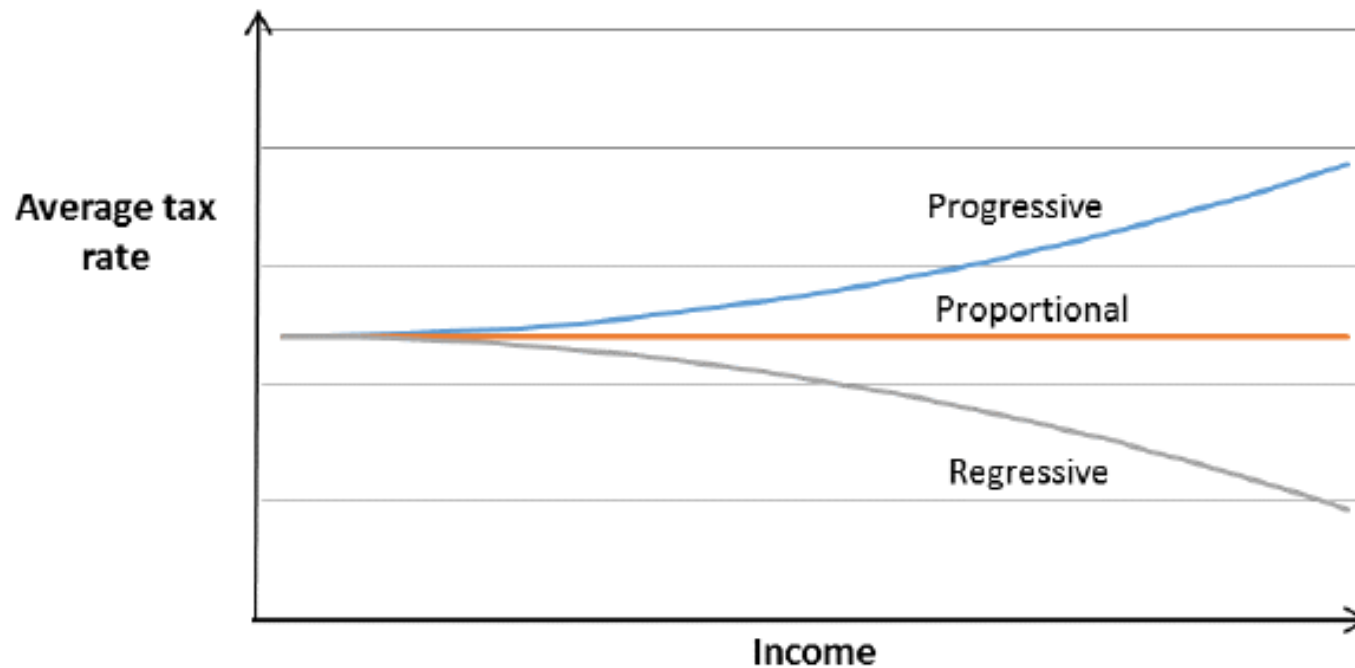
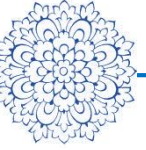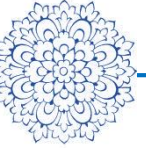# Tax base: Haig-Simon Comprehensive Income

- Taxable resources are an individual's ability to pay (i.e. potential annual consumption).

- Potential annual consumption: Total consumption during the year, plus any increases in wealth.

- Horizontal equity: treats all income equally.

- Difficulties:
  - Defining power to consumption/ability to pay
  - Non-consumption expenditures

Desirable features of a comprehensive PIT

- Broad tax base
  - Little income shifting opportunities
  - Little impact on choice of economic activity
  - No need to distinguish between capital and labor income.

- When marginal tax rates increase with income
  - A comprehensive measure of income improves progressivity.
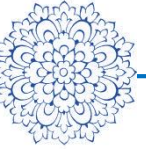 - Helps with fairness and vertical equity.
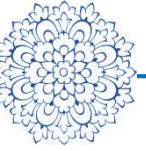
Deviations due to ability-to-pay

- Deductions for property and casualty losses

  - House fire

- Deduction for medical expenditures

  - E.g. any medical expenses above 10% of AGI

- Deduction for state and local tax payments

  - But, where do these taxes go?

Deviations due to cost of business

- Expenditures required for earning an income!

- What is legitimate cost of business?
  - Business meals, travel, …

- Unusual case
  - A rabbi claimed as a business expense the $4,031 he spent on 700 guests who attended his son's bar mitzvah.
  - A man tried to deduct $30,000 in expenses on illegal drugs.
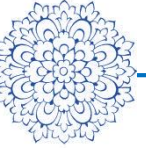 - Many OECD countries have traditionally allowed/ treated foreign bribes as business expenses.

Deviations due to Externality/Public Goods

- ## Charitable Giving
  - People may give to homeless shelters because of the tax break, but these would be underfunded otherwise.

- ## How about government provision?
  - Crowd-out vs. tax-subsidy crowd-in

- ## Marginal impact: change of behaviour

- ## Inframarginal impact on revenue: a break to those who would have given away anyway.
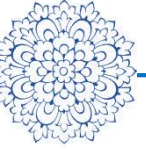
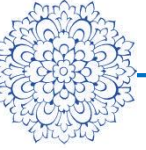# Deviations due to Externality/Public Goods

- Home ownership is subsidized through the home mortgage interest deduction.
  - Mortgage: Agreement to use a certain property, usually a home, as security for a loan.
  - Rent is not tax deductible.
- Home ownership may provide externalities through responsible citizenship.

Tax deductions vs. tax credits

- Tax deductions: Amounts by which taxpayers are allowed to reduce their taxable income through spending on items such as charitable donations or home mortgage interest.

- Tax credits allow taxpayers to reduce the amount of tax they owe to the government by a certain amount (e.g., the amount they spend on child care).

- Which one is more efficient?

- Which one is more equitable?

Tax expenditures

- Deviations from Haig-Simons are tax expenditures.
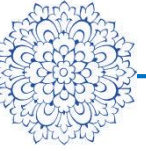 - Revenue losses due to exclusions, exemptions, …

Tax Expenditures in the US, 2013	Amount (Millions)
Employer-provided health insurance	$180,580
Home mortgage interest deduction	100,910
Exclusion of pension/401(k) contributions	72,740
Exclusion of net imputed rental income	51,080
Deductibility of charitable contributions	39,770
Total income tax expenditures	**1,135,967**

Source: Gruber, Chapter 18
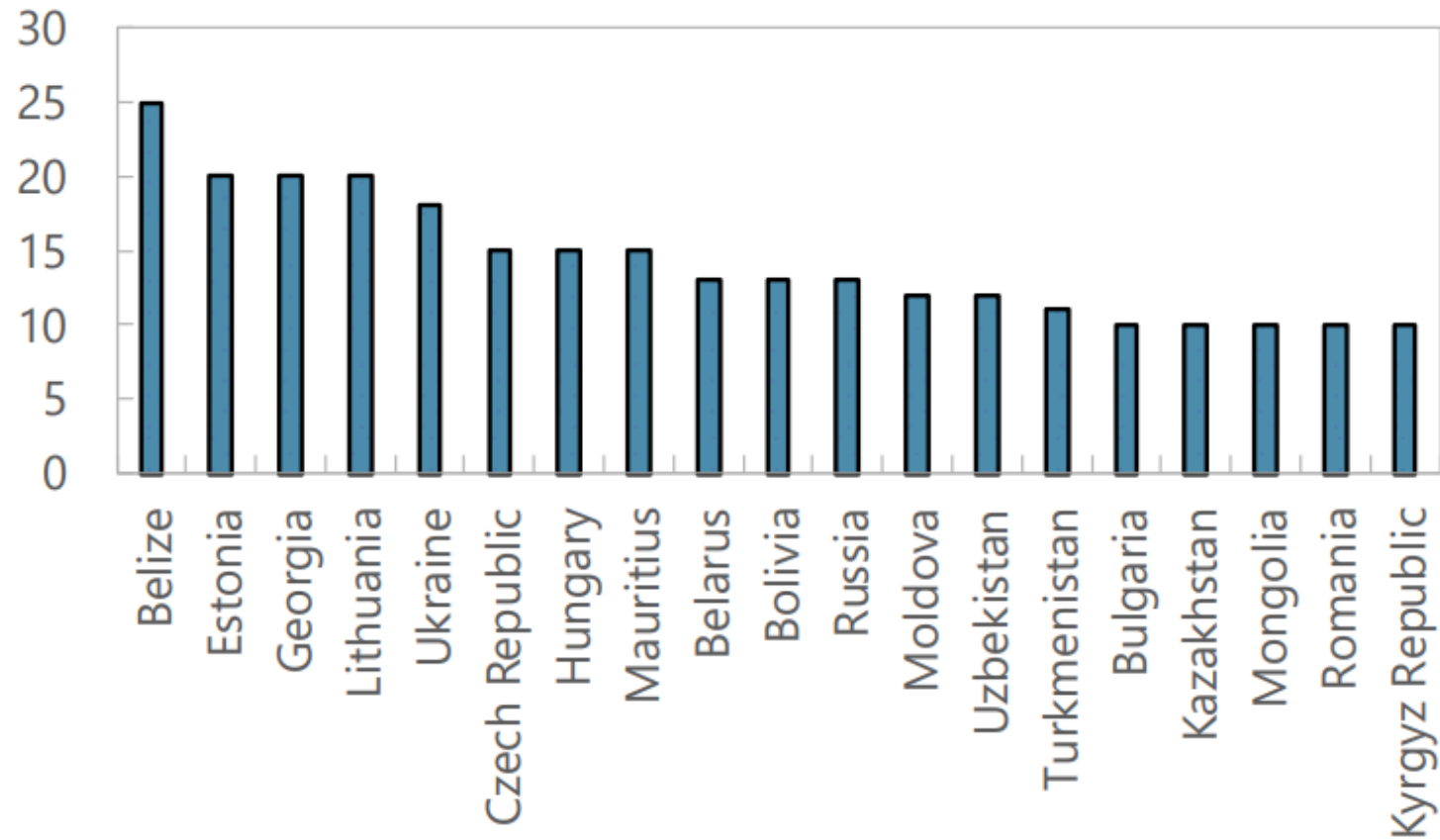
Choosing the PIT rate(s)
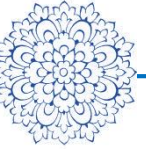
- Choosing tax rates is intertwined with choosing brackets!

- Tax rates and brackets in the optimal PIT reflect
  - Responsiveness of individuals
  - Social weights on different groups
  - Amount of revenue requirement

- Often an exemption threshold exists to protect low-income earners.
  - Trade-offs in choosing the threshold.

- Some countries have moved to a flat rate system.
  - Reduce redistributive capacity of PIT.
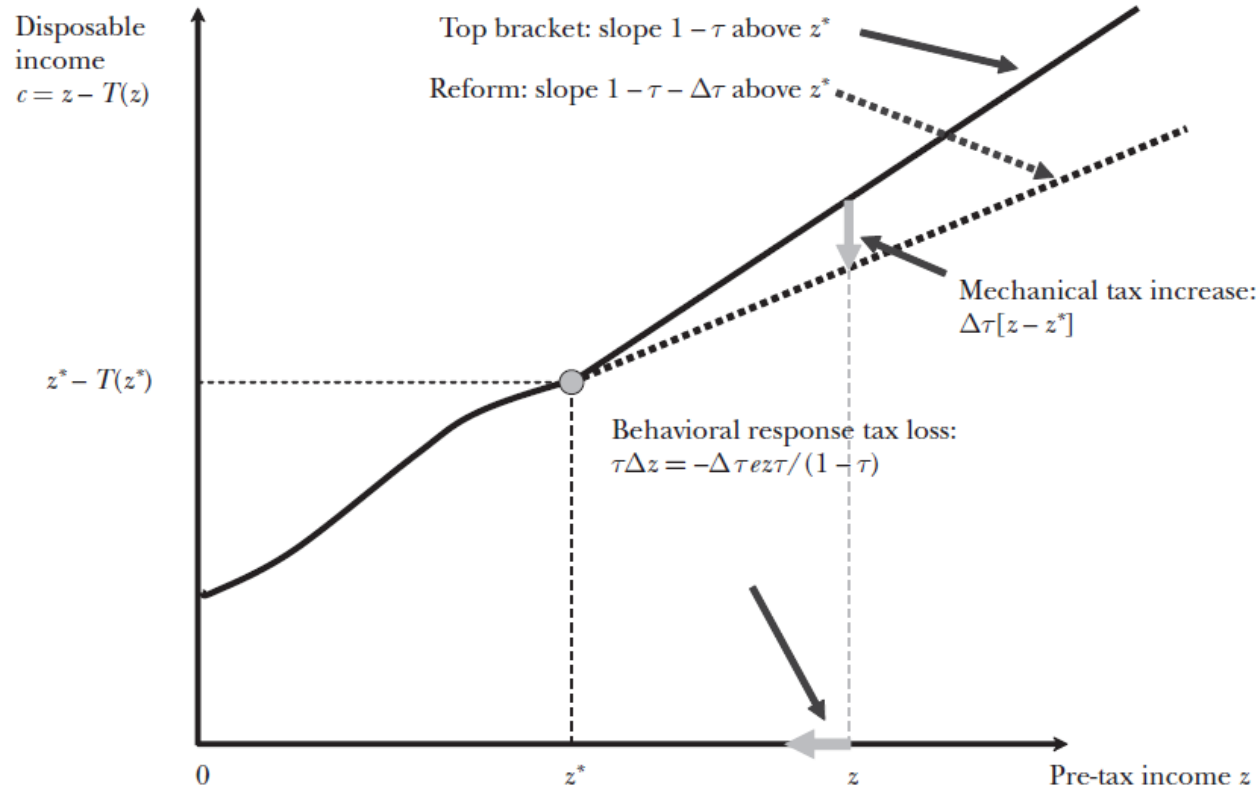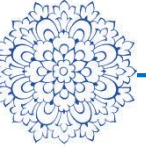 - Could improve efficiency.

Just a single PIT rate?

**Figure 4. Countries with Flat PIT Rates, 2019
(Percent)**

Source: de Mooij, R. A. (2020). Tax Policy and Inclusive Growth. *IMF Working Papers*, *2020*(271).

Top earner tax rate

Disposable income $c = z - T(z)$

Top bracket: slope $1 - \tau$ above z^*

Reform: slope $1 - \tau - \Delta\tau$ above z^*

Mechanical tax increase: $\Delta\tau[z - z^*]$

$z^* - T(z^*)$

Behavioral response tax loss: $\tau\Delta z = -\Delta\tau e z \tau/(1-\tau)$

$0 \qquad z^* \qquad z \qquad$ Pre-tax income z
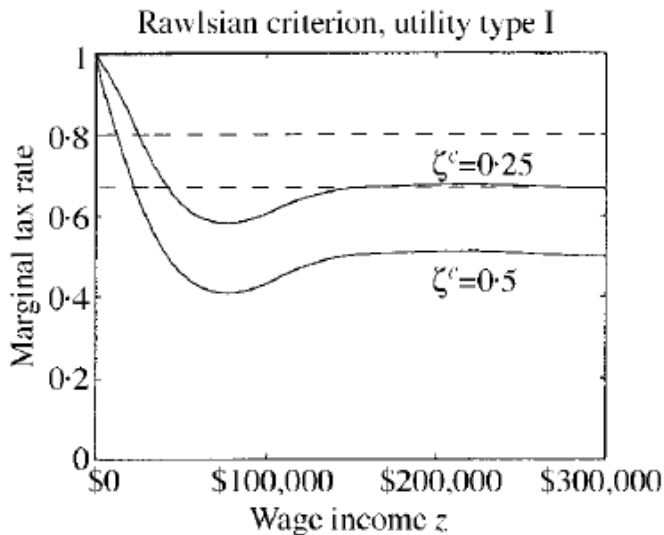
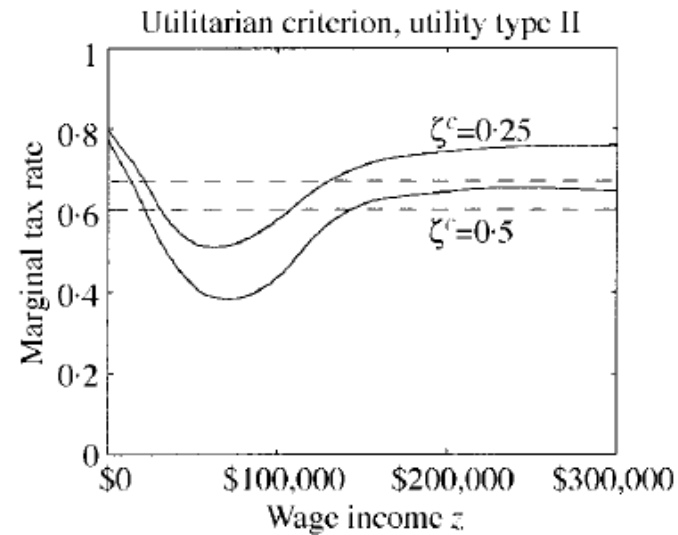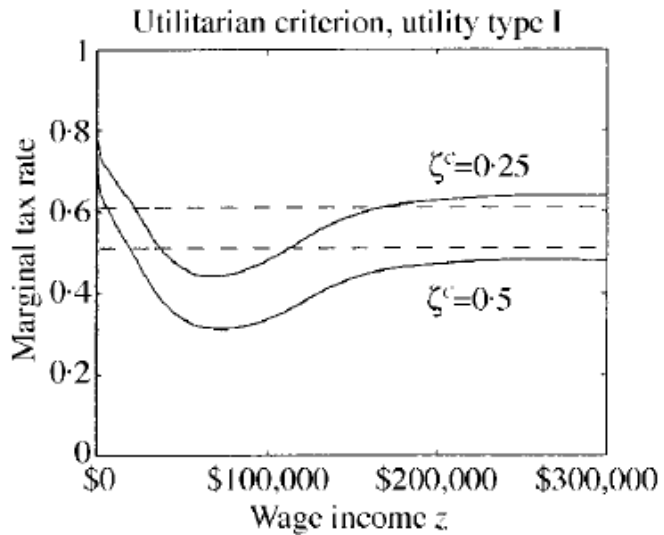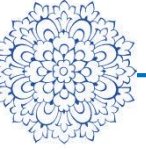Max revenue from the top bracket:
$$\tau^* = \frac{1}{1 + ae}$$
a for pareto distribution is approximately 1.5.
e is the taxable income elasticity

Source: The authors.
Notes: The figure depicts the derivation of the optimal top tax rate $\tau^* = 1/(1 + ae)$ by considering a small reform around the optimum which increases the top marginal tax rate τ by $\Delta\tau$ above z^*. A taxpayer with income z mechanically pays $\Delta\tau[z - z^*]$ extra taxes but, by definition of the elasticity e of earnings with respect to the net-of-tax rate $1 - \tau$, also reduces his income by $\Delta z = ez\Delta\tau/(1 - \tau)$ leading to a loss in tax revenue equal to $\Delta\tau e z\tau/(1 - \tau)$. Summing across all top bracket taxpayers and denoting by z_m the average income above z^* and $a = z_m/(z_m - z^*)$), we obtain the revenue maximizing tax rate $\tau^* = 1/(1 + ae)$. This is the optimum tax rate when the government sets zero marginal welfare weights on top income earners.

Source: Diamond, P., & Saez, E. (2011). The case for a progressive tax: From basic research to policy recommendation. Journal of Economic Perspectives, 25(4), 165-190.
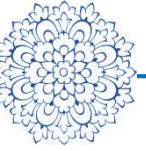
Examples of optimal marginal tax rates
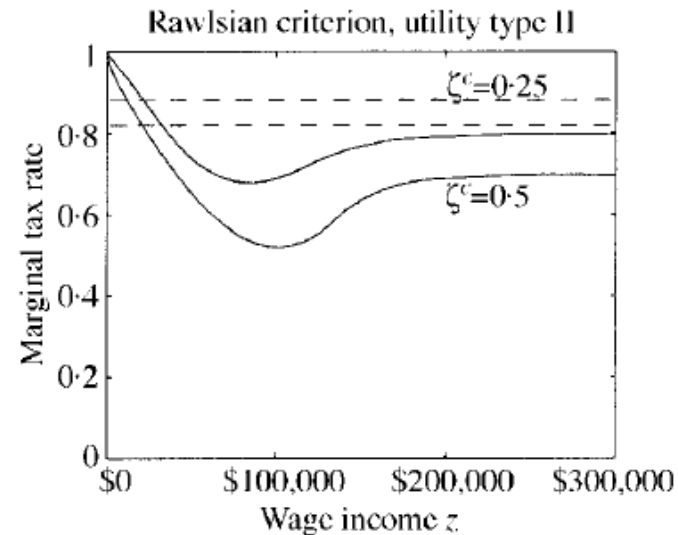
High marginal rates for low earners show phase out of benefits.
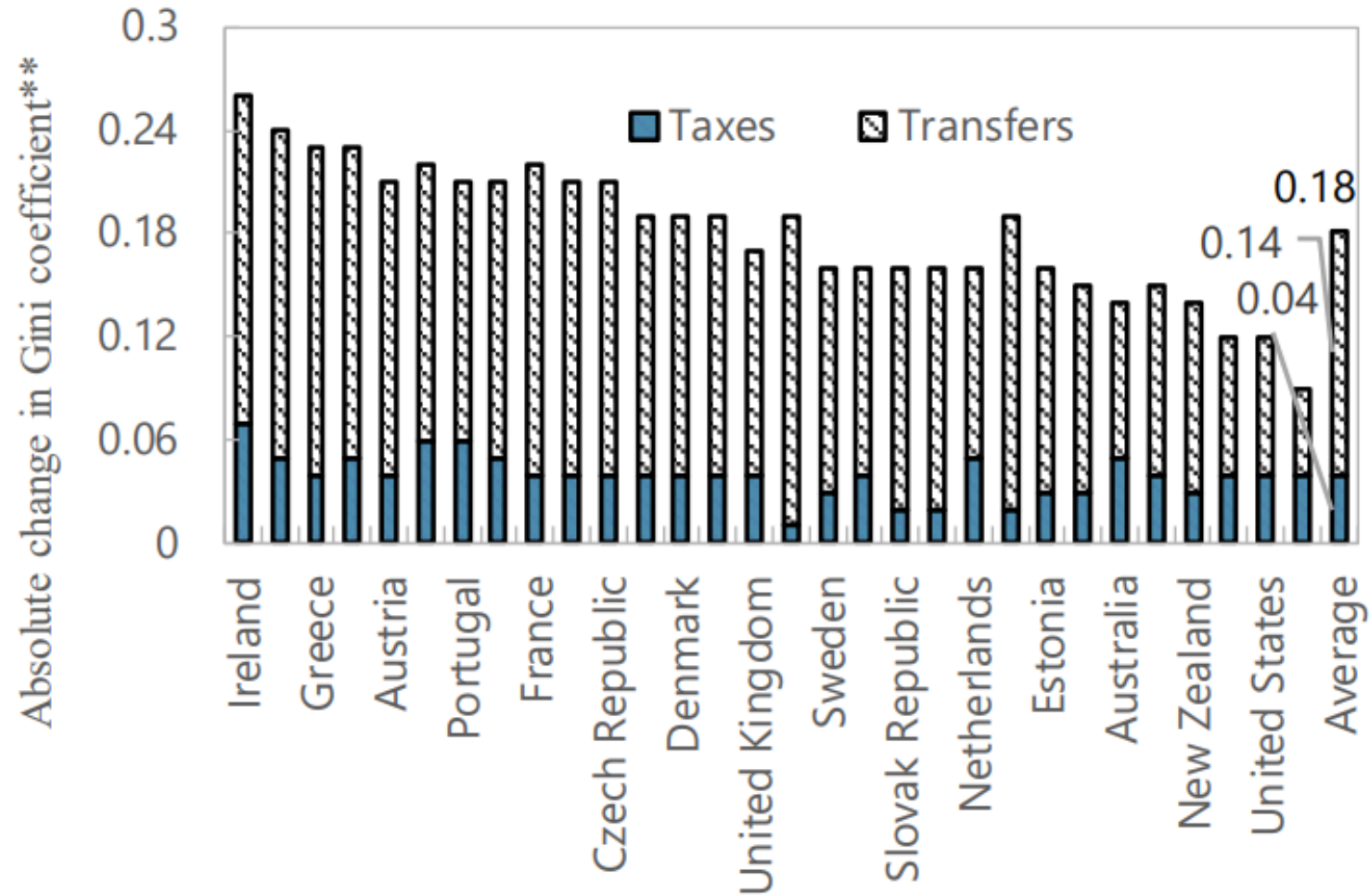
Low rates in the middle reflect bulk of income distribution

Rates depend on elasticities, social weights, and density of earners in each bracket.

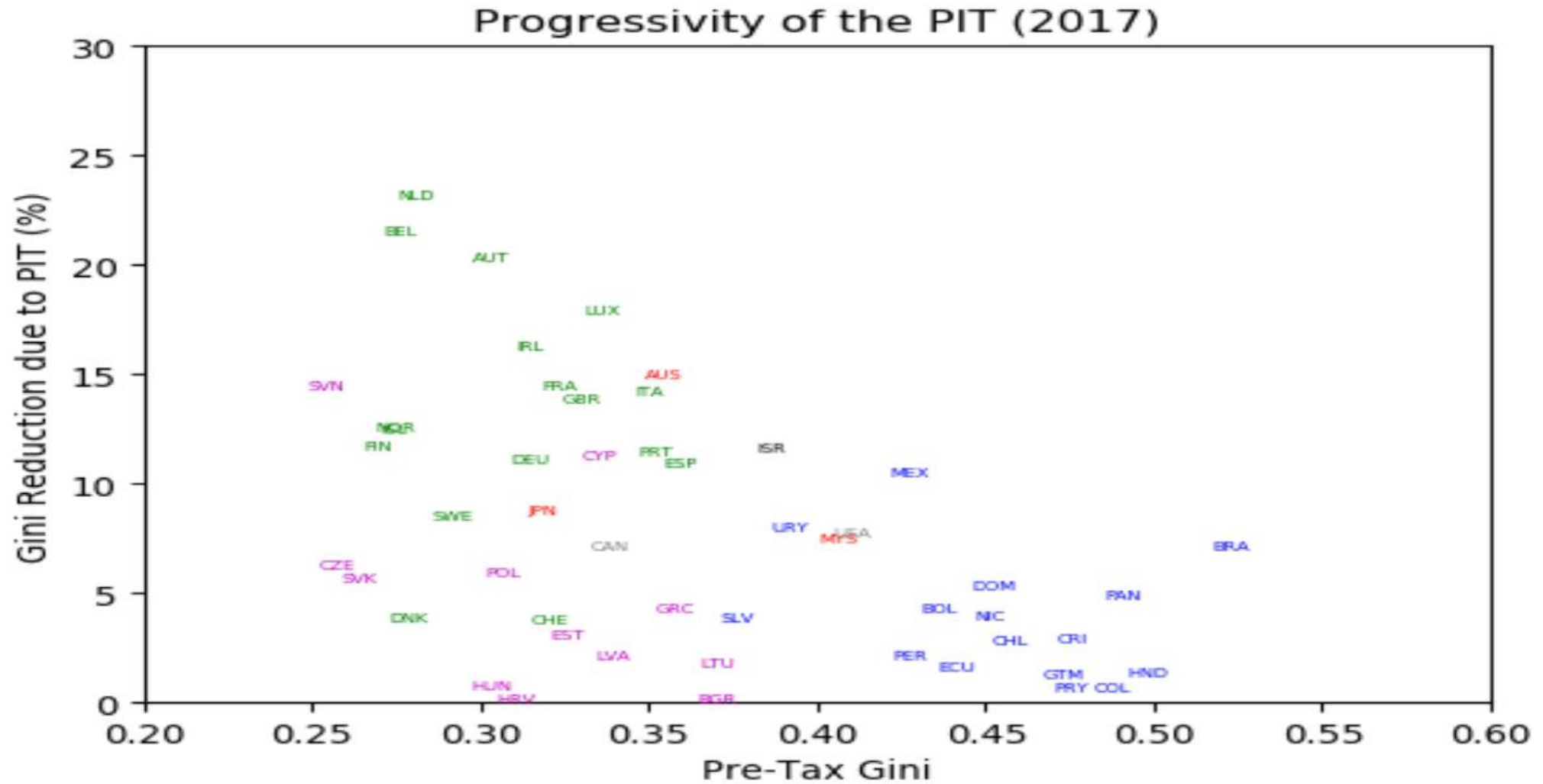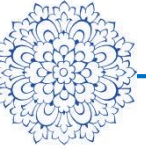# Redistributive impact of taxes and transfers

Figure 2. Redistributive Impact of Taxes and Transfers in Advanced Economies*

How much is due to PIT?

Progressivity of the PIT (2017)

Source: https://documents1.worldbank.org/curated/en/106141625812725457/pdf/Personal-Income-Tax.pdf
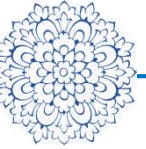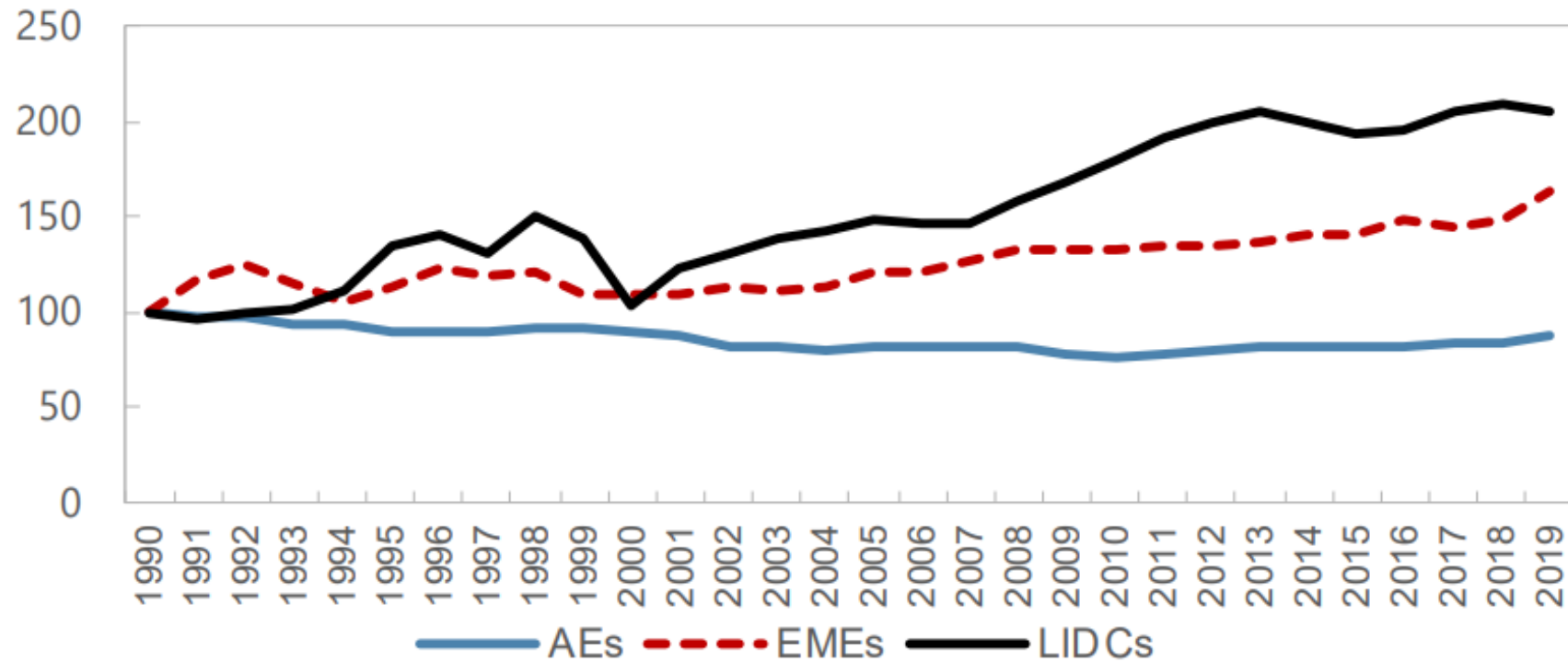
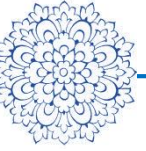# Trends of PIT income

Figure 5. PIT Revenue Growth Index 1990–2019 (1990=100)
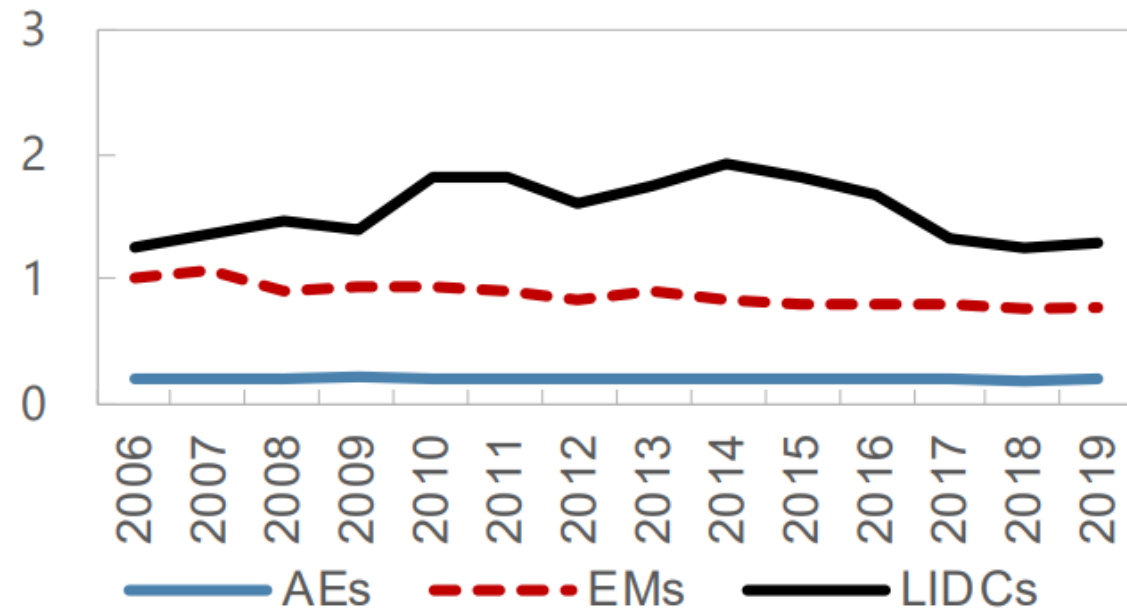
AE: Advanced Economies
EME: Emerging Markets Economies
LIDC: Low Income Developing Countries

Source: Benedek, M. D., Benitez, J. C., & Vellutini, C. (2022). Progress of the personal income tax in emerging and developing countries. International Monetary Fund.
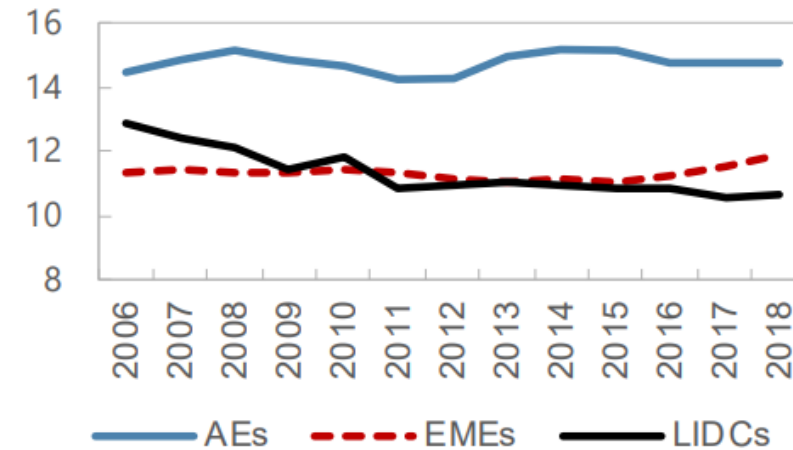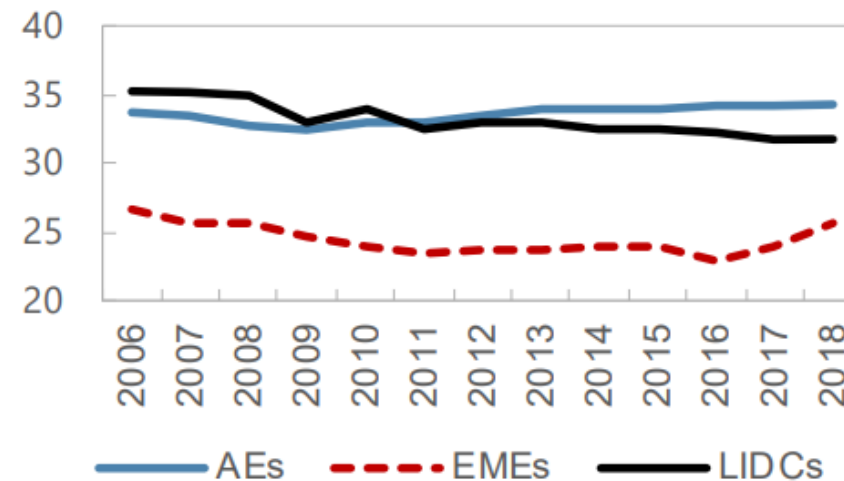
Changes in PIT policy variables?

Figure 6. Evolution of the PIT's Liability Threshold (in multiples of GDP per capita)

Figure 7. Average Non-zero Lowest Marginal PIT Rate (in percent)

Figure 8. Top Marginal PIT Rate (in percent)

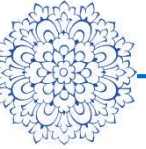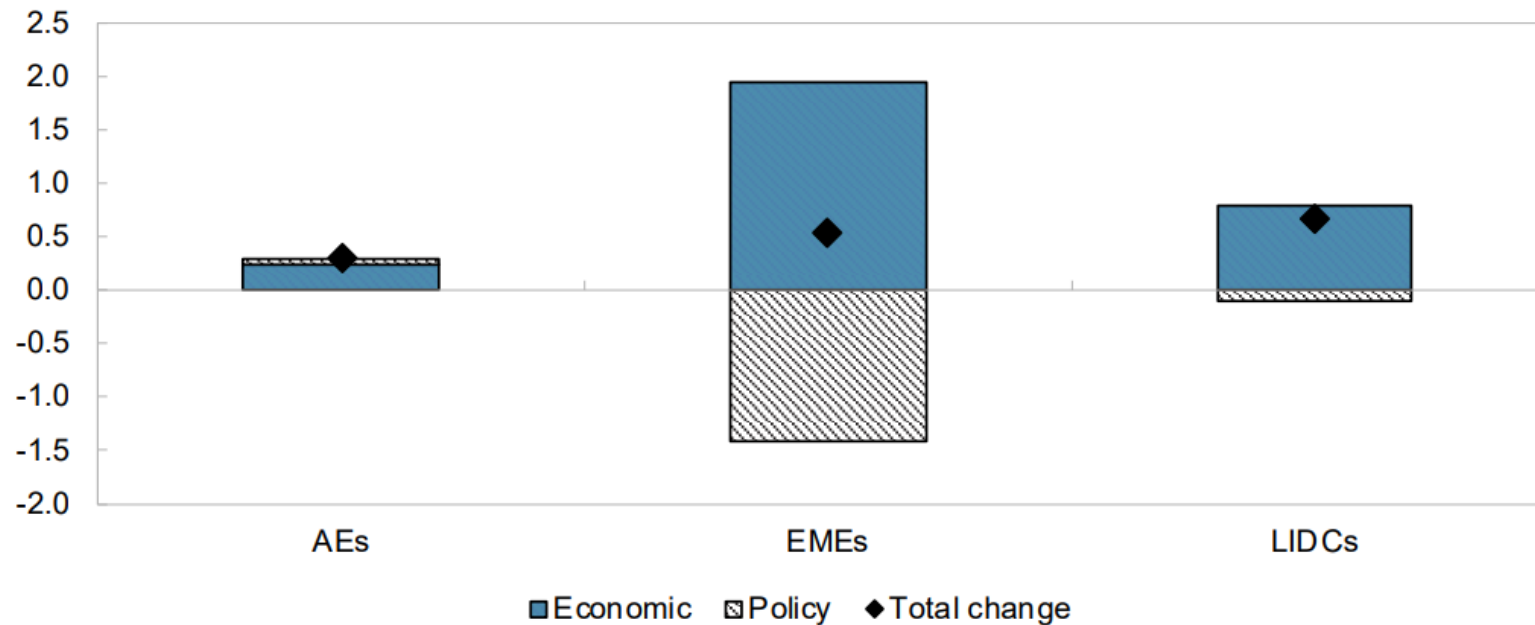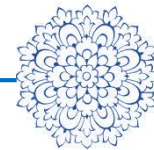# Contribution of policy and economic variables to PIT revenue growth

Figure 9. PIT Revenue Growth Explained by Policy and Economic Variables (2006–2018) in percentage points of GDP

Note: The economic variables include GDP per capita, agriculture as a share of GDP, self-employment as a share of total employment, the public sector wage bill as a share of GDP and annual inflation. Included policy variables: PIT threshold, the minimum non-zero PIT marginal rate, the maximum marginal PIT rate, the top threshold to pay the maximum marginal PIT rate, and CIT and VAT revenue as a share of PIT.
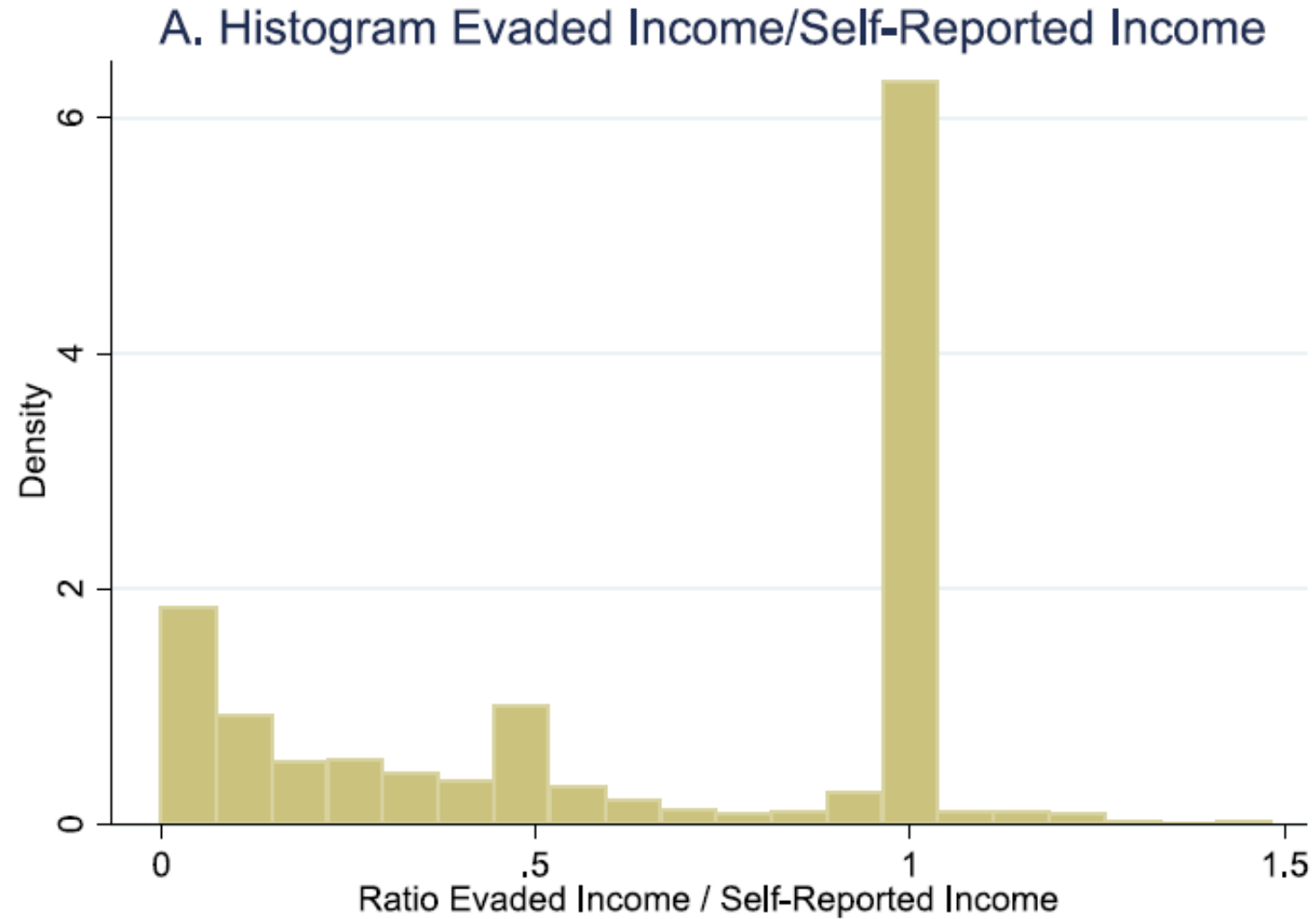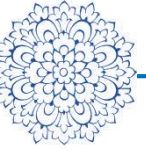Source: IMF calculations based on Table 2.

Source: Benedek, M. D., Benitez, J. C., & Vellutini, C. (2022). Progress of the personal income tax in emerging and developing countries. International Monetary Fund.

Individual vs. family PIT

- Any tax system that tries to achieve horizontal equity and progressivity have a marriage tax for some people.

  o **Marriage tax:** A rise in the joint tax burden on two individuals from becoming married.

- Taxing family incomes leads to a marriage tax.

	Individual Income	Individual Tax	Family Tax with Individual Filing	Total Family Income	Family Tax with Total Family Income
Michelle	$140,000	$32,000	$33,000	$150,000	$35,000
Barack	10,000	1,000			
Bill	75,000	13,000	26,000	150,000	35,000
Hillary	75,000	13,000			

Role of information in PIT enforcement

A. Histogram Evaded Income/Self-Reported Income

Kleven, H. J., Knudsen, M. B., Kreiner, C. T., Pedersen, S., & Saez, E. (2011). Unwilling or unable to cheat? Evidence from a tax audit experiment in Denmark. *Econometrica*, *79*(3), 651-692.
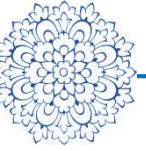
Contents

- Introduction

- What is personal income tax?

- Efficiency loss of taxation

- Design of personal income tax
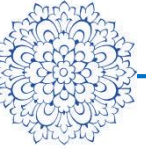
- **Concluding remarks**

Concluding remarks

- PIT is an effective revenue and redistribution instrument

- However, its success depends on
  - Design of PIT
  - Strength of the tax authority
  - Use and organization of information
  - Structure of the economy

- It could help with other taxes too, but limiting evasion/avoidance opportunities.

References

- Benedek, M. D., Benitez, J. C., & Vellutini, C. (2022). *Progress of the personal income tax in emerging and developing countries*. International Monetary Fund.

- de Mooij, R. A. (2020). Tax Policy and Inclusive Growth. *IMF Working Papers*, *2020*(271).

- Gruber, Public Finance and Public Policy, 2016.

- OECD (2006), *Fundamental Reform of Personal Income Tax*, OECD Tax Policy Studies, No. 13, OECD Publishing, Paris, https://doi.org/10.1787/9789264025783-en.