



TAX POLICY ANALYSIS & EVIDENCE-BASED TAX REFORM

Key indicators for policy analysis

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Why tax indicators are useful in policy analysis

- What is the overall tax burden in my country, relative to other countries?
 - How much tax do we raise on labour, on capital, on consumption ?
 - What have been the revenue effects of recent tax reforms?
 - How efficient is the VAT system?
- Macro economic indicators
- How much tax and SSC are paid at a given wage level or different family types (low-average-high)?
 - What is the effect of tax changes on household income
 - How much tax do companies effectively pay?
 - What is the effect of tax incentives, tax reliefs on the taxation of various types of income?
- Micro economic indicators
(Effective tax rates)



Key indicators for evidence based tax reform

- Macro-economic indicators
 - **Tax/GDP Ratio & tax structures (Revenue Statistics)**
 - **Implicit tax rates (ITR)**
 - **VAT revenue ratio**
- Micro-economic indicators (ETR)
 - **Effective tax rate on labour (Taxing Wages)**
 - **Effective tax rates on investment**
 - Effective tax rate on savings



TAX-TO-GDP RATIO & TAX STRUCTURE



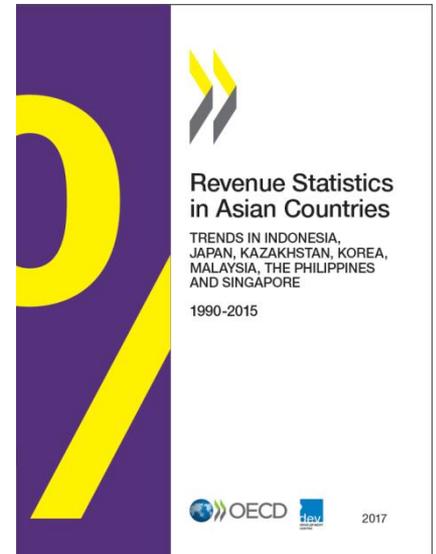
Tax-to-GDP ratio & tax structure (*Revenue Statistics*)

- Tax-to-GDP ratio: sum of revenues from all taxes, divided by GDP
- Taxes = unrequited, compulsory, payments to general government
 - Charges and fees are not taxes
 - SSC: give entitlement to benefits, but no direct link between contribution and benefits, so are treated as taxes
- Tax-to-GDP ratio shows:
 - Tax revenue data that is comparable across countries and across time;
 - Tax revenues against the economy which generated them
- Tax structures: tax as % of total tax revenue
 - Income tax, SSCs, payroll taxes, property taxes, goods and services taxes, other



Revenue Statistics publications

- Four regional publications covering 80+ countries: Africa, Asia & Pacific, Latin America & the Caribbean and the OECD
- Revenue Statistics in Asian Countries 2017 covers : Indonesia, Japan, Kazakhstan, Korea, Malaysia, the Philippines and Singapore
- Annual publication jointly published by the OECD & the ADB
- 2018 edition is also being prepared in cooperation with Pacific Island Tax Administrators Association and with the financial support of the EU

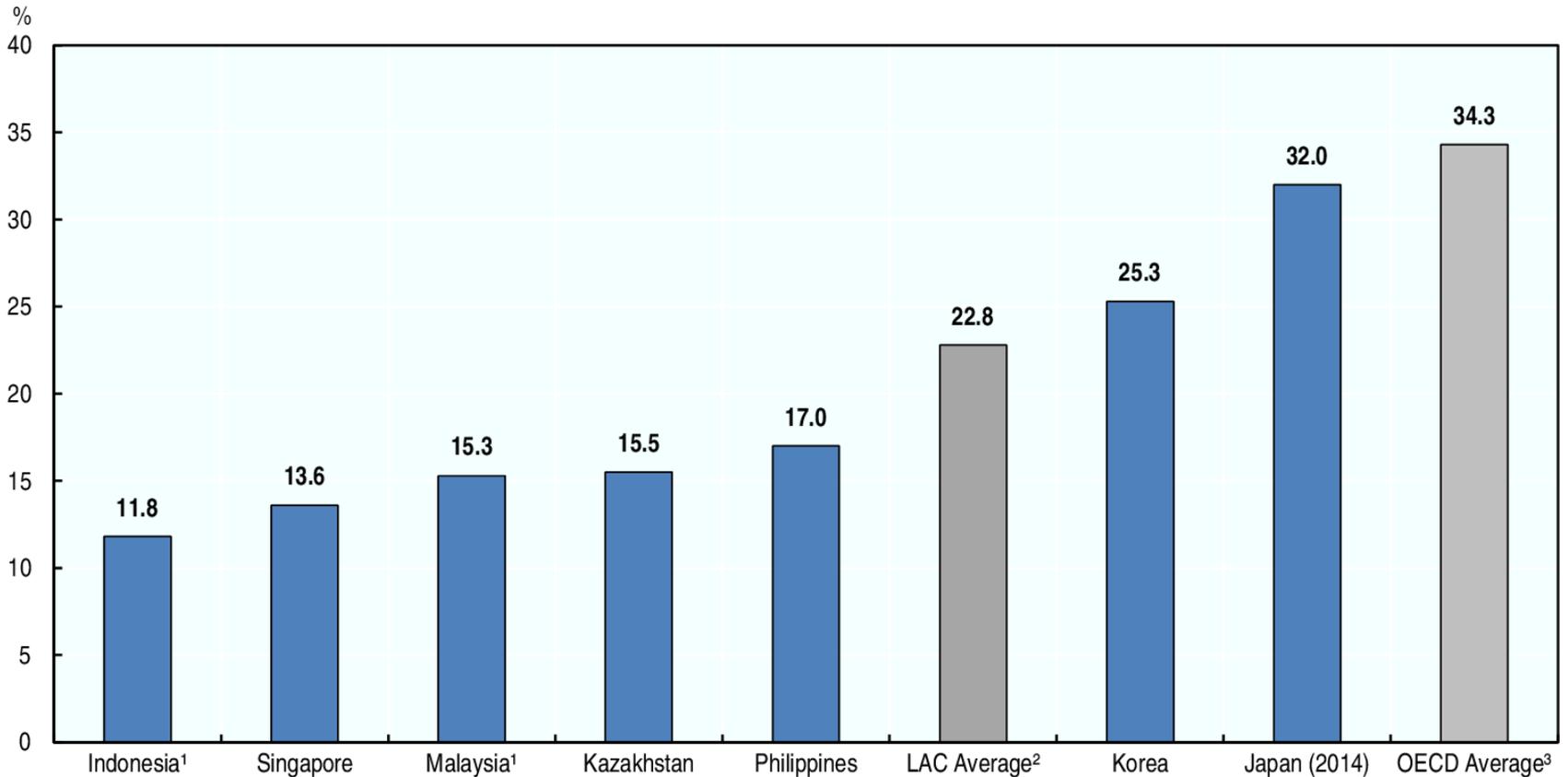


<http://www.oecd.org/tax/revenue-statistics-in-asian-countries-2017-9789264278943-en.htm>



Tax-to-GDP ratios in Asian Countries in 2015

Tax-to-GDP ratios in Asian countries compared to the OECD & LAC averages, 2015



1 The figures exclude state government revenues for Malaysia & social security contributions for Indonesia.

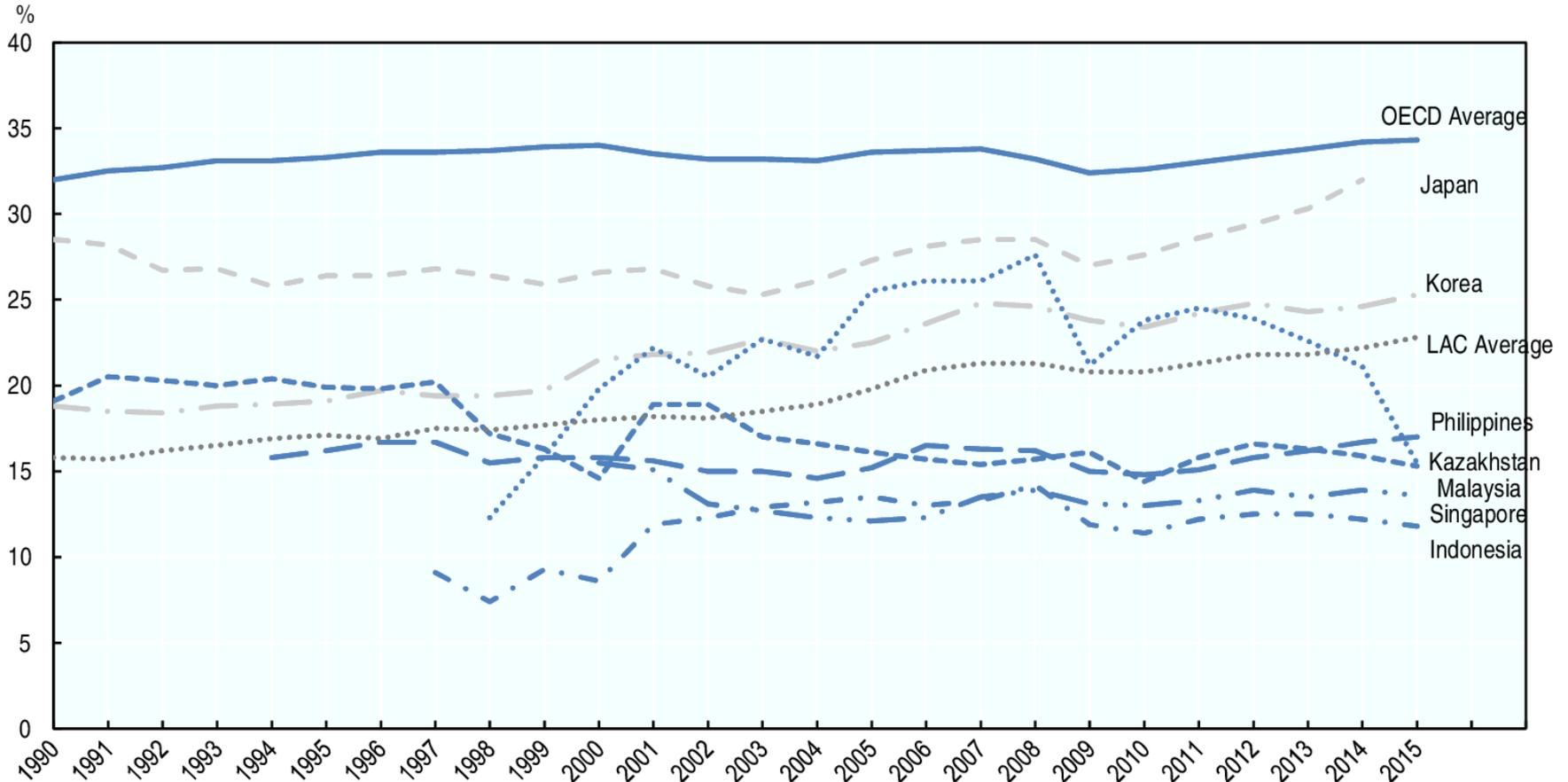
2 Represents the unweighted average for 24 LAC (Latin American & Caribbean) countries .

3 Represents the unweighted average for OECD member countries. Japan & Korea are also part of the OECD (35) group.



Changes in tax-to-GDP ratios over time

Tax-to-GDP ratios in Asian countries compared to the OECD & LAC averages, 1990-2015

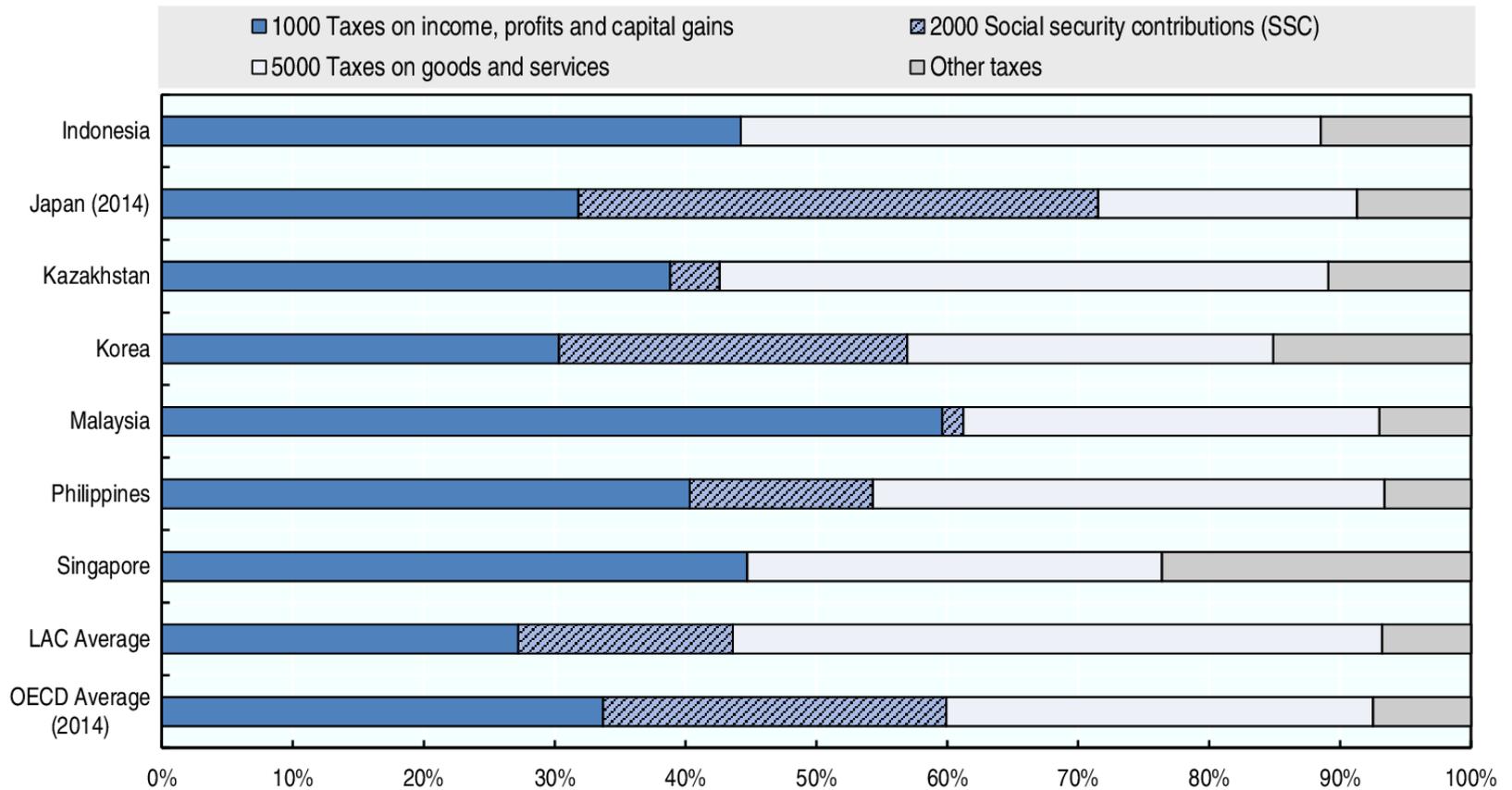


Source: Revenue Statistics in Asian Countries (2017)



Tax structures in Asian Countries, 2015

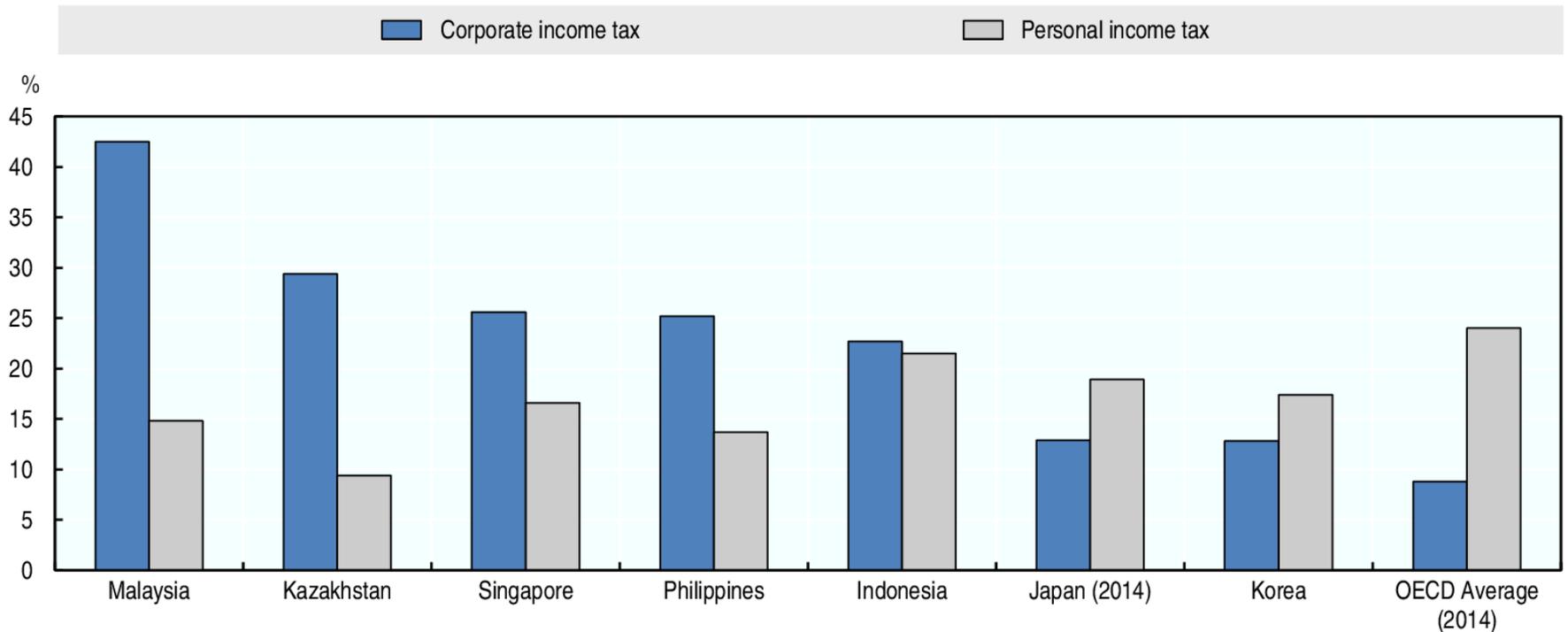
Tax structures, 2015





Personal & corporate income tax shares

Revenue from corporate income tax and personal income tax as % of total tax revenue, 2015





Limitations of the tax-to-GDP ratio

- Changes in the structure of GDP may affect the tax-to-GDP ratio, i.e. changes in the ratio do not necessarily reflect changes in tax policy
- Similar policies may be effected via the tax system or via expenditure, with different effects on the tax-to-GDP ratio
 - Tax expenditures or direct spending
 - Social expenditures and in-work tax credits
- Provides only aggregate information
 - No information on impact of tax system on individuals or businesses
 - GDP does not strictly correspond to the tax base



IMPLICIT TAX RATES



Implicit tax rates (ITR)

- Tax`-to-GDP ratio = Sum of all tax revenues/GDP
- A disaggregated ratio (individual tax /GDP) is not a convenient tax burden indicator for that tax:
 - GDP is not the tax base
 - Trends in the tax base may differ from trends in GDP
 - E.g. Consumption tax as % of GDP
- ITRs:
 - express aggregate tax revenues as a percentage of the potential tax base.
 - calculate the average amount of an individual tax paid relative to the underlying tax base



Implicit tax rates (ITR)

- Tax/GDP ratio = $\sum T_i / GDP$
- Implicit tax rates allow this to be split into two components:
 - $= \sum \frac{T_i}{B_i} \cdot \frac{B_i}{GDP}$
 - ↑ Implicit tax rates
 - i.e. the individual tax divided by its base (B_i), multiplied by the share of the base in GDP
- Allows disaggregation of two impacts on revenues:
 - Changes in the tax burden on the underlying tax base
 - Changes in the share of the tax base against GDP



Example: consumption taxes

$$\frac{\text{Consumption tax revenues}}{\text{GDP}} = \frac{\text{Consumption tax revenues}}{\text{Consumption}} * \frac{\text{Consumption}}{\text{GDP}}$$

Indicator currently used in *Revenue Statistics & Consumption Tax Trends*

Implicit tax rate on consumption

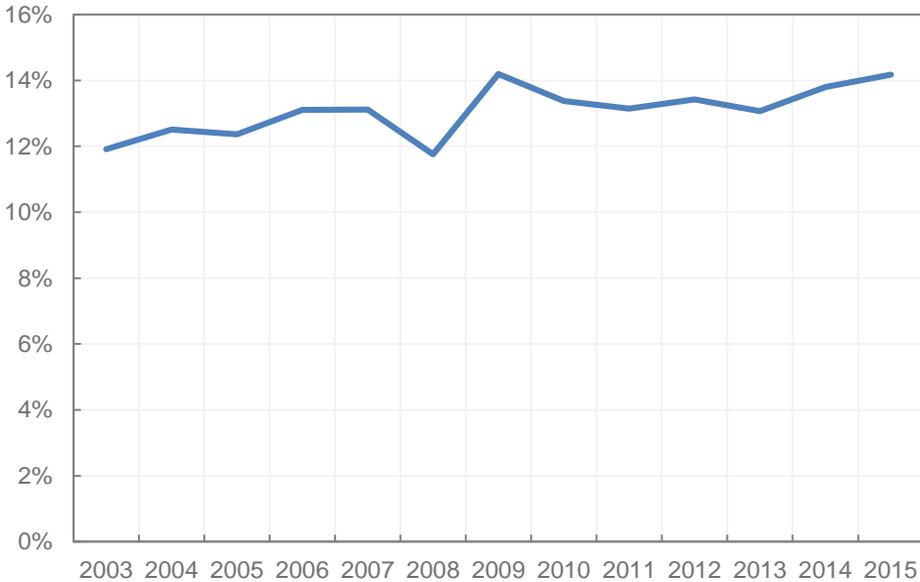
Share of consumption in GDP

- Assists in answering the question: what has driven changes in consumption tax revenues in recent years?
- Allows disaggregation of changes in tax burden (rates, or base broadening); and changes to the tax base in the economy

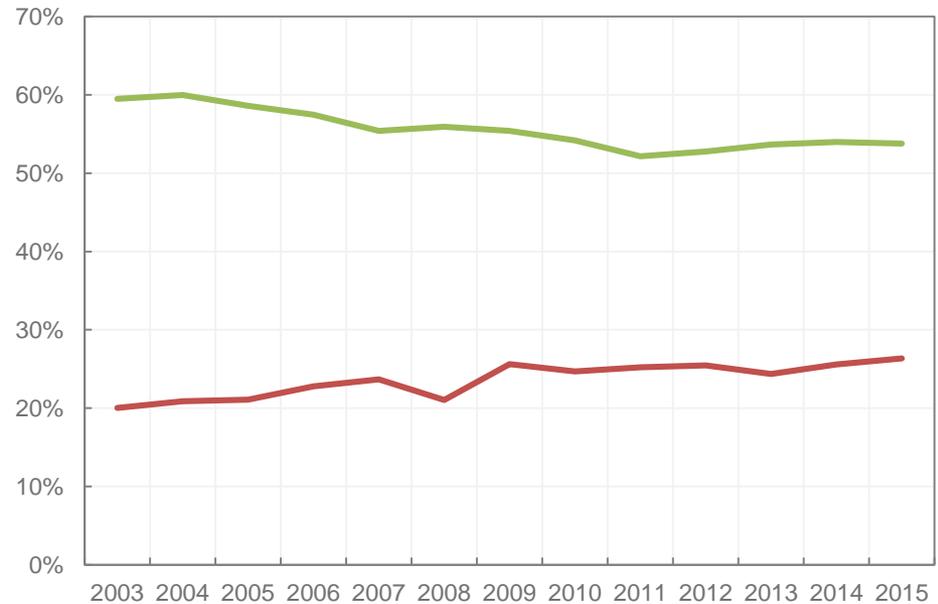


Example: in consumption tax revenues in Estonia

— Consumption tax as % of GDP



— Implicit Tax rate on consumption — Consumption as % of GDP





Calculating implicit rates

- ITRs are normally calculated for labour, capital and consumption (as well as energy)
- Numerator: Identifying tax revenues (*Revenue Statistics* data):
 - Tax revenues are divided into revenues from labour, capital, consumption
 - Requires splitting *Revenue Statistics* categories:
 - Taxes on income : both labour and capital – how to split?
 - Taxes on goods and services: mostly consumption, but some are capital
- Choosing the base : macro-economic proxy of the tax base (national account data)
 - Labour: gross compensation for employees + payroll taxes
 - Capital: property income of households + net operating surplus of incorporated enterprises + dividends received by government and “rest of the world”
 - Consumption: final consumption of households and government (excluding wages)



Implicit tax rate: Limitations

- Backward looking
- May be difficult to identify tax bases accurately in national accounts, particularly for capital
 - Bi are “source based”, while some Ti may be residence-based
 - Capital gain tax revenue included in TK, but capital gains are not included in Bk
 - National accounts calculate net operating surplus of corporates as a residual
- May be difficult to separate income tax revenues between labour and capital revenues
- To sum up:
 - Comparatively straightforward for consumption
 - Difficulties in identifying revenues for labour
 - Difficulties in identifying revenues and tax base for capital



VAT REVENUE RATIOS



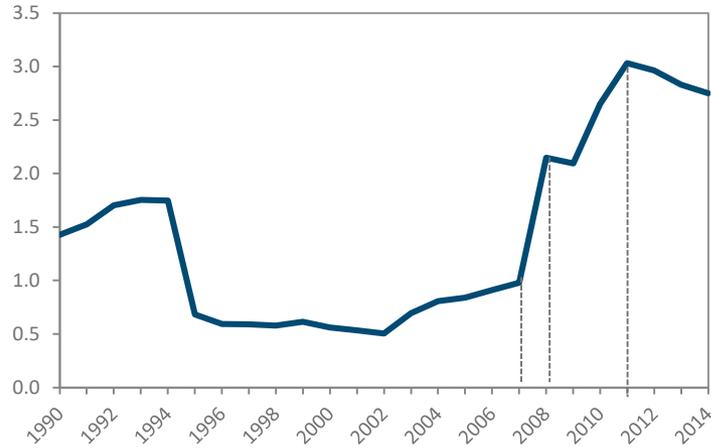
VAT Revenue Ratios

- The VAT revenue ratio measures how much revenue is collected as a % of the revenue that would be collected, if:
 - The standard rate was applied to all consumption; and
 - There is no avoidance or evasion
- Calculated as:
 - $\text{VAT revenue} / (\text{Consumption} * \text{standard VAT rate})$
- Increases in the VRR mean that:
 - Lower rates or zero rates have been reduced; or
 - Tax compliance has increased, or evasion has decreased
- Can be compared to ITRs and changes in headline rates to understand what drove changes in ITRs

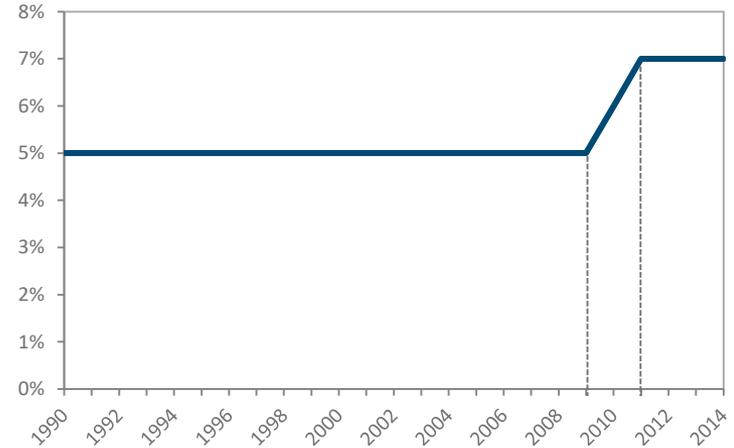


Example for Panama

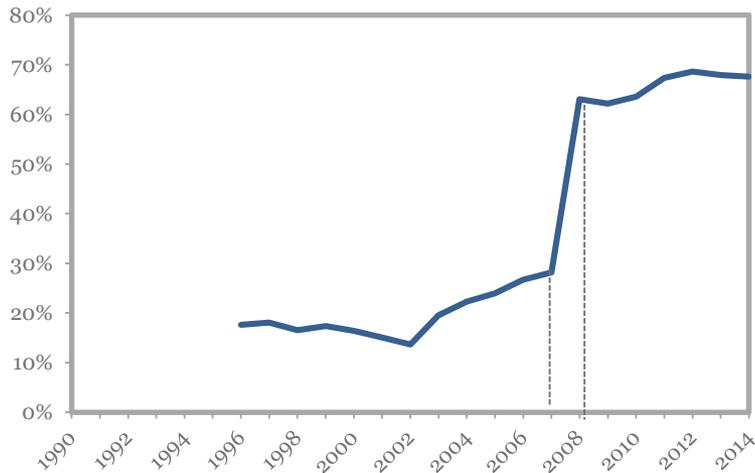
VAT as % GDP, 1990-2014



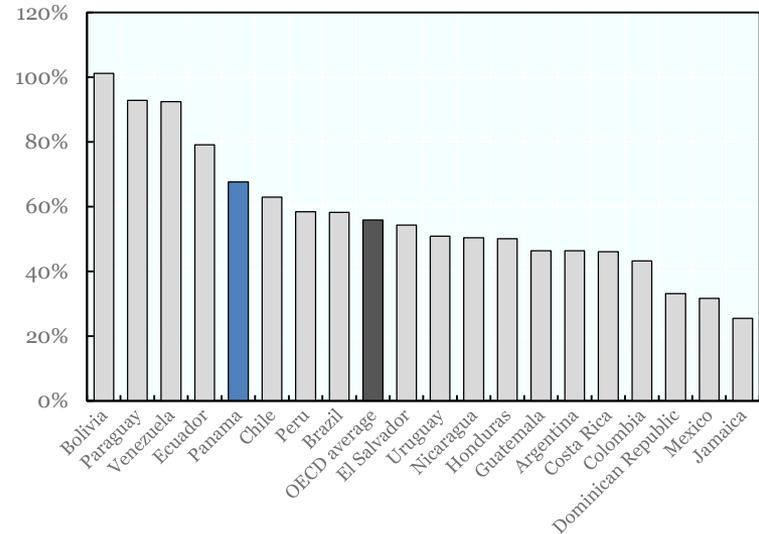
VAT rate in Panama, 1990-2014



VRR in Panama, 1990-2014



VRR in the LAC region, 2014





Limitations of the VRR

- May decrease if share of goods taxed at lower rates increases due to changes in the economy
- If VAT refunds are not made by the government, the VRR ratio will be higher, but refunds are an essential part of VAT neutrality
- VRR may be higher if VAT applied to exported goods (i.e. destination principle not applied)
- Some countries may have a difference between VAT base and consumption base in national accounts
- Not possible to disentangle “Policy Efficiency Ratio” and “Compliance Efficiency Ratio”



EFFECTIVE TAX RATES



Effective tax rates: introduction

- Effective tax rates measure the impact of tax by comparing post-tax and pre-tax income
 - They take into account both the tax base & tax rates
- Effective tax rates can be average or marginal
 - Average tax rates calculate the impact of tax on the overall level of income; e.g. post-tax labour income received by a worker
 - Marginal effective tax rates calculate the impact of tax on the next unit of income; e.g. the amount of income a worker will receive from the next dollar earned
- Effective tax rates can be backward or forward looking
 - Backward looking: Calculated ex post, reflect effects of past decisions; no indications about incentives (to invest, work etc)
 - Forward looking: calculated ex ante; anticipate impacts of tax rules on future income; provides information about incentives



EFFECTIVE TAX RATES ON LABOUR



Impact of tax on labour income

- The tax system affects post-tax wages through:
 - personal income taxes,
 - social security contributions paid by employees,
 - social security contributions and payroll taxes paid by employers and
 - cash benefits paid to working families
- Many of these differ by family types and levels of income
 - What is the overall impact of the tax system on workers at different income levels and in different family types?
- *Taxing Wages* models calculate post-tax income for:
 - Single earners, married couples; both with and without children
 - levels of income from 50% to 250% of average wage



Key indicators of tax burden on workers

- Average PIT=

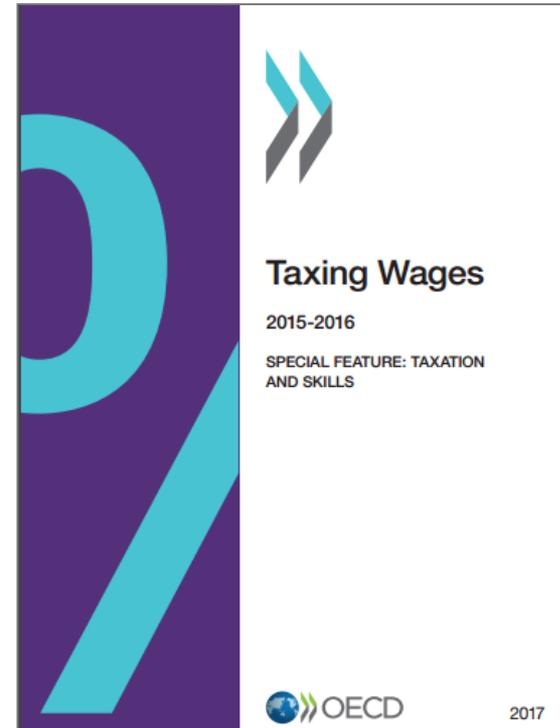
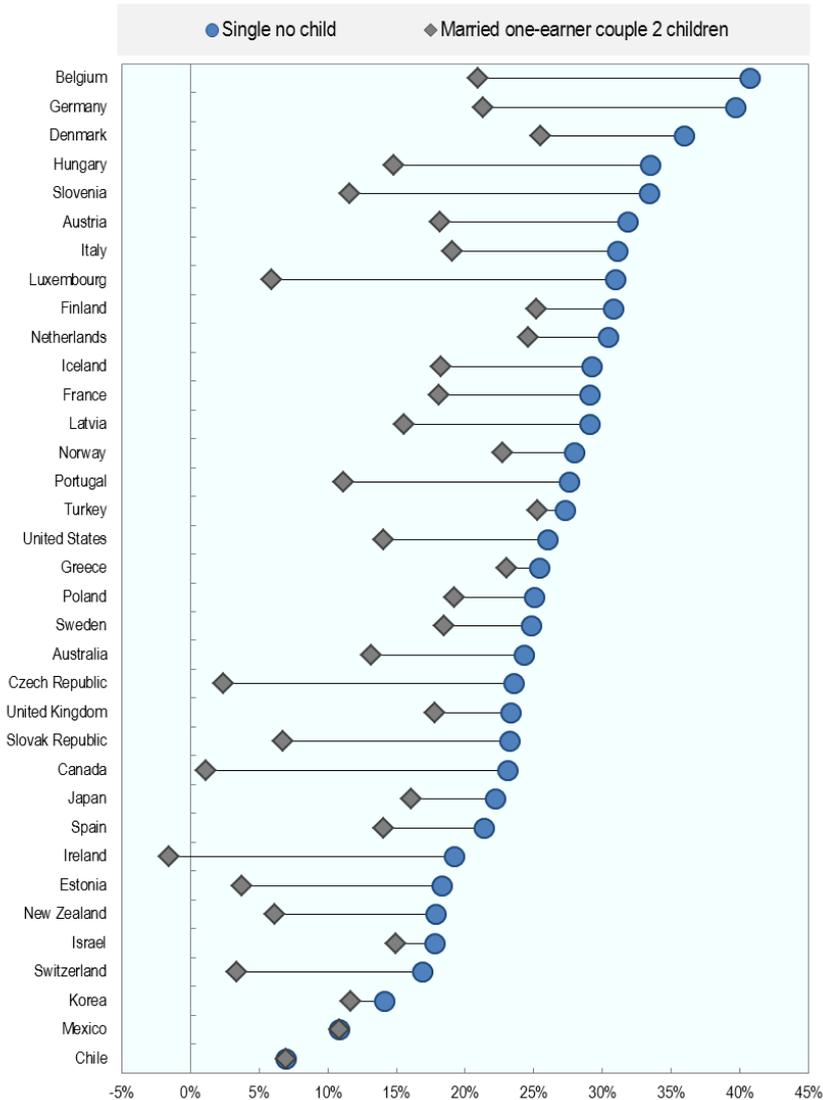
$$\frac{\text{PIT}}{\text{Gross earnings}}$$

- Net personal average effective tax rate (AETR) =

$$\frac{\text{PIT} + \text{employee SSC} - \text{family benefits}}{\text{Gross earnings}}$$



Taxing Wages net personal average tax rates, 2016



Note: The family type 'single no child' corresponds to a wage level of 100% of average wage. The family type 'married one earner couple 2 children' corresponds to a combined wage level of 100%-0% of average wage.

Source: Taxing Wages 2017:
<http://www.oecd.org/tax/tax-policy/taxing-wages-20725124.htm>



Marginal Effective Tax Rates on labour income

- Taxing Wages models also can calculate METRs:
 - How much of the next dollar of labour income will be paid in taxes?
- METRs are affected by:
 - Income tax schedule – moving to a higher tax band will increase METRs on the next dollar of income
 - Reduction of tax credits or deductions: moving to a higher level of income may reduce the amount of assistance given by the State, increasing the cost of earning the next dollar
- METRs vs AETRs
 - METRs give an indication of incentives at the intensive margin; e.g. to work more hours or to increase incomes
 - AETRs give an indication of incentives at the extensive margin; e.g. to enter the workforce



EFFECTIVE TAX RATES ON INVESTMENT



Corporate effective tax rates

- Statutory corporate tax rate is only a starting point:
 - Simple, allows for quick comparisons across countries
 - Provides indication of the “headline” signal provided to investors
- However, it is very limited as a basis for analysis:
 - Does not take into account measures which reduce the tax base: depreciation, other ordinary or special deductions
 - Does not take into account tax incentives (tax allowances, tax credits) that may apply
 - Does not consider personal level taxation of corporate income
- More robust approach in understanding impact of tax on corporate decisions: calculate ETRs on corporate income

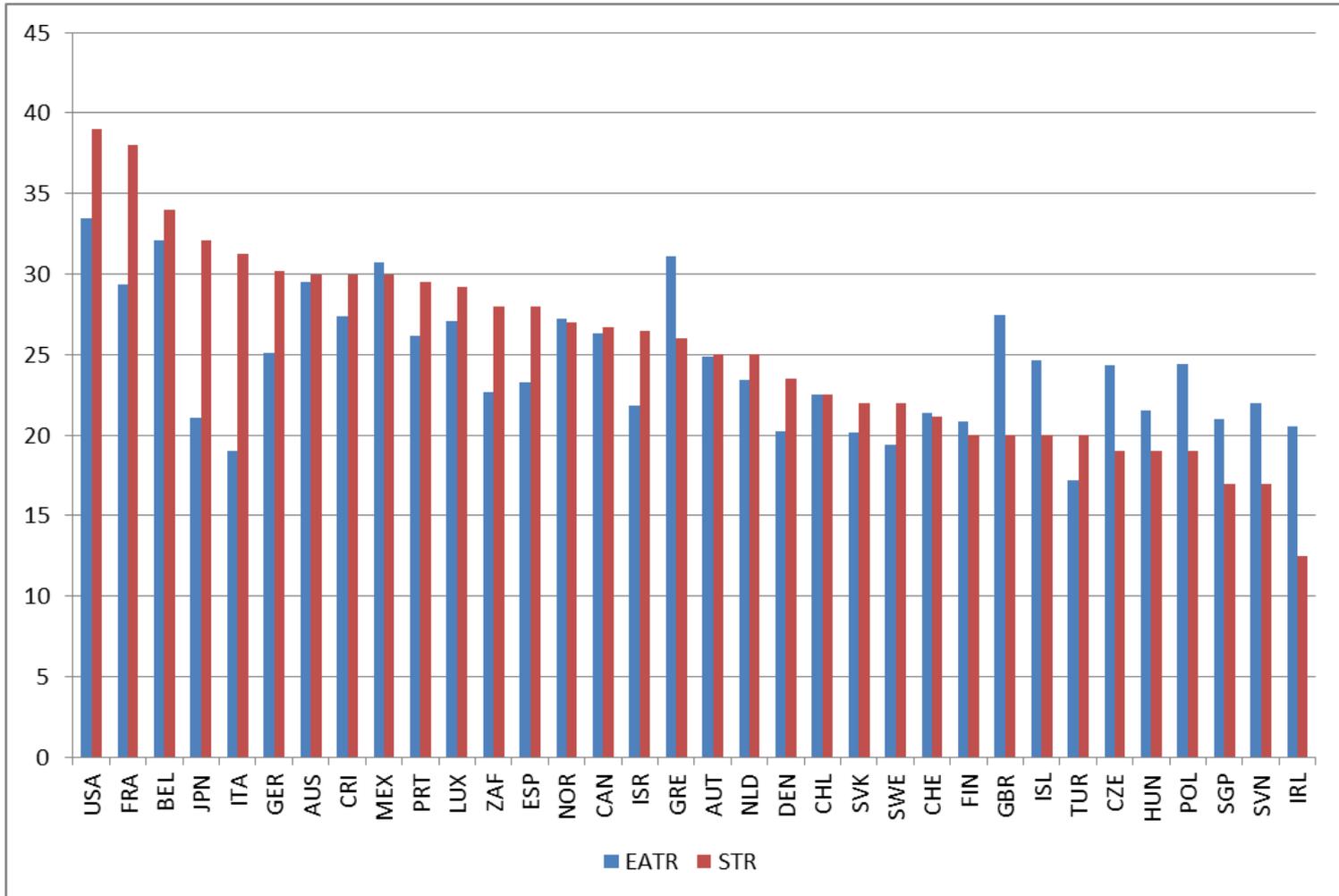


Forward-looking AETR on investment

- AETR: Captures the effect of tax rate and tax base provisions on a marginal investment
 - Takes into account tax depreciation and investment tax credits, tax treatment of interest, taxation of corporate income
 - Indicates incentives for decisions at extensive margin (location of investment, whether a project will be undertaken)
- Hanappi, T, 2017: *Corporate Effective Tax Rates* (OECD Tax Working Paper)
 - Follows approach in DEVEREUX and GRIFFITH (1998); computed for investments that earn an economic rent
 1. Defining a prospective investment project: rate of return, economic depreciation (project lifetime), economic parameters (inflation, real interest)
 2. Applying existing (or counterfactual) tax rules to calculate cash flows over the project lifetime
 3. Calculate effective taxation in terms of net present values (NPVs)



Statutory tax rates \neq AETRs





Conclusions

- Wide range of indicators are useful in tax policy, to understand impact of taxes on the economy, as well as decisions of individuals and corporations
- Macroeconomic indicators: (Tax-to-GDP ratio, ITRs, VRR)
 - Useful to illustrate the aggregate effect of tax policy changes
 - Limitations: identifying impact of tax policy on individuals and decisions
- Micro-indicators (ETRs on labour and corporate income)
 - Useful to explain the potential effect of taxes on economic behaviour
 - Linked to specific situations (advantage or drawback?) & can be difficult to interpret
- Using a range of indicators with complementary strengths is important in policy analysis



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