Tax Expenditures

Benchmarking & Measurement

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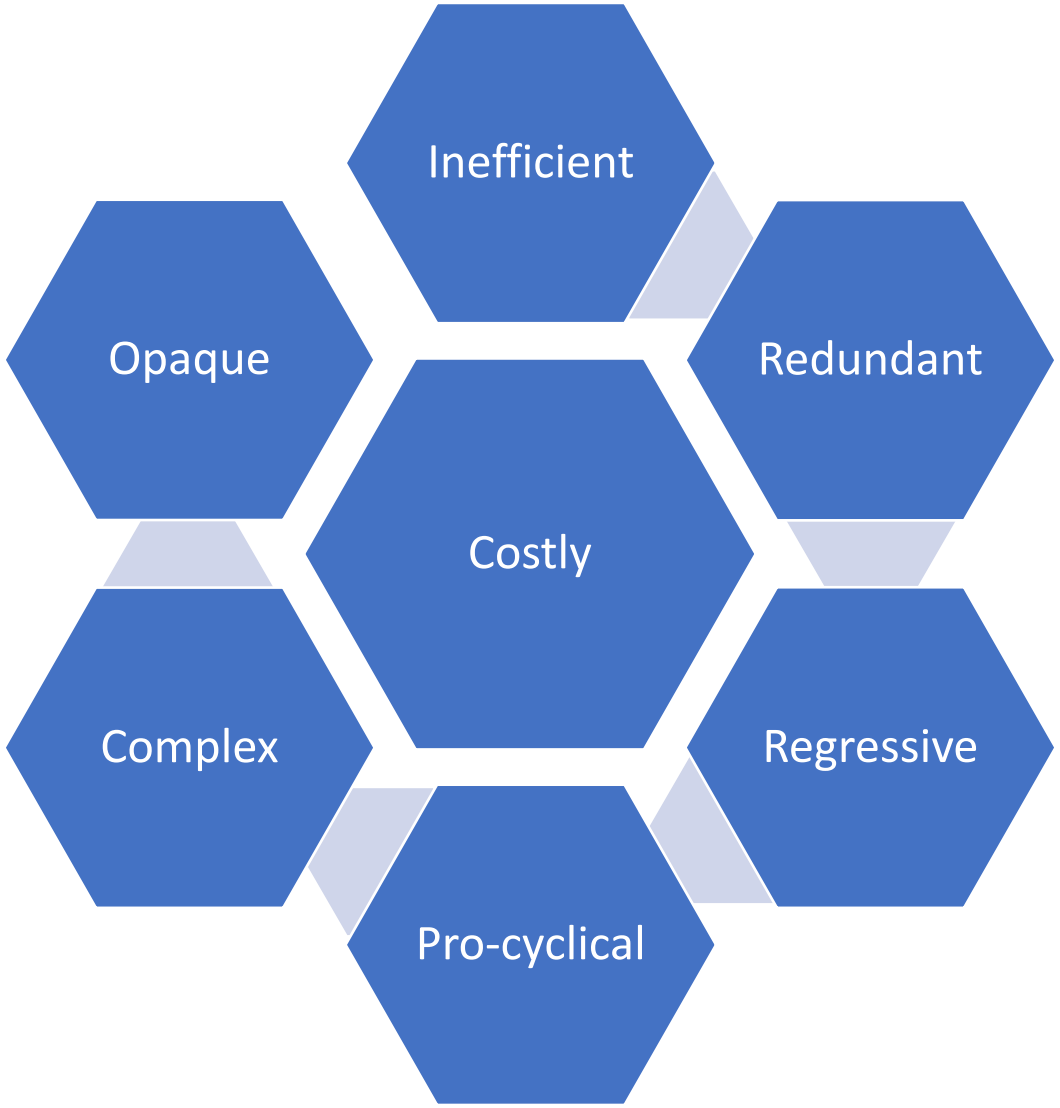
Macroeconomics, Trade & Investment

Outline

- Tax expenditures (TEs) are **costly**, particularly for developing countries
- Despite being costly, **Governance of TEs is weak** in low-income countries – many do not have MRE* framework
- MRE framework = Benchmarking & Measurement, Reporting, Cost-Benefit Analysis
- **MRE framework – key** to TE reform
- **Tax models are effective tools** to benchmark and measure tax expenditures
  - Microsimulation models
  - Macro models

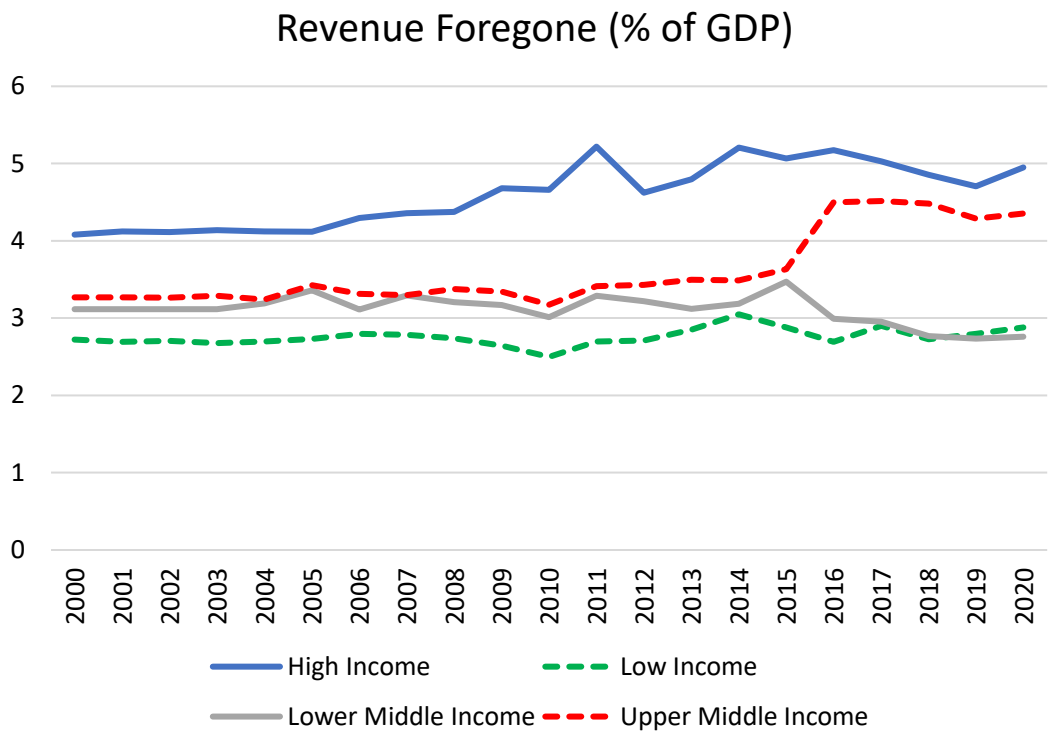
* MRE stands for Measurement, Reporting and Evaluation

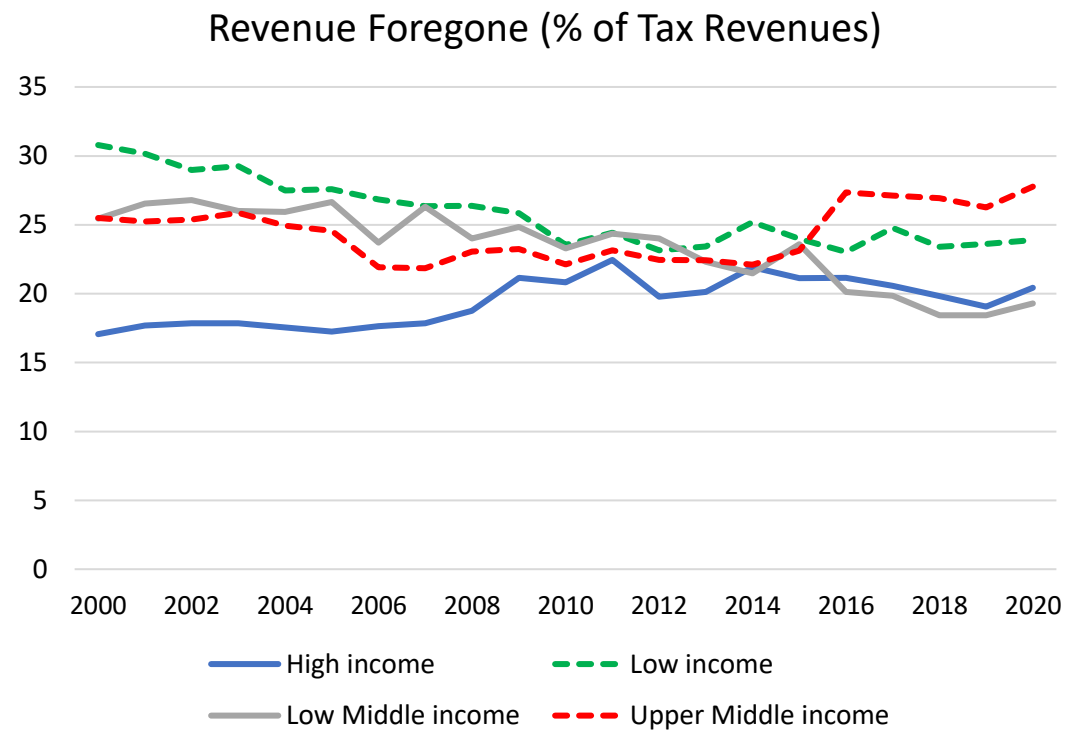
Tax expenditures are costly….



- Narrow base, higher rate
- Wasteful as may not be needed
- Favor the rich
- Significant fiscal cost
- Available when not needed
- Create tension between tax admin and taxpayers
- Not transparent

…particularly for developing countries

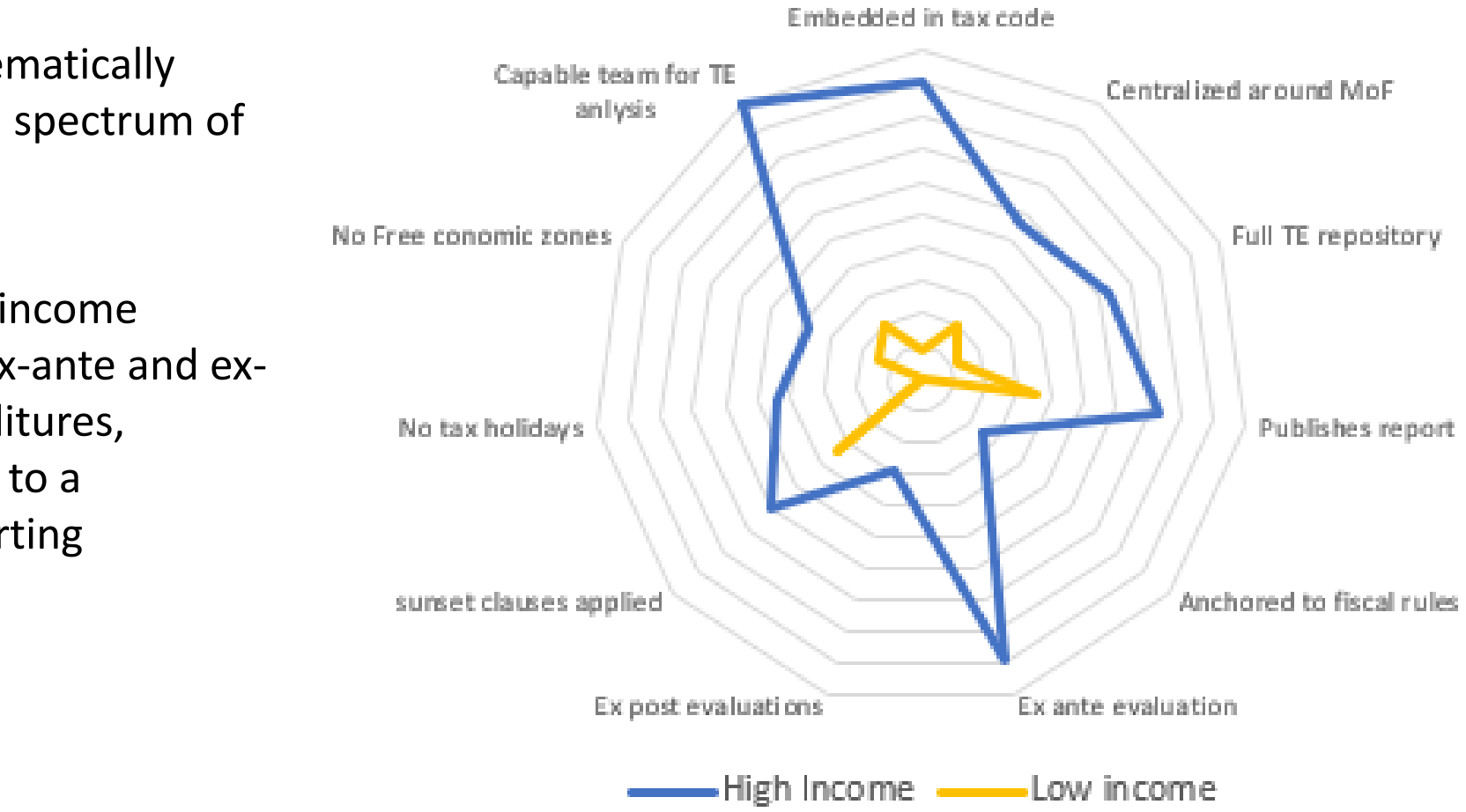




Source: GTED, World Bank calculations

Despite being costly, Governance is weak….

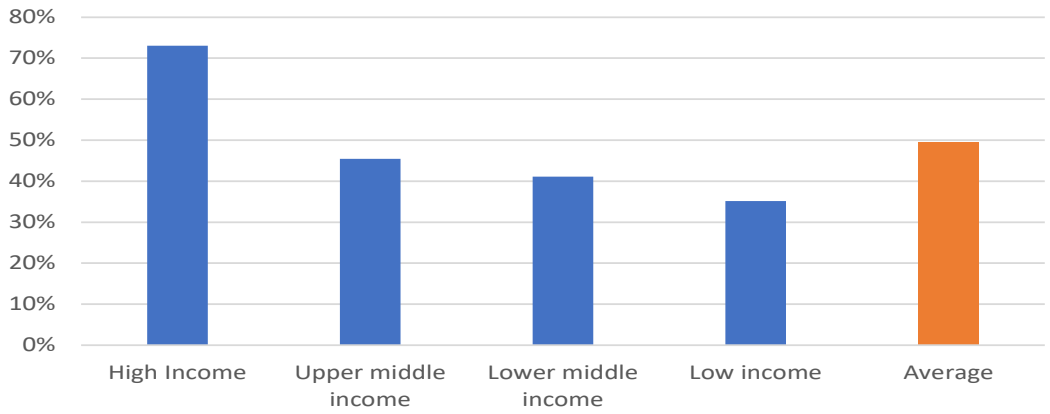
- Lower income countries systematically under-perform across the full spectrum of dimensions examined.
- For instance, capacity of low-income countries relatively weak in ex-ante and ex-post evaluation of tax expenditures, measurement with reference to a ‘benchmark’ policy, and reporting



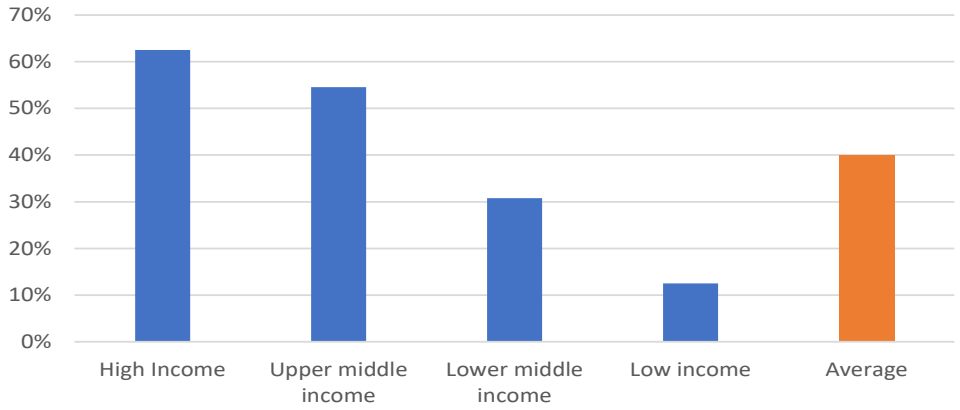
Source: World Bank Database

…. Many countries do not have a MRE framework

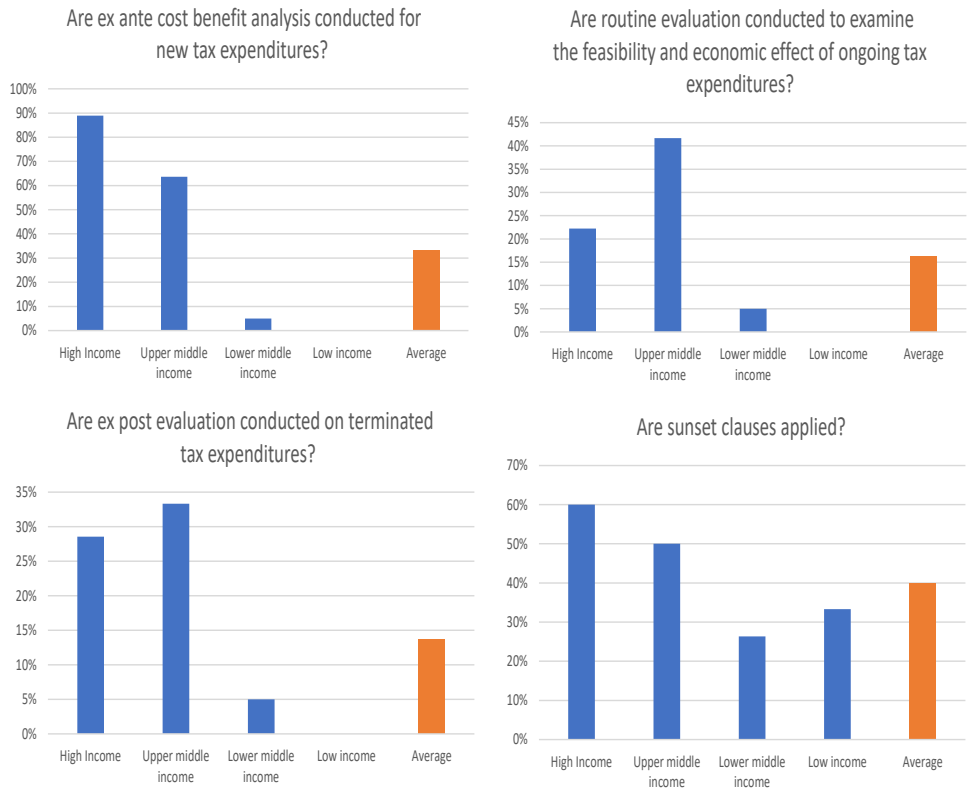
% Developing Countries Publishing Tax Expenditure Reports



Availability of full repository of tax expenditure accounts

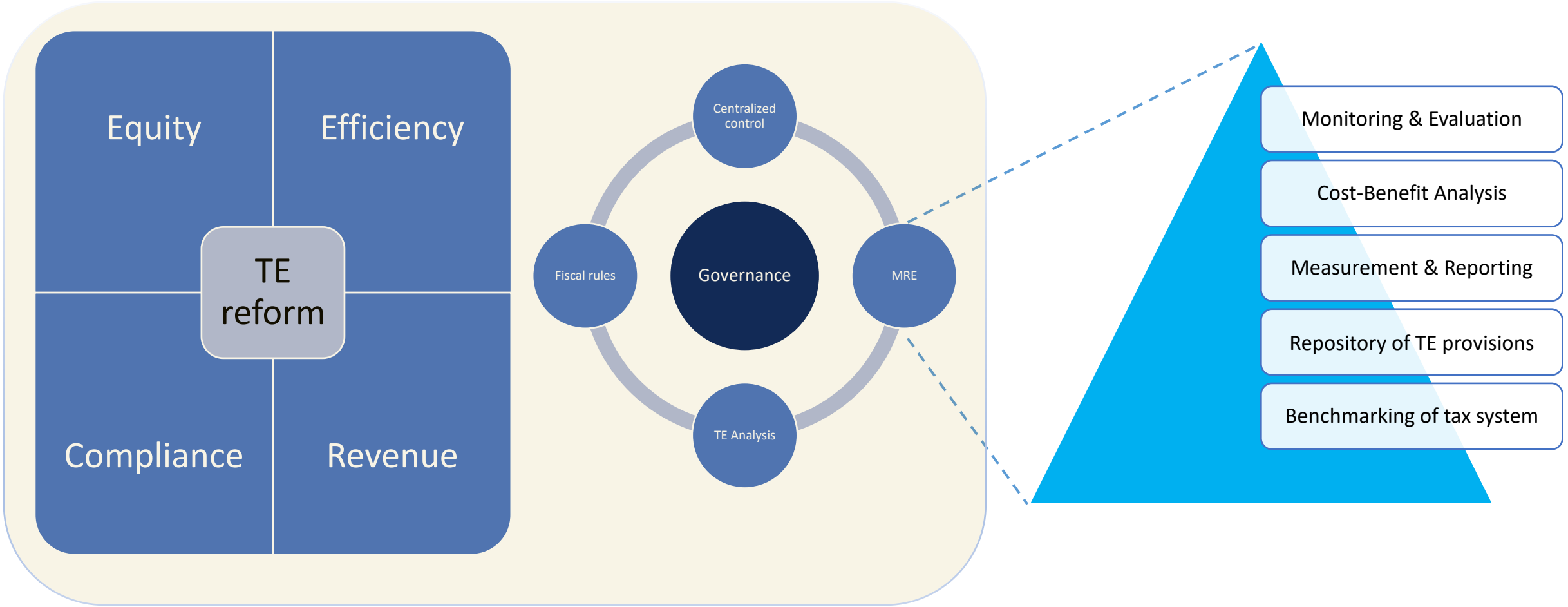


Availability of Evaluation Frameworks and Sunset Clauses



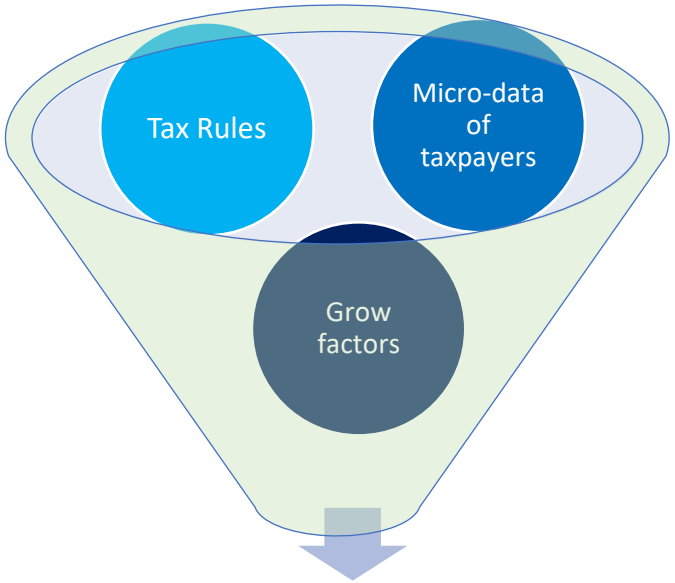
Source: World Bank Database

MRE framework is key to TE reform



Tax Models for Benchmarking & Measurement

Microsimulation Model (PIT/CIT)



Revenue forecasting,
Distributional analysis,
TE analysis

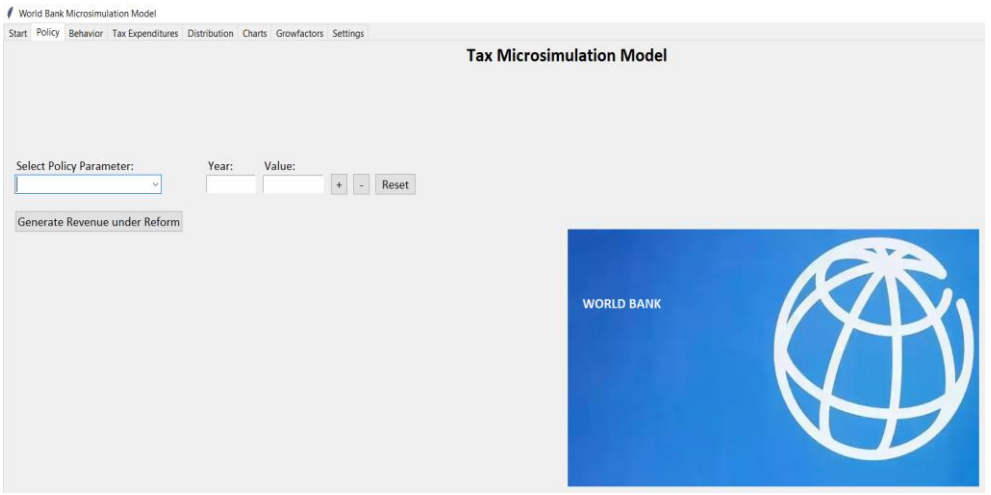
Macro Model (VAT)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
		Supply of products								Use of products									
		Valuation layers			Output					Intermediate Consumption				FCE			CF		
	Activities and components / Products	Trade and transport margins	Taxes on products	Subsidies on products	Primary Sector	Secondary Sector	Tertiary Sector	CIF/FOB adjustments on imports	Imports Goods and Services	Primary Sector	Secondary Sector	Tertiary Sector	Exports Goods and Services	FHCE	NPISHs	GFCE	Gross capital formation	Changes in inventories	TOTAL Supply = TOTAL Use
1	Primary	4	10	–3	87	195	–	–	98	6	262	37	14	68	–	2	2	–	391
2	Secondary	74	111	–5	2	1,900	56	–	284	33	769	228	428	572	–	3	361	28	2,422
3	Tertiary	–78	20	–	–	10	1,354	–10	84	8	216	324	69	361	16	363	23	–	1,380
4	CIF/FOB adjustment	–	–	–	–	–	–	10	–10	–	–	–	–	–	–	–	–	–	–
5	Direct purch. abroad by res.	–	–	–	–	–	–	–	43	–	–	–	–	43	–	–	–	–	43
6	Domestic purch. by non–res.	–	–	–	–	–	–	–	–	–	–	–	29	–29	–	–	–	–	–
7	Total	–	141	–8	89	2,105	1,410	–	499	47	1,247	589	540	1,015	16	368	386	28	4,236

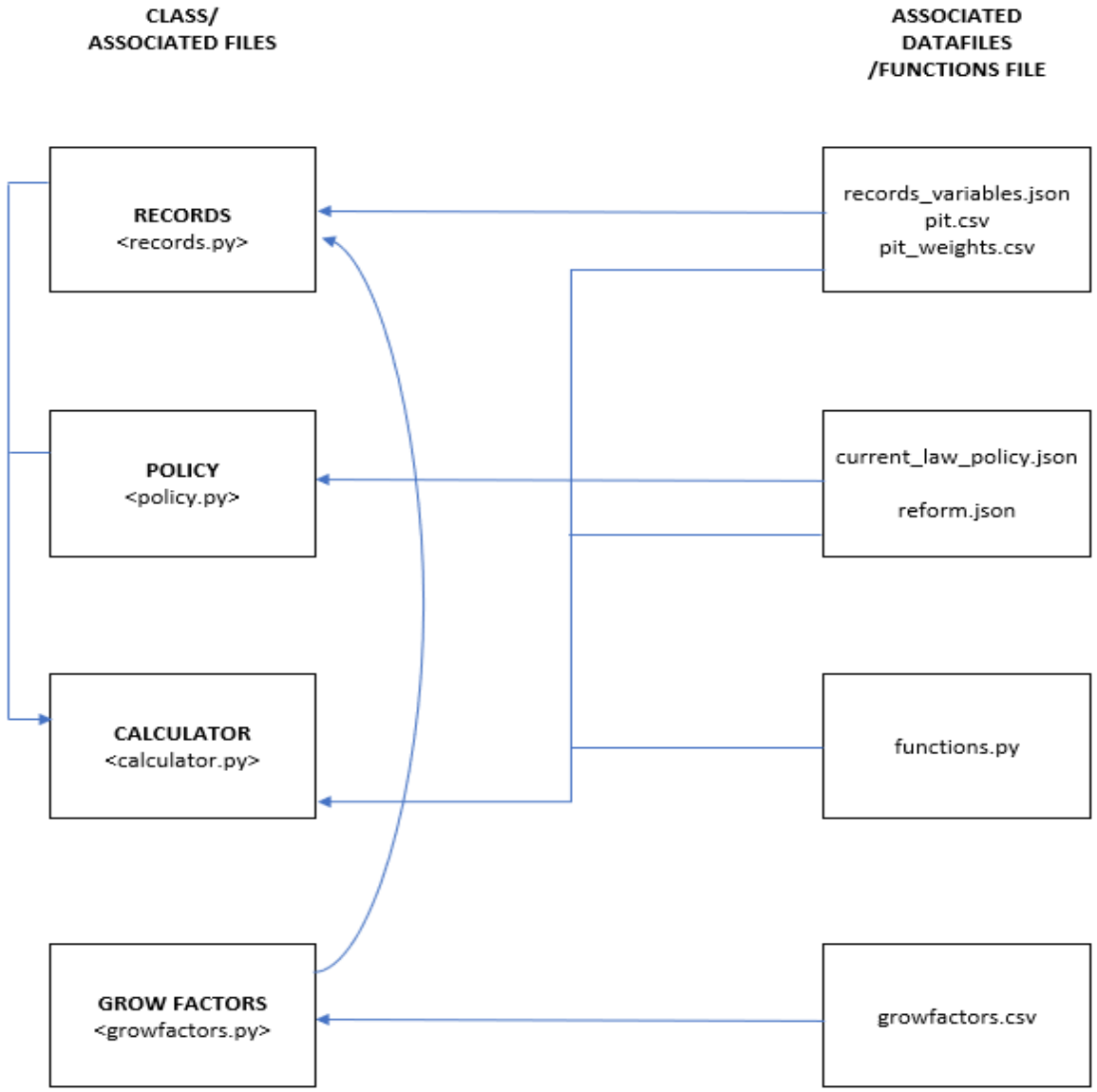
- Based on national accounts – Supply & Use Tables, Household survey data, Import data
- Use final consumption data, intermediate use data
- Provides aggregate TEs by sector

About World Bank Tax Micro Simulation Model

- Open-source model available on a collaborative platform www.github.com.
- Python-based
- Hosted on "World Bank Revenue Academy" (https://github.com/Revenue-Academy) – an online repository containing collection of analytical tools & models for tax policy analysis.
- Can be freely accessed & updated
- User-friendly GUI.
- Customizable for PIT, CIT & VAT
- User has full ownership – model runs in offline mode
- Customized for over 15 countries



Structure of the WB Tax Microsimulation Model



records_variables.json file defines all the variables from the tax return form aka the read variables as well as the calculated variables.
weights.csv file has the representative weights of the records of the tax filers.

current_law_policy.json file defines the current law policy variables which can be changed to simulate impact of policy changes.

functions.py file does all the tax calculations for each micro-unit in the data
function_name.json file contains names of all functions

growfactors.csv file contain the growth rates for read variables in the data file.
gdp_nominal.csv file contains nominal GDP for data year and future years to calculate tax as a % of GDP

WB Tax Microsim Model - Input files

- “pit_data_training.csv” file

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	id_n	Year	exempted_pit	income_wage_l	gross_i_w	income_add_l	income_supvr_l	income_officials_l	income_jury_l	income_manu_l	income_contract_l	income_agr_med_l	gross_i_l	income_prop_c	income_copyrights_c
2	175342	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
3	418030	2018	0	0	0	0	0	0	0	0	0	0	0	0	0
4	839935	2018	0	0	0	4444	0	0	0	0	0	0	4444	0	0
5	676536	2018	0	0	0	0	0	0	0	0	0	0	0	0	0

	A	B	P	Q	R	S	T	U	V	W	X	Y	Z
1	id_n	Year	income_dividends_c	income_interest_c	income_gamesch_c	income_other_c	gross_i_c	total_sources_of_i	total_gross_i	personal_allowance_w	ssc_w	deductions_income_prop_c	deductions_income_copyrights_c
2	175342	2018	0	0	5877	0	5877	1	5877	0	0	0	0
3	418030	2018	0	0	3092	0	3092	1	3092	0	0	0	0
4	839935	2018	0	0	0	0	0	1	4444	0	0	0	0
5	676536	2018	0	0	0	7219	7219	1	7219	0	0	0	0

	A	B	AA	AB	AC	AD	AE	AF	AG
1	id_n	Year	deductions_income_other_claimed_c	total_deductions	deductions_income_prop_c_rate	deductions_income_copyrights_c_rate	deductions_income_other_c_rate	exemption_income_gamesch_c	tax_base_income_salary_l
2	175342	2018	0	0	0	0	0	74.7	0
3	418030	2018	0	0	0	0	0	7.2	0
4	839935	2018	0	0	0	0	0	0	0
5	676536	2018	2527	2527	0	0	0.350048483	0	0

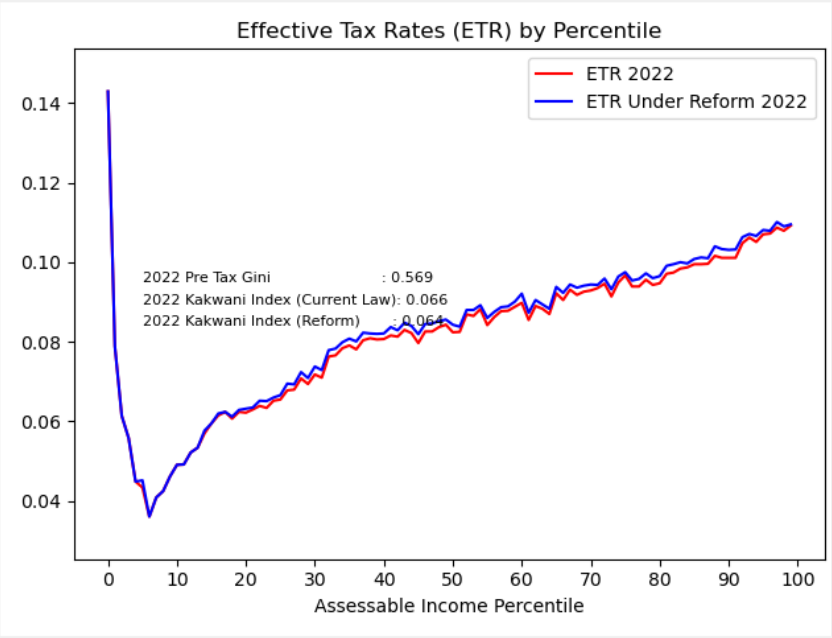
	A	B	AP	AQ	AR	AS	AT	AU	AV	AW
1	id_n	Year	tax_base_income_copyrights_c	tax_base_income_dividends_c	tax_base_income_interest_c	tax_base_income_gamesch_c	tax_base_income_other_c	total_taxbase_labour	total_taxbase_capital	taxbase_total
2	175342	2018	0	0	0	5130	0	0	5130	5130
3	418030	2018	0	0	0	3020	0	0	3020	3020
4	839935	2018	0	0	0	0	0	4440	0	4440
5	676536	2018	0	0	0	0	4690	0	4690	4690

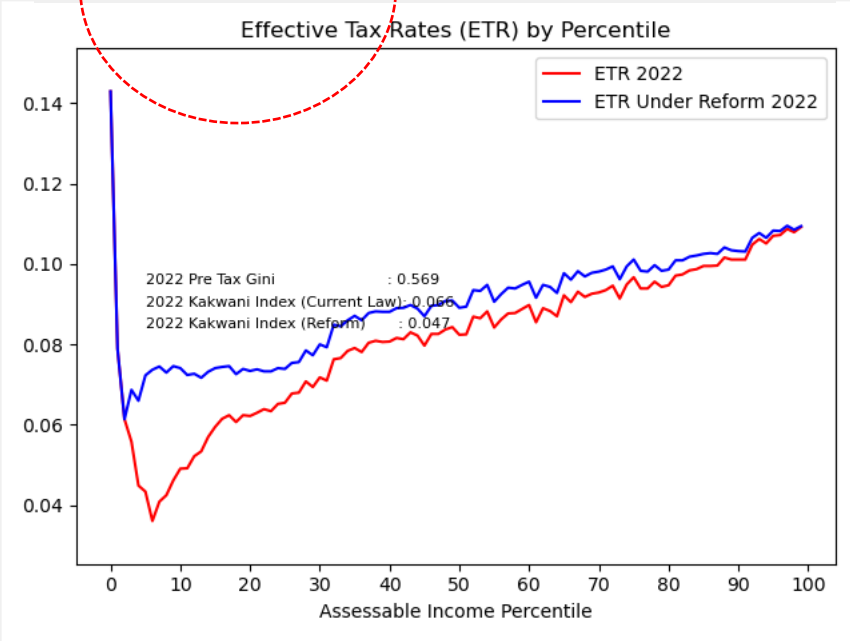
WB Tax Microsimulation Model - Benchmarking

Select Policy Parameter:	Year:	Value:
rate_income_artistic_photography_	2022	0
rate_income_copyrights_other_c	2022	0
rate_income_claimed_other_c	2022	0
rate_income_music_ballet_c	2022	0
rate_income_paintings_c	2022	0
rate_income_sculpture_c	2022	0

e.g. Personal Allowance as part of Benchmark or TE?

Select Policy Parameter:	Year:	Value:
rate_personal_allowance_w	2022	0





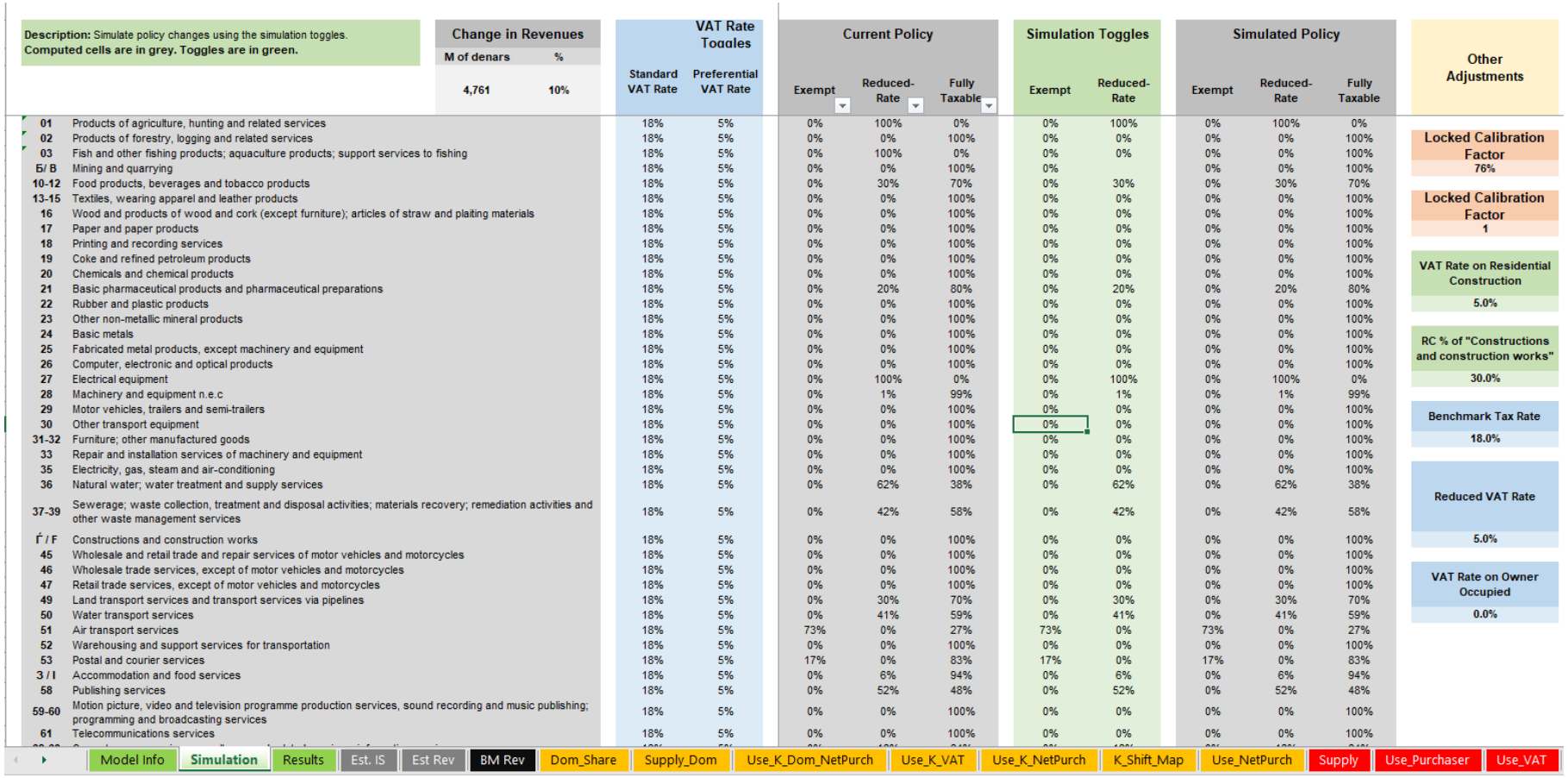

```
{
    "policy": {
    "_rate_personal_allowance_w": {"2018": [0.0]},
    "_rate_ded_income_agr_med_l": {"2018": [0.0]},
    "_rate_income_sculpture_c": {"2018": [0.0]},
    "_rate_income_artistic_photography_c": {"2018": [0.0]},
    "_rate_income_paintings_c": {"2018": [0.0]},
    "_rate_income_music_ballet_c": {"2018": [0.0]},
    "_rate_income_translations_lectures_c": {"2018": [0.0]},
    "_rate_income_stage_music_c": {"2018": [0.0]},
    "_rate_income_copyrights_other_c": {"2018": [0.0]},
    "_rate_income_claimed_other_c": {"2018": [0.0]}
    }
}
```


World Bank Microsimulation Model

	PIT Expenditure (billions)		
Tax Incentive	Current Law	Benchmark	Tax Expenditure
rate_personal_allowance_w	77.68	80.47	2.79
rate_ded_income_agr_med_l	77.68	78.88	1.20
rate_income_sculpture_c	77.68	77.69	0.01
rate_income_artistic_photography_c	77.68	78.02	0.35
rate_income_paintings_c	77.68	77.68	0.00
rate_income_music_ballet_c	77.68	77.89	0.22
rate_income_translations_lectures_c	77.68	77.68	0.00
rate_income_stage_music_c	77.68	77.68	0.00
rate_income_copyrights_other_c	77.68	77.68	0.00
rate_income_claimed_other_c	77.68	78.04	0.36

Macro Model – VAT Expenditure

- VAT expenditures can be estimated by sector using the SUTs
- Under benchmark policy, standard VAT rate is applied to sum of HH, NPISH, Govt final consumption (excluding imputed rent)
- Under Current policy, exemption and reduced rates, VAT on intermediate use is also considered
- Effect of exemption/ reduced rate can be measured by each sector



Description: Simulate policy changes using the simulation toggles.
Computed cells are in grey. Toggles are in green.

		Change in Revenues		VAT Rate Toggles		Current Policy			Simulation Toggles		Simulated Policy			Other Adjustments
		M of denars	%	Standard VAT Rate	Preferential VAT Rate	Exempt	Reduced-Rate	Fully Taxable	Exempt	Reduced-Rate	Exempt	Reduced-Rate	Fully Taxable	
		4,761	10%											
01	Products of agriculture, hunting and related services			18%	5%	0%	100%	0%	0%	100%	0%	100%	0%	Locked Calibration Factor
02	Products of forestry, logging and related services			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	76%
03	Fish and other fishing products; aquaculture products; support services to fishing			18%	5%	0%	100%	0%	0%	0%	0%	0%	100%	Locked Calibration Factor
B/ B	Mining and quarrying			18%	5%	0%	0%	100%	0%		0%	0%	100%	1
10-12	Food products, beverages and tobacco products			18%	5%	0%	30%	70%	0%	30%	0%	30%	70%	
13-15	Textiles, wearing apparel and leather products			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	VAT Rate on Residential Construction
16	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	5.0%
17	Paper and paper products			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
18	Printing and recording services			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	RC % of "Constructions and construction works"
19	Coke and refined petroleum products			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	30.0%
20	Chemicals and chemical products			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
21	Basic pharmaceutical products and pharmaceutical preparations			18%	5%	0%	20%	80%	0%	20%	0%	20%	80%	Benchmark Tax Rate
22	Rubber and plastic products			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	18.0%
23	Other non-metallic mineral products			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
24	Basic metals			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
25	Fabricated metal products, except machinery and equipment			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
26	Computer, electronic and optical products			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
27	Electrical equipment			18%	5%	0%	100%	0%	0%	100%	0%	100%	0%	
28	Machinery and equipment n.e.c			18%	5%	0%	1%	99%	0%	1%	0%	1%	99%	
29	Motor vehicles, trailers and semi-trailers			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
30	Other transport equipment			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
31-32	Furniture; other manufactured goods			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
33	Repair and installation services of machinery and equipment			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
35	Electricity, gas, steam and air-conditioning			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
36	Natural water; water treatment and supply services			18%	5%	0%	62%	38%	0%	62%	0%	62%	38%	
37-39	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services			18%	5%	0%	42%	58%	0%	42%	0%	42%	58%	
Ґ / F	Constructions and construction works			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
45	Wholesale and retail trade and repair services of motor vehicles and motorcycles			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
46	Wholesale trade services, except of motor vehicles and motorcycles			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
47	Retail trade services, except of motor vehicles and motorcycles			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
49	Land transport services and transport services via pipelines			18%	5%	0%	30%	70%	0%	30%	0%	30%	70%	
50	Water transport services			18%	5%	0%	41%	59%	0%	41%	0%	41%	59%	
51	Air transport services			18%	5%	73%	0%	27%	73%	0%	73%	0%	27%	
52	Warehousing and support services for transportation			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
53	Postal and courier services			18%	5%	17%	0%	83%	17%	0%	17%	0%	83%	
3 / I	Accommodation and food services			18%	5%	0%	6%	94%	0%	6%	0%	6%	94%	
58	Publishing services			18%	5%	0%	52%	48%	0%	52%	0%	52%	48%	
59-60	Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	
61	Telecommunications services			18%	5%	0%	0%	100%	0%	0%	0%	0%	100%	

Model Info | Simulation | Results | Est. IS | Est Rev | BM Rev | Dom_Share | Supply_Dom | Use_K_Dom_NetPurch | Use_K_VAT | Use_K_NetPurch | K_Shift_Map | Use_NetPurch | Supply | Use_Purchaser | Use_VAT

Limitations of Microsim & Macro Model

Microsimulation Model (PIT/CIT)

- Static estimates (unlike dynamic CGE)
- Data intensive
- Behavioral changes are challenging to estimate
- Only rule based tax expenditures which are non-discretionary can be modeled

Macro Model (VAT)

- Aggregation bias - weighted rate applied to each sector based on proportion of exempted, reduced rate and standard rate items
- Need to be combined with HH survey to get distributional impact
- Do not capture behavioral changes

Way forward

- TE reform
  - Strengthen MRE framework
  - Examine Stock and Flow of tax incentives
  - Streamline TE for better targeting
  - Adopt Minimum Alternate Tax

Thank you!

for questions, please contact rkumar40@worldbank.org