Practical Exercises – detailed explanation

1. Overview

In this practical exercise we are going to amend some of the parameters in the tax policies and then assess the effects of the changes on anticipated government tax revenues as well as poverty and inequality measures. There are two separate parts to this practical exercise:

- In the 'Labour income tax' policy, with a focus on the year 2020, increase the tax rate for tax band 5 ('Tax schedule, rate 5') from 25% to 27%; increase the tax rate for tax band 6 ('Tax schedule, rate 6') from 30% to 33%; and increase the tax rate for tax band 7 ('Tax schedule, rate 7') from 35% to 40%. How much extra tax revenue does this generate in 2020? What are the poverty and inequality measures under this reform scenario for 2020, and how do they compare with the equivalent figures from the standard 2020 system?
- In the 'Value Added Tax' policy, again with a focus on the year 2020, reduce the two VAT rates from 5% to 4%, and from 10% to 8%. For this task, we wish to examine the combined effects of the previous reform (to labour income tax) and this current reform to VAT. How much indirect tax revenue would be lost under these combined reform conditions in 2020 compared to the standard 2020 system? What are the poverty and inequality measures under this combined reform scenario for 2020, and how do they compare with the equivalent figures from the standard 2020?

2. Initial preparation steps

We start by making a copy of the entire folder containing **VNMOD v3.3** and calling it **VNMOD v3.3_taxreform**. We will use **VNMOD v3.3_taxreform** as the base model for this particular training exercise. Note that this 'training model' contains all system years from 2013-2022 inclusive (Figure 1).

For the purpose of this practical exercise, we will focus only on the 2020 system. To make it easier to navigate around the user interface, we can therefore move other systems into the 'Hidden Systems Box'. Performing this preparatory step means we will have space on the screen to focus on the existing 2020 system and the new reform scenarios we are going to implement. To move the earlier systems into the 'Hidden Systems Box', first right-click on the 2020 system header to bring up the menu list, then hover over the option to 'Move To Hidden Systems Box', and then choose 'All systems but selected'. This will just leave just the 2020 system visible. (Note that the hidden systems are still within the model, they are simply hidden from view.) Figure 2 shows the user interface once the earlier systems have been hidden. We can also now increase the width of the 2020 system so we can more easily see the contents.

10	Countr	ies Display	Country T	ools Admini	stration Tools	Add-Ons	Applications	Help & Info							
			5.3												
Run	Run	Old Vietnam													
ROMOD	EURON														
		loaded													
	Policy		Grp	No VN_2013	VN_2014	VN_2015	VN_2016	VN_2017	VN_2018	VN_2019	VN_2020	VN_2021	VN_2022	Comment	
		SetDefault_vr		n/a	n/a	n/a	n/a	n/a	n/a	n/a	on	n/a	n/a	DEF: Default values for switched-off policies	
		uprate_vn	mannal	on	on	on	on	on	00	on	on	on	on	DEF: UPRATING FACTORS	
														DEF: Recode negative incomes to	
		neg_vn		on	on	on	on	on	on	on	on	on	on	zero	
		lma_vn		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	DEF: COVID-19 transitions and shocks	
		ildef_std_v	1	on	on	on	on	on	on	on	on	on	on	DEF: STANDARD INCOME LIST	
		ildef_non_s	td_vn	on	on	on	on	on	on	on	on	on	on.	DEF: MODEL SPECIFIC INCOME LIST	
		ildef_stats_	vn	on	on	on	on	on	on	on	on	on	on	DEF: STATS PRESENTER INCOME LIST	
		ildef_exp_v	n	on	on	on	on	on	on	on	on	on	on	DEF: EXPENDITURE INCOME LISTS (COICOP)	
		tudef_vn		on	on	on	on	on	on	on	on	on	on	DEF: ASSESSMENT UNITS	
2		constdef_v		on	on	on	on	on	on	on	on	on	on	DEF: Constants	
		spl_vn		on	on	on	on	on	on	on	on	on	on	INC: Poverty lines	
2		spl01_vn		on	on	on	on	on	on	on	on	on	on	INC: Poverty designations	
3		ses_vn		on	on	on	on	on	on	on	on	on	on	INC: Equivalence scales	
4		tscer_vn		00	on	on	on	on	on	on	on	on	on	TAX: Employer social contributions	
5		tscee_vn		on	on	on	on	on	on	on	on	on	on	TAX: Employee social contributions	
6		tinkt_vn		on	on	on	on	on	on	on	on	on	on	TAX: Capital income tax	
7	+ 0	tinna_vn		00	on	on	on	on	on	on	on	on	on	TAX: Labour income tax	
9	. •	bed01_vn		n/a	n/a	n/a	on	on	on	on	on	on	on	BEN: Support of school expenses for the purchase of text books, notebooks and other school supplies to disabled pupil, orphan pupil, and pupil of poor HH	
9		bot01_vn		n/a	n/a	n/a	on	on	on	on	on	on	on	BEN: Electricity subsidy	
0		poa01_vn		on	on	on	on	on	on	on	on	on	on	BEN: Pension benefit for poor older people living without family support (Le. living without anyone of working age)	
1		bsacv01_vr		n/a	n/a	n/a	n/a	n/a	n/a	n/a	off	n/a	n/a	BEN: COVID response: Person-level financial relief package for poor and nearly poor households	
2		bsacv02_vr		n/a	n/a	n/a	n/a	n/a	n/a	n/a	off	n/a	n/a	BEN: COVID response policy for households with businesses and low business incomes	
3		tva_vn		00	on	on	on	on	on	on	on	on	on	TAX: Value Added Tax	
4		tex_vn		on	on	on	on	on	on	on	on	on	on	TAX: Excise Duties	
¢		vhhadi un		00	00	00	00	00	00	on	on	on	on	INC: Adjust consumption to new	
	WN													Textsiz	e:

Figure 1. The full 'training model'



	Countr	es Disolay Country	Tools Administ	ition Tools Add-Ons Applications Help & Info	
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Run	Run C		-		
RUHUU	DURCH	loaded			
-	Policy		No VN_2020	Comment	
				DEF: Default values for switched-off	
		SetDefault_vn	on	policies	
		uprate_vn	on	DEF: UPRATING FACTORS	
		neg_vn	on	DEF: Recode negative incomes to zero	
		lma_vn	n/a	DEF: COVID-19 transitions and shocks	
		ildef_std_vn	on	DEF: STANDARD INCOME LIST	
		ildef_non_std_vn	on	DEF: MODEL SPECIFIC INCOME LIST	
		ildef_stats_vn	on	DEF: STATS PRESENTER INCOME LIST	
		ildef_exp_vn	on	DEF: EXPENDITURE INCOME LISTS (COICOP)	
		tudef_vn	on	DEF: ASSESSMENT UNITS	
	+ 0	constdef_vn	on	DEF: Constants	
		spl_vn	on	INC: Poverty lines	
		spl01_vn	on	INC: Poverty designations	
	. 0	ses_vn	on	INC: Equivalence scales	
		tscer_vn	on	TAX: Employer social contributions	
		tscee_vn	on	TAX: Employee social contributions	
		tinkt_vn	on	TAX: Capital income tax	
	+ 0	tinna_vn	on	TAX: Labour income tax	
		bed01_vn	on	BBH: Support of school expenses for the purchase of text books, notebooks and other school supplies to disabled pupil, orphan pupil, and pupil of poor HH	
		bot01_vn	on	BEN: Electricity subsidy	
		poa01_vn	on	BBI: Pension benefit for poor older people living without family support (u.e. living without anyone of working age)	
		bsacv01_vn	off	BER: COVID response: Person-level financial relief package for poor and nearly poor households	Hidden Systems Box
				BER: COVID response policy for	VN_2014
		bsacv02_vn	off	households with businesses and low	VN_2015
				business incomes	VN_2016
		tva_vn	on	TAX: Value Added Tax	VN_2017
		tex_vn	on	TAX: Excise Duties	VN_2018
		vhhadi un	00	INC: Adjust consumption to new	VN_2019

Task 1: In the 'Labour income tax' policy, increase the rates of selected tax bands for the 2020 year.

Our first task requires us to increase the tax rates for certain tax bands in the 'labour income tax' policy. We will add a new reform scenario to the model to implement this change.

We begin by adding a new system to the model. As our reform scenario will focus on the effects of changing the tax rate in 2020, we will base our new reform scenario on the existing 2020 system (VN_2020).

To add a new 2020 reform scenario, we will copy the existing 2020 system and give the new reform scenario a suitable name. We right-click on the header for the existing 2020 system and we select '*Copy/Paste System*' and name this new system **VN_2020_reform01**. Figure 3 shows the user interface having added our new reform scenario.

2	Countr	nes Display I	Country Tools	Administ	ration Tools Add-Ons	Applications Help & Info	
	-		*				
m	Run		VN _				
CMOD	EURON						
	cource.	loaded		p	1		
	Policy		Grp/No	VN_2020	VN_2020_reform01	Comment	
		SetDefault_vn		on	on	DEF: Default values for switched-off policies	
		uprate_vn		on	on	DEF: UPRATING FACTORS	
		neg_vn		on	on	DEF: Recode negative incomes to zero	
		lma_vn		n/a	n/a	DEF: COVID-19 transitions and shocks	
		ildef std vn		on	on	DEF: STANDARD INCOME LIST	
		ildef_non_std_v		on	on	DEF: MODEL SPECIFIC INCOME LIST	
		ildef_stats_vn		on	on	DEF: STATS PRESENTER INCOME LIST	
		ildef_exp_vn		on	on	DEF: EXPENDITURE INCOME LISTS (COICOP)	
		tudef vn		on	on	DEF: ASSESSMENT UNITS	
		constdef_vn		on	on	DEF: Constants	
		spl_vn		on	on	INC: Poverty lines	
		spl01_vn		on	on	INC: Poverty designations	
		ses_vn		on	on	INC: Equivalence scales	
		tscer_vn		on	on	TAX: Employer social contributions	
		tscee_vn		on	on	TAX: Employee social contributions	
		tinkt_vn		on	on	TAX: Capital income tax	
		tinna_vn		on	on	TAX: Labour income tax	
		bed01_vn		on	on	BFIE Support of school expenses for the purchase of text books, motebooks and other school supples to disabled pupil, orphan pupil, and pupil of poor HH	
		bot01 vn		on	on	BEN: Electricity subsidy	
		poa01_vn		an	on	BER: Pension benefit for poor older people living without family support (i.e. living without anyone of working age)	
		bsacv01_vn		off	off	BEN: COVID response: Person-level financial relief package for poor and nearly poor households	Hidden Systems Box
		bsacv02_vn		off	off	BER: COVID response policy for households with businesses and low business incomes	VN_2014 VN_2015
		tva_vn		on	on	TAX: Value Added Tax	VN_2016
		tex_vn		on	on	TAX: Excise Duties	VN_2017
						INC: Adjust consumption to new	VN_2018
	N	vhhadi un	_	on	00		VN_2019

Figure 3. User interface showing original 2020 system and new 2020 reform system

We are now navigate to the labour income tax policy (**tinna_vn**) on the spine, and review the way that this policy is modelled (i.e. which functions and parameters are used).

It becomes evident, when reviewing the contents of this policy, that the tax schedule is implemented using a **SchedCalc** function (item 17.11 on the spine), but that the numeric values referenced in the **SchedCalc** are denoted through the use of constants. The **DefConst** function containing the income tax income thresholds and rates is located at position 17.1 on the spine.

For this exercise, we need to increase the tax rate for tax band 5 ('Tax schedule, rate 5') from 25% to 27%; increase the tax rate for tax band 6 ('Tax schedule, rate 6') from 30% to 33%; and increase the tax rate for tax band 7 ('Tax schedule, rate 7') from 35% to 40%. We then need to assess how much extra tax revenue this would generate in the 2020 calendar year. We also need to assess the effect on poverty and inequality for the 2020 year.

Figure 4 shows the configuration of the **DefConst** function once the edits have been made under the **VN_2020_reform01** system.

10	Undo hes	Display	Country	Tools Administra	ation Tools Add-Ons	Applications Help & Info	
		_	COOLINE		1000 1000		
-	-	*	*				
Run	Run Old	Vietnam	VN				
ROMOD				¥.			
		loaded		2			
	Policy		G	p/No VN_2020	VN_2020_reform01	Comment	
1	- fx (DefConst		on	on	Constants: Tax schedule	
.1.1		\$tinnatslt	01	5000#m	5000#m	Tax schedule, upper limit 1	
1.2		\$tinnatslt	02	10000#m	10000#m	Tax schedule, upper limit 2	
1.3		\$tinnatsit	03	18000#m	18000#m	Tax schedule, upper limit 3	
1.4		\$tnnatsit	04	32000#m	32000#m	Tax schedule, upper limit 4	
1.5		\$tnnatslt	05	52000#m	52000#m	Tax schedule, upper limit 5	
1.6		\$tinnatsit	06	80000#m	80000#m	Tax schedule, upper limit 6	
1.7		\$tinnatsrt	101	0.05	0.05	Tax schedule, rate 1	
1.8		\$tinnatsri	02	0.10	0.10	Tax schedule, rate 2	
1.9		\$tnnatsri	03	0.15	0.15	Tax schedule, rate 3	
1.10		\$tinnatsri	04	0.20	0.20	Tax schedule, rate 4	
1.11		\$tinnatsrt	05	0.25	0.27	Tax schedule, rate 5	
1.12		\$tinnatsri	06	0.30	0.33	Tax schedule, rate 6	
1.13		\$tinnatsri	07	0.35	0.40	Tax schedule, rate 7	
2	- fx (DefConst		on	on	Constants: Tax deduction	
2.1		\$tinta01		11000#m	11000#m	Base tax deduction	
2.2		\$tinta02		4900#m	4400#m	Additional tax deduction per depenent	
3	> fx l	DefConst		on	on	Constants: Initiate tax base	
4) fx t	BenCalc		on	on	Define tax base for labour income tax	
5) fir i	BenCalc		on	on	Base tax deduction	
.6) fx t	SenCalc		on	on	Additional tax deduction for dependents	
7	i fie i	SenCalc		on	on	Set dependent deduction to zero if the household member with the highest earnings is not a formal sector worker	
8	> fx /	withOp		on	on	Total tax deduction	
9	- fx /	withOp		on	on	Compute taxable income	
.9.1		Formula		/_tintb - tinta_s	il_tintb - tinta_s	Tax base minus total tax deduction	
.9.2		LowLim		0	0	May not be negative	
9.3		Output_V		tinty_s	tinty_s		
9.4		TAX_UNIT		tu_individu	tu_individual_vn		Hidden Systems Box
10	- fx 1	Big		on	00		VN_2013
10.1		Elig_Cond		ls_earns > 0 8.lfo=1	ils_earns > 0 & lfo=1	All people earning income	VN_2014 VN_2015
10.2		TAX_UNIT		tu_individu			VN_2016
11	- fx :	ichedCalc		on	on	Tax schedule for personal income tax	VN_2017
11.1	1001	Who_Mus	t	one	one		
						tinna_vn - DefConst	VN_2018

Figure 4. Reform applied to tax rates in labour income tax policy

Once we have implemented this change we can again run the model, in the same way as we did before in some previous tasks. Once the system has successfully run, we need to use the Statistics Presenter to generate the output. We wish to computer poverty and inequality measures on an income-basis (standard, not post-fiscal). The output from the Statistics Presenter is shown in Figure 5 (government revenue from taxes and expenditure on benefits), Figure 6 (poverty measures) and Figure 7 (inequality measures).

Figure 5. Statistics Presenter output on government revenue and expenditure

Southmod Statistics - Ba	seline/Reform				
Results for Viet Nam: vn_2020 vs vn_2020_re	orm01				
ax-ben policy Poverty Inequality				Export	Info
ax-benefit policy					
early, mill. national currency					
	vn_2020	un 2020 reform01	Difference		

		(base)	vn_2020_reform01	to base
•	Government revenue through taxes, SSC and indirect taxes	738,194.24	739,199.76	1,005.52
	direct taxes	34,557.06	35,562.58	1,005.52
	indirect taxes	138,289.74	138,289.74	0.00
	social security contributions (employer, employee and self-employed)	565,347.44	565,347.44	0.00
	Government expenditure on social transfers	283,080.70	283,080.70	0.00
	child benefits	7,103.74	7,103.74	0.00
	social assistance	18,103.56	18,103.56	0.00
	orphan/widow benefits	0.00	0.00	0.00
	disabled benefits	59,205.32	59,205.32	0.00
	unemployment benefits	1,513.36	1,513.36	0.00
	pension benefits	197,154.71	197,154.71	0.00

Figure 6. Statistics Presenter output on poverty levels

k-ben policy Poverty Inequality			
overty after taxes and transfers			
come based			
	vn_2020 (base)	vn_2020_reform01	Difference to base
Share of poor population, in %			
All	5.03	5.03	0.00
Poor households out of			000000
male headed households	5.68	5.68	0.00
female headed households	2.89	2.89	0.00
households with children	5.88	5.88	0.00
households with older persons	4.33	4.33	0.00
Poverty gap (average normalised poverty gap, FGT(1))			
All	2.05	2.05	0.00
Poor households out of			
male headed households	2.38	2.38	0.00
female headed households	1.00	1.00	0.00
households with children	2.42	2.42	0.00
households with older persons	1.71	1.71	0.00
Absolute national poverty line, in national currency, yearly:	10,734	10,734	0

As can be seen from Figure 6, increasing the tax rates of the specified tax bands in the labour income tax policy would have resulted in no change in the poverty rate during the 2020 calendar year.

Figure 7. Statistics Presenter output on inequality

Southmod Statistics - Base		orm	
Results for Viet Nam: vn_2020 vs vn_2020_reform	n01		
Tax-ben policy Poverty Inequality			
Inequality and the household income Income based	distributio	n after taxes a	and trans
	vn_2020 (base)	vn_2020_reform01	Difference to base
 Gini (household income) 	0.3591	0.3590	-0.0001
P80/P20	3.02	3.02	0.00
Quantiles of distribution and median			
20th	23,056.20	23,056.20	0.00
40th	36,840.00	36,840.00	0.00
50th	42,766.01	42,766.01	0.00
50th 60th	42,766.01 49,870.99	42,766.01 49,870.99	0.00

Absolute national poverty line, in national currency, yearly 10,734 10,734 0

As can be seen from Figure 7, increasing the tax rates of the specified tax bands in the labour income tax policy would have resulted in a very small reduction (-0.0001) in the Gini coefficient, from 0.3591 in VN_2020 to 0.3590 in VN_2020_reform01

Task 2: In the 'VAT' policy, decrease the tax rates from 5% to 4%, and from 10% to 8%, for the 2020 year.

Our second task requires us to lower the two tax rates in the VAT policy. We will add a new reform scenario to the model to implement this change. We will call our new system **VN_2020_reform02**.

We begin by adding a new system to the model. This time, we wish to examine whether the additional tax revenue generated in Task 1 above (i.e. increasing the labour income tax rates) can be used to facilitate a reduction in VAT rates. Therefore, this time, we will base our new reform scenario on the previous 2020 reform system, **VN_2020_reform01**.

To add a new 2020 reform scenario, we will copy the existing **VN_2020_reform01** system and give the new reform scenario the new name, **VN_2020_reform02**. Figure 20 shows the user interface having added our new reform scenario.

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1 0			Comment	VN 2020 reform02	VN_2020_reform01	a VN 2020	Grp/No	i i i i i i i i i i i i i i i i i i i	Policy	P	
Image: split in the split i			DEF: ASSESSMENT UNITS	on	on			tudef			
1 0			DEF: Constants	on	on		NAME IN CONTRACTOR				
i i			INC: Poverty lines	on	on	on		spl v		12	
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i b toose, vin on on on on TAC Employee social contributions i b takt_vin on on on on on on i b takt_vin on on on on on on i b takt_vin on on on on on on i b takt_vin on on on on on on on i b takt_vin on on on on on on on on i b dol0_twin on on <tdo< td=""><td></td><td></td><td>INC: Equivalence scales</td><td>on</td><td>on</td><td>on</td><td></td><td></td><td></td><td></td><td></td></tdo<>			INC: Equivalence scales	on	on	on					
> • • • • • • • • • • • • • • • • • •			TAX: Employer social contributions	on	on	on	vn	tscer			
\circ			TAX: Employee social contributions	on	on	on	vn	tscee			
Reference			TAX: Capital income tax	on	on	on	vn	tinkt			
i b bd01_vn on on on on bn			TAX: Labour income tax	00 -	on	on	vn	tinna			
1 0 000 j_vn 0<			the purchase of text books, notebooks and other school supplies to disabled pupil, orphan	an	on	on	_vn	bed01			
i • • • paol_vn i • • • a an peole living without family support (c.e. kring without anyone of manage peole living without anyone of nearly peor households i • • • bacv01_vn all off BERC CVID response: Person-level nearly peor households i • • • bacv01_vn all off BERC CVID response: Person-level nearly peor households i • • • bacv01_vn all off BERC CVID response: Person-level nearly peor households i • • • bacv01_vn all off BERC CVID response: Person-level nearly peor households i • • • bacv01_vn on on on on i • • • foelit on on on on i • • • foelit on on on on i • • • foelit on on on on on i • • • foelit on on on on on i • • • • foelit on on on on on on i • • • • • • • • • • • • • • • • • • •			BER: Electricity subsidy	on	on	on	_vn	bot01			
i biscv01_vn eff			people living without family support (i.e. living without anyone of	an	an	on	_vn	poa0			
* • • • bsecv02_vn eff off business incomes • • • tva_vn on on on on 1 * fit on on on on 1 * fit on on on on on 2 * fit on on on on on on 3 * fit on on on on on on 4 * fit on on on on on on * of text_vn on on on on on on * fit on on on on on on on * fit on on on on on on on * fit on on on on on on on * fit on on on on on on on * fit on on on on on on on * fit on on on on on On On * fit on on on on on Fit			financial relief package for poor and nearly poor households	off	off	off	01_vn	bsacu			
1 , fr Defil on on on on uts of items for which VAT rate is 5% 2 , fr ArithOp on on on on on calculate VAT rate is 5% 3 , fr Defil on on on on Calculate VAT rate is 15% 4 , fr ArithOp on on on on Uts of items for which VAT rate is 10% 4 , fr ArithOp on on on on Uts of items for which VAT rate is 10% 4 , fr ArithOp on on on on Uts of items for which VAT rate is 10% 4 , fr ArithOp on on on on Uts of items for which VAT rate is 10% 4 , fr ArithOp on on on On Edulate VAT rate is 10% 6 tex_vn on on on On Edulate VAT rate is 0% 6 text_vn on on on Edulate VAT rate is 0% Edulate VAT rate is 0% 6 text_vn on on on Edulate VAT rate on standord rate Edulate VAT rate is 0% </td <td></td> <td></td> <td>households with businesses and low</td> <td>off</td> <td>off</td> <td>off</td> <td>02_vn</td> <td>bsacy</td> <td>• •</td> <td></td> <td></td>			households with businesses and low	off	off	off	02_vn	bsacy	• •		
2 > jr Arthologo on on on Calculate total VAT paid on standard rate total VAT paid on standard rate total VAT paid on standard total total VAT paid on standard rate total VAT paid AT VAT paid AT VA			TAX: Value Added Tax	on	on	on	n	tva_v	- 0		
2 • Jr Artitycjo on on on rated filters by each household at 5% 3 • Jr Defin on on on uto of filters by each household at 5% 4 • Jr Artitycjo on on on Calculate VAT rate on standard rated (term by each household vat 5%) 6 • Itex_vn on on on Calculate VAT rate on standard rated (term by each household vat 5%) • Itex_vn on on on On TACkycles Dutles • Itex_vn on on On TACkycles Dutles • Itex_vn on on Machine Second water), terms • Itex_vn on on Machine Second water), terms • Itex_vs on on Machine Second water), terms • Itex_vn on on Machine Second water), terms			List of items for which VAT rate is 5%	on	on	on	1	fir De			1
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• • xhhadj_vn • • xhadj_vn • • on • • on	0.8	Hidden Sistems Box	TAX: Excise Duties	on	on	on	n	tex_v			
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VN_2017 VN_2018											

Figure 8. User interface showing original 2020 system, previous 2020 reform system, and new 2020 reform system

We now navigate to the VAT policy on the spine, and review the way that this policy is modelled (i.e. which functions and parameters are used).

We see there are four functions within the VAT policy (**tva_vn**), consisting of an **DefII** (i.e. define income list) and **ArithOp** (i.e. arithmetic operator) for each of the two VAT rates, 5% and 10%.

We see that the **Defil** function for the 5% VAT rate lists all the separate expenditure items (using their COICOP codes) and indicates that an item is subject to the 5% VAT rate using a 'plus' (+) sign.

Those items that are not subject to the 5% VAT rate are denoted by 'not applicable' (n/a). Using an income list here essentially adds up (sums) the household's expenditures across all items that are VAT-able at the 5% rate, and saves this aggregated household expenditure value in a variable called il_vat01. In the accompanying ArithOp for the 5% VAT items, we see that the household's aggregate expenditure on 5% VAT-able items is then multiplied by the constant **\$vat_r1**. This constant is not defined within the VAT policy, but rather we find it in the Constants policy towards the top of the user interface (line 10).

In order to implement the first part of this task, we need to find the constant **\$vat_r1** in the Constants policy, and change it from 0.05 to 0.04. Remember to only change the value in the VN_2020_reform02 system.

We then need to consider the 10% VAT rate. We should again review the contents of the VAT policy, to see that there are again two functions relating to this VAT rate: a **Defil** function and an **ArithOp** function. This time the income list sums the expenditures on items that are subject to the 10% VAT rate, and saves this aggregate income for each household. The **ArithOp** then multiples this by the relevant constant, which is also placed within the Constants policy. We need to change the value of this constant from 0.10 to 0.08, thereby reducing the VAT rate from 10% to 8%.

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0.1.1		\$tscer_f		0.215	0.215	0.215	SSNET contribution rate			
0.1.2		\$tscee_r		0.105	0.105	0.105	SSNIT contribution rate			
0.1.3		Spline_urban		1044#m	1044#m	1044#m	Poverty line for urban updated for pre/post-input dataset timepoint			
0.1.4		<pre>\$pline_rural</pre>		309 <i>4</i> m	809#m	809 <i>#</i> m	Poverty line for rural updated for pre/post-input dataset timepoint			
0.1.5		<pre>\$pline_urban_p f</pre>		993 ≄ m	993#m	993 ≠ m	Post-fiscal poverty line for urban areas			
0.1.6		spine_rural_pf		775≢m	775#m	775 <i>≢</i> m	Post-fiscal poverty line for rural areas			
0.1.7		\$pline_urban_u p		1964 <i>a</i> m	1964#m	1964#m	Upper poverty line for urban areas			
0.1.8		spline_rural_up		1473#m	1473 <i>≢</i> m	1473 <i>#</i> m	Upper poverty line for rural areas			
0.1.9		<pre>\$pline_urban_p f_up</pre>		1860#m	1860#m	1860 <i>#</i> m	Upper post-fiscal poverty line for urban areas			
0.1.10		<pre>\$pline_rural_pf _up</pre>		1403#m	1403#m	1403#m	Upper post-fiscal poverty line for rural areas			
0.1.11		<pre>\$pline_liv_std_ urban</pre>		1499.#m	1499#m	1499#m	Income threshold for Poor and Nearly Poor in urban areas			
0.1.12		<pre>\$pline_liv_std_r ural</pre>		1157#m	1157#m	1157#m	Income threshold for Poor and Nearly Poor in rural areas			
0.1.13		stinkt_ra		0.05	0.05	0.05	Tax rate on capital income			
0.1.14		\$vat_r1		0.05	0.05	0.04	VAT 5% rate (decrease to 4% in reform 2)			
10.1.15		\$vat_r2		0.10	0.10	0.08	VAT 10% rate (decrease to 8% in reform 2)			

Figure 9. User interface showing changes in the two VAT rates

We can then run the model to simulate the output of **VN_2020_reform02** system. Once the model has successfully run through to completion, we can use the Statistics Presenter.

Figure 10. Statistics Presenter output on government revenue and expenditure

Southmod Statistics - Baseline/Reform

Results for Viet Nam: vn_2020 vs vn_2020_reform02



Tax-benefit policy

Yearly, mill. national currency

		vn_2020 (base)	vn_2020_reform02	Difference to base
۲	Government revenue through taxes, SSC and indirect taxes	738,194.24	715,613.94	-22,580.31
	direct taxes	34,557.06	35,562.58	1,005.52
	indirect taxes	138,289.74	114,703.92	-23,585.82
	social security contributions (employer, employee and self-employed)	565,347.44	565,347.44	0.00
	Government expenditure on social transfers	283,080.70	283,080.70	0.00
	child benefits	7,103.74	7,103.74	0.00
	social assistance	18,103.56	18,103.56	0.00
	orphan/widow benefits	0.00	0.00	0.00
	disabled benefits	59,205.32	59,205.32	0.00
	unemployment benefits	1,513.36	1,513.36	0.00
	pension benefits	197,154.71	197,154.71	0.00

Figure 11. Statistics Presenter output on poverty



Þ	Share of poor population, in %			
	All	5.03	5.03	0.00
	Poor households out of			
	male headed households	5.68	5.68	0.00
	female headed households	2.89	2.89	0.00
	households with children	5.88	5.88	0.00
	households with older persons	4.33	4.33	0.00
	Poverty gap (average normalised poverty gap, FGT(1))			
	All	2.05	2.05	0.00
	Poor households out of			
	male headed households	2.38	2.38	0.00
	female headed households	1.00	1.00	0.00
	households with children	2.42	2.42	0.00
	households with older persons	1.71	1.71	0.00
	Absolute national poverty line, in national currency, yearly:	10,734	10,734	0

As can be seen from Figure 11, the adjustment of VAT and increasing the tax rates of the specified tax bands in the labour income tax policy would have resulted in no change in the poverty rate during the 2020 calendar year

Figure 12. Statistics Presenter output on inequality

Southmod Statistics - Baseline/Reform

Results for Viet Nam: vn_2020 vs vn_2020_reform02

Tax-ben policy Poverty



Inequality and the household income distribution after taxes and transfers, yearly

Income based

	vn_2020 (base)	vn_2020_reform02	Difference to base
 Gini (household income) 	0.3591	0.3590	-0.0001
P80/P20	3.02	3.02	0.00
Quantiles of distribution and median			
20th	23,056.20	23,056.20	0.00
40th	36,840.00	36,840.00	0.00
50th	42,766.01	42,766.01	0.00
60th	49,870.99	49,870.99	0.00
80th	69,559.98	69,559.98	0.00
Absolute national poverty line, in national currency, yearly	10,734	10,734	0

Such reforms would have resulted in a very small reduction (-0.0001) in the Gini coefficient, from 0.3591 in VN_2020 to 0.3590 in VN_2020_reform02