Taxes in GTAP

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GTAP and Global Modeling

- GTAP is the premier benchmarking dataset for global modeling
- International CGE models dependent on consistent data for cross-country comparisons and analysis
- Tax data a critical need in global modeling

Taxation in Global Models: Some Examples

- Analyzing global carbon trading systems: distribution and efficiency
- The social cost of agricultural subsidies
- Revenue neutral tariff reductions

Tax Issues in Global Climate Models

- EU has embarked on a system of tradable permits to reduce carbon emissions.
- Permits are mostly given out based on historic emissions.
- Potential efficiency gains from selling the permits and using revenue to lower other taxes.
- Babiker, Metcalf, and Reilly (2003) show that use of carbon revenues has large efficiency implications.

Social Cost of Agricultural Subsidies

- Subsidies to agriculture a source of concern in many countries
- Distorting taxes must be used to finance subsidies
- Social cost of subsidies are higher once these distortionary financing costs are taken into account

Reducing Trade Barriers

- Tariff reductions are often part of policy prescriptions to reduce trade barriers and stimulate economic activity
- Tariff revenue important for many countries to finance government programs
- Revenue neutral tariff reductions require increases in distortionary taxes
- Social costs of tariff reductions affected once distortionary tax policy taken into account

What GTAP Currently Does

- Excellent progress in GTAP6
- Broad coverage of many taxes
- Particular progress made on capital and labor factor taxes: rTO & rTF
- Good coverage for many countries

Taxes in GTAP ($ millions)					
		UK	USA	Uganda	
Private Consumption	domestic	16,456	26,953	-1	(VDPA-VDPM)
	imported	1,150	3,383	0	(VIPA-VIPM)
Government Consumption	domestic	0	0	0	(VDGA-VDGM)
	imported	0	0	0	(VIGA-VIPM)
Intermediate Consumption	domestic	23,468	-6,958	-1	(VDFA-VDFM)
	imported	5,457	-447	1	(VIFA-VIFM)
Output		58,834	-9,592	91	(OUTTAX or -OSEP)
Factor taxes	VFA - VOA	350,374	2,415,097	124	(VFA - VOA)
Exports		-264	-64	0	(VXWD-VXMD)
Imports		4,721	20,119	56	(VIMS-VIWS)
Total (NETAXES)		**460,196**	**2,448,490**	**270**	
IMF Taxes		**541,580**	**2,907,680**	**620**	
GTAP/IMF		85%	84%	44%	

Theory and GTAP
Factor Income Tax Rates

- GTAP reports taxes paid by firm (rTF) and taxes paid by individuals (rTO)
- Economic incidence not affected by statutory incidence

$$rT_{ACC} = \frac{VFA - VOA}{VFA} = \frac{rTF + rTO}{1 + rTF}$$

- Overall tax on factor income (rT_{ACC}) relevant for equity and efficiency analyses

Using IMF Data

- In previous work we show how to construct tax rates using IMF data
- Average tax rates as are GTAP tax rates
- Marginal tax rates could also be reported in GTAP

Some Comparisons

Consumption Tax Rates		
Country	IMF	GTAP
United States	6.2%	0.4%
United Kingdom	15.0%	1.4%
Uganda	5.2%	0.0%

Comparing Tax Rates Using OECD and GTAP6 Data A. Gurgel, G. Metcalf and J. Reilly, MIT Joint Program on the Science and Policy of Global Change Technical Note 7, May 2006.

Some Comparisons

Tax Rates on Capital Income				
Country	IMF	GTAP (ACC)	GTAP (rTF)	GTAP (rTO)
United Kingdom	44.6%	16.1%	4.0%	12.7%
United States	37.0%	8.4%	3.0%	5.7%
Uganda	5.8%	2.6%	0.1%	2.6%

Some Comparisons

Tax Rates on Labor Income				
Country	IMF	GTAP (ACC)	GTAP (rTF)	GTAP (rTO)
United Kingdom	29.7%	32.8%	18.0%	20.7%
United States	30.2%	33.7%	15.9%	23.2%
Uganda	7.9%	1.9%	0.1%	1.8%

Allocating Capital Income in Personal Income Tax to Capital Income: US

Adjusting Factor Taxes in the US		
	Labor	Capital
EPPA	30.2%	37.0%
GTAP6 (ACC)	33.7%	8.5%
Adj. GTAP6	25.8%	21.7%

Allocating Capital Income in Personal Income Tax to Capital Income: UK

Adjusting Factor Taxes in the UK		
	Labor	Capital
EPPA	29.7%	44.6%
GTAP6 (ACC)	32.8%	16.0%
Adj. GTAP6	25.8%	28.3%

Conclusions

- Tax data in GTAP key for important research areas
- GTAP has made excellent initial progress
- More work needed to allocate factor income taxes to appropriate factors
- More work needed on consumption taxes
- Improved tax coverage will enhance the value of GTAP dataset in a wide array of policy issues