11.M
Albania

Mark Horridge

Albania was grouped together with some other countries in the composite region called "Rest of the World" (XRW) in the GTAP 5 Data Base. The countries grouped in composite regions that those for which the GTAP project does not have national input-output tables. In 2000, the Commercial Law Development Program of the USAID provided funding to the Center for Global Trade Analysis to have Albania included as a separate region in the GTAP model of world trade. The Center sent Mark Horridge to Albania to construct an input-output table. Mark Horridge estimated an approximate I-O table for Albania, the first I-O table for many years.

This chapter documents the procedure followed in constructing an I-O table for Albania.[1] Although the reference year for the GTAP 5 Data Base is 1997, this was not a typical year since Albania experienced catastrophic economic and social disorder in 1997. Following local advice, the I-O table was estimated for the year 2000 as data for that year were more reliable and typical.

11.M.1 Methodology

Figure 11.M.1 shows a schematic input-output table. The cell "Intermediate demands" represents a 57x57 matrix showing the use of 57 commodities by 57 sectors. A typical entry [coal row, steel column] would show the value of coal used by the steel industry. The value would include both imported and locally-mined coal and would include the values of any indirect taxes levied on that flow.

Similarly, the cell "Final demands" represents a 57x4 matrix showing the use of 57 commodities by 4 final demanders. A typical entry [Footwear row, household column] would show the value of footwear (domestic plus imported, including tax, but excluding trade and transport margins) used by households.

Adding intermediate + final demands gives the total demand for goods. From this we can subtract imports (valued at tax-inclusive prices) to give the total demand for domestically-produced goods (in the final column).

The cell "Wages and profits" includes wages and the gross operating surplus of firms. The next cell "Tax on Domestic Products" shows tax on the *output* of the corresponding sectors. For instance, the entry [Tax, Cigarettes] would show the total of all indirect taxes levied on cigarettes. Taxes on *inputs* to cigarette production are already included in the intermediate demands values.

[1]Several Albanians were of assistance in compiling the I-O table, including: Adriana Civici, Pranvera Kastrati, and Eljone Konomi of the Ministry of Economy, and Godiva Rembeci and Gjergi Mano of the Institute of Statistics.

Figure 11.M.1 Schematic Input-Output Table

	57 Sectors	Final Demands: Households, Investment, Government, Exports	Total Demand for goods	*Less* (CIF Imports + Tax on Imports)	Demand for domestic goods
57 Commo-dities	Intermediate demands	Final demands for goods and services	Intermediate + final demands	VAT, excise, and import duties	Total less imports
Primary Factors	Wages and profits				
Tax on Domestic Products	VAT, excise, and production taxes				
Total Cost	Value of local production				

Adding together all costs of local industries [Intermediate demands, Wages and profits, Tax on Domestic Products] gives the value of local production. In a "balanced" input-output table, this should be equal, for each sector, to the final column "Demand for domestic goods". The "balance" condition can also be expressed in aggregate terms using the GDP identity:

GDP expenditure = Final demands for goods and services - CIF Imports
= GDP income = Wages and profits + Tax on Domestic Products + Tax on Imports

Our approach in estimating the Albanian input-output table was:

— obtained estimates from Albanian authorities of the column sums for each column in the I-O table;

— distributed the column sums between cells in each row using the input-output proportions from similar nations, and (for export and import columns) using trade figures supplied by the Center for Global Trade Analysis;

— adjusted the input-output proportions to ensure that supply equals demand for each of the 57 sectors.

An important source of data was an input-output table from GTAP in the format of Figure 11.M.1 which combined together the economies of Greece, Turkey, and Portugal. We scaled the rows and columns of this composite I-O table so that it agreed with known features of the Albanian economy.

11.M.2 Macroeconomic Source Data

Albania does not produce national accounts data in the same way as other countries. Nevertheless some data are available. Table 11.M.1 shows figures from the Albanian Ministry of Finance publication, 2001 Fiscal Statistics of Government.

As seen in the Table 11.M.1, Albania imports far than she exports. To pay for this, many Albanians working in EU countries send money home. Foreign aid is another source of income. Table 11.M.1 also suggests that in 2000, investment and household consumption accounted for 112% of GDP. The ratio of consumption to investment is harder to estimate. The IMF team [Table A1, IMF Staff Country Report No. 00/87, July 2000, Albania: Statistical Appendix] estimated that investment [in 1999] was 16% of GDP. We adopted this figure. This gave the control totals reported in Table 11.M.2 for our 2000 Albanian I-O table.

Table 11.M.1 Macroeconomic Summary

		1997	1998	1999	2000
Table 1.0	GDP, million lek current prices	341716	460631	506205	539210
	Lek/USD exchange rate	148.9	150.6	137.7	143.7
	GDP, million USD current prices	2294.9	3058.6	3676.1	3752.3
	Exports, million USD	159	208	275	256
	Imports, million USD	694	812	938	1070
	X-M, million USD	-535	-604	-663	-814
	[X-M]/GDP	-0.2331	-0.1975	-0.1804	-0.2169
	X/GDP	0.0693	0.0680	0.0748	0.0682
	M/GDP	0.3024	0.2655	0.2552	0.2852
Table 1.1	VAT and turnover tax, million lek current prices	15656	28769	29794	38121
	Excise Tax, million lek current prices	2168	4910	6961	9153
	Customs Duties, million lek current prices	8958	12615	11450	13548
	Total Indirect tax, million lek current prices	26782	46294	48205	60822
	Total Indirect tax/GDP	0.0784	0.1005	0.0952	0.1128
	Personnel costs, million lek current prices	25543	28336	31183	33240
	Operational and maintenance, million lek current prices	13535	18540	20072	19299
	Total current expenditure goods and services	39078	46876	51255	52539
	Total current expenditure/GDP	0.1144	0.1018	0.1013	0.0974
	[G+X-M]/GDP	-0.1188	-0.0957	-0.0791	-0.1195
	[C+I]/GDP	1.1188	1.0957	1.0791	1.1195

Table 11.M.2 Macroeconomic Control Totals

GDP	Million USD	3752.3
GDP	Million lek	539210
Expenditure Shares:	Investment	0.168
	Households	0.952
	Government	0.097
	Exports	0.068
	Less Imports	-0.285
	Total	1.000
Income Shares	Indirect Taxes	0.1128
	Factor Income	0.8872

11.M.3 Estimating the Size of Local Sectors

The previous section describes how we estimated the total size of Albanian value-added. To distribute it between sectors, we started from 2000 sectoral shares supplied by Ms. Godiva Rembeci of the Institute of Statistics. The shares (in the left-hand column of Table 11.M.3) incorporate estimates of the size of informal or un-recorded economic activity.

Table 11.M.3 Broad Sectoral Shares in Value-Added

Local Sectors	Rembeci Shares*	Modified Shares	Ratio	GTAP sectors
1 AgricForest	16.90	16.28	0.96	pdr, wht, gro, v_f, osd, c_b, pfb, ocr, ctl, oap, rmk, wol, for
2 Fishing	0.14	0.14	0.96	fsh
3 EnergyMining	0.60	0.58	0.96	col, oil, gas
4 OtherMining	0.23	0.22	0.97	omn
5 FoodProds	2.11	3.05	1.44	cmt, omt, vol, mil, pcr, sgr, ofd, b_t
6 TCF	2.39	2.30	0.96	tex, wap, lea
7 WoodPaper	1.44	1.39	0.96	lum, ppp
8 RefinCoke	0.15	0.14	0.96	p_c
9 ChemRubPlast	0.44	0.42	0.96	crp
10 Nmetlminprds	1.23	1.19	0.96	nmm
11 BasFabMtlPrd	1.28	1.23	0.96	i_s, nfm, fmp
12 MachinEqp	0.25	0.43	1.73	mvh, otn, ele, ome, omf
13 ElecGasWater	2.24	2.16	0.96	ely, gdt, wtr
14 Construction	7.33	5.65	0.77	cns
15 TradeHotels	26.36	25.38	0.96	trd
16 Transport	7.92	7.63	0.96	otp, wtp, atp
17 PostComms	2.55	2.46	0.96	cmn
18 Finance	3.85	3.71	0.96	ofi, isr
19 RealEstatEtc	14.50	13.97	0.96	obs, dwe
20 PubEduHealth	6.37	10.05	1.58	osg
21 OthComPerSvc	1.71	1.65	0.96	ros
Total	100.00	100.00		

* Sectoral shares supplied by Ms. Godiva Rembici of the Institute of Statistics.

The final column in the Table 11.M.3 shows the mapping of the 57 GTAP sectors to the local Albanian sectors. We used shares in agricultural output from the IMF team [Table A7, IMF Staff Country Report No. 00/87, July 2000, Albania: Statistical Appendix] to split agriculture between the 13 corresponding agriculture sectors. These agriculture shares are shown in the first line of Table 11.M. 4. The *INSTAT 2000 Structural Survey of Economic Enterprises* gave suggestions for other splits in the Table 11.M.4. In other cases we followed the proportions of the composite Greece-Turkey-Portugal I-O table.

Table 11.M.4 Mapping between INSTAT and GTAP Sectors

INSTAT Sectors	GTAP Sectors	Sectoral Shares	INSTAT Sectors	GTAP Sectors	Sectoral Shares
AgricForest	v_f	0.454	WoodPaper	ppp	0.532
	osd	0.033		lum	0.468
	ocr	0.179	RefinCoke	p_c	1.000
	gro	0.012	ChemRubPlast	crp	1.000
	rmk	0.123	Nmethminprds	nmm	1.000
	c_b	0.002	BasFabMtlPrd	fmp	0.693
	for	0.065		i_s	0.183
	wol	0.002		nfm	0.123
	ctl	0.052	MachinEqp	ome	0.490
	pdr	0.000		omf	0.195
	wht	0.044		mvh	0.149
	pfb	0.000		ele	0.127
	oap	0.034		otn	0.040
Fishing	fsh	1.000	ElecGasWater	ely	0.892
EnergyMining	oil	0.873		wtr	0.107
	col	0.089		gdt	0.001
	gas	0.038	Construction	cns	1.000
OtherMining	omn	1.000	TradeHotels	trd	1.000
FoodProds	mil	0.744	Transport	otp	0.832
	pcr	0.001		atp	0.107
	ofd	0.143		wtp	0.062
	sgr	0.000	PostComms	cmm	1.000
	omt	0.039	Finance	ofi	0.814
	cmt	0.036		isr	0.186
	b_t	0.030	RealEstatEtc	obs	0.645
	vol	0.008		dwe	0.355
TCF	lea	0.469	PubEduHealth	osg	1.000
	wap	0.335	OthComPerSvc	ros	1.000
	tex	0.196			

11.M.5 Trade Data

To break down exports and imports by sector we used figures for merchandise trade from the trade data base of the Center for Global Trade Analysis. We allowed for only small amounts of services trade, distributed according to the pattern in the Greece-Turkey-Portugal I-O table. The resulting vectors of exports and imports were uniformly scaled to match the macroeconomic trade targets listed in Table 11.M.2.

11.M.6 Trial Balance and Adjustments

The next step was to create a trial I-O table by modifying the composite Greece-Turkey-Portugal I-O table as follows:

— We uniformly scaled each industry column in the composite I-O table so that industry value-added was consistent with the shares in Tables 11.M.3 and 11.M.4.

— We scaled household, government, and investment final demands columns to match the macroeconomic targets of Table 11.M.2.

— Export and import vectors in the composite I-O table were replaced by the vectors described in section 11.M.5.

The resulting table was not “balanced”: local supply was not equal to local demands. We resolved the imbalances in two ways:

— If necessary, by changing the size of local industries.

— Preferably, by altering the composition of intermediate and final demand.

Changing the Size of Local Industries

Examination of the initial supply-demand differences suggested some revisions of the shares shown in Tables 11.M.3 and 11.M.4. In particular, our macroeconomic targets for investment and government demands were in tension with the original Rembeci shares of national value-added for the government and capital goods industries. Also, the food processing sector seemed insufficiently large to absorb agricultural output. To address these problems, the Rembeci shares were adjusted as shown in the second column of Table 11.M.3. Table 11.M.4 incorporates similar adjustments.

Altering the Composition of Intermediate and Final Demand

Our preferred explanation of supply-demand differences in the trial table was that Albanian technology or tastes differed from those in Greece, Turkey or Portugal. For example, excess supply of dairy products would occur if Albanians ate more cheese or yogurt than Greeks, Turks or Portuguese. Therefore we:

— adjusted all usage of each commodity to equate supply with demand. This affected intermediate usage, thus altering industry costs (=outputs) for other sectors, so that imbalances were reduced but not eliminated. Therefore we again:

— adjusted all usage of each commodity to equate supply with demand. Once more imbalances were reduced but not quite eliminated. Therefore we finally:

— adjusted all household, investment and government usage of each commodity to equate supply with demand. This eliminated all imbalances.

— The above adjustments to household, investment and government usage caused the balanced I-O table to have slightly different aggregate final demand shares to the target shares shown in Table 11.M.2. Therefore we uniformly scaled household, investment and government demand vectors to add up to the target totals. This created more small imbalances.

— the steps above were repeated several times until no further adjustments were necessary. However, the repetitions only required very tiny adjustments.

11.M.7 Primary Factor Proportions

The GTAP model and data base distinguishes four primary factors – Unskilled Labor, Skilled Labor, Capital and Land. No Albanian data was gathered to split sectoral value-added between these four. For each sector, value-added was split into four following the proportions for that sector in the composite Greece-Turkey-Portugal I-O table.

11.M.8 Indirect Tax Data

The main indirect taxes are value-added taxes (VAT), excise taxes, and import tariffs. All three fall overwhelmingly on imports since local tax enforcement is quite weak. Excise taxes are collected nearly entirely from Beverages&Tobacco and from Petrochemicals. Table 11.M.5 reports estimates of indirect taxes for 2000. Apart from applying the shares in Table 11.M.5, no sector-specific taxation data was gathered. Sector-specific estimates of tariff rates are sourced from external data by the Center for Global Trade Analysis.

Table 11.M.5 Indirect Tax Estimates, 2000 (million lek)

Taxes	Tax Revenues			Tax Share
	Imported Commodities	Domestic Commodities	Total	
VAT and turnover tax	28013	10108	38121	0.63
Excise Tax	7500	1653	9153	0.15
Customs Duties	13548	0	13548	0.22
Total	49061	11761	60822	1.00
Share	0.81	0.19	1.00	

Source: Albanian Ministry of Finance publication, 2001 Fiscal Statistics of Government, Tables 3.2a&b, also discussions with taxation officials

For use in the GTAP Data Base, user-specific tax rates should be specified in the I-O tables; this is not needed for the I-O format of Figure 11.M.1. No information was gathered to identify user-specific tax rates. For domestic and imported use of each of the 57 GTAP commodities, we assumed:

— the same commodity tax rate for each intermediate user;

— a rather higher tax rate for households;

— lower tax rates for investment and government users; and

— a very low tax rate for exports.

11.M.9 User-Specific Import Shares

Import use by sector should be specified in the I-O table for use in the GTAP Data Base; this is not needed for the I-O format of Figure 11.M.1. For each of the 57 GTAP commodities, we assumed:

- the same import-dependence for each intermediate user;
- a rather lower import-dependence for households and government;
- a rather higher import-dependence for investment; and
- exports were assumed to be wholly locally-produced.

11.M.10 Reliability of the Estimated Table

The estimated table[2] reflects the strong dependence of Albania on imports, and of the revenue on import taxation. It also reflects the approximate sectoral composition of the Albanian economy. The composition of exports and imports is drawn from the Center's data on international trade flows.

In practice, users of the GTAP Data Base and model usually aggregate sectors before conducting simulations – otherwise the model is too large to run easily. With the version of the GTAP Data Base that includes Albania, users who have an Albanian focus would be well advised to follow the sectoral aggregation in Table 11.M.3. That would avoid relying on the more speculative shares of Table 11.M.4.

11.M.11 Priorities for Improvements

The following steps would have improved the estimation procedure. In order of priority, they are:

- more careful and detailed estimates of value-added by industry;
- supplementation of value-added estimates with estimates of output by industry;
- estimates of the composition of household demand;
- sector-specific estimates of indirect taxation burden; and
- perhaps, selective adjustment of a few input-output coefficients.

All these could be done fairly easily without the need for a complete I-O survey.

[2] The Albanian I-O table may be downloaded from: www.monash.edu.au/policy/archivep.htm. Search for "Albania" on the page. An archive which contains MS Excel files of both the estimated Albanian table [IOTABS.XLS] and the composite Greece-Turkey-Portugal I-O table [COMPOSIT.XLS] should be found.

References

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