Chapter 2

Data base summary: macro data

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The goal of this chapter is to provide an overview of the macroeconomic features of the data base. Accordingly, we present a breakdown of both the uses and the sources of GDP in each of the 30 GTAP regions. (The reader is referred to the glossary at the front of this document for a detailed explanation of the three letter country codes used by GTAP.)

2.1 Uses of GDP

Table 2.1 reports expenditures on private household consumption (C), investment (I) and government purchases of goods and services (G), along with *fob* exports (X) and *cif* imports (M) of merchandise and non-factor services. All figures are in millions of 1992 $US. The total is obtained as follows: GDP = C + I + G + X - M. Sources of these figures will be described in more detail in subsequent chapters. Suffice it to say that C, I and G come from the World Bank (chapter 17.2) while X and M are obtained by aggregation of reconciled bilateral trade data from the UN's COMTRADE data base (chapter XX).

Perusal of the totals in table 2.1 reveals the dominance of the multi-trillion dollar economies in the US, EU-12 and Japan. Combined, they represent XX% of world GDP. Table 2.2 takes this same information and puts it on a share-basis. This reveals a wide variation in the uses of GDP across regions. For example, the share of investment in regional GDP ranges from a low of 15.5% in the USA to a high of 45.3% in Singapore. The latter figure is indicative of generally high

investment rates in the East Asian economies. Thailand, Korea, Hong Kong, China, Japan and Malaysia all fall in the 30–40% range.

The figure on government expenditure is not a complete measure of the role of government activity in the economy, as this only captures the direct consumption of goods and services by the government sector. The production of services by government, as well as government transfers, is omitted from G. Nevertheless, government consumption absorbs a significant share of GDP in many economies. This figure is in excess of 20% in Canada, the EU-3, the Central European Associates and the Middle East and Africa. On the other hand, it is under 10% in Japan, Indonesia, the Philippines, Chile and the Rest of South America.

The share of trade in GDP exhibits the greatest variation of all across regions. This is by far the highest for Singapore, which acts as a hub for a great deal of trade in Southeast Asia. Thus a large share of the imports into Singapore is simply reexported to another destination. Hong Kong also plays this role, with much of China's trade passing through this region. However, as will be discussed in chapter XX, Hong Kong's reexports have been placed on a direct trade basis in the version 3 data set. However, even abstracting from reexports, trade represents a very large share of GDP in Hong Kong's economy, with imports totaling 81.8% of GDP. Malaysia, Taiwan and the Central America/Caribbean region also show very large trade shares. These regions are followed by the European countries in EU-3, EFTA and CEA, where trade represents about one-third of GDP. However, EU-12 (E_U) shows a much lower trade share — only 11%. This is due to the fact that intra-regional trade within the EU-12 has been combined with domestic sales (for more details, see chapter XX).

Finally, we turn to the share of private consumption in regional GDP. Low levels of government purchases combine with large trade deficits to fuel high consumption shares in the Caribbean and Central America as well as Hong Kong. Mexico, Argentina, the Rest of South America and the Rest of South Asia also show high private consumption shares, offset by low investment and government shares.

2.2 Sources of GDP

Table 2.3 displays the sources of GDP for each of the 30 GTAP regions. These include payments to labor (L), capital (K) and agricultural land (N), as well as indirect taxes (T). The sources of the basic labor-capital splits are the individual region input-output tables. In these source tables it is customary to identify payments to labor, with the residual of value added being assigned to capital, in the case of non-agricultural sectors. It is important to bear in mind that, in most cases, we have not been able to disentangle returns to self-employed labor from returns to capital, and so we have overstated the relative importance of the capital input in these economies. In the case of agricultural sectors, volatile factor returns and the presence of agricultural land have led us to adopt a different

approach (see chapter 12.1 below). Here, we rely on econometrically estimated cost functions to determine the average primary factor shares in value-added.

Scrutiny of table 2.4 shows that labor's share in GDP is highest in the high-income high-wage economies: Australia, New Zealand, Japan, Taiwan, Canada, USA, and Western Europe. The Central/Eastern European economies and the Former Soviet Union also show very high labor shares. The shares of agricultural land in GDP are a function of the estimated cost shares for each region, in combination with the overall share of agriculture in GDP. It is the latter that differs most strongly across economies in the GTAP data base. The large share of agriculture in the Indonesian, Chinese and South Asian economies translates into agricultural land shares in GDP of between 7 and 8%. Of course with the accumulation of labor and capital over time, we expect this share to diminish rapidly. This is indeed the case, as can be seen by inspecting the shares for wealthier economies in table 2.4. So for example the USA, although a major agricultural exporter, has an estimated share of farmland in GDP of only 0.3%.

The indirect tax shares reported in table 2.4 are heavily dependent, not only on the tax structure in each region, but also on the source IO table. In particular, some source tables have very poor coverage of indirect taxes, in which case this share in table 2.4 will be under-reported.

Bearing that in mind, it appears that Malaysia, Thailand and China all have very high rates of indirect taxation. Having discussed the shares associated with L, N, and T, capital shares may be viewed as a residual, which is obviously subject to significant errors. The lowest share for capital arises in China (27.7%) and the highest is in Mexico (58.1%).

Table 2.1 Expenditure on GDP (US $ million)

	C	I	G	X	M	Total
AUS	184898	58433	54915	51755	52810	297191
NZL	25370	6748	6753	12595	11492	39974
JPN	2090611	1129079	341521	393186	309481	3644916
KOR	164923	112606	33447	87249	90227	307998
IDN	76097	34888	12183	38193	33058	128304
MYS	29852	19901	7578	49154	41599	64886
PHL	39152	11084	5116	16302	18609	53045
SGP	20855	18953	4564	78458	80950	41879
THA	60925	43807	11130	41203	45689	111376
CHN	222469	123312	41120	100815	103287	384429
HKG	58050	26579	8291	46149	62559	76510
TWN	115234	47999	36216	95325	83316	211459
IDI	161923	52130	27099	25479	26663	239967
RAS	63895	15157	10840	16784	20335	86341
CAN	342027	106025	123590	144678	143990	572330
USA	3996885	923499	1050396	613456	640541	5943696
MEX	237782	68483	33202	61105	72718	327854
CAM	59136	14894	8576	33261	46877	68990
ARG	162382	34794	31696	14336	19757	223452
BRA	255420	78060	62115	41015	30213	406396
CHL	26653	9700	4018	13477	12344	41504
RSM	127780	31522	16187	39239	44949	169779
E_U	4275876	1423938	1341714	781561	788851	7034238
EU3	296220	108145	129869	177351	161065	550520
EFT	204483	80129	61224	138527	118853	365510
EA	119830	40774	46562	63183	68169	202180
FSU	339074	101179	94859	49364	50313	534162
MEA	329777	132618	127277	180125	204592	565205
SSA	203353	51257	53647	65942	73014	301186
ROW	220460	64605	33230	54087	67031	305352

C Private consumption
I Investment
G Government consumption
X Exports
M Imports

Table 2.2 Expenditure on GDP (per cent GDP)

	C	I	G	X	M	Total
AUS	62.2	19.7	18.5	17.4	17.8	100.0
NZL	63.5	16.9	16.9	31.5	28.7	100.0
JPN	57.4	31.0	9.4	10.8	8.5	100.0
KOR	53.5	36.6	10.9	28.3	29.3	100.0
IDN	59.3	27.2	9.5	29.8	25.8	100.0
MYS	46.0	30.7	11.7	75.8	64.1	100.0
PHL	73.8	20.9	9.6	30.7	35.1	100.0
SGP	49.8	45.3	10.9	187.3	193.3	100.0
THA	54.7	39.3	10.0	37.0	41.0	100.0
CHN	57.9	32.1	10.7	26.2	26.9	100.0
HKG	75.9	34.7	10.8	60.3	81.8	100.0
TWN	54.5	22.7	17.1	45.1	39.4	100.0
IDI	67.5	21.7	11.3	10.6	11.1	100.0
RAS	74.0	17.6	12.6	19.4	23.6	100.0
CAN	59.8	18.5	21.6	25.3	25.2	100.0
USA	67.2	15.5	17.7	10.3	10.8	100.0
MEX	72.5	20.9	10.1	18.6	22.2	100.0
CAM	85.7	21.6	12.4	48.2	67.9	100.0
ARG	72.7	15.6	14.2	6.4	8.8	100.0
BRA	62.9	19.2	15.3	10.1	7.4	100.0
CHL	64.2	23.4	9.7	32.5	29.7	100.0
RSM	75.3	18.6	9.5	23.1	26.5	100.0
E_U	60.8	20.2	19.1	11.1	11.2	100.0
EU3	53.8	19.6	23.6	32.2	29.3	100.0
EFT	55.9	21.9	16.8	37.9	32.5	100.0
EA	59.3	20.2	23.0	31.3	33.7	100.0
FSU	63.5	18.9	17.8	9.2	9.4	100.0
MEA	58.3	23.5	22.5	31.9	36.2	100.0
SSA	67.5	17.0	17.8	21.9	24.2	100.0
ROW	72.2	21.2	10.9	17.7	22.0	100.0

C Private consumption
I Investment
G Government consumption
X Exports
M Imports

Table 2.3 Sources of GDP (US $ million)

	L	K	N	T	Total
AUS	161575	104751	3352	27513	297191
NZL	21176	13613	706	4479	39974
JPN	1976130	1350910	27661	290215	3644916
KOR	133851	121861	15124	37162	307998
IDN	38168	69833	10550	9752	128304
MYS	14373	30951	2406	17156	64886
PHL	18467	22698	3129	8751	53045
SGP	19313	16776	262	5528	41879
THA	21086	62899	4910	22482	111376
CHN	159279	106519	27328	91303	384429
HKG	35813	39182	38	1476	76510
TWN	108220	76014	3590	23635	211459
IDI	113924	83596	17380	25067	239967
RAS	35607	29755	6900	14080	86341
CAN	310504	222897	3298	35631	572330
USA	3507427	1950513	15906	469850	5943697
MEX	92166	190573	7691	37423	327854
CAM	20326	32048	2657	13958	68990
ARG	104105	109005	6136	4205	223452
BRA	161211	196100	5079	44007	406396
CHL	12794	20766	786	7157	41504
RSM	53290	92460	5051	18977	169779
E_U	3853336	2833834	25146	321923	7034239
EU3	289569	181869	4048	75034	550520
EFT	197796	134430	1600	31685	365510
EA	115749	72933	7065	6433	202180
FSU	300068	178658	4494	50943	534162
MEA	200322	296531	3276	65076	565205
SSA	126951	132844	5915	35476	301186
ROW	103751	135233	12055	54313	305352

L Labor N Land

K Capital

T Indirect Taxes

Table 2.4 Sources of GDP (per cent GDP)

	L	K	N	T	Total
AUS	54.4	35.2	1.1	9.3	100.0
NZL	53.0	34.1	1.8	11.2	100.0
JPN	54.2	37.1	0.8	8.0	100.0
KOR	43.5	39.6	4.9	12.1	100.0
IDN	29.7	54.4	8.2	7.6	100.0
MYS	22.2	47.7	3.7	26.4	100.0
PHL	34.8	42.8	5.9	16.5	100.0
SGP	46.1	40.1	0.6	13.2	100.0
THA	18.9	56.5	4.4	20.2	100.0
CHN	41.4	27.7	7.1	23.8	100.0
HKG	46.8	51.2	0.0	1.9	100.0
TWN	51.2	35.9	1.7	11.2	100.0
IDI	47.5	34.8	7.2	10.4	100.0
RAS	41.2	34.5	8.0	16.3	100.0
CAN	54.3	38.9	0.6	6.2	100.0
USA	59.0	32.8	0.3	7.9	100.0
MEX	28.1	58.1	2.3	11.4	100.0
CAM	29.5	46.5	3.9	20.2	100.0
ARG	46.6	48.8	2.7	1.9	100.0
BRA	39.7	48.3	1.2	10.8	100.0
CHL	30.8	50.0	1.9	17.2	100.0
RSM	31.4	54.5	3.0	11.2	100.0
E_U	54.8	40.3	0.4	4.6	100.0
EU3	52.6	33.0	0.7	13.6	100.0
EFT	54.1	36.8	0.4	8.7	100.0
EA	57.3	36.1	3.5	3.2	100.0
FSU	56.2	33.4	0.8	9.5	100.0
MEA	35.4	52.5	0.6	11.5	100.0
SSA	42.2	44.1	2.0	11.8	100.0
ROW	34.0	44.3	3.9	17.8	100.0

L Labor
K Capital
N Land
T Indirect Taxes