Chapter 2

Data Base Summary: Macroeconomic Data

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This chapter provides an overview of the macroeconomic features of the data base. Specifically, a breakdown of both the uses and the sources of Gross Domestic Product (*GDP*), in value and percentage terms, in each of the 66 GTAP regions is given. (The reader is referred to the glossary at the front of this documentation for an 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 *f.o.b.* exports (X) and *c.i.f.* imports (M) of merchandise and non-factor services. All figures are in millions of 1997 U.S. dollars. The total is obtained as: $GDP = C + I + G + X - M$. The sources for these figures are described in more detail in subsequent chapters. Data on C, I, and G come from the World Bank and other sources (see chapter 18.A) while trade data are obtained by an aggregation of the reconciled bilateral trade data from the United Nation’s COMTRADE data base (see chapter 15.B).

The total GDP column in table 2.1 reveals the dominance of the multi-trillion dollar economies of the United States, the European Union, and Japan which together make up 70 percent of world GDP. The USA is the largest region representing 27.4 percent of world GDP. Similarly, the EU-15 member countries together comprise 27.5 percent of world GDP. Greater disaggregation of the

Southern Africa region in the data base has singled out some of the world's smallest economies. Malawi, Mozambique, and Zambia each comprise only around 0.01 percent of world GDP. The entire Sub-Saharan Africa region represents 1.2 percent of world GDP.

Table 2.2 takes this same information and puts it on a share-basis. The table 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 8.8 percent in Malawi to a high of 44.6 percent in Singapore. The latter figure is indicative of generally high investment rates in the East Asian economies. China, Hong Kong, Korea, Malaysia, Thailand, and Vietnam all have investment rates falling in the 33–44 percent range. The average share of investment to GDP in the world is 21.6 percent.

The figures on government consumption expenditure do not represent a complete measure of the role of government activity in the economy since they only capture 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 comprises a significant share of GDP in many economies. This figure is in excess of 20 percent in Scandinavian countries, the Middle East, the SACU region, as well as in the Rest of Southern Africa. On the other hand, it is under 10 percent in Japan, Indonesia, Bangladesh, Mexico, Venezuela, Argentina, Mozambique, Uganda, and the Rest of World.

The share of trade in GDP exhibits the greatest variation of all across regions. This share is by far the highest for Singapore, which acts as a hub for a large proportion of trade in Southeast Asia. Thus a large share of the imports into Singapore is simply re-exported to another destination. Hong Kong also plays this role, with much of China's trade passing through this region. However, as discussed in chapter 15.C, Hong Kong's re-exports have been placed on a direct trade basis for the GTAP 5 data base and re-export mark-ups were estimated based on recently released trade data at the 8-digit level. Trade also constitutes more than 50 percent of GDP in Malaysia, Philippines, the Central America/Caribbean region, Belgium, Ireland, Luxembourg, the Netherlands, Central Europe, and Botswana. On the other hand, trade comprises less than 15 percent of GDP in Japan, Bangladesh, India, USA, Peru, Argentina, Brazil, and Uganda. Global trade comprises 22.1 percent of global GDP.

Finally, we turn to private consumption, the largest component of regional GDP. On average, private consumption comprises 63.4 percent of global GDP. In Hongkong, the Philippines, Bangladesh, Rest of South Asia, the Central America/Caribbean region, Argentina, Rest of South America, Greece, Mozambique, Tanzania, and Uganda, low levels of government purchases combine with large trade deficits to fuel high consumption shares of at least three-fourths of GDP. In Uruguay, Malawi, and Zambia, the high private consumption shares are offset by low investment and government shares.

2.2 Sources of GDP

Table 2.3 reports the sources of GDP for each of the 66 GTAP regions. These include payments to labor (unskilled and skilled), capital, agricultural land, natural resources, as well as indirect taxes. The split between skilled and unskilled labor categories is described in chapter 18.D. The source of the basic labor-capital splits are the individual region input-output (*I-O*) tables. In these source I-O 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 18.C). Here, we rely on econometrically estimated cost functions to determine the average primary factor shares in value-added.

Table 2.4 reports the sources of GDP in percentage shares for each region. Of the different sources, labor (unskilled and skilled) payments comprise the largest share of GDP, averaging 51.6 percent globally. Total labor's share in GDP is typically high in the high-income, high-wage economies of Japan, Taiwan, Canada, USA, and Western Europe. The Central European economies and the FSU also show very high labor shares. Unskilled labor comprises a larger share of GDP relative to skilled labor in all regions. Payment shares exceed 35 percent of GDP in China, India, Canada, USA, Argentina, Central Europe, the FSU, North Africa, and Sub-Saharan Africa. Payment shares for skilled labor exceed 20 percent of GDP in Australia, Taiwan, USA, and Western Europe.

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 Indonesia, India, Sri Lanka, and the Rest of South Asia translates into agricultural land shares in GDP of between 8 and 11 percent. In other Asian economies like China, Malaysia, Philippines, Vietnam, and Bangladesh, agricultural land accounts for between 4 and 6 percent of GDP. Of course, with the accumulation of labor and capital over time, we expect this share to diminish rapidly. This is indeed the case, as evident from the shares for wealthier economies in table 2.4. For example, the USA, although a major agricultural exporter, has an estimated share of farmland in GDP of only 0.6 percent.

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 I-O table. In particular, some source tables have very poor coverage of indirect taxes, in which case the share in table 2.4 will be under-reported. The table shows that China, Vietnam, the Central America/Caribbean region, Uruguay, Rest of South America, and Portugal all have high rates of indirect taxation at more than 15 percent of GDP.

Having discussed the shares associated with labor, land, and indirect taxes, capital shares may be viewed as a residual, which is obviously subject to significant errors. The lowest share for capital arises in Portugal at 24.4 percent and the highest is in Thailand at 71.1 percent.

Table 2.1 Expenditure on GDP (1997 US$ million)

GTAP Regions	Private Consumption	Investment	Government Consumption	Exports	Imports	Total GDP
AUS	240439	86191	67339	71900	73028	392841
NZL	41338	12953	9899	17433	16543	65079
CHN	414093	309995	104350	241436	215181	854694
HKG	103586	61068	14746	54728	94134	139994
JPN	2532620	1222348	412528	506278	418249	4255524
KOR	237333	154885	49288	162516	158518	445503
TWN	172052	59415	41048	138444	111278	299681
IDN	133054	61078	14763	56930	56991	208834
MYS	44044	41912	10905	96878	87648	106090
PHL	59729	20111	10592	41549	53625	78356
SGP	39107	35614	9036	131559	135495	79822
THA	84475	54786	15776	71758	69016	157780
VNM	15469	7247	2203	9304	12346	21876
BGD	35002	8842	1833	5419	7136	43959
IND	258450	96297	46787	47345	48995	399884
LKA	10913	3676	1563	4844	5392	15603
XSA	53098	12007	8337	11402	14166	70677
CAN	370406	118283	124446	234889	216897	631127
USA	5495105	1398368	1202158	872641	1023076	7945196
MEX	262957	78742	33655	115312	101842	388824
XCM	79050	22432	11545	39770	58743	94054
COL	64848	16138	15647	15778	17851	94559
PER	43070	15880	7475	7883	9389	64920
VEN	58485	14798	5470	23621	18637	83737
XAP	19257	5134	3500	7306	7950	27247
ARG	254987	65327	10279	28870	33489	325974
BRA	508587	157446	145718	59201	81273	789680
CHL	50492	19387	7689	19834	21255	76147
URY	14748	2392	2728	4210	5018	19059
XSM	7990	2535	1305	4516	5741	10605
AUT	115853	49375	39197	76182	83432	197174
BEL	153784	44777	35001	170534	172960	231135
DNK	86349	27477	42909	60629	52769	164595
FIN	63420	20200	25048	45495	37394	116769
FRA	834166	238522	269443	351405	319732	1373803
DEU	1205839	417287	407688	557949	527364	2061399

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Table 2.1 Expenditure on GDP (1997 US$ million) (Contd)

GTAP Regions	Private Consumption	Investment	Government Consumption	Exports	Imports	Total GDP
GBR	847541	219639	241148	338774	359636	1287466
GRC	87056	24585	16536	18317	31440	115055
IRL	37970	13627	10253	51762	47005	66607
ITA	718485	190761	186960	291071	259383	1127895
LUX	6854	1996	1560	7467	7977	9899
NLD	215074	73024	49949	220999	199977	359069
PRT	65165	25600	18883	29601	40780	98469
ESP	329737	109480	85957	137925	142163	520936
SWE	120957	31178	58886	96775	80111	227684
CHE	149267	48599	37467	100245	86148	249430
XEF	77844	36860	32585	66288	49573	164003
HUN	28459	10086	4620	22870	25130	40905
POL	87076	28151	23962	33549	48193	124545
XCE	84781	30032	24738	65702	74473	130780
XSU	363177	123310	91927	147627	138832	587209
TUR	129188	50165	23278	43657	53915	192374
XME	274230	113437	131420	182596	180512	521171
MAR	23012	6935	6005	9185	10189	34947
XNF	113888	37746	21847	45196	47773	170904
BWA	1442	1338	1239	2950	2192	4777
XSC	82846	24350	29199	34861	32205	139051
MWI	2148	248	319	637	535	2817
MOZ	3217	642	320	427	964	3642
TZA	5920	1138	708	1119	2133	6752
ZMB	3123	514	443	1106	971	4214
ZWE	5273	2217	1434	2605	3276	8252
XSF	4406	3236	3470	7422	4901	13633
UGA	5507	1020	652	739	1084	6835
XSS	124257	23694	16289	41237	48892	156586
XRW	213017	50015	26177	40844	56379	273674
WORLD	18375112	6246548	4360125	6409301	6409295	28981782

Table 2.2 Expenditure on GDP (percent GDP)

GTAP Regions	Private Consumption	Investment	Government Consumption	Exports	Imports	Total GDP
AUS	61.2	21.9	17.1	18.3	18.6	100
NZL	63.5	19.9	15.2	26.8	25.4	100
CHN	48.4	36.3	12.2	28.2	25.2	100
HKG	74.0	43.6	10.5	39.1	67.2	100
JPN	59.5	28.7	9.7	11.9	9.8	100
KOR	53.3	34.8	11.1	36.5	35.6	100
TWN	57.4	19.8	13.7	46.2	37.1	100
IDN	63.7	29.2	7.1	27.3	27.3	100
MYS	41.5	39.5	10.3	91.3	82.6	100
PHL	76.2	25.7	13.5	53.0	68.4	100
SGP	49.0	44.6	11.3	164.8	169.7	100
THA	53.5	34.7	10.0	45.5	43.7	100
VNM	70.7	33.1	10.1	42.5	56.4	100
BGD	79.6	20.1	4.2	12.3	16.2	100
IND	64.6	24.1	11.7	11.8	12.3	100
LKA	69.9	23.6	10.0	31.0	34.6	100
XSA	75.1	17.0	11.8	16.1	20.0	100
CAN	58.7	18.7	19.7	37.2	34.4	100
USA	69.2	17.6	15.1	11.0	12.9	100
MEX	67.6	20.3	8.7	29.7	26.2	100
XCM	84.0	23.8	12.3	42.3	62.5	100
COL	68.6	17.1	16.5	16.7	18.9	100
PER	66.3	24.5	11.5	12.1	14.5	100
VEN	69.8	17.7	6.5	28.2	22.3	100
XAP	70.7	18.8	12.8	26.8	29.2	100
ARG	78.2	20.0	3.2	8.9	10.3	100
BRA	64.4	19.9	18.5	7.5	10.3	100
CHL	66.3	25.5	10.1	26.0	27.9	100
URY	77.4	12.6	14.3	22.1	26.3	100
XSM	75.3	23.9	12.3	42.6	54.1	100
AUT	58.8	25.0	19.9	38.6	42.3	100
BEL	66.5	19.4	15.1	73.8	74.8	100
DNK	52.5	16.7	26.1	36.8	32.1	100
FIN	54.3	17.3	21.5	39.0	32.0	100
FRA	60.7	17.4	19.6	25.6	23.3	100
DEU	58.5	20.2	19.8	27.1	25.6	100

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Table 2.2 Expenditure on GDP (percent GDP) (Contd)

GTAP Regions	Private Consumption	Investment	Government Consumption	Exports	Imports	Total GDP
GBR	65.8	17.1	18.7	26.3	27.9	100
GRC	75.7	21.4	14.4	15.9	27.3	100
IRL	57.0	20.5	15.4	77.7	70.6	100
ITA	63.7	16.9	16.6	25.8	23.0	100
LUX	69.2	20.2	15.8	75.4	80.6	100
NLD	59.9	20.3	13.9	61.5	55.7	100
PRT	66.2	26.0	19.2	30.1	41.4	100
ESP	63.3	21.0	16.5	26.5	27.3	100
SWE	53.1	13.7	25.9	42.5	35.2	100
CHE	59.8	19.5	15.0	40.2	34.5	100
XEF	47.5	22.5	19.9	40.4	30.2	100
HUN	69.6	24.7	11.3	55.9	61.4	100
POL	69.9	22.6	19.2	26.9	38.7	100
XCE	64.8	23.0	18.9	50.2	56.9	100
XSU	61.8	21.0	15.7	25.1	23.6	100
TUR	67.2	26.1	12.1	22.7	28.0	100
XME	52.6	21.8	25.2	35.0	34.6	100
MAR	65.8	19.8	17.2	26.3	29.2	100
XNF	66.6	22.1	12.8	26.4	28.0	100
BWA	30.2	28.0	25.9	61.8	45.9	100
XSC	59.6	17.5	21.0	25.1	23.2	100
MWI	76.3	8.8	11.3	22.6	19.0	100
MOZ	88.3	17.6	8.8	11.7	26.5	100
TZA	87.7	16.9	10.5	16.6	31.6	100
ZMB	74.1	12.2	10.5	26.2	23.0	100
ZWE	63.9	26.9	17.4	31.6	39.7	100
XSF	32.3	23.7	25.5	54.4	35.9	100
UGA	80.6	14.9	9.5	10.8	15.9	100
XSS	79.4	15.1	10.4	26.3	31.2	100
XRW	77.8	18.3	9.6	14.9	20.6	100
WORLD	63.4	21.6	15.0	22.1	22.1	100.0

Table 2.3 Sources of GDP (1997 U$S million)

GTAP Regions	Unskilled Labor	Skilled Labor	Capital	Land	Natural Resources	Other Taxes	Total GDP
AUS	108923	79104	159004	2853	4953	38004	392841
NZL	20645	10733	24999	427	452	7823	65079
CHN	315057	73543	265704	36653	15353	148384	854694
HKG	35920	27239	74817	412	1121	485	139994
JPN	1356728	833801	1444726	9851	4888	605530	4255525
KOR	150900	62897	169318	9573	1248	51567	445503
TWN	97849	68727	106394	2542	869	23301	299681
IDN	70705	13713	98805	16533	6512	2565	208834
MYS	26073	8597	53809	4628	3104	9879	106090
PHL	22580	7918	33663	4526	1295	8374	78356
SGP	24025	13371	34763	334	101	7228	79822
THA	17005	5894	112129	4795	1091	16866	157780
VNM	6085	1751	8959	1088	581	3412	21876
BGD	16622	4781	17006	2614	727	2209	43959
IND	114062	23995	167324	42971	3928	47602	399884
LKA	5238	1454	5178	1404	142	2186	15603
XSA	19586	4259	28655	7783	747	9647	70677
CAN	231327	92051	213384	2691	8063	83613	631127
USA	2867483	2035699	2975086	45111	24503	-2686	7945196
MEX	79120	30110	220930	11054	6621	40990	388824
XCM	25424	9601	40376	3141	736	14776	94054
COL	32753	13999	36380	2859	1572	6996	94559
PER	12763	6555	38715	1585	576	4727	64920
VEN	21477	8495	42846	1453	5054	4411	83737
XAP	5983	2899	13972	915	866	2612	27247
ARG	115349	40500	147319	10057	1935	10813	325974
BRA	248360	120202	349774	10557	3010	57777	789680
CHL	18857	7649	37723	1565	800	9553	76147
URY	4683	1377	9313	554	37	3094	19059
XSM	2557	977	5073	309	27	1661	10605
AUT	54359	29564	87360	1018	170	24704	197174
BEL	79330	54335	83554	690	77	13149	231135
DNK	55489	38874	49110	2091	639	18392	164595
FIN	33355	22260	42605	1697	363	16490	116769
FRA	358332	226278	594356	11652	986	182200	1373803
DEU	620301	405077	813389	7440	3043	212150	2061399

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Table 2.3 Sources of GDP (1997 U$S million) (Contd)

GTAP Regions	Unskilled Labor	Skilled Labor	Capital	Land	Natural Resources	Other Taxes	Total GDP
GBR	447459	309034	430190	8181	5550	87053	1287466
GRC	39300	23698	33902	3847	4066	10242	115055
IRL	20907	14281	23882	541	124	6873	66607
ITA	274393	188169	554504	11570	1051	98209	1127895
LUX	3345	2239	3423	62	4	826	9899
NLD	104264	70467	130662	1284	1532	50860	359069
PRT	31157	24118	24045	1599	234	17315	98469
ESP	151850	95419	222323	7063	1596	42686	520936
SWE	78047	60451	60281	1272	461	27174	227684
CHE	84480	59595	79715	2115	133	23393	249430
XEF	53084	37912	48296	773	5191	18747	164003
HUN	10495	4714	17545	750	121	7279	40905
POL	36501	15470	47079	2600	1355	21539	124545
XCE	53791	15978	45902	3453	1295	10360	130780
XSU	215647	97370	197140	4170	23143	49739	587209
TUR	49022	18881	104357	2479	896	16737	192374
XME	135939	69574	211341	1783	34845	67688	521171
MAR	14224	4015	12557	690	202	3258	34947
XNF	66046	18784	59472	3057	7343	16202	170904
BWA	1027	562	2849	17	165	158	4777
XSC	51027	24650	46721	669	2352	13631	139051
MWI	1112	245	1089	101	23	247	2817
MOZ	1434	275	1480	151	32	269	3642
TZA	2703	334	2744	350	75	546	6752
ZMB	1503	389	1713	113	49	448	4214
ZWE	2806	1091	3180	141	51	983	8252
XSF	3280	1368	5984	129	1168	1704	13633
UGA	3208	437	2520	411	62	197	6835
XSS	61480	15804	59365	3170	7062	9705	156586
XRW	84896	29168	115346	13761	2453	28050	273674
WORLD	9359732	5592771	11156125	341728	208824	2322602	28981783

Table 2.4 Sources of GDP (percent GDP)

GTAP Regions	Unskilled Labor	Skilled Labor	Capital	Land	Natural Resources	Other Taxes	Total GDP
AUS	27.7	20.1	40.5	0.7	1.3	9.7	100
NZL	31.7	16.5	38.4	0.7	0.7	12.0	100
CHN	36.9	8.6	31.1	4.3	1.8	17.4	100
HKG	25.7	19.5	53.4	0.3	0.8	0.3	100
JPN	31.9	19.6	33.9	0.2	0.1	14.2	100
KOR	33.9	14.1	38.0	2.1	0.3	11.6	100
TWN	32.7	22.9	35.5	0.8	0.3	7.8	100
IDN	33.9	6.6	47.3	7.9	3.1	1.2	100
MYS	24.6	8.1	50.7	4.4	2.9	9.3	100
PHL	28.8	10.1	43.0	5.8	1.7	10.7	100
SGP	30.1	16.8	43.6	0.4	0.1	9.1	100
THA	10.8	3.7	71.1	3.0	0.7	10.7	100
VNM	27.8	8.0	41.0	5.0	2.7	15.6	100
BGD	37.8	10.9	38.7	5.9	1.7	5.0	100
IND	28.5	6.0	41.8	10.7	1.0	11.9	100
LKA	33.6	9.3	33.2	9.0	0.9	14.0	100
XSA	27.7	6.0	40.5	11.0	1.1	13.6	100
CAN	36.7	14.6	33.8	0.4	1.3	13.2	100
USA	36.1	25.6	37.4	0.6	0.3	0.0	100
MEX	20.3	7.7	56.8	2.8	1.7	10.5	100
XCM	27.0	10.2	42.9	3.3	0.8	15.7	100
COL	34.6	14.8	38.5	3.0	1.7	7.4	100
PER	19.7	10.1	59.6	2.4	0.9	7.3	100
VEN	25.6	10.1	51.2	1.7	6.0	5.3	100
XAP	22.0	10.6	51.3	3.4	3.2	9.6	100
ARG	35.4	12.4	45.2	3.1	0.6	3.3	100
BRA	31.5	15.2	44.3	1.3	0.4	7.3	100
CHL	24.8	10.0	49.5	2.1	1.1	12.5	100
URY	24.6	7.2	48.9	2.9	0.2	16.2	100
XSM	24.1	9.2	47.8	2.9	0.3	15.7	100
AUT	27.6	15.0	44.3	0.5	0.1	12.5	100
BEL	34.3	23.5	36.1	0.3	0.0	5.7	100
DNK	33.7	23.6	29.8	1.3	0.4	11.2	100
FIN	28.6	19.1	36.5	1.5	0.3	14.1	100
FRA	26.1	16.5	43.3	0.8	0.1	13.3	100
DEU	30.1	19.7	39.5	0.4	0.1	10.3	100

contd

Table 2.4 Sources of GDP (percent GDP) (Contd)

GTAP Regions	Unskilled Labor	Skilled Labor	Capital	Land	Natural Resources	Other Taxes	Total GDP
GBR	34.8	24.0	33.4	0.6	0.4	6.8	100
GRC	34.2	20.6	29.5	3.3	3.5	8.9	100
IRL	31.4	21.4	35.9	0.8	0.2	10.3	100
ITA	24.3	16.7	49.2	1.0	0.1	8.7	100
LUX	33.8	22.6	34.6	0.6	0.0	8.3	100
NLD	29.0	19.6	36.4	0.4	0.4	14.2	100
PRT	31.6	24.5	24.4	1.6	0.2	17.6	100
ESP	29.1	18.3	42.7	1.4	0.3	8.2	100
SWE	34.3	26.6	26.5	0.6	0.2	11.9	100
CHE	33.9	23.9	32.0	0.8	0.1	9.4	100
XEF	32.4	23.1	29.4	0.5	3.2	11.4	100
HUN	25.7	11.5	42.9	1.8	0.3	17.8	100
POL	29.3	12.4	37.8	2.1	1.1	17.3	100
XCE	41.1	12.2	35.1	2.6	1.0	7.9	100
XSU	36.7	16.6	33.6	0.7	3.9	8.5	100
TUR	25.5	9.8	54.2	1.3	0.5	8.7	100
XME	26.1	13.3	40.6	0.3	6.7	13.0	100
MAR	40.7	11.5	35.9	2.0	0.6	9.3	100
XNF	38.6	11.0	34.8	1.8	4.3	9.5	100
BWA	21.5	11.8	59.6	0.4	3.5	3.3	100
XSC	36.7	17.7	33.6	0.5	1.7	9.8	100
MWI	39.5	8.7	38.7	3.6	0.8	8.8	100
MOZ	39.4	7.5	40.6	4.2	0.9	7.4	100
TZA	40.0	4.9	40.6	5.2	1.1	8.1	100
ZMB	35.7	9.2	40.6	2.7	1.2	10.6	100
ZWE	34.0	13.2	38.5	1.7	0.6	11.9	100
XSF	24.1	10.0	43.9	0.9	8.6	12.5	100
UGA	46.9	6.4	36.9	6.0	0.9	2.9	100
XSS	39.3	10.1	37.9	2.0	4.5	6.2	100
XRW	31.0	10.7	42.1	5.0	0.9	10.2	100
WORLD	32.3	19.3	38.5	1.2	0.7	8.0	100