ECONOMIC & POLICY RESEARCH UNIT

Working Paper Series

Working Paper No. 06-11

October 2006

Eight-Sector Social Accounting Matrix of the UAE Economy

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Abstract

This paper creates an eight sector Social Accounting Matrix (SAM) for the UAE economy to capture all the money flows in the economy between the various agents. The SAM is set up for the year 2004. This SAM forms part of an eight sector CGE model of the UAE economy. To create the SAM use is made of data provided by the Ministry of Economy and Planning and the Central Bank of the UAE. However, since some of the data needed for the SAM are not available, estimates from a SAM for Kuwait are used to fill gaps. There are two striking features of the resulting SAM for the UAE. Because of the relatively low wages, the size of the total labor income is far smaller than the level of capital income. Another feature revealed by the SAM is that the receipts of the various taxes are relatively low. Having set up such a SAM provides researchers and modelers with a compact and systematic data set that can be used for further research aimed at a better understanding of the UAE economy.

Keywords: Social Accounting Matrix.

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1 Introduction

The creation of a Social Accounting Matrix (SAM) is important for it is an integral part of a Computable general Equilibrium (CGE) model and it is also useful for macroeconomic modeling. This is because the SAM contains all sorts of flows describing consumption, investment, intermediate inputs, government deficit, savings by the Rest-of-World (ROW) and the like. The SAM portrays these items in a systematic and clear way. The circular flow of goods and money can then be assessed more easily. The current document describes the setting up of the UAE SAM and each step in the process and contains details about the procedure followed. Macroeconomic data from the Ministry of Economy and Planning (MOEP) and the Central Bank (CB) of the UAE are used for setting up the SAM. Unfortunately, not all the required data are available and these unknown data have to be estimated. The way these data are estimated is also described in this document.

In Section 2 a description is given of the lay out of the SAM that is subsequently created. In Section 3 the macroeconomic data are described that are readily available from the MOEP and CB. How all unknown items in the SAM are estimated is described in Section 4. Finally, Section 5 presents the fully filled SAM for the UAE for the year 2004 for the 8 sectors.

2 Lay Out of the Proposed SAM

The aim is to set up a SAM for the UAE economy. This should be done with as much detail as possible, and at the same time the availability of data has to be taken into account. The MOEP distinguishes 15 sectors in their publications of data on their web site. Unfortunately, not all the required data are available that would enable the setting up of a 15-sector SAM. For instance, exports and imports by sector are not known. Also, import tariffs are unknown for the sectors. Therefore, a compromize has to be found such that there are enough interesting sectors and the data that need to be estimated in order to fill the gaps are not too large. It is for these reasons that this SAM comprises 8 sectors. By aggregating the 15 sectors of the MOEP into 8 sectors the most important sectors in the UAE are captured and the uncertainty because of the estimation of unkown items in the SAM is reduced to a minimum.

The MOEP distinguishes the following 15 sectors:

- Agriculture
- Crude oil/Natural gas
- Quarrying
- Manufacturing
- Electricity
- Construction
- Trade
- Restaurants and hotels
- Transport
- Real estate
- Social and personal services
- Financial corporations sector
- Government services sector
- Domestic services of households
- Imputed bank services

These 15 sectors are grouped into 8 sectors and the constituent sectors are listed as follows:

Agriculture

Crude oil and Natural gas Quarrying

- Crude oil/Natural gas
- Quarrying

Manufacturing and Electricity

- Manufacturing
- Electricity

Construction and Real estate

- Construction
- Real estate

Trade and Transport

- Trade
- Transport

Restaurants and hotels

Financial corporations sector

Government, Social and personal services

- Social and personal services
- Government services sector

The sectors 'Domestic services of households' and 'Imputed bank services' have been dispersed among all other sectors for convenience (this is described in one of the following Sections). The reason for this is that both sectors have little economic relevance and their characteristics are rather unique and at the same time different from the other sectors.

Tables 1 up to Table 3 provide a template SAM that will be filled with actual data for the UAE economy. In the template there is an entity Q which is equal to $VL+FTRS-DBSR+VK+GTRS-TY-DEPR$, where VL are wages, $FTRS$ are foreign transfers, $DBSR$ is the external debt service, VK is capital income, $GTRS$ are government transfers, TY is income tax, and $DEPR$ is depreciation. Appendix A provides a complete list of all abbreviations and the related data item or variable.

3 Available Data from the MOEP

Table 4 shows the data that are available from the MOEP for the 15 sectors that the MOEP reports about. It is assumed that the indirect tax rate tx is the same for all spending categories (private consumption C, investment J, and government consumption G). The reported values for these spending items by the MOEP are including the tax TX. The tax rate tx can be calculated as:

$$tx = \frac{TX}{C+G+J-TX} = \frac{1725}{184,677+48,221+84,647-1725} = 0.00546$$

The tax base for the indirect tax is equal to the three spending categories minus the amount of the tax itself. It is now possible to calculate the level of private consumption without tax as:

$$C(excl.\ tax) = \frac{C}{1+tx} = \frac{184,677}{1+0.00546} = 183,674$$

The level of indirect tax on consumption is then the difference between C and $C(excl.\ tax)$. This procedure can also be applied to investment and government consumption and results into:

$$J(excl.\ tax) = 84,187$$

$$G(excl.\ tax) = 47,959$$

The "Domestic services of households" as such is not a very relevant sector from an economic point of view. This sector does not employ capital and for these two reasons this sector is merged into the other sectors. The sector "Imputed bank services" has a negative value for capital income and the latter normally is the product of the return to capital and the physical stock of capital. A negative capital income requires either that the stock of capital in that sector is negative, or that the return on capital becomes negative. Both are undesirable so this sector is also merged into the other sectors. The merging is done by dispersing the values that the MOEP reports for these sectors over the other 13 sectors. The values are dispersed by dividing them over the other sector according to the contribution of each of the other sectors in the total value for all other 13 sectors. For instance if the intermediate consumption of the sectors "Domestic services of households" and "Imputed bank services" is distributed, the sum of the intermediate consumption for these two sectors is distributed over the remaining 13 sectors according to the part of intermediate consumption for each of the 13 sectors in total intermediate consumption for all 13 sectors together. Performing all these calculations provides the values for all 13 sectors as shown in Table 5. The 13 sectors are now aggregated into the 8 sectors according to the aggregation presented in Section 2. The outcome of this aggregation proces forms the 8-sector SAM in Table 6.

4 Estimating Unknow Sector Data

Data has to be estimated because of data limitations - not all data are available. The first item that will be estimated is the level of import by sector (Section 4.1). Then the level of

export by sector is estimated (Section 4.2).

4.1 Imports by Sector

The MOEP reports a number of categories of imported goods and services. Total imports of goods and services amounts to 249,844 mln. AED. The breakdown of this is contained in Figure 1.

Import type	Description	Level in AED
MC	Import of final goods	103,582
MK	Import of capital goods	81,208
MN	Imports of intermediate goods	65,054
M	Total imports of goods and services	249,844

Figure 1: Levels of import for all import categories (in mln. AED).

It is assumed at the outset that the sector "Government social and personal services" is not importing any goods or services. The import of final goods is assumed to be absorbed by four sectors: "Agriculture", "Trade and Transport", "Restaurants and hotels", and "Financial corporations sector". The level of final goods imported is distributed over these sectors according to their level of GDP at factor cost (GDP_{fc}) is described in Figure 2.

Sector	GDP_{fc}	Level of imports in AED
Agriculture	9,982	9,897
Trade and Transport	65,178	64,620
Restaurants and hotels	7,258	7,195
Financial corporations sector	22,058	21,870

Figure 2: Levels of import for four sectors based on imports of final goods (in mln. AED).

It is assumed that the imports of the sector "Crude oil and Natural gas and Quarrying" consists of 25% of the imports of intermediate goods and imported capital good, or 36,566 mln. AED. The remaining 75% of the imported intermediate goods and capital goods are assumed to be imported by the remaining two sectors "Manufacturing and Electricity" and "Construction and Real estate". The distribution of among these two sectors is governed by the distribution of GDP_{fc} and is contained in Figure 3.

Sector	$GDPfc$	Level of imports in AED
Manufacturing and Electricity	55,611	54,012
Construction and Real estate	57,333	55,684

Figure 3: Levels of import for the final two sectors based on imports of intermediate and imports of capital goods (in mln. AED).

4.2 Exports by Sector

It is assumed that the following sectors only produce for the domestic market of the UAE and therefore, are not engaged in any export activity:

- Agriculture
- Construction and Real estate
- Financial corporations sector
- Government and social and personal services

The MOEP provides the following data on exports as shown in Table 7. The lowest levels of exports (marked by the capital letters A through H) are divided according to the following distribution as shown in Figure 4.

Sector	Level of exports	Encompassing item from the MOEP
Crude oil and Natural gas and Quarrying	$126,022$	$A + B$
Manufacturing adn Electricity	$101,544$	$E + F + G + 25\%$ of H
Trade and Transport	$79,887$	$I + 75\%$ of H
Restaurants and hotels	$7,535$	$C + D$

Figure 4: Levels of export for four sectors based on export figures from the MOEP (in mln. AED).

4.3 Import and Export Tariffs by Sector

It is assumed that the import tariff rate is equal for all 8 sectors and its level is:

$$tm = \frac{TM}{M} = \frac{2,878}{249,844} = 0.0115$$

Estimates for the import levels excluding the taxes are already available (see Section 4.1). The tax TM by sector is then the tax rate tm times this latter amount and the result is shown in Figure 5.

	M	TM
Agriculture	9,897	114
Crude oil and Natural gas and Quarrying	36,566	421
Manufacturing and Electricity	54,012	622
Construction and Real estate	55,684	641
Trade and Transport	64,620	744
Restaurants and hotels	7,195	83
Financial corporations sector	21,870	252
Government and Social and Personal services	0	0
Total	249,844	2,878

Figure 5: Imports and import tariffs by sector (in mln. AED).

The export tax (TE) is zero in the UAE and the export tax rate (te) and the export tax collected is therefore also zero for each of the sectors.

4.4 IO-table and Private and Government Consumption

In Table 8 all the sector data is presented except the IO-table and the data for private and government consumption. It is known how much each sector delivers to all other 8 sectors (this is denoted by $INTD$). It is also known what each sector exports and delivers to each of the sectors as investment good. What is not known is how much each of the sectors receives from the other sectors and what each sector delivers to consumers as private consumption and to the government as government consumption. Our template SAM can now be partly filled and this leads to the following SAM divided in three tables (Table 9 through 11). The first 8 by 8 matrix of unknowns in the SAM is the IO table that needs to be estimated. It is possible to extract from the SAM the upper part containing the unknow sectoral data and put these in a separate table (Table 12). As the MOEP does not provide data on these last unknown items these latter items are estimated using data already available from Kuwait for the year 2000, see Babiker (2000). An IO-table is assembled with our eight sectors using the existing SAM for Kuwait and the Kuwait SAM also provides us with data on private and government consumption by sector. As the sectoral data has the services sector combined, the values for the services sector is divided over the sectors "Restaurants and hotels" and "Government, Social and Personal Services" based on the $GDPfc$ for both these sectors. The Kuwait IO-table can be found in Table 13. For Kuwait the levels of private and government consumption by sector are known and these are contained in Figure 6.

	Households	Government
Agriculture	202,742	2,137
Crude oil and Natural gas and Quarrying	0	6
Manufacturing and Electricity	1,824,698	417,084
Construction and Real estate	112,327	1,723
Trade and Transport	886,916	68,219
Restaurants and hotels	48,141	2,329
Financial corporations sector	714,205	47,886
Government, Social and Personal Services	256,680	12,415
Total	4,045,709	551,799

Figure 6: Levels of private and government consumption by sector for Kuwait (in mln. Kuwaiti Dinar).

The unknown IO-table and the level of private and government consumption by sector are estimated by assuming that the economies of Kuwait and the UAE are very similar. Values for the UAE are sought that are as close as possbile to the corresponding values of Kuwait while taking into account the relationships that exists among the values. First of all, sectoral data should add up to the total for the whole sector. Additionally, the rows in Table 12 add up to the so-called Grand Total. This is a Nonlinear Programming (NLP) problem where there is an objective function and a number of constraints. The objective function that is minimized is the sum of squared differences between the values for the UAE that are unknown and the corresponding values for Kuwait. The restrictions are the relationships mentioned before. This NLP problem is solved using the software GAMS, see Brooke, Kendrick, Meeraus and Raman (1998). The IO-table for the UAE that results from this process is shown in Table 14. The outcome of the NLP problem also provides estimates of the sectoral level of private and government consumption for the UAE in Figure 7.

Sector	Private Consumption	Government Consumption
Agriculture	21,676	1,396
Crude oil and Natural gas and Quarrying	0	0
Manufacturing and Electricity	0	28,014
Construction and Real estate	26,275	1,994
Trade and Transport	53,476	7,453
Restaurants and hotels	12,005	1,135
Financial corporations sector	40,124	5,197
Government, Social and Personal Services	30,117	2,770
Total	183,674	47,959

Figure 7: Estimated private and government consumption by sector for the UAE (in mln. AED).

5 The SAM for the UAE

All the data from the MOEP and the estimated sectoral data are combined and presented in Tables 15 through 17 as the SAM for the UAE. These tables present in a schematic way

all the money flows in the economy (United nations (2002) and consult the website of the United Nations Statistics Division on National Accounts (2007) for further details). On the left the first nine columns shows the flows in the production process. The upper nine rows and first nine columns constitute the intermediate flow of goods among the sectors. This is the so-called IO-table that shows where (from which sector) the intermediate inputs come from and where they go to (which sectors are the receiving sectors). There is also labor and capital employed in the production proces and the factor rewards are shown in the left part of the SAM. Imports, subsidies and import tariffs are provided in the remaining rows on the right. The next two columns show where the income is accumulated. Part of capital income is spent on depreciation of physical capital. The following three columns show what agents in the economy collect the income of capital and labor, and where the tax receipts end up. The final set of columns on the right show where the income is spent on. Here there are also two columns representing the Rest-of-the-World. In these we find the exports and the savings of the ROW.

There are two ways of looking at the SAM, horizontally, or vertically. Looking at a row horizontally, it shows where for instance a certain sector delivers its output to. Take the row for the Trade and Transport sector. The numbers in the row show where the output of the Trade and Transport sector ends up. The sector delivers intermediate inputs to the sectors Manufacturing and Electricity, Construction and Real Estate, and also to itself. The Trade and Transport sector delivers consumption goods to consumers, apparently no capital goods, it delivers government goods, and finally, it delivers export goods to the Rest-of-the-World. If one looks at a single column in the SAM, for instance again for the Trade and Transport sector, it shows what sectors and factors of production deliver to this sector. First, the intermediate inputs from the various sectors. Then the factors of production, capital and labor. The government pays out subsidies to the companies in the Trade and Transport sector and the government levies import tariffs on the imported goods and services to this sector. Finally, the sector receives import goods from the Rest-of-the-World.

The SAM contains in a way the budget constraints for the institutions of which it contains all the money flows. Take for instance the households. There is the column for the households and the row for the households. The column shows where the households spend all their money. Like consumption goods from the various sectors, income tax that has to be payed

to the government, and the remaining part of their income is saved and this is ultimately used for investment to increase the physical capital stock. The row shows where households receive their income from. They receive labor and capital income and they receive transfers from the government. As the income should be equal to the expenses for each institution in the SAM, it must be true that the column total equals the corresponding row total.

The first nine columns denote the eight production sectors and the total of production sectors. The next two columns denote the factors of production: capital and labor. Then we have three income generating items: households, and the government in its role as tax collectors and subsidy provider (the latter can be interpreted as a negative income for the government). The final five columns represent the institutions that do the spending.

One can look at the SAM and see that the flow of money goes through it in a cascade like manner. The various sectors deliver intermediate goods to one or more of the other sectors (possibly also to the sector itself) and the SAM is looked at in a row wise manner. The sectors receive intermediate inputs from the various sectors and now the SAM is looked at in a column wise manner. The factors of production get their factor rewards from each of the sectors and this is aggregated in the columns labeled Income Creation. The income is then channeled to the households or to the government in its role as tax collector or subsidy provider. How the households and the government is spending the income they receive is shown in the columns labeled Institutions. Consumption and investment goods are bought from all the eight sectors and this in turn constitutes the income for each sector. With this income the sectors can finance the intermediate inputs, the capital and labor input. From this latter observation it becomes clear that the SAM describes the circular flow of money in the UAE economy.

Considering the column for the Manufacturing and Electricity sector (Manufacturing sector for short) in the actual SAM for the UAE (Tables 15 through 17), it is clear that this sector uses inputs from the Government and Social and Personal Services sector (6,419 mln. AED), from the Trade and Transport sector (5,343 mln. AED), from the Construction and Real Estate sector (20,419 mln. AED), and 18,505 mln. worth of intermediate goods and services from the Crude Oil, Natural Gas and Quarrying sector. In total the Manufacturing sector receives 50,685 mln. AED worth of intermediate goods and services. The Manufacturing sector employs capital and labor and it has to pay rent income to the owners of the capital

in the amount of 46,221 mln. AED, and 9,181 mln. AED in wages to the laborers employed in the sector. The government receives the import tariffs, 622 mln. AED, on imported goods and services coming from the Rest-of-the-World to this sector. On the other hand the government pays out subsidies to the companies in the Manufacturing sector totaling 75 mln. AED. The amount of imported goods and services to the Manufacturing sector is 54,102 mln. AED. It is clear that the Manufacturing sector does not use any inputs from the other sectors by considering the row for this sector. The sector delivers capital goods and services in the amount of 31,089 mln. AED, government goods and services for 28,014 mln. AED, and the remaining output, 101.544 mln. AED, is exported to the Rest-of-the-World. The row total is 160,647 mln. AED (this can be considered the receipts of the sector) and it is equal to the column total (these are the expenditures of the sector).

A more elaborate SAM may contains more sectors, more factors of production and the like. Yet the interpretation is always the same. As the macroeconomic data for the UAE is rather limited we cannot have a too detailed SAM. The one that is constructed in this paper is possibly the best one can do with the data that is available at the moment.

6 Concluding Remarks

This paper is the first attempt to develop a social accounting matrix for the UAE economy. Unknown sectoral data that the MOEP does not provide have been estimated in order to complete the SAM. The figures for a comparable economy, Kuwait, served as a guidance while making these estimates. In addition, extensive use has been made of NLP techniques to come up with these estimates. A striking feature of the assembled SAM is that the labour income is substantially lower than the capital income. This is due to the relatively large size of the low wage working population in the UAE which consists mainly of expatriates from Asian and Arab countries. It can also be noted that the various taxes raised by the government are relatively low compared to the other items in the SAM. The government sector in the UAE currently is not dependent on taxes as a way of generating income. It can rely partly on the receipts of exporting its natural resource oil. The SAM can now provide modelers and macroeconometricians with the necessary data they need to set up detailed models for the UAE economy.

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Appendix A: List of Symbols used

VL	Wages
VK	Capital income
GDP_{fc}	Gross domestic product (factor costs)
$DBSR$	External debt service (US Dollars)
$FTRS$	Foreign transfers
$GTRS$	Government transfers
$DEPR$	Depreciation
TY	Income tax
TS	Taxes on firms
TX	Indirect taxes on domestic goods
TM	Import duties
TE	Tax on exports
C	Consumption
G	Government consumption
J	Investment (incl. build up of stock)
E	Total exports
M	Imports
B	Foreign borrowing/lending
$INTD$	Demand for intermediate inputs
$INTS$	Supply of intermediate inputs
SAV_{Net}^{HHs}	Savings by households net of depreciation
SAV^{Gov}	Savings by government
SAV^{ROW}	Savings by Rest-of-World
$PROD$	Production
$SUBS$	Subsidies to domestic firms
MC	Imports of final goods
MK	Imports of capital goods
MN	Imports of intermediate goods
tx	Indirect tax rate on domestic goods
tm	Import tariff rate

		A	B	C	D	E	F	G	H	Sector Total
Production	A. Agriculture	$INTD_{AA}$	$INTD_{BA}$	$INTD_{CA}$	$INTD_{DA}$	$INTD_{EA}$	$INTD_{FA}$	$INTD_{GA}$	$INTD_{HA}$	$INTD_{A}$
	B. Crude oil and Natural gas and Quarrying	$INTD_{AB}$	$INTD_{BB}$	$INTD_{CB}$	$INTD_{DB}$	$INTD_{EB}$	$INTD_{FB}$	$INTD_{GB}$	$INTD_{HB}$	$INTD_{B}$
	C. Manufacturing and Electricity	$INTD_{AC}$	$INTD_{BC}$	$INTD_{CC}$	$INTD_{DC}$	$INTD_{EC}$	$INTD_{FC}$	$INTD_{GC}$	$INTD_{HC}$	$INTD_{C}$
	D. Construction and Real estate	$INTD_{AD}$	$INTD_{BD}$	$INTD_{CD}$	$INTD_{DD}$	$INTD_{ED}$	$INTD_{FD}$	$INTD_{GD}$	$INTD_{HD}$	$INTD_{D}$
	E. Trade and Transport	$INTD_{AE}$	$INTD_{BE}$	$INTD_{CE}$	$INTD_{DE}$	$INTD_{EE}$	$INTD_{FE}$	$INTD_{GE}$	$INTD_{HE}$	$INTD_{E}$
	F. Restaurants and hotels	$INTD_{AF}$	$INTD_{BF}$	$INTD_{CF}$	$INTD_{DF}$	$INTD_{EF}$	$INTD_{FF}$	$INTD_{GF}$	$INTD_{HF}$	$INTD_{F}$
	G. Financial corporations sector	$INTD_{AG}$	$INTD_{BG}$	$INTD_{CG}$	$INTD_{DG}$	$INTD_{EG}$	$INTD_{FG}$	$INTD_{GG}$	$INTD_{HG}$	$INTD_{G}$
	H. Government and Social and Personal services	$INTD_{AH}$	$INTD_{BH}$	$INTD_{CH}$	$INTD_{DH}$	$INTD_{EH}$	$INTD_{FH}$	$INTD_{GH}$	$INTD_{HH}$	$INTD_{H}$
	Sector Total	$INTS'_{A}$	$INTS'_{B}$	$INTS'_{C}$	$INTS'_{D}$	$INTS'_{E}$	$INTS'_{F}$	$INTS'_{G}$	$INTS'_{H}$	$INTD$
Income creation	Labour income	VL_A	VL_B	VL_C	VL_D	VL_E	VL_F	VL_G	VL_H	VL
	Capital income	VK_A	VK_B	VK_C	VK_D	VK_E	VK_F	VK_G	VK_H	VK
Income distribution	Households									
	Government subsidies	TS_A	TS_B	TS_C	TS_D	TS_E	TS_F	TS_G	TS_H	TS
	Government taxes	TM_A	TM_B	TM_C	TM_D	TM_E	TM_F	TM_G	TM_H	TM
Institutions	Households									
	Capital									
	Government									
	ROW current	M_A	M_B	M_C	M_D	M_E	M_F	M_G	M_H	M
	ROW capital									

Table 1: Template SAM for the UAE (part I).

		Sector Total	Labour income	Capital income	Income households	Income government subsidies	Income government taxes
Production	A. Agriculture	$INTD_A$					
	B. Crude oil and Natural gas and Quarrying	$INTD_B$					
	C. Manufacturing and Electricity	$INTD_C$					
	D. Construction and Real estate	$INTD_D$					
	E. Trade and Transport	$INTD_E$					
	F. Restaurants and hotels	$INTD_F$					
	G. Financial corporations sector	$INTD_G$					
	H. Government and Social and Personal services	$INTD_H$					
	Sector Total	$INTD$					
Income creation	Labour income	VL					
	Capital income	VK					
Income distribution	Households		$VL + FTRS - DBSR$	$VK - DEPR$			
	Government subsidies	TS					
	Government taxes	TM			TY		
Institutions	Households				Q		
	Capital			$DEPR$			
	Government					TS	$TM + TY + TX + TE$
	ROW current	M	$-FTRS + DBSR$				
	ROW capital						

Table 2: Template SAM for the UAE (part II).

		Households	Capital income	Government income	ROW current	ROW capital
Production	A. Agriculture	C_A	J_A	G_A	E_A	
	B. Crude oil and Natural gas and Quarrying	C_B	J_B	G_B	E_B	
	C. Manufacturing and Electricity	C_C	J_C	G_C	E_C	
	D. Construction and Real estate	C_D	J_D	G_D	E_D	
	E. Trade and Transport	C_E	J_E	G_E	E_E	
	F. Restaurants and hotels	C_F	J_F	G_F	E_F	
	G. Financial corporations sector	C_G	J_G	G_G	E_G	
	H. Government and Social and Personal services	C_H	J_H	G_H	E_H	
	Sector Total	C excl. TX	J excl. TX	G excl. TX	E excl. TE	
Income creation	Labour income					
	Capital income					
Income distribution	Households			$GTRS$		
	Government subsidies					
	Government taxes	TX on C	TX on J	TX on G	TE	
Institutions	Households					
	Capital	SAV^{HHs}_{Net}		SAV^{Gov}		
	Government					
	ROW current					$-B$
	ROW capital		SAV^{ROW}			

Table 3: Template SAM for the UAE (part III).

	SUBS	INTD	PROD	VL	VK	TX	M	E	C	J	G	TM
Agriculture	351	3,274	13,043	2,719	7,381	20	NA	NA	NA	NA	NA	NA
Crude oil and Natural gas	0	6,535	129,813	2,312	120,949	17	NA	NA	NA	NA	NA	NA
Quarrying	0	360	1,198	141	687	10	NA	NA	NA	NA	NA	NA
Manufacturing	75	41,858	91,543	7,448	42,098	214	NA	NA	NA	NA	NA	NA
Electricity	0	6,713	13,455	1,526	5,194	22	NA	NA	NA	NA	NA	NA
Construction	0	40,150	68,818	15,244	13,224	200	NA	NA	NA	NA	NA	NA
Trade	19	7,841	46,674	13,532	25,150	170	NA	NA	NA	NA	NA	NA
Restaurants and hotels	0	5,853	13,919	2,454	4,889	723	NA	NA	NA	NA	NA	NA
Transport	230	17,166	44,369	9,316	17,947	170	NA	NA	NA	NA	NA	NA
Real estate	0	2,987	32,623	1,689	27,851	96	NA	NA	NA	NA	NA	NA
Social and personal services	0	1,353	8,347	2,671	4,280	43	NA	NA	NA	NA	NA	NA
Financial corporations sector	0	1,188	23,538	3,223	19,095	32	NA	NA	NA	NA	NA	NA
Government services sector	0	16,020	48,221	29,994	2,207	0	NA	NA	NA	NA	NA	NA
Domestic services of households	0	0	2,134	2,126	0	8	NA	NA	NA	NA	NA	NA
Imputed bank services	0	6,586	0	0	−6,586	0	NA	NA	NA	NA	NA	NA
Total	675	157,884	537,695	94,395	284,366	1,725	249,844	314,988	183,674	84,187	47,959	2,878

Table 4: Data available from MOEP for all 15 sectors (in mln. AED).

	SUBS	INTD	PROD	VL	VK	TX	M	E	C	J	G	TM
Agriculture	351	3,417	13,611	2,782	7,214	20	NA	NA	NA	NA	NA	NA
Crude oil and Natural gas	0	6,819	135,464	2,365	118,211	17	NA	NA	NA	NA	NA	NA
Quarrying	0	376	1,250	144	671	10	NA	NA	NA	NA	NA	NA
Manufacturing	75	43,680	95,528	7,620	41,145	215	NA	NA	NA	NA	NA	NA
Electricity	0	7,005	14,041	1,561	5,076	22	NA	NA	NA	NA	NA	NA
Construction	0	41,898	71,814	15,595	12,925	201	NA	NA	NA	NA	NA	NA
Trade	19	8,182	48,706	13,844	24,581	171	NA	NA	NA	NA	NA	NA
Restaurants and hotels	0	6,108	14,525	2,511	4,778	726	NA	NA	NA	NA	NA	NA
Transport	230	17,913	46,300	9,531	17,541	171	NA	NA	NA	NA	NA	NA
Real estate	0	3,117	34,043	1,728	27,221	96	NA	NA	NA	NA	NA	NA
Social and personal services	0	1,412	8,710	2,733	4,183	43	NA	NA	NA	NA	NA	NA
Financial corporations sector	0	1,240	24,563	3,297	18,663	32	NA	NA	NA	NA	NA	NA
Government services sector	0	16,717	50,320	30,685	2,157	0	NA	NA	NA	NA	NA	NA
Total	675	157,884	537,695	94,395	284,366	1,725	249,844	314,988	183,674	84,187	47,959	2,878

Table 5: Data from MOEP aggregated into 13 sectors (in mln. AED).

	SUBS	INTD	PROD	VL	VK	TX	M	E	C	J	G	TM
Agriculture	351	3,417	13,611	2,782	7,214	20	NA	NA	NA	NA	NA	NA
Crude oil and Natural gas and Quarrying	0	7,195	136,714	2,510	118,883	27	NA	NA	NA	NA	NA	NA
Manufacturing and Electricity	75	50,685	109,569	9,181	46,221	237	NA	NA	NA	NA	NA	NA
Construction and Real estate	0	45,015	105,857	17,323	40,145	297	NA	NA	NA	NA	NA	NA
Trade and Transport	249	26,096	95,006	23,374	42,121	342	NA	NA	NA	NA	NA	NA
Restaurants and hotels	0	6,108	14,525	2,511	4,778	726	NA	NA	NA	NA	NA	NA
Financial corporations sector	0	1,240	24,563	3,297	18,663	32	NA	NA	NA	NA	NA	NA
Government and Social and Personal services	0	18,129	59,030	33,418	6,340	43	NA	NA	NA	NA	NA	NA
Total	675	157,884	537,695	94,395	284,366	1,725	249,844	314,988	183,674	84,187	47,959	2,878

Table 6: Data from MOEP aggregated into 8 sectors (in mln. AED).

Item	Exports in mln. AED				Category
Exports	314,988				
Exports (Goods)		303,901			
Oil - Petroleum products and gas			141,184		
Crude oil exports				108,794	A
Gas exports				17,228	B
Petroleum products exports				15,162	E
Non-oil-petroleum-gas exports			162,717		
Other exports				12,967	F
Free zone exports				47,970	G
Re-exports				101,780	H
Exports (Services)		11,087			
Tourism exports			5,850		C
Transports exports			3,552		I
Direct purchases by government abroad and expenses of diplomatic missions			1,685		D

Table 7: Levels of export together with subdivisions as reported by the MOEP (in mln. AED).

	SUBS	INTD	PROD	VL	VK	TX	M	E	C	J	G	TM
Agriculture	351	3,417	13,611	2,782	7,214	20	9,897	0	NA	0	NA	114
Crude oil and Natural gas and Quarrying	0	7,195	136,714	2,510	118,883	27	36,566	126,022	NA	21,047	NA	421
Manufacturing and Electricity	75	50,685	109,569	9,181	46,221	237	54,012	101,544	NA	31,089	NA	622
Construction and Real estate	0	45,015	105,857	17,323	40,145	297	55,684	0	NA	32,051	NA	641
Trade and Transport	249	26,096	95,006	23,374	42,121	342	64,620	79,887	NA	0	NA	744
Restaurants and hotels	0	6,108	14,525	2,511	4,778	726	7,195	7,535	NA	0	NA	83
Financial corporations sector	0	1,240	24,563	3,297	18,663	32	21,870	0	NA	0	NA	252
Government and Social and Personal services	0	18,129	59,030	33,418	6,340	43	0	0	NA	0	NA	0
Total	675	157,884	537,695	94,395	284,366	1,725	249,844	314,988	183,674	84,187	47,959	2,878

Table 8: Data from MOEP aggregated into 8 sectors (in mln. AED).

		A	B	C	D	E	F	G	H	Sector Total
Production	A. Agriculture	NA	NA	NA	NA	NA	NA	NA	NA	NA
	B. Crude oil and Natural gas and Quarrying	NA	NA	NA	NA	NA	NA	NA	NA	NA
	C. Manufacturing and Electricity	NA	NA	NA	NA	NA	NA	NA	NA	NA
	D. Construction and Real estate	NA	NA	NA	NA	NA	NA	NA	NA	NA
	E. Trade and Transport	NA	NA	NA	NA	NA	NA	NA	NA	NA
	F. Restaurants and hotels	NA	NA	NA	NA	NA	NA	NA	NA	NA
	G. Financial corporations sector	NA	NA	NA	NA	NA	NA	NA	NA	NA
	H. Government and Social and Personal services	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Sector Total	3,417	7,195	50,685	45,015	26,096	6,108	1,240	18,129	157,884
Income creation	Labour income	2,782	2,510	9,181	17,323	23,374	2,511	3,297	33,418	94,395
	Capital income	7,214	118,883	46,221	40,145	42,121	4,778	18,663	6,340	284,366
Income distribution	Households									
	Government subsidies	−351	0	−75	0	−249	0	0	0	−675
	Government taxes	114	421	622	641	744	83	252	0	2,878
Institutions	Households									
	Capital									
	Government									
	ROW current	9,897	36,566	54,012	55,684	64,620	7,195	21,870	0	249,844
	ROW capital									
Total		23,072	165,574	160,647	158,809	156,707	20,675	45,321	57,887	788,692

Table 9: SAM with unknown cells for the UAE (Part I; in mln. AED).

		Sector Total	Labour income	Capital income	Income households	Income government subsidies	Income government taxes
Production	A. Agriculture	NA					
	B. Crude oil and Natural gas and Quarrying	NA					
	C. Manufacturing and Electricity	NA					
	D. Construction and Real estate	NA					
	E. Trade and Transport	NA					
	F. Restaurants and hotels	NA					
	G. Financial corporations sector	NA					
	H. Government and Social and Personal services	NA					
	Sector Total	$157,884$					
Income creation	Labour income	$94,395$					
	Capital income	$284,366$					
Income distribution	Households		$76,760$	$242,972$			
	Government subsidies	-675					
	Government taxes	$2,878$			$5,133$		
Institutions	Households				$274,584$		
	Capital			$41,394$			
	Government					-675	$9,736$
	ROW current	$249,844$	$17,635$				
	ROW capital						
Total		$788,692$	$94,395$	$284,366$	$279,717$	-675	$9,736$

Table 10: SAM with unknown cells for the UAE (Part II; in mln. AED).

		Households	Capital income	Government income	ROW current	ROW capital	Grand Total
Production	A. Agriculture	NA	0	NA	0		23,072
	B. Crude oil and Natural gas and Quarrying	NA	21,047	NA	126,022		165,574
	C. Manufacturing and Electricity	NA	31,089	NA	101,544		160,647
	D. Construction and Real estate	NA	32,051	NA	0		158,809
	E. Trade and Transport	NA	0	NA	79,887		156,707
	F. Restaurants and hotels	NA	0	NA	7,535		20,675
	G. Financial corporations sector	NA	0	NA	0		45,321
	H. Government and Social and Personal services	NA	0	NA	0		57,887
	Sector Total	183,674	84,187	47,959	314,988		788,692
Income creation	Labour income						94,395
	Capital income						284,366
Income distribution	Households			−40,015			279,717
	Government subsidies						−675
	Government taxes	1,003	460	262	0		9,736
Institutions	Households						274,584
	Capital	89,907		855			132,156
	Government	0					9,061
	ROW current			0		47,509	314,988
	ROW capital		47,509				47,509
Total		274,584	132,156	9,061	314,988	47,509	2,234,528

Table 11: SAM with unknown cells for the UAE (Part III; in mln. AED).

	A	B	C	D	E	F	G	H	Households	Capital	Government	ROWcurrent	Grand Total
A. Agriculture	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	0	23,072
B. Crude oil and Nat. gas and Quarrying	NA	NA	NA	NA	NA	NA	NA	NA	NA	21,047	NA	126,022	165,574
C. Manufacturing and Electricity	NA	NA	NA	NA	NA	NA	NA	NA	NA	31,089	NA	101,544	160,647
D. Construction and Real estate	NA	NA	NA	NA	NA	NA	NA	NA	NA	32,051	NA	0	158,809
E. Trade and Transport	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	79,887	156,707
F. Restaurants and hotels	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	7,535	20,675
G. Financial corporations sector	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	0	45,321
H. Government, Soc., and Pers. Services	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	0	57,887
Sector Total	3,417	7,195	50,685	45,015	26,096	6,108	1,240	18,129	183,674	84,187	47,959	314,988	788,692

Table 12: Unknown Sectoral Data in the SAM (in mln. AED).

	A	B	C	D	E	F	G	H	Total
A. Agriculture	0.0016	0.0000	0.0038	0.0001	0.0018	0.0000	0.0003	0.0000	0.0076
B. Crude oil and Natural gas and Quarrying	0.0000	0.0005	0.4809	0.0024	0.0000	0.0000	0.0000	0.0000	0.4839
C. Manufacturing and Electricity	0.0036	0.0098	0.1050	0.0618	0.0340	0.0019	0.0087	0.0101	0.2348
D. Construction and Real estate	0.0000	0.0020	0.0005	0.0000	0.0021	0.0001	0.0047	0.0005	0.0099
E. Trade and Transport	0.0023	0.0019	0.0231	0.0052	0.0351	0.0005	0.0085	0.0025	0.0790
F. Restaurants and hotels	0.0000	0.0003	0.0002	0.0001	0.0007	0.0000	0.0002	0.0002	0.0016
G. Financial corporations sector	0.0000	0.0018	0.0136	0.0033	0.0312	0.0012	0.0989	0.0063	0.1749
H. Government and Soc. and Pers. Services	0.0000	0.0015	0.0009	0.0003	0.0037	0.0002	0.0010	0.0009	0.0084
Total	0.0076	0.0177	0.6279	0.0732	0.1085	0.0038	0.1408	0.0205	1.0000

Table 13: IO-table for Kuwait.

	A	B	C	D	E	F	G	H	Total
A. Agriculture	0	0	0	0	0	0	0	0	0
B. Crude oil and Natural gas and Quarrying	0	0	18,505	0	0	0	0	0	18,505
C. Manufacturing and Electricity	0	0	0	0	0	0	0	0	0
D. Construction and Real estate	3,417	7,195	20,419	27,475	16,559	6,108	1,240	16,076	98,488
E. Trade and Transport	0	0	5,343	4,137	6,411	0	0	0	15,890
F. Restaurants and hotels	0	0	0	0	0	0	0	0	0
G. Financial corporations sector	0	0	0	0	0	0	0	0	0
H. Government Social and Personal services	0	0	6,419	13,403	3,126	0	0	2,053	25,000
Total	3,417	7,195	50,685	45,015	26,096	6,108	1,240	18,129	157,884

Table 14: Estimated IO-table for the UAE (in mln. AED).

		A	B	C	D	E	F	G	H	Sector Total
Production	A. Agriculture	0	0	0	0	0	0	0	0	0
	B. Crude oil and Natural gas and Quarrying	0	0	18,505	0	0	0	0	0	18,505
	C. Manufacturing and Electricity	0	0	0	0	0	0	0	0	0
	D. Construction and Real estate	3,417	7,195	20,419	27,475	16,559	6,108	1,240	16,076	98,488
	E. Trade and Transport	0	0	5,343	4,137	6,411	0	0	0	15,890
	F. Restaurants and hotels	0	0	0	0	0	0	0	0	0
	G. Financial corporations sector	0	0	0	0	0	0	0	0	0
	H. Government and Social and Personal services	0	0	6,419	13,403	3,126	0	0	2,053	25,000
	Sector Total	3,417	7,195	50,685	45,015	26,096	6,108	1,240	18,129	157,884
Income creation	Labour income	2,782	2,510	9,181	17,323	23,374	2,511	3,297	33,418	94,395
	Capital income	7,214	118,883	46,221	40,145	42,121	4,778	18,663	6,340	284,366
Income distribution	Households									
	Government subsidies	−351	0	−75	0	−249	0	0	0	−675
	Government taxes	114	421	622	641	744	83	252	0	2,878
Institutions	Households									
	Capital									
	Government									
	ROW current	9,897	36,566	54,012	55,684	64,620	7,195	21,870	0	249,844
	ROW capital									
Total		23,072	165,574	160,647	158,809	156,707	20,675	45,321	57,887	788,692

Table 15: SAM for the UAE (part I; in mln. AED).

		Sector Total	Labour income	Capital income	Income households	Income government subsidies	Income government taxes
Production	A. Agriculture	0					
	B. Crude oil and Natural gas and Quarrying	18,505					
	C. Manufacturing and Electricity	0					
	D. Construction and Real estate	98,488					
	E. Trade and Transport	15,890					
	F. Restaurants and hotels	0					
	G. Financial corporations sector	0					
	H. Government and Social and Personal services	25,000					
	Sector Total	157,884					
Income creation	Labour income	94,395					
	Capital income	284,366					
Income distribution	Households	0	76,760	242,972			
	Government subsidies	−675					
	Government taxes	2,878			5,133		
Institutions	Households	0			274,584		
	Capital			41,394			
	Government					−675	9,736
	ROW current	249,844	17,635				
	ROW capital						
Total		788,692	94,395	284,366	279,717	−675	9,736

Table 16: SAM for the UAE (part II; in mln. AED).

		Households	Capital income	Government income	ROW current	ROW capital	Grand Total GrandTotal
Production	A. Agriculture	21,676	0	1,396	0		23,072
	B. Crude oil and Natural gas and Quarrying	0	21,047	0	126,022		165,574
	C. Manufacturing and Electricity	0	31,089	28,014	101,544		160,647
	D. Construction and Real estate	26,275	32,051	1,994	0		158,809
	E. Trade and Transport	53,476	0	7,453	79,887		156,707
	F. Restaurants and hotels	12,005	0	1,135	7,535		20,675
	G. Financial corporations sector	40,124	0	5,197	0		45,321
	H. Government and Social and Personal services	30,117	0	2,770	0		57,887
	Sector Total	183,674	84,187	47,959	314,988		788,692
Income creation	Labour income						94,395
	Capital income						284,366
Income distribution	Households			−40,015			279,717
	Government subsidies						−675
	Government taxes	1,003	460	262	0		9,736
Institutions	Households						274,584
	Capital	89,907		855			132,156
	Government						9,061
	ROW current					47,509	314,988
	ROW capital		47,509				47,509
Total		274,584	132,156	9,061	314,988	47,509	2,234,528

Table 17: SAM for the UAE (part III; in mln. AED).