

Economic Diversification and Sustainable Development of GCC Countries: Tables

Table 1: Extended input-output table for Saudi Arabia based on 2010 data

	INDUSTRIES			FINAL USES			Output at basic prices	
	Agri-culture	Industry	Services	Con-sumption	Capital for-mation	Exports		
	1	2	3	4	5	6		
Input-output table for domestic output (bn SR)								
1	Agriculture	2	32	4	16	17	1	72
2	Industry	8	149	174	149	340	823	1 642
3	Services	9	108	249	648	81	52	1 147
4	Products at basic prices	18	288	427	813	438	876	2 860
5	Imports	5	52	106	169	163	79	574
6	Taxes less subsidies on prod	0	1	2	4	6	2	15
7	Products at purchasers' price	24	341	535	986	607	957	3 449
8	Compensation of employees	6	70	383				459
9	Other net taxes on product	- 4	2	5				4
10	Gross operating surplus	46	997	455				1 498
11	Value added at basic prices	48	1 069	844				1 961
12	Input at basic prices	72	1 410	1 378				
Input-output table for imports (bn SR)								
13	Agriculture	0	8	1	4	5	0	19
14	Industry	4	27	67	82	146	71	397
15	Services	1	16	37	83	13	8	158
16	Products at basic prices	5	52	106	169	163	79	574
EXTENSIONS								
Gross fixed capital formation (bn SR)								
17	Buildings	2	22	240				264
18	Transport equipment	2	21	34				57
19	Machinery and other equip	3	85	75				163
20	Total	7	129	348				484
Capital stock (bn SR)								
21	Buildings	47	282	2 785				3 114
22	Transport equipment	6	72	356				434
23	Machinery and other equip	8	771	492				1 271
24	Total	61	1 125	3 633				4 819
Employment (1.000 persons)								
25	Saudi	93	309	3 553				3 955
26	Non-Saudi	199	549	4 131				4 880
27	Total	293	858	7 684				8 835
Energy (1.000 tons oil equivalent)								
28	Crude oil, NGL and feedsto		181 727			- 5 046	294 881	471 562
29	Oil products	2 736	49 341	25 914	10 840	2 774	63 134	154 739
30	Natural gas		66 492					66 492
31	Electricity	316	5 849	5 138	9 342			20 645
32	Total	3 052	303 410	31 052	20 182	- 2 272	358 015	713 438
Air emissions (1.000 tons)								
33	Carbon dioxide (CO2)	5 931	287 027	91 187	61 806			445 950
34	Methane (CH4)	1 903	52 021	6 160	227			60 310
35	Nitrous oxide (N2O)	2 613	3 551	54	32			6 250
36	Sulfur dioxide (SO2)	58	2 056	25	46			2 185
37	Ammonia (NH3)	33	32	60	0			126
38	Nitrogen oxides (NOx)	39	642	785	91			1 556
39	Carbon monoxide (CO)	33	227	1 514	396			2 170
40	Organic compounds (NMVOC)	10	1 790	538	57			2 394
41	Hydrofluorocarbons (HFC)	6	69	117	100			291
42	Sulfur hexafluoride (SF6)	0	0	0	0			0
43	Total	10 625	347 415	100 439	62 753			521 232
Global warming, acid deposition and tropospheric ozone formation (1.000 tons)								
44	Greenhouse gases	855 913	2 480 206	237 422	76 419			3 649 960
45	Acid deposition	85	2 505	574	109			3 274
46	Tropospheric ozone	1 984	54 679	8 996	770			66 430
Water use (Mio. cubic meter)								
47	Desalinated water	50	270	586	378			1 284
48	Renewable groundwater	2 260	77	141	90			2 568
49	Non-renewable groundwater	15 298	251	425	273			16 247
50	Total	17 608	597	1 152	742			20 099

Saudi Arabia 2010

□ = Values

□ = Quantities

Source: Data from Central Department of Statistics and Information; Ministry of Economy and Planning; Ministry of Water and Electricity; International Energy Agency; World Bank; World Input-Output Database; European Commission; author's estimates.

Table 2: Input-output data for Saudi Arabia and Norway, 2005–2011

	Number of industries	Intermediate consumption of domestic products at basic prices	Intermediate consumption of imported products at basic prices	Intermediate consumption of products at basic pices	Taxes less subsidies on products	Intermediate consumption of products at purchasers' pices	Gross value added at basic prices	Output at basic prices
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Saudi Arabia (Mio. Saudi Riyal)								
2005	59	444 900	99 327	544 227	3 342	547 569	1 172 399	1 719 968
2010	59	728 715	168 027	896 742	2 830	899 572	1 960 873	2 860 445
2011	59	931 300	191 442	1 122 743	4 062	1 126 805	2 493 366	3 620 170
Norway (Mio. Norwegian Krona)								
2005	59	1 079 314	310 162	1 389 476	44 267	1 433 743	1 731 949	3 165 692
2010	65	1 468 471	448 813	1 917 284	63 684	1 980 968	2 260 620	4 241 588
2011	65	1 579 262	481 601	2 060 863	66 761	2 127 624	2 455 726	4 583 350
Saudi Arabia (Input coefficients %)								
2005	59	25.9	5.8	31.6	0.2	31.8	68.2	100.0
2010	59	25.5	5.9	31.3	0.1	31.4	68.6	100.0
2011	59	25.7	5.3	31.0	0.1	31.1	68.9	100.0
Norway (Input coefficients %)								
2005	59	34.1	9.8	43.9	1.4	45.3	54.7	100.0
2010	65	34.6	10.6	45.2	1.5	46.7	53.3	100.0
2011	65	34.5	10.5	45.0	1.5	46.4	53.6	100.0
Saudi Arabia (Sum of cumulative input coefficients/Number of industries)								
2005	59	1.5363	-	2.0067	-	-	-	-
2010	59	1.4965	-	1.7733	-	-	-	-
2011	59	1.5225	-	1.8118	-	-	-	-
Norway (Sum of cumulative input coefficients/Number of industries)								
2005	59	1.6195	-	2.0902	-	-	-	-
2010	65	1.6004	-	2.0807	-	-	-	-
2011	65	1.6130	-	2.1135	-	-	-	-
Diversity index "Backward Linkages" for Saudi Arabia (% of Reference Country Norway)								
2005	-	94.9	-	96.0	-	-	-	-
2010	-	93.5	-	85.2	-	-	-	-
2011	-	94.4	-	85.7	-	-	-	-

Source: Data from Statistics Norway; Central Department of Statistics and Information (CDSI) Saudi Arabia; author's estimates.

Table 3: Input-output data for Kuwait and Norway, 2005–2013

	Number of industries	Intermediate consumption of domestic products at basic prices	Intermediate consumption of imported products at basic prices	Intermediate consumption of products at basic prices	Taxes less subsidies on products	Intermediate consumption of products at purchasers' prices	Gross value added at basic prices	Output at basic prices
Kuwait (Mio. Kuwaiti Dinar)								
2005	80	10 716	1 450	12 166	- 752	11 414	23 900	35 314
2010	44	20 584	2 536	23 120	- 1 429	21 691	36 182	57 873
2013	50	25 776	4 518	30 294	- 1 398	28 896	53 162	82 058
Norway (Mio. Norwegian Krona)								
2005	59	1 079 314	310 162	1 389 476	44 267	1 433 743	1 731 949	3 165 692
2010	59	1 468 471	448 813	1 917 284	63 684	1 980 968	2 260 620	4 241 588
2013	59	1 655 109	558 949	2 214 058	75 509	2 289 567	2 749 018	5 038 585
Kuwait (Input coefficients %)								
2005	80	30.3	4.1	34.5	-2.1	32.3	67.7	100.0
2010	44	35.6	4.4	39.9	-2.5	37.5	62.5	100.0
2013	50	31.4	5.5	36.9	-1.7	35.2	64.8	100.0
Norway (Input coefficients %)								
2005	59	34.1	9.8	43.9	1.4	45.3	54.7	100.0
2010	59	34.6	10.6	45.2	1.5	46.7	53.3	100.0
2013	59	32.8	11.1	43.9	1.5	45.4	54.6	100.0
Kuwait (Sum of cumulative input coefficients/Number of industries)								
2005	80	1.3990	-	2.2638	-	-	-	-
2010	44	1.5783	-	2.2671	-	-	-	-
2013	50	1.5007	-	2.2412	-	-	-	-
Norway (Sum of cumulative input coefficients/Number of industries)								
2005	59	1.6195	-	2.0902	-	-	-	-
2010	65	1.6004	-	2.0807	-	-	-	-
2013	65	1.5667	-	2.0591	-	-	-	-
Diversity index "Backward Linkages" for Kuwait (% of Reference Country Norway)								
2005	-	86.4	-	108.3	-	-	-	-
2010	-	98.6	-	109.0	-	-	-	-
2013	-	95.8	-	108.8	-	-	-	-

Source: Data from Statistics Norway; Central Statistical Bureau (CSB) Kuwait; author's estimates.

Table 4: Primary Diversity Index values for Saudi Arabia and Norway

		1995	2000	2005	2010	2011
NORWAY						
Number of indigenous industries	N	33	33	33	33	33
Size	SI	1.0000	1.0000	1.0000	1.0000	1.0000
Number of non-zero elements	NON-ZERO	1090	1089	1090	1090	1090
Number of elements	N*N	1156	1156	1156	1156	1156
Density	DEN	0.9429	0.9420	0.9429	0.9429	0.9429
Condition number	CN	3.4960	3.7054	3.6340	3.9076	4.0122
Primary diversity measure	PDM	3.2964	3.4906	3.4265	3.6845	3.7832
SAUDI ARABIA						
Number of indigenous industries	N	33	33	33	33	33
Size	SI	1.0000	1.0000	1.0000	1.0000	1.0000
Number of non-zero elements	NON-ZERO	1052	1053	1066	1077	1077
Number of elements	N*N	1156	1156	1156	1156	1156
Density	DEN	0.910	0.911	0.922	0.932	0.932
Condition number C	CN	3.2999	3.0747	3.3256	3.5792	3.9049
Primary diversity measure	PDM	3.0030	2.8008	3.0666	3.3346	3.6380
Diversity index	PDM_{SA}/PDM_{NO}	0.9110	0.8024	0.8950	0.9051	0.9616

Source: Data from OECD Input-Output Tables.

Table 5: Adjusted net national savings as a test for sustainable development: all GCC countries, 2014

	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	United Arab Emirates	Norway		
Population	1.336	3.782	Population (Mio. persons)		3.961	2.374	30.777	9.071	5.137
Gross domestic product	24,983	42,996	20,458	86,853	24,575	44,450	97,200	US \$ per person	
+ Net income from abroad	-4,238	4,135	-1,097	-3,917	440	73	3,572		
= Gross national income (GNI)	20,745	47,131	19,361	82,936	25,016	44,522	100,772		
- Consumption of fixed capital	-1,310	-3,262	-2,753	-12,063	-2,182	-3,198	-16,050		
= Net national income	19,435	43,869	16,608	70,873	22,834	41,324	84,721		
- Natural resources depletion	-1,753	-6,088	-6,053	-3,430	-3,204	-2,654	-6,207		
= Adjusted net national income	17,682	37,781	10,556	67,443	19,630	38,670	78,515		
Gross national income (GNI)	20,745	47,131	19,361	82,936	25,016	44,522	100,772	US \$ per person	
- Final consumption	-14,145	-20,094	-9,682	-27,140	-14,288	-30,697	-61,173		
+ Net transfers from ROW	-1,769	-5,466	-2,601	-7,376	-1,259	-	-1,692		
= Gross national saving (GNS)	4,831	21,572	7,078	48,420	9,469	-	37,907		
- Consumption of fixed capital	-1,310	-3,262	-2,753	-12,063	-2,182	-3,198	-16,050		
= Net national saving	3,521	18,309	4,325	36,357	7,287	-	21,857		
+ Education expenditure	604	1,496	893	2,100	1,799	-	6,849		
- Energy depletion	-1,753	-6,087	-6,051	-3,430	-3,199	-2,654	-6,200		
- Mineral depletion	0	0	-1	0	-5	0	-7		
- Net forest depletion	0	0	0	0	0	0	0		
- Carbon dioxide damage	-210	-268	-197	-422	-199	-241	-98		
- Particulate emission damage	-18	-29	-21	-35	-37	-112	-38		
= Adjusted net national saving	2,144	13,421	-1,052	34,570	5,646	-	22,363		

Source: World Bank, World Development Indicators, March 2018.

Table 6: Adjusted net national savings as a test for sustainable development: Kuwait, 1995–2015

	1995	2000	2005	2010	2011	2012	2013	2014	2015
Gross national income (GNI)	32,074	44,410	87,979	123,881	163,208	186,767	187,416	178,272	127,259
Gross domestic product	84.8	84.9	91.8	93.2	94.4	93.2	92.9	91.2	90.0
+ Net income from abroad	15.2	15.1	8.2	6.8	5.6	6.8	7.1	8.8	10.0
= Gross national income (GNI)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
- Consumption of fixed capital	-7.6	-6.2	-6.2	-7.1	-6.0	-5.6	-5.6	-6.9	-7.4
= Net national income	92.4	93.8	93.8	92.9	94.0	94.4	94.4	93.1	92.6
- Natural resources depletion	-5.3	-7.5	-11.9	-9.6	-14.0	-15.3	-14.1	-12.9	-9.6
= Adjusted net national income	87.1	86.3	81.9	83.3	80.0	79.0	80.3	80.2	83.0
Gross national income (GNI)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
- Final consumption	-63.5	-53.5	-44.0	-42.9	-36.9	-36.1	-38.6	-42.6	-59.2
+ Net transfers	-4.6	-4.4	-3.9	-9.9	-8.8	-8.9	-10.2	-11.6	-13.0
= Gross national saving (GNS)	32.0	42.1	52.2	47.2	54.3	55.0	51.2	45.8	27.8
- Consumption of fixed capital	-7.6	-6.2	-6.2	-7.1	-6.0	-5.6	-5.6	-6.9	-7.4
= Net national savings	24.4	35.8	45.9	40.2	48.3	49.3	45.6	38.8	-
+ Education expenditure	5.2	5.2	4.0	3.2	3.2	3.2	3.2	3.2	3.2
- Energy depletion	-5.3	-7.5	-11.9	-9.6	-14.0	-15.3	-14.1	-12.9	-9.6
- Mineral depletion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Net forest depletion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Carbon dioxide damage	-1.0	-0.8	-0.7	-0.7	-0.5	-0.5	-0.5	-0.6	-
- Particulate emission damage	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
= Adjusted net national saving	23.1	32.6	37.3	32.9	36.8	36.6	34.0	28.4	-

Source: World Bank, World Development Indicators, March 2018.

Table 7: Adjusted net national savings as a test for sustainable development: Saudi Arabia, 1995–2015

	1995	2000	2005	2010	2011	2012	2013	2014	2015
	Million US \$ at current prices								
Gross national income (GNI)	145,534	190,407	331,174	535,251	680,923	745,670	757,616	769,903	670,763
	% of gross national income (GNI)								
Gross domestic product	98.5	99.5	99.2	98.7	98.6	98.7	98.6	98.2	97.2
+ Net income from abroad	1.5	0.5	0.8	1.3	1.4	1.3	1.4	1.8	2.8
= Gross national income (GNI)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
- Consumption of fixed capital	-10.6	-8.6	-8.2	-8.3	-7.1	-7.3	-8.5	-8.7	-9.1
= Net national income	89.4	91.4	91.8	91.7	92.9	92.7	91.5	91.3	90.9
- Natural resources depletion	-7.0	-11.8	-17.1	-13.0	-15.7	-15.4	-14.1	-12.8	-7.5
= Adjusted net national income	82.4	79.5	74.7	78.7	77.2	77.3	77.5	78.5	83.4
	% of gross national income (GNI)								
Gross national income (GNI)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
- Final consumption	-69.0	-61.7	-47.3	-51.8	-45.8	-47.8	-51.6	-57.1	-68.2
+ Net transfers	-11.5	-8.1	-4.5	-5.2	-4.3	-4.1	-4.7	-5.0	-6.7
= Gross national saving (GNS)	19.5	30.1	48.3	43.0	49.9	48.1	43.6	37.9	25.1
- Consumption of fixed capital	-10.6	-8.6	-8.2	-8.3	-7.1	-7.3	-8.5	-8.7	-9.1
= Net national savings	8.9	21.5	40.0	34.7	42.7	40.8	35.2	29.1	16.0
+ Education expenditure	5.4	7.1	7.3	7.2	7.2	7.2	7.2	7.2	7.1
- Energy depletion	-7.0	-11.8	-17.1	-13.0	-15.7	-15.4	-14.0	-12.8	-7.5
- Mineral depletion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Net forest depletion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
- Carbon dioxide damage	-1.0	-1.1	-1.0	-0.9	-0.7	-0.7	-0.8	-0.8	-
- Particulate emission damage	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1
= Adjusted net national saving	6.1	15.5	29.0	27.8	33.3	31.7	27.4	22.6	-

Source: World Bank, World Development Indicators, March 2018.