Chapter 5. Checking the Boundary-lines and Finding Limitations

In Chapter 4, resource rents and institutions are qualified as the boundary-lines to distinguish between the resource cursed countries and the resource curse avoided/escaped countries. The purpose of this chapter is to test the chosen boundary-lines to verify that they can be utilized to project the possibility of the solar energy curse in the future. Both qualified boundary-lines will be individually tested in this chapter.

5.1 Resource Rent and its Contribution to GDP & GDP Growth as the Boundary-line

When employing resource rents as a boundary-line to identify resource curse affected countries, one is faced with a great difficulty. Although it may be true that many resource-rich countries are suffering from the resource curse, it is however not sufficient to say that the resource rent itself is the cause of the resource curse as it is rather the way the resource rent is being used or utilized. Nevertheless, as resource rents is considered as the boundary-line, It is necessary to analyze whether it could potentially function as the boundary-line.

Economic growth plays a relatively large role in examining whether a county is affected by the resource curse or not. This is because, as mentioned in chapter 2, the poor economic growth of a resource-rich economy is often regarded as a consequence of the resource curse. Sachs & Warner (1997) consider a country to be suffering from the resource curse if it has a high share of resource exports in GDP and, during that period, experiences a poor economic growth rate compared to similar countries or an average region value. For instance, as mentioned in section 4.2.1, they look at 97 countries, between 1971 and 1989, using regression analysis to measure the impact of mineral and other resource exports share on GDP. Their finding is that an economy with a high share of resource exports to GDP in 1971 had a very slow growth rate. Here, the resource exports share of GDP will be perceived as the impact of the resource rents in this section. In other words, the resource exports share of GDP can represent the resource rent's impact, and it would be worth trying to use this as the boundary-line to find which countries are affected by the resource curse. Therefore, based on Sachs & Warner's (1995,1997) approach, this section will attempt to find whether the five North African countries are affected by the resource curse by looking at the resource export share in GDP and comparing the GDP growth during the same period.

When identifying which North African countries have been affected by the resource curse, Algeria and Libya (and possibly Egypt) stand out. However, as mentioned before, the energy

importers, Morocco and Tunisia (also Egypt) will be included in the process in this section as it will help one to see their current position compared to the countries affected by the resource curse. For example, if the rent size of solar energy can be projected, one can see how much its share will be of their GDP. If this 'share of the resource rent in GDP boundary-line' were to work, one can project if the energy importers have the potential to suffer from a solar energy curse.

As Sachs & Warner (1997) argue, the comparison should be made within countries with similar development statuses or an average region value. Therefore, taking the five North African countries in the GDP growth comparison is appropriate as they are in the same region and are all developing countries. However, the comparison only among the five countries will not provide accurate results as there are only three countries, Algeria, Libya and Egypt, which have the potential to be affected by the resource curse. Furthermore, Egypt occupies a unique position as it is both an exporter and importer of energy. Accordingly, one should broaden the range for the comparison in order to achieve more accurate results. Here, the MENA countries are considered suitable to be in the comparison as most of the MENA countries are developing countries, and they are in the same/close region. Therefore, the whole MENA region will be included in the process of comparing the GDP growth. One should note that the MENA region/countries are defined differently dependent on how one views them. For example, the World Bank considers 19 countries[11] as the MENA countries whereas the International Monetary Fund (IMF) considers 20 countries[12] as the MENA countries. Therefore, in this section, there will be three MENA country groups in accordance to the World Bank, the IMF, and the mutual countries selected from the World Bank and the IMF.

First, the average GDP growth during the period of 1993-2011 in the five North African countries and the average of the MENA countries will be compared in order to see where these five North African countries stand within the region. The reason for choosing the period 1993-2011, instead of a longer period, is due to the purpose of this thesis. If one is to just focus on the current resource curse, it should, indeed, choose to consist of a longer period of time. However, this thesis is dealing with solar energy, and its potential curse. As the use of solar energy in this region is still in its infancy, GDP growth in earlier period prior to the introduction of solar energy is not as relevant as the chosen period of focus. Therefore, for continuous future studies, it makes more sense to see recent GDP growth. Also, some may argue that, if this thesis were to only focus on the future, one should just use the GDP growth of the most recent year rather than the average GDP growth over a longer time frame. However, only looking at the GDP growth of a single year would not produce an accurate

[11] Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Syria, Tunisia, UAE, West Bank and GAZA, Yemen

[12] Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, UAE, Yemen

result as the GDP growth of a single year in a country may be greatly different from the previous or following year due to various reasons such as political changes or volatility of the resource they export. Furthermore, this section is based on Sachs & Warner's (1995,1997) idea which compares the economic growth of countries with a high share of resource exports in GDP in the same period of time to find which countries are in the resource curse.

Table 5: Average GDP Growth between 1993 and 2011 in the Five North African Countries, the NA and the MENA Countries[13]

Algeria	**Egypt**		**Libya**	**Morocco**		**Tunisia**	**The Five GDP Average (IMF)**	
2.98	4.84		1.74	4.04		4.22	3.56	
MENA GDP Average (World Bank)			**MENA GDP Average (IMF)**			**MENA GDP Average (World Bank & IMF)**		
All	Exclude the five	ME/NA	All	Exclude the five	ME/NA	All	Exclude the five	ME/NA
4.54	4.89	5.14/3.24	4.57	4.90	5.21/3.61	4.47	4.74	4.97/3.61

Source: World Economic Outlook Database September 2011, World Development Indicators (WDI)

As can be seen from the comparison in table 5, the average GDP growth for the energy exporters, Algeria and Libya, is lower than the average GDP growth of the MENA, ME, and NA countries and also within the five North African countries. However, if Egypt is considered as an energy exporter, it can be argued that energy exporters experience higher economic growth than other countries in the region as well as achieving higher economic growth than the average MENA and NA countries. However, its GDP growth is below the average GDP growth of the ME countries.

Table 5 also presents the comparisons among the average GDP growth of the MENA, the average GDP growth of the MENA excluding the five North African countries and the average GDP growth in the ME and NA regions. Despite which countries are considered to be in the MENA region, it can be perceived that the average GDP growth of the MENA region increases when excluding the five North African countries. Another finding is that the ME region, in general achieved higher economic growth compared to the NA region.

Overall, table 5 shows that the two energy exporters, Algeria and Libya, have been performing poorly in their economic growth when compared to the other MENA countries in general. However,

[13] The World Economic Outlook Database September 2011 does not provide the full annual GDP growth for all the countries. For Iraq, it there was missing years, 1993 to 2004. Therefore, the World Bank Development Indicator was used to present the period 1998-2004, but still missing 1993 to 1997. The GDP growth for West Bank and GAZA was also provided from the World Bank Development Indicator which covered 1995-2005. Also, the GDP growth in 2011 for Libya is missing.

the comparisons that are made in table 8 provide insufficient results to consider that the two energy exporters and other MENA countries are affected by the resource curse. In order to specifically identify which countries are affected by the resource curse, one should make the comparison among energy exporters. This comparison was made in table 5, but only among the five North African countries, technically only between Algeria and Libya, thus producing inaccurate results. Therefore, in order to achieve more accurate results, the MENA region should be divided into energy exporters and importers. Also, in the bigger picture, when the comparison is made between energy exporters and importers, it will enable one to see whether energy importers really outperform energy exporter in general, at least within the region. This process may not show which countries are affected by the resource curse individually, but it may show that if the resource-rich countries are outperformed by the resource-poor countries as mentioned in section 2.2, thus proving the existence of the resource curse itself.

When dividing the five countries into the energy exporters and importers, the placing of Egypt becomes problematic. Egypt can not be excluded from the category of energy exporters, nor energy importers. When compared to Algeria and Libya, Egypt may not be considered as an energy exporter as its oil and natural gas rents share of the GDP is substantially lower than the other two countries. For example, the average oil and natural gas rents share of the GDP in the period of 1993-2009 for Algeria, Egypt and Libya were 26.65 percent, 12 percent, and 42 percent, accordingly.[14] However, the share of oil and natural gas rents to take 12 percent of the GDP is not a small amount. For example, Mehlum et al. (2006b, p.1) considers that 10 percent resource export share in the GDP as a high rate. In other words, Egypt can be considered as both energy exporter and importer. Therefore, when comparing energy exporters and importers in the MENA and NA regions, all the comparison that are made will present the results including/excluding the average GDP growth of Egypt in both of the exporters and importers categories. Also, it would mean that countries which are considered as energy exporters in this section should have more than 10 percent share of oil, natural gas and other mineral resources exports in their GDP during the period of 1993-2009[15] which are presented in table 6 below. As can be perceived from table 6, Algeria, Bahrain, Egypt, Iran, Iraq, Kuwait, Libya, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates (UAE), and Yemen will be considered as energy exporters.

[14] See table 6.

[15] The year 2010 and 2011 are not provided by the World Development indicators.

Table 6: Resource Rents (% of GDP) of the MENA Countries during the Period of 1993-2009

Country	Mineral Rents (% GDP)	Natural gas rents (% GDP)	Oil rent (% of GDP)	Total rents (% of GDP)
Algeria	0	13	13.65	26.65
Bahrain	0	8.06	18.47	26.43
Djibouti	0	0	0	0
Egypt	0.06	4.65	7.29	12
Iran	0.12	6.35	25.88	32.35
Iraq[16]	0	1.33	86.75	88.08
Israel	0	0	0	0
Jordan	0	0	0	0
Kuwait[17]	0	2.5	45.38	47.88
Lebanon	0	0	0	0
Libya	0	3	39	42
Mauritania				
Morocco	0.82	0	0	0.82
Oman	0	7.35	34.18	41.53
Qatar	0	14.41	24.82	39.23
Saudi Arabia	0	3.06	39.82	42.88
Syria	0.12	2.76	21.71	24.59
Tunisia	0	3.04	3.94	6.98
UAE	0	5.53	24.59	30.12
West Bank and Gaza	0	0	0	0
Yemen	0	0	31.82	31.82

Source: World Development Indicators (WDI)

[16] The average is made between 1997 and 2009 as the year between 1993 and1996 is not provided.
[17] The average is made between 1993 and 2008 as the year 2009 is missing.

Table 7: Average GDP Growth Comparison between Energy Exporters of the NA and the MENA Countries 1993-2011[18] (%)

(Numbers in brackets present the GDP growth excluding Egypt)

Algeria, Egypt, Libya		3.19%
Algeria, Libya		2.36%
World Bank	MENA	4.79% (4.93%)
	Exclude Algeria, Libya	5.43%
	Exclude Algeria, Egypt, Libya	5.5%
	ME	5.5%
	NA	3.19% (2.36%)
IMF	MENA	4.65% (4.74%)
	Exclude Algeria, Libya	5.12%
	Exclude Algeria, Egypt, Libya	5.14%
	ME	5.23%
	NA	3.8% (3.54%)
World Bank + IMF	MENA	4.65%
	Exclude Algeria, Libya	5.12%
	Exclude Algeria, Egypt, Libya	5.14%
	ME	5.23%
	NA	3.8% (3.54%)

Source: World Economic Outlook Database September 2011, World Development Indicators (WDI)

Table 7 presents the GDP growth comparisons among the energy exporters in the five North African countries, the MENA energy exporters, the MENA energy exporters excluding the energy exporters of the five North African countries, and the ME and NA energy exporters. One can see that the average GDP growth of the energy exporters of the five North African countries, whether including/excluding Egypt, is lower than the average GDP growth of the energy exporters of the MENA, ME and NA countries, except for the result from the World Bank for the NA region.[19] This may mean that the North African energy exporters may be closer to the resource curse than the other countries in the region.

Despite which countries are considered in the MENA region or not, according to table 7, it

[18] The World Economic Outlook Database (September 2011) does not provide the full annual GDP growth for all the countries. For Iraq, it there was missing years, 1993 to 2004. Therefore, the World Bank Development Indicator was used to present the period 1998-2004, but still missing 1993 to 1997. The GDP growth for West Bank and GAZA was also provided from the World Bank Development Indicator which covered 1995-2005. Also, the GDP growth in 2011 for Libya is missing.

[19] The average GDP growth of the energy exporters of the five North African countries is the same as the average GDP growth of the NA countries from the World Bank's result. It is due to the fact that the energy exporters from the five North African countries are the only countries that are considered as energy exporters in the World Bank's result.

appears the ME energy exporters, in general, perform better in their economies compared to the NA energy exporters. However, it would be incorrect to assume that all NA energy exporters perform worse economically, or closer to the resource curse, than the ME energy exporters because, for instance, Sudan achieved higher average GDP growth (5.68 percent) than many ME energy exporters which achieved the third highest average GDP growth in the MENA region during the period of 1993-2011 (world Economic outlook Database, September 2011). This may also be the reason why the average GDP growth of the NA countries excluding the three North African energy exporters is higher than the average GDP growth of the energy exporters of the five North African countries whether including/excluding Egypt.

Nevertheless, what can be concluded from table 7 is that, though it may provide uncertain information about which region, ME or NA, is closer to the resource curse, one could argue that the North African energy exporters are closer to the resource curse than the other countries in the region in general when comparing the average GDP growth.

Table 8: Average GDP Growth: Comparison among the Energy Importers of the MENA, ME, NA, and the North African Energy Importers 1993-2011

Egypt, Morocco, Tunisia	4.37	
Morocco, Tunisia	4.13	
World Bank	MENA	3.98
	Exclude Morocco, Tunisia	3.93
	Exclude Egypt, Morocco, Tunisia	3.74
	ME	4.28
	NA	3.49 (3.15)[20]
IMF	MENA	4.12
	Exclude Morocco, Tunisia	4.12
	Exclude Egypt, Morocco, Tunisia	3.88
	ME	5.02
	NA	3.68 (3.29)[21]
World Bank + IMF	MENA	3.98
	Exclude Morocco, Tunisia	3.93
	Exclude Egypt, Morocco, Tunisia	3.74
	ME	4.28
	NA	3.49 (3.15)[22]

Source: World Economic Outlook Database September 2011, World Development Indicators (WDI)

[20] Excluding Egypt.
[21] Excluding Egypt.
[22] Excluding Egypt.

Table 8 presents comparisons among the average GDP growth of the North African energy importers, the MENA energy importers, the MENA energy Importers excluding the three North African countries and the ME and NA energy importers. As can be seen from table 8, the average GDP growth of the energy importers of the North African countries, whether including/excluding Egypt, was higher than the average GDP growth of the energy importers of the MENA countries and the NA countries. However, the result varies when it is compared to the ME region.

From the result based on World Bank and World Bank + IMF, the average GDP growth of the three North African countries is higher than the ME countries. However, when Egypt is excluded, the two North African countries' average GDP growth is lower than the ME countries. This is because, in the three North African countries, Egypt (4.84 percent) has comparably higher average GDP growth than Morocco (4.04 percent) and Tunisia (4.22 percent). Also, in the ME energy importers, though other countries achieved relatively high average GDP growth, West Bank and GAZA (2.73 percent) performed exceptionally poor compared to the other ME countries which appears as the reason why the average GDP growth of ME countries is substantially low.

For the result from the IMF, the average GDP growth of the three North African importers, whether including/excluding Egypt, was lower than the ME countries. It is due to the fact that energy importers, according to the IMF result, from the ME region are only Jordan (5.45 percent) and Lebanon (4.58 percent) which have relatively higher average GDP growth compared to the NA energy importers. For example, Jordan's average GDP growth is higher than all the individual NA countries, and Lebanon also has a higher average GDP growth than the NA countries except for Egypt. The comparison between the energy importers in the MENA region seems more complex than for the energy exporters. This may be due to the fact that out of 23 MENA countries, combining the countries from the World Bank and IMF, only seven countries are energy importers, and it makes the difference in their individual average GDP growth steeper. In other words, the average GDP growth substantially changes accordance of which countries to be included/excluded. Despite which countries to be considered in the MENA region, table 8 suggests that the ME energy importers, in general, performed better in their economies than the NA energy importers.

When one compares table 7 and table 8, a number of interesting results can be obtained. If one compares the average GDP growth between the North African energy exporters and importers, whether including/excluding Egypt, the energy importers achieved higher average GDP growth. In other words, the idea that resource-poor countries outperform resource-rich countries works. However, when looking at the comparison made outside of the five North African countries, which shows broader sites, most of the results are opposite except for the World Bank's result between the NA energy exporters and energy importers.

As can be concluded from the comparisons made above, the average GDP growth comparison alone does not seem to be the method that one can fully rely on in finding the resource curse as some energy export dependent countries achieve higher average GDP growth than energy importers, vice versa, and there is also a huge difference in the GDP growth among individual energy importers/exporters in the MENA, ME and NA region. However, this is not to say that the comparison of the GDP growth is a useless method in finding the resource curse. It definitely has the potential to function as a tool in identifying the resource curse but, as mentioned earlier, the average GDP growth comparison alone does not seem to have the ability to provide a clear distinction between the resource cursed and the non-resource cursed countries, or even the existence of the resource curse, thus inaccurate. In other words, more precise method should be implemented and used in order to achieve a better result in finding the resource curse.

5.2 Applying other 'Filters' on the GDP Growth Comparison Methods

One of the major problems in the average GDP growth comparison made in section 5.1 may be that it focused on classifying, and separating, the MENA countries and the five North African countries based on only their statuses of being energy exporter/importer. One could also argue that there are other factors that can put the MENA countries into different categories. Therefore, this section will apply some other 'filter's on the GDP growth comparison method for its improvement, and see whether it could provide more efficient results.

5.2.1 Income Level

The World Bank classifies economies into five groups based on their income level, low income economies, lower-middle income economies, upper-middle income economies, high income economies, and high income OECD members (World Bank Data Countries and Economies). The Gross National Income per capita is the main criterion for classifying economies.

Here, economies with low income levels and middle income levels are sometimes referred to as developing economies by the World Bank (World Bank Data How we Classify Countries). Many MENA countries are considered as developing countries as well. When the MENA countries are separated into energy exporters and importers, these countries can be separated again via different income-level given by the World Bank. Therefore, this section will test the World Bank's 'income level' filter on the GDP growth comparison method in order to see if the GDP growth comparison method can improve.

Table 9: Breaking the MENA Countries into Different Income Level Categories[23]

World Bank + IMF	Energy Exporters	Energy Importers
High income	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia**, United Arab Emirates	Israel*
Upper middle income	Algeria, Iran, , Libya, Tunisia	Jordan, Lebanon
Lower middle income	Egypt***, Iraq, Mauritania**, Morocco, Sudan**, Syria, *, Yemen	Djibouti, Egypt***, West Bank GAZA

Source: The World Bank Data Countries and Economies
http://data.worldbank.org/country (accessed: 21.02.2012)

Table 9 divides the MENA countries into three categories according to their income levels. What one can notice from table 9 is that there are no NA countries with the high income level, and there are six ME energy exporters with the high income level. Though it is not certain, this fact may have played a significant role for the results provided from the GDP growth comparisons made in 5.1 where the MENA and ME energy exporters have higher average GDP growth compared to the energy importers which is opposite of what Sachs & Warner (1997) argue.

Table 10: Dividing the MENA Countries according to the Income Level

Upper Middle Income MENA countries Average GDP Growth (1993-2011)						
Algeria	Libya	Tunisia	The Three Average	Upper middle (World Bank)	Upper middle (IMF)	Upper middle (World Bank & IMF)
2.98	1.74	4.22	2.98	3.83	3.83	3.83
Lower Middle Income MENA Countries Average GDP Growth (1993-2011)						
Egypt	Morocco	The Two Average	Lower middle (World Bank)	Lower middle income (IMF)	Lower middle (World Bank & IMF)	
4.84	4.04	4.44	3.82	4.18	4.02	

Source: World Economic Outlook Database, September 2011, World Development Indicators (WDI), World Bank Data GDP growth (Annual%)

Table 10 presents the average GDP growth comparison between the five North African countries and the other upper and the middle income MENA countries. High income countries are excluded in this comparison because none of the five North African countries have high income level.

For the upper-middle income countries, Algeria and Libya have lower average GDP growth than

[23] * only from the World Bank, **only from the IMF ***Both energy exporter/importer

the average GDP growth of the MENA countries. It is only Tunisia that has a higher average GDP growth compared to the other upper-middle income MENA countries. Here, it should be noted that Tunisia and the rest of the upper-middle income MENA countries, Jordan (5.45 percent) and Lebanon (4.58 percent), are energy importers, and Algeria and Libya are energy exporters. In other words, within the upper-middle income MENA countries, the energy importers outperform the energy exporters.

In the case of lower-middle income MENA countries, however, the result is different from the upper-income MENA countries. The average GDP growth of Egypt and Morocco is higher than the average GDP growth of the lower-middle income countries. However, when the average GDP growth of Egypt and Morocco are separately compared to the lower-middle income MENA countries, it is only Egypt that has a higher average GDP growth. Morocco also achieves the higher average GDP growth compare to the lower-middle income MENA countries, however, not from the IMF result. It is due to the fact that the IMF includes Sudan (5.68 percent) and Iraq (5.59 percent) as the lower-middle income countries which have higher average GDP growth than Morocco. Also, regarding the lower-middle income MENA countries, the case that the energy importers outperform the energy exporters does not apply. When using the result from the World Bank + IMF, there are nine lower-middle-income MENA countries[24], and already four countries, Sudan Iraq, Egypt (if considered as an energy exporter), and Yemen, have the better average GDP growth than the energy importers.

Furthermore, the lower-middle income countries from the five North African countries (Egypt and Morocco) achieve better average GDP growth than the upper-middle income countries (Algeria, Libya and Tunisia). A more extreme case can be also witnessed where Egypt (4.84 percent) has a higher average GDP growth than some of the high income MENA countries such as Oman (4.25 percent) and Saudi Arabia (2.79 percent). These facts show the income level does not always correlate with the average GDP growth which suggests that the pure combination of the income level and the average growth may not be a suitable method in finding the resource curse. However, one should take careful consideration when deciding to eliminate such a method as adding few critical filters may improve the method such as 1) the separation between the energy importers and the exporters in the region; 2) separation between the ME and NA countries as the ME countries perform better than the NA countries in terms of the GDP growth which is found in 5.1.

[24] Sudan, Iraq, Egypt, Morocco, Mauritania, Syria, West Bank GAZA, Djibouti.

Table 11: Dividing the MENA Countries according to the Income Level after adding the Two Filters 1993-2011

Upper Middle Income MENA Countries			**Upper Middle Income MENA Exporters**			**Upper Middle Income MENA Importers**		
WB	IMF	WB+IMF	WB	IMF	WB+IMF	WB	IMF	WB+IMF
3.83	3.83	3.83	2.9	2.9	2.9	5.02	5.02	5.02
Lower Middle Income MENA Countries			**Lower Middle Income MENA Exporters**			**Lower Middle Income MENA Importers**		
WB	IMF	WB+IMF	WB	IMF	WB+IMF	WB	IMF	WB+IMF
3.82	4.18	4.36	4.59 (4.51)	4.63 (4.59)	4.63 (4.59)	3.31 (2.79)	3.50 (2.83)	3.31 (2.79)
Upper Middle Income ME Countries			**Upper Middle Income ME Exporters**			**Upper Middle Income ME Importers**		
WB	IMF	WB+IMF	WB	IMF	WB+IMF	WB	IMF	WB+IMF
4.67	4.67	4.67	3.98	3.98	3.98	5.02	5.02	5.02
Lower Middle Income ME Countries			**Lower Middle Income ME Exporters**			**Lower Middle Income ME Importers**		
WB	IMF	WB+IMF	WB	IMF	WB+IMF	WB	IMF	WB+IMF
4.07	4.51	4.36	4.51	4.51	4.51	2.73	-	2.73
Upper Middle Income NA Countries			**Upper Middle Income NA Exporters**			**Upper Middle Income NA Importers**		
WB	IMF	WB+IMF	WB	IMF	WB+IMF	WB	IMF	WB+IMF
2.98	2.98	2.98	2.36	2.36	2.36	4.22	4.22	4.22
Lower Middle Income NA Countries			**Lower Middle Income NA Exporters**			**Lower Middle Income NA Importers**		
WB	IMF	WB+IMF	WB	IMF	WB+IMF	WB	IMF	WB+IMF
3.50	3.98 (3.77)	3.98 (3.77)	4.84	4.75 (4.71)	4.75 (4.71)	3.50 (2.83)	3.50 (2.83)	3.50 (2.83)

Source: World Economic Outlook Database September 2011, World Development Indicators (WDI), The World Bank Data GDP growth(annual%)

Table 11 presents the results after applying the two filters offered earlier. In the case of the energy exporters for all the MENA, ME, and NA regions, all the lower-middle income exporters outperformed the upper-middle income exporters. However, in the case of the energy importers for all the MENA, ME, and NA regions, exactly the opposite results have been achieved. Therefore, this disproves the assumption that a high-income economy has a higher level of GDP growth.

For the comparison among the upper-middle income MENA, ME and NA countries, as seen earlier, the energy importers outperform the energy exporters. However, in the lower-middle income countries comparisons, complete opposite results are obtained. In all separate comparisons among the MENA, ME and NA regions, all the lower-middle income energy exporters outperform the energy importers.

Above finding shows that the use of this method, which is based on the correlation between the income level and status of being energy exporter/importer, is problematic in identifying the resource curse. Furthermore, it is found that there is no clear correlation between income level and GDP growth. Also, the use of the second filter, the separation between the ME and NA countries, produced another complication rather than improving the method. For example, West Bank and Gaza is the only lower-middle income ME importer, result from the World Bank and the World Bank + IMF, and, there is not even a single lower-middle income ME importer from the IMF result. Similar case can be found in the upper-middle income ME exporters (only Iran), the upper-middle income NA importers (only Tunisia), and the lower-middle income NA exporters from the World Bank result (only Egypt). The GDP growth comparison between a single country and the average of few countries, of course, produces an inaccurate result.

The results from table 11 proves that the method combining the income level, the average GDP growth, and the country's status (regarding being an exporter/importer) is problematic when attempting to identify the resource curse. The failure of this method may be due to the combination of these three factors which complicates the process. However, perhaps, the main problem of this method is the indirect use of the income level as the development statuses of the countries. As seen earlier, a country with a higher income level does not mean that its average GDP growth is higher. Therefore, one needs to adapt a better filter to separate the countries which may bring more successful results.

5.2.2 Development Status

Although the method in 5.2.1 appears to have failed in identifying the resource curse, it has provided a useful point. As mentioned earlier, the World Bank refers low income and middle income economies as developing countries. Also, when considering the MENA countries, all the upper and lower middle income MENA countries are regarded as developing countries (World Bank Data Countries and Economies). However, classification of the countries by income level does not necessarily mean that it reflect development status (World Bank Data How we Classify Countries). Therefore, instead of using the income level, this section will apply the development status on the GDP growth comparison method.

One of the major problems in the method presented in 5.2.1 is that it concentrates too much in narrowing down and separating the countries into certain groups to achieve desired results. Therefore, this section will use a simpler method; the combination of the development status and the division of the countries between energy exporters and importers groups. Here, it must be

mentioned that, though all the upper and lower middle income MENA countries are considered as developing countries according to the World Bank, four countries, Djibouti, Mauritania, Sudan, and Yemen, are considered as the 'least developed countries' according to the UN classification (UNCTAD, 2011, p. xi). As the development status is a major filter in this method, if a group is to contain the least developed countries, their average GDP growth will be calculated both with/without the least developed countries in this method. As none of the five North African countries are classified as a developed country, this ranking can be excluded from this analysis.

Table 12: Seeing the GDP Growth in the MENA Region: Dividing the MENA Countries according to the Development Status and Exporters/Importers 1993-2011[25]

The average GDP growth of the MENA developing countries (%)	World Bank	3.82 <3.98> (3.74) [3.89]
	IMF	4.03 <4.1> (3.97) [4.02]
	World Bank + IMF	3.94 <3.98> (3.88) [3.89]
The average GDP growth of the MENA developing energy exporters (%)	World Bank	3.87 <3.79> (3.71) [3.57]
	IMF	4.05 <3.79> (3.96) [3.57]
	World Bank + IMF	4.05 <3.79> (3.96) [3.57]
The average GDP growth of the MENA developing energy importers (%)	World Bank	3.92 <4.31> (3.77) [4.20]
	IMF	4.12 <4.63> (3.98) [4.57]
	World Bank + IMF	3.92 <4.31> (3.77) [4.20]
The average GDP growth of the ME developing energy exporters (%)	World Bank	4.38 <4.38>
	IMF	4.38 <4.38>
	World Bank + IMF	4.38 <4.38>
The average GDP growth of the ME developing energy importers (%)	World Bank	4.25
	IMF	5.02
	World Bank + IMF	4.25
The average GDP growth of the NA developing energy exporters (%)	World Bank	3.19 (2.36)
	IMF	3.8 <3.19> (3.54) [2.36]
	World Bank + IMF	3.8 <3.19> (3.54) [2.36]
The average GDP growth of the NA developing energy exporters (%)	World Bank	3.68 <4.37> (3.29) [4.13]
	IMF	3.68 <4.37> (3.29) [4.13]
	World Bank + IMF	3.68 <4.37> (3.29) [4.13]
The average GDP growth of the Five countries (%)	Exporters	3.19 (2.36)
	Importers	4.37 (4.13)

Source: World Economic Outlook Database, September 2011, World Development Indicators (WDI), World Bank Data GDP growth (Annual%)

[25] ( ): exclude Egypt, < >: exclude the least developed countries, [ ]: exclude the least developed countries and Egypt.

Table 12 presents the average GDP growth comparison between the MENA, ME and NA developing energy exporters and importers.[26] When the average GDP growth between the MENA developing exporters and importers are compared, it is possible to find that in almost all cases, the energy importers have a higher average GDP growth than the exporters. A different result is obtained from the World Bank + IMF. This may be due to the fact that Iraq (5.59 percent) and Sudan (5.68 percent) achieved much higher average GDP growth compared to the other developing MENA exporters which brings up the entire developing MENA exporters' average GDP growth. For example, if Iraq and Sudan are excluded, the average GDP growth of the developing MENA exporters would be 3.60 percent (3.40 percent)[27], which is much lower than the initial result of the World Bank + IMF, 4.05 percent (3.96 percent)[28]. What is more important is the results which excluded all the least developed countries. The results show that, when excluding the least developed countries, the MENA developing energy importers have a higher average GDP growth. This suggests that development status may correlate with the exporters/importers difference and the GDP growth which can be used to identify the resource curse.

In the case of the ME developing energy exporters and importers, the idea that energy exporters are outperformed by energy importers does not work. All the results share the same countries for the developing ME exporters, and the average GDP growth of the energy exporters is higher than the energy importers except for the IMF result. When looking at an individual country, however, one can not conclude that all the energy exporters have a higher average GDP growth as it is only Iraq (5.59 percent) that has a higher average GDP growth than Jordan (5.45 percent) and Lebanon (4.58 percent). It is the average GDP growth of West Bank & Gaza (2.73 percent) which brings down the average GDP growth for the developing ME energy exporters. For example, if one excludes the West Bank & Gaza, the average GDP growth of the ME energy importers would be 5.02 percent which is much higher than the average GDP growth of the ME exporters' average GDP growth. Also, it must be mentioned that the reason why there is no change between the average GDP growth of the ME developing energy exporters before/after excluding the least developed countries (only Yemen) is that, though changed from 4.3775 to 4.38333, the numbers are rounded at the third decimal. And for the ME developing energy importers, there are no least developed countries.

When the average GDP growth of the NA developing exporters and importers are compared, the results attained are mixed. Except for the result from the World Bank, it shows that the NA developing exporters achieve higher average GDP growth than the energy importers. However, one

[26] Developing countries include Algeria, Egypt, Iran, Iraq, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia, West Bank and Gaza.
[27] Excluding Egypt.
[28] Excluding Egypt.

can not conclude that all the NA exporters achieve a higher average GDP growth than the energy importers as it is only Sudan (5.68 percent) that achieved a higher average GDP growth than the energy importers. Also, Djibouti's average GDP growth (1.61 percent) brings down the average GDP growth substantially for the energy importers. For example, if one excludes Sudan and Djibouti when measuring the average GDP growth from the IMF and IMF + World Bank results, the average GDP growth for the importers becomes 4.37 percent (4.13 percent)[29], and 3.33 percent (2.82 percent)[30] for the energy exporters which shows the reversed results. When looking at the results excluding the least developed countries from the NA exporters and importers, it is possible to see that the average GDP growth of the energy importers are all higher than the energy exporters. This, again, shows that the development level may correlate with the exporters/importers difference and the GDP growth which can be used to identify the resource cursed countries in the region.

When one compares the average GDP growth between the energy exporters and the importers from the five North African countries, it shows that, whether Egypt is included in either sides or not, the energy importers achieve a better average GDP growth. Within the five North African countries, at least, it can be said that the energy importers outperform the energy exporters. Furthermore, one can see that, whether being an energy exporters or importers, ME countries, in general, achieved the better GDP growth than the NA countries.

By looking at the comparison made above, one can say that the idea that energy exporters being outperformed by energy importers does not always work. However, when excluding the countries that have substantially much higher or lower average GDP growth, the idea that energy importers have higher average GDP growth works better. Unfortunately, there are a number of findings, for example, Sudan (a least developed country and an energy exporter) has higher average GDP growth than many other developing countries, which brings uncertainty in using Sachs & Warner's (1997) method. The finding from this section does not present one with sufficient enough evidence that the idea of Sachs & Warner, economies with a high share of resource exports in GDP, during the same period, experience a slow economic growth when compared to similar countries or average region value, as the method in finding the resource curse.

In other words, the use of the average GDP growth between energy exporters and importers can not be a suitable boundary-line. Though, their method does improve when the development status is applied, one can not be sure that if the improved method alone can be used to identify the resource curse. In other words, the use of this method might be more suitable to 'check' the result from other, more accurate, boundary-line. This will be discussed later in this thesis.

[29] Excluding Egypt.
[30] Excluding Egypt.

5.3 The Institutional Level as the Boundary-line

5.3.1 Identifying Suitable Sources to Measure Institutional Quality

In recent studies regarding the resource curse, institutional quality is perceived as a decisive factor that can place a country under the resource curse. For example, as presented earlier, Mehlum et al. (2006a, b) present convincing studies which emphasizes the importance of the institutional quality regarding the resource curse. Also, in section 4.3, institutional quality is chosen as a candidate for the boundary-line for checking which countries are affected by the resource curse and have the potential to be affected by a solar energy curse. Therefore, the aim of this section is to test whether the comparison of institutional quality among the MENA countries can be qualified as the boundary-line. This test is especially important for energy importers such as Morocco and Tunisia. For example, if this test is to work, the current institutional quality statuses may show which countries have already been affected by the resource curse but also may help in projecting which countries, especially the energy importers which are not currently affected, have the potential to suffer from a solar energy curse. Furthermore, in projecting which countries may suffer from a solar energy curse, the institutional quality comparison may be more relevant as the size of the rents provided by exporting solar electricity and the extent in which the North African countries will rely on this export is undeterminable.

When considering institutional quality as the boundary-line in identifying the resource curse, one faces great difficulty in measuring institutional quality itself, as this is a broad term which is linked to many socio political and economic aspects. Iimi (2006) emphasizes the importance of the institutional quality regarding the resource curse.[31] As can be seen in section 2.5.2, Iimi (2006) finds that Botswana's good institutional quality played a crucial role in protecting them from the effects of the resource curse. Here, when measuring institutional quality, he uses data from Kaufmann et al. (2003), which is based on the Worldwide Governance Indicators (WGI). As the GDP growth comparison method (Sachs & Warner 1997) is tested in section 5.1 and 5.2 in order to find whether the resource rent causes the resource curse, this section will also use the institutional quality comparison method (Iimi 2006) and the importance of the institutional quality notion (Mehlum et al., 2006a, b) to analyze whether it can be used as the boundary-line for identifying the resource curse.

Following Iimi's (2006) method, the WGI will be used in order to make the comparison of the institutional quality among the five North African countries and the MENA countries. Here, the reason for including the MENA countries is because the institutional quality comparison among only

[31] See section 2.5.2 or table 3.

the five North African countries is too narrow of a range and may therefore not produce an accurate outcome. In other words, by using a broader range, one is more likely to achieve a general pattern of the institutional quality difference among the energy exporters and energy importers. Also, it must be noted that the reason for choosing the WGI is not only based on Iimi's (2006) work but also after conducting a comparison with other indicators sources. For example, UNDP (2007) presents information and data on 35 governance indicator sources including the Governance Matters V (1996-2005) (Kaufmann et al., 2006). According to UNDP (2007, p.56), the Governance Matters V (1996-2005), which is based on WGI data, is known as the most quoted and used governance indicator source in media, academia and among international organizations, which report aggregate and individual governance indicator for 213[32] economies over the period of 1996-2005.

As this thesis will use the WGI to measure institutional quality, it is necessary to see how it is constructed in order to have a clear understanding of its uses.

The WGI defines governance as "the traditions and institutions by which authority in a country is exercised. This includes (a) the process by which governments are selected, monitored and replaced; (b) the capacity of the government to effectively formulate and implement sound policies; and (c) the respect of citizens and the state for the institutions that govern economic and social interactions among them."(Kaufmann et al. 2010, p. 4).

The WGI are based on 30 different data sources[33] which report the views and experiences of citizens, entrepreneurs, and experts in the public, private and NGO sectors from around the world, on the quality of various aspects of governance. The WGI draws on four different types of source data including surveys of households and firm, commercial business information providers, non-governmental organizations, and public sector organizations.[34]

The WGI contains six aggregate governance indicators which are **Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption.**[35] According to the UNDP (2007, p.57), the WGI is the most comprehensive governance index and provides insight into how countries compare in the six areas of governance quality. The fact that the WGI presents the governance quality in six dimensions is particularly advantageous because the institutional quality[36] is a broad term which is problematic if

[32] It is now over 200 countries over the period 1996-2011. http://info.worldbank.org/governance/wgi/resources.htm (accessed: 15.050.2013)

[33] See http://info.worldbank.org/governance/wgi/sources.htm (accessed: 15.05.2013)

[34] See http://info.worldbank.org/governance/wgi/resources.htm#sources (accessed: 15.05.2013) for more details.

[35] See table 13 for more specific description of each dimension.

[36] As mentioned in section 4.3, governance and institutions will be seen as one factor, therefore, refer to as institutional quality.

viewed as a single unit.[37] Also, the WGI's chosen period, 1996-2011, is rather recent which makes the WGI more suitable for the purpose of this thesis as the earlier institutional quality would be less relevant in identifying which countries are more in the danger of suffering from a solar energy curse.

Each of six aggregate WGI measures are constructed by averaging together that corresponds to the concept of governance being measured. Three main steps are taken in the process.

The first step is to assign data from individual sources to the six aggregate indicators. Individual questions from the data sources are assigned to each of the six aggregate indicators. For example, a firm survey question on the regulatory environment would be assigned to Regulatory Quality aggregate indicator.

The second step is to rescale the individual source data to run from 0 to 1. Here, a higher value corresponds to better outcomes. If an individual data source provides more than one question relating to a particular dimension of governance, they average together the rescaled sources.

The third step is to construct a weighted average of the individual indicators for each source by using an Unobserved Components Model (UCM)[38]. UCM is used to make the 0 to 1 rescaled data comparable across sources first, and construct a weighted average of the data from each source for each country. The UCM perceives that the observed data from each source are a linear function of the unobserved governance level, plus an error term. This linear function is different for each data sources, and therefore corrects for the remaining non-comparability of units of the rescaled data. The outcome of governance estimates are a weighted average of the data from each source. Here, weights reflect the pattern of correlation among data sources.

It must be noted that UCM assigns greater weight to data sources which are more strongly correlated with each other. According to Kaufmaan (2010, p.16), UCM's data-driven precision-weighting approach has the advantage of improving the precision of the overall aggregate indicators but does not affect much the ranking of countries on the aggregate indicators. This is one of the main reasons for WGI to choose this statistical tool. The composite measures of governance are in units of a standard normal distribution, with mean zero, standard deviation of one, and running from -2.5 to 2.5. Here, higher values indicate the higher quality of governance. It should be mentioned that the most important reason for choosing UCM is that this methodology generates margins of error for each governance estimates. WGI argues that these margins of error should be taken into account when making comparisons across countries and over time. More detailed explanation of margins of error will be illustrated in section 6.2.1.

[37] Other studies also perceive institutional quality with different dimension. For example, Hlepas's (2013) index of national institutional quality has four pillars which contain Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption.

[38] Goldberger (1972) is known to be the pioneer of UCM.

Table 13: WGI's Six Aspects of Governances and Descriptions

Aspects	Description
Voice and Accountability (V·A)	Captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.[39]
Political stability and absence of violence (P·S & A·V)	Measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.[40]
Government effectiveness (G·E)	Captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formation and implementation, and the credibility of the government's commitment such policies.[41]
Regulatory quality (R·Q)	Captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.[42]
Rule of law (R·L)	Captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the counts, as well as the likelihood of crime and violence.[43]
Control of corruption (C·C)	Captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.[44]

Source: The Worldwide Governance Indicators (WGI)

Table 13 presents WGI's six aspects of governance and their description. Here, as mentioned in section 2.5.2, Iimi (2006) argues that four aspects, Voice and Accountability, Government Effectiveness, Regulatory Quality, and Control of Corruption, played a crucial role for Botswana to escape from the resource curse. However, it is not to say that other aspects, Political Stability and Absence of Violence and Rule of Law, are not important. For example, Mehlum et al. (2006a, b) accentuate the importance of rule of law and apply it as an indicator in measuring institutional quality. Also, Mehlum et al. (2006a, p.1121), considers a weak rule of law as one of the elements that leads to grabber-friendly institution which results in rent-seeking behavior.

In the case of the Political Stability and Absence of Violence aspect, it is hard to find evidence that, especially in the resource-rich countries, better political stability is capable of reducing the violence. However, when looking at recent events in North Africa and more specifically at the murder

[39] http://info.worldbank.org/governance/wgi/pdf/va.pdf (accessed: 30.11.2012)
[40] http://info.worldbank.org/governance/wgi/pdf/pv.pdf (accessed: 30.11.2012)
[41] http://info.worldbank.org/governance/wgi/pdf/ge.pdf (accessed: 30.11.2012)
[42] http://info.worldbank.org/governance/wgi/pdf/rq.pdf (accessed: 30.11.2012)
[43] http://info.worldbank.org/governance/wgi/pdf/rl.pdf (accessed: 30.11.2012)
[44] http://info.worldbank.org/governance/wgi/pdf/cc.pdf (accessed: 30.11.2012)

of Libya's Colonel Gaddafi and the fall of his notorious regime, political stability within the region remains a major issue. This one example may not be convincing enough to say that the Political Stability and Absence of Violence aspect is relevant regarding the resource-rich countries or the resource curse itself. Nevertheless, it is worth including this aspect as one can test the correlation between the aspect and the resource curse. Therefore, all six aspects will be used to test the ability of the institutional quality comparison to be capable of being the boundary-line to measure the resource curse.

It must be noted that, though the enormous resource rent size is considered as one of the causes of the resource curse, it is more the poor management over the resources that is the determining factor which can bring about the resource curse. Here, institutional quality is closely related to the 'resource rent management quality'. For example, Voice and Accountability can prevent the inappropriate spending of the resource rent (Iimi 2006); government effectiveness can prevent overexploitation of the resource wealth (Iimi 2006); Rule of Law prevents rent-seeking; Control of Corruption can improve genuine saving (Dietz et al. 2007). In other words, institutional quality is, therefore, related to the accountability, democracy, transparency, and other factors which are important elements, not only regarding the escaping or preventing the resource curse, for countries' development. Furthermore, as it will be mentioned later, the improvement of institutional quality is necessary in preventing the already existing problems that are often fueled by the resource rent which, consequently, is perceived as the resource curse. Therefore, it makes it even more important to test and measure the all six institutional quality aspects in order to project the solar energy curse.

5.3.2 The Institutional Quality Comparison between Energy Exporters and Importers

The aim of this section is to test the correlation between institutional quality and the MENA countries' statuses of being energy exporters or importers. More specifically, the purpose of this test is to see whether there is a general difference in the institutional quality between the MENA energy exporters and importers. Although there is no concrete proof that all the energy exporters generally have the worse institutional quality than the energy importers, if the MENA energy exporters turn out to have worse institutional quality compared to the MENA energy importers in general, it can indirectly support the assumption that the MENA energy exporters, more importantly the North African energy exporters, may be affected by the resource curse and more likely to suffer from a solar energy curse. Furthermore, if it were to be the case, when the general difference is found, it could also confirm that the institutional quality comparison can be used as the boundary-line to identify the resource curse and a solar energy curse in the future.

As mentioned earlier, the WGI presents the institutional quality of countries during the period of 1996-2011. In this test, the standard errors will not be included, and the average institutional quality during the period of 1996-2011 will be applied. Here, it must be mentioned that the average institutional quality during certain periods by using WGI may not be the appropriate way. However, the aim of this section is not specifically to find out whether the five North African countries are affected by the resource curse, but testing the correlations between the MENA countries' statuses of being energy exporters or importers and the institutional quality. It means that if a specific year is chosen to test the correlation between them, this could provide an inaccurate result as there might be a large difference in the institutional quality score from the chosen year and the previous/subsequent years depending on certain event taken in each year. However, this test will include the average institutional quality during the period of 1996-2011, recent period of 2007-2011, and a single year 2011. If there is no substantial difference among three chosen period, one could argue that the use of the average institutional quality during certain period to test the correlation between the MENA countries' statuses of being energy exporters or importers and the institutional quality can be considered relevant. Furthermore, it must be mentioned that the 95 percent confidence level will be applied throughout this thesis when using the WGI.

Table 14: The Institutional Quality Comparison between the MENA Energy Exporters and the Importers 1996-2011, 2007-2011, 2011[45]

	V&A	P·S & A·V	G·E	R·Q	R·L	C·C
MENA	-0.95 (-1.03) *-1.03	-0.56 (-0.68) -0.84	-0.28 (-0.28) *-0.30	-0.33 (-0.27) *-0.29	-0.25 (-0.27) *-0.32	-0.25 (-0.30) *-0.38
MENA Exporters	-1.14/-1.15 (-1.24/-1.24) *-1.26/-1.27	-0.50/-0.50 (-0.60/-0.58) *-0.83/-0.79	-0.38/-0.36 (-0.32/-0.31) *-0.35/-0.33	-0.45/-0.46 (-0.39/-0.40) *0.48/-0.49	-0.31/-0.33 (-0.31/-0.32) *-0.37/-0.37	-0.30/-0.28 (-0.33/-0.31) *-0.42/-0.40
MENA Importers	-0.65/-0.60 (-0.73/-0.68) *-0.68/-0.62	-0.66/-0.66 (-0.81/-0.82) *0.91/-0.86	-0.16/-0.14 (-0.23/-0.21) *-0.26/-0.22	-0.14/-0.12 (-0.08/-0.06) *-0.001/0.04	-0.12/-0.13 (-0.20/-0.20) *-0.25/-0.23	-0.21/-0.17 (-0.29/-0.25) *-0.34/-0.30
ME	-0.86 (-0.93) *-0.99	-0.52 (-0.68) *-0.76	-0.12 (-0.06) *-0.04	-0.16 (-0.06) *-0.04	-0.05 (-0.08) *-0.10	-0.09 (-0.12) *-0.22
ME Exporters	-1.07 (-1.17) *-1.23	-0.28 (-0.40) *-0.54	-0.17 (-0.09) *-0.08	-0.25 (-0.18) *-0.24	-0.12 (-0.12) *-0.15	-0.09 (-0.10) *-0.21
ME Importers	-0.33 (-0.35) *-0.41	-1.14 (-1.37) *-1.31	0 (-0.02) *0.07	0.09 (0.23) *0.48	0.12 (0.01) *0.03	-0.09 (-0.16) *-0.26
NA	-1.10 (-1.21) *-1.1	-0.63 (-0.68) *-0.99	-0.56 (-0.68) *-0.77	-0.64 (-0.63) *-0.74	-0.59 (-0.60) *-0.70	-0.54 (-0.62) *-0.65
NA Exporters	-1.33/-1.42 (-1.42/-1.51) *-1.36/-1.44	-1.08/-1.23 (-1.09/-1.19) *-1.57/-1.66	-0.84/-0.99 (-0.91/-1.07) *-1.03/-1.17	-0.96/-1.17 (-0.91/-1.15) *-1.08/-1.33	-0.80/-1.05 (-0.79/-1.00) *-0.92/-1.08	-0.82/-0.94 (-0.90/-1.00) *-0.96/-1.06
NA Importers	-0.90/-0.87 (-1.04/-1.00) *-0.90/-0.84	-0.27/-0.19 (-0.37/-0.26) -0.58/-0.41	-0.30/-0.28 (-0.44/-0.44) *-0.53/-0.52	-0.33/-0.33 (-0.32/-0.35) *-0.38/-0.40	-0.31/-0.37 (-0.36/-0.41) *-0.47/-0.49	-0.30/-0.26 (-0.39/-0.34) *-0.40/-0.34
The Five	-1.04 (-1.18) *-0.96	-0.45 (-0.44) *-0.87	-0.36 (-0.45) *-0.59	-0.54 (-0.49) *-0.66	-0.36 (-0.39) *-0.54	-0.44 (-0.54) *-0.60
The Five Exporters	-1.20/-1.28 (-1.34/-1.42) *-1.24/-1.30	-0.68/-0.71 (-0.58/-0.49) *-1.22/-1.18	-0.70/-0.87 (-0.77/-0.94) *-0.91/-1.07	-0.83/-1.09 (-0.77/-1.05) *-1.00/-1.34	-0.59/-0.86 (-0.61/-0.83) *-0.80/-1.00	-0.69/-0.80 (-0.75/-0.83) *-0.85/-0.94
The Five Importers	-0.87/-0.79 (-1.02/-0.94) *-0.74/-0.54	-0.28/-0.12 (-0.41/-0.22) *-0.66/-0.35	-0.02/0.15 (-0.12/-0.05) *-0.27/-0.10	-0.17/-0.09 (-0.11/-0.06) *-0.20/-0.14	-0.04/0.02 (-0.10/-0.06) *-0.24/-0.16	-0.21/-0.07 (-0.35/-0.22) *-0.38/-0.24

Source: The Worldwide Governance indicators (WGI)

[45] Numbers without brackets represent the average institutional quality during the period of 1996-2011, numbers in brackets represent the average institutional quality during the period of 2007-2011, numbers after * represent the average institutional quality in 2011. Also, the number presented before the / is including Egypt, and the number presented after the / is excluding Egypt.

Table 14 presents the comparison of the institutional quality between the energy exporters and importers of the MENA, ME, NA and the five North African countries. The comparison between the MENA energy exporters and energy importers shows that, except for the Political Stability and Absence of Violence dimension, MENA energy importers have better institutional quality in all dimensions in all three periods. Also, except for the Political Stability and Absence of Violence dimension, the average institutional quality of MENA energy exporters is worse than the average institutional quality of the whole MENA countries, whereas the energy importers' average institutional quality is better than the average institutional quality of the whole MENA countries.

In the case of the comparison between the ME energy exporters and energy importers, except for the Political Stability and Absence of Violence and Control of Corruption dimensions, the ME energy importers have a better average institutional quality compared to the ME energy exporters. When looking at the Political Stability and Absence of Violence dimension, one can see that the ME energy importers have substantially worse score in institutional quality compared to ME energy exporters. In the case of the Control over Corruption dimension, though still the energy exporters score slightly better, the difference between the ME energy exporters and energy importers is not so wide. Furthermore, except for the two dimensions, the average institutional quality of the ME energy exporters is worse than the average institutional quality of the whole ME countries, whereas the ME energy importers' average institutional quality is better than the average institutional quality of the whole ME countries.

In the case of the comparison between the NA energy exporters and energy importers, the average institutional quality of the NA energy importers, in all dimensions, is better than the NA energy exporters whether including or excluding Egypt. Also, the average institutional quality of the NA energy exporters is worse than the average institutional quality of the whole NA countries, whereas the energy importers have a better average institutional quality than the average NA countries. Similarly, in the comparison between the five North African countries, one can obtain the same result as the NA case. Whether including/excluding Egypt, the energy importers have a better average institutional quality in all dimensions. Also, the average institutional quality for the energy exporters is worse than the average institutional quality of the five North African countries, whereas the energy importers have better institutional quality than the average of the five North African countries' institutional quality.

By looking at the result of the above test, in general, it appears that the MENA energy importers have better institutional quality compared to the energy exporters. Also, as mention earlier, this is more of the case within the NA countries and the five North African countries. Though it is not always the case, the finding that the MENA energy importers generally have better institutional

quality than the MENA energy exporters confirms the potential of the institutional quality comparison method to be a suitable boundary-line to identify the resource curse. Therefore, one needs to find a way to improve this method.

5.3.3 Testing the Correlation between the Development Status and the Institutional Quality

In section 5.2.2, unlike the income level, it was found that development status plays a crucial role in improving the GDP comparison method in identifying the resource curse in the five North African countries and the MENA countries. Section 5.3.2 shows that the institutional quality comparison method has the potential to be the boundary-line. However, one needs to find a way to improve the method in order to achieve a more accurate result. Therefore, the aim of this section will be to test whether the application of the development status filter can improve the institutional quality comparison methods in identifying the resource curse. In order to tackle the aim of this section, it is necessary to test whether there is a sufficient correlation between development status and institutional quality. Therefore, the development status will be directly applied to the institutional quality method, without making any separation between the MENA energy exporters and energy importers. If a strong correlation is found, one can argue that the applying development status may improve the institutional quality comparison method in identifying the resource curse. In this test, again, both the five North African countries and the MENA countries will be included in the process in order to have wider range and to get a better result.

Table 15: Separating the Countries according to the Development Status[46]

Developed Countries	Developing Countries	Least Developed Countries (UN classification)[47]
Bahrain, Israel, Kuwait, Oman, Qatar, Saudi Arabia, UAE	Algeria, Egypt, Iran, Iraq, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia, West Bank & GAZA	Djibouti, Mauritania, Sudan, Yemen

Source: The World Bank Data Countries and Economies http://data.worldbank.org/country (accessed: 08.05.2012)
UNCTAD (2011, Contents xi)

The MENA countries, including the five North African countries, are divided into three categories according to their development status in table 15. It must be noted that the list of developed

[46] The selected MENA countries are both from the World Bank and the IMF lists.
[47] It must be mentioned that these four countries have been considered as the least developed countries by all the UNCTAD's the least developed countries report from 1996 until 2011.

countries can vary dependent on which sources one uses. For example, the IMF considers 35 countries as developed countries, or advanced economies in their term (IMF 2013, p.140). It must be noted that the developed countries listed in table 15 are considered as high income economies by the World Bank. Of course, as mentioned before, the income level does not necessarily reflect development status. However, there is a clear distinction between developing countries and high income countries according to the World Bank, as the listed developed countries are considered as either OECD high income countries or non-OECD high income countries whereas the listed developing countries in table 15 are clearly labeled as developing countries (The World Bank Data Countries and Economies). Therefore, the countries that are considered either OECD high income countries or non-OECD high income countries by the World Bank are seen as developed countries in this section.

In this test, again, the standard errors will not be included, and the average institutional quality during the periods of 1996-2011, 2007-2011, and the single year 2011 will be applied. If there is no substantial difference among three chosen period, as in section 5.3.2, one can assume that the use of the average institutional quality during certain period to test the correlation between the development status and institutional quality can be considered relevant.

Table 16: The Institutional Quality Comparison among the Three Development Statuses Groups of the MENA Region, and the Five North African Countries[48]

	V·A	P·S& A·V	G·E	R·Q	R·L	C·C
Developed Countries	-0.66 (-0.77) *-0.83	0.18 (0.15) *0.13	0.48 (0.55) *0.51	0.48 (0.55) *0.49	0.55 (0.56) *0.54	0.55 (0.55) *0.41
Developing Countries	-1.05 (-1.12) *-1.05	-0.83 (-0.97) *-1.23	-0.54 (-0.53) *-0.54	-0.69 (-0.59) *-0.59	-0.47 (-0.54) *-0.61	-0.58 (-0.66) *-0.71
Least Developed Countries	-1.16 (-1.26) *-1.34	-1.11 (-1.31) *-1.46	-0.89 (-1.03) *-1.10	-0.79 (-0.98) *-0.85	-1.02 (-0.98) *-1.04	-0.74 (-0.80) *-0.84
The Five	-1.03 (-1.18) *-0.96	-0.45 (-0.44) *-0.87	-0.36 (-0.45) *-0.59	-0.54 (-0.49) *-0.66	-0.36 (-0.39) *-0.54	-0.44 (-0.54) *-0.60

Source: The Worldwide Governance indicators (WGI)

[48] Numbers without any brackets represent the average institutional quality during the period of 1996-2011, numbers in brackets represent the average institutional quality during the period of 2007-2011, numbers after * represent the average institutional quality in 2011.

Table 16 presents the institutional quality comparison among the three development status groups of the MENA countries and the five North African countries, in three different periods. As can be observed, in all six dimensions, during all three chosen periods, the average institutional quality is the highest in the developed countries and the lowest in the least development countries. Also, when the average institutional quality of the five North African countries, which are considered as developing countries, is compared to the three different development statuses groups, it is possible to see that their average institutional quality is between the average institutional quality of the developed countries and the average institutional quality of the least developed countries. This order occurs in all three given periods. Therefore, one can see that there is a strong correlation between development status and institutional quality. Furthermore, one can see that most of the average institutional quality scores of the five North African countries are higher than the average institutional quality of the MENA developing countries. In other words, if one is to use this method as the boundary-line, it may appear as the five North African countries are less likely to be in the resource curse, or less chances to suffer from a solar energy curse. However, it is dangerous to make such an assumption as this analysis is based on the average institutional quality, and, more importantly, the separation between the energy exports and the importers is not included in this test which is crucial when searching for the resource curse.

The fact that all more developed countries have higher institutional quality compared to the less developed countries in this test does not mean that one can assume that it is always the case because this analysis relies on the average institutional quality. The main point that should be derived from this analysis is that, though one can not conclude that the development status and the institutional quality are always parallel to each other, a strong correlation between the development status and the institutional quality is detected. In other words, the development status can be a crucial element which can improve the institutional quality comparison method in identifying the resource curse, or a solar energy curse.

5.3.4 Applying the Development Status on the Institutional Quality of the Energy Exporters and Importers

In section 5.3.2, it was argued that the institutional quality comparison has the potential to become the boundary-line to identify the resource curse in the five North African countries and the MENA countries. Though it has the potential, it appears that it needs certain improvements to obtain more accurate results. In section 5.3.3, fortunately, it is found that the application of the development status on the institutional quality comparison method can improve its process in

identifying the resource curse. Thus, the aim of this section is to find out whether the application of the development status improves the institutional quality comparison method in identifying the resource curse when the separation of the energy exporters and importers is added.

Table 17: Dividing the Energy Exporters and the Importers based on the Development Status[49]

Developed MENA Exporters	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE
Developed MENA Importers	Israel
Developing MENA Exporters	Algeria, Egypt, Iran, Iraq, Libya, Syria
Developing MENA Importers	Egypt, Jordan, Lebanon, Morocco, Tunisia, West Bank & Gaza
Least Developed MENA Exporters	Mauritania, Sudan, Yemen
Least Developed MENA Importers	Djibouti
Developed ME Exporters	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE
Developed ME Importers	Israel
Developing ME Exporters	Iran, Iraq, Syria
Developing ME Importers	Jordan, Lebanon, West Bank & Gaza
Least Developed ME Exporters	Yemen
Least Developed ME Importers	None
Developed NA Exporters	None
Developed NA Importers	None
Developing NA Exporters	Algeria, Egypt, Libya
Developing NA Importers	Egypt, Morocco, Tunisia
Least Developed NA Exporters	Mauritania, Sudan
Least Developed NA Importers	Djibouti

Source: The World Bank Data Countries and Economies
http://data.worldbank.org/country (accessed: 08.05.2012)
UNCTAD (2011, Contexts xi)

Table 17 presents the division of the energy exporters/importers of the MENA, ME, NA, and the five North African countries based on the development status. By looking at table 17, one can foresee some of the obstacles in making fair comparisons. Based on the same development status, there are cases with only one energy importer and few energy exporters. For example, these cases can be seen in the MENA developed energy importer (Israel), the least developed MENA energy importer (Djibouti), the ME developed energy importer (Israel), and the NA least developed energy importer (Djibouti). Also, Yemen is the only country that is in the category of the ME least developed exporter. Furthermore, there are some cases that the comparisons are just impossible to be made as there are no countries in certain categories such as the ME least developed energy importers, NA

[49] The Selected MENA countries combine the consideration of the World Bank and the IMF. The Least developed countries are from the UN classification.

developed energy exporters, and NA developed energy importers. It appears as, within the whole MENA countries, besides the comparisons between the developing exporters and importers, other comparisons are likely to produce inaccurate result due to the lack of candidates. Despite these obstacles, one can find that it is possible to make comparisons between the developing energy exporters/importers of the MENA, ME, and NA countries. The fact that these comparisons can be made is crucial because the five North African countries all fall in the category of developing countries. Therefore, the comparison between the developing energy exporters and energy importers of the MENA, ME, and NA will be made to test whether applying the development status on the institutional quality of the energy exporters/importers can improve the institutional quality comparison method. The standard errors will be excluded, and the average institutional quality during the periods of 1996-2011, 2007-2011, and the single year 2011 will be applied as before.

Table 18: The Institutional Quality Comparison between the Developing Energy Exporters and the Importers of the MENA, ME and NA Regions based on the Development Status[50]

	V&A	P·S&A·V	G·E	R·Q	R·L	C·C
MENA	-1.05 (-1.12) *-1.05	-0.83 (-0.92) *-1.23	-0.54 (-0.53) *-0.54	-0.69 (-0.59) *-0.59	-0.47 (-0.54) *-0.61	-0.58 (-0.66) *-0.71
MENA Exporters	-1.33/-1.39 (-1.40/-1.44) *-1.36/-1.40	-0.96/-1.03 (-1.03/-1.08) *-1.48/-1.52	-0.84/-0.94 (-0.79/-0.86) *-0.80/-0.84	-1.12/-1.27 (-1.02/-1.18) *-1.13/-1.29	-0.78/-0.92 (-0.84/-0.07) *-0.91/-1.01	-0.82/-0.89 (-0.91/-0.97) *-0.94/-0.99
MENA Importers	-0.76/-0.71 (-0.85/-0.78) *-0.75/-0.67	-0.67/-0.69 (-0.88/-0.90) *-0.99/-0.93	-0.21/-0.18 (-0.25/-0.21) *-0.29/-0.22	-0.20/-0.18 (-0.09/-0.07) *-0.08/0.06	-0.10/-0.10 (-0.19/-0.19) *-0.27/-0.24	-0.33/-0.29 (-0.40/-0.36) *-0.48/-0.44
ME	-1.06 (-1.07) *-1.12	-1.15 (-1.42) *-1.53	-0.69 (-0.59) *-0.50	-0.82 (-0.67) *-0.53	-0.56 (-0.67) *-0.66	-0.70 (-0.76) *-0.81
ME Exporters	-1.47 (-1.46) *-1.47	-1.24 (-1.48) *-1.75	-0.98 (-0.81) *-0.68	-1.40 (-1.27) *-1.25	-0.97 (-1.06) *-1.02	-0.95 (-1.06) *-1.03
ME Importers	-0.65 (-0.68) *-0.76	-1.06 (-1.35) *-1.32	-0.40 (-0.38) *-0.31	-0.24 (-0.08) *0.18	-0.15 (-0.28) *-0.29	-0.44 (-0.45) *-0.58
NA	-1.04 (-1.18) *-0.96	-0.45 (-0.44) *-0.87	-0.36 (-0.45) *-0.59	-0.54 (-0.49) *-0.66	-0.36 (-0.39) *-0.54	-0.44 (-0.15) *-0.60
NA Exporters	-1.2/-1.28 (-1.34/-1.42) *-1.24/-1.30	-0.68/-0.71 (-0.58/-0.49) *-1.22/-1.18	-0.7/-0.87 (-0.78/-0.94) *-0.91/-1.07	-0.83/-1.09 (-0.77/-1.05) -1.00/-1.34	-0.59/-0.86 (-0.61/-0.83) -0.80/-1.00	-0.69/-0.80 (-0.75/-0.83) -0.85/-0.94
NA Importers	-0.87/-0.79 (-1.02/-0.94) *-0.74/-0.54	-0.28/-0.12 (-0.41/-0.22) *-0.66/-0.35	-0.02/-0.15 (-0.12/0.05) *-0.27/-0.10	-0.17/-0.09 (-0.11/-0.06) *-0.2/-0.14	-0.04/-0.02 (-0.10/-0.06) *-0.24/-0.16	-0.21/-0.07 (-0.35/-0.22) *-0.38/-0.24

Source: The Worldwide Governance indicators (WGI)

Table 18 presents the institutional quality comparison between the developing energy exporters and energy importers of the MENA, ME and NA regions based on the Development status during three different periods. As can be observed in table 18, in all the average institutional quality comparisons made between the MENA, ME, and NA developing energy exporters and energy importers, the energy importers appear to have higher institutional quality than energy exporters in

[50] Numbers without any brackets represent the average institutional quality during the period of 1996-2011, numbers in brackets represent the average institutional quality during the period of 2007-2011, numbers after * represent the average institutional quality in 2011. Also, the number presented before the / is including Egypt, and the number presented after the / is excluding Egypt, as Egypt can be consider both energy exporter/importer.

all dimensions. One should notice that the NA countries in table 18 only involve the five North African countries. Even within this comparison, the energy importers have higher institutional quality than the energy exporters. Also, in all institutional quality dimensions in all regions, one can see that the average institutional quality is highest for the energy importers, middle for the regional average, and then the lowest for the energy exporters. As table 18 shows a very steady order and un-fluctuated data, one can argue that the application of development status improves the institutional quality comparison methods, and one is able to use the institutional quality comparison method in identifying the resource curse. Also, in the case of the Political Stability and Absence of Violence aspect, where it is hard to find evidences that better political stability is capable of reducing the violence, it also shows a steady order and un-fluctuated data. Therefore, this aspect will be added in this thesis to identify the resource curse in the five North African countries.