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Chinese Economic Expansion, Openness, Resource Curse and Deindustrialization in the MENA Region

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Abstract

The deindustrialization concept is used to define the decline in the share of manufacturing as an economy reaches to a high-income level. Kuznets indicates that a decreasing trend in manufacturing output and employment is a natural outcome of development of a country However, in addition to the structural change *a la* Kuznets, the worldwide shift of manufacturing to China is also shown another factor, which may accelerate the deindustrialization in developed and developing countries. The paper aims to examine the main determinants of the manufacturing development in the selected MENA countries. The Kuznets' structural change hypothesis is taken as the starting point of the empirical model specification in the paper. The model is also designed to capture the effects of openness and resource curse, in addition to the Chinese economic expansion. A panel data estimation is used for empirical models. The results reveal that there is no common Kuznets type invers U curve and resource curse dominates the industrialization in the MENA countries. The model estimated do not detect any impact of Chinese expansion on MENA manufacturing.

JEL Codes: O14, O25, O53

Keywords: Deindustrialization, MENA countries, Chinese economic expansion, openness, resource curse.

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Çin’in Ekonomik Genişlemesi, Dışa Açıklık, Doğal Kaynak Laneti ve MENA Bölgesinde Sanayisizleşme

Öz

Sanayisizleşme kavramı, bir ekonomi yüksek gelir düzeyine ulaştığında imalat sanayinin payının azalmasını tanımlamak için kullanılır. Kuznets, üretim çıktısı ve istihdamdaki düşüş eğiliminin bir ülkenin kalkınmasının doğal bir sonucu olduğunu belirtir. Bununla birlikte, Kuznets'teki yapısal değişime ek olarak, dünya çapında üretimin Çin'e kayması da gelişmiş ve gelişmekte olan ülkelerde sanayisizleşmeyi hızlandırabilecek başka bir faktör olarak gösterilmektedir. Makale, seçilmiş MENA ülkelerinde imalat sanayinin gelişiminin belirleyicilerini incelemeyi amaçlamaktadır. Kuznets'in yapısal değişim hipotezi, makaledeki ampirik model tanımlamasında başlangıç noktası olarak alındı. Model, Çin'in ekonomik genişlemesine ek olarak dışa açıklık ve doğal kaynak laneti etkilerini de yakalayacak şekilde de tasarlandı. Ampirik modellerin tahmini için panel veri kullanıldı. Sonuçlar, MENA ülkelerinde ortak bir Kuznets tipi ters U eğrisinin olmadığını ve doğal kaynak lanetinin sanayileşmeyi belirlediğini ortaya koydu. Tahmin edilen model MENA imalat sanayisi üzerinde Çin yayılmasının herhangi bir etkisini belirlemedi.

JEL Kodları: O14, O25, O53

Anahtar kelimeler: Sanayisizleşme, MENA ülkeleri, Çin’in ekonomik genişlemesi, dışa açıklık, doğal kaynak laneti.

1. Introduction

An increased pace of globalization after 1990 has brought about a debate on the worldwide shift of manufacturing and deindustrialization in many countries. As a matter of course, the shift of manufacturing was not symmetrical at the global level. China was and still is a rising economic star during three of four decades. Thus, China turned into a manufacturing giant. Deindustrialization, which is experienced at different levels in both developed and developing countries, is one of the most important features of this period. At the beginning, this fact was not alarming. However, the consequences of the 2008 Financial Crisis which has deeply affected the world economy, led countries to refocus on protecting their industries. The emergence of this great crisis before ending the first decade of the 21st century changed the paradigm: Industrial policies have regained their reputation in the aftermath of the Crisis whereas industrial policy was a forbidden word under the hegemony of globalization (Doğruel and Doğruel, 2018: 33). Some developing countries have been severely affected from the worldwide shift of manufacturing, and consequently deindustrialization. The paper focuses on how the MENA countries affected by the deindustrialization wave. The countries in the MENA region have heterogeneous character in terms of their natural resources and economic development performances. Some of them have rich natural resources and the region displays varying patterns in terms of economic growth and level of industrialization. Hence the paper aims to examine manufacturing performance in the selected MENA countries under an environment threatening economic development. The paper also intends to identify possible dynamics which can affect the development of the manufacturing sector in the region countries, including Chinese economic expansion.

The deindustrialization concept is used for defining the decline in the share of manufacturing as an economy reaches to a high-income level.[1] Kuznets addresses that a decreasing trend in manufacturing output and employment is a natural outcome of development of a country due to the sectoral shift from manufacturing to services. In addition to the structural change *à la* Kuznets, the worldwide shift of manufacturing to China is also shown another factor which may accelerate deindustrialization in the industrialized countries. Most of the developing economies are also deeply affected by the Chinese expansion.

The Kuznets' structural change hypothesis is taken as the starting point of the empirical model specification in the paper. The model is also designed to capture the effects of other factors, such as the existence of oil resources and openness, in addition to the Chinese expansion. A panel data estimation is used for empirical models. The data source is the World Development Indicators of the World Bank. The paper covers 1975-

[1] Rowthorn and Ramaswamy (1999: 18) provide a more precise definition: "The share of manufacturing employment has declined continuously for more than two decades in most advanced economies—a phenomenon that is referred to as deindustrialization." For recent contributions on the concept of deindustrialization see Rodrik (2016) and Bernard et al. (2016).

2014 period which starts right after 1970's oil shocks and ends before the beginning of world trade volume squeeze.

Model estimates show that the Chines expansion has no effect on the performance of the manufacturing in MENA countries considered. A common Kuznets type invers U curve to describe the development path of the manufacturing is not seen in these countries. However, it seems that resource course shapes the manufacturing performances of the selected MENA countries.

The paper is organized as follows. Following section presents a brief conceptual discussion on deindustrialization and possible dynamics that can affect the development of manufacturing sector. Section three outlines the basic descriptive characteristics of the selected MENA countries. Section four displays empirical model and section five gives the results of the analysis. The last section concludes the paper.

2. Conceptual Background

This section presents the debate on deindustrialization from conceptual and historical perspective. This brief evaluation indicates that Kuznets' facts are at the heart of the debate. Kuznets constructs a link between sectoral reallocation and development stages of countries. A decreasing trend in manufacturing output and employment may be related to increasing income level. The remaining factors which may have effect on deindustrialization are classified by three dynamics. The first one is openness: International convergence in prices may affect domestic production composition, the share of tradable and nontradable goods. The second is the effect of resource abundance which may cause to a resource curse. And the third one is the effect of China or more precisely Chinese economic expansion.

The debate on deindustrialization intensified in the second half of 1970s.[2] Cornwall (1980: footnote 1) argues that the early 1970s are the last "high employment" period in developed economies. He also indicates that, during the period 1973 - 1977, industrial and manufacturing employment decline in in all countries, at all income levels.[3] But, Rowthorn and Ramaswamy (1997) point out that mid-1960s as an earlier date for deindustrialization in the United States: Other early contributions on the discussion of deindustrialization are Lengelle (1966), Boumol (1967), Fusch (1968), and Singht (1977).[4] Rowthorn and Ramaswamy (1997) emphasizes that these contributors "…

[2] The book which was prepared by Blackaby (1979) has very elaborated discussion on this matter. The book covers a collection of papers on the economic difficulties of United Kingdom in the second half of 1970s. The papers are the collection of NIESR's conference which held on June 1978 (See Watson, 1981 book review).

[3]Cornwall (1980) quoted from Brown and Scherif (1979). The evaluation is based on the OECD Manpower Statistics and OECD Labour Force Statistics (See Cornwall, 1980: footnote 1).

[4] Rowthorn and Ramaswamy (1997) also quote Rowthorn and Wells (1987).

provide a unified and formal analysis of deindustrialization by linking it explicitly to the process of economic development and the pattern of foreign trade."

Although the debate on deindustrialization was widespread in 1970s, discussions on sectoral reallocation have a longer history. And the changing pattern of sectoral shares was at the core of the development discussions. Development economists contributed extensively to this matter and most of them were in the first half of the 20th century. Among them, Cornwall (1980) highlights Clark (1940), Kuznets (1958 and 1959), Chenery (1960), Maizels (1970), Chenery and Taylor (1968) and Fusch (1968) as the leading works which focused on "the changing pattern of output." Similarly, Kongsamut et al. (2001) list Clark (1940), Kuznets (1957) and Chenery (1960) as the studies on this matter. Kongsamut et al. (2001) call sectoral reallocations as the "Kuznets facts". It is also called as "structural changes".

One of six characteristics of modern economic growth in Kuznets (1973) defines the sectoral reallocation. The third one, which is directly related with our discussion, maintains the changes in sectoral composition:

> "Major aspects of structural change include the shift away from agriculture to nonagricultural pursuits and, recently, away from industry to services; a change in the scale of productive units, and a related shift from personal enterprise to impersonal organization of economic firms, with a corresponding change in the occupational status of labor" (Kuznets, 1973: 248).

The above debate reveals that economic growth which causes an increase at income level is the main factor behind changes in sectoral composition. Therefore, the income level will be taken as the main indicator (explanatory variable) in empirical models. However, we think that sectoral reallocation and therefore a decline in the share of manufacturing may be elucidated by other factors related to the economic dynamics of a country. We will stress three other dynamics behind the structural change: the first is the increasing trend in openness during the last two decades; the second is resource endowment of a country (country would be a resource rich or poor one in terms of natural resources); and the third is the rising share of Chinese manufacturing in the World trade. Potentially, these three dynamics may have effects on the sectoral reallocation of the resources, and consequently on the path of industrialization.

First, we try to identify the link between openness and deindustrialization. We think that the degree of openness increases as globalization intensifies. During the last three decades openness became a strong trend as a development strategy,[5] and the international institutions advised the developing countries to open their boundaries. Therefore, trade liberalization and globalization wave deeply affected the trade and the

[5] O'Rourke and Williamson (2002) argue that "Globalization was a defining term of the 1990s."

production structure of the countries. The spatial characteristics or location of firms changed due to the pressure of globalization. The questions at this point are whether openness affect deindustrialization and if so, it happens earlier than expected. Furthermore, it is possible also to ask whether deindustrialization was only outcome of globalization or of a natural development path. Saeger (1997: 580) states that "Is the contraction of manufacturing employment merely the result of the increasing maturity of developed economies? Or have the forces of globalization contributed to the shift of labor from manufacturing sector into services?" Same questions also may be raised on the industrialization path observed in the developing economies. Rodrik (2016) asserts that since 1980s, except from some Asian countries, low- and middle-income countries have faced deindustrialization. We control this dynamic by employing openness indicators in the empirical model.

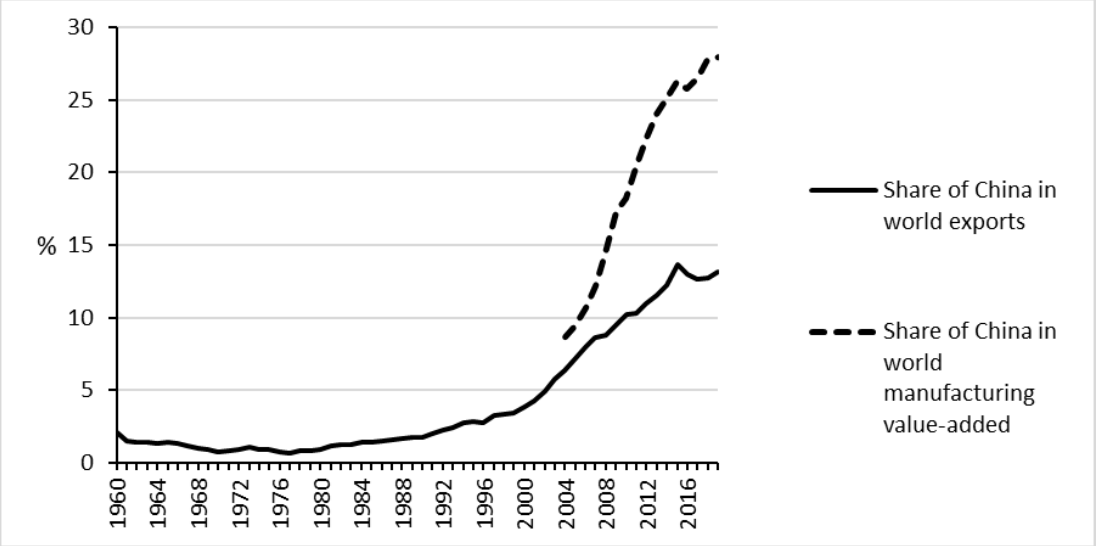
Resource curse is another critical concept in development economics and the second dynamic considered in this study, which can affect manufacturing sector. Auty (1995: 66) explains how the resource curse mechanism works. Sachs and Warner (2001) focus on the link between economic growth and resource abundance empirically and they reveal that "curse [of natural resources] is a reasonably solid fact." Auty and Furlonge (2019: 9) discuss the link between the resource based (primary) sector considering the Dutch disease, rent-seeking and dominancy of related interest groups, political factors, such as institutions, and price volatility in the international resource markets. Frankel (2012: 9) also discusses six channels of natural resource course including the Dutch disease.[6] However, Frankel's focus is on overall economic performances of countries rather than interaction between industrialization or deindustrialization and natural resource course. Corden and Neary (1982) examine the Dutch disease and deindustrialization phenomena together. We may also emphasize Neary (1982) and Wijnbergen (1984) for the Dutch disease discussion. In our study, the role of the natural resource abundance as the capacity to create a curse, especially via Dutch disease effects, is also controlled in the empirical model as in the previous dynamic "openness".

The third dynamic considered in this study is Chinese expansion. China became a manufacturing and trade giant during the last three decades, in which globalization has forced global economic players and games to change. Figure 1 shows that the share of China in the World export has strikingly raised by 1990s: The Chinese export share has fluctuated horizontally below 2 percent for three decades until 1990s, and then this share started to rise and exceeded 10 percent during the last decade. This observation at the same time indicates the growing power of Chinese manufacturing as it is seen in Figure 1: The share of China in the World Manufacturing value-added tripled in the period 2004-2019. Chinese phenomenon created a growing interest in discovering the effects of this economic expansion on both developed and developing countries. The recent

[6] Beyond the Dutch disease, other channels of natural resource course in Frankel (2012: 9) are decreasing path of world commodity prices, volatile movement of commodity prices, crowding out of manufacturing, and institutional failures which may be defined as autocratic/oligarchic or sometimes anarchic institutions.

literature covers some interesting observations on this matter.[7] Worldwide shift of manufacturing to China accelerated deindustrialization in the industrialized countries and some of the developing countries. However, the effect of Chinese boom on developing countries is not uniform. Hanson and Robertson (2010) emphasize the mix characteristics of this effect, based on the share of the manufacturing industry in merchandise exports for each country. They conclude that the countries specialized in manufacturing and their share of manufacturing exports in total export is higher than 80 percent are adversely affected by the Chinese expansion (Hanson and Robertson, 2010: 140). None of the countries in the MENA Region does not fit to this condition.

Table 1: China in the World Economy



Source: The World Bank, WDI

3. Industrialization Performance of MENA Region

As we discussed earlier, manufacturing output and employment levels are considered to identify sectoral reallocation or structural change. Therefore, mainly two indicators represent the pattern of industrialization: Sectoral distribution of employment and sectoral distribution of value added. Since the empirical model covers the composition of sectors by value added and limited sectoral employment data for the MENA countries, this section covers only sectoral distribution of value added. The sectors are manufacturing, agriculture, and services.[8] First, to understand the structural change in MENA countries better, we compare the patterns of industrialization in the MENA

[7] For example, among others see Wan (2005), Dimaranan et al (2009) and Wood and Mayer (2011).
[8] Due to rich natural gas and petroleum resources in MENA region, share of industry in GDP as, the sum of manufacturing, mining and energy in statistical classification, exceeds 40 percent over the period of 1975-2014. To emphasize the development in manufacturing we use share of manufacturing in GDP rather than share of industry.

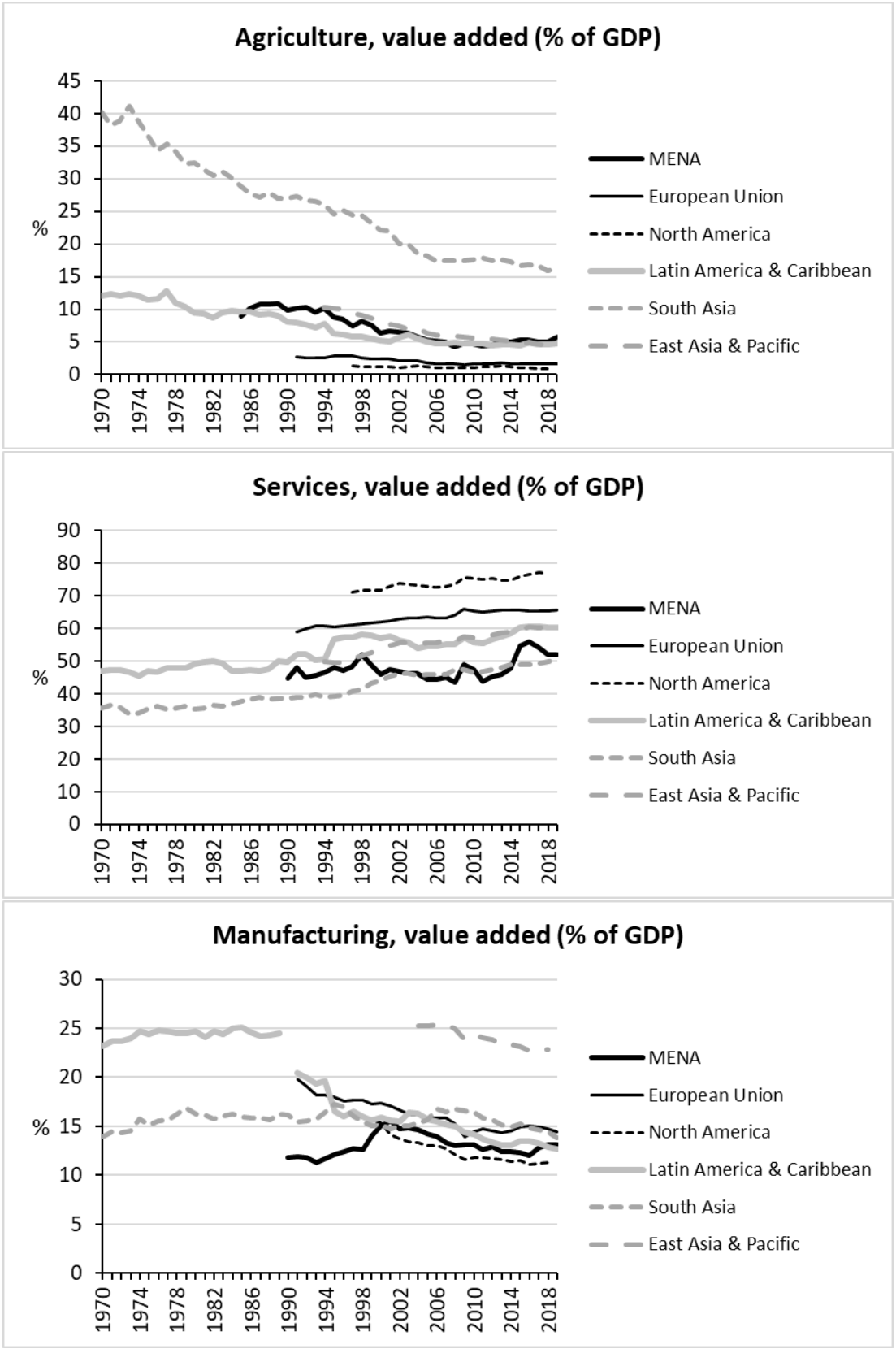
region with selected regions in the world. Then, we focus on the countries in the MENA region. The data for all regions start from 1960s. The MENA region value added data starts from 1975. The data source is the World Development Indicators of the World Bank.

Table 1: Manufacturing per capita value-added (constant 2010 US$)

	Algeria	Egypt	Jordan	Morocco	Oman	Tunisia	Saudi Arabia
1975	301	149	154	186	29	174	1284
1976	349	154	189	227	56	215	1249
1977	347	157	207	222	78	223	1171
1978	417	160	236	234	90	241	1162
1979	425	154	261	240	74	262	1337
1980	382	149	278	267	64	276	1082
1981	383	159	378	271	105	282	1257
1982	416	175	369	286	159	255	1075
1983	450	182	353	300	314	342	1195
1984	540	188	375	314	431	363	1340
1985	538	199	337	326	368	378	1237
1986	601	195	466	334	558	377	1206
1987	550	242	480	344	523	374	1300
1988	529	267	384	370	548	409	1355
1989	445	279	298	364	591	408	1256
1990	404	282	353	378	437	428	1289
1991	392	260	311	378	522	444	1356
1992	419	266	398	378	576	462	1451
1993	428	270	369	373	670	486	1425
1994	391	284	441	379	694	524	1443
1995	371	296	428	369	764	538	1441
1996	298	310	387	390	674	548	1481
1997	286	318	397	397	696	510	1525
1998	337	339	452	395	840	529	1612
1999	317	377	458	403	785	549	1527
2000	264	387	471	407	1084	558	1448
2001	284	387	490	394	1712	591	1476
2002	294	403	546	402	1629	584	1469
2003	282	382	567	434	1587	575	1594
2004	266	387	637	456	1521	598	1630
2005	254	385	656	442	1523	613	1570
2006	237	386	740	452	2059	630	1622
2007	230	385	842	439	2021	699	1736
2008	204	409	855	454	2084	781	1659
2009	247	428	829	487	2346	749	1991
2010	242	451	777	497	2107	751	2071
2011	244	439	777	499	2061	713	2020
2012	247	425	749	498	1876	701	2032
2013	249	430	770	530	1725	705	2067
2014	254	435	757	572	1571	707	2278
Average annual growth rate	0.05	2.93	4.97	3.02	13.95	3.90	1.78

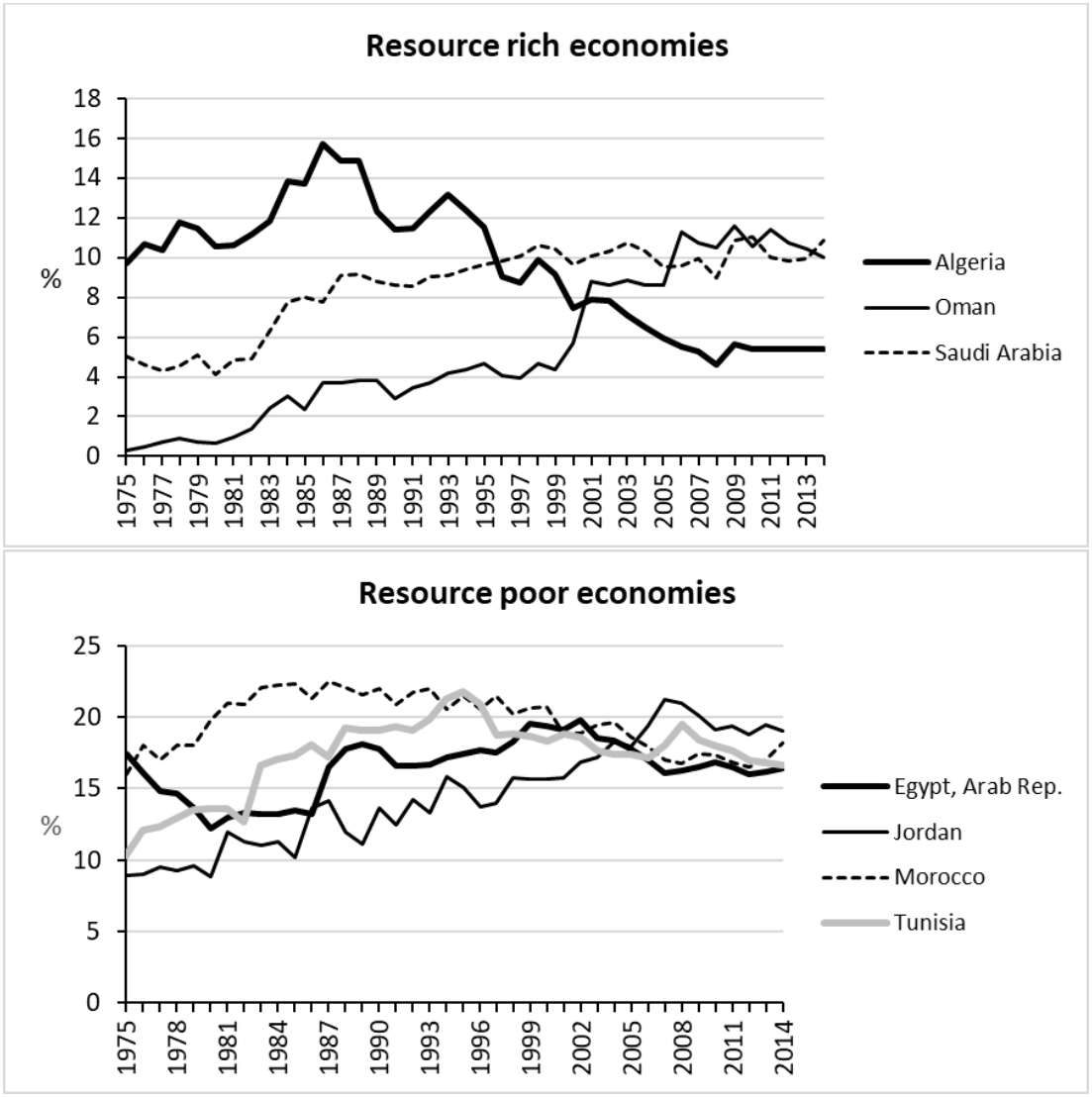
Source: The World Bank, WDI

Figure 2: Sectoral Value-Added Shares MENA



Source: The World Bank, WDI

Figure 3: Share of Manufacturing Value Added in GDP



Source: The World Bank, WDI

Value added share by sectors reflects more accurately the patterns of sectoral reallocations over the period considered. The share of agricultural value added has a decreasing trend in the developing regions as well as in the developed regions including MENA countries (Figure 2). We also observe increasing trends in the share of service sector in GDP in all regions. Service sector shares of the MENA region are close to the level of the regions dominated by middle income countries. Increase in manufacturing value-added share in MENA region reversed after 2000 and spans between the North America Region and the Latin America and Caribbean region. Figure 2 shows that the turning in the share of manufacturing value-added started at around 15 percent.

Figure 3 displays the manufacturing value added share in GDP for resource poor countries and for resource rich countries in the MENA region. Except Jordan, inverse U curves for the share of manufacturing are observed in resource poor countries during 1975-2014 period. Jordan has highest per capita manufacturing growth rate during this period among resource poor economies in the MENA region (annual average is 9.8 percent) (Table 1). Industrialization trends in the resource rich countries are diversified: Invers curve for Saudi Arabia, steady increase in Oman and stagnant trend after the mid of 1980's in Algeria. Algeria also has lowest per capita manufacturing value added figures after the mid of 1990's among the countries presented in Figure 3. In contrast to Algeria, per capita manufacturing value added levels two-fold higher than the other countries in Saudi Arabia for the entire period covered and in Oman after 2000 (Table 1). However, it should be noted that the high manufacturing value added in these countries is due to petroleum and petroleum products sectors in manufacturing which is strongly associated with high oil and natural resource production.

Table 2: Resources and Income Levels in Selected MENA Countries

	2000-2011 average			
	Total natural resources rents (% of GDP)	GDP per capita (constant 2005 US$)	Rank of natural resource rents	Rank of GDP per capita
Kuwait	52.18	31896.57	1	2
Saudi Arabia	50.12	13381.02	2	3
Oman	47.81	12945.79	3	4
Iran, Islamic Rep.	41.28	2693.63	4	7
Algeria	33.65	2876.85	5	6
Yemen, Rep.	32.74	819.44	6	11
United Arab Emirates	23.28	40726.82	7	1
Egypt, Arab Rep.	15.17	1277.64	8	10
Tunisia	5.56	3196.94	9	5
Morocco	1.59	1946.94	10	9
Jordan	1.35	2315.69	11	8

Source: Calculated from The World Bank, WDI

Industry, or more precisely manufacturing, is accepted as the engine of the economic growth in economic development literature. Observations outlined above show that the share of manufacturing sector in GDP is low in the MENA countries comparing with the countries at similar income levels. Therefore, industrialization has limited role in explaining the income differences in the MENA region. Table 2 exhibits the relation between natural resource rents and GDP per capita in the selected MENA countries as 2000-2011 averages. Table 2 shows that, except United Arab Emirates, Yemen and

Tunisia, order of total natural resources rents as the percentage of GDP is quite similar to the order of per capita GDP. In other words, oil, natural gas, and similar natural resource incomes have important contributions to the formation of national income in most of the MENA countries. United Arab Emirates diversifies its economy in the last decade and targeted to be a finance and trade hub in the region. This policy may explain its higher per capita income in the United Arab Emirates. High but reverse deviation is observed in Yemen. This is probably outcome of long-lasting political unrests which impede the development of the economic activities other than resource extracting. Rank deviation in Tunisia is relatively smaller than deviations in these countries.

This rough descriptive analysis reveals that the MENA region countries have different patterns: their sectoral reallocations and income formations have unconventional characteristics. Therefore, deindustrialization in the region countries may occur differently than other country experiences.

4. Model and Data

The model used for the analysis of the deindustrialization in MENA countries specified to capture the effects of Chinese expansion, openness, and natural resource abundance (mainly petroleum) on the level of deindustrialization. Econometric model is based on the interaction between economic development and industrialization *á la* Kuznets: It assumed that there is invers U shape relationship between per capita income and industrialization:

$$MAN = \beta_0 + \beta_1 GDP + \beta_2 GDP^2 + \beta_3 OPEN + \beta_4 RES + \beta_5 CHINA + \varepsilon \quad [1]$$

Natural resources (RES), Chinese expansion in the World market (CHINA) and openness (OPEN) are the control variables, which we assume, may have direct effect on the industrialization level in the MENA countries.

Dependent variable MAN indicates the industrialization level. In the deindustrialization literature, industrialization level is measured by the share of manufacturing employment in total employment. However, for the estimation of the model presented here, we prefer to use manufacturing sector value added as the proxy for the manufacturing output because of two reasons. Data limitation is the first reason: It is not possible to construct a sufficient time series manufacturing employment data for the MENA countries. Second one is related with the discussions on to what extend the change in the employment share is an appropriate indicator for the deindustrialization: Decrease in the share of manufacturing employment may also indicate the increase in labor productivity in manufacturing. Rowthorn and Ramaswamy (1997), state that “The main reason for deindustrialization is the faster growth of productivity in manufacturing than in services”. For the estimation of the model, manufacturing value added per capita is used.

Figures 3 displays the change in the share of manufacturing value added in GDP for the MENA countries. For both resource rich and resource poor MENA countries, the change in the manufacturing share do not present uniform trend during four-decade period. However, historical data for the industrialized countries show that the share of manufacturing in total employment and total value-added increases as the income level increases, and as the income level reaches to some level the share of manufacturing in the total economy tends to decline due to expansion of the service sector as it is discussed in the second section. The inverse U shape curve generally observed in the evolvement of the manufacturing is captured by the quadratic form in the model. GDP per capita (GDP) is used for the economic development. Following Kuznets facts, it is expected that β_1 is positive and β_2 is negative.

Effect of the openness on the domestic economy is a controversial topic in economics. Assuming that the MENA countries are also affected by the globalization through openness, the variable OPEN is added to the model as a control variable. There is no consensus on how to measure the openness or to determine an appropriate indicator for the openness. We employ a commonly used indicator which is defined as the ratio of trade volume to GDP:

[Merchandise Exports + Merchandise Imports] / GDP

RES is the total natural resources rent as the percentage of GDP. Considering the literature on the resource curse, it is expected that β_4 should have negative sign.

As it is discussed in the second section, immense expansion of manufacturing in China caused a global shift of manufacturing to China from rest of the world. Chinese expansion may directly affect a country through mutual economic relation, and we observe an increasing trend as the share of imports from China in total imports and the share of FDI from China in total FDI inflow in the MENA region. In addition to this direct impact, the region countries may be indirectly affected through the effects of Chinese expansion on the other trade partners of them. To capture direct and indirect effects together we employ share of the Chinese merchandise exports in the world export volume as the third control variable CHINA.

Model-1 is redefined by adding the interaction terms:

$$MAN = \beta_0 + \beta_1 GDP + \beta_2 GDP^2 + \beta_3 OPEN + \beta_4 RES + \beta_5 CHINA + \beta_6 OPEN*CHINA + \beta_7 OPEN*GDP + \varepsilon \quad [2]$$

The World Bank, World Development Indicators is used for constructing the panel data set of the estimations. Panel covers Algeria, Egypt, Jordan, Morocco, Oman, Tunisia, and Saudi Arabia and the years 1975-2014.

5. Estimation Results

Manufacturing sector is usually represented by the share of manufacturing value added and of employment in an empirical research. However, in this study, we used per capita manufacturing value added as the dependent variable. The reason behind this is related with the potentially strong linearity between the value added as the percentage of GDP and one of the explanatory variables, namely the total natural resources rent as the percentage of GDP (RES). Particularly for resource rich countries, the changes in the percentage share of natural resource rents due to the fluctuations in oil prices in the international market directly transmitted to the percentage share of the manufacturing value added. Using per capita manufacturing value added as the dependent variable eliminates this sort of linear dependency between explanatory and dependent variables.

It is possible to use two alternative indicators for openness: Ratio of trade volume to GDP and ratio of domestic prices to international prices. One of the typical characteristics of the oil rich countries is that they have high openness ratio if it is measured as the trade volume. Alternative openness indicator also suffers from same problem: Oil export revenues are used for financing the imported product to meet the domestic demand in the oil rich countries, which in turn, yield to decrease in the gap between domestic and international prices. Since the data for the relative prices is limited, we preferred ratio of trade volume to GDP.

The correlation coefficients of RES and OPEN measured as the trade volume are displayed in Table 3. The coefficients of correlations are significant most of the countries in the sample, and they are remarkably close to one in Algeria and Tunisia. Therefore, in addition to complete model (Model-A1), Model-1 is modified by using RES and OPEN separately as the explanatory variable (Model-A2 and -A3). Additionally, to consider potential correlation between RES and OPEN with GDP, only CHINA is used in Model-A4. Interaction terms in the Model-B are respecified accordingly.

Table 3: Correlation between RES and OPEN

Countries	Coefficient of correlation
Algeria	**0.86**
Egypt, Arab Rep.	**0.38**
Jordan	**0.30**
Morocco	0.25
Oman	**0.34**
Tunisia	**0.90**
Saudi Arabia	-0.20

Source: Authors' own calculation

Most of the variables in the model are non-stationary.[9] Therefore, first differences of all variables are used for the model estimations.

Table 4: Estimation Results without Interaction Terms

Dependent variable: Per capita manufacturing value added - constant 2010 US$

Period: 1975-2014

	Model A1				Model A2			
	Random		Fixed		Random		Fixed	
Constant	8.858332				8.882603			
T-Stat	*1.312200*				*1.320170*			
GDP	0.070479	**	0.071598	**	0.072840	**	0.074242	**
T-Stat	*2.075490*		*2.080190*		*2.14175*		*2.158080*	
GDP*2	-0.000001		-0.000001		-0.000001		-0.000001	
T-Stat	*-0.657160*		*-0.672330*		*-0.745330*		*-0.768780*	
RES	-2.969793	***	-2.904466	***	-3.213019	***	-3.156149	***
T-Stat	*-3.695270*		*-3.574900*		*-4.10419*		*-3.99653*	
CHINA	11.778713		11.852625		10.486065		10.508504	
T-Stat	*0.753510*		*0.751040*		*0.670130*		*0.666480*	
OPEN	-0.855155		-0.886820					
T-Stat	*-1.259220*		*-1.290880*					
Hausman	5.6497				5.5229			
Significance	0.3418				0.1373			

	Model A3				Model A4			
	Random		Fixed		Random		Fixed	
Constant	8.258183				8.212341			
T-Stat	*1.179130*				*1.173490*			
GDP	0.077262	**	0.077903	**	0.082555	**	0.083538	**
T-Stat	*2.224240*		*2.217050*		*2.361950*		*2.367410*	
GDP*2	-0.000001		-0.000001		-0.000001		-0.000001	
T-Stat	*-1.014750*		*-1.013810*		*-1.222310*		*-1.231130*	
RES								
T-Stat								
CHINA	15.684326		15.685473		13.926487		13.898003	
T-Stat	*0.981910*		*0.974550*		*0.865300*		*0.858630*	
OPEN	-1.455790	**	-1.476179	**				
T-Stat	*0.675459*		*-2.165300*					
Hausman	1.2642				0.1065			
Significance	0.7377				0.9911			

(*) significant at <10%, (**) significant at <5%, (***) significant at <1%,

[9] ADF- Fisher and LLC (Levin, Lin, and Chu) first generation panel unit root tests, and Pesaran's CADF second generation panel unit root test are used to check unit root. Estimations ignoring unit root result high t values for all coefficients.

Table 5: Estimation Results with Interaction Terms

Dependent variable: Per capita manufacturing value added - constant 2010 US$

Period: 1975-2014

	Model B1				Model B2			
	Random		Fixed		Random		Fixed	
Constant	8.007200				9.539272			
T-Stat	*1.142180*				*1.366130*			
GDP	0.089487	***	0.091266	***	0.072516	**	0.073887	**
T-Stat	*2.613550*		*2.615980*		*2.13201*		*2.143520*	
GDP*2	0.000000		0.000000		-0.000001		-0.000001	
T-Stat	*-0.152900*		*-0.150990*		*-0.733470*		*-0.754490*	
RES	-2.335499	***	-2.246885	***	-3.183110	***	-3.123405	***
T-Stat	*-2.805900*		*-2.654020*		-4.04444		-3.92643	
CHINA	15.855398		15.954712		8.392692		8.205974	
T-Stat	*0.887180*		*0.879080*		*0.502310*		*0.486470*	
OPEN	0.761275		0.801994					
T-Stat	*0.855390*		*0.885950*					
OPENCHINA	-0.228866		-0.236866					
T-Stat	*-0.804900*		*-0.820180*					
OPENGDP	-0.000363	***	-0.000378	***				
T-Stat	*-2.821770*		*-2.890180*					
RESCHINA	-0.174577		-0.192792		-0.239019		-0.262890	
T-Stat	*-0.260470*		*-0.283260*		*-0.356640*		*-0.388490*	
Hausman	5.9761				5.5306			
Significance	0.5425				0.3546			

	Model B3			
	Random		Fixed	
Constant	8.353493			
T-Stat	*1.125910*			
GDP	0.101147	***	0.102355	***
T-Stat	*2.93612*		*2.927310*	
GDP*2	0.000000		0.000000	
T-Stat	*-0.309670*		*-0.298770*	
RES				
T-Stat				
CHINA	17.102515		17.331877	
T-Stat	*0.973840*		*0.975560*	
OPEN	0.835654		0.873971	
T-Stat	*0.926870*		*0.956810*	
OPENCHINA	-0.131084		-0.141045	
T-Stat	*-0.465060*		*-0.494540*	
OPENGDP	-0.000470	***	-0.000481	***
T-Stat	*-3.769920*		*-3.813650*	
Hausman	5.8761			
Significance	0.3185			

(*) significant at <10%, (**) significant at <5%, (***) significant at <1%,

Estimation results are displayed in Tables 4 and 5. For all specifications coefficients of GDP are positive and significant, coefficients of GDP^2 are insignificant. Same result obtained in the model which is specified only by Kuznets fact. These results indicate

that there is no common nonlinear relation between GDP per capita and per capita manufacturing value added. Different patterns displayed in Figure 3 support these results. Small coefficients for GDP (around 0.01) indicate that one US dollar increase in GDP per capita produces less than one US dollar increase in manufacturing valuer added. Consequently, it is possible to conclude that the higher GDP per capita is associated with lower per capita manufacturing value added in the countries included in the panel.

Estimated coefficients for share of natural resource rent in GDP (RES) are also significant and the signs of the coefficients are negative in all models either with or without OPEN. This result shows that resource curse has a strong impact on the manufacturing performances of sample countries. On the other hand, the coefficients found for openness (OPEN) are significant only in the model when RES is not included. Considering the resource rich countries have also high openness ratio due to dominance of oils and natural gas exports in the trade, significant and negative signs for the coefficients of OPEN can be considered as the disguised effect of the resource curse rather than policy preference. Negative and significant coefficient for the interaction term OPENGDP also can seen as the indirect effect of natural resource on the development of the manufacturing.

The models estimated do not detect any effect of Chinese expansion on manufacturing value added. Estimation result shows that the industrialization of China, at least, does not block the industrialization in the MENA countries.

6. Conclusion

Estimation results of the econometric models specified in the paper reveal that–rich natural resources such as oil and natural gas are the main obstacles on the manufacturing development in the region. However, it seems that the Chinese expansion in the world economy which is considered as main source of the deindustrialization in the developed and the developing countries has no impact in the selected MENA countries.

One salient result of the estimated models is negative impact of natural resource abundance. However, strong resource curse on the development of the manufacturing in the MENA country may be misleading. Natural resource poor countries also do not display sound performance in industrialization during 1975-2014. The analyses presented in the paper do not sufficient to understand what would happen if resource curse absented in the MENA region.

The result founded for the Chinese expansion in the empirical analyses is a result that needs to be careful about. We should be prudent when making inferences based on econometric results. However, we should focus on more deeply the changing nature of Chinese economic policies from longer term perspective. There is a growing concern and literature on the Chinese rising interest in the Middle East Region. Ambitious “Belt

and Road Initiative" project of China draws attention. These investment initiatives might have a potential to affect the manufacturing in the region countries in future.

References

Auty, R. M. (1995), "Economic Development and the Resource Curse Thesis," in Oliver Morrissey, Frances Stewart, eds., *Economic and Political Reform in Developing Countries*, UK, Palgrave Macmillan, 58-80.

Auty, R. M. and H. I. Furlonge (2019), *The Rent Curse: Natural Resources, Policy Choice, and Economic Development*, Oxford, United Kingdom, Oxford University Press.

Bernard, A. B., V. Smeets and F. Warzynski (2016), Rethinking Deindustrialization, NBER Working Paper No. 22114.

Blackaby, F. (Ed.) (1979), *De-industrialisation*. National Institute of Economic and Social Research Economic Policy Papers No. 2. London, Heinemann.

Boumol, W. J. (1967), Macroeconomic of Unbalanced Growth: The Anatomy of Urban Crisis. *American Economic Review*, 57(3), 415-426.

Brown, C.J.F., and T.D. Scherif (1979), De-Industrialization: A Background paper," in Blackaby (1979).

Chenery, H. B. (1960), "Pattern of Industrial Growth," *American Economic Review*, 50 (4), 624-654.

Chenery, H. B. and L. Taylor (1968), "Development Patterns: Among Countries and Over Time," *Review of Economics and Statistics*, 50 (4), 391-416.

Clark, C. (1940), *The Conditions of Economic Progress*, London, Mac Millan.

Corden, W. M. and J. P. Neary (1982), "Booming Sector and De-Industrialisation in a Small Open Economy," *The Economic Journal*, 92(368), 825-848.

Cornwall, J. (1980), "Modern Capitalism and the Trend toward Deindustrialization," *Journal of Economic Issues*, 14(2), 275-289.

Dimaranan, B., E. Ianchovichina and W. Martin (2009), "How will growth in China and India affect the world economy?" *Review of World Economics*, 145(3): 551-571. https://doi.org/10.1007/s10290-009-0029-y.

Doğruel, F. and A. S. Doğruel (2018), Bıçak Sırtında Büyüme ve İstikrar: Küreselleşmenin Yükselişi ve Düşüşü, Second Edition, Istanbul: Istanbul Bilgi University Publication.

Frankel, J.A. (2012), "The Natural Resource Curse: A Survey of Diagnoses and Some Prescriptions," in Arezki, R., Pattillo, C.A., Quintyn, M., and Zhu, M. eds., *Commodity Price Volatility and Inclusive Growth in Low-Income Countries*, Washington, DC, IMF, 7–34.

Fusch, V.R. (1968), *The Service Economy*, New York: NBER.

Hanson, G. and R. Robertson (2010), "China and the Manufacturing Exports of Other Developing Countries," in Robert C. Feenstra and Shang-Jin Wei, eds., *China's Growing Role in World Trade*, Chicago and London, University of Chicago Press, 137-159.

Kongsamut, P., S. Rebelo and X. D. Danyang (2001), "Beyond Balanced Growth," *Review of Economic Studies*, 68(4), 869-882.

Kuznets, S. (1973), "Modern Economic Growth: Findings and Reflections," *The American Economic Review*, 63 (3), 247-258.

Kuznets, S. (1959), *Six Lectures on Growth*, Glencoe, III., Free Press.

Kuznets, S. (1958), "Quantitative Aspect of the Economic Growth of Nations; III, Industrial Distribution of the Labor Force by States, United States 1919-21 to 1955," *Economic Development and Cultural Change*, 6(4), 1-128.

Kuznets, S. (1957), "Quantitative Aspect of the Economic Growth of Nations; II." *Economic Development and Cultural Change*, Supplement to Vol. V (4), 3-111.

Lengellé, M. (1966), *The Growing Importance of the Service Sector in Member Countries*, Paris: OECD.

O'Rourke, K. H. and J. G. Williamson (2002), "When Did Globalization Begin?" *European Review of Economic History*, 6(1), 23-50.

Maizels, A. (1970), *Growth and Trade*, Cambridge, The University Press.

Neary, J. P. (1982), "Real and monetary aspects of the 'Dutch disease," UCD Centre for Economic Research Working Paper Series; No. 5, Publisher University College Dublin. School of Economics. http://hdl.handle.net/10197/1398

Rodrik, D. (2016), "Premature deindustrialization," *Journal of Economic Growth*, 21(1), 1–33.

Rowthorn, R. and R. Ramaswamy (1999), “Growth, Trade, and Deindustrialization,” *IMF Staff Papers*, 46(1), 18-41.

Rowthorn, R. and R. Ramaswamy (1997), “Deindustrialization–Its Causes and Implications,” *Economic Issues,* No:10, International Monetary Fund, September.

Rowthorn, R. and J.R. Wells (1987), *Deindustrialization of Foreign Trade*, Cambridge, Cambridge University Press.

Sachs, J., and A. Warner (2001), “The Curse of Natural Resources,” *European Economic Review*, 45(4-6), 827-838.

Saeger, S. (1997), “Globalization and deindustrialization: Myth and reality in the OECD,” *Review of World Economics (Weltwirtschaftliches Archiv),* Springer, 133(4), 579-608.

Singh, A. (1977), “UK Industry and the World Economy: A Case of Deindustrializaiton?” *Cambridge Journal of Economics*, 1(2), 113-136.

The World Bank, WDI (World Development Indicators)

Wan Jr., Henry (2005), "Chinese Trade Expansion and Development and Growth in Today's World," DEGIT Conference Papers c010_004, DEGIT, Dynamics, Economic Growth, and International Trade.

Watson, W. (1981), Book Review. *Journal of Comparative Economics*, 5(1), 92-95.

Wijnbergen, S. van. (1984), “The 'Dutch Disease': A Disease After All?” *The Economic Journal*, 94 (373), 41-55.

Wood, A. and J. Mayer (2011), “Has China de-industrialised other developing countries?” *Review of World Economics (Weltwirtschaftliches Archiv*), 147(2), 325-350.

Appendix

Table A1: FDI inflow to MENA countries

	Algeria			Egypt			Iran			Jordan		
	World	China	%	World	China	%	World	China	%	World	China	%
2001	1112.6	0.6	0.1	509.9	0.0			0.0			0.0	
2002	1071.5	5.3	0.5	646.9	0.0			0.0			0.0	
2003	853.7	2.6	0.3	237.4	0.0			7.8			0.0	
2004	721.6	27.1	3.8	2157.4	0.0			17.6			0.0	
2005	1095.2	49.9	4.6	5375.6	0.7	0.0		11.6			1.0	
2006	1795.4	91.0	5.1	10042.8	8.2	0.1		65.8			-6.2	
2007	1661.8	36.6	2.2	11578.1	12.3	0.1		11.4			0.6	
2008	2593.6	86.0	3.3	9494.6	24.1	0.3		-34.5			-1.6	
2009	2760.9	62.5	2.3	6711.6	53.5	0.8		124.8			0.0	
2010	2237.5	124.6	5.6	6385.6	48.1	0.8		511.0			0.0	
2011	..	..		-482.7	47.8	-9.9		615.6			0.0	
2012	..	..		5757.7	71.7	1.2		702.1			9.8	

	Kuwait			Morocco			Oman			Saudi Arabia		
	World	China	%	World	China	%	World	China	%	World	China	%
2001		0.0		2874.1	0.0		..	..		504.0	0.0	
2002		0.0		533.2	0.0		..	..		453.0	1.0	
2003		0.0		2429.1	0.0		..	..		778.0	0.0	
2004		1.7		1069.5	1.6		..	..		1942.0	1.0	
2005		0.0		3012.7	0.0		..	..		12097.0	0.0	
2006		4.1		2964.0	0.0		1587.8	-16.4	-1.0	17140.0	1100.0	6.4
2007		-6.3		4633.5	0.0		3431.5	9.4	0.3	22821.0	1428.0	6.3
2008		2.4		3608.0	3.4		2528.5	49.4	2.0	38151.0	1323.0	3.5
2009		2.9		3133.8	0.0		1461.9	26.5	1.8	32100.0	3605.0	11.2
2010		22.9		4166.3	0.0		1177.1	33.3	2.8	28105.0	1961.0	7.0
2011		42.0		3221.3	0.0		1050.5	-7.0	-0.7	..	..	
2012		-11.9		0.0	0.0		..	..		..	..	

	Tunisia			Yemen		
	World	China	%	World	China	%
2001	486.5	0.0	0.0		0.0	
2002	821.0	0.0	0.0		0.0	
2003	583.6	0.7	0.1		0.0	
2004	639.0	0.0	0.0		3.4	
2005	782.9	1.2	0.2		35.2	
2006	3307.9	73.1	2.2		7.6	
2007	1616.1	12.4	0.8		43.5	
2008	2758.4	17.7	0.6		18.8	
2009	1687.6	4.3	0.3		1.6	
2010	1512.5	11.6	0.8		31.5	
2011	1147.9	5.7	0.5		-9.1	
2012	1603.2	2.6	0.2		14.1	

Source: UNCTAD

Table A2: Share of China in Imports of Selected MENA Countries

	Algeria	Egypt	Iran	Jordan	Kuwait	Morocco
2001	2.0	4.0	4.5	4.9	4.4	
2002	2.8	4.5	4.7	6.7	5.2	
2003	3.8	4.9	5.5	8.0	5.7	3.4
2004	5.0	5.1	4.9	8.4	6.8	4.2
2005	6.5	4.6	6.1	9.2		5.1
2006	8.0	5.8	6.0	10.4	9.2	5.4
2007	8.6	6.0		9.7	11.5	5.9
2008	10.3	8.4		10.4	11.7	5.7
2009	12.1	8.7		10.9	12.4	7.8
2010	11.2	9.2	10.4	10.8	12.5	8.4
2011	10.0	9.2	10.3	10.0	14.8	6.5
2012	11.8	9.4		9.4	13.2	6.6
2013	12.4	10.5		10.4	13.4	6.9
2014	14.1	11.3		10.5	14.1	7.6
2015	15.9	13.1		12.9	16.0	8.4
Rank	**1**	**1**		**2**	**1**	**3**
from	**2014**	**2012**		**2003**	**2007**	**2014**

	Oman	Saudi Arabia	Tunisia	UAE	Yemen
2001	1.7	4.6	1.4		
2002	1.6	5.3	1.5		
2003	0.6	5.9	1.7		
2004	1.7	6.6	2.3		7.1
2005	2.4	7.4	2.9	8.5	6.2
2006	3.3	8.6	3.3	9.7	7.2
2007	3.0	9.7	3.4	9.9	9.1
2008	4.6	11.0	3.7		7.5
2009	4.8	11.3	5.0		9.3
2010	4.8	11.6	6.1		7.9
2011	4.6	13.1	6.1		6.5
2012	4.9	12.6	6.9	12.2	7.4
2013	3.1	12.8	6.3	12.3	7.8
2014	4.8	13.7	7.2	15.1	11.3
2015	5.0	14.6	8.4		
Rank	**4**	**1 -2**	**3**	**1**	**1**
from	**2014**	**2011**	**2014**	**2012**	**2014**

Source: UN COMTRADE