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Financialization, Growth, and the Resource Curse: Evidence from the MENA Region

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FINANCIALIZATION, GROWTH, AND THE RESOURCE CURSE: EVIDENCE FROM THE MENA REGION[1]

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Abstract

This study investigates whether the impacts of natural resource endowments (NREs) on growth are invariant on an endogenously estimated threshold level for international financial integration (IFI) in 13 Middle East and North Africa (MENA) economies over the 1970-2019 period. Our dynamic panel threshold estimation results suggest that NREs encourage growth up to a certain threshold level of IFI, beyond which the impact of NREs decreases for the sample of Gulf Cooperation Council (GCC) countries. This impact even becomes negative for the non-GCC economies. We also decompose IFI as resident-driven asset flows (capital outflows) and non-resident-driven liability flows (capital inflows) to investigate whether the direction of financial integration matters. We find that asset flows matter for the sample of GCC countries. There is a positive association between NREs and growth; however, this relationship diminishes with more capital outflows. Liability flows provide a data-driven estimated threshold for the non-GCC countries. NREs have a growth-enhancing effect in economies with fewer capital inflows but tend to dampen growth in economies with more capital inflows.

Keywords: Middle East and North Africa, financial development, international financial integration, resource curse, growth, panel threshold model.
JEL Classifications: C13, C33, F43, O10, O13, O47, Q32.

ملخص

تبحث هذه الدراسة فيما إذا كانت تأثيرات الثروات الطبيعية (NRE) على النمو ثابتة بالنسبة لمستوى الحد الأدنى التقديري الداخلي المنشأ للاندماج المالي الدولي (IFI) في 13 اقتصادًا في الشرق الأوسط وشمال إفريقيا خلال الفترة 1970-2019. وتشير نتائج تقدير الحد الأدنى للمجموعة الديناميكية إلى أن الثروات الطبيعية تشجع النمو حتى مستوى معين للحد الأدنى من الاندماج المالي الدولي، حيث يقل بعد هذا الحد تأثير الثروات الطبيعية بالنسبة لعينة بلدان مجلس التعاون الخليجي .(GCC) ويصبح هذا التأثير سلبيًا حتى بالنسبة للاقتصادات غير الخليجية. كما يتم تحليل الاندماج المالي الدولي على أنه تدفقات أصول مدفوعة بالمقيمين (تدفقات رؤوس الأموال الخارجة) وتدفقات الالتزام المدفوعة بغير المقيمين (تدفقات رؤوس الأموال الداخلة) للتحقق مما إذا كان اتجاه الاندماج المالي مهمًا. وجدت الدراسة أن تدفقات الأصول مهمة بالنسبة لعينة بلدان مجلس التعاون الخليجي. فيوجد ارتباط إيجابي بين الثروات الطبيعية والنمو، ولن تتضاءل هذه العلاقة مع زيادة تدفقات رأس المال الخارجة. توفر تدفقات الالتزام الحد الأدنى التقديري المستند إلى البيانات للبلدان غير الخليجية. ويتمثل تأثير الثروات الطبيعية في تعزيز النمو داخل الاقتصادات ذات تدفقات رأس المال الأقل، بينما يميل هذا إلى إضعاف النمو في الاقتصادات ذات تدفقات رأس مال داخلة مرتفعة.

1. Introduction

Is natural resource abundance a curse or a blessing for economic growth? Conventional wisdom maintains that countries with an abundance of non-renewable natural resources, such as oil and gas, have higher income levels and growth rates. This often appears to be the case for the income levels of the oil-rich Gulf Cooperation Council (GCC) countries (Bahrain, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates), all of which are classified as high-income economies by the World Bank. The results of the growth impact of natural resources, however, are often mixed. An early study by Sachs and Warner (1995), for instance, finds that natural resource abundance leads to lower growth rates, in what Auty (1993) coined the "resource curse." On the other hand, Smith (2015) finds that natural resource endowments (NREs) lead to growth in non-OECD economies. Frankel (2010), Papyrakis (2017), van der Ploeg (2011), and Badeeb et al. (2017) provide recent surveys in the resource curse literature.

This study aims to investigate the effect of NREs on growth in Middle East and North Africa (MENA) economies. Sethi et al. (2003) note that the investment decisions of foreign investors are often based on resource- and efficiency-seeking motivations. In this context, NREs may provide internalization advantages to host economies and attract both resource- and efficiency-seeking foreign investments. The favorable commodity prices and higher demand for non-renewable natural resources, including oil and gas, lead to higher income in MENA countries. All these may differentiate the investment decisions made by residents in resource-rich economies from those made by non-residents. Therefore, it may be plausible to suggest that the NRE-growth relationship may be affected by the investment decisions of foreign and domestic residents.

Conventional literature maintains that international financial integration (IFI), measured as the sum of gross stocks of financial asset purchases by domestic and foreign residents in GDP, may provide many benefits, including a better macroeconomic environment, improved institutional quality, and greater risk sharing, although it may increase vulnerability and sensitivity to crises. In this context, it may be plausible to suggest that the IFI levels of MENA economies may play a crucially important role in explaining the effect of NREs on growth. The sensitivity of growth to NREs may not necessarily be the same in economies with less or more IFI. Furthermore, the effect of NREs on growth may change depending on the direction of financial integration, i.e., non-resident-driven liability flows (capital inflows) and resident-driven asset flows (capital outflows).

To investigate the resource curse postulation, we consider a conventional growth equation that includes human capital and financialization augmented with the natural resource variables. Financialization refers to "increasing [the] role of financial motives, financial markets, financial actors, and financial institutions in an economy," according to Epstein (2005, p.3). In this study, we consider both the domestic and international aspects of financialization. Domestic financialization is represented by financial development. For the international aspect of financialization, we consider IFI represented by the sum of gross stocks of financial assets and liabilities as a percent of GDP (Lane and Milesi-Ferretti, 2018). The effects of the main components of IFI, resident-driven asset flows (capital outflows), and non-resident driven

liability flows (capital inflows) may also matter.[3] Therefore, we also consider international assets (capital outflows) and liabilities (capital inflows) as the main components of IFI. Our measure of NREs consists of fuel and mining product exports as a percent of GDP to represent the natural resource dependency (NRE_D) and total natural resource rents in GDP (NRE_D) to denote the natural resource abundance.

The bulk of the literature maintains that the growth impact of natural resources is invariant to the levels of capital inflows and outflows, and thus IFI. It may be plausible to suggest that the effect of NREs on growth may not be linear for a given level of IFI. The sensitivity of growth to NREs may change depending on the degree of IFI. This may also be the case for the main components of IFI. This study investigates whether IFI and its main components provide data-driven estimated thresholds for the effect of NREs on growth. The literature often tackles the non-linearity issue either by some interaction specifications or *ad hoc* sample-splitting procedures that maintain that the threshold level is exogenous. Alternatively, the threshold levels for the effect of IFI on the NRE-growth relationship may be better estimated endogenously by employing data-driven estimation procedures. In this context, we examine the thresholding effect of IFI in explaining the NRE-growth relationship by using the dynamic panel threshold estimation procedure of Kremer et al. (2013). The empirical literature often ignores the potential endogeneity of natural resource variables for the evolution of growth. The Kremer et al. (2013) procedure allows for the estimation of threshold effects even in the presence of endogeneity among the regressors. As a robustness check, the paper also reports the generalized method of moments (GMM) estimation (Arellano and Bover, 1995) results. To our knowledge, this is the first study that investigates the NRE-growth relationship by subjecting it to a data-driven estimated threshold level of IFI and its main components. We investigate this crucially important issue for a sample of 13 MENA economies over annual data for the 1970-2019 period. The MENA sample also includes the oil-rich GCC economies and thus appears to provide a promising research agenda on the resource curse issue.

The rest of this paper is organized as follows. Section 2 provides a brief literature review. Section 3 introduces the data and provides some descriptive statistics. Section 4 presents the empirical methodology and reports the estimation results. Section 4.1 introduces the dynamic panel threshold estimation procedure, while section 4.2 reports the estimation results. Section 4.3 presents the GMM estimation results. Finally, section 5 concludes and provides some policy implications.

2. A brief review of the literature

A large and growing number of studies empirically investigate the growth consequences of natural non-renewable resources. The seminal study by Sachs and Warner (1995) suggests that natural resource abundance, measured as natural resource exports in GDP, leads to lower

[3] An alternative measure to the *de facto* IFI, the *de jure* capital openness index KAOPEN by Chinn and Ito (2008) may also be considered. However, KAOPEN does not contain regulatory measures for capital inflows and outflows separately. Kose et al. (2009) suggest using the *de facto* measure as it represents how economies are financially integrated in practice. We believe that whether investigating the results of this paper are robust to the use of KAOPEN provides a promising research agenda.

growth. According to Auty (1993), resource abundance leads to the "resource curse." The recent surveys of the resource curse literature are provided by Frankel (2010), Papyrakis (2017), van der Ploeg (2011), and Badeeb et al. (2017).

Guillo and Perez-Sebastian (2015) provide a neoclassical, open-economy, two-sector theoretical model based on a dynamic Heckscher-Ohlin framework to explain the relationship between NREs and long-run growth. Their results suggest that growth is much lower in resource-abundant economies with higher capital intensity, whilst long-run income is higher in countries where the labor share in the resource-extractive primary sector is less than in the non-primary sector. According to the panel smooth transition regression estimation results by Damette and Seghir (2018), the positive effect of natural resources on growth becomes negative in resource-dependent economies with a higher share of primary exports in GDP. The results of Adekoya (2021) support the postulation that resource-rich countries are faced with the problem of the resource curse. James (2015) finds that the increased growth of resource-based sectors leads to the increased growth of non-resource sectors. The empirical findings by Badeeb et al. (2021) suggest that the impact of oil rents on sectors is asymmetric in the long run and symmetric in the short run. Smith (2015) remarks that the extraction of resources leads to higher growth in non-OECD countries. Atkinson and Hamilton (2003) note that the presence of a resource curse may reflect governments' inefficient use of resource revenues. Cheng et al. (2021) suggest that the development of resource-based cities can avoid the resource curse and lead to sustainable development if resources are used to improve innovation, manufacturing investment, and environmental regulation. Environmental regulation, according to Qian et al. (2021), can help coal mining cities turn into a "resource blessing."

Mehlum et al. (2006) argue that the institutional environment may be classified as grabber (producer) friendly when there is competition (complementarity) between rent-seeking behavior and production activities. Their results suggest that NREs lead to lower growth in a grabber-friendly institutional environment and higher growth in a producer-friendly institutional environment. The findings by Sala-i Martin and Subramanian (2013) indicate that the curse effect of resource endowments becomes a blessing under better institutional quality. Antonakakis et al. (2017) provide empirical support to Sala-i Martin and Subramanian (2013) and Mehlum et al. (2006). The empirical findings by Sarmidi et al. (2014) suggest that a certain threshold level of institutional quality is required to escape from the curse of natural resources. According to Ali and Faisal (2022), natural resource revenues boost economic growth by strengthening both financial development and institutional quality. In a similar vein, the results by Li et al. (2021) support the view that the blessing impact of the abundance and the utilization of natural resources is routed through financial development in G7 countries. Contrary to these findings, natural resource abundance leads to lower levels of voice and accountability (Alexeev and Conrad, 2011), higher corruption (Busse and Gröning, 2013), and rent seeking (Aragon et al. 2015). Natural resource abundance may hinder financial development in countries with poor institutions (Bhattacharyya and Hodler, 2014). Umar et al. (2021) mention excess reliance on natural resources as the cause of lower financial development in oil-producing countries. The results by Eslamloueyan and Jafari (2021) and Salari et al. (2022) support the hypothesis that the resource curse in oil-rich countries vanishes if human capital is above a certain level. Ma et

al. (2021) suggest promoting human capital and openness to avoid a remittance-induced Dutch disease in resource-rich economies.

Apergis and Payne (2014) find that better institutional quality reduces the unfavorable effect of oil reserves on economic performance in MENA countries. Lebdioui (2020) argues that resource-rich MENA countries tend to spend their resource revenues on consumption rather than on financing productive investment in non-resource tradable sectors. Belaid et al. (2021) find that, contrary to the resource curse, a resource blessing may be the case for MENA countries, as oil rents tend to lead to growth. Consistent with a view that dictatorships often have a higher tendency for rent-seeking behavior, the results of Belaid et al. (2021) also suggest that MENA countries with military executives suffer from the resource curse. According to the results by Ross (2015), on the other hand, resource abundance tends to make authoritarian regimes more durable as it provides them with the means to prolong their stay in power.

The bulk of the literature maintains that the resource curse is often related to institutional quality and governance, human capital, financial development, unfavorable commodity price fluctuations, and the crowding out of productive sectors (such as manufacturing). The literature, however, is yet to fully consider the effect of financial globalization or IFI in explaining the relationship between NREs and growth. In this study, we postulate that IFI, measured as the sum of gross stocks of financial assets and liabilities as a percent of GDP (Lane and Milesi-Ferretti, 2018), may also be important for the impact of NREs on growth. According to conventional wisdom, financial integration promotes growth as it leads to the efficient allocation of capital, higher levels of financial development, better governance, and stronger macroeconomic policies (Kose et al., 2010). On the other hand, financial integration may increase vulnerability and sensitivity to crises. In this context, it may be plausible to assume that the level and direction of IFI matter for reaping the beneficial effects of NREs on growth.

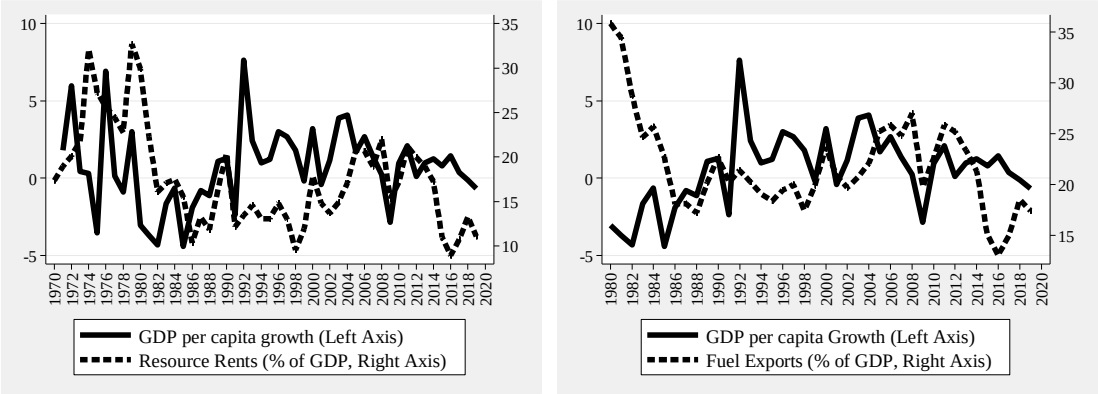
3. Data and descriptive statistics

In this paper, we investigate the effect of NREs on growth and postulate that the impact of NREs on growth may change depending on the IFI levels of economies. To investigate this crucially important research question, our sample contains annual observations for 13 MENA economies (Algeria, Bahrain, Egypt, Iran, Israel, Jordan, Kuwait, Morocco, Qatar, Saudi Arabia, Tunisia, Turkey, and the United Arab Emirates) over the 1970-2019 period. The choice of the sample is mainly determined by data availability. McKee et al. (2017) classify the MENA economies based on resource and labor endowments. Accordingly, the GCC countries (Bahrain, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates) are rich in NREs but poor in labor force. The rest of the sample may be categorized as relatively rich in terms of labor endowments but poor in natural resources. Therefore, we also consider the GCC and non-GCC countries separately.

In this study, growth is the log difference in real GDP per capita and the data used are from the United Nations Conference on Trade and Development database. HC is a human capital index constructed based on years of schooling and returns to education, with data from the Penn World Table (Feenstra et al., 2015). The HC ranges between 1.00 and 4.35, with higher values

representing more educated labor. FD proxies to financial development are measured as domestic credit to the private sector in GDP. The data for FD are from the World Bank's World Development Indicators (WDI-WB). IFI is measured as the sum of gross stocks of financial assets and liabilities in GDP, and the data are from the External Wealth of Nations database (Lane and Milesi-Ferretti, 2018). Our measure of NREs consists of fuel and mining product exports as a percent of GDP to represent the natural resource dependency (NRE_D) and total natural resource rents in GDP to reflect the natural resource abundance (NRE_A). The data for NRE_D and NRE_A are, respectively, from the World Trade Organization and WDI-WB.

Figure 1. GDP growth and NREs



(a) (b)

Figure 1 shows the evolution of real GDP per capita growth and NREs in MENA. Our measure of NREs is not only resource rents (percent of GDP), but also fuel exports (percent of GDP). The share of natural resource rents and fuel exports in GDP tend to be roughly equal in volatility. Resource rents in GDP are much higher for the period before 1980. According to Figures 1a and 1b, income per capita growth tends to move together with NREs.

Figure 2 shows the evolution of IFI over the 1970-2019 period. For the whole sample, IFI tends to increase until the mid-1980s and then decreases. The evolution of IFI differs in GCC and non-GCC countries. The pattern that we observe for the whole sample appears to be the case for GCC countries. On the other hand, IFI exhibits an increasing trend for the sample of non-GCC countries. The direction of financial integration seems to be different for the country groups. IFI appears to be driven by asset flows (capital outflows) for the GCC sample, but tends to be determined mainly by liability flows (capital inflows) for the non-GCC sample.

Figure 2. IFI

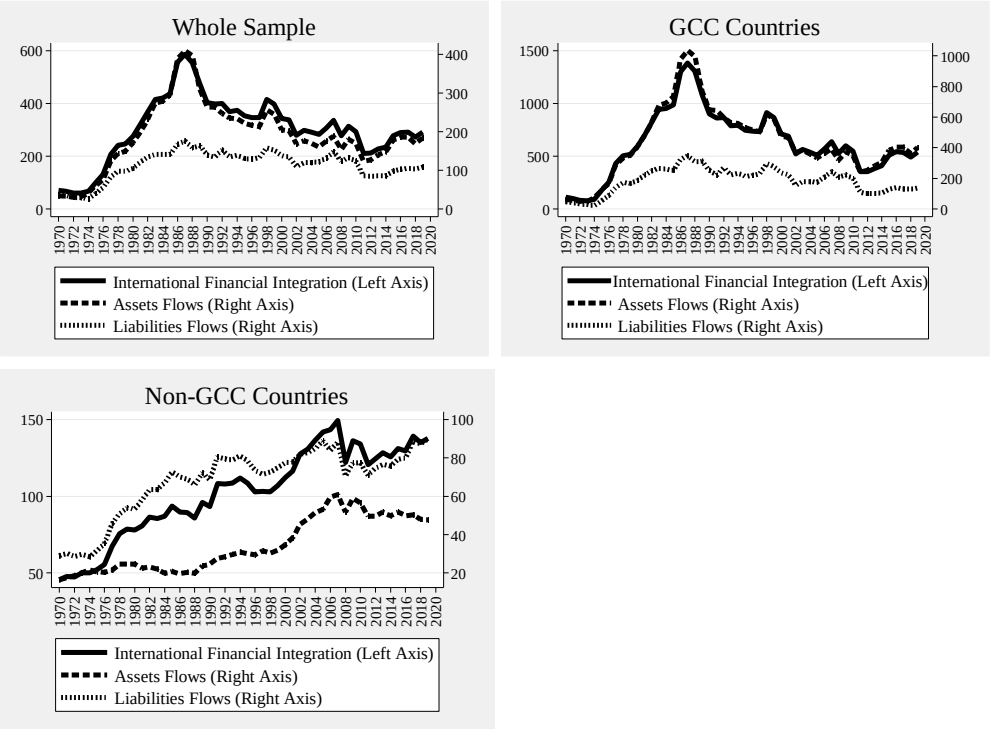


Table 1 reports some descriptive statistics for our variables of interest. Accordingly, the mean of growth is around 0.7 for the whole sample, although it is much lower and more volatile in GCC countries than in the others. Compared to the average growth rate of middle-income countries (around 3.1), the growth rates of the MENA countries are very low, suggesting that they tend to diverge to a lower income group. Also, GCC countries are much richer in terms of NREs based on both measures (NRE_D and NRE_A). The resource endowments for non-GCC countries are approximately the same as the middle-income country sample. The mean of human capital is almost the same for the samples of GCC, non-GCC, and middle-income countries. This appears to also be the case for financial development. Compared to the non-GCC and middle-income countries, the average level of IFI is substantially higher and more volatile for GCC countries. As already discussed in the context of Figure 2, IFI tends to be driven basically by capital outflows (capital inflows) for the GCC (non-GCC) sample.

Table 1. Descriptive statistics

	Growth	NRE_D	NRE_A	HC	FD	IFI	Assets	Liabilities
	Descriptive statistics: MENA							
Mean	0.704	17.710	17.516	2.004	41.331	288.83	173.10	113.525
Median	1.495	5.541	11.841	1.950	37.469	126.04	52.79	54.613
St. Dev.	7.325	21.176	18.006	0.578	22.982	489.35	294.99	227.288
CoV	10.412	1.196	1.028	0.289	0.556	1.694	1.704	2.002
	Descriptive statistics: GCC countries							
Mean	-1.071	35.059	32.780	2.089	39.584	588.561	398.898	188.507
Median	-0.383	35.179	31.734	2.092	35.903	286.218	231.193	38.825
St. Dev.	9.959	22.461	17.487	0.402	22.773	690.263	383.338	352.534
CoV	-9.306	0.641	0.533	0.192	0.575	1.173	0.961	0.533
	Descriptive statistics: Non-GCC countries							
Mean	1.812	6.314	7.952	1.952	42.423	104.039	35.812	67.933
Median	2.046	2.767	2.799	1.818	42.463	95.951	27.358	62.291
St. Dev.	4.709	9.187	9.924	0.661	23.073	66.423	29.652	46.848
CoV	2.599	1.455	1.248	0.338	0.544	0.638	0.828	0.690
	Descriptive statistics: Middle-income countries							
Mean	3.149	4.546	6.224	1.983	56.426	93.897	27.523	66.374
Median	3.091	0.720	5.788	1.883	48.500	82.814	21.153	57.350
St. Dev.	1.892	8.947	2.613	0.576	21.884	63.017	25.174	48.705
CoV	0.600	1.968	0.420	0.290	0.388	0.671	0.915	0.734

Note: St. Dev. and CoV represent, respectively, standard deviation and coefficient of variation for the corresponding variable.

4. Empirical methodology and results

4.1 Empirical methodology

To investigate the effect of NREs on growth, we consider the following benchmark equation:

$$GDPpc_{it} = \alpha_i + \alpha_1 GDPpc_{i,t-1} + \alpha_2 HC_{it} + \alpha_3 FD_{it} + \alpha_4 IFI_{it} + \alpha_5 NRE_{it} + u_{it} \quad (1)$$

In equation 1, the subscript i and t represent, respectively, country and time. GDPpc is the natural logarithm of real GDP per capita, HC is the human capital index (Feenstra et al., 2015), FD represents financial development measured as domestic credit to the private sector (percent of GDP), and IFI is international financial integration defined as the sum of gross stocks of financial assets and liabilities (percent of GDP). We consider NREs not only as the share of fuel exports in GDP to reflect the dependence on natural resources, but also as the total natural resource rents (percent of GDP) to represent the natural resource abundance. The evolution of income per capita may not be independent of its recent past, therefore equation 1 also includes lagged GDPpc.

The benchmark equation 1 maintains that the effect of NREs on growth is invariant to the IFI levels of economies. In this context, the IFI levels of MENA economies may play a crucially important role in explaining the effect of NREs on growth. Furthermore, IFI may behave as an

endogenous threshold for the impact of NREs on growth. In this context, we consider the following equation:

$$GDPpc_{it} = \alpha_i + \alpha_1 GDPpc_{i,t-1} + \alpha_2 NRE_{it}(IFI_{it} \leq \lambda) + \alpha_3 NRE_{it}(IFI_{it} > \lambda) + \alpha_4 HC_{it} + \alpha_5 FD_{it} + \alpha_6 IFI_{it} + u_{it} \quad (2)$$

In equation 2, λ is a data-driven estimated threshold. Considering the potential endogeneity of human capital, financial development, and IFI for the evolution of income per capita, we prefer to employ the dynamic panel threshold estimation procedure of Kremer et al. (2013). Under the null hypothesis of $\alpha_2 = \alpha_3$, there is no significant threshold effect of IFI in explaining the impact of NREs on growth. Therefore, we obtain equation 1. We estimate equation 2 for a sample of 13 MENA economies over the annual period of 1970-2019. Considering the differences in labor and resource endowments, we estimate equation 2 for the GCC and non-GCC countries.

The initial step of the dynamic panel threshold estimation procedure entails the elimination of country-specific fixed effects through a forward orthogonal transformation to remove serial autocorrelation. Then, we employ the Kremer et al. (2013) estimation procedure to find the value of the threshold. To this end, we first trim the smallest and largest five percent of the observations. Then, we search for the threshold by treating the rest of the observations as potential candidates. For each of the candidates, we estimate the de-meaned sample by employing the panel least squares procedure and select the threshold that yields the minimum sum of squared residuals. The observations in the sample are then divided into low and high regimes based on the estimated threshold value. After finding the statistically significant thresholding effect of IFI, we employ a GMM estimation procedure to estimate the slope parameters.

4.2 Estimation results

Table 2 reports the dynamic panel threshold estimation results of equation 2. According to the results in equations 2.1, 2.2, and 2.3, IFI provides a data-driven estimated threshold for the effect of NRE_D on growth. The endogenously estimated threshold level of IFI is around 290 for the whole sample and the GCC sample, although it is much lower (around 170) for the non-GCC sample. Table 1 reports that the mean of IFI is around 290 for the whole sample, 588 for the GCC sample, and 104 for the non-GCC sample. As compared to the mean, the threshold level of IFI is slightly lower for the GCC sample whilst much higher for the non-GCC sample. Around 20 percent of the observations are in the high regime containing more financially-integrated episodes. NRE_D leads to growth in the low regime, including less financially-integrated GCC and non-GCC economies. In the high regime, the growth-enhancing effect of NRE_D diminishes for the GCC countries. However, NRE_D decreases growth for the non-GCC sample. Income per capita appears to be highly persistent as suggested by the positive and approximately unity lagged income coefficient. The estimated coefficient for lagged income per capita may also be interpreted as lending empirical support to the validity of conditional income convergence (Barro, 2015).

Table 2. IFI as a threshold

	Eq. (2.1)	Eq. (2.2)	Eq. (2.3)	Eq. (2.4)	Eq. (2.5)	Eq. (2.6)
	Whole sample	GCC	Non-GCC	Whole sample	GCC	Non-GCC
Threshold	290.023	290.023	174.33	290.023	291.112	159.902
F_B[p-value]	0.00	0.00	0.01	0.00	0.001	0.00
Constant	0.866***	2.225***	0.496***	0.776***	1.895***	0.492***
	(0.116)	(0.339)	(0.124)	(0.096)	(0.280)	(0.088)
$GDPpc_{i,t-1}$	0.890***	0.772***	0.929***	0.903***	0.808***	0.933***
	(0.014)	(0.032)	(0.018)	(0.011)	(0.026)	(0.012)
HC_{it}	0.060***	0.073**	0.035**	0.049***	0.051**	0.028**
	(0.010)	(0.026)	(0.012)	(0.009)	(0.022)	(0.009)
FD_{it}	-0.012	-0.146***	0.036**	-0.013	-0.124**	0.036**
	(0.019)	(0.002)	(0.017)	(0.017)	(0.044)	(0.015)
IFI_{it}	-0.001	-0.004**	0.011	-0.002*	-0.003**	0.005
	(0.001)	(0.002)	(0.008)	(0.001)	(0.001)	(0.088)
NRE_D_{it}	0.159***	0.237***	0.168**			
($IFI_{it} \leq \lambda$)	(0.043)	(0.072)	(0.057)			
NRE_D_{it}	0.037	0.103*	-0.839**			
($IFI_{it} > \lambda$)	(0.038)	(0.057)	(0.271)			
NRE_A_{it}				0.180***	0.249***	0.014**
($IFI_{it} \leq \lambda$)				(0.038)	(0.062)	(0.005)
NRE_A_{it}				0.081*	0.134**	-0.092***
($IFI_{it} > \lambda$)				(0.045)	(0.068)	(0.026)
N	13	5	8	13	5	8
NT	498	196	302	632	241	392
χ^2_W[p-value]	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Standard errors are in parentheses. N and NT are, correspondingly, the numbers of countries and the effective number of observations. ***, ** and *, respectively, denote significance at the one percent, five percent and 10 percent levels.
F_B[p-value] is the bootstrap p-value for the linearity test.

An increase in human capital (HC) proxied by years of schooling and returns to education leads to higher growth for all country groups. Financial development is negatively associated with growth for the GCC sample. This evidence is consistent with the findings by Beck (2011, p.24) suggesting that "financial deepening is less income-elastic in resource-based economies." On the other hand, financial development encourages growth for the non-GCC sample potentially by alleviating the resource constraints of firms, providing risk diversification, and encouraging investment projects. An increase in IFI lowers growth for the GCC countries. This may not be surprising as IFI tends to be basically driven by capital outflows for the GCC sample (Figure 2). The estimated negative IFI coefficient is also consistent with the results by Benigno and Fornaro (2014), suggesting that access to foreign capital encourages consumption, leads the reallocation of productive sectors to the non-tradable sector, and decreases productivity and growth. As a robustness check, we also estimate equations 2.1, 2.2, and 2.3 by using total natural resource rents share in GDP as the natural resource abundance (NRE_A) measure. The estimation results reported by equations 2.4, 2.5, and 2.6 are essentially the same as those reported by equations 2.1, 2.2, and 2.3.

To investigate whether the direction of financial integration matters in explaining the effect of NREs on growth, we decompose IFI as asset and liability flows. Asset flows (capital outflows)

represent the net foreign financial asset purchases by domestic residents. On the other hand, liability flows (capital inflows) denote the net domestic financial asset purchases by foreign residents. Assets (Liabilities) are measured as the sum of portfolio equity, foreign direct investments (FDI), and debt assets (liabilities) as a percent of GDP. The data for assets and liabilities are from Lane and Milesi-Ferretti (2018).

First, we consider whether resident-driven asset flows (Assets) provide an endogenous threshold for the effect of NREs on growth. To this end, we estimate the following equation:

$$GDPpc_{it} = \alpha_i + \alpha_1 GDPpc_{i,t-1} + \alpha_2 NRE_{it}(Assets_{it} \leq \lambda) + \alpha_3 NRE_{it}(Assets_{it} > \lambda) + \alpha_4 HC_{it} + \alpha_5 FD_{it} + \alpha_6 IFI_{it} + u_{it} \quad (3)$$

Table 3 reports the estimation results for equation 3. Accordingly, resident-driven financial flows represented by Assets provide a significant threshold in explaining the impact of NRE_D on growth for the GCC countries and the whole sample. This may be plausible because IFI tends to be determined mainly by asset flows for the GCC sample as suggested by Figure 2. In this context, Elbadawi et al. (2019) note that resource endowments have been led by GCC economies to retain large savings as assets in sovereign wealth funds. The endogenously estimated threshold level of Assets is around 150, with almost 30 percent of the observations in the high regime. NRE_D leads to growth in both regimes, although this impact is much higher in the low regime. We obtain similar results when we consider the natural resource abundance (NRE_A) measure. The rest of the estimated coefficients are essentially the same as those reported in Table 2.

Table 3. Resident-driven financial flows (assets) as a threshold

	Eq. (3.1)	Eq. (3.2)	Eq. (3.3)	Eq. (3.4)	Eq. (3.5)	Eq. (3.6)
	Whole sample	GCC	Non-GCC	Whole sample	GCC	Non-GCC
Threshold	144.726	156.835	34.775	143.527	124.425	24.677
F_B[p-value]	0.085	0.00	0.255	0.001	0.001	0.312
Constant	0.867***	2.169***	0.439***	0.786***	2.072***	0.497***
	(0.116)	(0.341)	(0.126)	(0.097)	(0.283)	(0.089)
$GDPpc_{i,t-1}$	0.890***	0.775***	0.937***	0.902***	0.788***	0.931***
	(0.014)	(0.032)	(0.018)	(0.012)	(0.027)	(0.012)
HC_{it}	0.066***	0.098***	0.037**	0.054***	0.081***	0.042***
	(0.011)	(0.026)	(0.013)	(0.009)	(0.023)	(0.010)
FD_{it}	-0.019	-0.191***	0.030*	-0.017	-0.164***	0.030**
	(0.018)	(0.045)	(0.017)	(0.017)	(0.042)	(0.015)
IFI_{it}	-0.002	-0.005**	-0.002	-0.003**	-0.004**	-0.012*
	(0.001)	(0.002)	(0.008)	(0.001)	(0.001)	(0.006)
NRE_D_{it}	0.173***	0.241**	0.189**			
($Assets_{it} \leq \lambda$)	(0.050)	(0.076)	(0.070)			
NRE_D_{it}	0.045	0.104*	0.157**			
($Assets_{it} > \lambda$)	(0.039)	(0.059)	(0.057)			
NRE_A_{it}				0.185***	0.300***	0.161**
($Assets_{it} \leq \lambda$)				(0.040)	(0.064)	(0.051)
NRE_A_{it}				0.114**	0.130**	0.116**
($Assets_{it} > \lambda$)				(0.042)	(0.064)	(0.043)
N	13	5	8	13	5	8
NT	493	192	301	627	237	390
χ^2_W[p-value]	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Standard errors are in parentheses. N and NT are, correspondingly, the numbers of countries and the effective number of observations. ***, ** and *, respectively, denote significance at the one percent, five percent and 10 percent levels.
F_B[p-value] is the bootstrap p-value for the linearity test.

We also investigate whether non-resident-driven liability flows (Liabilities, capital inflows) provide an estimated threshold in explaining the effect of NREs on growth. For this, we consider:

$$GDPpc_{it} = \alpha_i + \alpha_1 GDPpc_{i,t-1} + \alpha_2 NRE_{it}(Liabilities_{it} \leq \lambda) + \alpha_3 NRE_{it}(Liabilities_{it} > \lambda) + \alpha_4 HC_{it} + \alpha_5 FD_{it} + \alpha_6 IFI_{it} + u_{it} \quad (4)$$

Table 4 reports the results. Accordingly, non-resident-driven financial flows (Liabilities) provide an endogenously determined threshold for the effect of natural resources on growth in the non-GCC sample. This may not be surprising because IFI tends to be driven mainly by liability flows for non-GCC economies. The estimated threshold is around 140. In economies with lower liability flows, NRE_D increases growth. On the other hand, NRE_D decreases growth in economies with higher liability flows. Conventional literature maintains that capital inflows, especially in the form of FDI, bring foreign technology and managerial capability, encourage risk sharing, and promote financial development and better governance. Consistent with this postulation, our estimation results suggest that a certain threshold level of liability flows is required to obtain the blessing effect of natural resources, while "too much" liability flows are associated with the resource curse. The estimated coefficients for the other variables

are essentially the same as those reported in Table 2. The estimation of equation 4 with the NRE_A measure also essentially provides the same results.

Table 4. Non-resident-driven financial flows (liabilities) as a threshold

	Eq. (4.1)	Eq. (4.2)	Eq. (4.3)	Eq. (4.4)	Eq. (4.5)	Eq. (4.6)
	Whole sample	GCC	Non-GCC	Whole sample	GCC	Non-GCC
Threshold	64.147	288.75	139.982	36.255	113.437	113.847
F_B[p-value]	0.851	0.550	0.001	0.192	0.255	0.01
Constant	0.857***	2.055***	0.519***	0.830***	1.707***	0.494***
	(0.120)	(0.334)	(0.126)	(0.099)	(0.274)	(0.089)
$GDPpc_{i,t-1}$	0.892***	0.786***	0.926***	0.897***	0.825***	0.932***
	(0.015)	(0.032)	(0.018)	(0.012)	(0.025)	(0.012)
HC_{it}	0.063***	0.088***	0.037**	0.050***	0.059**	0.040***
	(0.011)	(0.026)	(0.012)	(0.009)	(0.023)	(0.010)
FD_{it}	-0.022	-0.181***	0.038**	-0.006	-0.156***	0.033**
	(0.019)	(0.045)	(0.017)	(0.018)	(0.043)	(0.014)
IFI_{it}	-0.002*	-0.004*	0.010	-0.004**	-0.004**	-0.012*
	(0.001)	(0.002)	(0.008)	(0.001)	(0.002)	(0.006)
NRE_D_{it} ($Liabilities_{it} \leq \lambda$)	0.092**	0.194**	0.171***			
	(0.042)	(0.076)	(0.057)			
NRE_D_{it} ($Liabilities_{it} > \lambda$)	0.058	0.009	-0.858***			
	(0.040)	(0.089)	(0.270)			
NRE_A_{it} ($Liabilities_{it} \leq \lambda$)				0.180***	0.212***	0.126**
				(0.038)	(0.062)	(0.042)
NRE_A_{it} ($Liabilities_{it} > \lambda$)				0.109**	0.319**	-0.170
				(0.041)	(0.109)	(0.194)
N	13	5	8	13	5	8
NT	493	192	301	627	237	390
χ^2_W[p-value]	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Standard errors are in parentheses. N and NT are, correspondingly, the numbers of countries and the effective number of observations. ***, ** and *, respectively, denote significance at the one percent, five percent and 10 percent levels.
F_B[p-value] is the bootstrap p-value for the linearity test.

4.3 Robustness check: GMM estimation results

This section aims to provide a robustness check for our earlier estimation results. In this context, we prefer to employ a dynamic GMM procedure (Arellano and Bover, 1995) that explicitly considers the potential endogeneity of the explanatory variables. To this end, we estimate the following dynamic equation:

$$GDPpc_{it} = \alpha_i + \alpha_1 GDPpc_{i,t-1} + \alpha_2 NRE_{it} + \alpha_3 HC_{it} + \alpha_4 FD_{it} + \alpha_5 IFI_{it} + u1_{it} \quad (5)$$

Considering that the effect of NREs on growth may change depending on the IFI level, we also include the interaction of NREs with IFI. Since financial asset purchase/sale decisions may not be the same for domestic and foreign residents, we decompose the IFI as resident-driven asset flows and non-resident-driven liability flows. Then, we include the interaction of NREs with assets and liabilities. In this context, we estimate the following equations:

$$GDPpc_{it} = \alpha_i + \alpha_1 GDPpc_{i,t-1} + \alpha_2 NRE_{it} + \alpha_3 HC_{it} + \alpha_4 FD_{it} + \alpha_5 IFI_{it} + \alpha_6 NRE_{it} IFI_{it} + u2_{it} \quad (6)$$

$$GDPpc_{it} = \alpha_i + \alpha_1 GDPpc_{i,t-1} + \alpha_2 NRE_{it} + \alpha_3 HC_{it} + \alpha_4 FD_{it} + \alpha_5 IFI_{it} + \alpha_6 NRE_{it} Assets_{it} + u3_{it} \quad (7)$$

$$GDPpc_{it} = \alpha_i + \alpha_1 GDPpc_{i,t-1} + \alpha_2 NRE_{it} + \alpha_3 HC_{it} + \alpha_4 FD_{it} + \alpha_5 IFI_{it} + \alpha_6 NRE_{it} Liabilities_{it} + u4_{it} \quad (8)$$

Tables 5 and 6 report the difference in GMM estimation results for equations 5, 6, 7, and 8. Our measure of NREs is the share of fuel exports in GDP (NRE_D) and total natural resource rents (percent of GDP, NRE_A), respectively, in Tables 5 and 6. It may be plausibly assumed that human capital (HC), financial development (FD), and IFI are potentially endogenous for the evolution of growth. In the estimation of all equations, we consider the t-1 and t-3 dynamic lags of endogenous variables as instruments. Bond (2002) remarks that endogenous variables should be treated symmetrically with the dependent variable. Therefore, we specify the same dynamic lag structure for the instruments of the dependent variable. Roodman (2009) notes that a large instrument set overfits endogenous variables and weakens the Hansen test of instrument validity. Therefore, the instruments are combined through addition into smaller sets by using the "collapse" command of Roodman (2009). According to the Hansen-Sargan test for instrument validity and overidentification restrictions (χ^2_{H-S}), the instrument set is valid for the whole sample and for non-GCC countries. For the GCC sample, however, this doesn't appear to be the case. Therefore, the results for the GCC sample should be interpreted with this in mind. The consistency of the GMM estimators crucially depends on the absence of higher-order serial correlation in the idiosyncratic component of the error term. If the disturbance in the level equation is not serially correlated, there should be evidence of a significant negative AR (1) and an insignificant AR (2) in the difference equation (Arellano and Bond, 1991). The results for AR1 and AR2 for the equations therefore suggest the lack of serial correlation in the transformed GMM models.

NREs lead to higher growth in all the equations presented in tables 5 and 6. Our results also suggest that the impact of NREs on growth decreases with IFI. IFI, *per se*, doesn't seem to matter for growth. The impact of IFI and its main components (asset and liability flows), however, tends to be important for driving the impact of the NRE. The effect of NREs on growth decreases in GCC countries with more asset flows. On the other hand, in the non-GCC sample, the growth effect of NREs decreases with more liability flows. In accord with our earlier results, human capital is positive and significant for all the samples. Financial development encourages (discourages) growth for the non-GCC (GCC) sample. All these results provide further support to our earlier findings. Therefore, the results obtained by employing a dynamic panel threshold procedure in section 4.2 may be interpreted as robust to a different estimation method.

Table 5. GMM estimation results for NRE_D

	Eq. (5)			Eq. (6)			Eq. (7)			Eq. (8)		
	Whole sample	GCC	Non-GCC	Whole sample	GCC	Non-GCC	Whole sample	GCC	Non-GCC	Whole sample	GCC	Non-GCC
$GDPpc_{i,t-1}$	0.506*** (0.142)	0.501*** (0.070)	0.928*** (0.051)	0.569*** (0.139)	0.421*** (0.112)	0.915*** (0.060)	0.557*** (0.133)	0.434*** (0.113)	0.928*** (0.049)	0.582*** (0.142)	0.427*** (0.072)	0.744*** (0.103)
HC_{it}	0.187** (0.079)	0.245** (0.100)	0.032* (0.020)	0.167** (0.083)	0.205** (0.103)	0.038* (0.025)	0.156* (0.089)	0.195** (0.105)	0.029* (0.019)	0.179** (0.082)	0.237*** (0.052)	0.076* (0.040)
FD_{it}	0.015 (0.169)	-0.477*** (0.037)	0.046** (0.022)	-0.002 (0.177)	-0.334** (0.113)	0.044** (0.021)	0.033 (0.196)	-0.318** (0.122)	0.050* (0.032)	-0.037 (0.168)	-0.366*** (0.085)	0.230** (0.086)
IFI_{it}	-0.013** (0.005)	-0.014*** (0.003)	0.002 (0.007)	0.003 (0.011)	-0.004 (0.005)	0.011 (0.008)	0.009 (0.013)	0.006 (0.006)	0.003 (0.010)	-0.002 (0.011)	-0.001 (0.009)	0.038 (0.031)
NRE_D_{it}	0.642** (0.242)	0.393** (0.168)	0.198* (0.105)	0.774** (0.248)	0.625* (0.335)	0.350** (0.159)	0.860*** (0.227)	0.687** (0.350)	0.185* (0.116)	0.693*** (0.239)	0.688*** (0.688)	0.499** (0.185)
NRE_D_{it}* IFI_{it}				-0.021** (0.011)	-0.014** (0.005)	-0.161* (0.106)						
NRE_D_{it}* $Assets_{it}$							-0.001** (0.000)	-0.001** (0.00)	0.001 (0.00)			
NRE_D_{it}* $Liabilities_{it}$										-0.001 (0.00)	-0.001 (0.001)	-0.004** (0.002)
AR1 [p-value]	0.128	0.116	0.028	0.040	0.080	0.028	0.032	0.060	0.027	0.047	0.235	0.001
AR2 [p-value]	0.365	0.275	0.911	0.466	0.378	0.930	0.535	0.447	0.903	0.420	0.175	0.687
χ^2_{H-S} [p-value]	0.461	0.00	0.796	0.840	0.00	0.991	0.730	0.00	0.986	0.856	0.263	0.107
χ^2_W [p-value]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	13	5	8	13	5	8	13	5	8	13	5	8
NT	485	191	294	485	191	294	480	187	293	480	187	293

Notes: NT and N show, respectively, the total number of observations and cross section. The numbers in parentheses are the coefficient standard errors. ***, ** and * denote, respectively, significance at the one, five, and 10 percent levels. $\chi 2_{H-S}$ is the Hansen–Sargan test for instrument validity and overidentification restrictions. AR1 and AR2 are the asymptotically normally distributed first and second order serial correlation tests of the Arellano and Bond (1991). $\chi 2_W$ is the Wald test for the joint insignificance of the regressors. The values in square brackets are p-values.

Table 6. GMM estimation results for NRE_A

	Eq. (5)			Eq. (6)			Eq. (7)			Eq. (8)		
	Whole Sample	GCC	Non-GCC	Whole Sample	GCC	Non-GCC	Whole Sample	GCC	Non-GCC	Whole Sample	GCC	Non-GCC
$GDPpc_{i,t-1}$	0.575*** (0.138)	0.519*** (0.051)	0.845*** (0.098)	0.493** (0.173)	0.505*** (0.058)	0.801*** (0.084)	0.516*** (0.158)	0.558*** (0.059)	0.889*** (0.056)	0.696*** (0.132)	0.427*** (0.069)	0.931*** (0.016)
HC_{it}	0.088** (0.046)	0.253** (0.108)	0.069* (0.040)	0.208* (0.113)	0.205* (0.109)	0.084** (0.035)	0.201** (0.105)	0.186* (0.113)	0.053* (0.036)	0.146* (0.088)	0.211** (0.049)	0.023** (0.010)
FD_{it}	0.144 (0.154)	-0.472*** (0.091)	0.114* (0.074)	-0.037 (0.226)	-0.396*** (0.109)	0.085* (0.053)	-0.043 (0.210)	-0.355** (0.092)	0.078* (0.047)	-0.020 (0.148)	-0.364*** (0.083)	0.051* (0.028)
IFI_{it}	-0.003 (0.023)	-0.009*** (0.002)	0.008 (0.014)	0.009 (0.009)	-0.002 (0.002)	0.048 (0.035)	0.005 (0.005)	-0.002 (0.002)	-0.004 (0.015)	0.001 (0.005)	-0.008* (0.004)	0.007 (0.009)
NRE_A_{it}	0.440** (0.228)	0.405** (0.199)	0.258** (0.110)	0.692* (0.396)	0.494** (0.209)	0.716** (0.251)	0.601* (0.371)	0.365** (0.135)	0.353* (0.201)	0.660** (0.283)	0.325** (0.157)	0.386*** (0.084)
$NRE\_A_{it} * IFI_{it}$				-0.076* (0.050)	-0.047** (0.020)	-0.718** (0.344)						
$NRE\_A_{it} * Assets_{it}$							-0.001* (0.00)	-0.001* (0.00)	-0.001 (0.002)			
$NRE\_A_{it} * Liabilities_{it}$										-0.001 (0.001)	0.001 (0.001)	-0.003* (0.002)
AR1 [p-value]	0.013	0.045	0.00	0.129	0.059	0.003	0.053	0.100	0.031	0.014	0.034	0.031
AR2 [p-value]	0.260	0.189	0.706	0.123	0.204	0.629	0.135	0.218	0.733	0.125	0.126	0.735
χ^2_{H-S} [p-value]	0.166	0.00	0.340	0.362	0.00	0.093	0.741	0.00	0.857	0.236	0.00	0.990
χ^2_W [p-value]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	13	5	8	13	5	8	13	5	8	13	5	8
NT	515	191	311	502	191	383	497	187	382	497	187	382

Notes: NT and N show, respectively, the total number of observations and cross section. The numbers in parentheses are the coefficient standard errors. ***, ** and * denote, respectively, significance at the one, five, and 10 percent levels. $\chi 2_{H-S}$ is the Hansen–Sargan test for instrument validity and overidentification restrictions. AR1 and AR2 are the asymptotically normally distributed first and second order serial correlation tests of the Arellano and Bond (1991). $\chi 2_W$ is the Wald test for the joint insignificance of the regressors. The values in square brackets are p-values.

5. Concluding remarks

NREs matter for growth in oil-rich MENA economies. This paper investigates whether financial openness, measured as IFI, which is the sum of gross stocks of financial assets and liabilities as a percent of GDP, provides a data-driven estimated threshold for the effect of NREs on growth in MENA. Considering the heterogeneity in resource endowments, we investigate this important research question by dividing the whole sample into GCC and non-GCC countries.

Our dynamic panel threshold estimation results suggest that IFI provides an endogenously estimated threshold in explaining the relationship between NREs and growth. We find that the impact of NREs is growth enhancing in less financially-integrated economies. On the other hand, in more financially-integrated economies, the growth-accelerating effect of NREs diminishes for the GCC sample while NREs decelerate growth for the non-GCC sample. These empirical findings may suggest that the blessing effect of NREs appears to be the case for less financially-integrated economies. Also, the "resource curse" holds in more financially-integrated non-GCC economies.

The main components of IFI, i.e., capital inflows and outflows, tend to matter for the effect of NREs on growth. We find that capital outflows (foreign financial asset purchases by domestic residents) provide a data-driven estimated threshold for the GCC sample. The impact of NREs is growth accelerating, especially in economies with fewer capital outflows. On the other hand, capital inflows (domestic asset purchases by foreign residents) constitute an endogenously estimated threshold for the non-GCC countries. Consistent with the conventional literature maintaining that capital inflows provide a better macroeconomic environment, our estimation results suggest that a certain threshold level of capital inflows is required to obtain the blessing effect of natural resources while "too much" capital inflows are associated with the resource curse.

The empirical findings in this study propose an IFI channel to explain the effect of NREs on growth for the MENA sample. Our study highlights the importance of both the level and direction of financial integration for the relationship between NREs and growth. A certain threshold level of financial integration encourages the effect of NREs on growth while "too much" financial integration, especially in the form of capital inflows, diminishes the NRE-growth relationship. The findings in this study suggest that policies aiming to improve financial development may provide a more efficient allocation of capital flows and thus alleviate the unfavorable effects of financial integration. The empirical question investigating whether the composition of capital inflows and outflows (i.e., FDI vs. non-FDI flows) matter in explaining the effect of NREs on growth is a promising research agenda for future studies. This agenda may be enriched by investigating the robustness of our empirical results for the MENA sample to different samples of economies with an abundance of natural resources.

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