**FINANCIALIZATION, GROWTH AND RESOURCE CURSE: THE MENA EVIDENCE**

Erdal Özmen

Middle East Technical University, Ankara, Turkey

E-mail: ozmen@metu.edu.tr

and

Fatma Taşdemir

Sinop University, Sinop, Turkey

E-mail: ftasdemir@sinop.edu.tr

**ABSTRACT**

This study investigates whether the impacts of natural resource endowments (NRE) on growth are invariant to 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 NRE encourages growth up to a certain threshold level of IFI beyond which NRE leads to lower growth. 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 Gulf Cooperation Council (GCC) countries. There is a positive association between NRE and growth, albeit this relation diminishes with more capital outflows. On the other hand, liability flows provide data-driven estimated threshold for the non-GCC countries. The effect of NRE is growth accelerating in economies with less capital inflows while this is growth decelerating in economies with more capital inflows.

**Key words:** Middle East and North Africa Economies, Financial Development, International Financial Integration, Resource Curse, Growth, Panel Threshold Model.

**JEL Classifications:** C13, C33, F43, O10, O13, O47, Q32.

1. **Introduction**

Is natural resource abundancy a curse or blessing for economic growth? The conventional wisdom often maintains that countries with abundant 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 United Arab Emirates) which are all classified as high-income economies by the World Bank. The results for the growth impact of natural resources, however, are often mixed. An early study by Sachs and Warner (1995), for instance, finds that natural resource abundancy leads to lower growth rates. These countries suffer from what Auty (1993) coins as “resource curse”. On the other hand, Smith (2015) finds that natural resource endowments lead to growth in non-OECD economies. Frankel (2010), Papyrakis (2017), and Badeeb et al. (2017) provide recent surveys of the resource curse literature.

The empirical literature analyzing the impact of natural resources often ignores the other main determinants of growth such as human capital and financial development. Furthermore, 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 international financial integration. These variables on the other hand, may provide endogenous thresholds for the growth impacts of natural resources. This paper aims to investigate this crucially important issue by employing dynamic panel threshold estimation procedure of Kremer et al. (2013). As a robustness check, the paper also reports the generalized method of moments (GMM) estimation (Arellano and Bover, 1995) results. We consider annual data over the 1970-2019 period for the Middle East and North Africa (MENA) countries. The MENA sample includes also the oil rich GCC economies and thus appears to provide a promising research agenda on the resource curse issue.

To investigate the resource curse postulation, we consider a conventional growth equation which includes human capital, financial development and international financial openness augmented with the natural resource variables. Our measure of natural resource endowments (NRE) consists of fuel and mining products 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 abundancy. International financial integration (IFI) is measured as the sum of gross stocks of financial assets and liabilities as a percent of GDP (Lane and Milesi-Ferretti, 2018). We also consider the basic components of IFI, that is, resident-driven asset flows (capital outflows) and non-resident driven liability flows (capital inflows).

Financialisation refers to “increasing role of financial motives, financial markets, financial actors, and financial institutions in an economy” Epstein (2005, p.3). In this study, we consider both the domestic and international aspects of financialisation. The domestic financialisation is represented by financial development. For the international aspect of financialisation we consider IFI and international assets (capital outflows) and liabilities (capital inflows) as the main components of IFI.

We investigate whether IFI and the basic components of IFI provide data-driven estimated threshold for the effect of natural resource endowments on growth. The literature often tackles the nonlinearity issues either by some interaction specifications or *ad hoc* sample-splitting procedures which maintain that the threshold level is exogenous. Alternatively, the threshold levels for the effect of IFI on natural resource endowments-growth relation may better be estimated endogenously by employing data-driven estimation procedures. In this context, we examine the thresholding effect of IFI in explaining the natural resource endowments-growth relation by employing 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 the estimation of threshold effects even in the presence of endogeneity among the regressors. To our knowledge, this is the first study that investigates the natural resource endowments-growth relation by subjecting it to data-driven estimated threshold level of IFI. We investigate this crucially important issue for a sample of 13 MENA economies over the annual data of the 1970-2019 period.

The plan of the rest of this paper is as follows. Section 2 provides a brief literature review. Section 3 introduces the data and provides some descriptive statistics. Section 4 provides the dynamic panel threshold procedure and reports the estimation results. Finally, Section 5 concludes and provides some policy implications.

1. **A Brief Review of the Literature**

There is now a large and growing number of studies empirically investigating the growth consequences of natural non-renewable resources. The seminal study by Sachs and Warner (1995) suggests that natural resource abundancy measured as the natural resource exports in GDP leads to lower growth. According to Auty (1993), resource abundancy leads to “resource curse”. The recent surveys of the resource curse literature are provided by Frankel (2010), Papyrakis (2017), and Badeeb et al. (2017).

Ross (1999) argues that decline in terms of trade, fluctuations in commodity prices, the repatriation of profits by foreign investors to their home countries and the shift of capital and labour from manufacturing industry to other sectors are the basic reasons for the resource curse evidence. Guillo and Perez-Sebastian (2015) provides an open-economy two-sector neo-classical theoretical model based on a dynamic Heckscher–Ohlin framework to explain the relationship between natural resource endowments 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 with the labor share in resource-extractive primary sector is less than 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 turns into negative in resource dependent economies with higher primary exports share in GDP. James (2015) finds that higher growth of resource-based sectors leads to higher growth of non-resource sectors. Smith (2015) remarks that extraction of resources leads to higher growth in non-OECD countries. Chekuri et al. (2017) finds that natural resource abundancy leads to higher growth, while the volatility of resource revenue decreases growth in Algeria. Atkinson and Hamilton (2003) notes that the presence of resource curse may reflect the inefficient use of resource revenues by the governments.

Apergis and Katsaiti (2018) finds that natural resource abundancy leads to higher poverty. The empirical findings by Hausman and Rigobon (2003) suggests that the presence of large non-tradable sector plays a crucially important role in adjusting to shocks in the resource sector. Manzano and Rigobon (2001) explains the resource curse with debt overhang argument that governments may increase their foreign debts under favorable commodity prices whilst this may not be the case when commodity prices worsen. van der Ploeg and Poelhekke (2009) finds that the blessing effect of natural resources is related with the development of financial markets which may lessen the volatility in commodity prices.

Mehlum et al. (2006) argues that institutional environment may be classified as grabber (producer) friendly where there is a competition (complementarity) between rent-seeking behavior and production activities. Their results suggest that natural resource endowments lead to lower growth in grabber friendly institutional environment while higher growth in producer friendly institutional environment. The findings by Sala-i Martin and Subramanian (2013) indicates that the curse effect of resource endowments becomes blessing under better institutional quality. Iimi (2007), Antonakakis et al. (2017) and Henry (2019) 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. Brunnschweller and Bulte (2008) finds that abundancy in natural resources leads to better institutional quality and higher growth. Contrary to this finding, natural resource abundancy leads to lower level of voice and accountability (Alexeev and Conrad, 2011), higher corruption (Busse and Gröning, 2013) and rent-seeking (Aragon et al. 2015). The results by Eslamloueyan and Jafari (2021) support the hypothesis that the resource curse in oil-rich countries vanishes if human capital is above a certain level.

Apergis and Payne (2014) considers MENA countries and finds that better institutional quality reduces the unfavorable effect of oil reserves on the economic performance. Belaid et al. (2021) finds that, contrary to the resource curse, resource blessing may be the case for MENA countries as oil rents tend to lead to growth. Lebdioui (2020) argues that resource-rich MENA countries have tended to spend their resource revenues for consumption rather than financing productive investment in non-resource tradable sectors. 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 resource curse. According to the results by Ross (2015), on the other hand, the resource abundancy 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 often maintains that causes of the resource curse are related with the unfavorable fluctuations in commodity prices, crowding out of productive sectors like manufacturing and poor institutional quality. The literature, however, is yet to fully consider the effect of financial globalization or international financial integration (IFI) in explaining the relationship between natural resource endowments 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 effect of natural resource endowments on growth. The conventional theory maintains that financial openness leads to efficient allocation of capital, promotes risk sharing, financial development, better governance and macroeconomic policies (Kose et al., 2010). Barrot and Serven (2018) notes that higher financial openness may amplify the sensitivity to external shocks like sudden stops. In this context, it may be plausible to assume that the level of IFI matters for reaping the beneficial effects of financial integration. Natural resource abundancy in MENA may provide internalization advantages to host economies and attract efficiency seeking investment (Sethi et al., 2003). Therefore, we may assume that natural resource endowments-growth relation may be affected by the IFI. Furthermore, IFI may provide data-driven estimated threshold for the effect of natural resource endowments on growth.

1. **The Data and Some Descriptive Statistics**

This paper investigates the effect of natural resource endowments (NRE) on growth. Furthermore, we postulate that the impact of NRE on growth may change depending on the international financial integration (IFI) levels of the 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 United Arab Emirates) over the 1970-2019 period. The choice of the sample is mainly determined by data availability. McKee et al. (2017) classifies the MENA economies based on resource and labour endowments. Accordingly, Gulf Cooperation Council (GCC) countries (Bahrain, Kuwait, Qatar, Saudi Arabia and United Arab Emirates) are rich in natural resource endowments but poor in labour force. The rest of the sample may be categorized as being rich in terms of labour endowments but poor in natural resources. Consequently, we consider also the GCC and non-GCC countries, separately.

In this study, Growth is the log. difference of real GDP per capita and the data for real GDP per capita are from United Nations Conference on Trade and Development database. HC is human capital index constructed based on years of schooling and returns to education and the data are taken from Penn World Table (Feenstra et al., 2015). HC has values between 1.00 and 4.35 with higher values representing more educated labor. FD proxies to financial development measured as domestic credit to private sector in GDP. The data for FD are from World Development Indicators, World Bank (WDI-WB). IFI is international financial integration measured as the sum of gross stocks of financial assets and liabilities in GDP and the data are from External Wealth of Nations database (Lane and Milesi-Ferretti, 2018). Our measure of natural resource endowments (NRE) consists of fuel and mining products’ 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 abundancy (NRE\_A). The data for NRE\_D and NRE\_A are, respectively, from World Trade Organization and WDI-WB.

**Figure 1:** GDP growth and Natural Resource Endowments



1. (b)

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

**Figure 2:** International Financial Integration





Figure 2 shows the evolution of international financial integration (IFI) over the 1970-2019 period. For the whole sample, IFI tends to be increasing until the half of the 1980s and then decreasing. 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 the 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 basically by asset flows (capital outflows) for the GCC sample. On the other hand, IFI tends to be determined mainly by liability flows (capital inflows) for the non-GCC sample.

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| **Table 1:** Some 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: Gulf Cooperation Council (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:** \*\* and \* denote, respectively, significance at the 1 and 5 percent levels. St. Dev. and CoV represent, respectively, standard deviation and coefficient of variation (standard deviation over the mean) for the corresponding variable. |

Table 1 reports some descriptive statistics for our variables of interest. Accordingly, the mean of growth is around 0.7 for the whole sample, albeit it is much lower and more volatile in GCC countries than 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 are much more rich in terms of natural resource endowments based on both measures (NRE\_D and NRE\_A). The resource endowments for the non-GCC are approximately the same with 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 also be the case for financial development. Compared to the non-GCC and middle-income countries, the average level of international financial integration is substantially much higher and more volatile for the 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.

1. **Empirical Methodology and Results**

**4.1 Empirical Methodology**

To investigate the effect of natural resource endowments on growth, we consider the following benchmark equation:

$GDPpc\_{it}=α\_{i}+α\_{1}GDPpc\_{i,t-1}+α\_{2}HC\_{it}+α\_{3}FD\_{it}+α\_{4}IFI\_{it}+α\_{5}NRE\_{it}+u\_{it}$ (1)

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

The benchmark eq. (1) maintains that the effect of NRE on growth is invariant to the international financial integration (IFI) levels of the economies. The conventional literature maintains that IFI may provide many benefits including better macroeconomic environment along with institutional quality and greater risk sharing, albeit it may increase the vulnerability and sensitivity to crises. In this context, the IFI levels of the MENA economies may play a crucially important role in explaining the effect of NRE on growth. Furthermore, IFI may behave as endogenous threshold for the impact of NRE on growth. In this context, we consider the following equation:

$GDPpc\_{it}=α\_{i}+α\_{1}GDPpc\_{i,t-1}+α\_{2}NRE\_{it}(IFI\_{it} \leq λ)+α\_{3}NRE\_{it}(IFI\_{it} >λ) + α\_{4}HC\_{it}+ α\_{5}FD\_{it}+α\_{6}IFI\_{it}+u\_{it} $ (2)

In eq. (2), λ is data-driven estimated threshold. Considering the potential endogeneity of human capital, financial development and international financial integration for the evolution of income per capita, we prefer to employ dynamic panel threshold estimation procedure of Kremer et al. (2013). Under the null hypothesis of α2 = α3, there is no significant threshold effect of IFI in explaining the impact of NRE on growth and therefore, we obtain eq. (1). We estimate eq. (2) for a sample of 13 MENA economies over the annual period of 1970-2019. Considering the differences in labor[[1]](#footnote-1) and resource endowments, we estimate eq. (2) for the GCC and non-GCC countries.

The initial step of the dynamic panel threshold estimation procedure consists of the elimination of country-specific fixed effects by forward orthogonal transformation to remove serial autocorrelation. By employing panel threshold estimation procedure of Hansen (1999), we first trim the smallest and largest 5% of the observations. Then, we search for the threshold by treating all the rest of the observations as potential candidates. For each of the candidate observation, we estimate the de-meaned sample by employing 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 the low and high regimes based on the estimated threshold value. After finding a statistically significant thresholding effect of IFI, we employ generalized method of moments (GMM) estimation procedure to estimate the slope parameter.

**4.2 Estimation Results**

Table 2 reports the dynamic panel threshold estimation results of eq. (2). According to the results in eq.s (2.1), (2.2) and (2.3), international financial integration (IFI) provides 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 GCC, albeit it is much lower with 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 and 104 for the non-GCC sample. As compared to the mean, the threshold level of IFI is slightly lower for the GCC whilst higher for the non-GCC. 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 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 provides an empirical support to the validity of conditional income convergence. However, rather than providing a support for the conditional income convergence postulation (Barro, 2015), this result may better be interpreted as suggesting divergence as the average growth rates of the MENA countries, compared to the middle-income country sample, are very low (Table 1).

An increase in human capital (HC) proxied by the 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 “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 financial integration (IFI) lowers growth for the GCC countries. This may not be surprising as IFI tends to be driven basically by capital outflows for the GCC sample (Figure 2). The estimated negative IFI coefficient is consistent also with the results by Benigno and Fornaro (2014) suggesting 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 eq.s. (2.1), (2.2) and (2.3) by using total natural resource rents share in GDP as the natural resource abundancy (NRE\_A) measure. The estimation results reported by equations (2.4), (2.5) and (2.6) are essentially the same with those reported by (2.1), (2.2) and (2.3).

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| **Table 2:** International Financial Integration (IFI) as 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 |
| FB[p-value] | 0.00 | 0.00 | 0.01 | 0.00 | 0.001 | 0.00 |
| Constant | 0.866\*\*\*(0.116) | 2.225\*\*\*(0.339) | 0.496\*\*\*(0.124) | 0.776\*\*\*(0.096) | 1.895\*\*\*(0.280) | 0.492\*\*\*(0.088) |
| GDPpci,t-1 | 0.890\*\*\*(0.014) | 0.772\*\*\*(0.032) | 0.929\*\*\*(0.018) | 0.903\*\*\*(0.011) | 0.808\*\*\*(0.026) | 0.933\*\*\*(0.012) |
| NRE\_Dit(IFIit ≤ λ) | 0.159\*\*\*(0.043) | 0.237\*\*\*(0.072) | 0.168\*\*(0.057) |  |  |  |
| NRE\_Dit(IFIit > λ) | 0.037(0.038) | 0.103\*(0.057) | -0.839\*\*(0.271) |  |  |  |
| NRE\_Ait(IFIit ≤ λ) |  |  |  | 0.180\*\*\*(0.038) | 0.249\*\*\*(0.062) | 0.014\*\*(0.005) |
| NRE\_Ait(IFIit > λ) |  |  |  | 0.081\*(0.045) | 0.134\*\*(0.068) | -0.092\*\*\*(0.026) |
| HCit | 0.060\*\*\*(0.010) | 0.073\*\*(0.026) | 0.035\*\*(0.012) | 0.049\*\*\*(0.009) | 0.051\*\*(0.022) | 0.028\*\*(0.009) |
| FDit | -0.012(0.019) | -0.146\*\*\*(0.002) | 0.036\*\*(0.017) | -0.013(0.017) | -0.124\*\*(0.044) | 0.036\*\*(0.015) |
| IFIit | -0.001(0.001) | -0.004\*\*(0.002) | 0.011(0.008) | -0.002\*(0.001) | -0.003\*\*(0.001) | 0.005(0.088) |
| N | 13 | 5 | 8 | 13 | 5 | 8 |
| NT | 498 | 196 | 302 | 632 | 241 | 392 |
| $χ\_{W}^{2}$[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 1%, 5 % and 10% levels. |

To investigate whether the main components of financial integration matters in explaining the effect of natural resource endowments on growth, we decompose the international financial integration as assets and liabilities flows. Asset flows (capital outflows) represent the net foreign financial asset purchases by domestic residents. On the other hand, liabilities 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, capital outflows) provide endogenous threshold for the effect of NRE on growth. To this end, we estimate the following equation:

 $GDPpc\_{it}=α\_{i}+α\_{1}GDPpc\_{i,t-1}+α\_{2}NRE\_{it}(Assets\_{it} \leq λ)+α\_{3}NRE\_{it}(Assets\_{it} >λ) + α\_{4}HC\_{it}+α\_{5}FD\_{it}+α\_{6}IFI\_{it}+u\_{it}$ (3)

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| **Table 3:** Resident-driven financial flows (Assets) as 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 |
| FB[p-value] | 0.085 | 0.00 | 0.255 | 0.001 | 0.001 | 0.312 |
| Constant | 0.867\*\*\*(0.116) | 2.169\*\*\*(0.341) | 0.439\*\*\*(0.126) | 0.786\*\*\*(0.097) | 2.072\*\*\*(0.283) | 0.497\*\*\*(0.089) |
| GDPpci,t-1 | 0.890\*\*\*(0.014) | 0.775\*\*\*(0.032) | 0.937\*\*\*(0.018) | 0.902\*\*\*(0.012) | 0.788\*\*\*(0.027) | 0.931\*\*\*(0.012) |
| NRE\_Dit(Assetsit ≤ λ) | 0.173\*\*\*(0.050) | 0.241\*\*(0.076) | 0.189\*\*(0.070) |  |  |  |
| NRE\_Dit(Assetsit > λ) | 0.045(0.039) | 0.104\*(0.059) | 0.157\*\*(0.057) |  |  |  |
| NRE\_Ait(Assetsit ≤ λ) |  |  |  | 0.185\*\*\*(0.040) | 0.300\*\*\*(0.064) | 0.161\*\*(0.051) |
| NRE\_Ait(Assetsit > λ) |  |  |  | 0.114\*\*(0.042) | 0.130\*\*(0.064) | 0.116\*\*(0.043) |
| HCit | 0.066\*\*\*(0.011) | 0.098\*\*\*(0.026) | 0.037\*\*(0.013) | 0.054\*\*\*(0.009) | 0.081\*\*\*(0.023) | 0.042\*\*\*(0.010) |
| FDit | -0.019(0.018) | -0.191\*\*\*(0.045) | 0.030\*(0.017) | -0.017(0.017) | -0.164\*\*\*(0.042) | 0.030\*\*(0.015) |
| IFIit | -0.002(0.001) | -0.005\*\*(0.002) | -0.002(0.008) | -0.003\*\*(0.001) | -0.004\*\*(0.001) | -0.012\*(0.006) |
| N | 13 | 5 | 8 | 13 | 5 | 8 |
| NT | 493 | 192 | 301 | 627 | 237 | 390 |
| $χ\_{W}^{2}$[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 1%, 5 % and 10% levels. |

Table 3 reports the estimation results for eq. (3). Accordingly, resident-driven financial outflows represented by Assets provide significant threshold in explaining the impact of NRE\_D on growth for the GCC countries and the whole sample. The endogenously estimated threshold level of Assets is as around 150 with almost 30 percent of the observations are in the high regime. NRE\_D leads to growth in both regimes, albeit this impact is much higher in the low regime. Considering the GCC countries are implementing pegged exchange rate regimes[[2]](#footnote-2), fuel export revenues may be expected to be used also to stabilize the real exchange rate via capital outflows to avoid excessive real appreciations. More stable exchange rates may encourage trade, investment and thus growth. We obtain the similar results when we consider the natural resource abundancy (NRE\_A) measure. The rest of the estimated coefficients are essentially the same with those reported in Table 2.

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

$GDPpc\_{it}=α\_{i}+α\_{1}GDPpc\_{i,t-1}+α\_{2}NRE\_{it}\left(Liabilities\_{it}\leq λ\right)+α\_{3}NRE\_{it}\left(Liabilities\_{it}>λ\right)+ α\_{4}HC\_{it}+α\_{5}FD\_{it}+α\_{6}IFI\_{it}+u\_{it} $ (4)

The estimation results for eq. (4) are reported in Table 4. Accordingly, non-resident driven financial flows represented by Liabilities provide endogenously determined threshold for the effect of natural resources on growth in the sample of non-GCC. The estimated threshold is around 140. In economies with lower liabilities flows, NRE\_D increases growth. On the other hand, NRE\_D decreases growth in economies with higher liabilities flows. The conventional literature maintains that capital inflows, especially in the form of foreign direct investments, bring foreign technology and managerial capability, encourage risk sharing, promote financial development and better governance. As 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 is associated with the resource curse. The estimated coefficients for the other variables are essentially the same with those reported in Table 2. The estimation of eq. (4) with the NRE\_A measure also provides essentially the same results.

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| **Table 4:** Non-resident-driven financial flows (Liabilities) as 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 |
| FB[p-value] | 0.851 | 0.550 | 0.001 | 0.192 | 0.255 | 0.01 |
| Constant | 0.857\*\*\*(0.120) | 2.055\*\*\*(0.334) | 0.519\*\*\*(0.126) | 0.830\*\*\*(0.099) | 1.707\*\*\*(0.274) | 0.494\*\*\*(0.089) |
| GDPpci,t-1 | 0.892\*\*\*(0.015) | 0.786\*\*\*(0.032) | 0.926\*\*\*(0.018) | 0.897\*\*\*(0.012) | 0.825\*\*\*(0.025) | 0.932\*\*\*(0.012) |
| NRE\_Dit(Liabilitiesit≤ λ) | 0.092\*\*(0.042) | 0.194\*\*(0.076) | 0.171\*\*\*(0.057) |  |  |  |
| NRE\_Dit(Liabilitiesit> λ) | 0.058(0.040) | 0.009(0.089) | -0.858\*\*\*(0.270) |  |  |  |
| NRE\_Ait(Liabilitiesit≤ λ) |  |  |  | 0.180\*\*\*(0.038) | 0.212\*\*\*(0.062) | 0.126\*\*(0.042) |
| NRE\_Ait(Liabilitiesit> λ) |  |  |  | 0.109\*\*(0.041) | 0.319\*\*(0.109) | -0.170(0.194) |
| HCit | 0.063\*\*\*(0.011) | 0.088\*\*\*(0.026) | 0.037\*\*(0.012) | 0.050\*\*\*(0.009) | 0.059\*\*(0.023) | 0.040\*\*\*(0.010) |
| FDit | -0.022(0.019) | -0.181\*\*\*(0.045) | 0.038\*\*(0.017) | -0.006(0.018) | -0.156\*\*\*(0.043) | 0.033\*\*(0.014) |
| IFIit | -0.002\*(0.001) | -0.004\*(0.002) | 0.010(0.008) | -0.004\*\*(0.001) | -0.004\*\*(0.002) | -0.012\*(0.006) |
| N | 13 | 5 | 8 | 13 | 5 | 8 |
| NT | 493 | 192 | 301 | 627 | 237 | 390 |
| $χ\_{W}^{2}$[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 1%, 5 % and 10% levels. |

**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 dynamic generalized method of moments (GMM) procedure (Kremer et al., 2013) which explicitly considers the potential endogeneity of the explanatory variables. To this end, we estimate the following dynamic equation:

$GDPpc\_{it}=α\_{i}+α\_{1}GDPpc\_{i,t-1}+α\_{2}NRE\_{it}+α\_{3}HC\_{it}+α\_{4}FD\_{it}+α\_{5}IFI\_{it}+u1\_{it}$ (5)

Considering the effect of NRE on growth may change depending on the level of international financial integration (IFI), we also include the interaction of NRE with IFI. Regarding the financial assets purchases/sales decisions may not be the same for domestic and foreign residents, we decompose the IFI as resident-driven assets flows and non-resident-driven liability flows. Then, we include the interaction of NRE with assets and liabilities. In this context, we estimate the following equations:

$GDPpc\_{it}=α\_{i}+α\_{1}GDPpc\_{i,t-1}+α\_{2}NRE\_{it}+α\_{3}HC\_{it}+α\_{4}FD\_{it}+α\_{5}IFI\_{it}+α\_{6}NRE\_{it}IFI\_{it}+u2\_{it}$ (6)

$GDPpc\_{it}=α\_{i}+α\_{1}GDPpc\_{i,t-1}+α\_{2}NRE\_{it}+α\_{3}HC\_{it}+α\_{4}FD\_{it}+α\_{5}IFI\_{it}+α\_{6}NRE\_{it}Assets\_{it}+u3\_{it}$ (7)

$GDPpc\_{it}=α\_{i}+α\_{1}GDPpc\_{i,t-1}+α\_{2}NRE\_{it}+α\_{3}HC\_{it}+α\_{4}FD\_{it}+α\_{5}IFI\_{it}+α\_{6}NRE\_{it}Liabilities\_{it}+u4\_{it}$ (8)

Tables 5 and 6 report the difference GMM estimation results for equations (5), (6), (7) and (8). Our measure of NRE is fuel exports share 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 international financial integration (IFI) are potentially endogenous for the evolution of growth. 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 dependent variable. In the estimation of all equations, we consider t-1 and t-3 dynamic lags of endogenous variables as instruments. Roodman (2009) notes that a large instrument set overfits endogenous variable 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 (χ2H−S), the instrument set is valid for the whole sample and the non-GCC countries. For the GCC sample on the other hand, this appears not to be the case. Therefore, the results for the GCC sample should better be interpreted with this caution. 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 significant negative AR (1) and 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.

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| **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 |
| GDPpci,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) |
| HCit | 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) |
| FDit | 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) |
| IFIit | -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\_Dit | 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\_Dit\* IFIit |  |  |  | -0.021\*\*(0.011) | -0.014\*\*(0.005) | -0.161\*(0.106) |  |  |  |  |  |  |
| NRE\_Dit\* Assetsit |  |  |  |  |  |  | -0.001\*\*(0.000) | -0.001\*\*(0.00) | 0.001(0.00) |  |  |  |
| NRE\_Dit\* Liabilitiesit |  |  |  |  |  |  |  |  |  | -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 |
| $χ\_{H-S}^{2}$ [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\_{W}^{2} $[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 level at 1, 5 and 10 percent. χ2H−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). χ2W is the Wald test for the joint insignificance of the regressors. The values in square brackets are p-values. |

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| **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 |
| GDPpci,t-1 | 0.575\*\*\*(0.138) | 0.519\*\*\*(0.051) | 0.863\*\*\*(0.095) | 0.493\*\*(0.173) | 0.505\*\*\*(0.058) | 0.857\*\*\*(0.133) | 0.516\*\*\*(0.158) | 0.558\*\*\*(0.059) | 0.889\*\*\*(0.056) | 0.696\*\*\*(0.132) | 0.427\*\*\*(0.069) | 0.931\*\*\*(0.016) |
| HCit | 0.088\*\*(0.046) | 0.253\*\*(0.108) | 0.061\*\*(0.032) | 0.208\*(0.113) | 0.205\*(0.109) | 0.080\*(0.043) | 0.201\*\*(0.105) | 0.186\*(0.113) | 0.053\*(0.036) | 0.146\*(0.088) | 0.211\*\*(0.049) | 0.023\*\*(0.010) |
| FDit | 0.144(0.154) | -0.472\*\*\*(0.091) | 0.092(0.133) | -0.037(0.226) | -0.396\*\*\*(0.109) | -0.014(0.158) | -0.043(0.210) | -0.355\*\*(0.092) | 0.078\*(0.047) | -0.020(0.148) | -0.364\*\*\*(0.083) | 0.051\*(0.028) |
| IFIit | -0.003(0.023) | -0.009\*\*\*(0.002) | 0.016\*(0.010) | 0.009(0.009) | -0.002(0.002) | 0.020(0.018) | 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\_Ait | 0.440\*\*(0.228) | 0.405\*\*(0.199) | 0.214\*\*\*(0.067) | 0.692\*(0.396) | 0.494\*\*(0.209) | 0.355\*\*(0.152) | 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\_Ait \* IFIit |  |  |  | -0.076\*(0.050) | -0.047\*\*(0.020) | -0.274\*(0.188) |  |  |  |  |  |  |
| NRE\_Ait\* Assetsit |  |  |  |  |  |  | -0.001\*(0.00) | -0.001\*(0.00) | -0.001(0.002) |  |  |  |
| NRE\_Ait\* Liabilitiesit |  |  |  |  |  |  |  |  |  | -0.001(0.001) | 0.001(0.001) | -0.003\*(0.002) |
| AR1 [p-value] | 0.013 | 0.045 | 0.040 | 0.129 | 0.059 | 0.060 | 0.053 | 0.100 | 0.031 | 0.014 | 0.034 | 0.031 |
| AR2 [p-value] | 0.260 | 0.189 | 0.907 | 0.123 | 0.204 | 0.841 | 0.135 | 0.218 | 0.733 | 0.125 | 0.126 | 0.735 |
| $χ\_{H-S}^{2}$ [p-value] | 0.166 | 0.00 | 0.391 | 0.362 | 0.00 | 0.646 | 0.741 | 0.00 | 0.857 | 0.236 | 0.00 | 0.990 |
| $χ\_{W}^{2} $[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 level at 1, 5 and 10 percent. χ2H−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). χ2W is the Wald test for the joint insignificance of the regressors. The values in square brackets are p-values. |

The natural resource endowments (NRE) lead to higher growth in all the equations presented by Tables 5 and 6. Our results also suggest that the impacts of NRE on growth decreases with international financial integration. International financial integration (IFI), *per se*, seems not to matter for growth. The impact of IFI and its main components (asset and liability flows), however, tend to be important for driving the impact of NRE. The effect of NRE on growth decreases in GCC countries with more asset flows. On the other hand, in non-GCC countries sample, the growth effect of NRE decreases with more liability flows. In accord with our earlier results, human capital is positive and significant for all the samples. The evidence for the impact of financial development is mixed (positive in Table 5 and insignificant in Table 6) for the non-GCC sample. Higher financial development discourages growth for the GCC sample. All these results provide a further support to our earlier findings. Therefore, the results obtained by employing dynamic panel threshold procedure in Section 4.2 may be interpreted as robust to a different estimation method.

1. **Concluding Remarks**

Natural resource endowments (NRE) matter for growth in oil rich Middle East and North Africa (MENA) economies. This paper investigates whether financial openness measured as international financial integration (IFI, sum of gross stocks of financial assets and liabilities as a percent of GDP) provides data-driven estimated threshold for the effect of NRE on growth in MENA. Considering the heterogeneity in resource endowments, we investigate this important research question by dividing the whole sample as Gulf Cooperation Council (GCC) and non-GCC countries.

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

Our estimation results suggest that the main components of international financial integration, i.e., capital inflows and outflows, matter for the effect of NRE on growth. We find that capital outflows (net foreign financial asset purchases by domestic residents), provide data-driven estimated threshold for the sample of GCC. The impact of NRE is growth accelerating especially in economies with less capital outflows. On the other hand, capital inflows (net domestic asset purchases by foreign residents) constitute endogenously estimated threshold for the non-GCC countries. As consistent with the conventional literature maintaining capital inflows, especially in the form of foreign direct investments, bring foreign technology and managerial capability, encourage risk sharing, promote financial development and better governance, 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 is associated with the resource curse.

To conclude, international financialisation represented by the level of international financial integration matters for the effect of natural resource endowments on growth. A certain threshold level of financial integration encourages the effect of NRE on growth while “too much” financial integration diminishes the NRE-growth relation.

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1. As an anonymous referee points out, immigration is crucially important for Algeria and the other GCC countries. World Population Prospects published by United Nations provide net migration rate data which are available only for five-year periods. As this study uses annual data, we are unable to incorporate migration into our estimations. However, many thanks to the referee, this important issue appears to be a promising research question. [↑](#footnote-ref-1)
2. According to the fine exchange rate regime classification by Ilzetzki, Reinhart and Rogoff (2017), the GCC countries are implementing ERR2 (pre-announced peg or currency board arrangement), ERR4 (*de facto* peg) or ERR7 (*de facto* crawling peg). [↑](#footnote-ref-2)