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MACROECONOMIC INSTITUTIONS: LESSONS FROM
WORLD EXPERIENCE FOR MENA COUNTRIES

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Abstract

What can be learned from the world experience about different macroeconomic institutions, to improve macroeconomic performance in countries that face high volatility and large unpredictable structural changes in international commodity prices, and in the MENA region in particular? In addressing this question, this paper starts by describing the recent evolution and current state of ten formal economic institutions in five key areas of macroeconomic management, for a large world sample and 6 regions. A review of the empirical literature (conducted separately for world and MENA samples) on the effects of the ten institutions on macroeconomic performance indicators (including growth, among several other variables) yields striking differences between institutions. A new Macroeconomic Institutions Frontier Index, which provides country-level measures of adoption of eight current best-practice institutions, is applied to quantify the distance of MENA countries from the international best practice in adopting frontier institutions. Then the paper focuses on the reverse causality, reviewing the international evidence on economic and institutional conditions that foster adoption of frontier macroeconomic institutions. Final policy lessons are drawn for strengthening macroeconomic policy making and institutional reform in MENA countries.

Keywords: Institutions and the Macroeconomy, Regimes, Macroeconomic Policy, Monetary Policy, Fiscal Policy.

JEL Classifications: E02, E42, E60, E52, E62.

1. Introduction

The end of the commodity super-cycle imposes major challenges for macroeconomic institutions and policy actions in commodity exporting-economies in general and Middle-East and North African (MENA) countries in particular. The income losses from the massive decline in oil and gas prices have been particularly severe for MENA countries – both those directly affected by lower energy export revenue and those indirectly affected by lower current and capital flows from their neighbors. In MENA oil-exporting countries, government budgets have been put under strong pressure, forcing governments to finance growing deficits and/or adjusting to lower energy export revenue by finding other sources of revenue and cutting expenditure. The private sector has also been forced to adjust to lower income and higher taxes by cutting investment and consumption. MENA oil-importing countries that are dependent on international transfers, foreign investment flows and loans, and worker remittances received from MENA oil exporters have also been adversely affected.

In addition, all MENA countries face very large energy price volatility observed during and after the commodity super-cycle. This high uncertainty represents a significant cost for conducting fiscal and taking investment decisions by the government and private firms. It also makes life costly for consumers and workers, as they face high levels of uncertainty regarding their levels of income, employment, and investment.

The macroeconomic policy framework among different commodity-exporting and importing countries varies markedly, as a result of major differences in country flexibility and resilience to deal with a structural decline in international commodity prices. Some commodity exporters had in place a flexible macroeconomic policy framework (including more flexible exchange rates and more flexible monetary and fiscal policies) that enabled them to adjust better to lower export prices. Others, however, were less prepared due to significant rigidities in their macro policies, including less flexible exchange rates, lack of independent monetary policy or pro-cyclical fiscal policy.

This paper's ultimate question is the following. What can we learn from world experience about different macroeconomic institutions, to improve macroeconomic performance in countries that face high volatility and large unpredictable structural changes in international commodity prices, and in the MENA region in particular? This is a complex, general question that requires to be addressed by slicing it into five sub-questions.

First, which is the descriptive evidence on recent trends and the current state in the choice of macroeconomic institutions in the world and in the MENA region? Second, which is the evidence on the effects of macroeconomic institutions on macroeconomic performance indicators (including growth) in the world and in MENA countries? Third, which is the current international best practice regarding adoption of macroeconomic institutions that

foster macroeconomic performance and stability – and which is the distance between MENA countries and those economies that are the forefront in their choice of macro institutions? Fourth, regarding reverse causality, which is the world evidence on factors and conditions that enhance adoption of frontier institutions? Finally, which are the key lessons that can be drawn from the preceding review for strengthening macroeconomic institutions and performance in MENA countries?

This paper addresses the latter questions in the following sections. Section 2 describes the recent evolution and current state of ten formal economic institutions in five key areas of macroeconomic management. The data is assembled for a world sample comprised by up to 193 countries, classified into six major country groups: advanced countries, emerging-market and developing economies (EMDEs), resource-rich (RR) countries, MENA countries, MENA oil exporting countries, and MENA oil importing countries.

Section 3 reviews and summarizes the empirical literature (comprised by 155 papers) that reports world evidence on the effects of exchange-rate and other macroeconomic regimes on macroeconomic performance indicators, including growth, investment, trade, inflation, fiscal performance measures, financial crises, trade and capital account openness, among other. Section 4 provides an analogous review and summary for the evidence circumscribed to MENA countries (based on 23 studies).

Section 5 proposes and applies a new Macroeconomic Institutions Frontier Index that provides country-level measures of adoption of eight current best-practice institutions in the five key areas of macroeconomic management that have been the focus of this paper. This index is used to quantify the distance of MENA countries from international best practice in adopting frontier macroeconomic institutions.

Section 6 focuses on the reverse causality. It reviews the international evidence on economic and institutional conditions that foster adoption of frontier macroeconomic institutions.

The final section distills the policy lessons from the previous review and comparisons that are relevant for strengthening macroeconomic policy making and institutional reform in MENA countries.

2. World distribution of macroeconomic institutions

North's definition of institutions in his classical article (North, 1991) reflects the key aspects of institutions that will be documented here: they are informal or formal constraints that reduce uncertainty; they strengthen incentives to produce and exchange more efficiently; they evolve gradually over time; and they shape an economy towards growth, stagnation or decline. In order to review the contribution of institutions to growth

and other measures of macroeconomic performance, in this paper I focus on a set of formal institutions.

At a very general level, and abstracting from informal institutions, economic performance is shaped by formal political, economic, and social institutions. Rodrik (2000) groups formal institutions that matter for growth into five categories: (i) property rights; (ii) regulatory institutions, (iii) institutions for macroeconomic stabilization, (iv) institutions for social insurance, and (v) institutions of conflict management.

This paper focuses selectively on ten formal economic institutions in five key areas of macroeconomic management (institutions are defined in parentheses, when they are not represented directly by the macro management area): exchange-rate regimes, monetary policy institutions (central bank independence; monetary policy regimes), macro-prudential institutions, fiscal policy institutions (tax rates; fiscal rules; fiscal councils; sovereign wealth funds), and international integration (trade openness; capital-account openness).²

The institutions analyzed here define current best national practice in the five areas of macroeconomic policy management, in both advanced countries and EMDEs. Certainly, there are other economic institutions (related to product markets, labor markets, competition, innovation, business conditions, among others) and political institutions (such as democracy, protection of property rights, absence of corruption) that are potentially very important in contributing to macroeconomic performance, but they are not assessed in this paper.

Next I introduce the institutions in the latter areas and present their distribution over time and across 193 countries classified into six major country groups: Advanced countries, MENA countries, MENA oil exporting countries, MENA oil importing countries, Emerging-Market and Developing Economies (EMDEs), and Resource-rich (RR) countries.³ The choice of country groups is determined by differences in development levels and this paper's focus on resource-rich economies and the MENA region. This implies that several countries belong to different country groups. Country group averages are unweighted country averages or country counts for each group.

² I use the term "institutions" in a broad sense, comprising institutions in a more narrow sense (for example, central bank independence and sovereign wealth funds), regimes (exchange-rate and monetary regimes), and policies (macro-prudential and openness policies).

³ The Annex summarizes the list of countries by country groups.

2.1. Exchange-rate regimes

The choice of an exchange-rate regime is a key component of a country's macroeconomic framework. A floating exchange rate regime is a prerequisite for the conduct of an independent monetary policy and offers protection against foreign shocks and currency crises, but at the cost of higher short-term exchange-rate volatility. A hard peg or outright adoption of a foreign currency is optimal for economies that do not require an independent monetary policy, are highly integrated with a large economy, and/or are small in size.

The world distribution of exchange-rate regimes does not exhibit clear trends during 2008-2016 (Fig. 1). Roughly 80% of countries have in place a floating exchange-rate regime or a soft peg. Hard pegs are observed in 13% of countries.

However, there are significant differences in the distribution of exchange-rate regimes across country groups in 2016 (Fig. 2). Floats are by far the regime of choice in advanced countries (86%), in contrast to EMDEs at large (26%), where soft pegs dominate (46%). Among RR economies, soft pegs (63%) and hard pegs (20%) dominate. The choice of soft pegs is even stronger in MENA countries (76%). Among the 11 MENA oil exporters, 10 have a soft peg in place. Among the 10 MENA oil importers, 6 have a soft peg, 1 country has a hard peg and another a float.

2.2. Monetary policy institutions

The two key institutions for the conduct of an effective monetary policy are central bank independence and the choice of monetary regime.

Central bank independence – like exchange-rate floating – is an important condition for the conduct of an independent monetary policy. The number of independent central banks and the degree of independence have increased significantly in most world regions since the 1990s (Fig. 3). Garriga's (2016) measure of *de jure* central bank independence shows that advanced countries exhibit, on average, the highest levels of independence toward 2012. EMDEs and RR economies are at an intermediate level. In MENA oil-exporting and importing countries the average degree of independence of central banks is much lower.⁴

⁴ As an alternative of this *de jure* measure, there is the Dreher et al. (2010) *de facto* measure of central bank independence given by the turnover rate (TOR) of central bank governors. The disadvantage of the latter measure is that "central bank governors can hold office for quite some time simply by being subservient to political leaders" (Klomp and de Haan, 2010), reflecting "that governors behave in accordance with the wishes of the government" (de Haan and Eijffinger, 2016). Considering the latter objections, I use the this *de jure* measure.

Monetary policy regimes (in a narrow sense) are determined by the choice of nominal anchor for the conduct of monetary policy. In the past, the choice of explicit anchors was limited to the exchange rate or a monetary (or credit) aggregate – or the lack of any explicit anchor. Since 1990, inflation targeting is added as an additional anchor, adopted as the monetary regime of choice by many economies that aim at strengthening effectiveness of their independent monetary policy. A fourth category of monetary regimes in the IMF classification (“Other” in Fig. 4) comprises countries that lack an explicit anchor or are members of a currency union.

About 30% of advanced economies target inflation in 2016. The large number of advanced countries in the “Other” category reflects euro area membership by 18 European countries. In contrast, the exchange rate is the nominal anchor adopted by roughly 50% in both EMDEs and RR economies. No MENA country has inflation targeting in place. The explicit monetary regime of choice is the exchange rate, selected by 67% of all MENA countries. 82% of MENA oil exporters and 50% of MENA oil importers the exchange rate is chosen as nominal anchor. The latter shares are obviously very close to the corresponding MENA country shares with soft and hard pegs in place, depicted in Fig. 2.

2.3. Macro-prudential policy institutions

Development and adoption of macro-prudential policy institutions are not new but they have gained momentum in the aftermath of the Global Financial Crisis. They complement both micro-prudential regulatory requirements on banks and macroeconomic policies with macro-prudential requirements. Among the latter are time-varying counter-cyclical tools and requirements that strengthen bank balance sheets and limit excessive risk taking by banks and their borrowers.

Cerutti et al. (2017), using data from the Global Macroprudential Policy Instruments (GMPI) dataset on macro-prudential tools, construct two macro-prudential indicators (which are aggregates of partial indicators): the index of borrower-targeted instruments (comprised by two regulations) and the index of financial institution-targeted instruments (comprised by ten regulations). The overall macro-prudential index combines the two latter indicators into one aggregate indicator.⁵

⁵ If a regulation is in place in any given country and year, it is marked by a value of 1; it is zero otherwise. The index of borrower-targeted instruments is defined as the sum of two requirements: loan-to-value ratio caps and debt-to-income ratios. Its lowest value is zero and its highest is 2. The index of financial institution-targeted instruments is defined as the sum of ten requirements: time-varying/dynamic loan-loss provisioning, general counter-cyclical capital buffer/requirement, leverage ratio, capital surcharges on SIFIs, limits on interbank exposures, concentration limits, limits on foreign currency loans, counter-cyclical reserve requirements, limits on domestic currency loans, and levy/tax on financial institutions. Its lowest value is zero and its highest is 10. The macro-prudential index ranges between a minimum value of zero and a maximum of 10.

Application of macro-prudential tools has been rising between 2000 and 2013 (Fig. 5). Surprisingly the use of macro-prudential instruments is more widespread in EMDEs than in advanced countries. MENA is at the forefront of applying a larger number of macro-prudential tools. Oil-exporting countries adopt more borrower-targeted instruments than other regions, while oil-importing MENA countries adopt more financial institutions-targeted instruments than other regions. However, all country groups have, on average, still few macro-prudential tools in place. This may have changed since 2013 and is likely to be more widespread in the near future.

A related question is if the central bank or another government agency responsible for financial regulation is in charge of oversight of the aforementioned macro-prudential tools. Cerutti et al. construct the central bank oversight index (ranging from zero to one) as the fraction of macro-prudential rules that are supervised by the central bank; the complementary fraction is supervised by other financial regulators. The data – only available for 2013 – reflect that the central bank shares this task with other government agencies in advanced countries, EMDEs, and RR economies. However, in MENA countries only the central bank is in charge of overseeing enforcement of macro-prudential regulations.

2.4. Fiscal policy institutions

A developed fiscal framework comprises several fiscal institutions that contribute to fiscal sustainability, solvency, transparency, intergenerational equity, and policy counter-cyclicality, and therefore to macroeconomic performance. We consider four key institutions of an advanced fiscal framework: tax rates, fiscal rules, fiscal councils, and sovereign wealth funds (SWFs).

There are complex trade-offs involved in assessing the effects of taxation on macro performance. On one hand, distorting negative growth effects of taxes rise more than proportionally with tax rates. On the other hand, higher taxes allow to finance higher levels of public goods that are necessary for growth (i.e., public infrastructure and education) and social integration and equity (through public transfer programs).

In the absence of comprehensive measures of tax systems that are internationally comparable, we use partial but readily available cross-country measures of taxes, namely legal tax rates on transactions (indirect taxes) and income (corporate and personal income taxes).

Direct tax rates are higher in advanced countries than in other economies, reflecting the larger size of government in high-income economies (Fig. 6). Average indirect tax rates are close to 17% in advanced countries and roughly 10% in EMDEs and RR economies. Indirect tax rates average 7% in MENA, -and differ strongly between oil exporters (where

they are very low) and oil importers (much higher). Average corporate tax rates are close to 23% in the world at large and are similar across the six country groups. However, the top marginal tax rate on personal income taxes is much higher in advanced countries (40%) than the top tax rate in the five other country groups (which is close to 20%, on average). The lowest tax-paying country group among our six groups is MENA oil exporters, where oil revenue represents a very significant income base for government revenue.

Since 1990 fiscal rules are adopted by rising numbers of advanced countries, EMDEs, and RR economies (Fig. 7). However, only one among 21 MENA countries (Iran) has adopted a fiscal rule. Regarding different types of rules, budget balance, debt, and expenditure rules are more frequently in place than revenue rules. Several countries have more than one rule in place.

Fiscal councils are government agencies, endowed with legal and/or operational independence, with a legal mandate that comprises monitoring budget preparation and execution (including compliance with fiscal rules), conducting positive and normative fiscal analysis, and providing policy recommendations. Fiscal councils are a more recent institutional innovation, which is increasingly adopted since the 2008-2009 crisis, mostly by advanced countries (Fig. 8). In 2017 only 12 EMDEs, 4 RR countries, and one MENA oil exporter have fiscal councils in place.

Most councils are both legally and operational independent from governments. Most councils conduct positive analysis of fiscal policy (half of them add policy recommendations to their duties) and most conduct both ex-ante and ex-post analysis.

Sovereign wealth funds are key fiscal institutions in natural resource-exporting countries that face volatile commodity prices and/or a finite endowment of resources. They are more frequently adopted in EMDEs and particularly in RR economies (Fig. 9). 10 of 11 oil-exporting MENA countries have at least one sovereign wealth fund in place in 2017. The reason that many countries have more than one sovereign wealth fund in place is because either different councils linked to different policy objectives (for example, counter-cyclical fiscal policy or inter-generational transfers) or they are implemented by individual states within a federated country.

The Linaburg-Maduell Sovereign Wealth Fund Transparency Index shows large differences in governance and financial transparency of sovereign wealth funds across different regions. Sovereign wealth funds are generally more transparent in advanced countries than in EMDEs. On average transparency is lower in MENA countries than in EMDEs.

2.5. International integration

Economic openness is a key policy component to attain high levels of macroeconomic performance, including high growth. The main indicators of a country's integration to the world economy comprise measures of trade openness and capital-account (or financial) openness.

The standard measure of trade openness is the ex-post ratio of exports and imports to GDP. Although readily available, this measure has limitations. It does not only reflect domestic barriers to trade integration but also structural country features like size and distance from trading partners, which affect trade ratios. In addition, it reflects the temporary influence of commodity price cycles.

Having in mind the latter drawbacks, trade integration shows a positive trend in all country groups since 1970 (Fig. 10). Trade openness is larger in advanced countries than in the five other country groups. Among all other country groups, MENA oil exporters exhibit the largest and MENA oil importers the lowest degree of trade integration.

International financial integration is represented by the ex-ante Chinn-Ito Index of capital-account openness (Fig. 11).⁶ All countries exhibit a liberalizing trend toward less restrictions on cross-border financial transactions since 1970. However, this positive trend is much stronger in advanced countries than in the five other country groups. EMDEs as a group exhibit a weak trend reduction of capital-account restrictions. This trend is stronger in MENA countries. MENA oil exporters liberalized their capital accounts in the wake of the first oil boom, but did not liberalize further after 1976. Among the six country groups, MENA oil importers are the least financially open.

3. Effects of Macroeconomic Institutions on Macroeconomic Performance in the World

3.1. Introduction

A large body of research points to the key role of well-designed institutions in strengthening macroeconomic performance. Such institutions constrain the exercise of power at high and low political levels, the conduct of policymakers, and the behavior of individual agents – consumers, workers, firms – in any sector or market. Institutions restrict the exercise of discretionary power and support rule-based, efficient behavior.

⁶ The Chinn-Ito index (KAOPEN) is a measure of a country's degree of capital account openness. KAOPEN is based on binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The authors use principal component analysis to extract the first principal component, which is the KAOPEN index. Then the KAOPEN index is normalized to range between zero (least open) and one (most open). More details are reported in Chinn and Ito (2006, 2017).

The transmission mechanisms from good institutions to macro performance are not easy to disentangle. Most of them are indirect, affecting intermediate variables before impacting ultimate objectives such as economic growth, income stability or inflation. For example, inflation targeting may contribute to better anchoring of inflation expectations, strengthening monetary policy credibility and macroeconomic stability, which may reduce inflation, stabilize income, and raise growth. Trade opening is likely to lead to short-term closing of import-competing industries before exports respond to lower tariffs on inputs and a more depreciated exchange rate – hence productivity, investment, and GDP are likely to exhibit a U-shaped response to trade opening. A similar result is often observed in the case of financial deregulation and liberalization, especially when financial reforms are not carefully implemented, leading to a financial crisis, which prompts a second round of better financial reforms. Hence institutional reforms have very different effects on ultimate policy objectives – like growth – depending on the form they take and on the time horizon during which they are evaluated.

A related complexity of reform effects stems from interaction effects between different institutions and macro performance. For example, Acemoglu et al. (2008) report from cross-country evidence that central bank independence reforms tend to reduce inflation but the stabilizing effect is asymmetric: it is stronger (weaker) in countries with strong (weak) political institutions.

In a recent paper, Tylecote (2016) discusses three important books on institutions and development: North et al. (2009), van Zanden (2009), and Acemoglu and Robinson (2012). Tylecote concludes that the latter volumes are built on three key hypotheses: institutions matter for macro performance and growth; politics and economics are interconnected; and sustainable economic growth requires strong participation and openness of institutions.

In this section I review and summarize the empirical literature that reports world evidence on the effects of exchange-rate and other macroeconomic regimes on macroeconomic performance indicators, including growth, investment, trade, inflation, fiscal performance measures, financial crises, trade and capital account openness, among others.

A dozen methodological comments on the scope of this review and the summary information presented in the following tables are in order.

- (i) The review in this section comprises 155 empirical studies on the direct and indirect effects of 10 economic institutions on macroeconomic performance.
- (ii) The aforementioned set is comprised by 143 multi-country (cross-section and panel-data) studies, 6 multi-state studies for a given country, and 6 country studies.
- (iii) Most studies were published between 2000 and 2018; a few were published between 1990 and 1999.

- (iv) The multi-variate specifications used in the latter studies are not derived from first principles but include potential causal variables as independent variables, which are broadly consistent with theory and previous empirical evidence.
- (v) Studies differ significantly in model specification, inclusion of right-hand side regressors, estimation techniques, and samples. This review does not assess differences in the quality of models or the robustness of empirical findings of the studies surveyed here.
- (vi) This is not a meta-analysis of previous research. However, it refers to the general conclusions reached by several meta-analyses and survey papers available on the effects of some of the institutions covered here. The latter references are included in the subsequent text but not in the summary tables, which report results of individual studies.
- (vii) Dependent variables include different measures of GDP levels and growth rates, growth determinants (for example, investment and productivity), and many other macroeconomic and financial performance variables.
- (viii) Independent variables include measures and proxies of the institutions identified in the previous section and relevant controls.
- (ix) Individual determinants included here are ordered by variable categories in the summary tables below.
- (x) Qualitative results on the statistical significance of each relevant regressor are included by identifying its positive or its negative sign (if significant at 95% level or above), or both the zero and positive sign, or both the zero and negative sign if reported in different regressions of the same study. For example, Table 1 reports in its first line the empirical results on the effects of the dummy variable for a de facto flexible exchange-rate regime (ERR) in all economies on per capita GDP growth. The first result in this line is reported as “0 (5)”, which means a statistically non-significant effect is reported by the study listed as number 5 in the footnote of Table 1. The fifth result in the first line is reported as “0 or + (11)”, which means that the study listed as number 11 in the footnote of Table 1 reports two different results (in separate regressions), corresponding to statistically non-significant and statistically positive effects.
- (xi) If at least one study reports a significant finding, other studies’ statistically zero findings are also reported in the same line.
- (xii) When one or several studies report consistently a non-significant result for the effect of an institutional variable, generally I do not include this result as a line in the corresponding table. However, the studies that report non-significant results are identified in the last footnote of the corresponding table.

3.2. Effects of Macroeconomic Institutions on Macroeconomic Performance

3.2.1. Exchange-Rate Regimes

Exchange-rate regimes can have significant effects on growth. Consistent with the literature on optimal currency regimes, particular exchange-rate regimes – flexible, intermediate, or fixed exchange rates – could affect growth in any direction, depending on the country's structural conditions. Not surprisingly, the world's empirical evidence is mixed regarding the growth effects of exchange-rate regimes in samples that are representative of all economies (Table 1). However, in separate samples comprised by advanced countries (EMDEs), flexible (fixed) regimes are more likely to have positive effects. This is consistent with the fact that advanced countries (EMDEs) are more (less) likely to have a flexible (fixed or intermediate) exchange-rate system in place, tend to be larger (smaller), and are more (less) likely to conduct an independent monetary policy.

Bi-causality is observed between exchange-rate regimes and inflation. On one hand, high inflation requires nominal exchange-rate adjustment and therefore is inconsistent with fixed exchange rates. On the other hand, a fixed exchange-rate regime may strengthen central banks' monetary discipline and hence induce lower inflation.

While low inflation characterizes most advanced economies, moderate and high inflation is observed in several EMDEs. Hence it is not surprising that flexible exchange rates tend to have no statistically significant effects in advanced countries (Table 2). By contrast, flexible (fixed) exchange rates tend to have positive (negative) effects both in EMDEs and in world samples, where EMDEs are highly represented.

Research findings on the contribution of exchange-rate regimes to the probability of financial crises are generally non-conclusive (Table 3).

Regarding the likelihood of banking crises, only one study reports an unambiguous negative effect of flexible exchange rates for the world sample. Other studies report non-significant or contradictory results on the effects of flexible, intermediate, and fixed exchange rates on banking crises in different samples (all economies, advanced countries, EMDEs).

Flexible regimes do not have statistically significant effects on the probability of currency crises in advanced countries (Table 3). For the all-economies and EMDE samples, flexible exchange rates have zero or even positive effects on the likelihood of currency crises. Fixed exchange rates have contradictory effects on the probability of currency crises. The latter somewhat surprising results are probably due to the definition of exchange rate crises in several studies.⁷ Intermediate exchange rates have either zero or positive effects on the probability of currency crises – this finding is more consistent with a priori expectations.

⁷ In principle, currency crises (associated to the depletion of central bank foreign reserves and a currency depreciation, which put an end to a fixed or intermediate exchange-rate regime) cannot be observed in a

Theory predicts that trade rises between a country that adopts a fixed exchange rate and the country against which the former's rate is set, due to the absence or decline of exchange-rate uncertainty. The empirical findings tend to validate this hypothesis (Table 4). The effects of fixed exchange rates on overall and bilateral trade generally range from zero to positive.

3.2.2. Monetary Policy Institutions

Central bank independence raises growth directly and indirectly by lowering central bank governor turnover (Table 5). Central bank independence also contributes to higher foreign direct investment, lower real interest rates on 10-year bonds, and lower financial instability.

There is strong and systematic evidence, based on meta-analyses and surveys of previous research, that central bank independence contributes significantly and robustly to lower inflation (Berger et al. 2001; Klomp and DeHaan, 2010a). Further individual studies (included in Table 5) confirm the negative effects of central bank independence on inflation and the positive effects of central bank turnover (which is lowered by central bank independence) on inflation.

A majority of studies reports evidence of positive effects of inflation targeting on GDP growth rates and per capita levels. But some studies report zero or negative effects (Table 6).

On inflation itself (and on inflation expectations) the results are also mixed, but a majority of studies report negative effects of this monetary regime on inflation. As documented in the survey paper on inflation targeting by Schmidt-Hebbel and Carrasco (2016), the results depend on the country groups that are used as treatment and control groups in the corresponding studies. In advanced economies, inflation targeting is likely not to affect inflation, compared to non-targeting advanced economies. However, in EMDEs inflation targeting leads to significantly lower inflation, compared to non-targeting EMDEs.

Macroeconomic stability tends to be enhanced by inflation targeting. Most studies report negative effects of inflation targeting on the second moments of inflation, GDP growth, the output gap, and short-term interest rates. This is likely a result of better anchoring of inflation expectations under inflation targeting (Schmidt-Hebbel and Carrasco, 2016).

floating regime. However, several studies included here define currency crises by observed annual depreciation rates beyond a pre-defined threshold level, which includes large depreciations in floating regimes.

3.2.3. Macroprudential Policies

Recent world evidence on the effects of macro-prudential policies is encouraging, supporting expectations that these policies are effective in raising growth and financial stability.

Macro-prudential activism, defined as the number of macroprudential policy actions adopted by country, raises per capita growth and lowers per capita growth volatility. A shock in bank reserve requirements reduces GDP in the short term.

Several indicators of financial stability are strengthened by macro-prudential policies. Stronger macro-prudential policies (measured by a higher index of macro-prudential activism or a positive macro-prudential policy shock) reduce aggregate, bank, and housing credit, as well as housing prices. Higher macro-prudential activism lowers bank default frequency and raises bank stability.

3.2.4. Fiscal Policy Institutions

Tax cuts have generally positive effects on GDP growth and per capita GDP levels (Table 8). Tax cuts on corporate and personal income tend to have indirect positive growth effects by raising investment and FDI, and by reducing consumption.

In the U.S., corporate tax cuts encourage innovation by raising US patents and citations per patent. In China, VAT reform raises innovation in state-owned enterprises but results for privately-owned enterprises are mixed. The number of corporations increases and long-term corporate debt levels decline when corporate taxes are lowered in the U.S.

Most studies report significant positive effects of different measures of fiscal rules (aggregate or any rule, particular rules, Maastricht Treaty) on per capita GDP growth (Table 9).

There is ample evidence that fiscal rules tend to improve fiscal performance directly (which tends to boost growth indirectly). Several studies report positive and significant effects of different measures and types of fiscal rules on different measures of the budget balance. One study reports positive effects of fiscal rules on government deficits, but effects turn negative when the fiscal rule interacts with its legal enforcement. Government debt levels are not affected by fiscal rules.

Reported results on the effects of fiscal rules on fiscal policy cyclicalities are mixed. In most cases, different fiscal rules do not affect the cyclical correlation between the government budget and GDP or between government expenditure and GDP. The exception is the expenditure rule, which reduces the cyclical correlation between government expenditure and GDP, hence turning fiscal policy more counter-cyclical.

Fiscal rules reduce government bond spreads. Fiscal rules raise the standard deviation of per capita GDP growth (not reported in the table) but reduce it when rules are interacted with a measure of discretionary fiscal policy (as reported in the table).

There is no evidence to date on direct effects of fiscal councils on GDP growth rates and levels. However, several studies report negative significant effects of fiscal councils on GDP growth forecast errors (Table 10).

There is more evidence on the effects of fiscal councils on fiscal performance. Several studies report that different measures of fiscal councils raise significantly primary budget balances and reduce significantly their forecast errors. However, three studies report negative effects of councils on the level and variation of cyclically-adjusted budget balances. A relevant result on the interaction between rules and councils is that existence of a fiscal council strengthens compliance with a numerical fiscal target rule.

There is also lack of evidence to date on the direct effects of sovereign wealth funds on GDP growth rates and levels. However, several studies show that sovereign wealth funds contribute to fiscal performance and macroeconomic stability (Table 11). Funds are reported to reduce the level and growth rate of government expenditure. Funds also reduce the volatility of government expenditure (both aggregate and capital spending) and the volatility of the cyclically-adjusted fiscal balance.

There are several positive effects of funds on other measures of macroeconomic stability. Inflation levels decline and measures of volatility of broad money, inflation, and the effective real exchange rate are lowered by an oil fund. Adverse effects of commodity-price volatility on physical capital are mitigated by a sovereign wealth fund.

Investments by sovereign wealth funds in corporations are a mixed blessing for the latter: equity price to book ratios rise, returns on equity decline, and Sharpe ratios decline.

3.2.5. Trade and Financial Openness

The direct effects of different measures of trade openness (trade liberalization and ex-post measures of trade to GDP ratios) on GDP growth rates and per capita GDP levels are generally positive and significant (Table 12). Eight studies report significant positive effects of different measures of openness on aggregate or per capita GDP growth. However, seven studies report non-significant results for some particular trade openness measures, but most of them present positive and significant results for other measures.

There is weak evidence that trade liberalization and lower trade barriers raise FDI. There is strong evidence that trade liberalization and trade ratios to GDP raise gross fixed-capital investment.

The direct effects of different measures of capital-account openness (aggregate and disaggregate measures of capital-account liberalization, financial openness, and capital controls) on GDP growth are generally positive and significant (Table 13). Only one study reports positive results of capital controls on growth. Regarding indirect growth effects, capital-account openness raises financial depth (measured by the GDP ratio of domestic credit to the private sector).

Bumann et al. (2013) conducted a meta-analysis of previous research on the effects of external and domestic financial liberalization (capital-account, banking, and equity-market liberalization) on economic growth. The authors conclude that financial liberalization has, on average, a weak but positive effect on growth.

4. Effects of Macroeconomic Institutions on Performance in MENA Countries

This section reviews and summarizes the more limited empirical evidence on the contribution of macroeconomic institutions on macroeconomic performance in MENA countries.

The review in this section comprises 23 empirical studies on the direct and indirect effects of 4 economic institutions on macroeconomic performance in MENA countries. The aforementioned set is comprised by 23 multi-country papers (based on cross-section and/or panel data). Most studies were published between 2000 and 2017; a few were published between 1995 and 2000.

Methodological points (i) to (xi) raised in section 3.1 also apply here. However, point (xii) does not apply here. Due to the smaller number of studies for MENA countries, all results – including those that report non-significant results – are included in the subsequent tables.

4.1. Exchange-Rate Regimes

Most studies for MENA reject existence of significant effects of fixed exchange-rate regimes on various macroeconomic performance indicators, including the level of GDP, the rate of inflation, foreign direct investment, exports, imports, and trade. Exchange-rate misalignment lowers per capita GDP. But misalignment does not have a robust effect on exports. Similarly, real exchange-rate volatility does not have a robust effect on exports and on imports. In sum, neither exchange-rate regimes nor relevant exchange-rate measures have statistically robust effects on macroeconomic performance in the MENA region.

4.2. Macro-Prudential Policies

Only one study reports evidence on the effects of macro-prudential policies in MENA. Borrower-targeted macro-prudential policies have a significant positive effect on bank stability in MENA countries.

4.3. Fiscal Policy Institutions

There is no evidence on the effects of fiscal institutions (taxes, fiscal rules, sovereign wealth funds, and fiscal councils) on MENA's macro performance. The evidence on the effects of fiscal policies in MENA is scarce and generally inconclusive. One study reports an expansionary effect of government expenditure on GDP.

4.4. Trade Openness

Several studies report significant effects of different measures of trade openness on different measures of macroeconomic performance variables for MENA countries. GDP levels and growth rates are raised by different measures of trade openness. Trade raises inflation. Foreign direct investment is boosted by trade. Trade changes the composition of tax revenue, away from taxes on goods and services and toward personal and corporate income taxes. WTO and GAFTA membership by MENA countries foster their export diversification. However, EU and the GCC membership lead to the opposite result: more specialization in exports.

5. Macroeconomic Frontier Institutions and the Distance of MENA Countries from the Frontier

Current international best practice in macroeconomic management is based on a combination of economic institutions which, according to current knowledge, implies the largest benefits for the conduct of policies and the behavior of households and firms, and, therefore, for macroeconomic performance. This institutional mix combines appropriate exchange-rate and monetary regimes, frontier macro-prudential policies, a developed fiscal framework, and high levels of international integration. Regarding the choice of exchange-rate and monetary regimes, a floating exchange rate with inflation targeting is optimal for countries that pursue an independent monetary policy. However, for smaller countries and/or those economies that are strongly integrated with large economies that issue a reserve currency, a pegged exchange rate and an exchange-rate anchor is optimal. Central bank independence is desirable in all economies with a central bank entrusted with attainment of monetary and financial stability.

However, what is optimal today, was not optimal some decades ago and is not likely to be optimal some decades into the future. For example, inflation targeting, fiscal rules, and fiscal councils were largely unknown institutions before 1995. And what is understood by inflation targeting today is very different from what it meant at its beginning in 1990. The standards of bank regulation differ widely between Basle I and Basle III – macro-

prudential regulation is a framework more fully developed after the Global Financial Crisis.

Best practice in economic institutions will continue evolving in the future, as technology, political demands, and policy-making changes. This requires continued attention of policy makers, experts, and politicians to learn from international experience in order to adapt and change domestic institutions.

Having the latter in mind, I propose a new Macroeconomic Institutions Frontier Index (MIFI) that provides a country-level measure of adoption of eight current best-practice institutions in the five key areas of macroeconomic management that have been the focus of this paper. The eight institutions are the following: central bank independence, inflation targeting, macro-prudential policies, fiscal rules, fiscal councils, sovereign wealth funds, trade openness, and capital-account openness. Note that I exclude from MIFI two institutions that I have included in previous sections of this paper: exchange-rate regimes and tax rates. The reason for these exclusions (discussed above) are that neither the choice of exchange-rate regime nor the choice of tax rates is independent of country-specific features (including country size and development level) and their effects on macroeconomic performance are ambiguous.⁸

Making use of the indices and data sources for the eight institutions introduced in previous sections, I scale binary discrete variables as either 1 or 0 and re-scale non-binary discrete variables according three values: 1, 0.5 and 0. Then I add values for each institution and country, yielding a cross-country range of aggregate values between 0 (minimum) and 8.0 (maximum).

Table 18 summarizes the eight individual institutions grouped by macro management areas, the original data source and period, and the simple scaling and re-scaling procedure applied to obtain the MIFI measure. The last column lists basic cross-country distribution statistics for world samples that comprise between 118 and 189 countries.

The world distribution for circa 2016 of MIFI is depicted in Fig. 12, in combination with the world distribution of the Index of the Quality of (Overall) Institutions (first pillar – Institutions – of the Global Competitiveness Index) constructed by the World Economic Forum (WEF). The indices are positively correlated: countries with better institutions

⁸ A caveat is in order regarding inclusion of inflation targeting in MIFI. The choice of an inflation target may not be optimal for a central bank that does not pursue an independent monetary policy because it has a credible fixed exchange rate in place. In such case, sticking to the peg as the nominal anchor of choice dominates an inflation target, as long as fiscal and monetary policies remain consistent with the peg and the country's structural and policy conditions are consistent with an optimal currency area between the domestic economy and the economy that issues the reference currency.

(according to WEF) are more likely to have in place macroeconomic institutions that are at the best-practice international frontier (a high value of MIFI). However, the correlation is not perfect. There are several countries with frontier macroeconomic institutions in place that receive low grading regarding the quality of overall institutions, and viceversa.

Comparing the sub-samples of MENA and advanced countries, the former lag behind the latter in both institutional quality and frontier macroeconomic institutions (Figure 13). It is also noteworthy that the 6 MENA oil importers display, on average, lower levels in both measures than the 9 MENA oil exporters included here.

Compared to other EMDEs, MENA oil importers display on average a level of institutional quality that is close to the average of EMDEs, while MENA oil exporters display on average an institutional quality that is well above that of the average EMDE (Figure 14). Regarding MIFI, MENA oil importers are below the average EMDE, while MENA oil exporters are close to the average EMDE. Similar conclusions apply to the comparison between MENA countries and other resource-rich economies (Figure 15).

Next I present a simple comparison of cross-country correlations between 2010-2016 average per capita GDP and 2016 MIFI measures for MENA and for non-MENA countries in the world (Fig. 16). At a given level of per capita GDP, the average MENA country has significantly less macro frontier institutions in place than the average non-MENA country. For instance, at the world's average per capita income, the value of MIFI is 3.3 for the average MENA country, while it attains 5.3 for the average non-MENA country. Controlling for per capita GDP, MENA countries are at a larger distance from best international practice in macroeconomic institutions than non-Mena countries.

Finally, I depict the three-dimensional world country distribution for per capita GDP, MIFI, and institutional quality, confirming the high correlations among the three measures for the world at large (Fig. 17).

6. Adoption of Frontier Macroeconomic Institutions

In previous sections I have reviewed the evidence on the contribution of macroeconomic institutions to macroeconomic performance. Here I assess briefly the reverse causality, from economic performance to the adoption of macroeconomic institutions. Then I turn to the conditions that affect design, implementation, and upgrading of macroeconomic institutions.

6.1. World Evidence on Adoption of Macroeconomic Regimes

In a recent survey paper, Schmidt-Hebbel and Martínez (2018) review the empirical literature on the determinants of establishing and maintaining economic institutions in advanced, emerging-economy, and developing countries. Their survey is based on

findings reported by about 100 studies on the determinants of 10 economic institutions, including many covered in this paper. The survey concludes that the main determinants of institutions can be grouped into seven categories.

First, development matters. Its proxy, GDP per capita, is a key co-determinant of the likelihood of adopting and maintaining most advanced economic institutions.

Second, political regimes and political-economy conditions matter. A higher level of democracy, less corruption, more government effectiveness, better quality of public institutions, political stability of the government, and government ideology raise significantly the likelihood of institutional change.

Third, few crises beget reforms. While crises (i.e., currency, banking, debt, and high-inflation crises) may weaken reform opponents, it is not generally true that crises beget reforms. The evidence on the statistical significance of crisis timing on reforms is weak and partial. Only trade and capital-account liberalization are positively influenced by the incidence of some types of crises.

Fourth, financial development matters weakly. Deep and diversified domestic financial markets are statistical co-determinants of economic institutions. The exception is the likelihood of having a floating exchange rate in place, which rises significantly with financial development.

Fifth, macroeconomic policy regimes and conditions matter – sometimes. A floating exchange rate contributes to adoption of inflation targeting. Monetary and fiscal-policy conditions are statistically significant in explaining adoption of exchange-rate regimes, monetary regimes, and fiscal institutions (fiscal rules and sovereign wealth funds).

Sixth, macroeconomic conditions matter – sometimes. Often, but not always, inflation is positively associated to institutional change. The business cycle has a negative effect on institutional adoption – i.e., it is more likely that institutions are put in place in recessions than in booms.

Finally, external conditions matter. Globalization (reflected by larger trade and capital-account openness) and financial assistance provided by international financial institutions raise the likelihood of institutional reforms.

6.2. Design, Implementation, and Upgrading of Macroeconomic Institutions

Drawing from the general literature on reforms and international experience, next I discuss different features and conditions that influence the design, implementation, and upgrading of macroeconomic policy institutions.

6.2.1. Complexity

Institutions vary enormously according to their complexity. On one extreme, best practice regarding international integration involves free flows of goods, services, and capital across countries. Attaining this is relatively simple, as it implies eliminating domestic barriers to trade in goods, services, and capital. On the other extreme is, for example, domestic financial liberalization jointly with putting in place domestic regulatory and supervisory standards in banking and capital markets to match international best practice. The latter is a very complex task that requires continuous future upgrading as financial markets, instruments, and technology evolve.

6.2.2. Legal barriers to institutional change

Different legal barriers have to be overcome to adopt different institutions. Some require constitutional changes, others need legal or regulatory amendments, and others are defined by technical authorities. Monetary institutions provide an example: central bank independence requires constitutional or legal amendments (depending on the country), while exchange-rate and monetary regimes are decided by the minister of finance and/or the central bank board. Obviously institutional change must overcome more political hurdles if it involves legal or constitutional change approved by the legislative.

6.2.3. Learning

Institutional best practice evolves as a result of learning from domestic and international experience, policy contagion, and trial-and-error experience. Technology and more frequent contacts among policymakers and experts accelerate international diffusion of best practice. As new institutional designs are tested every day in more than 190 independent countries, learning from international experience is made easy today.

Learning from policy failure is at least as important as learning from success. For example, financial liberalization without appropriate regulation and supervision – in Latin America in the 1970s and 1980s, and in the U.S. in the 1990s and 2000s – led to deep financial crises and protracted recessions. These policy failures led to significant subsequent upgrading of financial regulation and supervision.

6.2.4. One size does not fit all

Institutions that are optimal for one type of countries are not necessarily optimal for other country categories. Two dimensions imply watersheds for institutional choice: country development and country size. The degree of development determines adoption of

complex institutions, as shown by the empirical evidence discussed in the previous section. For example, financial markets are often underdeveloped in poor economies and therefore do not necessarily require complex regulation and supervision exercised by large agencies staffed by financial-market experts.

Country size represents a similar limitation to effective adoption of complex institutions. In very small economies it is often not feasible to put in place complex independent fiscal institutions like fiscal councils and sovereign wealth funds. Direct management of government resource rents by the ministry of finance, possibly constrained by a fiscal rule and accountable to parliament, may constitute a more feasible fiscal framework in small economies.

6.2.5. Timing, sequencing, and gradualism

There is little systematic evidence on optimal timing of institutional reform. The sooner reforms are undertaken, the earlier their benefits are reaped.

Sequencing of institutional changes – which reforms should be done earlier and which subsequently – was intensely discussed – both analytically and empirically – during the 1980s and early 1990s, at a time of fundamental market reforms worldwide. However, no robust conclusions were reached about optimal sequencing of reforms comprising different reform packages. Today, when discussing more refined policy reforms and institutions, the issue of optimal sequencing has all but disappeared from policy discussions.

On gradualism, there are institutions which are either not possible or not optimal to introduce gradually. This is evident in the case of adoption of some policy regimes – say fiscal rules – and institutional agencies – like fiscal councils, sovereign wealth funds, and independent central banks.

However, institutional complexity of the corresponding regimes and agencies can grow over time. For example, the tasks of an independent fiscal council could be widened over the years. Also in the case of inflation targeting, many countries adopted this regime in a “light” version during the 1990s, which was gradually upgraded in subsequent years. Again, complexity of institutions differs between rich and poor economies, and between large and small countries. Less complex institutions are often better in smaller countries than the complex institutions found in large advanced countries.

6.2.6. International technical assistance

International financial institutions, development agencies, and think tanks are uniquely positioned in providing technical assistance to countries aiming at institutional improvements. They draw on extensive experience regarding international best practice

in designing and implementing frontier institutions, as well as on internal and external expertise of specialists. Many international institutions have made and are making a difference in assisting all countries – both EMDEs and advanced countries – to bring their institutions closer to international best practice.

7. Conclusions for MENA Countries

This paper has conducted an extensive review of macroeconomic regimes, focusing on (i) their current distribution in the world and in major world regions (including MENA), (ii) the existing empirical evidence of the effects of macro regimes on growth and other measures of macroeconomic performance – both for the world at large and for MENA countries separately –, (iii) the measurement of the distance between MENA countries and the best-practice international frontier regarding macroeconomic institutions, and (iv) the conditions that affect adoption of macroeconomic institutions. In the following I summarize the main lessons drawn from this review for MENA countries.

The focus of the paper has been on ten formal economic institutions grouped in five key areas of macroeconomic management (institutions are defined in parentheses, when they are not represented directly by the macro management area): exchange-rate regimes, monetary policy regimes (central bank independence; monetary regimes), macro-prudential regimes, fiscal policy regimes (tax rates; fiscal rules; fiscal councils; sovereign wealth funds), and international integration (trade openness; capital-account openness).

7.1. Distribution of Macroeconomic Institutions in the World and in MENA

The world distribution of exchange-rate regimes does not exhibit clear trends during 2008-2016. Roughly 80% of countries have in place a floating exchange-rate regime or a soft peg in 2016. Hard pegs are observed in 13% of countries. However, there are significant differences in the distribution of exchange-rate regimes across country groups. Floats are by far the regime of choice in advanced countries (86%), in contrast to EMDEs at large (26%), where soft pegs dominate (46%). Soft pegs are very dominant in MENA (76%). Among the 11 MENA oil exporters, 10 have a soft peg in place. Among the 10 MENA oil importers, 6 have a soft peg, 1 country has a hard peg and another a float.

Central bank independence – like exchange-rate floating – is an important condition for the conduct of an independent monetary policy. The number of independent central banks and the degree of independence have increased significantly in most world regions since the 1990s. Advanced countries exhibit, on average, the highest levels of independence toward 2012. EMDEs are at an intermediate level. In MENA oil exporting and importing countries the average degree of independence of central banks is much lower.

Regarding the choice of monetary regime, about 30% of advanced economies target inflation in 2016. In contrast, the exchange rate is the nominal anchor adopted by roughly

50% in EMDEs. No MENA country has inflation targeting in place. The explicit monetary regime of choice is the exchange rate, selected by 67% of all MENA countries. The exchange rate is the nominal anchor in 82% of MENA oil exporters and 50% of MENA oil importers.

Adoption of macro-prudential tools has been rising between 2000 and 2013. Surprisingly the use of macro-prudential instruments is more widespread in EMDEs than in advanced countries. MENA is at the forefront of applying a larger number of macro-prudential tools. Oil exporting MENA countries adopt more borrower-targeted instruments than other regions, while oil-importing MENA countries adopt more financial institutions-targeted instruments than other regions. However, all country groups have, on average, still few macro-prudential tools in place. This may have changed since 2013 and is likely to change further in the future.

A developed fiscal framework comprises several fiscal institutions that contribute to fiscal performance. Direct tax rates are higher in advanced countries than in other economies, reflecting the larger size of government in high-income economies. Average indirect tax rates are close to 17% in advanced countries and roughly 10% in EMDEs. Indirect tax rates average 7% in MENA, and differ strongly between oil exporters (where they are very low) and oil importers (much higher). Average corporate tax rates are close to 23% in the world at large and are similar across the six country groups. However, the top marginal tax rate on personal income taxes is much higher in advanced countries (40%) than the top tax rate in the five other country groups (which is close to 20%, on average). The lowest tax-paying country group is MENA oil exporters, where oil revenue represents a very significant income base for government revenue.

Since 1990 fiscal rules are adopted by rising numbers of advanced countries and EMDEs. However, only one among 21 MENA countries (Iran) has adopted a fiscal rule. Fiscal councils are increasingly adopted since the 2008-2009 crisis, mostly by advanced countries. In 2017 only 12 EMDEs and one MENA oil exporter have fiscal councils in place. Sovereign wealth funds are key fiscal institutions in natural resource-exporting countries that face volatile commodity prices and/or a finite endowment of resources. They are more frequently adopted in EMDEs and particularly in resource-rich economies. 10 of 11 oil-exporting MENA countries have at least one sovereign wealth fund in place in 2017. Sovereign wealth funds are generally more transparent in advanced countries than in EMDEs. On average transparency is lower in MENA countries than in EMDEs.

International trade integration shows a positive trend in all country groups since 1970. Trade openness is larger in advanced countries than in the five other country groups. Among all other country groups, MENA oil exporters exhibit the largest and MENA oil importers the lowest degree of trade integration.

Regarding international financial integration, all countries exhibit a liberalizing trend toward less restrictions on cross-border financial transactions since 1970. However, this positive trend is much stronger in advanced countries than in the five other country groups. EMDEs as a group exhibit a weak trend reduction of capital-account restrictions. This trend is stronger in MENA countries. MENA oil exporters liberalized their capital accounts in the wake of the first oil boom but did not liberalize further after 1976. Among the six country groups, MENA oil importers are the least financially open.

7.2. Effects of Macroeconomic Regimes on Macroeconomic Performance in the World and in MENA

Here I summarize the lessons from the research reviewed in this paper. When drawn from research for world samples (i.e., the findings reported in section 3), I do not refer explicitly to the world. When drawn from studies for MENA (i.e., the findings reported in section 4), I refer explicitly to this region.

Consistent with the literature on optimal currency regimes, the empirical evidence is mixed regarding the growth effects of exchange-rate regimes in samples that are representative of all economies. However, in separate samples comprised by advanced countries (EMDEs), flexible (fixed) regimes are more likely to have positive growth effects. This is consistent with the fact that advanced countries (EMDEs) are more (less) likely to have a flexible (fixed or intermediate) exchange-rate system in place, tend to be larger (smaller), and are more (less) likely to conduct an independent monetary policy.

Bi-causality is observed between exchange-rate regimes and inflation. On one hand, high inflation requires nominal exchange-rate adjustment and therefore is inconsistent with fixed exchange rates; on the other, a fixed exchange-rate regime may strengthen central banks' monetary discipline and hence induce lower inflation. While low inflation characterizes most advanced economies, moderate and high inflation is observed in several EMDEs. Hence it is not surprising that flexible exchange rates tend to have no statistically significant effects on inflation in advanced countries. By contrast, flexible exchange rates tend to have positive inflation effects in EMDEs.

Theory predicts that trade rises between a country that adopts a fixed exchange rate and the country against which the former's rate is set, due to the absence or decline of exchange-rate uncertainty. The empirical findings tend to validate this hypothesis.

Most studies for MENA reject existence of significant effects of fixed exchange-rate regimes on various macroeconomic performance indicators, including the level of GDP, the rate of inflation, foreign direct investment, exports, imports, and trade. However,

exchange-rate misalignment lowers per capita GDP. But misalignment does not have a robust effect on exports. Similarly, real exchange-rate volatility does not have a robust effect on exports and on imports. In sum, neither exchange-rate regimes nor relevant exchange-rate measures have statistically robust effects on overall macroeconomic performance in the MENA region.

Central bank independence raises growth directly and indirectly by lowering central bank governor turnover. Central bank independence also contributes to higher foreign direct investment, lower real interest rates on 10-year bonds, and lower financial instability. There is strong and systematic evidence that central bank independence contributes significantly and robustly to lower inflation.

A majority of studies reports evidence of positive effects of inflation targeting on GDP growth rates and per capita levels. But some studies report zero or negative effects. On inflation itself (and on inflation expectations) the results are also mixed, but a majority of studies report negative effects of this monetary regime on inflation. Macroeconomic stability tends to be enhanced by inflation targeting.

Macro-prudential activism, defined as the number of macroprudential policy actions adopted by country, raises per capita growth and lowers per capita growth volatility.

One study reports evidence on the effects of macro-prudential policies in MENA. Borrower-targeted macro-prudential policies have a significant positive effect on bank stability in MENA countries.

Tax cuts have generally positive effects on GDP growth and per capita GDP levels. Tax cuts on corporate and personal income tend to have indirect positive growth effects by raising investment and FDI, and by reducing consumption.

Most studies report significant positive effects of different fiscal rules on per capita GDP growth. There is ample evidence that fiscal rules tend to improve fiscal performance (which tends to boost growth indirectly). Reported results on the effects of fiscal rules on fiscal policy cyclicality are mixed. Fiscal rules reduce government bond spreads.

There is no evidence to date on direct effects of fiscal councils on GDP growth rates and levels. There is more evidence on the effects of fiscal councils on fiscal performance. Several studies report that different measures of fiscal councils raise significantly primary budget balances and reduce significantly their forecast errors. However, some studies report negative effects of councils on the level and variation of cyclically-adjusted budget balances. A relevant result on the interaction between rules and councils is that existence of a fiscal council strengthens compliance with a numerical fiscal target rule.

There is also lack of evidence to date on the direct effects of sovereign wealth funds on GDP growth rates and levels. However, several studies show that sovereign wealth funds contribute to fiscal performance and macroeconomic stability. There are several positive effects of funds on other measures of macroeconomic stability. Inflation levels decline and measures of volatility of broad money, inflation, and the effective real exchange rate are lowered by an oil fund. Adverse effects of commodity-price volatility on physical capital are mitigated by a sovereign wealth fund.

There are no studies on the effects of fiscal institutions (taxes, fiscal rules, sovereign wealth funds, and fiscal councils) on MENA's macro performance. The evidence on the effects of fiscal policies in MENA is scarce and generally inconclusive.

The direct effects of different measures of trade openness (trade liberalization and ex-post measures of trade to GDP ratios) on GDP growth rates and per capita GDP levels are generally positive and significant. There is weak evidence that trade liberalization and lower trade barriers raise FDI. There is strong evidence that trade liberalization and trade ratios to GDP raise gross fixed-capital investment.

Several studies report significant effects of different measures of trade openness on macroeconomic performance variables in MENA. GDP levels and growth rates are raised by different measures of trade openness. But trade also raises inflation. Foreign direct investment is boosted by trade. Trade changes the composition of tax revenue, away from taxes on goods and services and toward personal and corporate income taxes. WTO and GAFTA membership by MENA countries foster their export diversification. However, EU and the GCC membership lead to the opposite result: more specialization in exports.

Finally, the direct effects of different measures of capital-account openness (aggregate and disaggregate measures of capital-account liberalization, financial openness, and capital controls) on GDP growth are generally positive and significant for the world. There are no separate studies on the effects of capital-account openness for MENA countries.

7.3. Distance of Macroeconomic Institutions in MENA Countries from the International Frontier

Current international best practice in macroeconomic management is based on a combination of economic institutions which, according to the evidence reviewed in this paper, implies the largest benefits for the conduct of policies and for macroeconomic performance. This institutional mix combines appropriate exchange-rate and monetary regimes, frontier macro-prudential policies, a developed fiscal framework, and high levels of international integration.

Having the latter in mind, I have developed in this paper an aggregate Macroeconomic Institutions Frontier Index (MIFI) that provides a country-level measure of adoption of eight current best-practice institutions: central bank independence, inflation targeting, macro-prudential policies, fiscal rules, fiscal councils, sovereign wealth funds, trade openness, and capital-account openness.

Not surprisingly, advanced countries display higher values of MIFI than EMDEs. MENA oil importers score on average below the average EMDE, while MENA oil exporters are on average close to the average EMDE. Similar conclusions apply to the comparison between MENA countries and other resource-rich economies.

In both world and MENA cross-country samples, MIFI is positively correlated with the WEF measure of overall quality of institutions. MIFI is also positively correlated with per capita GDP.

At a given level of per capita GDP, the average MENA country has significantly less macro frontier institutions in place than the average non-MENA country. For instance, at the world's average per capita income, the value of MIFI is 3.3 for the average MENA country, while it attains 5.3 for the average non-MENA country. Controlling for per capita GDP, MENA countries are at a larger distance from best international practice in macroeconomic institutions than non-MENA countries. Hence MENA countries face a major challenge to adopt macroeconomic institutions or bring them closer to international best practice.

7.4. Adoption and Implementation of Frontier Macroeconomic Institutions

On the reverse causality – from macroeconomic conditions and regimes to the adoption of macroeconomic institutions – a review of the empirical literature on the determinants of establishing and maintaining economic institutions in advanced countries and EMDEs leads to the following conclusions, which are relevant for MENA.

Development matters: GDP per capita is a key co-determinant of the likelihood of adopting and maintaining most advanced economic institutions. Political regimes and political-economy conditions matter: higher levels of democracy, less corruption, more government effectiveness, better quality of public institutions, political stability, and government ideology raise significantly the likelihood of institutional change. Crises (i.e., currency, banking, debt, and high-inflation crises) generally do not beget reforms; only trade and capital-account liberalization are positively influenced by some types of crises. Deep and diversified domestic financial markets are statistical co-determinants of economic institutions. Some macroeconomic policy regimes and conditions matter: a

floating exchange-rate regime contributes to adoption of inflation targeting and good monetary and fiscal policy conditions contribute to adoption of exchange-rate regimes, monetary regimes, and fiscal institutions (fiscal rules and sovereign wealth funds). Inflation is positively associated to institutional change and institutions are more likely to be put in place in recessions than in booms. Finally, trade and capital-account openness and financial assistance matter: they raise the likelihood of institutional reform.

Also relevant for MENA is the inference – drawn from the general literature on reforms and international experience – about different features and conditions that have a significant bearing on design, implementation, and upgrading of macroeconomic policy regimes and institutions. They include the following.

Institutional complexity should not be under-estimated: legal statutes, functions and responsibilities, governance, accountability, and independence of frontier macroeconomic institutions (central banks, macro-prudential supervisors, fiscal councils, sovereign wealth funds) should be strengthened over time. Monetary, macro-prudential, and fiscal policy rules also require continuous attention and upgrading.

Institutional best practice evolves as a result of learning from domestic and international experience. As new institutional designs are tested every day in more than 190 independent countries, learning from international experience is made easy today.

One size does not fit all: institutions that are optimal for one type of countries are not necessarily optimal for other country categories. For example, institutions should be kept small and simple in poorer and smaller economies.

There is no robust evidence regarding optimal timing, sequencing, and gradualism of institutional reform. Countries should adopt macroeconomic institutions and upgrade them toward international best practice as soon as they could, considering their political and resource constraints.

A final policy conclusion emerges from the review undertaken in this paper. MENA countries may consider putting in place a permanent and independent advisory commission with the task of assessing policy needs, proposing design and implementation of macroeconomic policy reforms (including policy rules), and proposing adoption/upgrading of macroeconomic institutions. Endowed with political independence, a limited budget, and a highly qualified but small staff, such a commission – accountable to the government or congress – could contribute significantly to bring MENA countries to best international practice in macroeconomic policies and institutions.

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Table 1. Exchange-rate regimes and growth

Dependent variable	Independent variable		Empirical findings
Growth of GDP per capita	De facto flexible ERR	All economies	- (5); 0 or - (2, 6); + (8); 0 or + (9)
		Advanced economies	0 or + (11, 17)
		EMDEs	0 or - (11, 17)
	De facto fixed ERR	All economies	0 (8, 9); + (5, 12); 0 or + (3, 13); - (10, 14, 18)
		Advanced economies	0 or - (3); 0 (10, 13, 18); 0 or + (12)
		EMDEs	0 or + (3, 13); - (10, 18); + (12, 16)
	De facto intermediate ERR	All economies	- (5, 10, 18); 0 or + (8); 0 (9); 0 or - (13)
		Advanced economies	0 (13, 18)
		EMDEs	0 or - (13); + (16); - (18)
	De jure fixed ERR	All economies	+ (12); 0 or - (15); 0 (18)
De jure intermediate ERR	All economies	+ (18)	
Growth of GDP	De facto fixed ERR	All economies	0 or + (1); 0 or - (4, 7)

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. De Grauwe and Schnabl (2008) (table 4, column 6); 2. Aghion et al. (2009) (table 1, columns 2-5); 3. Harms and Kretschmann (2009) (table 5, column 4); 4. Tsangarides (2012) (tables 1a, columns 2-11) (tables 2a, columns 2-11); 5. Bailliu et al. (2003) (table H.1, columns 3, 4 and 7); 6. Bleaney and Francisco (2007) (table 4, columns 3-6); 7. Coudert and Dubert (2005) (table 6, columns 2-3); 8. Garofalo (2005) (table 9, column 2); 9. Huang and Malhotra (2004) (table 1, column 2) (table 2, column 2); 10. Levy-Yeyati and Sturzenegger (2003) (table 5, columns 3-5); 11. Rogoff et al (2003) (table 15, columns 2-10); 12. Ashour and Chen Yong (2018) (table 1, column 2) (table 3, column 2) (table 4, column 2); 13. Dubas et al. (2010) (table 12, columns 2-7); 14. Edwards and E. Levy-Yeyati (2005) (table 3, columns 2-4); 15. Eichengreen and Leblang (2003) (table 3, columns 2-4); 16. Guellil et al. (2017) (table 4, column 2); 17. Husain et al. (2005) (table 10, columns 2-10); 18. Levy-Yeyati and Sturzenegger (2001a) (table 5, columns 2-5).

Note: ERR (Exchange Rate Regime).

The following studies report non-significant results for related variables: Petreski (2009) (table 3, columns 2-8); Rose (2011) (table 2, columns 2-4); Domaç et al. (2001) (table 7, column 2).

Table 2. Exchange-rate regimes and inflation

Dependent variable	Independent variable		Empirical findings
Percent change of the consumer price index	De facto flexible ERR	All economies	0 or + (1); 0 (2); + (7, 13, 14, 15)
		Advanced countries	0 or - (5, 15); 0, +, or - (7)
		EMDEs	0 or + (5, 7, 15)
	De facto fixed ERR	All economies	- (1, 2, 4, 13, 14); 0 or - (6, 10, 11)
		EMDEs or non-industrial countries	0 or - (4); - (6, 11, 12)
	De jure flexible ERR	All economies	0 (7, 15); +(9)
EMDEs		0 or + (15)	
De jure fixed ERR	All economies	0 or + (3); - (4); 0 (6, 10); + (9)	
	EMDEs or non-industrial countries	0 or - (4);	
Percent change of the GDP deflator	De facto flexible ERR	All economies	0 or + (8)
		EMDEs	0 or + (8)

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Bleaney and Francisco (2007) (table 1, columns 2-6); 2. Coudert and Dubert (2005) (table 7, column 2); 3. De Grauwe and Schnabl (2008) (table 2, column 2) (table 3, column 2); 4. Ghosh et al. (2011). (table 4, columns 2- 8) (table 5, columns 2- 8) (table 6, columns 2-12); 5. Husain et al. (2005) (table 9, columns 2-10); 6. Levy-Yeyati and Sturzenegger (2001b) (table 4, columns 2-5 and 10); 7. Rogoff et al. (2003) (table 13, columns 2-3) (table 14, columns 2-10); 8. Rose (2011) (table 3, columns 2-5) (table 4, columns 2-5); 9. Domaç et al. (2001) (table 4, column 2); 10. Ghanem (2010) (table 7.1, columns 2-8) (table 7.2, columns 2-8) (table 7.3, columns 2-8); 11. Ghosh et al. (2014) (table 6, columns 2-7); 12. Lohi (2014) (table 1, columns 2-9); 13. Toulaboe and Terry (2013) (table 2, columns 2-5); 14. Yamada (2013) (table 4, columns 3-9); 15. Cruz-Rodríguez (2016b) (table 5, columns 2-9) (table 6, columns 2-9).

Note: ERR (Exchange Rate Regime).

Table 3. Exchange-rate regimes and financial crises

Dependent variable	Independent variable	Empirical findings	
Probability of Banking Crises	De facto flexible ERR	All economies	- (2)
		EMDEs	0 or - (1)
	De facto fixed ERR	All Economies	0 or - (6)
		EMDEs	0 or - (6)
	De jure flexible ERR	EMDEs	0 or - (12)
		All Economies	0 or - (6)
De jure fixed ERR	EMDEs	0 or - (6); 0 or + (12)	
	All Economies	0 or + (4, 5); + (7); 0 (11)	
Probability of Currency Crises	De facto flexible ERR	Advanced countries	0 (4, 5)
		EMDEs	0 or + (4, 5); + (7)
		All Economies	0 (11); + (3)
	De facto intermediate ERR	EMDEs	+ (3)
		All Economies	0 (8, 11); 0 or - (9); - (10)
	De facto fixed ERR	EMDEs	0 or - (8, 9)
		All Economies	+ (4); 0 (5, 11)
	De jure flexible ERR	Advanced countries	0 (4, 5)
		EMDEs	0 (4, 5)
	De jure intermediate ERR	All Economies	0 (11)
De jure fixed ERR	All Economies	0 or + (11)	

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Angkinand and Willett (2006) (table 3, columns 2-7); 2. Angkinand and Willett (2011) (table 2, columns 2-5); 3. Bubula and Otker-Robe (2003) (table 2, columns 2-3); 4. Cruz-Rodríguez (2016c) (table 5, columns 2-9) (table 6, columns 2-9); 5. Cruz-Rodríguez (2016a) (table 6, columns 2-9) (table 7, columns 2-9); 6. Domaç and Peria (2003) (table 1, columns 2-7) (table 2, columns 2-9) (table 3, columns 2-9); 7. Esaka (2010) (table 2; columns 2-5); 8. Esaka (2011) (table 2, columns 2-9); 9. Esaka (2013) (table 3, columns 2-5); 10. Esaka (2014) (table 2, columns 2-10); 11. Haile and Pozo (2006) (table 6, columns 2-5); 12. Mendis (2002) (table 7, columns 4-5).

Note: ERR (Exchange Rate Regime).

The following studies report non-significant results for related variables: Combes et al. (2016) (table 3, columns 2-9) (table 4, columns 2-9) (table 5, columns 2-9).

Table 4. Exchange-rate regimes and trade

Dependent variable	Independent variable		Empirical findings
$Ln\left(\frac{M_{ei}}{M_{USAi}}\right)$	De facto fixed ERR	All economies	0 or + (1)
M_{ei} is imports of country i from country e			
M_{USAi} is imports of country i from the United States	De jure fixed ERR	All economies	0 (1)
Bilateral trade (as percent of GDP)	De facto fixed ERR	All economies	0 or + (2, 4, 6); + (5, 8)
		EMDEs	+ (8)
	De jure fixed ERR	All economies	+ (2, 8, 9); 0 (6)
		EMDEs	+ (8)
Exports to country i from country j (i =US, EU countries or Japan)	De jure fixed ERR	EMDEs	0 or - (3)
Exports i from country j	De facto fixed ERR	All economies	+ (7)

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Broda and Romalis (2011) (table 3.3, columns 2-10); 2. Fritz-Krockow and Jurzyk (2004) (table 4, columns 2-9) (table 5, columns 2-10); 3. Nilsson and Nilsson (2000) (table 4, columns 2-12); 4. Adam and Cobham (2007) (table 5, column 2); 5. Chong and Wong (2015) (table 2, columns 2-6); 6. Klein and Shambaugh (2006) (table 2, columns 2-5) (table 5, columns 2-4); 7. Ledesma Rodriguez et al. (2014) (table 2, columns 2-3 and 6-7) (table 3, columns 2-3 and 6-7); 8. Qureshi and Tsangarides (2012) (table 3, columns 2-7) (table 4, columns 2-7); 9. Frenkel and Rose (2002) (table 1, columns 2-6).

Note: ERR (Exchange Rate Regime).

The following studies report non-significant results for related variables: Hegarty and Wilson (2017) (table 6, columns 6-9).

Table 5. Effects of central bank independence

Dependent variable	Independent variable	Empirical findings
Income and growth		
Growth of GDP per capita	Central Bank Governor turnover rate	0 or - (1); 0 (5)
GDP growth	Index of Central Bank Independence	0 or + (2)
Investment		
FDI	Index of CBI	0 or + (3)
Other variables		
10-year real bond rates	Index of CBI	0 or - (3)
CB transparency index	Index of CBI	+ (4)
Index of financial instability indicators	Index of CBI	- (6)
Inflation		
Inflation	Central Bank Governor turnover rate	0 or + (7, 8, 9)
	Index of Central Bank Independence	- (8)

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Cukierman et al. (1993) (table 1, columns 2 and 6); 2. Garriga (2016) (table 2, columns 5 and 7); 3. Bodea and Hicks (2014) (table 2, columns 2-13); 4. Crowe and Meade (2008) (table 4, columns 2, 3 and 5); 5. Haan and Kooi (2000) (table 6, column 2) (table 7, column 2); 6. Klomp and de Haan (2009) (table 2, columns 4, 6-9); 7. Klomp and de Haan (2010b) (table 1, columns 2-7); 8. Posso and Tawadros (2013) (table 1, columns 4 and 5) (table 2, columns 2-7); 9. Alpanda and Honig (2014) (table 6, columns 3, 5 and 7).

The following studies report non-significant results for related variables: Grilli et al. (1991) (table 16, column 2); Cukierman et al. (1993) (table 1, columns 3 and 5); Anastasiou (2005) (table A5, columns 2-7).

Table 6. Effects of inflation targeting

Dependent variable	Independent variable	Empirical findings
Income and growth		
Growth of GDP per capita	Inflation targeting (D=1)	0 or - (4)
Growth of GDP	Inflation targeting (D=1)	0 (3); 0 or - (1); 0 or + (6, 8, 10)
	Soft inflation targeting (D=1)	+ (5)
	Full inflation targeting (D=1)	+ (5)
GDP per capita	Soft inflation targeting (D=1)	0 or + (2)
	Full inflation targeting (D=1)	0 or + (2)
Macroeconomic variables		
CPI Inflation	Inflation targeting (D=1)	0 (3, 6, 12, 19); 0 or - (1, 4, 7, 8, 10, 11, 13, 14, 15, 16, 20, 22); - (9, 17, 18)
Inflation expectations (one year ahead)	Inflation targeting (D=1)	0 or - (10)
Stability		
Inflation volatility	Inflation targeting (D=1)	0 (3, 6, 19); 0 or - (1, 10, 11, 13, 14, 21); - (9); 0 or + (8)
GDP growth volatility	Inflation targeting (D=1)	0 (3, 6, 8, 9); 0 or - (1); - (10, 12)
Output gap volatility	Inflation targeting (D=1)	- (9)
Volatility of short-term interest rate	Inflation targeting (D=1)	0 or - (8, 10)

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Brito and Bystedt (2010) (table 2, columns 2-7) (table 3, columns 2-7); 2. Mollick et al. (2011) (table 2, columns 6-11) (table 3, columns 6-11); 3. Naqvi and Rizvi (2009) (tables 2-5); 4. Ayres et al. (2014) (table 4, columns 2-6) (table 6, columns 2-6); 5. de Guimarães e Souza et al. (2016) (table 1, columns 2-9) (table 2, columns 2-9); 6. Abo-Zaid and Tuzemen (2012) (table 13, columns 2-5) (table 14, columns 2-5); 7. Angeriz and Arestis (2006) (table A1, appendix, column 3); 8. Ball and Sheridan (2005) (table 6.3, panel B, columns 2-9) (table 6.4, panel B, columns 2-9) (table 6.6, panel B, columns 2-9) (table 6.7, panel B, columns 2-9) (table 6.9, panel B, columns 2-5); 9. Batini and Laxton (2007) (table 3, column 2); 10. Brito and Bystedt (2006) (table 2, panel B, columns 2-3) (table 3, panel B, columns 2-3) (table 6, panel B, columns 2-3) (table 7, panel B, columns 2-3) (table 8, panel B, columns 2-3) (table 9, panel B, columns 2-3); 11. de Mendonça and de Guimaraes e Souza (2012) (table 3, columns 2-19) (table 4, columns 2-19); 12. Gonçalves and Salles (2008) (table 2, columns 2-4) (table 4, columns 2-4); 13. Lin and Ye (2009) (table 4, columns 2-8) (table 5, columns 2-8); 14. Mishkin and Schmidt-Hebbel (2007) (table 6, columns 2-7) (table 11, columns 2 and 3) (table 12, columns 2 and 3); 15. Valera (2017) (table 4.5, columns 2-9); 16. Calderón and Schmidt-Hebbel (2010) (table 3, columns 2-6); 17. Wu (2004) (table 2, columns 2 and 3); 18. Vega and Winkelried (2005) (table 3, columns 3-8); 19. Lin and Ye (2007) (table 3, columns 2-8) (table 4, columns 2-8); 20. Biondi and Toneto (2008) (table 3, columns 2-7); 21. Willard (2012) (table 1, columns 2-3 and 7-12); 22. Yamada (2013) (table 7, columns 3-9).

The following studies report non-significant results for related variables: Abo-Zaid and Tuzemen (2012) (table 13, columns 6-7) (table 14, columns 6-7); Ball and Sheridan (2005) (table 6.8, panel B, columns 2-9).

Table 7. Effects of macroprudential policies

Dependent variable	Independent variable	Empirical findings
Income and growth		
Growth of GDP per capita	Index of macroprudential activism	+ (4)
Standard deviation of real per capita GDP growth	Index of macroprudential activism	- (4)
% GDP	Bank reserve requirements shock	- (1)
Financial system stability		
Credit (% of GDP)	Index of macroprudential policy	- (6)
	Macroprudential policy shock	- (2, 3)
Housing price growth	Index of macroprudential policy	0 (5)
Housing prices	Index of macroprudential policy	- (8)
	Macroprudential policy shock	- (2)
Credit growth	Index of macroprudential policy	0 or - (5)
Bank credit	Index of macroprudential policy	- (8)
Housing credit	Index of macroprudential policy	- (8)
Annual change of the expected bank default frequency over a 1-year horizon	Index of macroprudential policy	- (7)
Annual change of Z-score*	Index of macroprudential policy	+(7)

* A higher value of Z-score indicates a more stable bank.

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Vuletin (2014) (figure 5); 2. Tillmann (2015) (figures 2 and 3); 3. Zdzienicka et al. (2015) (figure 3); 4. Boar et al. (2017) (table 2, columns 2-7); 5. Cerutti et al. (2017) (table 6, columns 2-11); 6. Fendoglu (2017) (table 7, columns 10 and 11); 7. Altunbas et al. (2018) (table 4, columns 2, 4, 6, and 8); 8. Akinci and Olmstead-Rumsey (2018) (table 4, column 3; table 5, column 3; table 6, column 3).

Table 8. Effects of tax reforms

Dependent variable	Independent variable	Empirical findings
Income and growth		
GDP per capita	1% tax liability cut	+ (5)
GDP growth	1% legislated tax increase	- (7)
Investment		
Private sector gross investment per capita	1% tax liability cut	+ (5)
Foreign direct investment (%GDP)	Effective corporate tax rate	- (6)
Consumption		
Consumer expenditure per capita	1% tax liability cut	+ (5)
Innovation		
Number of patents by US firms	Corporate tax increase at US state level	0 or - (1)
	Dummy: 1 if there has been a significant tax increase; -1 if there has been a significant tax decrease; 0 otherwise	- (4)
Number of citations per USA patent	Dummy: 1 if there has been a significant tax increase; -1 if there has been a significant tax decrease; 0 otherwise	- (4)
Pursue R&D (0 = No, 1 = Yes)	VAT reform (China), POEs*	- (2)
	VAT reform (China), SOEs*	+ (2)
R&D spending (% variation)	VAT reform (China), POEs*	- (2)
	VAT reform (China), SOEs*	+ (2)
New product and process sales (% variation)	VAT reform (China), POEs*	+ (2)
	VAT reform (China), SOEs*	+ (2)
Firms		
Long-term book leverage by firms	Corporate taxes decrease at the US state level	0 (3)
	Corporate taxes increase at the US state level	+ (3)
Real long-term debt by firms	Corporate taxes increase at the US state level	+ (3)
Business density (number of limited liability corporations) per 100 people	Effective Corporate tax	- (6)
Average number of limited liability corporations registered per year	Effective Corporate tax	- (6)

Notes: The Chinese VAT reform converted value-added tax from the original production-based VAT to a consumption-based VAT, thereby removing double taxation on investment goods (Howell, 2016, page 1997). POEs are privately-owned enterprises and SOEs are state-owned enterprise.

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Mukherjee et al. (2017) (table2, panel A, columns 2-7); 2. Howell (2016) (table 8, columns 2-10); 3. Heider and Ljungqvist (2015) (table 3, columns 2-10); 4. Atanassov and Liu (2015) (table IIIA, columns 2-5) (table IIIB, columns 2-5); 5. Mertens and Ravn (2012) (figure 3, unanticipated tax liability shock); 6. Djankov et al. (2010) (table 5, Panel A, columns 2 and 5) (table 5, Panel B, columns 2 and 5); 7. Romer and Romer (2010) (figure 5, Panel C).

The following studies report non-significant results for related variables: Mukherjee et al. (2016) (table 2, panel A, columns 2-7); Howell (2016) (table 8, columns 2-10); Heider and Ljungqvist (2015) (table 3, columns 2-10); Djankov et al. (2010) (table 5, Panel A, columns 2 and 5); Tomljanovich (2004) (table 3, columns 2-4) (table 4, columns 2-4); Bloom et al. (2002) (table 1, columns 2-6).

Table 9. Effects of fiscal rules

Dependent variable	Independent variable	Empirical findings
Income and growth		
Growth of GDP per capita	Overall rule index	0 or + (6)
	Expenditure rule index	0 or + (6)
	Budget balance and debt rule index	0 or + (6)
	Supranational fiscal rules in Eastern Caribbean Currency Union	0 or + (3)
	Supranational fiscal rules in Central African Economic and Monetary Community	0 or + (3)
	National fiscal rule	0 or + (3)
	Budget balance rules in Low and Middle-Income Countries	0 or - (5)
	Maastricht Treaty (1997-2005)	+ (7)
Log GDP per capita	Index of fiscal discipline	+ (2)
Growth rate of GDP	Index of fiscal discipline	+ (2)
Fiscal performance		
Fiscal policy volatility	Budget balance rule	- (1)
	Budget balance rule index	+ (4)
Government budget balance (% of GDP)	Budget balance rule	+ (16)
	Debt rule	+ (16)
	Expenditure rule	0 (16)
Government deficit (% of GDP)	Budget balance rule	- (11); + (14)
	Legal enforcement* Budget balance rule	- (14)
	Expenditure rule	0 (11); 0 or + (14)
	Debt rule	- (14)
Real budget balance per capita	Fiscal rule	+ (13)
Cyclically-adjusted primary balance (% of GDP)	Fiscal rule overall index	0 or + (8)
	Fiscal rule coverage index	0 or + (8)
	Output gap * Fiscal rule dummy	+ (9)
Cyclical correlation between government expenditure and GDP	Budget balance rule	0 (16)
	Debt rule	0 (16)
	Expenditure rule	- (16)
Cyclical correlation between government budget balance and GDP	Budget balance rule	0 (16)
	Debt rule	0 (16)
	Expenditure rule	0 (16)
Government debt (% of GDP)	Budget balance rule	0 (16)
	Debt rule	0 (16)
	Expenditure rule	0 (16)
Other		
Government bond spread (10-year)	Balanced budget rule	0 or - (1)
	Fiscal rule index * Cyclical dummy	0 or - (10)
Government bond spread against the German Bund	Fiscal rules index	0 or - (12)
Standard deviation of the growth rate of real GDP per capita	Discretionary fiscal policy* Expenditure rule	0 or - (15)
	Discretionary fiscal policy* Revenue rule	0 or - (15)
	Discretionary fiscal policy* Budget balance rule	0 or - (15)
	Discretionary fiscal policy* Debt rule	0 or - (15)
	Discretionary fiscal policy* Fiscal rule	- (15)

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Badinger and Reuter (2017) (table 2, columns 3 and 5) (table 3, columns 3 and 5) (table 5, columns 2, 3, 4 and 6); 2. Macsim and Oprea (2017) (table 3, columns 2-7); 3. Menkulasi (2016) (tables 6.2-6.9); 4. Badinger and Heinrich Reuter (2015) (table 5, columns 6-8); 5. Ray et al. (2015) (table A.2, columns 4-9) (table A.4, columns 4-9); 6. Afonso and Jalles (2013) (table 1, columns 2-13) (table 2, columns 2-13); 7. Castro (2011) (table 3, columns 2-8); 8. Debrun and Kumar (2007b) (table 2, columns 2-7); 9. Alberola et al. (2016) (table 4, columns 2 and 3); 10. IMF (2009) (Appendix IIB, table 1, columns 4, 5 and 6); 11. Dahan and Strawczynski (2013) (table 2, columns 2 and 3); 12. Iara and Wolff (2014) (table 1, columns 2-13); 13. Krogstrup and Wälti (2008) (table 1, columns 2-7); 14. Neyapti (2013) (table 1, columns 2-7); 15. Sacchi and Saloti (2015) (table 4, columns 2-6) (table 5, columns 2-6); 16. Schmidt-Hebbel and Soto (2017) (table 4, columns 4-9) (table 5, columns 4-9) (table 6, columns 4-9) (table 7, columns 4-9).

The following studies report non-significant results for related variables: Badinger and Reuter (2017) (table 2, columns 3 and 5) (table 3, columns 3 and 5) (table 5, columns 2, 3, 4 and 6); Macsim and Oprea (2017) (table 3, columns 2-7); Menkulasi (2016) (table 6.1);); Ray et al. (2015) (table A.2, columns 4-9) (table A.3,

columns 4-9) (table A.4, columns 4-9); Castro (2011) (table 3, columns 2-8); Alberola et al. (2016) (table 4, columns 2 and 3); IMF (2009) (Appendix IIb, table 1, columns 4, 5 and 6).

Table 10. Effects of fiscal councils

Dependent variable	Independent variable	Empirical findings
Growth forecast		
Absolute forecast error of GDP growth	Dummy: 1 if country has a fiscal council (FC)	- (3); 0 (6, 7)
	Dummy: 1 if country has a FC, legal independence	- (3); 0 (6)
	Dummy: 1 if country has a FC, safeguards on budget	- (3); 0 (6)
	Dummy: 1 if country has a FC, high media impact	- (3); 0 (6)
Forecast error of GDP growth	Dummy: 1 if country has a FC	0 or - (7)
	Fiscal council *Fiscal rule	+ (7)
Fiscal performance		
Absolute forecast error of primary balance	Dummy: 1 if country has a fiscal council (FC)	- (3, 6); 0 or - (7)
	Dummy: 1 if country has a FC, legal independence	- (3, 6)
	Dummy: 1 if country has a FC, safeguards on budget	- (3, 6)
	Dummy: 1 if country has a FC, high media impact	- (3, 6)
Primary balance	Fiscal council index* Fiscal Rule Index	+ (4)
Absolute value of the change in the cyclically-adjusted bud balance	Intensity of media reports (t-1): number of times the official name of the FC appears in a country 's national press	+ (2)
	Fiscal council index (t-1)	0 or + (5)
Cyclically-adjusted primary balance	Fiscal council index	0 or - (1)
Primary Balance	Dummy: 1 if country has a FC, legal independence	+ (6)
	Dummy: 1 if country has a FC, staff number	+ (6)
	Dummy: 1 if country has a FC, fiscal rule monitoring	+ (6)
	Dummy: 1 if country has a FC, costing of measures	+ (6)
	Dummy: 1 if country has a FC, forecast assessment	+ (6)
	Dummy: 1 if country has a FC, high media impact	+ (6)
Other		
Government compliance with numerical fiscal rule	Dummy: 1 if country has a FC in preceding period	0 or + (7)

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Debrun and Kumar (2007a) (table 3, columns 3 and 4) (table 4, columns 2-4); 2. Debrun et al. (2012) (table 2, columns 2-6); 3. IMF (2013) (table 4, column 2) (table 6, column 2); 4. Maltritz and Wüste (2015) (table 2, column 2) (table 3, column 2); 5. Coletta et al. (2015) (table 5, columns 3-5) (table 6, columns 2 and 3); 6. Debrun and Kinda (2017) (table 5, columns 2-9) (table 6, columns 2-5) (table 7, columns 2-5); 7. Beetsma et al. (2018) (table 2, columns 2-8) (table 4, columns 2-8) (table 5, columns 2-8) (table 7, columns 2-10) (table 8, columns 2-6).

The following studies report non-significant results for related variables: Maltritz and Wüste (2015) (table 2, column 2) (table 3, column 2); Debrun and Kinda (2017) (table 5, columns 2-9); Beetsma et al. (2018) (table 3, columns 2-8).

Table 11. Effects of sovereign wealth funds

Dependent variable	Independent variable	Empirical findings
Fiscal performance		
Government expenditure	Stabilization fund dummy	0 or - (3)
	Stabilization fund dummy * GDP	0 or - (3)
Government expenditure growth	Sovereign wealth fund (SWF) dummy	0 or - (5)
	SWF dummy * GDP growth	- (4)
Volatility of government expenditure	SWF dummy	- (5)
Volatility of government capital expenditure	SWF dummy	- (5)
Volatility of cyclically-adjusted fiscal balance	SWF dummy	- (5)
Stability		
Broad money volatility	Oil fund dummy	- (6)
CPI inflation	Oil fund dummy	- (6)
CPI inflation volatility	Oil fund dummy	- (6)
Real effective exchange rate volatility	Oil fund dummy	0 or - (6)
Capital stock per capita	SWF dummy* Commodity price volatility	0 or + (1)
Firm performance		
Change in return on equity	SWFs' ownership in the company (t-1)	0 or - (2)
Price to book value of the company	SWFs' ownership in the company (t-1)	0 or + (2)
Sharpe ratio	SWFs' ownership in the company (t-1)	- (7)

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Mohaddes and Raissi (2017) (table 3, columns 8-10); 2. Urban (2017) (table 2, part 1, columns 3 and 5) (table 2, part 2, columns 2-5) (table 3, part 1, columns 2-5) (table 3, part 2, columns 2-5); 3. Asik (2017) (table 3, columns 2-13) (table 5, columns 2-9); 4. Coutinho et al. (2014) (table 6a, columns 2 and 6) (table 6b, columns 2 and 6); 5. Sugawara (2014) (table 1, columns 2-8) (table 2, columns 2-9); 6. Shabsigh and Ilahi (2007) (table 2, columns 2, 4 and 6) (table 3, columns 2, 4 and 6) (table 4, columns 2, 4 and 6); 7. Knill et al. (2012) (table 5, column 2).

The following studies report non-significant results for related variables: Mohaddes and Raissi (2017) (table 3, columns 2-7); Urban (2017) (table 2, part 1, columns 2 and 4) (table 2, part 2, columns 2 and 4); Bova et al. (2016) (table 6, columns 3, 4 and 6); Koh (2017) (table 7, column 3).

Table 12. Effects of trade openness

Dependent variable	Independent variable	Empirical findings
Income and growth		
Growth of GDP per capita	Dummy: 1 for open economies, 0 otherwise	+ (1, 5); 0 or + (6)
	Sum of exports and imports (% of GDP)	+ (2, 7, 11); 0 (3); 0 or - or + (9)
	Dummy: 1 if the year is greater than the year of liberalization	0 or + (6)
GDP per capita	Sum of exports and imports (% of GDP)	0 or + (2); 0 (10); + (12)
	Exports (% of GDP)	0 (10); 0 or - or + (14)
	Composite trade share index	+ (13)
Investment		
FDI (% of GDP)	Index of trade liberalization	0 or + (4); 0 or - or + (8)
	Barriers to trade: Tariff revenue (% imports)	0 or - (4)
Gross Fixed Capital Investment (% of GDP)	Dummy: 1 if the year is greater than the year of liberalization	+ (6)
	Sum of exports and imports (% of GDP)	+ (10)
	Exports (% of GDP)	+ (10)

Source: the sources for the results reported here are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Sachs et al. (1995) (table 11, columns 6-8); 2. Dollar and Kraay (2003) (table 1, columns 4-13) (table 4, columns 2-13); 3. Kraay (2004) (table 4, columns 2) (table 5, columns 2); 4. Demekas et al. (2007) (table 2, columns 2-3); 5. Kneller et al. (2008) (table 2, column 2); 6. Wacziarg and Welch (2008) (table 3, columns 2-6) (table 5, columns 2-5); 7. Chang et al. (2009) (table 1, column 2); 8. Campos and Kinoshita (2010) (table 1, columns 2-8) (table 2, columns 2-11) (table 3, columns 2-7) (table 4, columns 2-7); 9. Gries et al. (2011) (table 6, column 9); 10. Kim et al. (2011) (table 2, columns 2-5); 11. Gries and Redlin (2012) (table 4, columns 2 and 3); 12. Sakyi et al. (2012) (table 2, columns 2 and 3); 13. Sakyi et al. (2015) (table 4, column 2); 14. Huchet-Bourdon et al. (2018) (table 2, columns 2-8).

The following studies report non-significant results for related variables: Kim et al. (2011) (table 2, columns 2-5); Kraay (2004) (table 4, columns 3) (table 5, columns 3).

Table 13. Effects of capital-account openness

Dependent variable	Independent variable	Empirical findings
Income and growth		
Growth of GDP per capita	Quinn capital account liberalization index	+ (1); 0 or + (2, 4)
	Proportion of years in which countries had liberalized capital accounts (IMF Dataset)	0 (1, 2, 6); 0 or + (4)
	Capital controls * (with financial crisis)	0 or + (3)
	Capital controls *(without financial crisis)	- (3)
	Index of capital openness	+ (7)
Growth of GDP	Dummy: 1 if controls on financial credits, equities, or collective investments in in t-1, else 0	0 or + (5)
Financial development		
Domestic credit to private sector (% of GDP)	Proportion of years in which countries had liberalized capital accounts (IMF Dataset)	+ (6)

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Bekaert et al. (2005) (table 4, columns 8 and 9); 2. Edinson et al. (2004) (table 5, columns 2-7); 3. Eichengreen and Leblang (2003) (table 4, columns 3 and 4) (table 6, columns 3 and 4); 4. Klein (2003) (table 1, columns 2-5); 5. Klein (2012) (table 4, columns 2-7); 6. Klein and Olivei (2008) (table 8, columns 2 and 4); 7. Quinn and Toyoda (2008) (table 8, columns 2-7).

The following studies report non-significant results for related variables: Grilli and Milesi-Ferretti (1995) (table 4, columns 2-5); Butkiewicz and Yanikkaya (2008) (table 1, columns 2-9).

Table 14. Effects of exchange-rate regimes in MENA countries

Dependent variable	Independent variable	Empirical findings
Income and growth		
GDP	De facto fixed ERR	0 (2)
GDP per capita	Exchange rate misalignment	- (3)
Inflation		
CPI (var.%)	De facto fixed ERR	0 or - (4)
	De jure fixed ERR	0 (4)
FDI and trade		
FDI	De facto fixed ERR	0 (1, 2)
	De facto fixed ERR	0 (1)
Exports	Real exchange rate volatility	0, +, or - (5, 8); 0 or + (7)
	Exchange rate misalignment	0, +, or - (5)
Imports	Real exchange rate volatility	0 or + (7)
	De facto fixed ERR	0 (1)
Real bilateral trade	De facto fixed ERR	0 or + (6)

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Benbouziane and Benamar (2007) (table 4, columns 2 and 5); 2. Saab et al. (2012) (table 3, column 4); 3. Mohieldin and Elsherif (2017) (table 9, column 2); 4. Ghanem (2012) (table 7.1, columns 2, 4, 6 and 8) (table 7.2, columns 2, 4, 6 and 8) (table 7.3, columns 2, 4, 6 and 8); 5. Achy and Sekkat (2003) (table 5, columns 3 and 4) (table 6, columns 3 and 4); 6. Adam and Cobham (2008) (table 4, column 2); 7. Lahrèche-Révil and Milgram (2006) (table 4, columns 2-4) (table 5, columns 2-4); 8. Rey (2006) (table 5). Note: ERR (Exchange Rate Regime).

Table 15. Effects of fiscal policies in MENA countries

Dependent variable	Independent variable	Empirical findings
Income and growth		
Growth of GDP per capita	Government expenditure	0 or - (1)
	Share of tax revenues in total revenues	0 (1)
	Fiscal balance	0 or + (1)
Growth of GDP	Government expenditure	0 or + (2)
Log GDP	Government expenditure	+ (3)

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Eken et al. (1997) (table 6, columns 2-11); 2. Fasano and Wang (2001) (table 2, columns 2-6); 3. Hamdi and Sbia (2013) (table3, column 2).

Table 16. Effects of macro-prudential and other macro-policies in MENA countries

Dependent variable	Independent variable	Empirical findings
Bank stability		
Z-score*	Index of macro-prudential policies	0 (1)
	Index of borrower-targeted macro-prudential policies	+ (1)
	Index of financial-targeted macro-prudential policies	0 (1)

* A higher value of Z-score indicates a more stable bank.

Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Ghosh (2017) (table 5, columns 2-7).

Table 17. Effects of trade openness in MENA countries

Dependent variable	Independent variable	Empirical findings
Income and growth		
GDP per capita	Sum of exports and imports (% of GDP)	0 or + (2); + (6); 0 (7)
GDP per capita Growth	Sum of exports and imports (% of GDP)	0 or + (2); 0 (4, 5)
	Index of trade openness and financial development	0 or + (1)
GDP	Trade in services	+ (3)
	Trade in goods and services	+ (3)
GDP sectoral	Real value of trade	0 or + (3)
Inflation		
GDP deflator (% change)	Sum of exports and imports (% of GDP)	+ (8)
FDI		
Net FDI (% of GDP)	Sum of exports and imports (% of GDP)	+ (10)
Fiscal variables		
Tax revenue from personal and corporate income taxes	Sum of exports and imports (% of GDP)	+ (9)
Tax revenue from domestic taxes on goods and services	Sum of exports and imports (% of GDP)	- (9)
Other tax revenues	Sum of exports and imports (% of GDP)	0 (9)
Export diversification		
Herfindahl-Hirschman Index (HHI) of exports*	World trade organization membership, WTO (D=1)	0 or - (11)
	Greater Arab Free Trade Area, GAFTA (D=1)	0 or - (11)
	Gulf Cooperation Council, GCC (D=1)	0 or + (11)
	EU Association Agreements (D=1)	0 or + (11)

* Higher values of HHI represents larger export concentration.

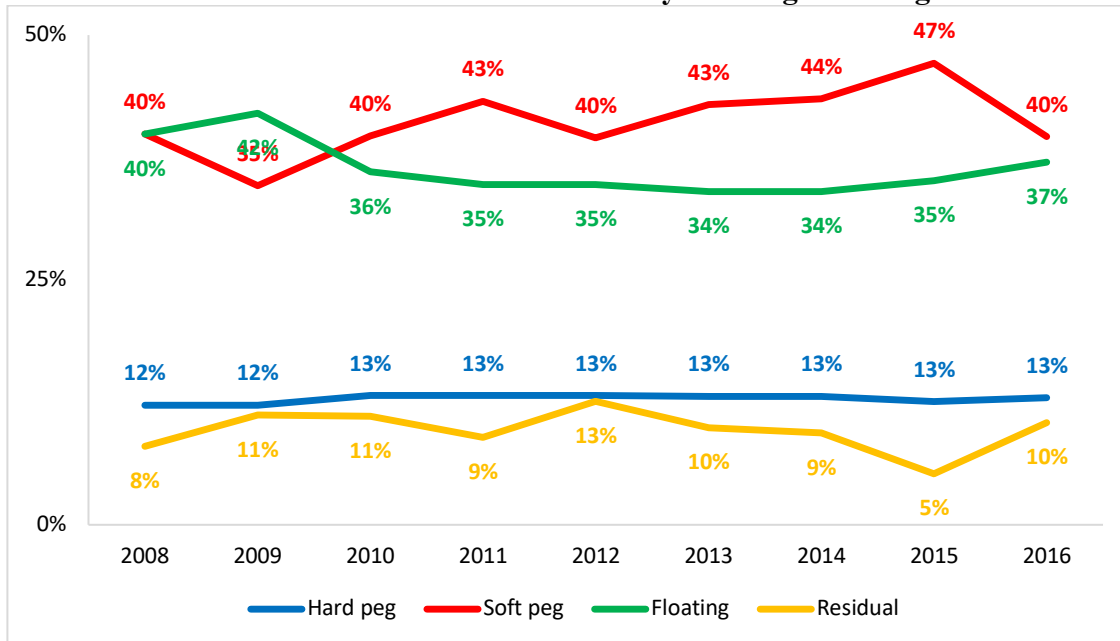
Source: the sources are the corresponding tables and specific columns, rows, or regressions of the following studies: 1. Nabli and Véganzonès-Varoudakis (2004) (table 1, column 2 and 3); 2. Haouas and Yagoubi (2005) (table 4, columns 2-7) (table 5, columns 2-7); 3. Karam and Zaki (2014) (table 3, columns 2-7) (table 4, columns 2-7); 4. Omri et al. (2015) (table 3, column 5, row 14); 5. Rachdi et al. (2015) (table 3, columns 2-4); 6. Muhammad and Jian (2016) (table 1, columns 2 and 3); 7. Ayad and Belmokaddem (2017) (table 6, columns 1-4); 8. Lotfalipour et al.(2013) (table 6, column 2); 9. Tosun (2003) (table 4, columns 2-8); 10. Onyeiwu (2003) (table4, columns 5 and 6); 11. Dogruel and Tekce (2011) (table 7, columns 2-7).

Table 18. Components of the Macroeconomic Institutions Frontier Index (MIFI)

Macroeconomic management areas	Variable	Source	Period	MIFI		Statistics	
Monetary policy framework	Inflation Targeting (IT)	AREAER database 2016	2016	Yes	1.0	Max	1.0
				No	0.0	Min	0.0
	Central Bank Independence (CBI)	Garriga (2016)	2010-2012	CBI > 0.75	1.0	Mean	0.2
				0.5 < CBI < 0.75	0.5	Obs	189
			Other	0.0	Max	1.0	
					Min	0.0	
					Mean	0.5	
					Obs	175	
Macro-prudential policy framework	Macro-prudential Index (MPI)	Cerutti et al. (2017)	2009-2013	MPI > 4	1	Max	1.0
				2 < MPI < 4	0.5	Min	0.0
				MPI < 2	0.0	Mean	0.5
						Obs	118
Fiscal policy framework	Fiscal rule (FR)	IMF, Fiscal Rules Dataset 1985-2015	2015	Yes	1.0	Max	1.0
				No	0.0	Min	0.0
	Fiscal council (FC)	IMF, Fiscal Council Dataset 2017	2017	Yes	1.0	Mean	0.5
				No	0.0	Obs	189
	Sovereign wealth funds (SWFs)	SWFI Dataset	2017	Yes	1.0	Max	1.0
				No	0.0	Min	0.0
					Mean	0.3	
					Obs	189	
Framework of international integration	Trade openness (TO)	World Bank Dataset	2010-2016	TO > 100%	1.0	Max	1.0
				50% < TO < 99%	0.5	Min	0.0
				Other	0.0	Mean	0.6
	Capital-account openness (CAO)	Chinn-Ito index	2010-2015	CAO > 0.75	1.0	Obs	182
				0.5 < CAO	0.5	Max	1.0
				< 0.75	0.0	Min	0.0
			Other	0.0	Mean	0.4	
					Obs	173	

Source: the author.

Figure 1. Exchange-rate regimes in the world, 2008-2016
Percent distribution of IMF member countries by exchange-rate regimes



Notes: (1) The IMF classification of exchange-rate arrangements comprises the following regimes: Hard peg (no separate legal tender, currency board), Soft peg (conventional peg, stabilized arrangement, crawling peg, crawl-like arrangement, pegged exchange rate within horizontal bands), Floating (floating, free floating), Residual (other managed arrangements). (2) Within the group of advanced countries, the AREAER database does not provide information on Macao SAR, Puerto Rico, and Taiwan. Therefore, the number of advanced countries in this sample is 36.

Source: Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER database, 2016).

Figure 2. Exchange-rate regimes, 2016
Percent distribution of exchange-rate regimes by region

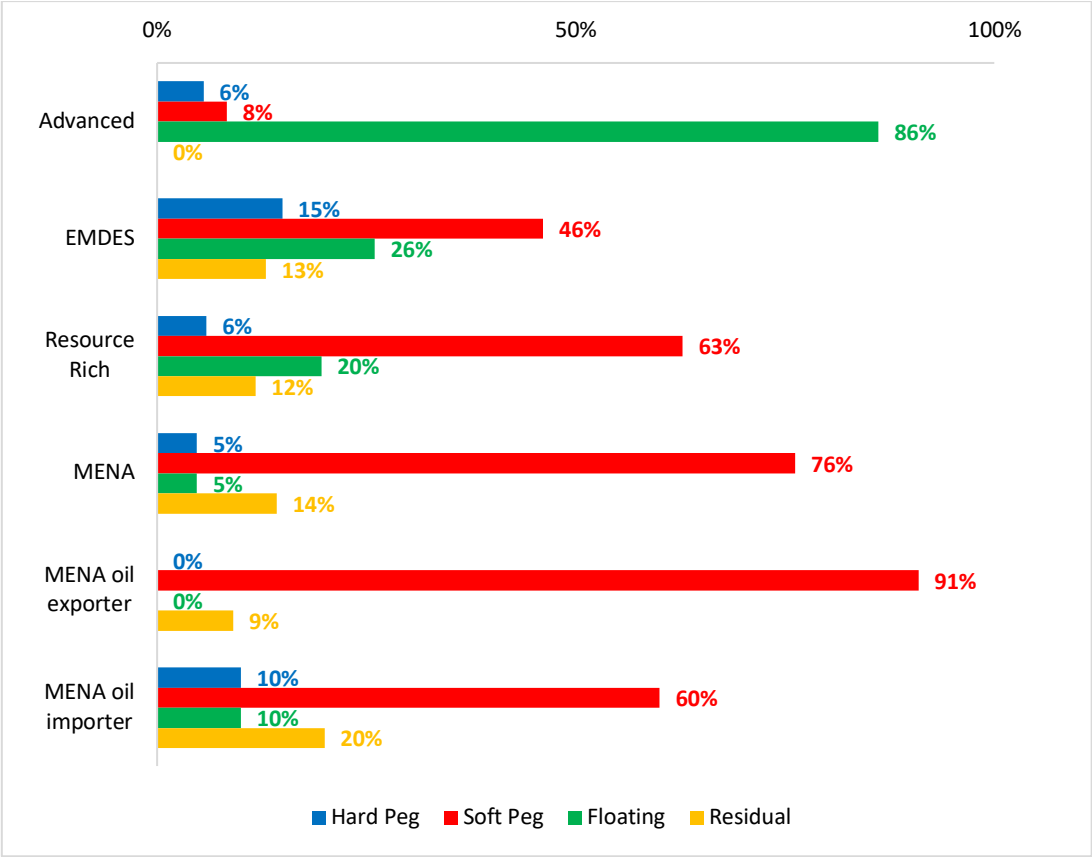
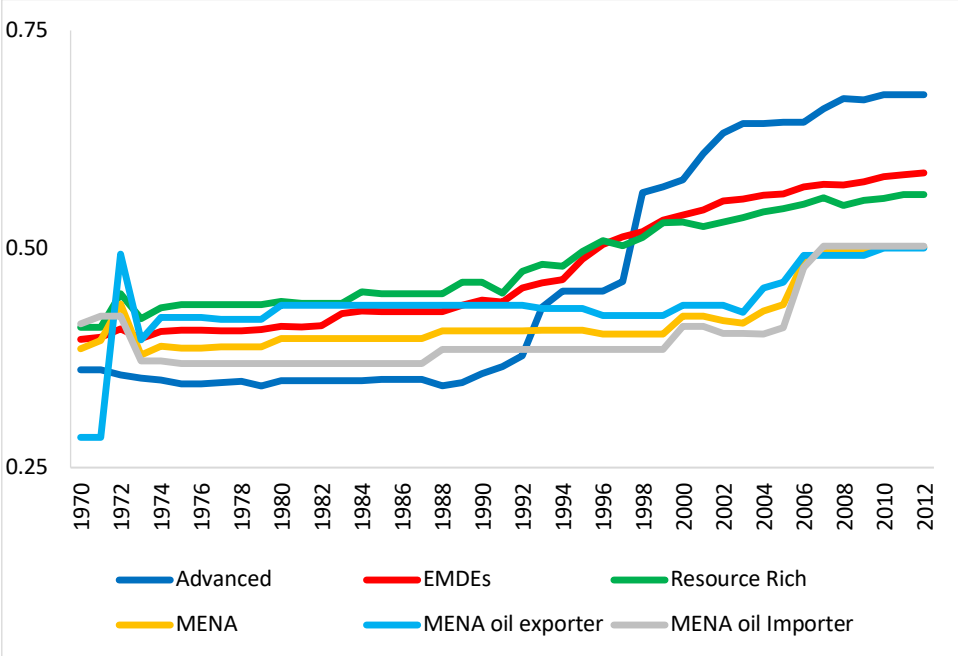
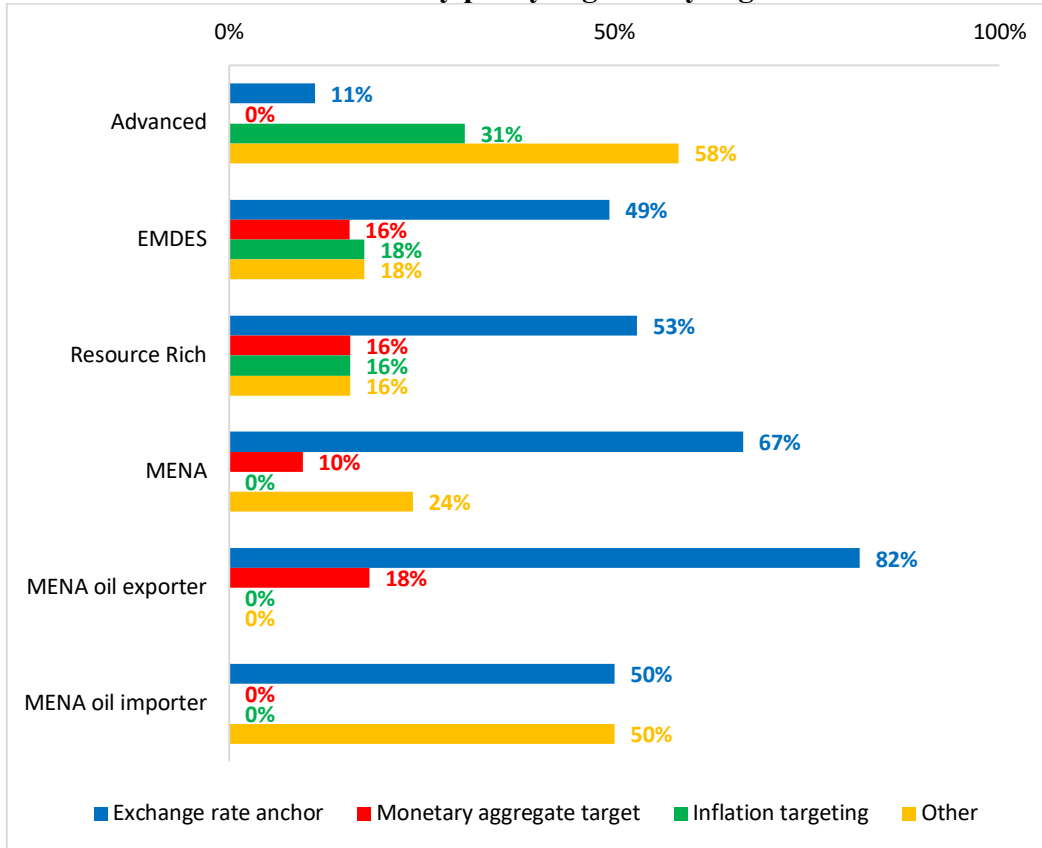


Figure 3. Central bank independence, 1970-2012
Central bank independence by region



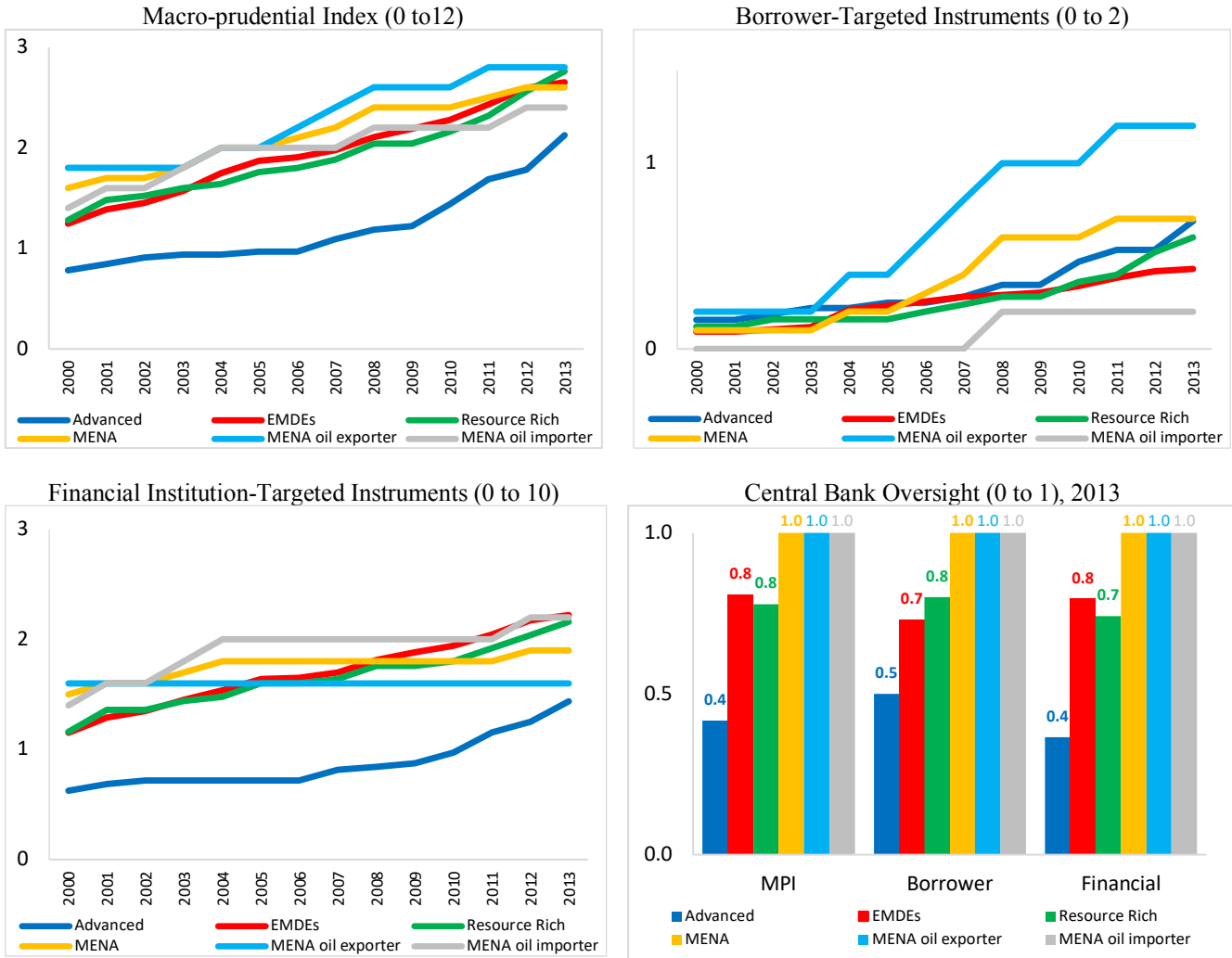
Notes: (1) Based on the central bank de jure independence index by Garriga, which ranges from 0 (least independent) to 1 (most independent). (2) The jump in MENA countries in 1972 is due to a temporary central-bank reform in Iran.
 Source: Garriga (2016).

Figure 4. Monetary policy regimes, 2016
Percent distribution of monetary policy regimes by region



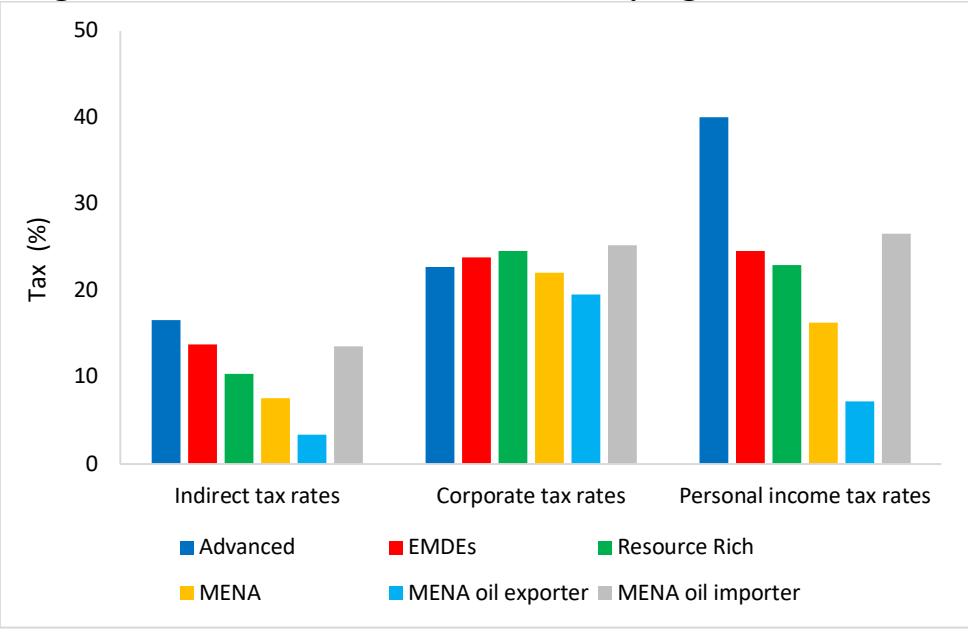
Note: Within the group of advanced countries, the AREAER database does not provide information on Macao SAR, Puerto Rico, and Taiwan. Therefore, the number of advanced countries in this sample is 36.
 Source: IMF, AREAER (Annual Report on Exchange Arrangements and Exchange Restrictions), 1970-2016.

Figure 5. Macro-prudential regimes, 2000-2013
Macro-prudential policy tools by region



Source: Cerutti et al. (2017).

Figure 6. Tax rates, 2018
Legal tax rates on transactions and income by region



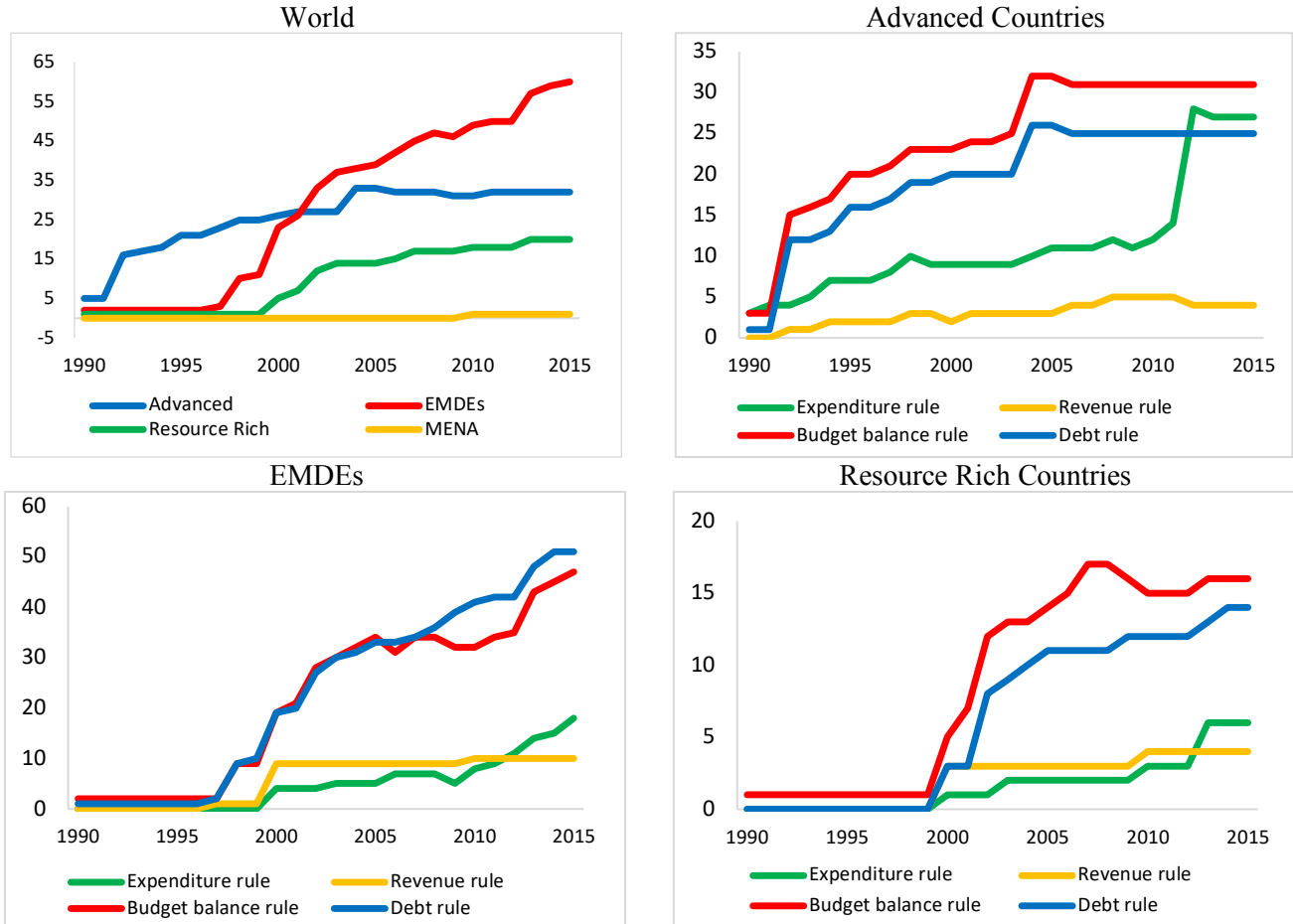
Notes: 1) Indirect, corporate, and personal income tax rates are computed as simple averages of legal tax rates.

2) Indirect taxes include VAT, GST, and other. 3) The personal income tax is defined as the top marginal legal tax rate.

Source: the author, based on KPMG, Deloitte, and PWC data.

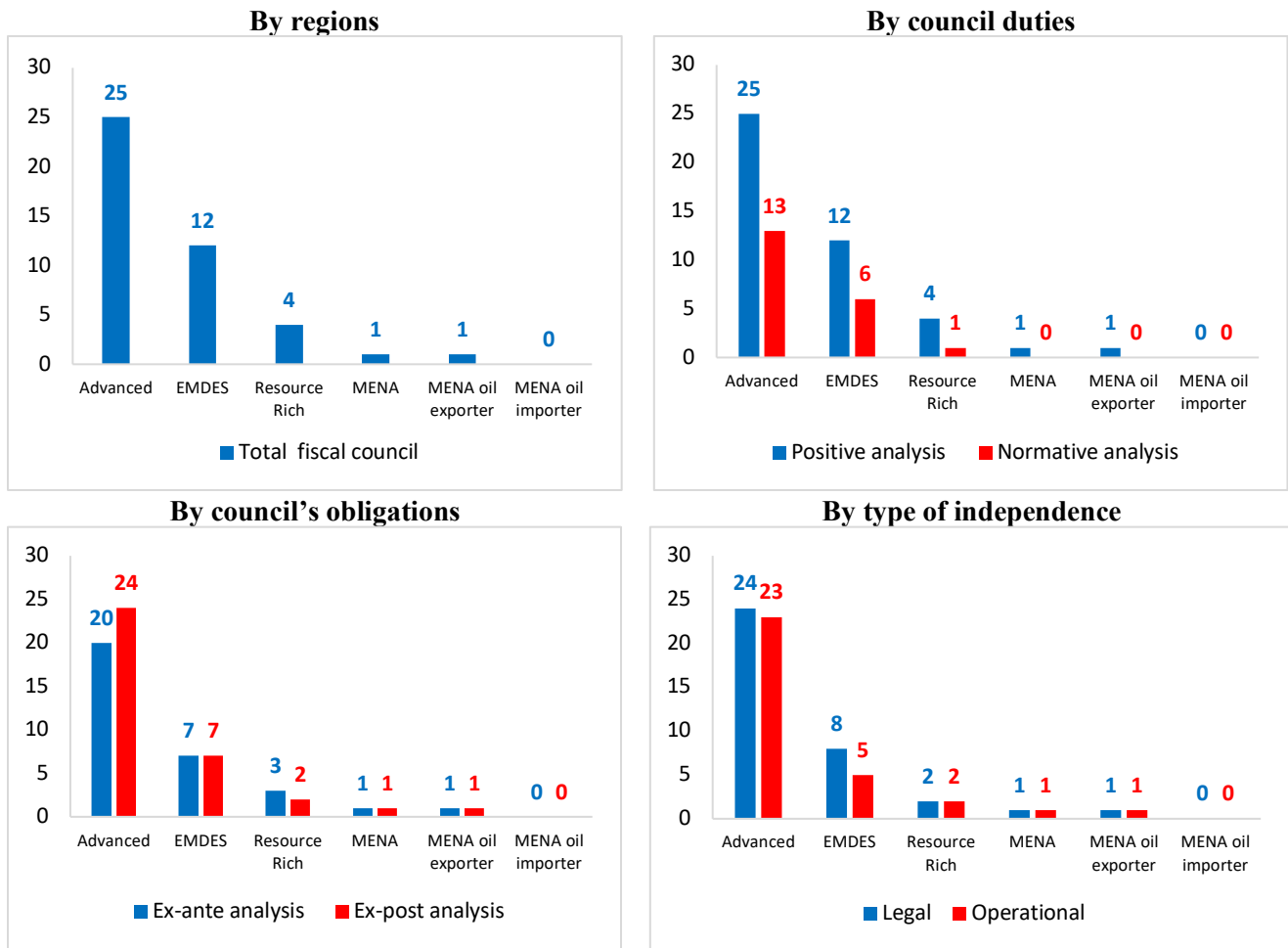
Figure 7. Fiscal rules, 1985-2015

Number of countries with fiscal rules, by regions and types of rules



Notes: The vertical axis represents the number of countries with the corresponding fiscal rule in place. In the group of MENA countries, only Iran (oil exporter) has in place a revenue rule since 2010.
Source: IMF, Fiscal Rules Dataset 1985-2015.

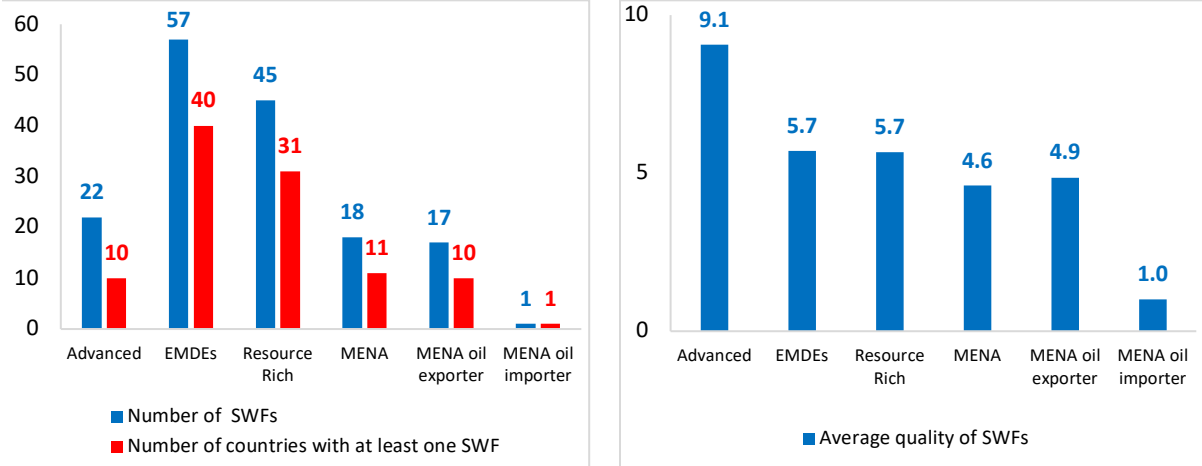
Figure 8. Fiscal councils, 2017
Number of countries with fiscal councils, by regions and types of councils



Notes: 1) The vertical axis represents the number of countries with the corresponding fiscal council. 2) Definitions: Positive analysis: The council performs positive analyses (Yes: 1, No: 0). Normative analysis: The council performs normative analysis or provides recommendations (Yes: 1, No: 0). Ex-ante analysis (Monitoring of fiscal rules): The council is mandated to monitor compliance with numerical fiscal rules (Yes: 1, No: 0). Ex-post analysis (Yes: 1, No: 0). Legal independence: The council's independence from political interference is guaranteed by law or treaty (Yes: 1, No: 0). Operational independence: even if a council is not legally independent, it might operate (and be generally perceived) as an independent body because its analysis reflects its expertise.

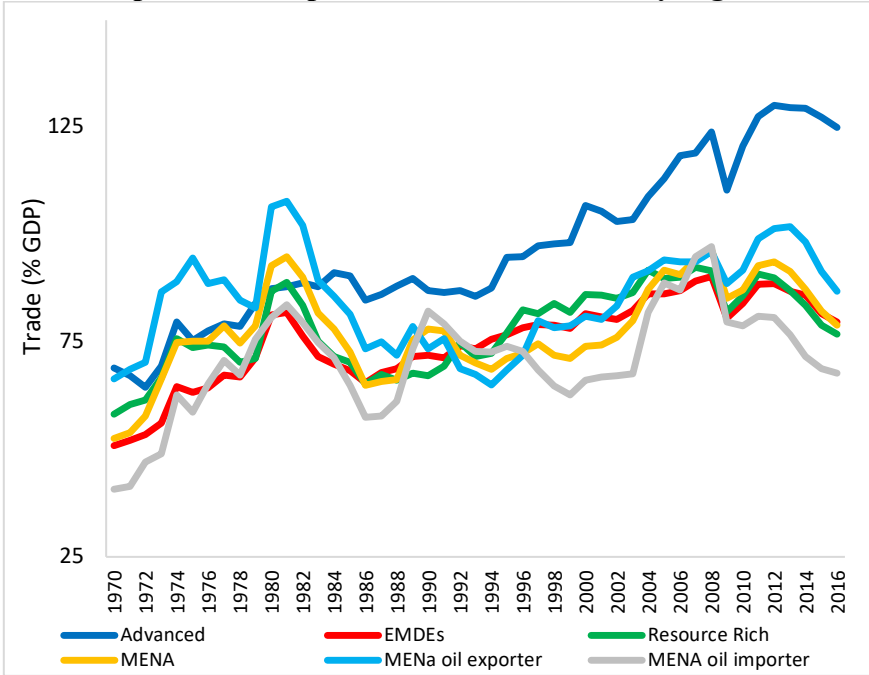
Source: IMF Fiscal Council Dataset, 2017.

Figure 9. Sovereign wealth funds, 2017
Number of countries with sovereign wealth funds, by regions and by numbers and transparency



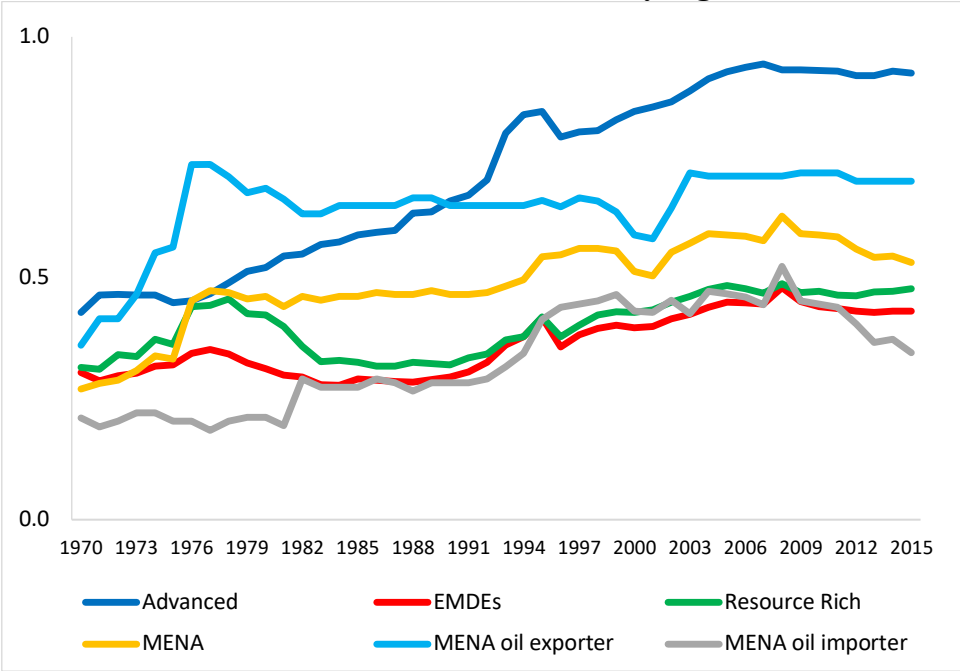
Note: SWF transparency is measured by the Linaburg-Maduell SWF transparency Index reported by SWFI, which ranges from 1 (least transparent) to 10 (most transparent).
 Source: SWFI.

Figure 10. Trade openness, 1970-2016
Sum of exports and imports as a share of GDP by regions



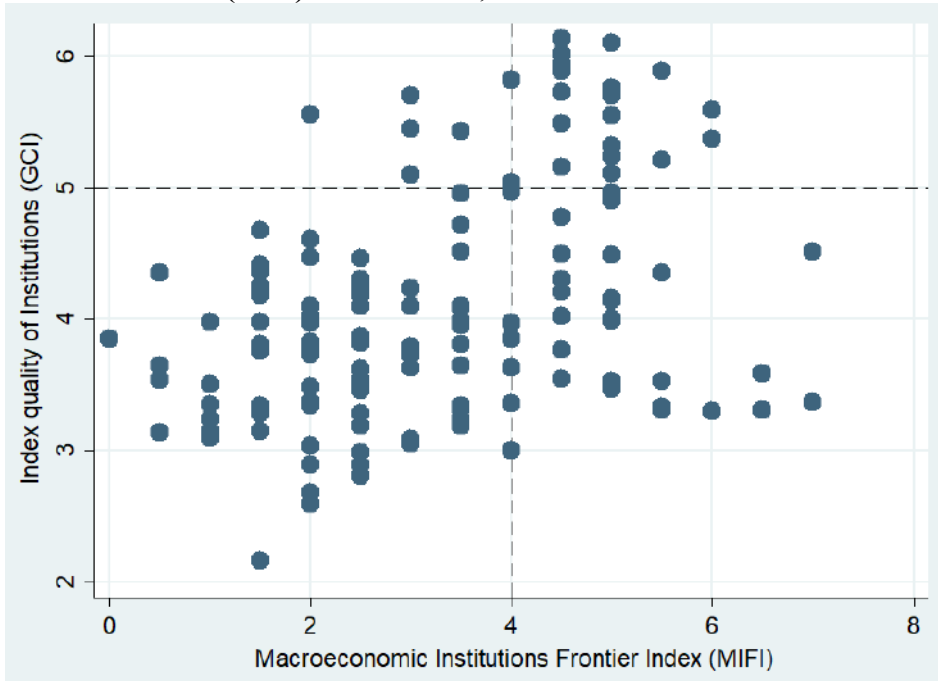
Source: World Bank.

Figure 11 Capital-account openness, 1970-2015
Chinn-Ito index normalized between 0 and 1, by regions



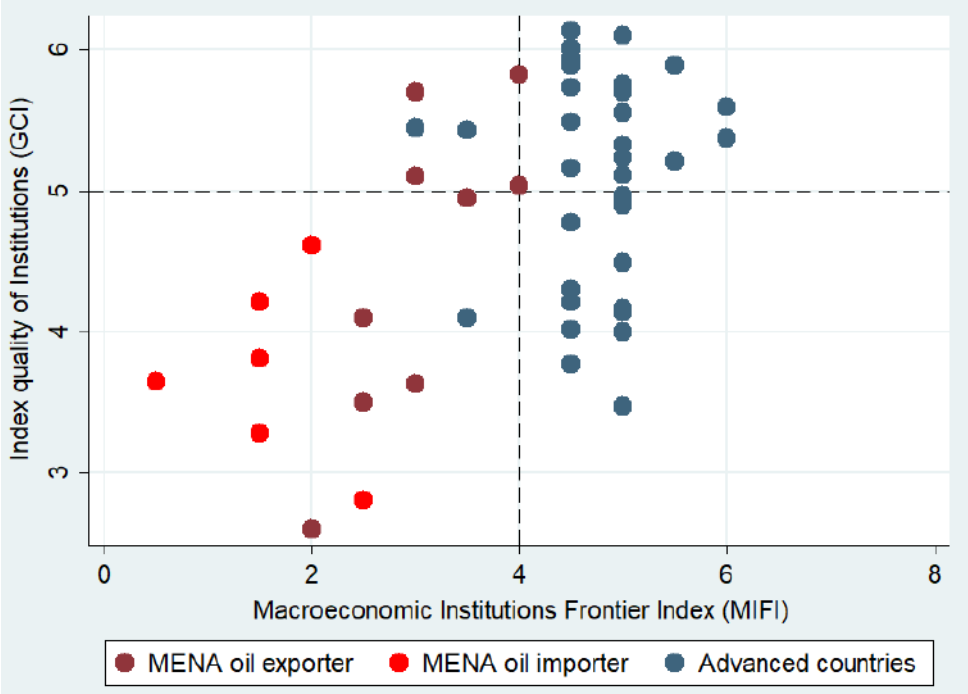
Source: Chinn and Ito (2006, 2017).

Figure 12. Macroeconomic Institutions Frontier Index (MIFI) and Index of Quality of Institutions (GCI) in the world, circa 2016



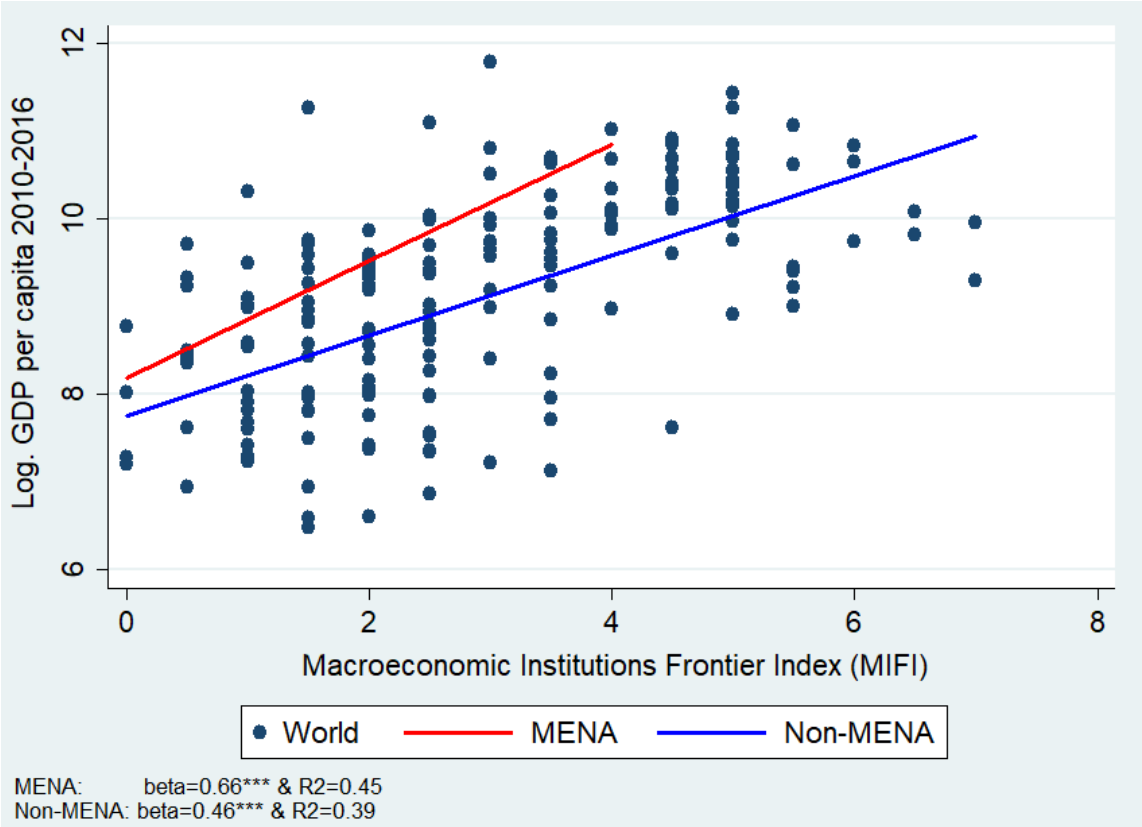
Source: the author and World Economic Forum (Global Competitive Index, First pillar: Institutions).

Figure 13. MIFI and Index of Quality of Institutions in MENA and Advanced Countries, circa 2016



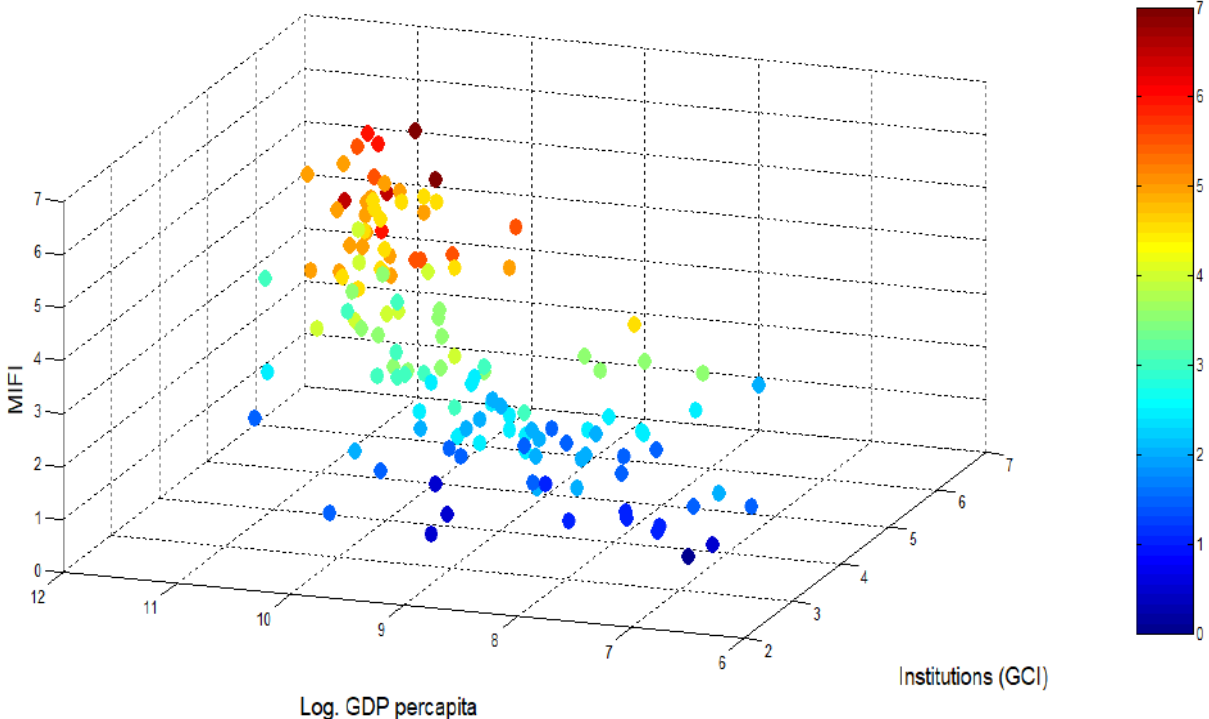
Source: the author and World Economic Forum (Global Competitive Index, First pillar: Institutions).

Figure 16. MIFI and Per capita GDP in MENA and non-MENA Countries, circa 2016



Note: the log-linear equation is: $\ln(GDP\ per\ capita) = \alpha + \beta(MRFI) + \varepsilon$
 Source: the author and IMF.

Figure 17. MIFI and Per capita GDP per capita, MIFI, and Index of Quality of Institutions in the World, circa 2016



Source: the author.

Note: the color code is for MIFI measures, ranging from dark blue (lowest) to dark red (highest).

Annex

Lists of countries

Advanced countries (39)			
Australia	Germany	Lithuania	Singapore
Austria	Greece	Luxembourg	Slovak Republic
Belgium	Hong Kong SAR	Macao SAR	Slovenia
Canada	Iceland	Malta	Spain
Cyprus	Ireland	Netherlands	Sweden
Czech Republic	Israel	New Zealand	Switzerland
Denmark	Italy	Norway	Taiwan
Estonia	Japan	Portugal	United Kingdom
Finland	Korea	Puerto Rico	United States
France	Latvia	San Marino	

Source: IMF (World Economic Outlook).

MENA countries (21)			
Algeria	Jordan	Oman	Tunisia
Bahrain	Kuwait	Qatar	United Arab Emirates
Djibouti	Lebanon	Saudi Arabia	Yemen
Egypt	Libya	Somalia	
Iran	Mauritania	Sudan	
Iraq	Morocco	Syria	

Source: IMF (Regional Economic Outlook: Middle East and Central Asia).

MENA oil exporter countries (11)	MENA oil importer countries (10)
Algeria	Djibouti
Bahrain	Egypt
Iran	Jordan
Iraq	Lebanon
Kuwait	Mauritania
Libya	Morocco
Oman	Somalia
Qatar	Sudan
Saudi Arabia	Syria
United Arab Emirates	Tunisia
Yemen	

Source: IMF (Regional Economic Outlook: Middle East and Central Asia).

Emerging and Developing Economies (EMDEs) (154)

Afghanistan	Ecuador	Maldives	Solomon Islands
Albania	Egypt	Mali	Somalia
Algeria	El Salvador	Marshall Islands	South Africa
Angola	Equatorial Guinea	Mauritania	South Sudan
Antigua and Barbuda	Eritrea	Mauritius	Sri Lanka
Argentina	Ethiopia	Mexico	St. Kitts and Nevis
Armenia	FYR Macedonia	Micronesia	St. Lucia
Azerbaijan	Fiji	Moldova	St. Vincent and the Grenadines
Bahrain	Gabon	Mongolia	Sudan
Bangladesh	Georgia	Montenegro	Suriname
Barbados	Ghana	Morocco	Swaziland
Belarus	Grenada	Mozambique	Syria
Belize	Guatemala	Myanmar	São Tomé and Príncipe
Benin	Guinea	Namibia	Tajikistan
Bhutan	Guinea-Bissau	Nauru	Tanzania
Bolivia	Guyana	Nepal	Thailand
Bosnia and Herzegovina	Haiti	Nicaragua	The Bahamas
Botswana	Honduras	Niger	The Gambia
Brazil	Hungary	Nigeria	Timor-Leste
Brunei Darussalam	India	Oman	Togo
Bulgaria	Indonesia	Pakistan	Tonga
Burkina Faso	Iran	Palau	Trinidad and Tobago
Burundi	Iraq	Panama	Tunisia
Cape Verde	Jamaica	Papua New Guinea	Turkey
Cambodia	Jordan	Paraguay	Turkmenistan
Cameroon	Kazakhstan	Peru	Tuvalu
Central African Republic	Kenya	Philippines	Uganda
Chad	Kiribati	Poland	Ukraine
Chile	Kosovo	Qatar	United Arab Emirates
China	Kuwait	Republic of Congo	Uruguay
Colombia	Kyrgyz Republic	Romania	Uzbekistan
Comoros	Lao P.D.R.	Russia	Vanuatu
Costa Rica	Lebanon	Rwanda	Venezuela
Croatia	Lesotho	Samoa	Vietnam
Côte d'Ivoire	Liberia	Saudi Arabia	Yemen
Democratic Republic of the Congo	Libya	Senegal	Zambia
Djibouti	Madagascar	Serbia	Zimbabwe
Dominica	Malawi	Seychelles	
Dominican Republic	Malaysia	Sierra Leone	

Source: IMF (World Economic Outlook).

Resource Rich countries (RR) (51)

Albania	Ecuador	Mauritania	Sudan
Algeria	Equatorial Guinea	Mexico	Suriname
Angola	Gabon	Mongolia	Syria
Azerbaijan	Guinea	Niger	Timor-Leste
Bahrain	Guyana	Nigeria	Trinidad and Tobago
Bolivia	Indonesia	Norway	Turkmenistan
Botswana	Iran	Oman	United Arab Emirates
Brunei Darussalam	Iraq	Papua New Guinea	Uzbekistan
Cameroon	Kazakhstan	Peru	Venezuela
Chad	Lao P.D.R.	Qatar	Vietnam
Chile	Liberia	Republic of Congo	Yemen
Côte d'Ivoire	Libya	Russia	Zambia
Democratic Republic of the Congo	Mali	Saudi Arabia	

Source: IMF (2012) and Venables (2016).