How Economic, Political, and Institutional Factors Influence the Choice of Exchange Rate Regimes? New Evidence from Selected Countries of the MENA Region

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HOW DO ECONOMIC, POLITICAL, AND INSTITUTIONAL FACTORS INFLUENCE THE CHOICE OF EXCHANGE RATE REGIMES? NEW EVIDENCE FROM SELECTED MENA COUNTRIES

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Abstract

In this paper, we investigate how economic, political, and institutional factors affect the choice of exchange rate regimes using data on eight Middle East and North Africa (MENA) countries over the 1984-2016 period. Specifically, we run random-effects ordered probit regressions of the likelihood of exchange rate regimes on the potential determinants of exchange rate regimes. Three important findings emerge from the analysis. The first finding is that political and institutional factors play an important role in determining the exchange rate regime in MENA countries, where a democratic political regime and a low level of corruption increase the probability of opting for a fixed regime, while strong governments, political stability (such as less internal conflicts and more government stability), more law and order enforcement, and a left-wing government decrease the probability of opting for a fixed regime. The second finding is that bureaucracy, independent central banks, elections, terms of trade, and monetary independence have no effect on the choice of exchange rate regimes. The third finding is that financial development is not a robust determinant of the choice of exchange rate regimes. Our results still hold when considering alternative specifications, and they have important implications for policymakers in MENA countries.

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ملخص

في هذا البحث، نبحث كيفية تأثير العوامل الاقتصادية، والسياسية، والمؤسسية على اختيار أنظمة سعر الصرف، باستخدام بيانات عن ثمانية بلدان في منطقة الشرق الأوسط وشمال إفريقيا (*MENA*) خلال الفترة من 1984 إلى 2016. على وجه التحديد، نُجري تحليل انحدار احصائي للاحتمالات ذي أثار العشوائية لترجيح أنظمة سعر الصرف على المحددات المحتملة لأنظمة سعر الصرف. فتظهر ثلاث نتائج مهمة من التحليل. 1) تلعب العوامل السياسية والمؤسسية دورًا مهمًا في تحديد نظام سعر الصرف في بلدان الشرق الأوسط وشمال إفريقيا: يرفع النظام السياسي الديمقراطي ومستوى الفساد المنخفض من احتمالية اختيار نظام ثابت، في حين أن الحكومات القوية والاستقرار السياسي، مثل: نزاعات داخلية أقل، والمزيد من الاستقرار الحكومي، ومن إنفاذ القانون والنظام، والحكومة اليسارية، يقلل من احتمالية اختيار نظام ثابت. 2) لا تؤثر البيروقراطية، والبنوك المركزية المستقلة، والانتخابات، وشروط التبادل التجاري، والاستقلال النقدي على اختيار أنظمة سعر الصرف. 3) لا تعد التنمية المالية محددًا قاطعًا لاختيار أنظمة سعر الصرف. لا تزال نتائجنا قائمة عند النظر في المواصفات البديلة، كما أن لعا آثار مهمة على صانعي السياسات في بلدان الشرق الأوسط وشمال إفريقيا.

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1. Introduction

Since the collapse of the Bretton Woods system in 1971 and the move to floating currencies, the choice of exchange rate regime has been of great importance in the case of emerging market countries and has not ceased to attract the attention of economists and policymakers. Indeed, the exchange rate crises that particularly affected emerging countries during the 1990s revived the debate on the choice of exchange rate regime (Frieden et al., 2001; Álvarez et al., 2011; Berdiev et al., 2012; Rodriguez, 2016). This old international economics debate on the arbitration between a fixed, floating, or intermediate regime has just been renewed following the new international economic and political architecture.

In particular, countries in the large Middle East and North Africa (MENA) region have been subjected to a number of events and upheavals in recent decades, such as the 1990 Gulf war affecting several countries in the region, the Lebanese civil war that took place until 1990, the Algerian civil war in 1991, and the Arab Spring Revolution of 2011, which began in Tunisia and then spread to other countries such as Egypt, Libya, Yemen, and Syria. Such wars have generated huge economic, political, and institutional losses. Indeed, they have been accompanied by the spread of corruption, the aggravation of political instability (government), terrorism, insecurity, the lack of enforcement of laws, civilian casualties, and increased military spending (Alnasrawi, 1992; Helfont and Helfont, 2012). On the other hand, they also led to the decline of various macroeconomic indicators, mainly due to the deterioration of the purchasing power of many countries in the region and the instability of the value of their currencies, which is reflected in the weakening of nominal and real exchange rates, a mirror of economic development. Such factors have led some countries like Egypt to devalue their local currency against the dollar and to change their exchange rate regime from an intermediate system to a managed floating and pure floating one afterwards. Other countries, such as Morocco and Tunisia, have opted for more flexibility to encourage more foreign exchange reserves and further limit exogenous shocks (Ghanem, 2009).

These series of new factors translating the new economic, political, and institutional framework have placed the debate over the choice of exchange rate regime in the MENA region back on the agenda. Theoretically, the debate over the choice of the exchange rate regime is based on the publication of Mundell's (1961) article titled "Optimal currency area." Later, a lot of theoretical as well as empirical literature tried to answer this crucial question to identify how countries choose their exchange rate regimes, such as Mckinnon (1963), Kenen (1969), Dreyer (1978), Melvin (1985), Savvides (1990), and Eichengreen et al. (2003). These authors focus only on economic factors as determinants of exchange rate regime choice in developed countries and emphasize factors related to optimal currency areas, financial integration, monetary autonomy, and the nature of shocks.

However, the theory concerning the choice of the exchange rate regime has evolved, integrating another current of the new factors: it is the political economy approach that emphasized the role of political and institutional factors in determining the choice of exchange rate regime. In this context, Frieden and Stein (2001), Markiewicz (2006), Frieden et al. (2010), and Rodriguez

(2016) suggest that political and institutional factors also influence the choice of exchange rate regimes and provide detailed guidance on the dynamics of choice.

In this regard, the renewed interest in this paper's MENA region research is due to several reasons. Firstly, it is due to the new economic and political factors characterizing these economies, which are reflected, on the one hand, by a dangerous decline in the economic growth of several countries in the region during the last few decades and the need to move towards another economic model that can promote stability and development. On the other hand, this economic downturn makes little sense if not incorporated into the increasing degree of political risk through the deterioration in political stability and institutional quality experienced by most of these economies. In addition, some countries' transition to new exchange rate regimes to meet certain challenges and constraints has revived interest in the choice of exchange rate regime.

This paper's main contribution is to replace political risk by its components in the MENA region and to determine which of them play a role in the choice of exchange rate regimes by considering national and international economic characteristics. To the best of our knowledge, this is the first study conducted on this issue for MENA countries. Specifically, random-effects ordered probit models of the likelihood of exchange rate regimes on potential (economic, political, and institutional) determinants of exchange rate regimes are estimated (in accordance with data properties) for a panel of eight countries for the 1984-2016 period. The empirical results have important implications for policymakers in charge of the choice of exchange rate regime.

The remainder of the paper is organized as follows: section 2 discusses theories of the determinants of exchange rate regimes, while section 3 describes the econometric methodology and data. Section 4 reports the main empirical results and section 5 offers some concluding remarks.

2. Theoretical considerations

Many theoretical and empirical studies have examined the choices of the determinants of the exchange rate regime as a key decision in any economy to achieve rapid and stable growth. However, the factors driving the selection of the most appropriate exchange rate regime are inconclusive and it is a widely debated topic. Such a subject is not recent and finds renewed interest in the new economic and political context, characterized primarily by the amplification of macroeconomic fluctuations and the multitude of shocks to the economy, in addition to the increase in country risk, particularly through political instability and the deterioration of the institutional economy.

2.1. Economic determinants

The traditional criteria for choosing the exchange rate regime arise mainly from the theory of Optimal Currency Area (OCA), determining the choice between a fixed or a flexible exchange rate regime. This is the first approach for exchange rate regime selection developed in the 1960s and initiated by Robert Mundell (1961). This theory builds and expands on three main works

by Mundell (1961), Mckinnon (1963), and Kenen (1969). Thus, Mundell (1961) suggests that countries whose capital and labor factors are immobile are more likely to adopt a flexible exchange rate regime while countries characterized by the mobility of their factors of production are more likely to choose a fixed exchange rate regime.

Mckinnon (1963) suggests that the more open the economy, the more likely it is to choose a fixed exchange rate regime. Kenen (1969) suggests that the more diversified the economy, the more likely it is to choose a fixed exchange rate regime and vice versa.

In addition, the level of reserves is considered among the main features of maintaining a fixed exchange rate regime, which consists of having an adequate level of reserve. Indeed, it is generally impossible to establish a fixed regime without having a significant level of foreign exchange reserves.

Mundel (1963) emphasized the characteristics of capital mobility as a determining criterion of the choice of optimal exchange rate regime and proposed the impossible trinity in 1963 as an explanation for this choice. Since economic policy is based on three main concepts (monetary policy, exchange rate policy and capital account management policy), Mundell's impossible trinity suggested that it is impossible for a country to simultaneously achieve a fixed exchange rate, monetary policy independence, and financial market integration. By using this triangle, three cases can be distinguished. The first scenario states that a country with a fixed exchange rate regime and an independence of monetary policy could not have a perfect mobility of capital. The second scenario is monetary dependence. We refer to the criterion of an optimal currency area, a fixed exchange rate regime with capital account liberalization prohibiting any independence of monetary policy. Meanwhile, in the third scenario, a country with perfect capital mobility and autonomy of monetary policy makes it impossible to adopt a fixed exchange rate.

Another determinant that intervenes in the choice of exchange rate is the nature of shocks. This is the modern version of the OCA theory that focuses on the importance and nature of the shock and its fundamental effect on the choice of exchange rate regime. Mundell (1963) and Melvin (1985) show in their studies that in case of real shocks,[5] a flexible exchange rate regime is more adequate, while in the case of nominal shocks,[6] a fixed exchange rate regime is more appropriate to cope better.

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[5] Real shocks are in relation to the terms of trade and are mainly the result of changes in the country's current account, which are, in turn, generated by a change in imports or exports.
[6] Nominal shocks result from an unexpected variation in the money supply in circulation, which makes it possible to change the behavior of economic agents or shocks in relation to expenditure related to the change in consumption or investment, or public expenditure.

2.2. Political and institutional determinants

Political instability may influence the choice of the exchange rate regime. This effect has been the subject of several studies such as Edwards (1996), Meon and Rizzo (2002), Alesina and Wagner (2006), and Frieden et al. (2001, 2010).[7]

Among the main indicators of political instability, we can quote socioeconomic conditions, internal conflicts, and government stability. Each indicator can influence the choice of exchange rate regime. The theory of political economy shows a controversy between the authors who integrated political instability in their research and found mixed results. On the one hand, an unstable government cannot opt to maintain a fixed exchange rate regime. This idea is confirmed by Frieden et al. (2001)[8] and Rodriguez (2016). In addition, Edwards (1996) confirmed this idea and used a theoretical model to explain the effects of political instability on the choice of exchange rate regime. On the other hand, other studies such as Alesina and Wagner (2006) and Honig (2007) have confirmed that an unstable government can favor setting its exchange rate regime.

The choice of exchange rate regime can also be influenced by the type of political system of both democratic and autocratic countries. The latest work on the effect of democracy on the choice of exchange rate regime has shown that democracy is associated with a flexible exchange rate regime for two reasons. The first reason is that flexibility allows policymakers to conduct an autonomous monetary policy to improve internal economic conditions. The second is that the transparency of monetary commitments and the transparency of the political system are considered substitutes. Autocratic institutions generally lack credibility with investors, which is linked to their lack of political transparency and legitimacy, making the adoption of a fixed exchange rate regime preferable for providing credibility (Broz, 2002; Steinberg et al., 2015).

Elections that occur in democratic institutions allow for choosing between a fixed or flexible exchange rate regime. In their book "Currency Game," Frieden and Stein (2001) suggest that elections influence exchange rate policy. Since politicians can avoid depreciation at the time of elections, they resort to a fixed exchange rate regime by attempting to launch stabilization programs to reduce inflation and generate an economic boom. Other studies contradicting Frieden and Stein (2001) and Hossain (2009), such as the study of Bernhard and Leblang (1999) and Carmignani et al. (2008), suggest that it is difficult for the government to adhere to a fixed exchange rate regime because of political pressures to support expansionary policies.

A government's strength can influence the choice of exchange rate regime. Previous studies have found that a weak government cannot opt for a fixed regime. This result is confirmed by Frieden and Stein (2001) in "Currency Game." Indeed, this regime requires the government to respond to exogenous shocks with internal adjustment measures and excludes the use of a monetary policy to stimulate the national economy. This idea is also confirmed by Eichengreen (1992), Edwards (1996), and Rodriguez (2016).

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[7]Frieden et al. (2001) is one of the early references followed by Piragic and Jameson (2005).

[8] Frieden et al. (2001) suggest that unstable political systems have been associated with larger fiscal deficits, making it more difficult for governments to maintain parity.

Institutional quality also has a significant influence on the choice of exchange rate regime. Among the best-known indicators of institutional quality are corruption, bureaucracy, and law and order.[9] The existing literature on institutional quality shows that countries with poor institutional quality find it difficult to maintain a fixed exchange rate regime. They often have very high inflation and large continuous devaluations, so they fall freely. While Alesina and Wagner (2006), Honig (2009), and Fraj et al. (2018) suggest that weak governments with poor institutional quality may adopt a fixed exchange rate regime, this difference in outcome depends on the sample as well as the political and economic characteristics of a country.

Exchange rate policy and the independence of the central bank[10] are closely related. Indeed, the latter is associated with price stability. Therefore, a country with a more independent central bank might prefer to fix its exchange rates to provide credibility to lower inflation (Jacome and Vozquez, 2008; Crow and Meade, 2008; Eijffinger and Hoeberichts, 2008). Other authors such as Steinberg and Walter (2013) and Berdiev et al. (2012) have found that independent central banks correlate with flexible exchange rate regime. Indeed, central bank independence often makes it more difficult to stabilize the exchange rate because it is reluctant to reduce the interest rate and shows that this independence reduces exchange rate stability.

The partisan theory of macroeconomic policy initiated by Hibbs (1977) is based on the idea that political parties weigh differently on economic performance (inflation, unemployment ...etc.) and may influence the choice of exchange rate regime. Alesina (1988) has proposed an alternative model. He suggests that left-wing parties are more likely to use an expansionary macroeconomic policy, and are thus more likely to adopt a flexible exchange rate regime, while right-wing parties are more concerned with stabilizing the economy and are thus more likely to maintain a fixed exchange rate regime.

3. Econometric methodology and data
We use annual data over the 1984-2016 period for a sample of eight MENA countries: Algeria, Morocco, Egypt, Tunisia, Jordan, Saudi Arabia, Bahrain, and Kuwait. We limit ourselves to this sample because the exchange rate regime of certain countries does not change over time and there is a lack of required data to assess the situation for the MENA region. These data are extracted from different sources: namely the World Development Indicator (WDI), the International Country Risk Guide (ICRG), and the Database of Political Institutions (DPI).

3.1. Exchange rate regime classification
In our empirical analysis, we used Ilzetzki, Reinhart, and Rogoff's (2008) de facto classification updated until 2016 and divided into two classifications. The first is "fine classification" and is composed of 15 groups. The second is "coarse classification," which was retained in our study

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[9] Better institutional quality means a low level of corruption and a high level of law and order enforcement and bureaucracy. Institutions with poor institutional quality are considered weak institutions and vice versa.
[10] A central bank is independent when it is not subject to government guidelines.

and composed of six groups, where the latter is an aggregation of the former. [11] This classification has the advantage of looking at what countries do, rather than what they say they do. Therefore, they use the actual exchange rates regime. Using this classification, we notice that the exchange rate regimes of the MENA region can be classified into three main categories, while regimes five and six were not adopted by the sample of MENA countries during the period considered. Hence, we limit ourselves to the main groups (fixed, intermediate and floating) to facilitate the implementation of our econometric methodology.

3.2. An ordered probit model

Given that there is an order of historically evolving exchange rate regime in the data, and since the dependent variable (exchange regime) is of the multinomial type, we use an ordered probit model. In addition, given the panel structure of the dataset, the possible existence of unobservable country effects must be considered not to bias the estimation results. Furthermore, as discussed by Neyman and Scott (1948) and Hsiao (2014), estimating a fixed-effects model with small and fixed T transmits the inconsistency of the incidental parameters into the other coefficients. In addition, other research papers such as that of Alain Trognon (2003) show that, unlike the random effect model, the non-linear framework agrees relatively poorly with the fixed effects. This is empirically confirmed in our investigation when testing for the appropriate form of country-specific effects. Therefore, in what follows, we consider a model with random effects rather than fixed effects.[12]

Specifically, the model takes the following form:

$$Y^{*}_{it} = X_{it}\beta + \varepsilon_{it} \quad i = 1,..., N \qquad t = 1,…, T,$$

where $^{*}_{it}$ is a latent (non-observable) variable indicating the exchange rate regime adopted by country i in year t. X_{it} is a vector of exogenous explanatory variables, while β is a vector of coefficients for the independent variables. ε_{it} is defined as:

$$\varepsilon_{it} = u_{i} + v_{it}$$

where u_{i} is a country-specific random effect that does not vary over time, and v_{it} is a white noise error term. Following the coarse classification of Ilzetzki, Reinhart, and Rogoff (2008) extended to 2016 for the eight MENA countries during the 1984-2016 period of analysis, this variable is determined from the model as follows:

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[11] The coarse classification by Reinhart and Rogoff (2008) is the following: 1-No separate legal tender, 1-Pre announced peg or currency board arrangement, 1-Pre announced horizontal band that is narrower than or equal to +/-2%, 1-De facto peg , 2-Pre announced crawling peg, 2-Pre announced crawling band that is narrower than or equal to +/-2%, 2-Defacto crawling peg, 2-Defacto crawling band that is narrower than or equal to +/-2%, 3-Pre announced crawling band that is wider than or equal to +/-2%, 3-De facto crawling band that is narrower than or equal to +/-5%, 3-Moving band that is narrower than or equal to +/-2% (i.e. allows for both appreciation and depreciation overtime), 3 Managed floating, 4-Freely floating, 5-Freely falling, 6-Dual market in which parallel market data is missing.

[12] However, for result credibility, an ordered probit with country-fixed effects is also estimated as a robustness test.

$$Y_{it}= \begin{cases} 0 & if \quad Y^*_{it} \leq \mu_0 \text{ (a fixed exchange rate is adopted by country i in the year t)} \\ 1 & if \quad \mu_0 < Y^*_{it} \leq \mu_1 \text{ (an intermediate exchange rate is adopted by country i in the year t)} \\ 2 & if \quad \mu_1 < Y^*_{it} \text{ (a flexible exchange rate regime is adopted by country i in the year t)} \end{cases}$$

The empirical analysis is based on four models. The first one investigates the relevance of economic and financial variables. The second combines economic and financial variables with political and institutional variables. In case of non-significance of political risk, we move to the third model. The latter incorporates economic and financial variables with political risk to ensure the non-significance of this factor. If it also remains insignificant, we move to the last specification. The final model includes a combination of economic, financial, and political economic variables that determine the exchange rate regimes in the MENA country. In a last step, we run a sensitivity analysis to ensure the reliability of results. Our main contribution is to replace the political risk by its components to determine which of the seven selected components play a role in the choice of the exchange rate regime.

3.3 Economic, financial, political, and institutional data
3.3.1. Economic and financial variables
This first category includes factors related to geography and trade that are generally associated with optimal currency areas and the impossible trinity. Trade openness and the relative size of the economy are the two main variables that matter for the exchange rate regime. Constant real GDP is an indicator of the relative size of the economy. Trade openness is measured by the sum of exports and imports of goods and services as a share of GDP. Inflation is measured by the consumer price index expressed in log. Thus, high inflation should increase the likelihood of adopting a flexible regime (Álvarez et al., 2011; Frieden and Stein, 2001).

Domestic credit to the private sector (percentage of GDP) is used as a proxy for financial development (Rodriguez, 2016). The empirical analysis also uses the ratio of the central bank's international reserves to the money supply (reserves/M2) for measuring international reserves (Calvo and Reinhart, 2002).

Financial openness is a financial variable to learn about the degree of mobility of the capital essential factor of the impossible trinity. We use the Kaopen index of Chinn and Ito (2006, 2015) as a measure for this variable, which is available from 1970 and is based on four binary nominal variables reported in the International Monetary Fund's (IMF) Annual Report on Exchange Arrangements and Exchange Rate Restrictions. Thus, a higher number provides information on low capital mobility. Government spending is measured by general government final consumption expenditure (percentage of GDP). The foreign direct investment variable is measured by the sum of equity, reinvestment of profits, and other long- and short-term capital divided by GDP. Another economic variable included is monetary independence, an index that measures the degree of monetary autonomy. This index varies between zero and one. The higher the value, the closer to one and the greater the monetary independence.

3.3.2. Political and institutional variables

The political risk rating is a score that varies between zero and 100. The lower the total risk point values, the higher the risk and vice versa. This variable consists of 12 components in three sub-categories of risk: political, financial, and economic. Seven components were chosen. Government stability is a score that varies between 0 and 12. The lower the value, the more the government is unstable and vice versa. In addition, the internal conflict is a component that varies between 0 and 12, used to assess the political violence in the country and its real or potential impact on governance. The lower the value, the higher the risk of internal conflict and vice versa. Finally, socioeconomic conditions as a component aim to assess the socioeconomic pressures at work in society that could constrain government action or fuel social dissatisfaction. It gives a value of zero for poor socioeconomic conditions and a value of 12 for a better condition. These three components are used as proxies for political stability.

Corruption is a score varying between zero and six: zero for higher corruption and six for lower corruption. Also, law and order are two sub-categories. The sum of these two sub-components is equal to a score that varies between zero and six. A high score is given to a country with a judicial system, while a low score (one) indicates a very high crime rate if the law is ignored. Finally, the bureaucratic quality score varies between zero and six. The strong points are granted to the countries where bureaucracy has strength and expertise, while the weak points correspond to countries that do not have a strong bureaucracy because of a change of government. Thus, these last three components are used as proxies for measuring institutional quality.

Another institutional component is used as a measure of democracy. It is a score that varies between zero and six. The highest score corresponds to democracies, while the lowest score corresponds to autarchies.

The analysis uses three other indicators from the World Bank's DPI. Government strength is measured by the number of years that the incumbent has in office (Edwards, 1996). Long executive mandates indicate strong governments. Besides, the "elections" variable means that in case of an executive election this year, the variable takes the value of one, otherwise it is zero. The expected effect of these variables is also positive. The left-wing government is a variable dummy that takes the value of one for the left part and zero in the case of a right or centrist party.

Finally, the analysis includes the turnover rate of central bank governors[13] as a proxy for measuring central bank independence (Cukierman, 1992). This rate is calculated as the number of changes of central bank governors divided by the term of office. This index varies between zero and one. The higher the value of the index, which is close to one, the greater the independence of the central bank (Ghrissi and Smida, 2009).[14]

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[13] Cukierman (1992) argued that in the cases of countries where the rule of law is less strongly embedded in the political culture, there can be wide gaps between the formal and legal institutional arrangements and their practical impact. The turnover rate of central bank governors is a good proxy for central bank independence than measures based on central bank laws.

[14] The data of this study are available from the corresponding author. See Table 5 for further details.

4. Econometric results

4.1 Descriptive statistics

Table 1 shows the distribution of exchange rate regime during the period of analysis. The first remark is that the exchange rate regime of MENA countries can be categorized primarily into three categories (zero, one, and two).

The second is that the regime most used by these countries is the fixed exchange rate with a percentage of 46.97 while the least popular regime is the flexible regime with a percentage of 15.75.

Table 1. Descriptive statistics

Categorical Variable	Total Observations	Outcomes	Observations	Percentages
Exchange Rate regime	264	0	124	46.97
		1	100	37.88
		2	40	15.15

Table 2 shows the distribution of exchange rate regimes for subperiods using the coarse classification. The first remark is that MENA exchange rate regimes can be primarily classified using three categories.

Table 2. The number of transitions in the exchange rate regime for the sample of countries over the 1984-2016 period

Err[15] Year	Fixed	Intermediate	Flexible
1984	3	2	3
1990	16	12	20
1995	14	14	12
2000	20	15	5
2005	20	20	
2010	22	18	
2016	29	19	

Notes: 3 indicates the number of times that a fixed exchange rate regime was adopted by the sample of countries during the year 1984. 5 indicates that during the period from 1996 to 2000 the flexible exchange rate regime was used 5 times by the sample of countries. 19 indicates that during the period from 2011 to 2016 the intermediate exchange rate regime was adopted 19 times by the sample of countries.

[15] Exchange rate regime.

4.2. Estimation results

Table 3 presents the estimated coefficients of random-effect ordered probit models for the choice of the exchange rate regime. We can distinguish the estimation results of three models as well as the basic one (one).

In the first model, all coefficients are statistically significant except for financial development. The negative coefficient of GDP indicates that countries with high GDP are more likely to favor a fixed exchange rate regime. This result confirms the study of Sfia (2007) stating that countries with large economic size opt for a fixed exchange rate regime.

However, inflation has a positive coefficient, which means that a low level of inflation is associated with a fixed exchange rate regime. This result is in line with the study made by Frieden et al. (2001), Rodriguez (2016), and Liu et al. (2020).

The government expenditure ratio is positive, showing that an increase in public spending decreases the likelihood of having a fixed regime. Indeed, an increase in public spending strengthens the economy but also generates inflation, which leads to a drop in investment and private consumption resulting from an increase in taxes and thus a reduction in household income. On the contrary, a fixed regime favors investment and reduces inflation. Such a result coincides with that found by Bornukova (2004).

In contrast, the effect of trade openness is negative, implying that the probability of choosing a fixed exchange rate regime is greater in countries with high activity with the rest of the world. This result is comparable to that found with Frieden et al. (2001, 2010), Piragic and Jameson (2005), Markiewicz (2006), and Rodriguez (2016).

As for the reserve ratio, its effect is positive, which means that the probability of having a fixed exchange rate regime is low in countries with an adequate level of reserve stocks. It is well-known that a fixed exchange rate regime requires a large international reserve stock. However, given the level of macroeconomic shocks to which the sample of countries are affected and the fragility of their financial system, the choice of a more flexible exchange rate system encouraging exports remains more favorable to absorb these economic risks and to avoid crises of exchange rates, the experience of which in emerging countries has shown how violent they can be. Therefore, the accumulation of reserves, which reflects an exchange rate strategy to achieve growth based on exports, probably relies on a reason of prudence by monetary authorities, which makes it a form of "precautionary wealth" to reduce macroeconomic risks. Thus, increasing international reserves may reduce the likelihood of adopting a fixed exchange rate regime. Our result confirms the interpretation of Calvo and Reinhart (2002), who suggest that floating-oriented countries should keep a large stock of reserves to protect themselves in the event of a currency crisis. A similar result was found by Frieden et al. (2001), Rodriguez (2016), and Liu et al. (2020).

Finally, the coefficient of financial openness is negative, indicating that a country with high capital mobility has a high probability of adopting a fixed exchange rate regime. A similar result was confirmed by Rodriguez (2016).

Table 3. Determinants of exchange rate regimes in MENA, 1984-2016
Dependent variable: exchange rate regime (Elzetzki, Reinhart, and Rogoff classification). Estimates based on ordered probit regressions with random effects.[16]

	(1)	**(2)**	**(3)**	**(4)**
GDP	-0.644	-0.534	-0.613	-0.561
	(0.017)**	(0.032)**	(0.024)**	(0.022)**
Inflation	0.496	0.530	0.485	0.539
	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Financial Development	-0.207	-0.303	-0.141	-0.375
	(0.338)	(0.271)	(0.566)	(0.117)
Government expenditures	2.007	2.168	1.95	2.213
	(0.002)***	(0.001)***	(0.003)***	(0.001)***
Trade openness	-0.017	-0.015	-0.017	-0.014
	(0.027)**	(0.062)*	(0.024)**	(0.071)*
International reserves	0.591	0.706	0.550	0.742
	(0.002)***	(0.001)***	(0.006)***	(0.000)***
Financial opening	-1.115	-0.915	-1.084	-0.929
	(0.015)**	(0.048)**	(0.019)**	(0.043)**
CBI		-0.430		-0.350
		(0.485)		(0.560)
Left wing dummy		1.116		1.123
		(0.004)***		(0.004)***
Political Risk		-0.008	-0.008	
		(0.605)	(0.582)	
Prob (chi 2)	(0.000)***	(0.000)***	(0.000)***	(0.000)***
N	*216*	*205*	*216*	*205*

*** $P < 0.01$

** $P < 0.05$

* $P < 0.1$

P-values are reported in parentheses.

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[16] To avoid the endogeneity problem, the independent variables are lagged by one year.

The second models combine economic, financial, political, and institutional variables. The results for the economic variables are similar to the first model. For political and institutional variables, we note that the central bank independence variable is not significant. The effect of the variable left-wing dummy is positive and significant, suggesting that left-wing governments have a lower probability of choosing a fixed exchange rate regime in the MENA study panel. In fact, the left-wing parties implement policies that improve growth against stability. They have more preferences to manage the national economy and are more likely to use an expansionary macroeconomic policy but less likely to adopt a fixed exchange rate regime. This result is confirmed by the partisan theory initiated by Hibbs (1977) and extended by Alesina (1988), Berdiev et al. (2012), and Liu et al. (2020). As for the effect of political risk, it turns out to be negative, which reveals that, in a situation of political uncertainty, the probability of maintaining a fixed exchange rate regime is less preferable. However, this effect is not significant in the MENA region.

To investigate the robustness of our findings, we introduce only the political risk with the economic and financial variables in a third model. The findings are identical to what was previously found, while the political risk remains insignificant.

Finally, the fourth equation drops the political risk factor and shows that all economic, financial, and institutional variables remain significant (except for central bank independence) and have the same signs as the other three specifications.

4.3. Sensitivity analysis and robustness checks

Table 4 presents a sensitivity analysis using the same estimation methodology by adding a variable from the DPI and ICRG to show the effect of the latter on exchange rate regime choice.

The first model provides an estimate of the basic equation by including the monetary independence of Aizenman et al. (2008) to account for other factors of the impossible trinity. The estimated coefficient of this variable is negative and not significant. This can be explained by the fact that these MENA countries do not attach importance to monetary independence in the choice of exchange rate regime. This result confirms the findings of Rodriguez (2016).

The second model reports estimates of the basic equation and adds a measure of foreign direct investment. The estimated coefficient of this variable, being negative and significant, means that a high degree of foreign direct investment increases the probability of opting for a fixed regime. This result is confirmed by Bornukova (2004). The main results are similar to those found previously.

The third econometric model considers the estimate of the basic equation while adding terms of trade, which are considered a measure for real shocks. The estimated variable is not significant, suggesting that in the case of the selected MENA countries, this external shock does not play a role in the choice of exchange rate regime.

As for the fourth equation, we introduce socioeconomic conditions in the basic equation as a proxy for political instability. The coefficient of this variable is negative but not significant, which indicates that sociopolitical conditions, such as unemployment, poverty...etc., do not play a role in the choice of exchange rate regime.

The fifth model presents an estimate of the basic equation by integrating government stability[17] as a proxy for political instability and as a component of political risk. This variable is positive and significant, which suggests that a country in a situation of political stability (high government stability) has a low probability of maintaining a fixed exchange rate regime. On the contrary, a country in a situation of political instability favors a fixed exchange rate regime. In fact, in a situation of political instability, investors lose their confidence in the country, leading to a decline in economic activity; therefore driving governments to opt for a fixed exchange rate regime as a tool to strengthen credibility, increase confidence in the national currency, and control inflationary expectations. This result is similar to the study of Alesina and Wagner (2006) and Honig (2007).

Model six estimates the basic equation and incorporates another component of political risk, namely internal conflict,[18] which is also used as a proxy for political instability. The effect of this variable is positive and significant, which means that in a situation of political stability (low levels of terrorism, political violence, and disorder), the probability of having a fixed exchange rate regime is low. The results of these three specifications lead us to conclude that political stability decreases the likelihood of maintaining a fixed regime.

We introduce in the seventh equation an additional measure of corruption, which represents a component of political risk studied as a proxy for institutional quality.[19] The coefficient of this variable is negative and significant, meaning that in the case of low (high) corruption, a fixed exchange rate regime is more (less) likely. Indeed, countries with strong corruption have poor macroeconomic management where a flexible exchange rate regime is more appropriate to improve economic activity.

We also incorporate another measure of institutional quality (a component of political risk): law and order. The estimate of equation eight shows that this institutional quality proxy suggests that a high level of law enforcement and order decreases the probability of adopting a fixed regime. Indeed, good law enforcement and order improves the institutional quality that promotes credibility and value confidence in the national currency, hence the appreciation of the exchange rate and the improvement of the economic situation, so it is more likely that a flexible exchange rate regime will be chosen.

The ninth model incorporates the basic equation with another additional measure of political risk that is bureaucracy, also used as a proxy for institutional quality. The effect of this variable is positive, indicating that a high level of bureaucracy decreases the probability of maintaining

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[17] The higher the value, the more the government is stable, and vice versa.
[18] The higher the value, the lower the risk of internal conflict, which implies a situation of political stability.
[19] The higher the value, the lower the level of corruption, which implies better institutional quality.

a fixed exchange rate regime. However, this effect is not significant in the case of all eight MENA countries.

The results of these last three components (corruption, law and order, and bureaucracy) which are used as proxies for institutional quality, reveal that the influence of these factors is not decisive because they have contradictory impacts on the choice of exchange rate regimes.

The tenth equation incorporates another component of political risk: democracy. Unlike the previous literature, the estimated coefficient of this variable is negative and significant, which indicates that democracy is linked to a fixed exchange rate regime. Indeed, countries of the MENA region are autocratic, given that this region has experienced a slowdown in economic growth – more precisely in recent years where the use of a fixed exchange rate regime is more appropriate for improving economic growth. Additional research is still necessary for each country in the MENA region to know the reality behind the differences in the results that can be linked to the local culture (Cao et al., 2020) or to the political and economic characteristics of a country.

Finally, to explore other policy aspects, two other variables account for the effects of political variables on the process of choosing an exchange rate regime, namely elections and years in office. The first variable is integrated in equation 11 and shows that elections are not involved in the choice of exchange rate regime of some MENA countries.

The last model (equation 12) incorporates an additional measure of the number of years in office used as a proxy for the government's strength. It suggests that the effect of this variable is positive and significant. Consequently, a strong government (that has been in power for more than 10 years) is less likely to be associated with a fixed exchange rate regime. Indeed, when it comes to strong governments, they will be successfully able to manage the economy and achieve growth. These governments prioritize economic development and contribute to full employment in the country using an expansionary fiscal policy. In addition, the flexible exchange rate regime promotes transparency and good governance, reduces fragility in the face of shocks, and privileges the adoption of an autonomous monetary policy. Therefore, a strong government can be tied to a floating exchange rate regime.

As a robustness check, estimations of ordered probit models with fixed effects have been carried out, and they confirm the results of the estimations with random effects in the sense that the signs of the impacts (positive or negative) of the different variables previously discussed remain the same in both cases. However, a notable difference is that the size of the impacts is sometimes different. Besides, our results are robust to the inclusion of time dummies to account for the "global crisis."

Table 4. Sensitivity analysis (all the independent variables are lagged by one year)

	M.I (1)	F.D.I (2)	Terms of Trade (3)	Socio-eco (4)	G.S (5)	Conflict (6)	Corruption (7)	Law (8)	Bureaucracy (9)	Democracy (10)	Elections (11)	Years in office (12)
GDP	-0.358	-0.484	-0.321	-0.369	-0.592	-0.699	-0.688	-0.693	-0.560	-0.872	-0.563	- 0.448
	(0.017)**	(0.055)**	(0.046)**	(0.218)	(0.029)**	(0.013)***	(0.018)***	(0.015)***	(0.021)**	(0.010)***	(0.021)**	(0.126)
Inflation	0.525	0.630	0.515	0.626	0.673	0.583	0.623	0.608	0.533	0.647	0.532	0.558
	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Financial Development	-0.505	-0.302	-0.447	-0.259	-0.422	-0.690	-0.257	-0.572	-0.374	-0.295	-0.374	-0.431
	(0.019)**	(0.220)	(0.066)*	(0.303)	(0.089)*	(0.010)***	(0.301)	(0.033)**	(0.118)	(0.269)	(0.117)	(0.077)*
Government Expenditures	3.110	1.693	2.856	2.234	2.601	2.177	2.430	2.301	2.254	2.790	2.235	1.965
	(0.000)***	(0.017)**	(0.000)***	(0.002)***	(0.000)***	(0.002)***	(0.000)***	(0.001)***	(0.001)***	(0.000)***	(0.001)***	(0.005)***
Trade Openness	-0.022	-0.014	-0.021	-0.019	-0.013	-0.008	-0.015	-0.011	-0.014	-0.005	-0.014	-0.014
	(0.001)***	(0.083)*	(0.001)***	(0.033)**	(0.109)*	(0.312)	(0.065)*	(0.172)	(0.071)*	(0.610)	(0.069)*	(0.114)
International Reserves	0.893	0.722	0.871	0.715	0.833	0.839	0.774	0.873	0.743	0.711	0.743	0.760
	(0.000)***	(0.000)***	(0.000)***	(0.001)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.001)***	(0.000)***	(0.000)***
Financial Opening	-1.990	-0.933	-0.920	-0.778	-1.056	-1.153	-1.004	-0.883	-0.916	-1.443	-0.944	-1.315
	(0.020)**	(0.044)**	(0.026)**	(0.094)*	(0.022)**	(0.014)***	(0.031)**	(0.053)**	(0.045)**	(0.005)***	(0.041)**	(0.011)***
I.C.B	-1.970	-0.291	-0.842	-0.149	-0.176	-0.203	-0.446	-0.081	-0.391	-0.714	-0.373	0.376
	(0.088)*	(0.644)	(0.149)	(0.807)	(0.778)	(0.761)	(0.471)	(0.898)	(0.518)	(0.255)	(0.537)	(0.528)
Left wing dummy	0.051	1.094	0.992	1.254	1.145	0.880	1.108	1.384	1.161	1.308	1.111	1.013
	(0.000)***	(0.006)***	(0.000)***	(0.003)***	(0.004)***	(0.031)**	(0.006)***	(0.002)***	(0.004)***	(0.004)***	(0.004)***	(0.009)***
Additional Variable	-0.282	-0.157	-0.374	-0.297	0.150	0.192	-0.370	0.217	-0.215	-0.484	0.163	0.040
	(0.695)	(0.009)***	(0.450)	(0.156)	(0.025)**	(0.003)***	(0.066)*	(0.096)*	(0.556)	(0.000)***	(0.497)	(0.000)***
Prob (chi 2)	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Number of observations	188	204	188	205	205	205	205	205	205	205	205	205

*** $p < 0.01$

** $p < 0.05$

* $P < 0.1$

P-Values are reported in parentheses.

Finally, table 5 summarizes our results as well as those found by previous studies.

Table 5. Variable definitions, sources, nature, expected signs, references and actual signs of each determinant

Variables	Variables sources	Nature of the variable	Expected signs	References	Actual sign of each determinant
GDP	World Development Indicators (WDI)	Economic variable	(+)	Rodriguez (2016)	(–)
			(–)	Sfia (2007)	
Inflation	WDI	Economic variable	(+)	Frieden and Stein (2001) Álvarez et al. (2011) Rodriguez (2016)	(+)
Financial development	WDI	Economic variable	(+)	Markiewicz (2009) Frieden et al. (2010)	(–)
			(–)	Levy-Yeyati et al. (2010) Berdiev et al. (2012) Rodriguez (2016)	
Government expenditures	WDI	Economic variable	(+)	Bornukova (2004)	(+)
Trade openness	WDI	Economic variable	(–)	Frieden et al. (2001) Piragic and Jameson (2005) Markiewicz (2006) Frieden et al. (2010) Rodriguez (2016)	(–)
Monetary independence	Aizenman, Chinn and Ito (2010) updated up to 2014	Economic variable	(–)	Mundell (1963)	Not significant
International reserves	WDI	Economic variable	(+)	Calvo and Reinhart (2002) Rodriguez (2016) Liu et al. (2020)	(+)
			(–)	Lahrèche (2000) Yougbare (2009)	
Financial opening	Chinn M. et Ito H. (2006) updated up to 2015	Economic variable	(–)	Berdiev et al. (2012) Levy-Yeyati et al. (2010) Rodriguez (2016)	(–)
FDI	WDI	Economic variable	(–)	Bornukova (2004)	(–)
Terms of Trade	WDI	Economic variable	Not significant	Rodriguez (2016)	Not significant
CBI	Calculation of the authors	Institutional variable	(+)	Berdiev et al. (2012) Steinberg and Walter (2013)	Not significant
			(–)	Jacome and Vozquez, (2008) Crow and Meade (2008) Eijffinger and Hoeberichts (2008)	

Left-wing dummy		Database of Political Institutions (DPI)	Institutional variable	(+)	Alesina(1988) Rodriguez (2016) Liu et al. (2020)	(+)
Elections		DPI	Political variable	(+)	Benhard and Leblang (1999) Carmignani et al. (2008)	Not significant
				(−)	Frieden and Stein (2001) Hossain (2009)	
Political risk		International Country Risk Guide, The Political Risk Services Group (ICRG) (2016)	Political variable	(−)	Rodriguez (2016)	Not significant
Years in office		DPI	Political variable	(−)	Edwards (1996) Frieden and Stein (2001) Rodriguez (2016)	(+)
Political stability	*Internal conflict ICRG		Political variable	(+)	Alesina and Wagner (2006) Honig (2007)	(+)
	*Socioeconomic condition ICRG					Not significant
	*Government stability ICRG			(−)	Edwards (1996) Frieden et al. (2001) Rodriguez (2016)	(+)
Institutional quality	*Corruption ICRG		Institutional variable	(+)	Honig (2009) Fraj et al. (2018)	(−)
	*Law and order ICRG					(+)
	*Bureaucracy ICRG			(−)	Frieden et al. (2001)	Not significant
Democracy		ICRG	Institutional variable	(+)	Broz (2002) Steinberg et al. (2015) Rodriguez (2016)	(−)

The differences between our results and those of previous papers can be explained mostly by country sample selection and different estimation periods. Besides, Table 5 shows that our study also differs from most previous ones by allowing several institutional and political factors to influence the exchange rate in the specific economic and politic context of the MENA region. Indeed, our sample includes eight MENA countries which have specificities, such as the degree of financial development, central bank independence, political risk…etc. Furthermore, the different economic and political context of the MENA region compared to other regions (such as Latin America, for instance), it is not surprising to get different results. This is all the truer as most previous studies haven't accounted for the possible links between exchange regime and political risk components (such as internal conflicts, socioeconomic conditions, law and order, and government stability) in the modelling.

For instance, Edwards (1996), using a panel of 63 countries during the 1980-1992 period, finds that political instability and the strength of the government (weak government) are linked to a flexible exchange rate regime. The same result was obtained by Frieden et al. (2001) for a panel of Latin American countries during the 1960-1994 period. Rodriguez (2016) only focused on

the effect of political stability for a sample of 20 Latin American countries during the 1985-2010 periods.

In our study, we shed more light on the institutional and political determinants of the exchange rate regime in the MENA region. In particular, we show that a high level of government stability and less internal conflict (as well as the left-wing government) influence exchange rate regimes in MENA countries by decreasing the probability of adopting a fixed regime. We also find that strong governments have a low probability of favoring a fixed regime. On the contrary, as shown by Table 5, democratic institutions and a low level of corruption increase the probability of choosing a fixed regime. However, bureaucracies, elections, terms of trade, an independent central bank, monetary independence, and socioeconomic conditions have no effect on the choice of exchange regimes in the MENA region. Finally, we find that financial development is not a robust determinant of the choice of exchange rate regimes as it is not significant in several specifications.

5. Conclusion

The process of choosing the exchange system is very complex. It is considered one of the main choices of macroeconomic policies because the exchange rate is a variable that determines the trade flows of both goods and services and puts significant pressure on the balance of payments, the general level of prices, and other key macroeconomic variables. According to the theoretical and empirical economic literature on the choice of exchange rate regimes, this old debate in international economics is still gaining attention and is particularly acute in the case of emerging countries that have experienced a succession of economic and political crises. Indeed, the main economic reflections offer an exhaustive review of the literature and reveal that this choice of type of exchange rate regime is dependent on the economic characteristics of the country, such as the size of an economy, inflation, the level of international reserves, financial development, and commercial and financial openness (Mckinnon, 1963; Kenen, 1969; Dreyer, 1978; Melvin, 1985; Yougbare, 2009). However, such a choice also depends on the political risk of the countries, which reflects mostly in political instability, institutional quality, elections, the strength of the government, the ideology of part, and the independence of the central bank (Edwards, 1996; Frieden et al., 2001; Berdiev et al., 2012; Rodriguez, 2016; Hadj Fraj et al., 2018).

Nevertheless, existing studies failed to reach a consensus on the importance of political and institutional factors in determining the exchange rate regime. Indeed, authors have found mixed results and obtained ambiguous conclusions about the effect and importance of economic, political, and institutional factors in the choice of exchange rate regime.

From this perspective and following the various political and economic upheavals which struck the MENA region, the architecture of these countries has changed both economically and socially. Therefore, there was a particular need to review the criteria according to which the exchange rate regime was chosen in this region. Besides, to the best of our knowledge, no other studies have been conducted on this issue for MENA countries while incorporating the country

risk factor as well as political and institutional factors as potential determinants of the choice of exchange rate regimes. These considerations led us to conduct an empirical study and estimate random-effects ordered probit models of the likelihood of exchange rate regimes on the potential determinants of exchange rate regimes for a panel of eight countries for the 1984-2016 period.

Our econometric results (which are robust to alternative specifications) confirm the importance of economic, financial, political, and institutional factors for MENA exchange rate policy. A large stock of reserves and an increase in government spending decrease the probability of choosing a fixed regime. Meanwhile, low inflation, a large country, and a high level of trade openness, financial openness, and foreign direct investment increase the probability of opting for a fixed regime. Regarding political and institutional factors, such as more law enforcement and order, political stability (a high level of government stability and less internal conflict), and the left-wing government influence the choice of exchange rate regimes in MENA by decreasing the probability of adopting a fixed regime. Likewise, strong governments with more years in office also have a low probability of favoring a fixed regime. However, democratic institutions and a low level of corruption increase the probability of choosing a fixed regime. Besides, bureaucracies, elections, terms of trade, an independent central bank, and monetary independence have no effect on the choice of exchange regimes. Finally, financial development is not a robust determinant of the choice of exchange rate regimes in MENA countries as it is not significant in several specifications.

On the policy front, our findings suggest that the choice of exchange rate regimes should be made (at a given time) according to the degree of importance accorded to the aforementioned (significant) factors, which evolve both in time and space. No exchange rate regime is therefore universal or eternal (Frankel, 1999). Since all the fixed, intermediate, and flexible regimes have advantages and disadvantages, it is imperative to evolve in parallel with the economic, financial, political, and institutional characteristics of the country.

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