Corruption and extreme wealth. Evidence at country level

Héctor Flores Marquez\textsuperscript{1}, Ana Lilia Valderrama Santibañez\textsuperscript{1}, Gerardo Angeles Castro\textsuperscript{2} and Omar Neme Castillo\textsuperscript{*}

Abstract: The aim of the paper is to demonstrate that extreme wealth at country level is a consequence of corruption for a set of 42 countries over the period 2005–2018. A dynamic estimation (sys-GMM) is conducted, and different indices of corruption are used in order to obtain solid results. The data on extreme wealth is taken from Forbes annual listing of billionaires. The main findings are highly supportive of the idea that corruption fosters extreme wealth, acting as a greasing wheel that contributes to this unbalanced economic process. Therefore, billionaires face incentives to perform these types of acts which tend to perpetuate the corrupt system. However, legal mechanisms are also significant determinants of extreme wealth. Results also confirm that factors such as economic freedom and its components, as well as other economic and political variables, have positive effects on this wealth.

Subjects: Global Governance; International Economics; Development Economics; Political Economy

Keywords: corruption; extreme wealth; economic freedom; civil liberties; panel data

JEL Classifications: D73; P46; P48

ABOUT THE AUTHOR

Hector Flores Marquez is a doctoral student in economics at the National Polytechnic Institute at the Higher School of Economics. His topics of interest are related to corruption, government, the economy, and international development. Ana Lilia Valderrama Santibañez is a Professor-Researcher at the National Polytechnic Institute at the Higher School of Economics. Her topics of interest are related to industrial economics and development in international or national contexts. She is a member of the Group of Economics of Care and Economic Autonomy. Gerardo Angeles Castro is a professor-researcher at the National Polytechnic Institute at the Higher School of Economics. His topics of interest are related to economic developments, such as inequality and poverty. Omar Neme Castillo is Professor-Researcher at the National Polytechnic Institute at the Higher School of Economics. His research topics are related to international economics and economic development.

PUBLIC INTEREST STATEMENT

Extreme wealth, that of at least one billion dollars owned by a person or family, is a growing phenomenon in the world with potential effects on social, political and economic dimensions. Simultaneously, corruption - misuse of delegated power for private gain - occurs in all countries of the world. Although it is recognized that the origin of extreme wealth it is associated with own efforts and legal mechanisms (company founders, top executives, investments, etc.), there seems to be a relationship between extreme wealth and corruption. In any case, these legal or illegal determinants allow accumulating material and non-material resources, that translate into power and wealth, and in turn, tends to create economic elites. In this context, this study explores the role of corruption in amassing these fortunes. The main findings are highly supportive of the idea that corruption fosters extreme wealth. However, legal mechanisms are also significant determinants of extreme wealth.
1. Introduction
Corruption exists in all countries and societies. It is a growing phenomenon that has become an endemic problem around the world. Although there is no consensus, corruption could explain why many countries are poor and have difficulties in engaging in a growth path that allows their citizens to become wealthy (Johnston, 2009).

An extension of this idea could also be true, that is, a pathology of corruption that boosts few people in corrupt systems to extreme wealth (one billion dollars or more). This ultra-wealth means that everyone else in the country may be relatively, if not absolutely, poor. Fjelde (2009) argues that the conversion of public funds into private payoffs, linked to corruption, negatively impacts poverty. Gupta et al. (2002) also, state that corruption increases poverty.

Moreover, Wade (2004) & Kwasi (2017) suggest that inequality comes together with poverty. In this respect, the growth of inequality suggests that the current economic system, characterized by corruption, cannot generate sustainable social wellbeing (Purje & Nilsson, 2015), by means of deterring economic growth, tax and government revenues or reducing public institutions capacities, among other negative effects.

Piketty (2015) has shown that disparities in wealth have been increasing in many countries, due to the improvement of the financial position of the 1% best off (named as the 0.1%). Richest people can translate their financial power into political power through a variety of mechanisms, for instance, corruption. The massive inequalities in income and wealth undermine the value of democracy and the ideal of political equality in particular (Christiano, 2008).

1.1. Extreme-wealth
In this context, countries tend to accumulate an extreme wealth in some individuals and their families. This wealth has economic relevance as some studies have stated. In particular, Killewald et al. (2017) found that family wealth is associated with outcomes at the micro level, including education, family income levels, labour incomes, self-employment, net power relations, and so on. They also state that among the key determinants of wealth are continuous flows of income into the household and personal and social traits. At the macro level, economic, political and social structures and institutions shape wealth.

More specifically, the sources of extreme wealth have also been described in empirical studies. For instance, Sussman et al. (2014) regard four sources of extreme personal wealth: heir, entrepreneur, executive (owners or managers of large companies), and financial (investments or trading). The first one is considered as unearned wealth, obtained through familiar or close relationships, and the last three are gained by personal merits.

Also, Jacobs (2015) identifies six dimensions that contribute to this extreme wealth, namely crime, cronyism, and inheritance (not-meritocratic), and monopoly, globalization, and technology (meritocratic). He found that most billionaires have been helped by cronyism or monopoly and by globalization. These legal or illegal determinants allow accumulating material and non-material resources that translate into power and wealth and, in turn, tend to create economic elites at the national level.

Thus, while some wealth originates from legal sources, either self-made or inherited, it is possible that other part arises from illegal sources such as corruption, cronyism, or even lobbying, which often has the effect of protecting economic benefits of narrow interest groups to the detriment of overall welfare (OECD, 2013). Certainly, Freud & Oliver (2016) recognize that wealth is increasingly self-made, which could be explained, given the economic conditions, by the faster growth of capital returns in comparison to income.
In any case, despite the slow growth of global income, extreme wealth is increasing rapidly (Freund & Oliver, 2016), while the phenomenon of corruption is suffered in all economies (Moulds, 2019). In all the world regions real total extreme wealth increased over the period 2005–2018 in absolute terms as well as a percentage of GDP at notable growth rates of 260% and 93%, respectively. In 2018, the accumulated total extreme wealth was equivalent to 8% of the world GDP. Furthermore, total extreme wealth grew in each individual country. The number of countries with at least one person with extreme wealth rose from 49 in 2005 to more than 70 in 2018.

1.2. Corruption
Simultaneously, levels of perceived corruption increased throughout the world. Considering four of the most popular indices (Corruption Perception Index, Government Integrity, Control of Corruption and Absence of Corruption) the average scores decreased in the same period among 7% to 10% in each index.

Even more relevant, regions that worsened their corruption indices or remained below the mean score are simultaneously those which gained most in terms of extreme wealth over the period. Countries such as Brazil, China, Russia, and India notably increased their total real extreme wealth while facing high corruption levels.

Literature finds evidence about corruption effects in some aspects, for instance, inequality (Policardo & Sánchez, 2018), poverty (Gupta et al., 2002) economic development (Akay, 2006), economic growth (Podobnik et al., 2008), welfare loss (Lambsdorff, 2017), public debt (Benfratello et al., 2018) and so on. A general finding is that higher levels of corruption lead to more inequality and more poverty, meaning lower incomes for the population at the bottom of social structure and higher incomes for that at the top (Fransés & De Groot, 2016).

The concept of corruption broadly used is proposed by Transparency International (TI), which is a more global definition in the literature: “the misuse of delegated power for private gain,” that is, corruption is the abuse of power for private economic benefit, sometimes not necessarily for the benefit of oneself, but for partisan, family, or class interests. This definition includes non-monetary benefits, such as promises of future employment contracts to family members or “gifts” in exchange for certain concessions.

A main aspect is that corruption, as a way of attempting to gain private economic rents, may lead to an extraordinary wealth among a few (Gupta et al., 2002) because it implies economic mechanisms like unbalanced favours that allow the corrupter to access a better economic position (tax evasion, investment in regulated sectors, set prices in a market) that could damage the economic performance of a country, although in different magnitudes among countries (Allen et al., 2018).

In this respect, systemic corruption occurs when structures allow corrupt actions to appear normal and conform to the social system or at least to highly influential parts of it, for a long period of time (Lambsdorff et al., 2005). In this context, corruption concentrates power since it is frequent that political parties or candidates are financed by economic interest groups in exchange for the granting of perks once they come to power. Corruption is the cause that political power has been concentrated in the hands of a few people, and it has been used to create wealth in favour of those who hold it. This has generated an increase in inequality and the appearance of new rich linked to power, while the population often struggles in poverty.

Acemoglu and Robinson (2014) established that the poverty and stagnation of underdeveloped countries, as well as the high levels of corruption that afflict most of them, are fundamentally due to the existence of extractive institutions, economic or political in nature, that translate into greater power, extreme income inequality, and low economic growth.
1.3. Corruption and extreme wealth
In any case, there is limited literature concerning corruption and extreme wealth. In particular, Neumayer (2004) and Torgler and Piatti (2013) correlated the number of super rich people within countries with several variables like GDP, population size, and corruption. They find that corruption stimulates the number of super rich people to increase. In this respect, Franses and De Groot (2016) argue that the disproportionate influence of the richest can bias governmental decisions in favour of power groups, for example, through tax evasion, standing for wealth accumulation. As a consequence, extreme wealth could be a result of corrupt sub-systems characterized by relatively stable networks—among rich people and between them and politicians and government officers—rather than exceptional, independent, individual events (Nielsen, 2003).

This paper does not focus on the number of super rich people but merely examines the total wealth among those very wealthy individuals in a country. It is studied if corruption acts as a greasing wheel that contributes to that extreme wealth. In this way, the aim is to demonstrate that accumulated extreme wealth at country level is positively related to corruption for a set of 42 countries over the period 2005–2018.

Although there is a growing literature on the relationship between corruption and inequality, there is a lack of studies on the effect of corruption on super-wealth. This document contributes to this matter. Moreover, the existing papers tend to focus on the number of superrich, while this paper examines the value of extreme wealth at country level.

Also, the study employs data available from Forbes annual listing of billionaires for 2005–2018 period. Measures of economic, political, social, and institutional issues are included in the econometric model. Given the data set, a dynamic panel data model is estimated, which shows the elasticities of extreme wealth at the national level associated with corruption.

The structure of the paper is as follows: Section 2 describes the data, Section 3 resumes and discusses the estimation results, and Section 4 concludes.

2. Data and methodology

2.1. Data
While literature recognizes several ways to reach extreme wealth (Jacobs, 2015), there is evidence that this wealth tends to grow in the context of political and economic power (Volscho & Kelly, 2012). Following the literature, the econometric model considers economic, political, and institutional aspects that shape wealth levels. The dependent variable, total extreme wealth, is calculated from data of Forbes annual listing of billionaires over the 2005–2018 period for a set of 42 countries (Table 1). The data are obtained from Freund and Oliver (2016) of Peterson Institute for International Economics and completed with annual reports of Forbes annual listing of billionaires.

Billionaires are those that have at least one billion dollars in a given year or are very close to this level (the arbitrary umbral reported is 0.7 billion dollars). The list of billionaires includes only those who accumulate their fortune, in principle, by legal means. In each case, since corruption measurements are based on people’s perceptions of the phenomenon, it is worth to prove the relationship between corruption and extreme wealth using Forbes data.

Moreover, due to the fact that the analysis is at the national level, the variable total extreme wealth (tew) is constructed by summing up the fortune of each billionaire for a given country and year expressed in real terms. Therefore, the focus of the paper is on extreme total wealth at the country level. While the wealthiest can be expected to enjoy greater economic and political power, it is assumed that regardless of fortune size, all billionaires have relationships in their respective geographic, sectoral, and temporal contexts that can contribute to their wealth.
It should be noted that corruption is a socioeconomic phenomenon that is hard to measure. However, literature has given particular importance to perceptions people have about corruption. It widely uses institutional sources based on surveys that establish perceptions, considering differences among social and economic sectors, political attitudes, and activities.

Moreover, due to the fact that the literature finds different effects of corruption on several socioeconomic variables, and since the corruption indices have slightly different interpretations, four alternative corruption indices are used in the estimation. Thus, explicative variables include corruption, which is measured by Government Integrity sub-index of economic freedom measured by Heritage Foundation (gi); Corruption Perception Index of Transparency International (cpi); Control of Corruption Index of the Worldwide Governance Indicators (cc); and the sub-factor Absence of Corruption included in the Global State of Democracy Indices (GSDI) of International Institute for Democracy and Electoral Assistance—IDEA (ac).

All the indices are composite, that is, they include several factors, such as bribery, extortion, nepotism, cronyism, coercion, graft, and so on. In all the cases, the lowest value represents the worst achievement (more corruption), while the highest shows the best performance (less corruption). It is worth noting that corruption indices comprise both score and rank economies; nevertheless, the corruption data used in this study are the scores.

In this respect, the Index of Economic Freedom focuses on four key aspects that measure 12 specific components of the economic environment over which governments typically exercise policy control: rule of law, government size, regulatory efficiency, and market openness.

Government Integrity (GI) is a subcomponent of the rule of law dimension used as a proxy for corruption since it incorporates elements linked to this phenomenon (about perception as well as of its combat), becoming a robust index. GI considers that corruption (bribery, extortion, nepotism, cronyism, patronage, embezzlement, and graft), erodes economic freedom by introducing insecurity and coercion into economic relations. The scale of GI is from 0 to 100.

The Corruption Perception Index (CPI) indicates the degree of corruption in the public sector according to the perception of businessmen and country analysts, on a scale from zero (very

---

Table 1. Selected countries

|   | Argentina | Hong Kong | Portugal |
|---|-----------|-----------|----------|
| 1 | Australia | India | Russia |
| 2 | Austria | Indonesia | Singapore |
| 3 | Belgium | Ireland | South Africa |
| 4 | Brazil | Israel | South Korea |
| 5 | Canada | Italy | Spain |
| 6 | Colombia | Japan | Sweden |
| 7 | Chile | Kazakhstan | Switzerland |
| 8 | China | Malaysia | Thailand |
| 9 | Denmark | Mexico | Turkey |
| 10 | Egypt | Netherlands | Ukraine |
| 11 | France | Norway | United Arab Emirates |
| 12 | Germany | Philippines | United Kingdom |
| 13 | Greece | Poland | United States |

The countries were selected countries were included when they had at least one billionaire in the period. Source: own elaboration.
corrupt) to 100 (absence of corruption). It is a composite index made up of a combination of surveys on corruption carried out by several institutions.

CPI data capture various aspects of corruption, namely: bribery, diversion of public funds, prevalence of officials using public office for private gain without facing consequences, ability of governments to contain corruption, and enforce effective integrity mechanisms in the public sector, meritocratic versus nepotistic appointments in the civil service, access of civil society to information on public affairs, among others.

According to the Worldwide Governance Indicators (WGI), the index Control of Corruption (CC) is an indicator of governance along with five other dimensions (voice and accountability, political stability, and absence of violence, government effectiveness, regulatory quality, and rule of law). CC reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests. The individual data sources are rescaled to range from 0 to 1, with higher values corresponding to better outcomes.

Finally, the Global State of Democracy Indices depict democratic trends at the country levels across a broad range of different attributes of democracy. GSDI is based on 116 individual indicators using different types of sources (expert surveys, research groups and analysts, and observational data). These indicators are grouped into five main democracy attributes: representative government, fundamental rights, checks on government, impartial administration, and participatory engagement.

The impartial administration attribute measures fair and predictable public administrations. A sub-component of this attribute is the absence of corruption (AC), which denotes the extent to which the executive and public administration more broadly, do not abuse office for personal gain. The AC score runs from 0 to 1, with 0 representing the lowest achievement and one the highest.

Simultaneously, large fortunes can be generated by legal mechanisms. Following Freund and Oliver (2016), wealth can be classified as inherited or self-made, the latter being divided into four categories: founders, executives, financiers, and politically connected and resourceful billionaires. To consider this option, a dummy (dsmw) with a value of 1 is included as an explanatory variable if the origin of the fortune of at least one billionaire in country-i in year-j is considered self-made.

Since in economically free societies, individuals are free to work, produce, consume, and invest in any way they please, and governments allow all types of resources to move freely, four dimensions of the economic freedom index are included. Furthermore, there is a strong relationship between inequality and government institutions linked to economic freedom (Graafland & Lous, 2018), and therefore a relation between several dimensions of economic freedom and extreme wealth.

Specifically, the index of economic freedom excluding government integrity sub-index (ief-gi) is first considered. Alternatively, the model covers 11 sub-indices which include quantitative and qualitative factors related to economic, political and institutional factors: government size (govsize), regulatory efficiency (regeffi), open markets (openmark), property rights (proprig), tax burden (taxburden), government spending (govspend), business freedom (busfree), monetary freedom (monfree), trade freedom (tradefree), investment freedom (invfree), and financial freedom (finfree). The higher the index values, the better the performance in each factor.

Two other political/social factors are alternatively incorporated. These sub-attributes are elected government (elecctedgov) which approximates political freedoms with respect to the possibility of citizens to effectively elect their rulers, and civil liberties (civilib) which reflects the extent to which civil rights and liberties are respected. Both are taken from GSDI-IDEA. Lederman et al. (2001) found great evidence of the importance of political institutions in determining the level of
corruption. They suggest that democracy, parliamentary systems, and political stability are correlated with lower rates of corruption.

Finally, the model considers an economic variable in order to control for market size heterogeneities. It can be expected that when market size increases, extreme wealth also does. This is approximated by the Gross Domestic Product in real terms (rgdp). The data are obtained from World Development Indicators.

In brief, reliable individual, political, social, and economic factors encourage better context for businesses, rentability and new investments. All the variables are expressed in terms of natural logarithms, so the estimates describe the sensitivity of the total extreme wealth to changes in the explanatory variables. Descriptive statistics, correlation matrix, and a summary statistic for extreme wealth data are shown in the appendix.

2.2. Methodology
To estimate the effects of corruption on extreme wealth, a dynamic panel model is built. Since the sample includes a finite T and large N, the OLS Fixed Effects approach in a dynamic model implies a downward bias of the OLS estimators, producing an inconsistent estimator (Phillips & Sul, 2007). As a consequence, a GMM system (sys-GMM), developed and modified by Arellano and Bond (1995) and Blundell and Bond (1998), is used.

The method encompasses a regression equation in both differences and levels, each one with a specific set of instrumental variables. This methodology not only deals with that bias but also with endogeneity problems since the model includes a lagged dependent variable, which may imply a correlation between the lagged regressor and the error term. In addition, the right-hand variables show correlation with past and current error terms; hence, the approach uses lagged endogenous variables as instruments to control endogeneity. Likewise, by construction, there is heteroskedasticity and autocorrelation within individual unit errors, but not across them, that is, the residuals of the difference equation should possess serial correlation, but the differenced residuals should not exhibit significant AR (2) behaviour (Baum et al., 2003).

The dynamic equation in the first differences, where the left-hand variable depends on its past realisations, is expressed as follows:

\[
tew_{it} - tew_{i,t-1} = (tew_{it-1} - tew_{i,t-2}) + \sum_{k=1}^{n} \beta_k (X_{it-k} - X_{it-k-1}) + (u_{it} - u_{i,t-1})
\]  

(1)

In this functional relationship, tew is total extreme wealth; the vector of the explanatory, X, alternatively includes the four corruption indices and the other variables previously introduced, and u is the term error, i stands for country, t for year, and t-1 for one lag. The model is mainly based on the approach of Torgler and Piatti (2013) and Volscho and Kelly (2012), which incorporate as determinants of the number of billionaires several dimensions such as economic (GDP, globalization, trade, and tax rates), social (population size), and political (democracy and institutions). Additionally, model (1) considers a meritocratic determinant of extreme-wealth.

The sys-GMM significantly improves accuracy and reduces the small sample bias (Blundell & Bond, 2000). Also, this methodology is appropriate when T < N, as is the case. Thus, the results are expected to effectively explain the effect of corruption on extreme-wealth.

Finally, assessing the consistency of the sys-GMM estimator requires three specification tests. First, since the model considers that errors show a heteroscedastic distribution that avoids estimation bias, the Hansen test of overidentifying restrictions is used to evaluate the joint validity of the instruments. The null hypothesis establishes that overidentification restrictions are valid, that is, that instruments are not correlated with the error process.
Second, the difference-in-Hansen test, calculated as the difference between the Hansen statistics for first-differenced GMM and sys-GMM, is asymptotically distributed as a $\chi^2$ with $n$ degrees of freedom equal to additional instruments. The test operates under the null hypothesis of joint validity of a given instrument subset. The third test assesses the serial correlation in the models. The null hypothesis establishes no second-order serial correlation in the first-differenced equation.

3. Results and discussion

In order to evidence the corruption effect on extreme wealth, one corruption index is taken at a time, and equation (1) is estimated considering variables linked to political and economic factors non-correlated among them, and a meritocratic (legal) determinant of extreme wealth. Thus, 24 four different specifications are estimated, six for each corruption index.

Before considering the results of each variable individually, it should be noted that the statistical significance of the coefficients remains across the different specifications, except for the sub-indices of the index of economic freedom (govsize, regeff, openmark). In general, the following key findings highlight (Table 2): i) the variable with the greatest impact on extreme wealth is economic freedom (lief-gi); ii) the main origin of super-wealth is associated with legal mechanisms (particularly self-made wealthy founders, executives, financiers, and politically connected and resourceful billionaires)(dsrnw); iii) current super-fortunes contribute to future extreme accumulation (rtnw); iv) ultra-wealth is positively related to corruption, measured by the four alternative indices (gi, cpi, cc, ac); v) the effect of corruption (gi, cpi, cc, ac) is, on average, similar to that of the economic (rgdp) and political-institutional variables (electegov, civlib); vi) democratic government systems and civil liberties represent a counterbalance of extreme wealth —and of economic and political power concentrated in billionaires— (electegov, civlib); vii) Favourable economic contexts (rgdp), as might be expected, foster extreme wealth.

3.1. Corruption

The results shown in Table 2 are highly supportive of the idea that corruption fosters extreme wealth. Estimations consistently show significant corruption coefficients at 1%, with negative signs, as expected. Thus, the results are robust with respect to alternative corruption indices. Similar evidence was found by Torgler and Piatti (2013) and Franses and De Groot (2016). In particular, it is established that corruption, in the form of unbalanced influence, may lead to extraordinary wealth among the wealthy.

This means that a better performance in any of the analysed corruption indices, which in fact represents less corruption or perception about it, leads to lower levels of total extreme wealth of a given country. Furthermore, results suggest that public and private measures against corruption could be translated into a restraint effect of wealth in the hands of billionaires.

On the other hand, when public power is exercised for private gain by economic elites, which is likely to cause corruption indices to decline, super-rich tend to capture the benefits of grand forms of corruption. According to the World Bank, the larger the value of the corrupt transaction, the higher the position in the public hierarchy of the public officials involved, and as could be expected, the power and economic resources of their counterparts.

Consequently, the super-rich people have no incentive to pass up opportunities for corruption as that would mean not maximizing their wealth. This is in line with Jong and Khagram (2005), who established that the rich are likely to have greater motivation as well as opportunities to engage in corruption acts in order to preserve and advance their status, privileges, and interests. Johnston (2009) confirms this idea by establishing that illicit ways of using power and wealth abound. Since corruption is a universal phenomenon, it is predicted to occur, independently of the country, if the net expected gains are positive (Ahmd et al., 2012).
Table 2. Determinants of extreme wealth in selected countries (sys-GMM)

| Variables  | [1]       | [2]       | [3]       | [4]       | [5]       | [6]       | [7]       | [8]       | [9]       | [10]      | [11]      |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| tew,       | 0.5260    | 0.5437    | 0.5153    | 0.4971    | 0.4711    | 0.4660    | 0.5390    | 0.5457    | 0.5224    | 0.5053    | 0.4828    |
|            | (0.000)*  | (0.000)*  | (0.000)*  | (0.000)*  | (0.000)*  | (0.000)*  | (0.000)*  | (0.000)*  | (0.000)*  | (0.000)*  | (0.000)*  |
| gi         | -0.5200   | -0.9491   | -0.8800   | -0.3487   | -0.7721   | -0.7679   | -         | -         | -         | -         | -         |
|            | (0.014)*  | (0.000)*  | (0.002)*  | (0.180)** | (0.006)*  | (0.009)*  |           |           |           |           |           |
| cpi        |           |           |           |           |           |           |           | -0.5766   | -0.9076   | -0.9683   | -0.3434   | -0.6836   |
|            |           |           |           |           |           |           | (0.008)   | (0.001)*  | (0.003)*  | (0.257)   | (0.001)*  |
| cc         |           |           |           |           |           |           |           |           |           |           |           |
| ac         |           |           |           |           |           |           |           |           |           |           |           |
| dsmw       | 0.6613    | 0.6610    | 0.5929    | 0.6147    | 0.6415    | 0.5343    | 0.7090    | 0.7577    | 0.7918    | 0.6254    | 0.6951    |
|            | (0.001)*  | (0.003)*  | (0.016)*  | (0.003)*  | (0.002)*  | (0.070)** | (0.000)   | (0.000)   | (0.005)*  | (0.000)*  | (0.001)*  |
| ief-gi     | 1.7483    |           | 1.6290    |           |           | 1.8162    |           |           |           |           |           |
|            | (0.018)*  |           | (0.022)*  |           |           | (0.006)   |           |           |           |           |           |
| govsizex   | -0.1059   |           |           |           |           |           | 0.0340    |           |           | -0.0335   |           |
|            | (0.651)   |           |           |           |           |           | (0.895)   |           |           | (0.895)   |           |
| regeffi    | -0.0569   |           |           |           |           |           | -0.0824   |           |           | -0.3237   |           |
|            | (0.940)   |           |           |           |           |           | (0.911)   |           |           | (0.640)   |           |
| openmark   | 0.34554   |           | 0.5683    |           |           | 0.4362    |           |           |           | 0.6165    |           |
|            | (0.490)   |           | (0.334)   |           |           | (0.394)   |           |           |           | (0.246)   |           |
| proprig    |           | 0.8243    |           | 0.8136    |           | 0.8762    |           | 0.8769    |           | 0.7077    |           |
|            | (0.002)*  | (0.002)*  | (0.002)*  | (0.002)*  | (0.000)*  | (0.001)*  | (0.000)   | (0.000)   | (0.000)   | (0.002)*  | (0.003)*  |
| taxburden  |           |           |           | 0.7531    |           |           | 0.5571    |           |           | 0.5276    |           |
|            |           |           |           | (0.084)** |           |           | (0.218)   |           |           | (0.313)   |           |
| govspend   |           |           |           | -0.1501   |           |           | -0.1689   |           |           | -0.1523   |           |
|            |           |           |           | (0.033)*  |           |           | (0.025)*  |           |           | (0.013)*  |           |

(Continued)
| Variable      | Coefficient | Standard Error | Coefficient | Standard Error | Coefficient | Standard Error | Coefficient | Standard Error | Coefficient | Standard Error | Coefficient | Standard Error |
|---------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| busfree       | 0.1347      | 0.0765         | -0.03382    | 0.0935         | -0.0353     | 0.0946         | -           |                | -           |                | -           |                |
| monfree       | -0.3288     | 0.585          | -0.3557     | 0.522          | -0.1178     | 0.830          | -           |                | -           |                | -           |                |
| tradefree     | 0.0572      | 0.880          | 0.0869      | 0.832          | 0.2083      | 0.544          | -           |                | -           |                | -           |                |
| invfree       | -0.3288     | 0.585          | -0.3557     | 0.522          | -0.1178     | 0.830          | -           |                | -           |                | -           |                |
| finfree       | -0.0414     | 0.871          | 0.0561      | 0.840          | 0.0301      | 0.905          | -           |                | -           |                | -           |                |
| electedgov    | -0.0241     | 0.446          | -0.0775     | 0.112          | -0.7466     | 0.173          | -           |                | -           |                | -           |                |
| civilib       | -0.3623     | 0.131          | -0.7602     | 0.024          | -0.7052     | 0.059          | -           |                | -           |                | -           |                |
| rgdp          | 0.4802      | 0.000          | 0.4598      | 0.000          | 0.4827      | 0.000          | -           |                | -           |                | -           |                |
| constant      | -2.0305     | 0.169          | -2.2394     | 0.145          | -1.9789     | 0.177          | -           |                | -           |                | -           |                |
| F             | 488.85      | 0.000          | 767.861     | 0.000          | 1122.24     | 0.000          | 464.29      | 0.000          | 693.78      | 0.000          | 1213.7      | 0.000          |
| AB AR(1)      | 0.104       | 0.101          | 0.106       | 0.109          | 0.112       | 0.111          | 0.112       | 0.114          | 0.112       | 0.112          | 0.12        |                |
| AB AR(2)      | 0.538       | 0.559          | 0.587       | 0.566          | 0.68        | 0.555          | 0.568       | 0.596          | 0.573       | 0.63           |            |                |
| Hansen Test   | 0.65        | 0.667          | 0.673       | 0.651          | 0.702       | 0.654          | 0.669       | 0.75           | 0.647       | 0.661          |            |                |
| Diff-in-Hansen Test | 0.118 | 0.127          | 0.133       | 0.116          | 0.128       | 0.115          | 0.121       | 0.132          | 0.115       | 0.123          |            |                |
| N             | 546         | 546            | 546         | 546            | 546         | 546            | 546         | 546            | 546         | 546            |            |                |

Table 2. (Continued)
| No. of instruments | 67 | 70 | 74 | 67 | 70 | 74 | 67 | 70 | 74 | 67 | 70 | 74 | 67 | 70 | 74 | 67 | 70 | 74 | 67 | 70 | 74 |
|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Variables          | [12] | [13] | [14] | [15] | [16] | [17] | [18] | [19] | [20] | [21] | [22] | [23] | [24] | [25] | [26] | [27] | [28] | [29] | [30] | [31] | [32] |
| tew⁻¹              | 0.4721 [0.000]** | 0.5153 [0.000]* | 0.4896 [0.000]* | 0.4869 [0.000]* | 0.4891 [0.000]* | 0.4574 [0.000]* | 0.4489 [0.000]* | 0.5124 [0.000]* | 0.5052 [0.000]* | 0.489 [0.000]* | 0.4979 [0.000]* | 0.4891 [0.000]* | 0.4869 [0.000]* | 0.4891 [0.000]* | 0.4574 [0.000]* | 0.4489 [0.000]* | 0.5124 [0.000]* | 0.5052 [0.000]* | 0.489 [0.000]* | 0.4979 [0.000]* | 0.4891 [0.000]* |
| gi                 | -0.7637 [0.018]* | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| cpi                | - | -0.8214 [0.002]* | -1.1952 [0.001]* | -1.1099 [0.002]** | -0.5918 [0.057]** | -0.9271 [0.013]* | -0.9338 [0.012]* | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| cc                 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| oc                 | 0.6761 [0.018]* | 0.6395 [0.001]* | 0.7033 [0.000]* | 0.5701 [0.012]* | 0.6173 [0.003]* | 0.6318 [0.008]* | 0.5611 [0.006]* | 0.6901 [0.000]* | 0.7089 [0.000]* | 0.6179 [0.003]* | 0.6520 [0.000]* | 0.6331 [0.001]* | 0.5645 [0.024] | - | - | - | - | - | - | - |
| dsmw               | - | 2.1104 [0.002] | - | - | 1.8335 [0.010] | - | - | 1.9707 [0.002]** | - | - | 1.7094 [0.010] | - | - | - | - | - | - | - |
| ief-gi             | - | - | 0.1044 [0.676] | - | - | 0.0043 [0.987] | - | - | 0.0778 [0.777] | - | - | 0.0631 [0.811] | - | - | - | - | - | - | - |
| govsize            | - | - | -0.0579 [0.938] | - | - | -0.2869 [0.681] | - | - | -0.0238 [0.975] | - | - | -0.3609 [0.590] | - | - | - | - | - | - | - |
| regeffi            | - | - | 0.4822 [0.391] | - | - | 0.6148 [0.308] | - | - | 0.7128 [0.173]** | - | - | 0.6394 [0.263] | - | - | - | - | - | - | - |
| openmark           | 0.7452 [0.001]* | - | 0.8293 [0.001]* | 0.7961 [0.001]* | - | 0.7993 [0.001]* | 0.8103 [0.001]** | - | 0.6661 [0.015] | 0.6758 [0.008] | - | 0.6059 [0.017] | 0.6410 [0.006] | - | - | - | - | - | - | - |
| propprt            | -* | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | (Continued)
| Variable  | Estimate (SE) | Estimate (SE) | Estimate (SE) | Estimate (SE) | Estimate (SE) | Estimate (SE) | Estimate (SE) | Estimate (SE) | Estimate (SE) | Estimate (SE) |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| taxburden | 0.4993 (0.311)*** | - | - | 0.7063 (0.152)*** | - | - | 0.6366 (0.149)*** | - | - | 0.6520 (0.190)*** | - | - | 0.6610 (0.125)*** |
| govs pend | -0.1745 (0.012)** | - | - | -0.1651 (0.025)** | - | - | -0.1838 (0.018)** | - | - | -0.1545 (0.038)** | - | - | -0.1756 (0.024)** |
| busfree | -0.1276 (0.779) | - | - | -0.0021 (0.997) | - | - | -0.0969 (0.843) | - | - | -0.0877 (0.870) | - | - | -0.1027 (0.825) |
| monfree | -0.0770 (0.897) | - | - | -0.1673 (0.757) | - | - | -0.2557 (0.649) | - | - | -0.1083 (0.840) | - | - | -0.2340 (0.668) |
| tradefree | 0.2252 (0.614) | - | - | 0.0376 (0.930) | - | - | 0.4928 (0.904) | - | - | 0.2071 (0.696) | - | - | 0.0910 (0.857) |
| invfree | 0.2875 (0.177)*** | - | - | 0.2883 (0.187) | - | - | 0.3022 (0.221) | - | - | 0.2704 (0.288) | - | - | 0.2730 (0.310) |
| finfree | 0.0669 (0.788) | - | - | 0.0036 (0.989) | - | - | 0.0849 (0.758) | - | - | 0.1002 (0.717) | - | - | 0.1444 (0.622) |
| electedgov | - | -0.0152 (0.593) | -0.0792 (0.110)** | -0.0603 (0.275) | - | - | -0.0035 (0.904) | - | -0.0599 (0.329) | - | -0.0456 (0.329) | - | - | - |
| electedgov | -0.6066 (0.064)** | - | - | - | -0.2518 (0.314) | -0.6385 (0.041)** | -0.5947 (0.088)** | - | -0.0456 (0.329) | - | - | -0.1674 (0.556) | -0.4193 (0.224) | -0.3738 (0.315) |
| rgdp | 0.5294 (0.000) | 0.4877 (0.000)* | 0.5028 (0.000)* | 0.5091 (0.000)* | 0.5145 (0.000) | 0.5366 (0.000) | 0.5505 (0.000) | 0.5091 (0.000)* | 0.5223 (0.000) | 0.5380 (0.000) | 0.5153 (0.000) | 0.5328 (0.000) | 0.5558 (0.000) | 0.5558 (0.000) |
| constant | -2.4702 (0.134)*** | -1.9034 (0.130)*** | -2.1075 (0.167)*** | -2.0167 (0.275)*** | -2.0544 (0.140)*** | -2.3179 (0.139)*** | -2.3397 (0.045)** | -2.5138 (0.038)*** | -3.0572 (0.079)** | -2.9290 (0.079)** | -2.3403 (0.072)** | -2.7377 (0.072)** | -2.7441 (0.093) | (Continued) |
| F     | 594.01 | 811.19 | 1173.72 | 493.81 | 637.64 | 989.23 | 603.21 | 788.32 | 897.97 |
|-------|--------|--------|---------|--------|--------|--------|--------|--------|--------|
| AR(1) | 0.119  | 0.105  | 0.108   | 0.111  | 0.108  | 0.111  | 0.111  | 0.112  | 0.109  |
| AR(2) | 0.668  | 0.541  | 0.561   | 0.629  | 0.682  | 0.613  | 0.679  | 0.718  | 0.611  |
| Hansen Test | 0.707 | 0.664 | 0.669 | 0.629 | 0.682 | 0.666 | 0.679 | 0.656 | 0.651 |
| Diff-in-Hansen Test | 0.126 | 0.117 | 0.13 | 0.117 | 0.125 | 0.129 | 0.117 | 0.128 | 0.114 |
| N     | 546    | 546    | 546     | 546    | 546    | 546    | 546    | 546    | 546    |
| No.of instruments | 74 | 70 | 70 | 74 | 74 | 67 | 70 | 67 | 74 |

Standard errors on 0.**, and *** significance at 1%, 5% and 10%, respectively.

Source: own elaboration.
Table 3. Sensitivity analysis of extreme wealth determinants in selected countries (sys-GMM)

| Variables   | [1]       | [2]       | [3]       | [4]       | [5]       | [6]       | [7]       | [8]       | [9]       | [10]      | [11]       |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| tew, t-1    | 0.5460    | [0.000]*  | 0.5611    | [0.000]*  | 0.5134    | [0.001]*  | 0.5160    | [0.000]*  | 0.4955    | [0.004]*  | 0.4557      | [0.000]*    |
| gi          | -0.4459   | [0.039]*  | -0.7675   | [0.025]*  | -0.4982   | [0.120]***| -0.2868   | [0.083]** | -0.6531   | [0.073]** | -0.6207      | [0.174]**   |
| cpi         |           |           |           |           |           |           |           |           |           |           |             |
| cc          |           |           |           |           |           |           |           |           |           |           |             |
| ac          |           |           |           |           |           |           |           |           |           |           |             |
| dsmw        | 0.6801    | [0.000]*  | 0.6818    | [0.002]*  | 0.5301    | [0.016]*  | 0.6108    | [0.000]*  | 0.5200    | [0.042]** | 0.6220      | [0.008]*    |
| ief-gi, t-1 | 1.5390    | [0.040]*  | -         | -         | 1.3288    | [0.075]** | -         | -         | 0.4216    | [0.580]   | -           |             |
| govsize, t-1| -         | -0.0611   | [0.771]   | -         | -0.0740   | [0.769]   | -         | -         | 0.3325    | [0.096]** | -           | -           |
| regeffi, t-1| -         | -0.1900   | [0.790]   | -         | -0.5069   | [0.459]   | -         | -         | -1.2175   | [0.102]** | -1.2381     | [0.047]*    |
| openmark, t-1| -         | 0.3844    | [0.409]   | -         | 0.6323    | [0.253]   | -         | -         | 0.0456    | [0.918]   | -           | 0.3876      |
| proprig, t-1| -         | 0.6410    | [0.008]*  | 0.5333    | [0.053]** | -         | 0.7426    | [0.016]*  | 0.7558    | [0.0458]  | -1.1651     | [0.429]     |
| taxburd, t-1| -         | -         | 1.0824    | [0.104]** | -         | 0.8037    | [0.142]** | -         | -         | 1.5449    | [0.007]*    |
| gospends, t-1| -         | -         | -0.2878   | [0.187]***| -         | -0.3097   | [0.152]** | -         | -         | -0.3048   | [0.140]**   |
| busfree, t-1| -         | -         | -0.1672   | [0.667]   | -         | -0.3057   | [0.426]   | -         | -         | -0.5277   | [0.228]     |
| monfree, t-1| -         | -         | -0.1514   | [0.769]   | -         | -0.1783   | [0.767]   | -         | -         | -0.7163   | [0.325]     |

(Continued)
| Variables     | [1]  | [2]  | [3]       | [4]  | [5]  | [6]       | [7]  | [8]  | [9]       | [10] | [11] |
|---------------|------|------|-----------|------|------|-----------|------|------|-----------|------|------|
| tradefree_{t-1} | -    | -    | -0.0566 [0.921] | -    | -    | 0.0533 [0.933] | -    | -    | -0.5276 [0.328] | -    | -    |
| invfree_{t-1}   | -    | -    | 0.0762 [0.718]   | -    | -    | 0.1766 [0.408]   | -    | -    | -0.0387 [0.857]   | -    | -    |
| finfree_{t-1}   | -    | -    | 0.1411 [0.599]   | -    | -    | 0.2598 [0.352]   | -    | -    | 0.2590 [0.349]   | -    | -    |
| electedgov_{t-1} | -0.0247 [0.528] | -0.0741 [0.115]** | -0.0258 [0.763] | -    | -    | -0.0184 [0.697] | 0.0421 [0.121]** | 0.0878 | -    | -    |
| civlib_{t-1}    | -    | -    | -0.3785 [0.140]** | -0.7969 [0.094] | -0.7962 [0.059]** | -    | -    | -0.6091 [0.070]** | -0.6722 [0.108]** |
| rgdp_{t-1}      | 0.4253 [0.000]** | 0.4223 [0.001]** | 0.4706 [0.001]** | 0.4630 [0.000]** | 0.4853 [0.000]** | 0.5413 [0.001]** | 0.3968 [0.001]** | 0.3775 [0.002]** | 0.4408 [0.005]** | 0.4541 [0.001]** | 0.4551 [0.001]** |
| constant        | -1.0028 [0.522] | -1.6340 [0.307] | -1.4393 [0.434] | -1.3464 [0.316] | -1.9003 [0.223] | -2.2148 [0.167]** | -0.4866 [0.981] | 0.0348 [0.989] | -0.0240 [0.583] | -0.8689 [0.687] | -0.7321 [0.687] |
| F              | 408.16 [0.000] | 449.11 [0.000] | 595.21 [0.000] | 473.41 [0.000] | 662.65 [0.000] | 694.86 [0.000] | 393.03 [0.000] | 484.11 [0.000] | 692.35 [0.000] | 376.85 [0.000] | 469.79 [0.000] |
| AB AR(1)       | 0.086 | 0.087 | 0.074 | 0.086 | 0.088 | 0.072 | 0.091 | 0.105 | 0.086 | 0.096 | 0.102 |
| AB AR(2)       | 0.839 | 0.879 | 0.894 | 0.888 | 0.964 | 0.727 | 0.865 | 0.608 | 0.722 | 0.88 | 0.779 |
| Hansen Test    | 0.609 | 0.630 | 0.630 | 0.607 | 0.623 | 0.635 | 0.618 | 0.620 | 0.642 | 0.609 | 0.628 |
| Diff-in-Hansen Test | 0.116 | 0.122 | 0.120 | 0.115 | 0.118 | 0.127 | 0.116 | 0.123 | 0.125 | 0.114 | 0.120 |
| N              | 546 | 546 | 546 | 546 | 546 | 546 | 546 | 546 | 546 | 546 | 546 |
| No. of instruments | 66 | 69 | 73 | 66 | 69 | 73 | 66 | 69 | 73 | 66 | 69 |

(Continued)
| [12] | [13] | [14] | [15] | [16] | [17] | [18] | [19] | [20] | [21] | [22] | [23] | [24] |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| -0.6926 | 0.6567 | 0.6457 | 0.6428 | 0.6992 | 0.5105 | 0.6738 | 0.8882 | 1.1191 | -0.2997 | 0.0887 | 0.8482 | -0.0237 |
| 1.0246 | 0.6985 | 0.6482 | 0.6304 | 0.5153 | 0.5050 | 0.5032 | 0.1401 | -0.0312 | 0.0887 | 0.9070 | 0.1401 | 0.0145 |
| -0.7309 | -0.3133 | -0.2794 | -0.2818 | -0.1145 | -0.1366 | -0.3566 | -0.4885 | 0.0429 | -0.1145 | 0.0145 | -0.3566 | -0.4885 |
| 0.2870 | 0.7017 | 0.5646 | 0.7160 | 0.6036 | 0.6828 | 0.6828 | 0.7365 | 0.6135 | 0.0800 | 0.0007 | 0.0669 | 0.0107 |
| -0.6926 | -1.0136 | -0.8717 | -0.5476 | -0.7280 | -0.7309 | -0.7280 | -1.0136 | -0.0348 | -0.0348 | -0.0348 | -0.0348 | -0.0348 |
| 0.6567 | 0.1170 | 0.9669 | 0.9669 | 0.9669 | 0.9669 | 0.9669 | 0.9669 | 0.9669 | 0.9669 | 0.9669 | 0.9669 | 0.9669 |
| -0.4479 | -0.4479 | -0.4479 | -0.4479 | -0.4479 | -0.4479 | -0.4479 | -0.4479 | -0.4479 | -0.4479 | -0.4479 | -0.4479 | -0.4479 |
| 0.7080 | 0.7080 | 0.7080 | 0.7080 | 0.7080 | 0.7080 | 0.7080 | 0.7080 | 0.7080 | 0.7080 | 0.7080 | 0.7080 | 0.7080 |
| -0.0348 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 |
| 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| 0.7267 | 0.7267 | 0.7267 | 0.7267 | 0.7267 | 0.7267 | 0.7267 | 0.7267 | 0.7267 | 0.7267 | 0.7267 | 0.7267 | 0.7267 |
| -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 | -0.0307 |
| 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

Table 3. (Continued)
Table 3. (Continued)

| [12] | [13] | [14] | [15] | [16] | [17] | [18] | [19] | [20] | [21] | [22] | [23] | [24] |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| -0.7752 | - | - | 0.0434 | - | - | -0.0887 | - | - | 0.1349 | - | - | -0.1088 |
| [0.291] | [0.919] | [0.884] | [0.841] | [0.856] | [0.1118] | [0.869] |
| -0.4386 | - | - | 0.0405 | - | - | 0.0311 | - | - | 0.1359 | - | - | 0.1886 |
| [0.428] | [0.951] | [0.961] | [0.839] | [0.869] | [0.440] | [0.466] |
| 0.0948 | - | - | 0.1790 | - | - | 0.2004 | - | - | 0.1416 | - | - | 0.0311 |
| [0.696] | [0.468] | [0.362] | [0.839] | [0.466] | [0.961] | [0.440] |
| 0.3500 | - | - | 0.1568 | - | - | 0.2221 | - | - | 0.2199 | - | - | 0.0311 |
| [0.146]** | [0.586] | [0.370] | [0.393] | [0.440] | [0.961] | [0.440] |
| -0.6723 | - | - | -0.0193 | - | - | -0.0471 | - | - | -0.0611 | - | - | -0.02681 |
| [0.357] | [0.139]*** | [0.516] | [0.334] | [0.587] | [0.139]*** | [0.516] |
| -0.6723 | - | - | -0.0193 | - | - | -0.0471 | - | - | -0.0611 | - | - | -0.02681 |
| [0.144]** | [0.357] | [0.139]*** | [0.516] | [0.334] | [0.587] | [0.139]*** | [0.516] |
| 0.5065 | 0.4614 | 0.4434 | 0.4902 | 0.4714 | 0.4915 | 0.5449 | 0.4661 | 0.5031 | 0.4804 | 0.4895 | 0.5448 |
| [0.001]* | [0.001]* | [0.001]* | [0.001]* | [0.001]* | [0.001]* | [0.001]* | [0.001]* | [0.001]* | [0.001]* | [0.001]* | [0.001]* |
| -0.8504 | -1.1405 | -1.2145 | -1.2910 | -1.2773 | -1.7625 | -1.9904 | -1.7106 | -1.9405 | -1.6917 | -1.9873 | -2.1862 |
| [0.669] | [0.438] | [0.436] | [0.376] | [0.239] | [0.220] | [0.272] | [0.209] | [0.324] | [0.245] | [0.206] | [0.228] |
| 718.28 | 430.97 | 624.56 | 702.93 | 702.80 | 410.54 | 519.71 | 590.49 | 413.28 | 617.46 | 592.84 | 73 |
| [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| 0.084 | 0.085 | 0.089 | 0.074 | 0.085 | 0.089 | 0.072 | 0.084 | 0.087 | 0.073 | 0.086 | 0.089 |
| 0.969 | 0.907 | 0.972 | 0.787 | 0.919 | 0.992 | 0.686 | 0.817 | 0.842 | 0.908 | 0.858 | 0.898 |
| 0.649 | 0.610 | 0.614 | 0.630 | 0.605 | 0.609 | 0.632 | 0.608 | 0.630 | 0.644 | 0.607 | 0.615 |
| 0.124 | 0.115 | 0.119 | 0.127 | 0.134 | 0.116 | 0.126 | 0.117 | 0.118 | 0.12 | 0.115 | 0.116 |
| 546 | 546 | 546 | 546 | 546 | 546 | 546 | 546 | 546 | 546 | 546 | 546 |
| 73 | 66 | 69 | 73 | 66 | 69 | 73 | 66 | 69 | 73 | 66 | 69 |

Standard errors on ( ), * , ** , and *** significance at 1%, 5% and 10%, respectively.
Source: own elaboration.
Given its economic and lobbying power, as well as its extensive resources, the corrupt system tends to perpetuate itself. As corruption continues over time, it reinforces itself, strengthening the existing links between people and entities and expanding the areas for corruption processes, concentrating power and richness. Following Lambsdorff et al. (2005), corruption as a phenomenon could intensify existing institutional weakness and lead to a self-reinforcing process of moral decline and social disintegration, as well as to social disorganization that does more complex to remove or eliminate the accumulated effect of corruption, which feeds the longer-term implications for greater wealth, growth and equality in the affected countries.

Thus, whether it is because of the existence of a strong kleptocratic system or one where power groups put pressure on the government, the evidence suggests that total extreme wealth of a country tends to be boosted from corruption.

The above has negative effects on such economic variables like growth (Gründler & Potrafke, 2019; Ivanyna et al., 2018), inequality (Ariely & Uslaner, 2017; Gupta et al., 2002), employment (Tomic, 2018), and poverty (Dincer & Gunalp, 2008; Gupta et al., 2002). In short, the greater negative externalities of corruption are mainly paid by economic actors which operate outside of the grand corruption network, while the wealthy, inside it, keep accumulating political power, savings and wealth.6

3.2. Self-made wealth

However, statistical significance is also found throughout the specifications of the variable of self-made wealth. This means that legal mechanisms that generate wealth, such as the creation of companies, being a top executive of a large corporation, investing in financial markets or trading globally, among other resources that billionaires possess, favour extreme accumulation. Therefore, considering the two results, it can be inferred that the nation accumulated ultra-wealth is achieved both by legal and illegal means, or in other words, that part of these great fortunes may be associated with corruption and the other is effectively self-obtained within the national legal framework. This result is similar to that indicated by Bagchi and Svejnar (2015), who point out that some billionaires acquired wealth through the use of political connections or cronyism, while others obtained it in a relatively standard legal environment. In any case, the finding suggests a need to consider (identify and monitor) the sources and nature of extreme wealth.

3.3. Control variables

Considering control variables in the model, other relevant results are obtained. Economic freedom (excluding government integrity) also fosters extreme wealth. In all the cases, this variable is significant at 1% and with positive sign. A similar result is found by Torgler and Piatti (2013). In particular, free movement of capital allows investment to tend toward more profitable sectors, thus enriching the owners of capital and promoting their concentration.

Specifically, the sign and significance of the coefficient related to property rights, as expected, suggests the existence of a positive effect on extreme wealth. This result is in line with that of Prinz (2016). The property rights variable is linked to a legal framework that assures private property and its use. Thus, corporations owned by super rich people enjoy a bias in the legal framework that partially supports their activities and outcomes.

Contrary to expectations, the sign of the significant coefficient of tax burden is positive, which means that an increase in, for example, the top marginal tax rate on individual or corporate income does not even discourage the creation of extreme wealth, but rather encourages it. Independently of the corruption index or the control variables used, all the estimations show the same result.

This is in contrast to the findings of Valscho and Kelly (2012) who establish that the increase in super-wealth comes from lower tax rates on higher incomes. Nevertheless, they are consistent
with Troiano (2017) who found that income inequality, which implies a greater gap between the richer and the poorer, raised after different policy measures oriented towards improving income distribution. Consequently, this kind of top marginal taxes is a source of economic inefficiencies (Jacobs, 2015).

Moreover, corruption in practice could lead to biases in the tax system in favour of the rich, making the tax system effectively a regressive one, so the poor are the ones who bear the greatest tax burden (Li et al., 2000). In any case, taxes are on income and not on wealth, so even when covering the tax burden, the super-rich have a margin to continue accumulating wealth.

Government spending is systematically significant at 1%, and invariably shows a negative sign. Since the sub-index rating is not linear, penalizing both government spending below 30% of GDP and that above 58%, negative coefficients imply that both relatively small public spending and high spending lead to increases in extreme wealth. Only a set of public consumption and payment transfers that represents a budget balanced may increase the sub-index and, as a result, restrict ultra-wealth.

Poor public investment leaves room for investments and accumulation of companies owned by the wealthier and, in particular, by those with political power and other types of connections—possibly linked to corruption-. This could be most present in countries with low state intervention in economics.

On the other hand, excessive public investment, far from representing a crowding out of the private capital of the billionaires, opens up opportunities for enrichment based not on market efficiency, but on relationships between corrupt senior public officials and powerful entrepreneurs or by putting pressure on the government in order to obtain privileges (Jacobs, 2015). This could be the situation of participatory-state countries. The idea that a high public spending, for social and welfare purposes, could co-exist with super-richness was also stated by Neumayer (2004).

In any case, government actions shape decisions about private capital. Thus, a low or high public investment encourages the wealthy to rent-seeking behaviour that allows them to capture income and wealth that in any other situation they would not secure. Moreover, this is in line with the argument that public spending policies are not doing enough to redistribute from the richest to the poorest (Oxfam, 2017).

Considering civil liberties, all specifications find significant coefficients at either 1%, 5%, or 10%. Nevertheless, contrary to expectations, the signs are negative. This means that enhancing human rights, such as freedoms of expression, association, religion, movement, and personal integrity may reduce super fortunes. This finding is opposite to that of Anwar and Cooray (2012) who claim that improvements in political rights and civil liberties enhance the benefits of the financial system.

One possible explanation, in line with Graf (2003), is that huge capital owners might be in a politically advantaged position to protect their interests even in an environment where civil liberties are strong. In this respect, Johnston (2009) establishes that there are new ways to move the benefits derived from illegal actions across borders. For example, they might move their capitals to some tax paradise or change the company's legal charters. Following Oxfam (2016) the existence of an elaborate system of tax havens and an industry of wealth managers would represent a mechanism to do that.

Moreover, governments that tend to respect human and economic rights, compel the corrupts to search for illegal ways to maximize their economic benefits. This reinforces the idea that the ultra-rich might obtain benefits derived from their political connections, which in turn may distort
markets in their favour. This mainly occurs when corruption is in the economic and political structures because it prevents the compliance of basic rights (Johnston, 2009).

Finally, the results show that enhanced civil rights are associated with lower extreme wealth. But Busse (2004), finds both positive and negative evidence of civil liberties on foreign investment, a great source of extreme fortunes. In this respect, more evidence is necessary to conclude about this effect.

In just a few cases, the elected government coefficient is negative and significative at 10%. This suggests that democracy, based on popular elections or effective opportunities for the population to be elected to some public office, among others, helps to restrain extreme wealth.

In this sense, literature has identified the elements of good governance such as effective, representative, transparent and accountable government institutions. In particular, Charron and Lapuente (2009) argue that, after a certain degree of wealth, democratic states have stronger incentives to do the best for their nation’s development. Profeta et al. (2013) found evidence that the political strength of democratic institutions contributes to taxation. An extension of this idea is that democratic governments can establish measures to face extreme inequality. Thus, the democratically elected government seems to represent a counterbalance to the economic power of the oligarchies. Nevertheless, Johnston (2009) identified that, in some cases, corruption and “democracy” allow the rich to get richer even at the expense of everyone else. Consequently, more evidence is required in this regard.

With respect to the economic variable, its significance is observed in all the specifications at 1%. The results suggest that when general economic conditions improve, the fortune in the hands of the very rich also does. As the economic activity of a country faces better conditions, that is, GDP expands, the rich people go through a process of enriching because the base of their fortune is strengthened.

A similar result was found by Volscho and Kelly (2012). They assert that a higher GDP per capita, related to a bigger market, might induce greater wealth since that economy includes wealthier people. As a corollary, in global politics, power and influence are a function of a country’s GDP size (Oxfam, 2017). Accordingly, the greater the GDP of a given country, the greater their total super-richness, the greater their global power.

While the above is an expected result, it should be noted that the political and institutional dimensions tend to contribute more to extreme wealth than the economic variable (GDP). This suggests that factors such as lobbying (or even corruption) are in the structure of extreme wealth. Finally, the remaining control variables are not systematically significant through the specifications. Since these variables include aspects directly related to economic factors, the above idea is reinforced.

Lastly, Table 2 also reports the p-values for Hansen, Diff-in-Hansen, and AR(1) and AR(2) Tests. In all specifications, the test does not reject the null hypothesis, neither of joint validity of instruments nor of additional instruments. Furthermore, as expected, there is no evidence of second-order autocorrelation around the specifications. The results suggest that each specification is well specified as a sys-GMM model in the context of extreme wealth determinants.

3.4. Sensitivity analysis
The general explanatory power was maintained when other control variables were included (such as population, GDP per capita, the Gini index, and the favouritism index) or some of the original ones excluded. Alternatively, explanatory variables were lagged as instruments to evaluate the sensitivity of the results. In general, both the significance and the signs remained. In addition, specification tests consistently indicate that the sys-GMM estimator is better than the first
difference GMM. In summary, the reported specifications are well defined and robust, so they accurately reflect the effects of the variables on extreme wealth.

Briefly, it can be seen in Table 3 that coefficients of corruption are systematically significant and keep the estimated signs. This reinforces the hypothesis that corruption tends to foster extreme wealth at the country level. In this respect, corrupt economic environments act as a vehicle that allows accumulating extreme wealth in oligarchies, in line with Torgler and Piatti (2013) argument. Finally, although the results are robust, a more in-depth investigation should consider cultural aspects and other individual characteristics of the wealthiest, as well as the sectoral differences that are the source of this accumulation. Likewise, deeper exploration should directly discuss the effect of political regimes and the propensity of laissez-faire economies to generate extreme wealth.

4. Conclusions
According to the results, it is clear that legal mechanisms are the main statistically significant factors of extreme wealth. However, since corruption is also a significant determinant of ultra-richness, it could be concluded that some fortunes are obtained by self-made efforts and legal resources, while others are connected to non-legal mechanisms, such as corruption.

In this sense, the main finding shows that corruption positively affects extreme wealth in all the specifications, which includes different variables linked to political/institutional and economic factors. Given the robust evidence, it is stated that this phenomenon acts as a greasing wheel that contributes to extreme wealth for a set of 42 countries over the period 2005–2018.

When economic elites exercise their political and economic power to obtain some benefit from the public power, centralize the proceeds of grand corruption forms. As a result, the super-rich, or at least some of them, face incentives to perform these types of acts since they contribute to increase their wealth. This tends to perpetuate the corrupt system and, at the same time, make it complex to eliminate the accumulated effect of corruption in the affected countries. As a corollary, the negative externalities of corruption are mainly paid by common individuals outside of the grand corruption network.

The findings also evidence the positive statistical effect of economic and political variables on extreme wealth. In general, economic freedom, excluding government integrity, boosts extreme wealth. Specifically, it is found that property rights systems encourage super- fortunes mainly via new investments and reinvestment from wealthy individuals. Furthermore, the tax system could be biased in favour of the wealthy, which means that, for instance, top marginal tax rates on individual or corporate income encourage richness. In respect of government spending, unbalanced public budgets, that is relatively low or high public consumption, tend to foster ultra-wealth. However, these kinds of public spending policies do not redistribute from the richest to the poorest.

Interestingly, civil liberties show a negative effect on super fortunes; enhancing human rights, such as freedoms of expression, association, movement, and so on may reduce them. Nevertheless, given the growing path of extreme wealth, it is possible that super rich people enjoy a politically advantageous position protecting their interests. Democratically elected governments represent a counterbalance to the power of the economic oligarchies although it is possible that corruption and democracy coexist favouring great fortunes.

Lastly, as it was expected, as GDP expands the wealthy get richer. In this sense, economic activity represents the basis of their huge fortune. In any case, the effect of political and institutional dimensions on extreme wealth is bigger than the economic variable. Thus, corruption among other factors, such as lobbying, is in the structure of extreme wealth.
Consequently, as Johnston (2009) argued, corruption benefits the few (billionaires and those inside the corruption network) at the expense of the many; it delays and distorts economic development, preempts basic rights, and diverts public resources from basic services. In brief, as Saez and Zucman (2020) state, an extreme concentration of wealth means an extreme concentration of power: the power to influence government policy, the power to stifle competition, and the power to shape ideology.

As in many cases, the rent-seeking behaviours mean capturing income and wealth that one did not produce, for example, through pressure on the government to obtain privileges (Jacobs, 2015), then a choice to control the larger fortunes, and move toward equality, are public and private anti-corruption measures that restrict those behaviours. Another way to control extreme wealth is a public investment of high quality that promotes more public well-being.

Acknowledgements
The authors would like to thank two anonymous reviewers for comments on earlier draft.

Disclosure statement
No potential conflict of interest was reported by the authors.

Funding
This work was supported by the Instituto Politecnico Nacional [IPN- SIP20202071].

Author details
Héctor Flores Marquez1
Ana Lilía Valderrama Santibáñez1
Gerardo Angeles Castro2
Omar Neme Castillo1
E-mail: onemec@ipn.mx
1 Instituto Politécnico Nacional. Escuela Superior De Economía, Plan De Agua Prieta 66, Plutarco Elias Calles, 01150, Miguel Hidalgo, Mexico City, Mexico.
2 Instituto Politécnico Nacional. Dirección De Prospectiva E Inteligencia Tecnológica, Tecnópoli. Av. Wilfrido Massieu S/N, Edificio Tecnopoli, Zacatenco, 07738, Gustavo A. Madero, Mexico City, Mexico.

Citation information
Cite this article as: Corruption and extreme wealth. Evidence at country level, Héctor Flores Marquez, Ana Lilía Valderrama Santibáñez, Gerardo Angeles Castro & Omar Neme Castillo, Cogent Social Sciences (2021), 7: 1910163.

Notes
1. The four corruption indices show high correlations as they have common data sources or are used as variables in their respective calculations. The correlation coefficients are as follows: gci-cpi: 0.97; gci-ac: 0.88; gi-ac: 0.87; gi-cc: 0.60; cpi-cc: 0.59; and cc-ac: 0.52. However, they maintain conceptual differences.
2. Following Heritage Foundation, in economically free societies, governments allow labour, capital, and goods to move freely, and refrain from coercion or constraint of liberty beyond the extent necessary to protect and maintain liberty itself.
3. The score of GII is the equally weighted average scores of six sub-factors: public trust in politicians; irregular payments and bribes; transparency of government policymaking; absence of corruption; perceptions of corruption, and governmental and civil service transparency.
4. For WGI governance consists of the traditions and institutions by which authority in a country is exercised, including the process by which governments are selected, monitored, and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them.
5. Democracy is conceptualized as popular control over public decision-making and decision-makers, and equality of respect and voice between citizens in the exercise of that control.
6. It should be noted that control of corruption index has the greatest mean effect on extreme-wealth (−0.93), following by absence of corruption index (−0.91), corruption perception index (−0.78), and government integrity index (−0.71). In this sense, considering the different meanings of the indices, it could be interpreted that both petty and grand forms of corruption, as well as the seized of state by elites are the factors that contribute the most to super-richness (control of corruption approach). It is followed by the abuse of public power for private gains along the whole public administration as a mechanism that favours corruption opportunities of the wealthy people (absence of corruption approach).
7. In the case of lower income countries, the empirical results could also be associated with the idea of human rights illusion, that is, fragile democracies pursue strategies around human rights, even reforming legal frameworks, but in practice liberties are not guaranteed.

References
Acemoglu, D., & Robinson, J. A. (2014). Por qué fracasan los países. Los orígenes del poder, la prosperidad y la pobreza. Revista Austral de Ciencias Sociales, 26(8), 139–146. https://doi.org/10.4206/rev.austral.cienc.soc.2014.n26-08
Ahmad, E., Ullah, M., & Arfeen, M. (2012). Does corruption affect economic growth? LatinAmerican Journal of Economics, 49(2), 277–305. http://dx.doi.org/10.7766/LAJE.v49i2.277
Akçay, S. (2006). Corruption and human development. The Cato Journal, 26(1), 29–48. http://www.cato.org/sites/cato.org/files/serialsJournals/j512006/cj26n1-2.pdf
Allen, F., Qian, J., & Shen, L. (2018). “Corruption and competition”. CEPR Discussion paper, 13218. https://ssrn.com/abstract=3262543
Anwar, S., & Cooray, A. (2012). Financial development, political rights, civil liberties and economic growth: Evidence from South Asia. Economic Modelling, 29(3), 974–981. https://doi.org/10.1016/j.econmod.2012.02.009
Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-component models. Journal of Econometrics, 68(1), 29–51. https://doi.org/10.1016/0304-4076(94)01642-D
Arlely, G., & Uslaner, E. (2017). Corruption, fairness, and inequality. International Political Science Review, 38
(3), 349–362. https://doi.org/10.1177/0192511116641091
Bagchi, S., & Svejnar, J. (2015). Does wealth inequality matter for growth? The effect of billionaire wealth, income distribution, and poverty. Journal of Comparative Economics, 43(3), 505–530. https://doi.org/10.1016/j.jce.2015.04.002
Baum, C., Schaffer, M. and Stillman, S. (2003). Instrumental variable and GMM: estimation and testing. Stata Journal, 3(1):1–31.
Benfratello, L., Del Monte, A., & Pennacchio, L. (2018). Corruption and public debt: A cross-country analysis. Applied Economics Letters, 25(5), 340–344. https://doi.org/10.1080/13504851.2017.1321831
Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics, 87(1), 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8
Blundell, R., & Bond, S. (2000). GMM estimation with persistent panel data: An application to production functions. Econometric Reviews, 19(3), 321–340. https://doi.org/10.1080/07474939300880475
Busse, M. (2004). Transnational Corporations and repres-

...
Policardo, L., & Sánchez, J. (2018). Corruption causes inequality, or is it the other way around? An empirical investigation for a panel of countries. Economic Analysis and Policy, 59(4), 92–102. https://doi.org/10.1016/j.eap.2018.05.001

Prinz, A. (2016). Do capitalist institutions breed billionaires? Empir Economics, 51(4), 319–332. https://doi.org/10.1007/s00181-015-1058-0

Profeta, P., Puglisi, R., & Scabrosseti, S. (2013). Does democracy affect taxation and government spending? Evidence from developing countries. Journal of Comparative Economics, 41(3), 684–718. https://doi.org/10.1016/j.jce.2012.10.004

Purje, H., & Nilsson, E. (2015). Extreme poverty and extreme wealth. KEPA Policy Briefs, 19. Finish Service Centre for Development Cooperation (KEPA), https://www.fingo.fi/sites/default/tiedostot/julkaisut/extreme-poverty-and-extreme-wealth.pdf

Saez, E., & Zucman, G. (2020). Taxing the superrich. Boston Review, 9(2020). http://bostonreview.net/forum/emmanuel-saez-gabriel-zucman-taxing-superrich

Slemrod, J. (1992). Does taxes matter? Lessons from the 1980s. American Economic Review, 82(2), 250–256. https://www.jstor.org/stable/2117409

Sussman, L., Dubofsky, D., Levitan, A., & Swidan, H. (2014). Good rich, bad rich: Perceptions about the extremely wealthy and their sources of wealth. International Journal of Bus and Social Res, 4(8), 44–57. http://dx.doi.org/10.18533/bsr.v4i8.585

Tomic, I. (2018). What drives youth employment in Europe? Economic vs non-economic determinants. International Labour Review, 157(3), 379–408. https://doi.org/10.1111/ilr.12113

Torgler, B., & Piatti, M. (2013). Extraordinary wealth, globalization, and corruption. Review of Income and Wealth, 59(2), 341–359. https://doi.org/10.1111/roiw.12027

Troiano, U. (2017). “Do taxes increase economic inequality? A comparative study based on the state personal income tax”. NBER Working pap., No. 24175. https://www.nber.org/papers/w24175.pdf

Volscho, T., & Kelly, N. (2012). The rise of the super-rich: Power resources, taxes, financial markets, and the dynamics of the top 1 percent, 1949 to 2008. American Sociological Review, 77(5), 679–699. https://doi.org/10.1177%2F0003125512458508

Wade, R. (2004). Is globalization reducing poverty and inequality? World Development, 32(4), 567–589. https://doi.org/10.1016/j.worlddev.2003.10.007

Appendix

Table A1. Summary statistics for extreme wealth data

| Year | Number of billionaires | Total extreme wealth (sum of extreme wealth for all countries) ($) | Total extreme wealth average (by country, $) | Total extreme wealth average (by billionaire, $) | Total extreme wealth average as a percentage of GDP (%) |
|------|-----------------------|---------------------------------------------------------------|--------------------------------------------|-------------------------------------------------|------------------------------------------------------|
| 2005 | 667                   | 2,572.3                                                       | 61.2                                       | 3.9                                             | 3.46                                                 |
| 2006 | 760                   | 2,903.4                                                       | 69.1                                       | 3.8                                             | 3.52                                                 |
| 2007 | 901                   | 3,703.0                                                       | 88.2                                       | 4.1                                             | 3.90                                                 |
| 2008 | 1,071                 | 4,631.9                                                       | 110.3                                      | 4.3                                             | 4.41                                                 |
| 2009 | 752                   | 2,519.7                                                       | 60.0                                       | 3.4                                             | 2.50                                                 |
| 2010 | 968                   | 3,697.4                                                       | 88.0                                       | 3.8                                             | 3.32                                                 |
| 2011 | 1,140                 | 4,551.5                                                       | 108.4                                      | 4.0                                             | 3.61                                                 |
| 2012 | 1,157                 | 4,560.4                                                       | 108.6                                      | 3.9                                             | 3.49                                                 |
| 2013 | 1,337                 | 5,314.4                                                       | 126.5                                      | 4.0                                             | 3.90                                                 |
| 2014 | 1,537                 | 6,305.7                                                       | 150.1                                      | 4.1                                             | 4.51                                                 |
| 2015 | 1,689                 | 6,931.3                                                       | 165.0                                      | 4.1                                             | 5.22                                                 |
| 2016 | 1,724                 | 8,945.4                                                       | 213.0                                      | 5.2                                             | 6.44                                                 |
| 2017 | 1,929                 | 10,564.5                                                      | 251.5                                      | 5.5                                             | 7.16                                                 |
| 2018 | 2,095                 | 12,564.9                                                      | 299.2                                      | 6.0                                             | 8.03                                                 |
| Growth rate 05–18 (%) | 214.1             | 388.5                                                        | 388.5                                      | 55.5                                           | 131.7                                                 |

Note: calculations consider variables in billions of real US dollars (2018 = 100).
Source: own elaboration.
| Variable | Obs | Mean | Std. Dev. | Min  | Max  |
|----------|-----|------|-----------|------|------|
| tew      | 588 | 24.391 | 1.481     | 20.72 | 31.33 |
| gi       | 588 | -0.629 | 0.439     | -1.66 | -0.05 |
| cpi      | 588 | -0.629 | 0.427     | -1.61 | -0.05 |
| cc       | 588 | 1.211  | 0.257     | 0.00  | 1.39  |
| ac       | 588 | -0.513 | 0.383     | -2.06 | -0.03 |
| dsmw     | 588 | 0.964  | 0.186     | 0.00  | 1.00  |
| ief-gi   | 588 | -0.384 | 0.135     | -0.80 | -0.09 |
| govsizex | 588 | -0.522 | 0.360     | -1.78 | -0.07 |
| regeffi  | 588 | -0.273 | 0.137     | -0.71 | -0.04 |
| openmark | 588 | -0.401 | 0.223     | -1.06 | -0.09 |
| proprig  | 588 | -0.520 | 0.439     | -1.90 | -0.02 |
| taxburden| 588 | -0.394 | 0.228     | -1.12 | 0.00  |
| govspend | 588 | -0.723 | 0.701     | -5.30 | 0.00  |
| busfree  | 588 | -0.304 | 0.216     | -1.04 | 0.00  |
| monfree  | 588 | -0.250 | 0.098     | -0.82 | -0.06 |
| tradefree| 588 | -0.219 | 0.119     | -1.43 | -0.05 |
| invfree  | 588 | -0.525 | 0.400     | -2.30 | -0.05 |
| finfree  | 588 | -0.534 | 0.319     | -1.61 | -0.11 |
| electedgov| 588 | -0.291 | 0.880     | -4.61 | 0.00  |
| civilib  | 588 | -0.305 | 0.279     | -1.20 | 0.00  |
| rgdp     | 588 | 27.871 | 1.147     | 25.31 | 31.37 |

Note: All the variables are expressed in logarithmic form, except dsmw.
Source: own elaboration.
### Table A3. Correlation matrix

| Variable         | tew     | gi      | cpi      | cc      | ac      | dsmw    | ief-gi   | govsize  | regeffi  | openmark  | proprig   |
|------------------|---------|---------|----------|---------|---------|---------|----------|----------|----------|-----------|-----------|
| tew              | 1       |         |          |         |         |         |          |          |          |           |           |
| gi               | 0.168   | 1       |          |         |         |         |          |          |          |           |           |
| cpi              | 0.162   | 0.974   | 1        |         |         |         |          |          |          |           |           |
| cc               | 0.083   | 0.597   | 0.597    | 1       |         |         |          |          |          |           |           |
| ac               | 0.152   | 0.872   | 0.888    | 0.52    | 1       |         |          |          |          |           |           |
| dsmw             | 0.279   | 0.060   | 0.078    | 0.07    | 0.003   | 1       |          |          |          |           |           |
| ief-gi           | 0.166   | 0.766   | 0.754    | 0.48    | 0.701   | 0.106   | 1        |          |          |           |           |
| govsize          | -0.009  | -0.0451 | -0.465   | -0.26   | -0.458  | 0.102   | -0.012  | 1        |          |           |           |
| regeffi          | 0.118   | 0.811   | 0.805    | 0.47    | 0.753   | 0.004   | 0.829   | -0.375  | 1        |           |           |
| openmark         | 0.129   | 0.790   | 0.792    | 0.47    | 0.767   | 0.055   | 0.860   | -0.626  | 0.800    | 1         |           |
| proprig          | 0.194   | 0.893   | 0.877    | 0.50    | 0.808   | 0.098   | 0.820   | -0.414  | 0.804    | 0.828     | 1         |
| taxburden        | 0.017   | -0.0465 | -0.471   | -0.25   | -0.483  | 0.147   | -0.058  | 0.930   | -0.380   | -0.433   | -0.421   |
| govspend         | -0.054  | -0.0374 | -0.388   | -0.25   | -0.372  | 0.064   | 0.013   | 0.895   | -0.320   | -0.348   | -0.350   |
| busfree          | 0.123   | 0.748   | 0.736    | 0.44    | 0.683   | -0.029  | 0.773   | -0.360  | 0.950    | 0.761    | 0.730    |
| monfree          | 0.061   | 0.671   | 0.680    | 0.36    | 0.643   | 0.064   | 0.673   | -0.283  | 0.785    | 0.624    | 0.688    |
| tradefree        | 0.050   | 0.599   | 0.608    | 0.40    | 0.573   | 0.075   | 0.596   | -0.320  | 0.582    | 0.728    | 0.554    |
| invfree          | 0.140   | 0.750   | 0.752    | 0.37    | 0.728   | 0.007   | 0.788   | -0.434  | 0.751    | 0.929    | 0.805    |
| finfree          | 0.117   | 0.693   | 0.688    | 0.43    | 0.676   | 0.078   | 0.830   | -0.328  | 0.725    | 0.929    | 0.750    |
| electedgov       | 0.045   | 0.075   | 0.072    | -0.01   | 0.153   | -0.016  | 0.087   | -0.307  | 0.160    | 0.261    | 0.223    |
| civil            | -0.019  | 0.469   | 0.480    | 0.26    | 0.611   | -0.113  | 0.297   | -0.586  | 0.430    | 0.548    | 0.547    |
| rgdp             | 0.738   | 0.174   | 0.173    | 0.04    | 0.230   | 0.143   | 0.037   | -0.121  | 0.105    | 0.070    | 0.135    |
| Variable     | taxburden | govspend | busfree | morfree | tradefree | invfree | finfree | electedgov | civlib | rgdp |
|--------------|-----------|---------|---------|---------|-----------|---------|---------|------------|--------|------|
| taxburden   | 1         |         |         |         |           |         |         |            |        |      |
| govspend     | 0.768     | 1       |         |         |           |         |         |            |        |      |
| busfree      | -0.352    | -0.227  | 0.555   |         |           |         |         |            |        |      |
| morfree      | -0.352    | -0.311  | -0.235  | 0.557   |           |         |         |            |        |      |
| tradefree    | -0.311    | -0.289  | -0.343  | 0.713   | 0.446     |         |         |            |        |      |
| invfree      | -0.262    | -0.343  | -0.343  | 0.592   | 0.530     | 1       |         |            |        |      |
| finfree      | -0.432    | -0.343  | -0.343  | 0.592   | 0.530     | 1       | 1       |            |        |      |
| electedgov   | -0.362    | -0.226  | -0.235  | 0.559   | 0.530     | 0.797   | 1       | 0.309      | 0.228  |      |
| civlib       | -0.620    | -0.467  | -0.467  | 0.386   | 0.337     | 0.337   | 0.337   | 0.337      | 0.337  |      |
| rgdp         | 0.146     | 0.101   | 0.101   | 0.068   | 0.068     | 0.068   | 0.068   | 0.068      | 0.068  | 1    |

Note: All the variables are expressed in the logarithmic form, except dsmw.

Source: Own elaboration.
