

DETERMINANTS OF EXTREME WEALTH: THE ROLE OF CORRUPTION¹

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Abstract

The aim of the paper is to determine the effect of corruption on extreme wealth of individuals included in Forbes list of super-rich over the period 2006-

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2015. The methodology used is sys-GMM since it allows to control heterogeneity/endogeneity among individuals. Three novel and different measures of direct corruption are used. The main finding shows that structural corruption positively affects individual extreme wealth, in a context of political/institutional, economic and personal factors. Although it is identified that sporadic or one-time corruption limits extreme wealth. Nevertheless, it is also found that the extreme accumulation is based on a combination of factors, such as meritocratic, non-meritocratic, and personal traits. In any case, this tends to perpetuate the corrupt systems and their accumulated effect on elites. Based on the foregoing, this research recommends certain corruption control mechanisms such as: the establishment of a global tax on extreme wealth, teamwork between the company, civil society and the government, public and private anti-corruption measures and a public investment of high quality that promotes more public well-being.

Keywords: corruption, extreme wealth, not-meritocratic determinants, individual merits, corruption

JEL Classification Codes: D31, D73, E2, K4, P46, P48

I. Introduction

The universal problem of corruption benefits minorities and harms majorities. This phenomenon distorts economic growth and development trajectories, diminishes human rights, diverts resources destined to basic public services, limits the effectiveness of public policies, damages political, government and market systems, and compromises international aid, among others aspects (Johnston, 2005).

A general finding is that higher levels of corruption lead to more inequality and more poverty, meaning lower incomes for population at the bottom of social structure and higher incomes for that at the top (Franses & de Groot, 2015). At country level, inequality has grown between 1980 and 2016. In the main world regions, the top 10% share rose to about 45-50% of total income in 2016. Differences in income concentration among countries suggests that inequality could be explained by several other factors like politics, economics or social systems (Alvaredo *et al.*, 2017).

Extreme-wealth are not visible as a social problem (Yee *et al.*, 2016)². Moreover, inequality is highlighted by the extreme wealth, also known as super-rich. In this sense, the world's 85 richest individuals have a combined wealth equal to that of the poorest half of humanity (about 3.5 billion people) (Fuentes & Galasso, 2014, 2014). In this respect, a possible explanation of Lagarde's (2013) argument that excessive inequality is corrosive to growth and society, is the extreme wealth that concentrates capital in few people and limits wealth options for the majority.

While there are several ways to reach that excessive wealth (Jacobs, 2015), there are some evidences that increases in wealth occurs in a context of political and economic power (Volscho & Kelly, 2012), which is in turn, link to corruption as the argument of Johnston (1997). This

² Literature defines super-rich considering some characteristics about: material wealth, capacity to generate and accumulate wealth, elite positions, and transnational mobility owing multiple countries (Yee *et al.*, 2016).

kind of power implies that the richest enjoy higher capacity to influence the behaviour and decision of others or the event courses than any other actors, including the government at all the levels, businessman, and the low and medium-classes. So, the disproportionate influence of the richest can bias governmental decisions in favour of the group of power, for example through tax evasion (Hans & de Groot, 2016).

In accordance with Campos and Giovannoni, (2007) favourite roads to exercise political influence are lobbying (mainly in rich countries) and corruption (in poor countries), both considered as substitutes. Moreover, public perceptions suggest that global economy is the way to plutocracy, a social structure where corruption takes place (Russell, 2018). In this respect, Jacobs (2015) asserts that 50% of the world's billionaire wealth is due to either inheritance or a high presumption of cronyism.

Literature considers a broad array of economic, political, cultural, and psychological factors as genesis of corruption (Husted, 1999). In general, corruption is structurally associated to economic polarization processes, both within and among nations, particularly since economic freedom was intensified. This strategy implies that power and richness are increasingly concentrated in multinational corporations and elite groups (Saad & Johnston, 2005), linked to super-richness.

This idea is associated with Piketty (2014) which asserts about that the rising global inequality could lead to an increase in the influence of wealthy individuals, who may use their power to change the political and economic institutions in their favour. That political and economic power is in the field of corruption. Roughly speaking, corruption occurs when public officials unlawfully enrich their social network as well as themselves by misusing the power entrusted to them (Svensson, 2005).

In this way, both the fact that no country is free of corruption (Cieslik & Goczek, 2018), and the growing interest in measuring it in a large group of countries by different international institutions, suggest that corruption is related to global socioeconomic processes. Particularly, corruption and the economic wealth of a nation are correlated (Donchev & Ujhelyi, 2014). While the poorest countries in the world are generally the most corrupt, and the richest ones are the less corrupt, this phenomenon raises the question about how corruption and extreme-wealth are correlated.

Also, a corruption syndrome has been proposed by Johnston (2005) that would explain why many countries are poor and have difficulties in engaging in socio-economic development that would allow their citizens to become wealthy. An extension of this idea could also be true, that is, a pathology of corruption that boost few people in corrupt systems to extreme wealth. Hence, not only could corruption lead to more poverty at the bottom end of the income spectrum, it could also lead to exceptional wealth for only a few. This could be a result of a corruption sub-systems characterized by relatively stable networks -among rich people and between them and politicians and government officers- and rather than exceptional, independent, individual events (Nielsen, 2003).

The aim of the paper is to determine the effect of corruption on extreme wealth of individual included in Forbes list of super-rich (those having at least one billion US dollars) over the period 2006-2015. The hypothesis is that corruption functions as the greasing wheel for getting richer. The methodology used is sys-GMM since it allows to control heterogeneity/endogeneity among individuals. The next section discusses the relation between extreme-wealth determinants and Corruption. Section 3 describes data and methodology. Section 4

shows the results and discusses them. Finally the main conclusions are showed.

The document contributes to the literature on the role of corruption on the determinants of extreme wealth from a quantitative approach. In addition, this research does not use the usual indicators for measuring corruption, such as Corruption Perception Index, Economic Freedom and Government Integrity, it identifies news that disclose possible acts or scandals of corruption that involves super-rich. The proposed corruption variables consider the effects of structural and temporary corruption separately.

II. *Extreme-Wealth Determinants and its Relation with Corruption*

There are several theoretical approaches that explain emergence, increase and lifespan of extreme wealth. Despite this, Korom *et al.* (2017), signal that the lack of data makes difficult to test. In this respect, the roots of this kind of wealth have 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), financial (investments or trading). While the former is considered as unearned wealth, obtained through familiar or near relationships; the later are gained by personal merits.

About inheritance, Korom (2016) shows evidence that wealth transfers contribute more to wealth accumulation than other variables like higher incomes; thus, contributes to reinforcing the inequality cycle. Simultaneously, Clignet (2009) argues that private wealth is highly concentrated in the hands of a miniscule segment of the population, meaning that just one reduced group is able to inherit and bequeath wealth, partially responsible for reproducing patterns of extreme wealth across generations.

Entrepreneurship is possible because there are skill-biased individuals who are likely to be disproportionally rewarded for their relatively high productivity derived from their talents and their capacities to work and manage a larger pool of resources (Kaplan & Rauh, 2013). From this approach, self-made entrepreneurs endowed with notable skills can apply them in lucrative fields, whether in large companies or operating in dynamic sectors, in the stock market or in highly lucrative commercial activities, which leads to an exceptional increase of their income and wealth (Korom *et al.*, 2017). Top managers of larger companies can become wealthier because of the high level of compensations they are rewarded. In general, there are two approaches to CEO compensation (Frydman & Jenter, 2010). By one hand, high levels of compensation are the consequence of powerful managers setting their own pay and that of their nearest collaborators. On the other hand, these high compensations are the result of optimal contracting in a competitive market struggling for most talent managers.

Moreover, a central component of a management control system is the incentive and motivational mechanism of compensation contracts, in which most executives are rewarded in the form of cash and company stock (Nourayi & Krishnan, 2006). Cordeiro & Velitayh (2003) hold that CEO compensation is related to the magnitude of their responsibilities, risks and efforts to be taken. This suggests that CEOs have incentives to achieve better performance standards using all their power and resources to do so. In this respect, agency theory identifies a power bias favourable to the executives, allowing them to pursue their self-interests by big compensation packages (Grabke & Gomez, 2002).

Lastly, financial and commercial activities could conduce to extreme wealth. Global

financial markets provide services to old, and maybe most relevant, to new financial elites in order to manage financial assets allowing them to raise their wealth (Beaverstock *et al.*, 2010). In this process, these markets exclude groups with limited resources to invest in and, in contrast, promote wealthy individuals to get super-rich. In accordance to Featherstone (2014), a new group of extremely wealthy people have emerged, owner and intermediates, who knows how to exploit the business and the financial advantages of banking and financial sector in their own interests.

Likewise, Volscho & Kelly (2012) point out that the emerge of super-rich partially comes from the increase in trade openness, which let businessmen increase their economic power and reduced the number of firms with ultra-high levels of gains. In turn, these business benefits were concentrated in a few owners of extreme wealth. For Haseler (2000) commercial traders focus their activities and resources on global or national operations that are more profitable and, in certain form, more stable. Even more, commercial and financial traders are correlated, due to when former reach some threshold of wealth, usually start to expand and diversify their investment portfolios to financial markets.

Nevertheless, these three mechanisms of earned wealth are associated with corruption because they represent opportunities for personal enrichment since; as U4ACRC (2018) asserts, entrepreneurs, executives and financiers hold extensive discretionary power over resource allocation mainly in environments with weak supervision. For example, Featherstone (2014) establishes that offshore finance is often seen as secretive, with non-disclosure rules operated by a set of trustees. Likewise, Phongpaichit & Baker (2016) states that economic inequalities, just like extreme wealth, underlie inequalities of power, social position and access to different kind of resources. They add that power is concentrated in a few at the top of the economic pyramid.

In this sense, Jacobs (2015), recognizes that the accumulation of extreme wealth is enabled by a series of social, economic, and political phenomena, besides personal characteristics. He identified six dimensions that contributes on this super-richness, namely crime, cronyism, and inheritance, which are classified as not meritocratic, and monopoly, globalization, and technology based on individual merits.

Jacobs (2015) states that crime mainly refers to white-collar financial crimes such as fraud, embezzlement, tax evasion, bribery, price-fixing, intellectual property theft, or insider trading, all different ways to make a lot of money through illegal means. Cronysm involve tailoring public action them to private interests through lobbying, funding political campaigns, politicization of the civil service, politicization of the media, or private sector funding of research and media to influence the political agenda and policy options. Family or friendship ties among business and political elites also buy influence. Inheritance transmits wealth from one generation to the next; it is the quintessential rent and is clearly not meritocratic. Monopoly refers to a market failure situation in which a single supplier dominates a market, with high degrees of market power and can thereby overcharge consumers. Thus, high market concentration, such as monopolies or oligopolies can overcompensate rich people boosting extreme wealth. Globalization increases a company's potential customer base and therefore potential profits. In the real world, however, most of consumers are supplied by a select group of multinational companies that controls global market and some domestic or local markets in almost all industries. This market concentration, due exploitation of economies of scale in production and distribution, produces extreme wealth. Technology allows some highly skilled workers to get notably higher incomes compared with only marginally less highly skilled

workers, offering more opportunities to enlarge their wealth. Particularly, information and communication technologies are the main mechanisms to do this. Moreover, this kind of technology amplifies the base of companies' consumer, achieving almost all the world and, in turn, with time creating extreme-wealth.

In concrete, he found that most of billionaires have been helped by cronyism or monopoly, and by globalization. Even more, the results suggest that cronyism is a central source of extreme wealth in developing countries. However, Krysmanski (2007) finds that some non-competitive market structures like oligarchies, have risen from corrupt privatisation practices.

Jacobs (2015) states that bribery is a particular form of crime. Accordingly, to Noonan (1984), bribers include every variety of business from very small to multinationals; from ordinary citizens to presidents; and are from all nationalities, sex, ethnics, religions. Noonan (1984) adds that frequently bribers have high office and comfortable income, bribe to maintain or expand their power or wealth, and accept bribes given as tributes for their power or wealth.

For Enderwick (2005), it is widely agreed that crony capitalism generates significant economic rents, which result in a misallocation of resources and lower incentives for wealth creation for the people excluded from circle of friendship. The author aggregates that cronyism has cost for society and economics grouped on allocative inefficiencies; dynamic inefficiencies; corruption and transaction costs; and problems of social and political stability.

Cronyism exists when elites use personal influence to leverage the power of the state for private gain. Government officials and businesspeople collude to rig the rules for their mutual benefit and at the expense of consumers, taxpayers, and businesses that lack the proper connections (Jacobs, 2015). It should be recognized that cronyism is not always illegal or harmful. Lobbying becomes cronyism when it pursues private interests. But, as Enderwick (2005) states, corruption accompanies cronyism. An aspect link to corruption is the lobbying power or influence, which means that someone has different mechanisms to influence in other one. This power is based in two reinforcing categories named bases or resources of that capacity and, the possibility to exercise the power (Lowery, 2013).

While lobbying power is not bad by itself, since its potential positive effects over democracy, their abuses mingle with corruption. For example, Lowery (2013) holds that, for example, the political agenda is biased by a deeper level of influence shaped by elites, largely rigging the game before it has even begun. Moreover, Kibler & Kibler (2016) states that lobbying groups have become much more sophisticated and influential, and are able to wield direct power over public policy and even control the regulatory bodies created to mitigate corporate power. They aggregate that lobbying has created a system in which individuals and corporations can use unlimited funds in influencing regulatory frameworks and those aspiring to and/or in political office.

Accordingly, to Randall (2004), this is because such concentrated high trust among the elites promotes political rent seeking, known to be accompanied or driven by corrupt practices (DID, 2015). Randall (2014) concludes that entrusting the governance of great corporations to a few wealthy families promotes this undesirable distribution of national trust, which could bias opportunities of wealth creation in favour for those in the political and economic elites.³ This is

³ A counter-argument suggests rents, and consequently corrupt rent-seeking behaviour, need not always be detrimental to growth and development. Where rents are invested productively, they can also be a source of growth (DID, 2015).

linked to the argument of Korom *et al.* (2017) who show that economic elites and organized groups of business interests have larger impact on government policy and governmental action, while average citizens have only marginal influence. For instance, Freeland (2012) points out cases where, like in Russia, China, Mexico, and other emerging nations, a spate of new billionaires has emerged out of close and corrupt relationships with the ruling party or government, granting them state-protected monopolies in lucrative industries, allowing them to amass immense fortunes.

Likewise, Winters (2011) shows how historically the rich have grabbed political power in order to use it to protect their wealth. In concrete, businesspeople could and did use their own substantial wealth to make payments that reflected loyalty to a personal network (McMenamim, 2013). About these networks, Urry (2014) argues that they operate in a more systematic and conscious manner, manipulating tax and regulatory regimes well beyond the influence of wealthy elites in political lobbying.⁴ In any case, special interest groups with access to public decisions, like lobbyists, offer resources (such as campaign contributions, political endorsements, or future career opportunities) to policymakers in exchange for policy favours (Groll & McKinley, 2015). Hence, there is a link between lobbying and favouritism.

Likewise, the influence of political connections is intimately linked to extreme wealth. Following Lévêque (2020) they involve both companies and individuals who are politically connected. Companies or executives connected with regulators or politicians can obtain inside information that leads them to adopt different commercial behaviours to maximize their benefits that would not be achieved without these connections. Political connections likewise may (directly) influence incomes, for instance, those of lobbyists who facilitate access to politicians.

On the other hand, corruption describes a direct relationship between the State and the private sector, while society remains as a marginal actor, which, however, pays the high costs of this social phenomenon. There are numerous theoretical approaches to corruption, and as systematic data on corruption is disponible the empirical studies about it is growing. Correa & Jaffe (2015) resume the main results in the literature about corruption effects. By one hand, corruption directly affects economic growth, foreign trade, FDI attraction and income inequality. By the other, there is a correlation between it and tax levels, nation wealth, inflation, weak institutions, physical investment, human capital and some cultural aspects.⁵

A short part of the literature focuses on the relationship between corruption and wealth, and particularly on extreme wealth. However, a general finding is that higher levels of corruption lead to more inequality and more poverty, meaning lower incomes at the lower end, and, at the same time, an increase in the creation of super fortunes (Torgler & Piatti, 2013). In this same way, Neumayer (2004) found that corruption makes the number of superrich to increase within countries. Also, Gupta *et al.* (2002) argue that corruption can lead to tax evasion or otherwise disproportionate favours to only a few. This would imply that some

⁴ Following Krysmanski (2007), the chances of the political elite of joining the money elite are nearly nil with some exceptions, particularly to ex-politicians. Nevertheless, he recognizes, the space of the political elite is severely affected by lobbying and corruption, which imply economic groups could exercise that kind of power for private gains.

⁵ Since there is a large set of variables related to corruption, Johnston (2005), for example, proposed the notion of “corruption syndrome”, which argues about why exists poor countries and about the obstacles they face for reach out a sustainable way of economic development, a key factor for wealthy societies. Also, corruption has high costs transferred to society in such several aspects like human lives, trust, human rights, inequality, gender, crime conflicts, environment (U4ACRC, 2018).

individuals can become exceptionally rich, while others remain in poverty or nearby it.

Hall (2016) affirms that the normative power of super-wealthy has allowed them obtaining disproportionately economic benefits derived from illicit economic activities. In this sense, proposes three categories of illicit super-rich: criminal entrepreneurs (operating in illegal markets), financial fraudsters (defrauding legal markets for personal gains) and corrupt public officials (abusing their legitimate position in the public arena for private gain). In several cases, the last two dimensions contribute to those involved to become richer.

III. *Data and Methodology*

A panel data model is used to estimate effects of corruption on extreme wealth for a set of individuals included in Forbes list of super-rich (see table 1). Panel data methodology allows increasing degrees of freedom over time and controlling for unobserved variables (Pignataro, 2018). The model to be estimated is:

$$ew_{it} = \alpha + \beta_1 corrup_{it} + \beta_2 polc_{it} + \beta_3 inheri_{it} + \beta_4 emd_{it} + \beta_5 vamne_{it} + \beta_6 ict_{it} + \beta_7 age_{it} + \beta_8 gend_{it} + \beta_9 gnipc_{it} + \beta_{10} va_{it} + u_{it} \quad (1)$$

Where α is the constant to be estimated, i the individual observation (billionaire), t the year. ew_{it} is extreme-wealth; $corrup_{it}$ is a variable of corruption; $inheri_{it}$ is inheritance; emd_{it} is the extent of market dominance variable; ict_{it} is information and technology communications; age_{it} and $gend_{it}$ represent the age and gender of the billionaire; $gnipc_{it}$ is gross national income per capita; va_{it} is voice and accountability variable. u_{it} is the error term and the parameters β_1 to β_{10} are the coefficient of individual independent variable to be estimated. The expected signs for *corrupt*, *polc*, *inheri*, *emd*, *vamnc*, *ict*, and *gnipc* are positive; while for *age* and *gend* are a priori indetermined. Variables are described in table 1. Particularly, three different dummy variables of corruption are used. They take a value of 1 if any news or corruption scandal is identified when searching the web on official, news and formal pages, and a value of 0 otherwise. In brief, if a corruption news is identified in a particular year, the variable *corrup1* takes the value of 1 for the entire period (retroactive to the entire period); if a news of corruption is identified, the variable *corrup2* takes the value of 1 from that year (and for the rest of the period); and, if a news of corruption is identified, the variable *corrup3* takes the value of 1 only for that year. The variable *corrup1* means that if someone is corrupt, he always has been and always will be corrupt; *corrup2* implies that when someone engages in acts of corruption, from then on he will be corrupt; and the variable *corrup3* suggests that someone can be corrupt once or sporadically. The first two reflect systematic corruption and the last situational or non-structural corruption. Finally, *corrup2* and *corrup3* are time variant.

Since the panel data models tend to show problems of autocorrelation, heteroscedasticity, cross-sectional dependence and multicollinearity bias, several tests are used to determine whether the fixed effects model fulfill the conditions for consistency and validity. In concrete, Pesaran, Wald, Wooldridge, Modified DW, Baltagi-Wu-LBI and Variance Inflation Factor - FIV- are employed.

Moreover, the sys-GMM dynamic panel data technique is used, which is an extension of the Generalized Method of Moments (GMM). The GMM proposed by Arellano-Bover (1995)

TABLE 1. VARIABLES AND SOURCES

Factor	Dimension	Variable	Short name	Observations	Source
Dependent	Extreme Wealth	Realnetworth	<i>ew</i>	Real value of individual wealth per year	Freund & Olliver (2016) & Forbes Extreme-Wealth List
			<i>corrup1</i>	Dummy with a value of 1, for all the years, if any news or corruption scandal is identified when searching the web on official, news and formal pages, and a value of 0 otherwise.	Own web research. Diverse web pages (news, governmental, civil society organizations, etc.)
Not meritocratic	Crime	Corruption	<i>corrup2</i>	Dummy with a value of 1, from the year identified, if any news or corruption scandal is found when searching the web on official, news and formal pages, and a value of 0 otherwise.	Own web research. Diverse web pages (news, governmental, civil society organizations, etc.)
			<i>corrup3</i>	Dummy with a value of 1, only for the year identified, if any news or corruption scandal is found when searching the web on official, news and formal pages, and a value of 0 otherwise.	Own web research. Diverse web pages (news, governmental, civil society organizations, etc.)
			<i>polc</i>	Dummy with a value of 1 if a political relationship is identified when searching the web on official, news and formal pages, and a value of 0 otherwise.	Own web research. Diverse web pages (news, governmental, civil society organizations, etc.)
Individual merits	Inheritance	Inheritance	<i>inheri</i>	Dummy with a value of 1 if the source of wealth is some inheritance and a value of 0 otherwise.	Freund & Olliver (2016) & Forbes Extreme-Wealth List
	Monopoly	Extent of market dominance	<i>emd</i>	Dummy variable categorized according to the answers to the question: "How do you characterize corporate activity? ". With values between 1 = dominated by a few business groups and 7 = spread among many firms.	Global Competitiveness Index. World Economic Forum
	Globalization	[vammc/gdp] ₋₁	<i>vammc</i>	Value added of Multinational Companies as a proportion of GDP, lagging one period. (current US\$)	OECD, Analytical AMNE Database
Personal characteristics	Technology	ict	<i>ict</i>	Mobile cellular subscriptions (per 100 people)	World Development Indicators. World Bank
	Age	age	<i>age</i>	Age in years	Freund & Olliver (2016) & own web research
Economic context	Gender	gender	<i>gend</i>	Dummy with a value of 1 if it is a man and a value of 0 otherwise	Freund & Olliver (2016), Forbes Extreme-Wealth List & own web research
	GNIPC	gnipc	<i>gnipc</i>	Gross National Income in U.S. dollars using the World Bank Atlas method, divided by the midyear population.	World Data Bank. World Bank
Political/Institutional context	Democracy	Voice and Accountability	<i>va</i>	Indicator of voice and accountability, which reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	World Governance Indicators. World Bank

Source: Own elaboration.

specifies a dynamic model with time-invariable individual-specific effects. This seems relatively plausible in the case of the extreme wealth if one considers that other variables outside the analysis such as the social regime show, in general, slow variations over time. Formally, the dynamic panel model is:

$$ew_{it} = \alpha + \delta ew_{it-1} + \beta_1 corrup_{it} + \beta_2 polc_{it} + \beta_3 inheri_{it} + \beta_4 emd_{it} + \beta_5 vamnc_{it} + \beta_6 ict_{it} + \beta_7 age_{it} + \beta_8 gend_{it} + \beta_9 gnipc_{it} + \beta_{10} va_{it} + e_i + u_{it} \quad (2)$$

Where $i = \{1, \dots, 2244\}$, and $t = \{2005, \dots, 2016\}$. The OLS estimator is inconsistent since ew_{it-1} is correlated with the no-observed effect of each individual (e_i). The term e_i could be assumed as fixed or random effect. In any case, to eliminate invariant effects by individual (billionaires) the model establishes first differences, but the correlation effect of the lagged variable with u_{it-1} is remained. Thus, equation (2) is formally specified as:

$$ew_{it} - ew_{it-1} = \alpha + \beta_1(ew_{it-1} - ew_{it-2}) + \beta_2(X_{it} - X_{it-1}) + (u_{it} - u_{it-1}) \quad (3)$$

Where ew_t is the dependent variable, and X_{it} is a set of explanatory and control variables. Equation (3) is estimated using the lagged values of the endogenous variables as instruments in order to consider the possible endogeneity between the set of explanatory and control variables. The instruments used in (3) are valid if the error term, u_{it} , is not serially correlated, that is, they are independent.

Nevertheless, accordingly to Alonso & Arellano (1996) the GMM estimator in first differences has statistical limitation due to finite sample bias and low precision. As an alternative, the extended dynamic GMM model, proposed by Blundell & Bond (1988), combines the first lagged differences of the dependent variable with its lagged levels. The model named as sys-GMM, considers both regressions in levels and in first differences. In the former case, the instruments are the lagged differences, and in the latter case, the lagged levels. Blundell *et al.* (2000) establish that the sys-GMM has better finite sample properties in terms of bias.

In any case, additional instruments may not be valid since they over-identify the instrumented variables. Since the estimators consider the largest possible number of instruments, the probability of over-identification is high. In consequence, the “collapse” option in STATA is used to limit this number (Roodman, 2009). This specification error tends to occur when there are large T ($t > 10$). The command establishes the creation of an instrument for each variable and lag and not one for each period of time, variable and lag, avoiding the proliferation of instrument variables in system-GMM estimates.

In this sense, the Hansen test is used, which is consistent in the presence of heteroscedasticity and autocorrelation. The Hansen test assess the joint validity of the instruments, assuming a heteroscedastic error distribution. In addition, the difference-in-Hansen test is also used. The test estimates the difference between the Hansen statistics for first-differenced GMM and sys-GMM.

Also, autocorrelation could be present in the model since the lagged dependent variable is associated with individual-specific effects. In this case, it could be accepted a certain degree of persistence in the conditions that determine extreme wealth for a given billionaire. Whatever, the absence of second-order serial correlation in the differentiated residuals, should be verified in order to get consistent estimator. In this sense, the Arellano-Bond test of autocorrelation is

used.

Finally, the document seeks to establish how extreme wealth is determined or varies with a set of variables that include characteristics at the personal, economic and political levels, and since these follow different processes, the analysis considers their endogenous, exogenous or predetermined nature. In general terms, an exogenous variable is determined outside the model, that is, it is not related to the rest of the independent variables and, therefore, there is no correlation between the errors of the variable and those of the model ($\text{Cov}[x_t, \varepsilon] = 0$); an endogenous variable is determined within the model, that is, there is bidirectional causality ($\text{Cov}[x_t, \varepsilon] \neq 0$); and a default variable (weakly exogenous) is determined outside the model and prior to the current time, so it is not correlated with contemporary or future errors, but may be with past errors ($\text{Cov}[x_{1s}, \varepsilon_t] \neq 0$, with s and t being different time periods).

Following the above, the variables *polc*, *vamnc*, *gnipc*, and *va* are treated as endogenous; *ict*, *age*, and *gend* as exogenous, and *inheri* and *emd* as predetermined. In this respect, the character of each variable depends on theoretical aspects as well as the research context. Particularly, the values of the former seem to influence each other in a reinforcing system. The values of the latter are determined by variables not directly incorporated in the model. The inheritance and market dominance variables also seem to be determined outside the model but at a prior point in time.

IV. Results and Discussion

Results of the most reliable system-GMM estimation are reported in table 2. The results of the complete model (equation 2) as well as of various combinations of independent variables are shown. Considering first not-meritocratic factors, it could be observed the relevance of corruption as determinant of extreme-wealth. The coefficients of *corrup1* and *corrup2* are positive and statistically significant, while the coefficient of *corrup3* is negative and significant. The three have also the biggest effect on extreme wealth. This result is in line with Torgler & Piatti (2013), Neumayer (2004), and Gupta *et al.* (2002). Therefore, corruption can be a determinant factor fostering extreme-wealth on a worldwide base. In respect to the first two corruption variables, the finding can be interpreted as those billionaires tend to capture benefits of grand forms of corruption, exercising their structural economic and political power. Furthermore, when the extreme rich get richer through corruption, it also increases the income of their counterparts, which favours the win-win link between them. A similar idea is stated by Jong & Khagram (2005) who identified greater motivation and opportunities for rich people to involve in corruption acts and systems. In addition, since corruption tends to statistically foster super-richness, it helps to perpetuate this type of acts (Ahmad *et al.*, 2012).

By contrast, the negative coefficient of *corrup3* means that corruption reduces extreme wealth. Nevertheless, considering the construction of the variable, this sign suggests that being corrupt once or sporadically reduces large fortunes. In other words, not being part of a corruption network negatively affects the process of creating extreme wealth. Alternatively, being excluded from the corrupt structure limits opportunities for extreme enrichment.

Thus, the existence of a kleptocratic system at country level, as well as, a political system where a limited group of power and influence pressures the government decisions in favour of their own position, could be the basis in which extreme wealth are constructed from corruption.

In terms of Hall (2016), financial fraudsters, such as directors, executives, owners and founders, among others, and corrupt public officials, given their legitimate position in the public decision-making space, collude with each other to illegally enrich themselves. In short, extreme-wealth depends on systematic practices of bribery, extortion, nepotism, fraud, and so on, confirming Jacobs (2015) arguments.

Political connections are also a relevant variable for extreme-wealth. It shows a positive and significant coefficient. Thus, billionaires often benefit from their political connections, advantages that would not materialize without these relationships with high-ranking politicians. Although, as Freund & Oliver (2016) point out, being related to a politician does not necessarily lead to exceptional treatment compared to other businessmen, when the connections are based on financial donations from the businessman to the politician, mainly at electoral time, it is highly probable that mediate a subsequent retribution from the second to the first. This cronyism seems to be related to favouritism in political/governmental decisions. That is, the existence of a network among friends or associates provides better access of their members to resources, public projects, and so on, which in turn, enrich the richest.

This result is in line with Jacobs (2015) and Smith (2015). Particularly, the latter considers when an economy operates under cronyism models, the friends of the rulers can appropriate large amounts of wealth for themselves and their close peers, for example, by receiving monopolies protected by the government, early economic policy advisories, etc.

In addition, the variable inheritance is positive and significant as determinant of extreme-wealth, in line with Kesiter & Young (2014), Jacobs (2015) and Korom (2016). Thus, although some wealth could be originated by illegal sources, some of them arise from legal mechanism just like inherited. A possible explanation for this effect is that tycoons transfer their wealth, via inheritances, mainly to their relatives, turning them into billionaires or, putting them in a position that allows them to considerably increase their wealth, given their previous wealth and other meritocratic individual factors. In any case, the inheritance can also include the transfer of political power that leads to amassing a greater fortune. Also, the relevance of inheritance, contrary to what Piketty & Zucman (2015) suggests, is based on the idea that the increase in human capital or the accumulation of wealth during the life cycle are minor part of the total accumulation of wealth, so that inheritance has the main participation.

It is worthy to note that since inheritance transmits wealth from one generation to the next, these transfers contribute to intergenerational wealth accumulation in hand of few, not necessarily for meritocratic attributes. In consequence, inheritances not only reproduce patterns of extreme wealth across generations, but limit opportunities for meritocratic factors as wealth determinants.

Considering individual merit variables, monopoly and globalization factors tend to show positive and statically significant coefficients, confirming the results of Jacobs (2015). In respect the former, extreme-wealth could result from the effective exercise of monopoly power. A similar idea is stated by Stiglitz (2016). To the extent that the markets are dominated by a small number of large companies or business groups, the benefits that they can obtain are maximized, enriching their owners. Furthermore, in a context of monopoly structures, this richness could be determined by industrial relations, as well as market and labour regulation institutions. Since political connections are also relevant, it could be inferred that this acts as a complement mechanism for extreme-wealth. This result is also related to the ability of billionaires and their families to retain control over corporations (Korom *et al.*, 2017), while the

Variables	Model 3 (<i>corrup3</i>)										
<i>ew_i</i>	0.7495 *	0.7688 *	0.7521 *	0.7721 *	0.7686 *	0.7713 *	0.7573 *	0.7681 *	0.7647 *	0.7608 *	0.7454 *
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
<i>corrup1</i>	-	-	-	-	-	-	-	-	-	-	-
<i>corrup2</i>	-	-	-	-	-	-	-	-	-	-	-
<i>corrup3</i>	-0.0388 ***	-0.0325 **	-0.0333 ***	-0.0339 **	-0.0300 **	-0.0303 **	-0.0284 **	0.0309 **	0.0321 **	-0.0292 **	-0.0382 ***
	[0.101]	[0.076]	[0.101]	[0.085]	[0.091]	[0.096]	[0.071]	[0.082]	[0.086]	[0.057]	[0.103]
<i>polc</i>	0.0045 *	0.0043 *	-	-	-	-	-	-	-	-	0.0045 *
	[0.000]	[0.000]	-	-	-	-	-	-	-	-	[0.000]
<i>inheri</i>	0.0350 **	-	0.0360 **	-	-	-	-	-	-	-	0.0349 **
	[0.085]	-	[0.066]	-	-	-	-	-	-	-	[0.080]
<i>end</i>	0.0120 ***	-	-	0.0284 *	-	-	-	-	-	-	0.0147 ***
	[0.107]	-	-	[0.004]	-	-	-	-	-	-	[0.099]
<i>vammc</i>	0.0005	-	-	-	0.0043	-	-	-	-	-	-
	[0.284]	-	-	-	[0.279]	-	-	-	-	-	-
<i>ict</i>	-0.0002	-	-	-	-	-0.0002	-	-	-	-	-
	[0.219]	-	-	-	-	[0.189]	-	-	-	-	-
<i>age</i>	0.0005	-	-	-	-	-	0.0013 **	-	-	-	0.0005
	[0.419]	-	-	-	-	-	[0.064]	-	-	-	[0.372]
<i>gend</i>	0.0009	-	-	-	-	-	-	0.0212	-	-	-
	[0.277]	-	-	-	-	-	-	[0.365]	-	-	-
<i>gnipc</i>	0.0038 ***	-	-	-	-	-	-	-	0.0040 *	-	0.0040 **
	[0.113]	-	-	-	-	-	-	-	[0.002]	-	[0.086]
<i>va</i>	-0.0045 **	-	-	-	-	-	-	-	-	-0.0101 *	-0.0041 **
	[0.057]	-	-	-	-	-	-	-	-	[0.017]	[0.098]
<i>constant</i>	0.0689 **	0.1585 *	0.1580 *	0.0216 **	0.1605 *	0.1676 *	0.0832 **	0.1797 *	0.1191 *	0.1027 *	0.0418 *
	[0.066]	[0.000]	[0.000]	[0.077]	[0.000]	[0.000]	[0.063]	[0.000]	[0.000]	[0.000]	[0.040]
AB AR(1) (prob>Z)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AB AR(2) (prob>Z)	0.720	0.703	0.718	0.773	0.706	0.709	0.703	0.706	0.696	0.746	0.724
Hansen Test	0.275	0.279	0.294	0.617	0.269	0.257	0.289	0.286	0.285	0.296	0.274
Diff-in-Hansen Test	0.212	0.211	0.257	0.587	0.218	0.203	0.242	0.237	0.262	0.242	0.218
N	8765	8765	8765	8765	8765	8765	8765	8765	8765	8765	8765
No. of instruments	52	52	52	52	52	52	52	52	52	52	52

Source: own elaboration.

1. Values in parentheses correspond to the p-values for each variable.
 2. *, **, and *** are 1%, 5%, and 10% significance, respectively.

corporation retains control over the markets.

Regarding globalization, the estimation confirms the result of Jacobs (2015). Thus, globalization process, by one hand, extends the potential market size under better cost conditions, due exploitation of economies of scale in production and distribution (Stiglitz, 2016), and once the firms enter to foreign markets, their profits and wealth tend to increase. By the other hand, globalization offers access to other suppliers at lower costs and, therefore improving profits and wealth. Even though globalization can generate benefits to many economies and societies, the current economic-political power system -as well financial system- tend to perpetuate inequalities, concentrating benefits in those members of the mentioned systems.

Market concentration and high levels of multinational companies' production, in combination with the increased ease of moving intangible assets, profits and headquarters across borders (Di Nino *et al.*, 2020), allow the billionaires owners of this kind of firms to accumulate wealth. Thus, the bigger the value added by multinational companies, the bigger their fortunes. However, the contribution of multinationals to great fortunes is limited when they do not systematically participate in acts of corruption (*vamnc* is not statistically significative in model 3 -*corrup3*-).

In contrast, technology contributes negatively to extreme wealth. It means that subscriptions to cellular telephone act as a counterbalance of extreme accumulation. In a way, the number of cellular telephones -in combination with internet access- has contributed to creating a kind of equality between consumer-producer, by allowing the former to access a wide range of providers (national or international) with lower prices and dispersing, to a certain extent, the effect of domestic markets concentrated on few producers.

Although literature tends to establish that ICTs are an important factor for enhancing firms' capacity to improve productivity and net income (OECD, 2004), the ICT variable used here refers to the potential use that people make of it. In this respect, it is also recognized that this kind of technology impacts on income growth and poverty alleviation; thus, adoption of ICTs by all society groups represents gains for society as a whole -including those at the base of economic pyramid-, and not just for those at the top. As Mirza *et al.* (2019) established distribution of wealth depends on how access to technology is distributed.

Considering the economic variable, it is observed that the gross national income per capita, proxy of market size, is statistically significative and positive affects extreme-wealth. That is, greater markets allow to amass bigger fortunes, mainly in those with more economic and political possibilities. In short, a growing per capita income -link to high wages- depicts more chances for strongest firms to obtain growing profits.

An argument that explains this result is the fact that an expanding group of successful entrepreneurs from emerging-market, characterized for medium-high and a growing per capita income, tends to build large and global companies that allow them getting extraordinarily wealth (Freund & Oliver, 2016). Furthermore, as emerging markets grow, new large companies tend to dominate them from a position where they can extract monopoly rents, first in the home economy and then in other external economies. Also, when markets are finite, that is, with a not-growing per capita income, and there are non-appropriate social policies, an extreme wealth inequality could emerge which, in turn, is associated with great fortunes (Huang & Solomon, 2001).

The effect of political variable, voice and accountability as proxy of political institutions

quality and democracy, on extreme wealth is negative and significant. This result is in line with Saich (2012) and Scheve & Stasavage (2017). Thus, to the extent to which a country's citizens are unable to participate freely in selecting their government -or at least not to be influenced to-, enjoy freedoms of expression, association, and free media, and even, to influence in public decisions, the huge fortunes concentrated in few individuals or families are free for keep growing. As a result, relatively unhealthy and weak democracies -via lack of transparency and accountability- are unable to effectively control extreme enrichment. Possibly, the mechanisms that link democracy with extreme wealth are, in terms of Jacobs (2015), crime and cronyism.

Even in a strong democratic system, as Robeyns (2019) recognizes, billionaires can spend/invest part of their surplus money in political processes, either financing political parties and candidates for popularly elected positions, promoting an agenda for collective decision making with bias in their favour, and influencing opinions through different communication and entertainment media. However, the estimated positive sign suggests, contrary to what Prenzler *et al.* (2018) find, the existence of weak democracies with relative low capacity to enforce, in general, political systems consistent with common ethical principles and public opinion, that guide the society for more equity ways.

As a corollary, following Saich (2012), it is clear that the performance of national democracy systems (including government and its officials) cannot deal effectively with the problem of corruption and growing huge fortunes. Furthermore, wealth-equalizing policies may be absent if the democratic process is captured by the rich and very rich (Scheve & Stasavage, 2017). In accordance to Cox (2017), traditional democratic political representation, or providing 'voice' for groups or communities with low incomes, is not sufficient to overcome deep structural drivers of inequality; argument which could be extended to the idea of extreme-wealth.

In respect personal characteristics determinants of extreme-wealth, it is observed that age tends to be no significant. So, there is not statistically differences among -adult- ages to be billionaire. An explanation is that in recent years, a growing part of the extreme rich corresponds to young entrepreneurs and middle adult heirs, in contrast to the traditional wealth held by adults in advanced ages. Furthermore, although some individuals are born in a context of extreme wealth, or high wealth that enables them to accumulate even more wealth, other people are born with limited wealth, but with effort and time they obtain higher income that accumulate and invest thanks to their individual merits (relationships, education, etc.).

Lastly, differences between billionaires' gender are not statistically significant as extreme-wealth determinant. That is, opportunities to be or become a tycoon across women and men are relatively equal. This could be explained by the fact that the origin of almost 50% of the extreme-wealth is inheritance in which inside there do not seem to be relevant differences by sex.

Nevertheless, Tickamyer (1981) found evidence that there are fewer women than men in the economic elites. In this sense, the total base of billionaires shows an overrepresentation of men, explaining this result. Also asserts that sources of wealth differ among women and men; and, compared to men, they have less control over their wealth. There is evidence about polarization of wealth across gender and generations explained by differences in ownership of worthy market goods and other financial assets. Furthermore, Yamokoski (2007) states that sex, marital status and parenthood have a combined effect on distribution and opportunities of

wealth accumulation. Thus, since literature tends to provide evidence of sex disparities in wealth distribution, the result found here must be taken with caution and reserve. Other variables seem to be more important than age or sex, for example, Kesiter & Young (2014) point out that maintaining control of financial resources, education and skills related to entrepreneurship -provide unique access to high-income occupational and business opportunities.

It should be noted the significance of the results. Table 2 also reports the p -values for Hansen, Diff-in-Hansen, and $AR(1)$ and $AR(2)$ tests, as well as test over the fixed and random panel, relating autocorrelation, heteroscedasticity, cross-sectional dependence and multicollinearity bias. In short, the test does not reject the null hypothesis neither of joint validity of instruments nor of additional instruments; there is no evidence of second-order autocorrelation in sys-GMM estimation. The results suggest that the estimated equation as a sys-GMM model is a good specified to analyse the determinants of extreme wealth.

Likewise, in order to check for robustness of results the next options were followed in the sys-GMM estimations. First, the control variables were removed for equation. Second, equation (1) was estimated using lags of all the explanatory variables as instruments. Finally, an alternative measure of cronyism was used (favouritism) instead of political connections.⁶ Results are shown in table 3.

Briefly, almost all the variables maintained their significance and sign in the three different alternatives. In particular, corruption keeps their direct effect on extreme wealth. In any case, this reinforces the hypothesis that corruption tends to foster extreme wealth. At the same time, the sign of *corrup3* remains the negative. Then, it could be argued that in socioeconomic and political contexts characterized by corrupt, this phenomenon could be acting as basis for accumulating extreme wealth in oligarchies, in line with Torgler & Piatti (2013) argument. Briefly, the results are well defined and robust, so they accurately reflect the effects of the variables on extreme wealth. Finally, although the results are robust, a more in-depth investigation should consider cultural aspects and other individual characteristics of the wealthiest.

V. Conclusions

Following Piketty (2014) the rising global inequality and, for extension, the rising extreme-wealth, could lead to an increase in the influence of wealthy individuals, in particular the wealthiest, at least in their economic of origin. They, may use their power to change the political and economic institutions in their favour, becoming in a class of political-economic oligarchy. Accordingly, to our robust results, one main mechanism for do this is corruption. The main finding shows that corruption positively affects individual extreme wealth, in a context of political/institutional, economic and personal factors.

In general sense, the accumulation of extreme wealth is based on a combination of factors,

⁶The variable favoritism in decisions of government officials (*favor*) es taken from the World Economic Forum Global Competitiveness Index, and is represents the perception about the extent in which government officials show favoritism to well-connected firms and individuals when deciding upon policies and contracts. The favoritism index range of values is 1 (always show favoritism) to 7 (never show favoritism).

TABLE 3. DETERMINANTS OF EXTREME-WEALTH OF SELECTED BILLIONAIRES (sys-GMM)

Variables	corrup1			corrup2			corrup3		
	Removing control variables	Explanatory variables lagged	Alternative measure of cronym	Removing control variables	Explanatory variables lagged	Alternative measure of cronym	Removing control variables	Explanatory variables lagged	Alternative measure of cronym
<i>ew_1</i>	0.6757* [0.000]	0.7364* [0.000]	0.7199* [0.000]	0.7233* [0.000]	0.7425* [0.000]	0.7516* [0.000]	0.7315* [0.000]	0.7425* [0.000]	0.7488* [0.000]
<i>corrup1</i>	1.3018* [0.020]	0.0393** [0.099]	0.2315** [0.064]	-	-	-	-	-	-
<i>corrup2</i>	-	-	-	1.0849* [0.080]	0.0034** [0.083]	0.0237** [0.082]	-	-	-
<i>corrup3</i>	-	-	-	-	-	-	-0.8485** [0.069]	-0.0064** [0.072]	-0.0176** [0.089]
<i>polc</i>	-	0.0103** [0.066]	-	-	0.0150** [0.083]	-	-	0.0160** [0.054]	-
<i>fav</i>	-	-	0.2320* [0.000]	-	-	0.1712* [0.003]	-	-	0.1652* [0.003]
<i>inheri</i>	-	0.0343** [0.076]	0.0118** [0.070]	-	0.0283*** [0.107]	0.0120** [0.068]	-	0.0297** [0.079]	0.0116** [0.095]
<i>end</i>	-	0.0044** [0.053]	0.0837* [0.045]	-	0.0095* [0.192]	0.0633* [0.028]	-	0.0077* [0.280]	0.0610* [0.033]
<i>vamnc</i>	-	0.0002 [0.212]	0.0002 [0.283]	-	0.0002 [0.189]	0.0001 [0.082]	-	0.0002 [0.193]	0.0002 [0.097]
<i>ict</i>	-	-0.0006 [0.194]	-0.0023* [0.012]	-	-0.0007 [0.167]	-0.0018* [0.018]	-	-0.0006 [0.196]	-0.0018* [0.020]
<i>age</i>	-	0.0015* [0.043]	0.0009 [0.513]	-	0.0015* [0.040]	0.0063 [0.660]	-	0.0015* [0.040]	0.0004 [0.598]
<i>gend</i>	-	0.0090 [0.151]	-0.0536 [0.400]	-	0.0085 [0.756]	-0.0167 [0.580]	-	0.0042 [0.877]	-0.0186 [0.537]
<i>gnipc</i>	-	0.0000 [0.246]	0.0000 [0.565]	-	0.0000 [0.257]	0.0000 [0.901]	-	0.0000 [0.298]	0.0000 [0.859]
<i>va</i>	-	0.0033** [0.089]	-0.0116** [0.088]	-	0.0023** [0.074]	-0.0090** [0.088]	-	-0.0030 [0.240]	-0.0090** [0.089]
<i>constant</i>	0.0390** [0.091]	-0.0904 [0.301]	0.2416 [0.455]	0.00217** [0.084]	0.1193*** [0.101]	0.0843 [0.436]	0.1046** [0.053]	0.1167 [0.172]	0.0827* [0.044]
AB AR(1) (prob>Z)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AB AR(2) (prob>Z)	0.819	0.761	0.737	0.341	0.762	0.724	0.225	0.760	0.726
Hansen Test	0.277	0.228	0.247	0.178	0.199	0.183	0.188	0.193	0.210
Diff-in-Hansen Test	0.192	0.173	0.194	0.124	0.156	0.117	0.145	0.151	0.172
N	8765	8765	8765	8765	8765	8765	8765	8765	8765
No. of instruments	24	54	52	24	54	52	24	54	52

Source: own elaboration.

1. Values in parentheses correspond to the p-values for each variable.
2. *, **, and *** are 1%, 5%, and 10% significance, respectively.

such as meritocratic, non-meritocratic, and personal traits, that oligarchies or power groups have managed to exploit. In any case, oligarchies use their political and economic power to obtain benefits from public power, concentrating gains of grand corruption, and thus, accumulate extra wealth. In consequence, billionaires have incentives to follow inside a network of corruption. This tends to perpetuate the corrupt systems, their accumulated effect on elites, and the rising inequality.

Failures on democratic systems, incomplete reforms of global economy, strong nets among politicians and public officers and rich people, domestic market failures, among others, even in nation of more advanced development stages, pave the way for corruption as an extreme enrichment mechanism, in combination with legal factor influencing fortunes.

Also, balancing extreme wealth with other levels of wealth requires political and private will in a combination of strong and effective public power to combat and punish corruption. However, personal incentives on both sides seem to be oriented more to private gain than to social benefit. Finally, since the problems of corruption and extreme enrichment are global, joint agreements are also required at the local, national and international levels. One possible mechanism is the establishment of a global tax on extreme wealth.

Then, joint agreements also mean the simultaneous concurrence of three actors is necessary: the Companies that express their position on the problem; the State that develops its strategies to combat this phenomenon and the Civil Society that informs and educates citizens about concrete actions applied. Therefore, a choice to control the larger fortunes, and move toward equality, are public and private anti-corruption measures that restrict those behaviors. Another way to control extreme wealth is a public investment of high quality that promotes more public well-being.

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