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The Effect of Democracy on Income: An Analysis of Countries Affected by Coups d'État

Summary: Although there is a considerable amount of study which examines the effect of democracy on national income, a limited number of papers analyses the effect of democracy on per capita income. The main objective of this research is to show the effect of democracy level on per capita income among new sample 21 countries which share a similar coup d'état experience in their political history, to fulfil the gap in the literature. The countries selected are from different continents and are those most affected by coups. The impact of two different democracy indicators (Freedom House and Polity IV) on the per capita income of the countries in the period 2000-2014 is analysed. The results of the panel data estimation show that, an increase in democracy level has a positive effect on per capita income for both democracy indicators. As expected, the effect of the investment, secularism and education variables on income is positive, whereas the effect of population growth rate is negative. And trade has no definite effect on per capita income.

Key words: Coup d'états, Democracy, Income, Panel data.

JEL: C33, F10, I25, 010, P16.

It is commonly believed in economics literature is that there is a relationship between democracy level and income. Can such an association be present in countries where democracy has been interrupted with coup d'états? More precisely, is there a relationship between coups d'états (or autocratic regimes) and income? Coup periods are interruptions to democracies, which may prevent the countries from enjoying the benefits of democracies during that period. However, there is no agreement among scholars on how to define a coup. Jonathan M. Powell and Clayton L. Thyne (2011, p. 252) defined coups as "*illegal and overt attempts by the military or other elites within the state apparatus to unseat the sitting executive*". It can be argued that there has always been a correlation between democracy level and *per capita* income. Some researchers (Fabrice Murtin and Romain Wacziarg 2014; Jakob B. Madsen, Paul A. Raschky, and Ahmed Skali 2015) have also cited a transitional relationship between democracy and income. However, whether or not autocratic regimes hinder a high level of economic income is a controversial issue.

The main objective of this research is to determine the relationship between the level of democracy and *per capita* income. Twenty-one countries having experienced

a coup d'état are selected for the analysis. The effect of democracy level on *per capita* income during the period of 2000-2014 is investigated. A major limitation of the literature is that the relationship between democracy and *per capita* income has been often examined in accordance with developed/developing country differentiations and (or) limiting the scale with one specific region. The first contribution of this research is to investigate countries which are exposed to coup d'état. The second one is that secularism ("Government Regulation of Religion") variable is included to the determinants of *per capita* income such as education, investment and trade.

Panel data analysis is used to examine the effect of democracy on *per capita* income. The results show that two democracy variables (Freedom House and Polity IV) have a positive effect on *per capita* income. The article is organised as follows: Section 1 provides a brief history of coups d'état, and Section 2 discusses the relationship between democracy and *per capita* income. Section 3 presents the model, the data collection, and the results. Finally, Section 4 provides the conclusions.

1. Brief History of Coups d'État

The military-civil relation is one of the most tumultuous research topics of political science. The involvement of military as an institution into politics even taking power in many cases has been a non-negligible part of political history of the world even if it has been seen as a makeshift attempt under regular conditions. Understanding reasons and causes of coups and the assessment of coup risks in addition to coup preventing measures constitute a significant place within the academic literature. The genealogy of coup d'états exceeds the boundaries of the article even so the main indicators of contemporary coups (or coup attempts) are weakness of civil society, legitimacy of the ruling regime (or a discussion of it) and previous successful coup attempts (Aaron Belkin and Evan Schofer 2003, pp. 594-595). These factors categorically contain both "pull" (motivations of agents) and "push" (structural conditions) factors which are formulated by Ekkaryt Zimmermann (2013, p. 246) who investigates reasons of coups. Samuel Edward Finer (2002) carries out a similar analysis and, describes conditions may lead to coups as *increased civilian dependence on the military* particularly focusing on war, cold war and civil war conditions; *the effect of domestic circumstances* which is specified under three state of affairs as *overt crises*, the excessive level of fragmentation within political spectrum, *latent crisis*, the contestation in between small ruling elite and "masses" and *the power vacuum*, the absence of organized political forces; the final condition is *the popularity of the military.* Although the conditions of war and (or) civil war are considered to be the state of exceptions, the signified factors and conditions leading coups directly resonate with *the level of political culture* as it has been indicated as the power of *civilian institutions* (Finer 2002, pp. 72-85).

An analysis of the history of coups d'états showed that their occurrences were concentrated in certain years. As shown in Figure 1, there was an increase in the number of coups and coup attempts across the world during the periods of 1962-1966, 1974-1976 and 1990-1992, early 2000s and after 2012.

If the coup-prevention strategies of a regime fail, and a coup d'état succeeds, the society is bound to suffer some aftermaths. Coups can be quite bloody and brutal. The main goals of such coup attempts are to hinder democratic solidarity and preclude

democratization (Theresa Simcic 2013; Thyne and Powell 2016). Various researchers have found that coups are staged to change the government or regime (Powell and Thyne 2011, p. 250, see Table 1). More specifically, in most cases, the aim is to replace primary leader or chief executive (Powell and Thyne 2011, pp. 249-250; Thyne and Powell 2016, p. 195). Another interesting detail about coups is that, perpetrators are mostly part of the government elite and extensively include military officers; in any case, they are part of the privileged elite of the community. Moreover, the method used to unseat the leader varies from the exercise of legitimate powers to illegal means (Powell and Thyne 2011, pp. 249-250; Thyne and Powell 2016, pp. 195-196).
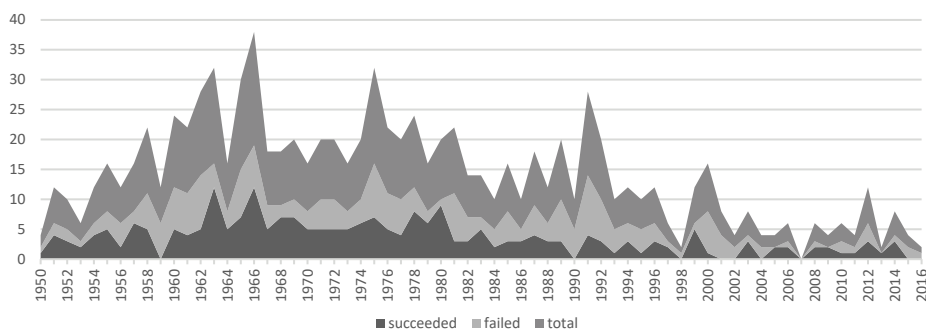
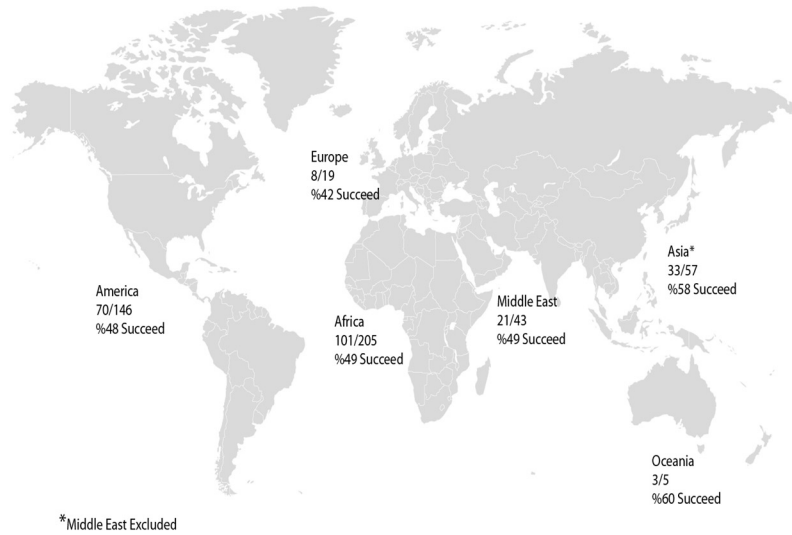**Source:** Powell and Thyne (2011, p. 255).

Figure 1 Coups d'État after 1950

Based on the literature and the data in Powell and Thyne (2011) and Thyne and Powell (2016), Africa is the continent that has, suffered coups the mostly. Figure 2 shows the geographic distribution of these coups. Approximately 44% of the successful or attempted coups worldwide have taken place in Africa and 49% of the coups in this continent have succeeded. Latin America ranks as the second continent with the most coups. A total of 146 coup attempts have been staged in Latin America, of which 70 (48%) have been successful. In the same period, Middle East countries have been experienced 43 coups 21 of which (about 49%) have resulted in success. In the rest of Asia, the number of coup attempts is 57, of which 33 have succeeded. In Europe, 19 coups attempts have taken place in the same period, 8 of which have met with success. Apart from Azerbaijan and Ukraine all the other countries that have experienced such attempts are located in Southern Europe (Spain, Portugal, Cyprus, Greece, and Turkey).

The world map in Figure 3 shows the countries in which coup attempts have taken place after 2000, some of which have succeeded. The dark areas on the map indicate the countries in which coup attempt has been successful more than once. Egypt, Fiji, Guinea-Bissau, Mauritania, and Thailand have experienced two coups since 2000.

The dark-grey areas on the map indicate those countries that have experienced a coup d'état more than once, whereas the sideliners are those in which a coup attempt has failed. In the period studied, the countries with the most coups d'état or coup

attempts are again in the African continent. During 2000-2016, there were 19 coups attempts in Africa, 11 of which failed. In Latin America, coup attempts in Ecuador, Peru, Paraguay and Venezuela did not prosper, whereas a coup succeeded in Honduras in 2009. In Europe, a successful coup attempts took place in Ukraine, whereas the attempt in Turkey was repressed (Figure 3).

America
70/146
%48 Succeed

Europe
8/19
%42 Succeed

Africa
101/205
%49 Succeed

Middle East
21/43
%49 Succeed

Asia*
33/57
%58 Succeed

Oceania
3/5
%60 Succeed

*Middle East Excluded

Source: Powell and Thyne (2011, p. 255, 2016).

Figure 2 Geographic Distribution of the Coup Attempts between 1950-2016

■ Succeeded more than one
☐ Succeeded once
≡ Failed
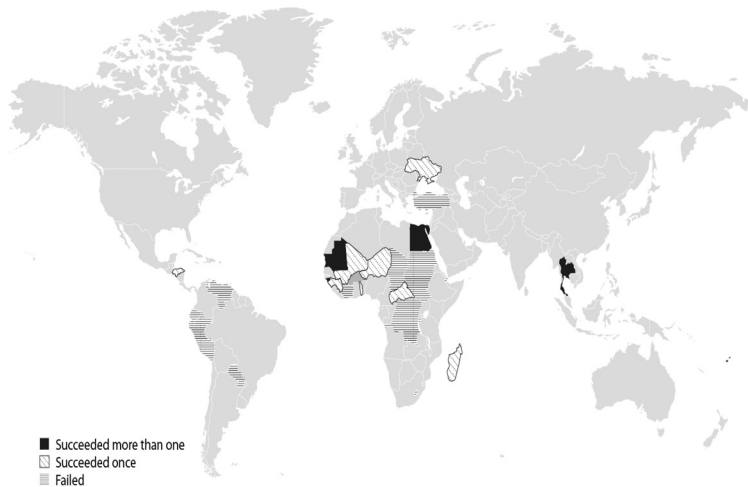
Source: Powell and Thyne (2011).

Figure 3 Recent Coups and Coup Attempts (after 2000)

Although half of the world has been described as democratic by Freedom House (2016)[1], the number of successful coups in the last decade (17) has surpassed during the previous decade (15). Nevertheless, considering the recent examples of Honduras (2009), Mali (2012), Egypt (2013), Thailand (2014), and Turkey (2016), it has been argued that the coups do not happen only in non-democratic countries (Curtis Bell 2016, p. 2).

Economic development, a high level of democracy, empowerment of civil society, enhanced freedom of the press, and respect for the rule of law are regarded as coup prevention strategies. However, the literature shows that different countries apply different strategies. Aside from the above-mentioned, to make an ethnic, denominational staff in military and in some other key positions or to subordinate the military, and bribery, which have more recently been seen in Iraq and Syria (Belkin and Schofer 2003).

2. Relationship between Democracy and Income/Growth

Francisco L. Rivera-Batiz and Luis A. Rivera-Batiz (2002, pp. 135-136) emphasize that democracy is more than elections. Rather, the concept includes press freedom, the absence of censorship, clear and active legal institutions, transparency, openness, and citizen participations in policy-making. The different researches that have analysed the effect of democracy level on growth and/or *per capita* income have yielded different results. Economist have mostly determined whether or not democracy leads to high growth rates, whereas political scientists have mainly examined the effect of a developed economy on the growth of democracy (Paresh Kumar Narayan and Russell Smyth 2006, p. 82). Studies in different countries or country groups and with different analysis methods have also yielded varying results.

Some studies have found a weak relationship between democracy and growth (Narayan and Smyth 2006, pp. 83-84). Ali Sandalcılar (2013) reports that 40% of 483 researches show no relationship between two variables. Charles Kurzman, Regina Werum, and Ross E. Burkhart (2002, pp. 7-8) review 47 studies and reported that 40% of them find a positive association, whereas 10 show no significant relationship. Hristos Doucouliagos and Mehmet Ali Ulubasoğlu (2008, p. 62), carry out a meta-analysis of 483 regressions (from 84 studies) and find that 27% of them show a positive and significant association, 15% show a negative and significant relationship, 37% are positive, and 21% are negative and statistically insignificant. Thus, 58% of the studies could not establish a relationship between democracy and growth. These results indicate that fairly more than one-third of studies shows no relationship between these two variables.

Robert J. Barro (1996), Xavier X. Sala-i-Martin (1997), Jenny A. Minier (1998), Matthew A. Baum and David A. Lake (2003), Roberto Rigobon and Dani Rodrik (2004), Sugata Ghosh and Andros Gregoriou (2009), Vishal Chandr Jaunky (2013), Daron Acemoglu et al. (2014b), Madsen, Raschky, and Skali (2015) find a positive

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[1] **Freedom House.** 2016. Freedom in the World Country Ratings 1973-2016. https://freedomhouse.org/sites/default/files/Country%20Ratings%20and%20Status%2C%201973-2016%20%28FINAL%29.xlsx (accessed January 16, 2016).

direct and/or indirect effect of democracy on growth, economic performance, and income in different samples. Democracy level is reported to have a negative effect on economic growth by Jong-sung You (2011) and Ari Aisen and Francisco José Veiga (2013) and on income by Narayan, Seema Narayan, and Smyth (2011). Further, Murtin and Wacziarg (2014) do not find any important effect of democracy on *per capita* income. Even in autocratic regimes with limited political rights, considerably advanced economic freedoms and property rights may be provided (Barro 1996). The most important variable that emerges in this case is economic freedoms. In all cases, autocracy does not bring about economic growth and/or development (Barro 1996).

Seymour Martin Lipset, reveals that there is a valid relationship between democracy and income in his view which after so called as "Lipset hypothesis". This hypothesis actually took origins from Aristotle. In other words, countries with a high per person GDP achieve a higher level of democracy; however, there is no statement that all "rich" countries become more democratic (Seymour Martin Lipset 1959 as cited in Barro 1996). Barro (1996) apply a similar approach, in which democracy is regarded as return of economic growth. There is no country can sustain democracy without economic development as well as this study proves that economic development or income might not maintain without democracy today.
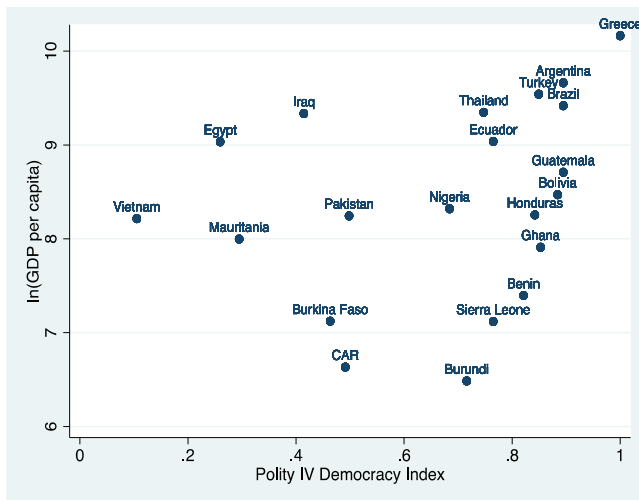
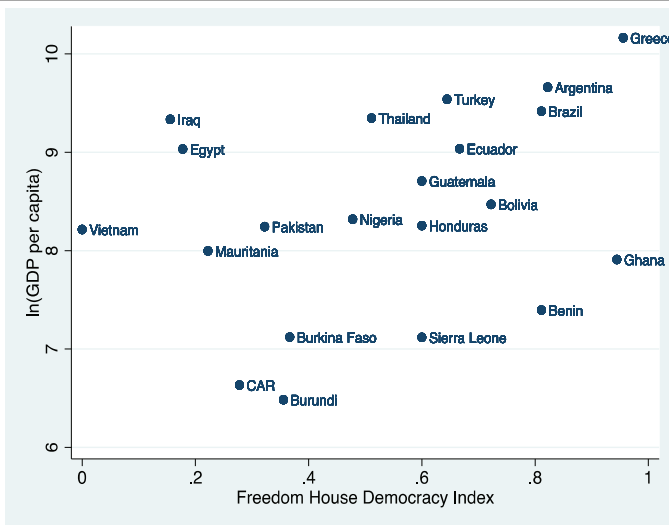**Notes:** CAR - Central African Republic.

Source: Author's calculations.

Figure 4 Democracy Score (Polity IV) and Income (per capita GDP (PPP)): 2000-2014 Averages

Shown in Figures 4 and 5, there is a substantial relationship between democracy and *per capita* income. There are four countries which are in foreground. These countries are Greece, Argentina, Turkey and Brazil, which are distinct from the rest of the sample in terms of both democracy and *per capita* income. Greece has the highest level of democracy based on both the Freedom House and Polity IV indices, probably due to the positive effect of its membership of the European Union. Undoubtedly, it can be

argued these indices leads to a high *per capita* income. Argentina and Brazil are the leading economies for their continent; they also have the highest *per capita* GDP among the sample of the South American continent.

Turkey differs from the other countries in the (Middle East) region in both the indices and its dynamic economy. The data on Iraq, Egypt and Vietnam indicate that there is no need to democratize to achieve a high *per capita* income (relatively). However, when it comes to African countries, this argument seems to show a change, with Benin, Sierra Leone, Burundi, Burkina Faso, and the Central African Republic (CAR), which can be considered moderate democracies according to the Polity IV index, having the lowest levels of *per capita* income. However, for Table 5, except Benin, the African representatives are not free societies so this argument explains one of the reasons why Benin's *per capita* income is highest in African sample.

Notes: CAR - Central African Republic.

Source: Author's calculations.

Figure 5 Democracy Score (Freedom House) and Income (per capita GDP (PPP)): 2000-2014 Averages

Yong U. Glasure, Aie-Rie Lee, and James Norris (1999, p. 475) highlight the existence of a trade-off between economic growth and democracy. Most countries tend to prefer economic growth. For instance, a surge in political rights may increase growth in a dictatorship or may devastate it due to concerns about the redistribution of income in a middle-class democracy (Barro 1996). In this regard, according to Barro countries with an average level of democracy are the best candidates for economic growth, followed by those with rock bottom and maximum levels respectively. The most robust finding of Barro is that the average level democracies are differentiated with their superior growth rates from others (1996, p. 14). When this argument is evaluated in the context of *per capita* income, a positive correlation may be found between moderate democracy level and *per capita* income as shown in Figures 4 and 5.

Similarly, in political systems with at least two freely elected parties, policy makers receive pressure from different interest groups: they may prefer populist policies for re-election rather than following long-term growth. The effect of non-democratic policies is uncertain (Alberto Alesina et al. 1996). As Barro (1996, p. 12) points out, when only some neglected variables added, democracy might effect on growth positively and may increase *per capita* income. These variables are rule of law, schooling rate, average life expectancy, and birth rate. However, there is no direct link between democracy type and income and/or growth. Jagdish N. Bhagwati (2002) cites that markets may experience growth in both democratic and authoritarian regimes. Doucouliagos and Ulubasoğlu (2008, p. 64) emphasize that, more particularly, "*democracy has enormous indirect effects on growth*" through such channels as human capital, income distribution, political stability, and economic freedom. Several methodological and empirical researches have proven the emphasis such as Alesina et al. (1996), Barro (1996), Baum and Lake (2003), Acemoglu et al. (2008), and Dawid Piątek, Katarzyna Szarzec, and Michał Pilc (2013).

Acemoglu et al. (2008) shows that the relationship between democracy and income has varied across the time. Five hundred years ago, when almost all countries were non-democratic, the income levels were quite similar. The main hypothesis of the study is that countries pass through different cycles of political-economic development. Historical factors such as Independence Day, restrictions on executive and religion affect the relationship between democracy and income. The collapse of feudalism, the age of industrialisation, and the process of colonization are the breaking points in the development process. Herein, these breaking points are the reactions of countries to these developments (Acemoglu et al. 2008). As Barro (1996) points out, the use of dummy variables is important in this kind of analysis. Without such variables, the relation between democracy and growth may show a weak correlation as reported Acemoglu et al. (2009). Similarly, the results of Acemoglu et al. (2008) have not shown any missing relation between democracy and income. Only, restrictions on executive, Independence Day and religion variables weaken the relations between these two. For example, an economic crisis can end a dictatorship and may result with an emergence of a democratic government. The effect of democracy on income is investigated by reversing the analysis of Acemoglu et al. (2008) in this study. Other important variables such as human capital and religion (or instead the regulatory policies of governments into religion) are included in the analysis.

3. Data, Methodology, and Analysis Results

The data covers countries in different parts of the world that have been affected by coups or coups attempts the most. As mentioned above (Figure 2), Africa is the continent mostly affected by coups. Therefore, eight of the countries are from African continent (Benin, Burkina Faso, Burundi, Central African Republic, Ghana, Mauritania, Nigeria and Sierra Leone). The second continent suffered from the coups the most is Latin America. Bolivia has experienced 12 coups and 11 coups attempts, whereas Argentina has had 13 and seven, respectively. These are the top two countries, affected by coups or coups attempts in the South America. Argentina, Bolivia, Brazil, Ecuador, Guatemala, and Honduras are the other countries in the sample from the continent. The

sample from the Middle East includes Egypt and Iraq. Egypt has witnessed four coups d'états and its current ruling executive came to power through a coup. Iraq has survived eight coups, and four coup attempts. In the sample from Asia, Thailand has witnessed the most contemporary coups d'état. In 2014, the Thai army launched a coup after a political crisis. Vietnam, which has had four coups and four coups attempts is included as a representative of Southeast Asia. Pakistan is the only other Asian country. Greece and Turkey comprise the sample from Europe. Greece has witnessed two coups, one in 1967 and another in 1973. Turkey has had the highest rate of coup or coup attempts in the continent. With successful coups d'état in 1960, 1971, and 1980 (Powell and Thyne 2011). In July 2016, the resistance of the people and politicians put an end to another bloody coup attempt in Turkey.

Some countries (such as Afghanistan, Haiti and Syria) are excluded from analysis due to unavailability of data. Thus, a total of twenty-one countries are selected including those most affected by coups, as shown in Figure 2. The analysis aims to measure the effect of democracy on *per capita* income in the period 2000-2014.

Previous studies of Barro (1991, 1996) and N. Gregory Mankiw, David Romer, and David N. Weil (1992) have contributed the literature on the determinants of economic growth in different countries. As previously emphasized, the different studies in this field have considered many different variables as having an impact on economic growth (Michael T. Rock 2009, p. 943). Although several studies have examined the effect of democracy on economic growth, few have investigated the effect of democracy level on *per capita* income. Therefore, in the present study, *per capita* income is used as a dependent variable. The effect of democracy on *per capita* income is estimated with the use of following model:

$$y_{it} = \alpha + \beta dem_{it} + \gamma \boldsymbol{X}'_{it} + \delta_i + u_{it}, \tag{1}$$

where y is the *per capita* GDP. Narayan, Narayan, and Smyth (2011), Daniel Sakyi (2011), Acemoglu, Francisco A. Gallego, and James A. Robinson (2014), Murtin and Wacziarg (2014) and Madsen, Raschky, and Skali (2015) also considered the *per capita* income (GDP) and applied a similar approach in their analysis. The data on *per capita* GDP and PPP (current value in US$) were taken from the WDI DataBank (World Bank 2017)[2]. dem is the democracy score of country i in period t, and β parameter the causal effect of democracy on *per capita* income. Two proxy variables are used to analyse the effect of democracy on *per capita* income. The first variable is the Polity IV index, dem_{it}^{polity} which is published by the Polity IV Project of "the Center for Systemic Peace". Within this index, countries are given a score ranging from -10 to +10 with -10 indicating "full autocracy" and +10 signifying "full democracy" (Polity IV Project 2014). The second variable is the Political Rights index dem_{it}^{FH}, a democracy index published by Freedom House. This index ranges between +1 and +7, with +1 indicating "free", and +7 signifying "not free" (Freedom House 2016). A positive relationship is expected between both variables and *per capita* income. The same

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[2] **World Bank.** 2017. World Develepment Indicators (WDI) Online DataBank. http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators (accessed January 02, 2017).

approach is applied in Acemoglu et al. (2008), Sakyi (2011), Acemoglu et al. (2014), Acemoglu, Gallego, and Robinson (2014), Murtin and Wacziarg (2014) and Madsen, Raschky, and Skali (2015). The data is normalized between 0 and 1, with a higher number indicating a higher level of democracy. And X' vector of control variables for country i in period t, which are investment, trade, education, population growth rate, and GRI. δ_i denotes the country dummies, and ε_{it} is the error term.

Two separate equations are estimated in this study. The first is Equation (2), where dem_{it}^{FH} is the independent variable:

$$y_{it} = \alpha_0 + \beta_1 dem_{it}^{FH} + \gamma_1 \ln(investment)_{it} + \theta_1 \ln(trade)_{it} + \lambda_1 ln(education)_{it} + \sigma_1 Pop_{it}^{Growth} + \varrho_1 GRI_{it} + \delta_i + \varepsilon_{it}. \tag{2}$$

The second is Equation (3), where dem_{it}^{polity} is the independent variable for democracy:

$$y_{it} = \alpha_1 + \beta_2 dem_{it}^{polity} + \gamma_2 \ln(investment)_{it} + \theta_2 \ln(trade)_{it} + \lambda_2 ln(education)_{it} + \sigma_2 Pop_{it}^{Growth} + \varrho_2 GRI_{it} + \eta_i + \epsilon_{it}. \tag{3}$$

In Equations (2) and (3); $\ln(investment)$ the natural log of gross capital formation (GCF) as % of GDP for all samples in the period 2000-2014. A positive relation between investment level and *per capita* income is expected. The GCF data are obtained from the World Bank (2017).

Variable $\ln(trade)$ is the natural log of trade (% of GDP) and one of the control variables for the twenty-one countries in between 2000-2014. Trade is a dummy variable for trade openness. Barro (1996), Jose Tavares and Romain Wacziarg (2001), Rigobon and Rodrik (2004), Rock (2009), Aisen and Veiga (2013), Sandalcılar (2013), Acemoglu et al. (2014), Houssem Rachdi and Hichem Saidi (2015), and Raufhon Salahodjaev (2015) also use these variables in a similar approach. The trade data is obtained from the World Bank (2017). A positive effect of trade openness on *per capita* income is expected.

Variable $ln(education)$ denotes the primary school enrolment (% gross) of females. Many studies have analysed education as a determinant of *per capita* income or economic growth including Barro (1996), Minier (1998), Baum and Lake (2003), Acemoglu, Gallego, and Robinson (2014), Murtin and Wacziarg (2014), Madsen, Raschky, and Skali (2015) and Kevin Sylwester (2015). The primary school enrolment (% gross) of females is used as a proxy variables for human capital similarly T. Paul Schultz (1990) and Baum and Lake (2003). The data is obtained from the WDI DataBank (World Bank 2017).

Pop_{it}^{Growth} refers to the population growth rate of the twenty-one countries selected, in the period 2000-2014. Population growth leads to a decrease in *per capita* income; thus, a negative impact on *per capita* income has expected. Minier (1998), Kurzman, Werum, and Burkhart (2002), Rock (2009) and Aisen and Veiga (2013) regress population growth as a determinant of growth/*per capita* income. The data on population growth rate is from the World Bank (2017).

The effect of secularism is added to the model with a different approach. Different from Barro (1996), Tavares and Wacziarg (2001), Acemoglu et al. (2008) and Acemoglu, Gallego, and Robinson (2014) a secularism variable is used to measure the

effect of secularism on *per capita* income rather than religion. The "Government Regulation of Religion Index" (*GRI*) is included into the analysis as a proxy for secularism. GRI is among the "International Religious Freedom data" provided by the Association of Religion Data Archives (ARDA) online Website. Two aggregate data is obtained from ARDA (2017)[3]. The GRI score ranges from 0-10 and, with lowest values indicating less regulation. The estimator is expected to have a negative sign i.e. more secularism in society makes a positive contribution on *per capita* income. However, in this study a positive correlation expected because the GRI data is normalized.

Variables δ_i and ε_{it}, respectively, are the country-specific effects and the error term for Equation (2), the corresponding symbols η_i and ϵ_{it} for Equation (3). The test results of the "unit and time effects" of the model indicate that the model is one-way and has no time effects (Appendix).

One of the most important challenges in analysing the effect of democracy on *per capita* income is the lack of data. In fact, the sample data for the period of study could not be enlarged thus, panel data analysis is applied, as is common in the literature. It is a well-established fact that the panel estimate has increased prediction power compared with other classical estimation methods (Jerry Coakley and Ana Maria Fuertes 1997). Panel data analysis has become a preferred method among researchers due to some advantages, such as reducing multicollinearity among the explanatory variables, providing more efficient predictors, facilitating inference, allowing the estimation of dynamic coefficients, and having more precise estimators, by providing large data points and thus increasing the degree of freedom (Cheng Hsiao 2003, pp. 3-7; Badi H. Baltagi 2008, pp. 6-8; Marno Verbeek 2008, pp. 355-358).

Notable researchers, such as Barro (1996), Tavares and Wacziarg (2001), Elias Papaioannou and Gregorios Siourounis (2008), Rock (2009), Carl Henrik Knutsen (2012), Acemoglu et al. (2014), Murtin and Wacziarg (2014) and Madsen, Raschky, and Skali (2015) have used panel data estimation in many studies on the relationship between democracy and growth or *per capita* income so as to avoid problems such as unobserved heterogeneity and multicollinearity. Equations (2) and (3) above are estimated by using both with fixed and random effects models, as well as by removing the educational variable, which has an unbalanced characteristic. Education is the variable that suffers the most from lack of data. A considerable amount of data on (female) education in Bolivia, Iraq, Nigeria and Sierra Leone is missing. Thus, all analysis carries out with and without education data.

Based on the specification tests done, the model should be estimated with the standard error-corrected estimates. For all equations, the Hausman test results are also rejects random effect model (REM) and confirms the preference for fixed effects model (FEM) (Appendix). Both models, however, have also been predicted once with the random effects model. Previously, it has been confirmed that there are no time effects and that unit effects barely exist in the model (Appendix). Considering the "modified Wald test for groupwise heteroskedasticity" is applied for detection of heteroskedasticity in FEM. For both Equations (2) and (3), heteroskedasticity is detected regardless of whether the lneducation variable is present or not (Appendix, Table C1).

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[3] **Association of Religion Data Archives (ARDA).** 2017. International Religious Freedom Data. http://www.thearda.com/Archive/Files/Downloads/IRF2001_DL2.asp (accesed January 20, 2017).

Because the sample consists of many different countries, it is also more convenient to estimate the model with robust standard errors that also correct the model heteroskedasticity a *priori*. Modified Alok Bhargava, Luisa Franzini, and Wiji Narendranathan (1982) Durbin-Watson and Baltagi and Ping X. Wu (1999) LBI tests performs to determine serial correlation and find that the test statistic is far from the critical value of 2. For this reason, the basic hypothesis of "no autocorrelation" is rejected. According to the M. Hashem Pesaran (2004) CD test, the main hypothesis of "no cross-sectional dependence" is rejected at the 95% confidence level for Equations (2) and (3) (Appendix, Table C1). The Pesaran CD test could not be done for Equations (2) and (3) with "lneducation" due to the unbalanced data for this variable. However, the models with the "lneducation" variable are also estimated with robust estimators. Therefore, heteroskedasticity, serial correlation and the correlation between units are detected for one-way unit effected FEM.

Levene (1960) and Brown and Forsythe (1974) tests are applied for detection of heteroskedasticity (Howard Levene 1960 and Morton B. Brown and Alan B. Forsythe 1974; cited by Christopher F. Baum 2006) to REM. Bhargava, Franzini, and Narendranathan (1982) Durbin-Watson and Baltagi and Wu (1999) LBI tests performs for detection of autocorrelation. The tests showed the existence of heteroscedasticity and autocorrelation, for Equation (2) with and without the education variable, respectively (Appendix, Table C2). In this context, John C. Driscoll and Aart C. Kraay (1998) estimator for FEM (DK-FEM) and Manuel Arellano (1987), Kenneth A. Froot (1989) and William H. Rogers (1993) estimator for REM (AFR-REM) are applied.

Table 1 Effect of Democracy (Freedom House Index) on *per capita* Income

Dependent variable $ln(Y_{it})$ Estimator	(1) DK-FEM	(2) DK-FEM	(3) AFR-REM	(4) AFR-REM
dem_{it}^{FH}	0.1118* (0.057)	0.1651* (0.081)	0.1263 (0.129)	0.1707 (0.162)
$ln(investment_{it})$	.0614** (0.022)	0.1577*** (0.026)	0.0743 (0.074)	0.1681*** (0.064)
$ln(trade_{it})$	0.0884 (0.085)	0.1804* (.089)	0.0549 (0.166)	0.1577 (0.162)
$Population_{it}^{Growth}$	-0.2963*** (0.061)	-0.1678*** (0.042)	-.3578*** (0.094)	-0.1950** (0.077)
$ln(education_{it})$	0.5033*** (0.078)	-	0.5278*** (0.175)	-
GRI_{it}	0.6710*** (0.165)	0.9071*** (0.207)	0.5652*** (0.188)	0.8442*** (0.183)
C	5.6041*** (0.406)	6.8282*** (0.501)	5.7761*** (0.847)	6.9826*** (0.726)
R^2	0.44***	0.39***	0.43***	0.08***

Notes: DK-FEM and AFR-REM denote the Driscoll-Kraay fixed effect and the Arellano (1987), Froot (1989) and Rogers (1993) random effect estimators, respectively. For DK-FEM, the standard errors are shown within parenthesis (columns 1 and 2). For AFR-REM, the robust standard errors are presented within parenthesis (columns 3 and 4). C is constant. * significant at the 10% level. ** significant at the 5% level. *** significant at the 1% level.

Source: Author's calculations.

Table 1 presents the results of Driscoll and Kraay's estimation of Equation (2) columns 1 and 2 with and without the "lneducation" variable. As expected the coefficient of democracy is significant and positive. Columns 3 and 4 show the results of the REM estimators of Arellano (1987), Froot (1989) and Rogers (1993) for Equation (2) with and without "lneducation" variable. The variable dem_{it}^{FH} is no longer statistically significant in columns 3 and 4.

As shown in Table 1, a significant relation is found between democracy (Freedom House index) and *per capita* income, although the probability of the democracy variable is 0.071 for Equation (2) with the education variable and 0.060 for Equation (1) without the education variable. Democracy have a positive and slight effect on *per capita* income for the Driscoll-Kraay estimator. Except for trade (columns 1, 3 and 4) all variables are significant and showed the expected values for the Driscoll-Kraay estimator. Here population growth is expected to have a negative impact on *per capita* income, where population increases faster than *per capita* GDP.

However, when Equation (2) is estimated according to the random effects model, the significant relationship between democracy and economic growth disappears: the coefficient of democracy yields a nonsignificant result. In this estimation method, the *p* values are increased by 0.33 and 0.293 respectively.

Table 2 presents the analysis results for Equation (3), in which $dem_{it}^{PolityIV}$ is the independent variable. Columns 1 and 2, respectively show the results of the Driscoll-Kraay estimator with and without education variable. In both models and equations, the Polity IV variable is significant and has a more distinct effect on *per capita* income with *p* values of 0.000 and 0.001. As previously mentioned, Equation (3) is

Table 2   Effect of Democracy (Polity IV index) on *per capita* Income

Dependent variable $ln(Y_{it})$	(1)	(2)	(3)	(4)
Estimator	DK-FEM	DK-FEM	AFR-RE	AFR-RE
$dem_{it}^{PolityIV}$	0.2523***	0.3370***	0.2340**	0.3426**
	(0.059)	(0.055)	(0.120)	(0.132)
$ln(investment_{it})$	0.0583**	0.1412***	0.0727	0.1513**
	(0.023)	(0.022)	(0.077)	(0.073)
$ln(trade_{it})$	0.0904 (0.075)	0.1942**	0.0647	0.1734
		(.073)	(0.170)	(0.165)
$Population_{it}^{Growth}$	-0.2965***	-0.1871***	-.3452***	-0.2117***
	(0.067)	(0.042)	(0.090)	(0.082)
$ln(education_{it})$	0.4479***	-	0.4686***	-
	(0.083)		(0.173)	
GRI_{it}	0.6723***	0.8519***	0.5720***	0.7884***
	(0.167)	(0.188)	(0.195)	(0.180)
C	5.7346***	6.7290***	5.9031***	6.9034***
	(0.376)	(0.427)	(0.862)	(0.733)
R^2	0.46***	0.42***	0.42***	0.12***

Notes: DK-FEM and AFR-REM are refer to the Driscoll-Kraay fixed effect and the Arellano (1987), Froot (1989) and Rogers (1993) random effect estimators, respectively. For DK-FEM, the standard errors are shown within parenthesis (columns 1 and 2). For AFR-REM, the robust standard errors are presented within parenthesis (columns 3 and 4). C is constant. * significant at the 10% level. ** significant at the 5% level. *** significant at the 1% level.

Source: Author's calculations.

also estimated according to AFE-RE with and without the "lneducation" variable. Here, the p values are 0.052 (Equation (3)) in column 3 and 0.010 in column 4 (in which "lneducation" is removed from Equation (3)).

Another interesting finding is shown in Tables 1 and 2 is that for both methods in models without the education variable, the relationship between democracy and *per capita* income is stronger, similarly to Madsen, Raschky, and Skali (2015). In addition, in many studies based on Mankiw, Romer, and Weil (1992), the effect of human capital on growth or *per capita* income is limited. Acemoglu, Gallego, and Robinson (2014) is one of the most important examples of such study. On the other hand, as emphasized by Madsen, Raschky, and Skali (2015, p. 184), if the proxy variable for education is capable of measuring the quality of education, more meaningful results might be derived. As shown in Table 2, all variables are significant, except for trade, which is significant only in column 2; this result is as expected. To summarize, the total effect of democracy in the selected countries with a coup d'état history has been beneficial to income. These results can be regarded as consistent with the general framework of theoretical and empirical models, such as in Acemoglu, Gallego, and Robinson (2014), Acemoglu et al. (2014b) and Madsen, Raschky, and Skali (2015).

4. Conclusion

Countries suffer coup d'états as an intervention to their democracy no matter whether they are democratic or nondemocratic, are developed or undeveloped, and have high or low *per capita* income. The present study analyses the relationship between level of democracy and *per capita* income in the sample of selected countries. The impact of democracy on *per capita* income is analysed using two different equations applied for two different democracy criteria, namely the Polity IV and Freedom House indices, and a set of control variables. The countries that have had the most number of coups after 1950 are selected from different continents, and the impact of democracy level on *per capita* income is analysed in the sample. Based on the data from the period of 2000-2014, the effect of democracy on *per capita* income in the twenty-one selected countries is found to be positive.

Two important results are derived from the research. First, democracy variables have a strong and robust effect on *per capita* income with the inclusion of other control variables such as education, investment, trade, secularism and population while the effects of Freedom House index of democracy slighter than Polity IV. Investment, education, and secularism, as the control variables, are found to be significant with a positive effect on *per capita* income. Population growth is also significant and, as expected has a negative effect on *per capita* income, which is regarded as having a relative effect. The effect of trade on *per capita* income is positive at some slighter degree. It is only significant the Driscoll-Kraay estimator, without education variable. Second, when education proxy variable is excluded from the analysis, the effect of democracy on *per capita* income becomes evident.

Estimations reveal that democracy have a non-negligible effect on *per capita* income as previously reported in Acemoglu (2014) and Madsen, Raschky, and Skali (2015) in contrast with the relevant literature such as Kurzman, Werum, and Burkhart (2002), Doucouliagos and Ulubasoglu (2008) and Sandalcilar (2013). The panel data

approach proves that, when economies evolved from autocracy to democracy, coup d'état experienced countries enjoy from high *per capita* income. Sure, it is not a coincidence that the world's leading developed or prosperous countries have developed democratic systems. Therefore, an increase in the level of democracy for the countries having suffered coup d'états, will emerge as an element to bring along the level of prosperity. The creation or membership of associations like European Union may also emerge as another variable that will increase the level of democracy and may increase *per capita* income.

The presented results are arguably important for sample and study period (twenty-one coup d'états affected countries and fifteen years) which also entails the major limitation of the paper. It will be more precise to analyse with all coup d'état affected countries for long years however might not be possible due to the lack of data. To study with a large amount of data will give a chance to use dynamic panel data, this project is leaved to further studies. Determining the effect of democracy on *per capita* income for countries having suffered coup d'états separately for different regions with large data will also be beneficial. And one might add some of the regional factors such as language, historical links, culture, trade relations and/or economic integrations. To analyse the determinants of democracy in a similar vein also needs further research.

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Appendix

Table A1 Unit and Time Effects Together: *F*-test Results (Equation (2) with and without *Ineducation* Variable)

Equation (2)	
χ^2	Prob.
776.00	0.0000
Equation (2) without the education variable	
χ^2	Prob.
1063.23	0.0000

Notes: The null hypothesis is rejected at the 95% confidence level.

Source: Author's calculations.

Table A2 Unit Effect: *F*-test Results

Equation (2)	
χ^2	Prob.
495.48	0.0000
Equation (2) without the education variable	
χ^2	Prob.
748.68	0.0000

Notes: The null hypothesis is rejected at the 95% confidence level.

Source: Author's calculations.

Table A3 Time Effect: *F*-test Results

Equation (2)	
χ^2	Prob.
0.00	1.0000
Equation (2) without the education variable	
χ^2	Prob.
0.00	1.0000

Notes: The null hypothesis cannot be rejected at the 95% confidence level.

Source: Author's calculations.

Table A4 Unit and Time Effects Together: *F*-test Results (Equation (3) with and without *Ineducation* Variable)

Equation (3)	
χ^2	Prob.
778.21	0.0000
Equation (3) without the education variable	
χ^2	Prob.
1009.91	0.0000

Notes: The null hypothesis rejected at the 95% confidence level.

Source: Author's calculations.

Table A5 Unit Effect: *F*-test Results

Equation (3)	
χ^2	Prob.
487.92	0.0000
Equation (3) without the education variable	
χ^2	Prob.
487.92	0.0000

Notes: Null hypothesis rejected at 95% confidence level.

Source: Author's calculations.

Table A6 Time Effect: *F*-test Results

Equation (3)	
χ^2	Prob.
0.00	1.0000
Equation (3) without the education variable	
χ^2	Prob.
0.00	1.0000

Notes: The null hypothesis cannot be rejected at 95% confidence level.

Source: Author's calculations.

Table A7 Selection between Models (FEM and REM): Hausman Test Results

	Equation (2)	Equation (2) without *Ineducation*
Test result	20.98	18.59
Prob.	0.0018	0.0023
	Equation (3)	Equation (3) without *Ineducation*
Test result	19.46	18.60
Prob.	0.0034	0.0023

Source: Author's calculations.

Table A8 Specification Test Results for FEM

	Equation (2)		Equation (2) without *Ineducation*	
	Test stat.	Prob.	Test stat.	Prob.
Modified Wald test	2820.69	0.0000	267.49	0.0000
Baltagi-Wu LBI test	0.575	-	0.578	-
Bhargava, Franzini, and Narendrana-than (1982) Durbin Watson test	0.239	-	0.301	-
Pesaran CD test	-	-	23.548	0.0000
	Equation (3)		Equation (3) without *Ineducation*	
	Test stat.	Prob.	Test stat.	Prob.
Modified Wald test	3468.36	0.0000	426.09	0.0000
Baltagi-Wu LBI test	0.529	-	0.552	-
Bhargava, Franzini, and Narendrana-than (1982) Durbin Watson test	0.198	-	0.261	-
Pesaran CD test	-	-	21.511	0.0000

Source: Author's calculations.

Table A9 Specification Test Results for REM

		Equation (2)		Equation (2) without *Ineducation*	
		Test stat.	Prob.	Test stat.	Prob.
Levene (1960), Brown and Forsythe (1974)	W0	7.740	0.0000	4.562	0.0000
	W50	5.343	0.0000	3.343	0.0000
	W10	7.519	0.0000	4.504	0.0000
Baltagi-Wu LBI test		0.575	-	0.578	-
Bhargava, Franzini, and Narendranathan (1982) Durbin Watson test		0.239	-	0.301	-
		Equation (3)		Equation (3) without *Ineducation*	
		Test stat.	Prob.	Test stat.	Prob.
Levene (1960), Brown and Forsythe (1974)	W0	8.3391206	0.0000	5.6994055	0.0000
	W50	5.7128666	0.0000	3.9589872	0.0000
	W10	8.0826212	0.0000	5.5712076	0.0000
Baltagi-Wu LBI test		0.529	-	0.552	-
Bhargava, Franzini, and Narendranathan (1982) Durbin Watson test		0.198	-	0.261	-

Source: Author's calculations.

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