Petro Rents, Political Institutions, and Hidden Wealth: Evidence from Bank Deposits in Tax Havens[1]

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Abstract

Do political institutions limit rent-seeking by politicians? To address this question, we study the transformation of petroleum rents into hidden wealth using unique data on bank deposits in tax havens. We find that petroleum rents are associated with increases in hidden wealth, but only when political institutions are very weak. We also discern an interesting interaction with political risk: events such as elections and domestic conflict are preceded by increases in hidden wealth when political institutions are weak, which is consistent with a view of autocratic rulers as forward-looking rent-seekers whose behavior is constrained by political checks and balances.

1 Introduction

Political elites can abuse public office to extract rents. Even moderate levels of political rents may have socially undesirable effects, through the adverse selection of political candidates and by distorting political incentives (e.g., Acemoglu and Robinson (2006) and Besley and Persson (2011)). In countries without strong democratic governance, political rents can be substantial and the economic and political consequences severe. The intensity of political rent-seeking can be further exacerbated by the presence of unearned income (Smith, 2008), such as income from petroleum and other natural resources (Robinson et al., 2006).[1]

In democracies and dictatorships alike, political institutions shape the incentives and constraints faced by political actors and can therefore potentially serve to control politicians and prevent abuse of power. A large literature in political economy has investigated how institutions affect political outcomes in democracies under the assumption that politicians are self-interested rent-seekers (e.g. Persson and Tabellini, 2000). Similarly, a literature on the institutional foundations of autocracies, including Bueno de Mesquita et al. (2003), Acemoglu, Robinson and Verdier (2004) and Besley and Kudamatsu (2007), begins from the assumption that autocratic politicians are motivated by rents. Recent in-depth studies of autocracies, e.g. Blaydes (2011) on Mubarak's Egypt, confirms the central role of such rents in explaining leader behavior.

While political rents thus feature prominently in theories of political economy, they are notoriously difficult to quantify and investigate empirically. In contexts where political rents derive from corruption and embezzlement, by their very nature characterized by secrecy, the empirical challenges are even more formidable. Existing empirical studies of political rents typically use crude proxies, including Bueno de Mesquita et al. (2003) who measure "opportunities for kleptocracy" by the government budget surplus, and Gandhi and Przeworski (2008) who use the share of public sector wages in GDP to capture patronage.

[1] See also Ross (2001, 2012) and Cabrales and Hauk (2011)

In light of these measurement problems, it is interesting to note that abundant anecdotal evidence connects political elites and oil money to offshore banking.[2] These colorful accounts describe how heads of states and other members of political elites use bank accounts in foreign financial centers to appropriate and launder public funds often originating from natural resource rents. For example, a recent report by the Financial Action Task Force, a joint venture between the OECD and the World Bank, lists 32 case studies of grand corruption, of which 27 involved foreign bank accounts and 21 involved bank accounts in tax havens (FATF, 2011). In one of these cases, the former President of petroleum-rich Nigeria, Sani Abacha, is "safely estimated to have embezzled between USD 2-4 billion during his four and a half year rule" (FATF, 2011, p. 30). The Abacha family had funds located on numerous bank accounts in at least twelve jurisdictions, including well-known tax havens Switzerland, Jersey, Liechtenstein and the Cayman Islands.

In this paper, we shed light on the interaction between political institutions and political rents by showing that lack of political checks and balances is a crucial factor in the transformation of natural resource rents into personal wealth stashed away in secret bank accounts in tax havens. Our key innovation is the use of a rich dataset on cross-border banking from the Bank for International Settlements (BIS) to construct a novel measure of hidden wealth. The BIS data contains information from banks in 43 countries including the major tax havens Switzerland, Luxembourg, Cayman Islands, Bahamas, Jersey and Singapore. For each of the 43 countries, the BIS statistics provide information about bank deposits owned by residents of more than 200 countries at the bilateral level. For example, we observe the value of deposits held in Swiss banks by residents of Saudi Arabia, in Luxembourg banks by residents of Nigeria, in Cayman banks by residents of Venezuela, and so on. On the basis of the BIS statistics, we compute annual country-level values of deposits held in havens. This measure of hidden wealth can be computed for all countries in the world and is perfectly comparable across countries because the data source is not the countries themselves but banks in well-regulated financial centers.

[2] E.g. New York Times, 2006; Global Witness 2004; Financial Action Task Force, 2011.

Equipped with this novel measure, we study the relationship between petroleum rents, political risk and hidden financial wealth.

Our first finding is that when political institutions are poor, windfall gains from petroleum extraction translate into larger stocks of hidden wealth. In autocratic regimes, there is a strong and statistically significant association between changes in petro rents and changes in tax haven deposits whereas there is no such pattern in other political regimes. Within the class of autocracies, even relatively weak political checks and balances, such as the existence of political parties or a legislature, significantly reduce the association between petro rents and tax haven deposits. These findings suggest that in countries with sufficiently weak political institutions, rents from the petroleum sector are partly captured by political elites and hidden in havens. We discuss a number of alternative interpretations, including tax avoidance by multinational firms, tax evasion by domestic firms and households, and lack of local absorptive capacity, and argue that these interpretations either do not fit the observed empirical patterns, or are much less plausible.

Our second finding is that when political institutions are poor, stocks of hidden wealth increase in response to political risk. In autocracies, both elections and domestic conflict such as revolutions and guerilla warfare are *preceded* by increases in bank deposits held in havens. This finding suggests that political elites anticipate political instability and respond by transferring part of the wealth they have amassed domestically to havens. We also find that the relation between haven deposits and political risk is much more pronounced in petroleum rich autocracies, which suggests that it reflects kleptocratic precautionary savings responses by the political elites who control the petroleum sector, rather than households and local firms responding to political uncertainty by hiding wealth.

The effects of petroleum rents and political risk are not only statistically significant in a number of different specifications but also of substantial magnitude. Our estimates suggest that around 1.5%-2.5% of petroleum rents in autocracies are transferred to bank accounts in tax

havens. In light of the anecdotal evidence showing that corrupt political leaders own a diversified portfolio of foreign assets (e.g. Los Angeles Times, 2011), the share of petroleum rents that is diverted and hidden abroad is likely to be considerably larger. Drawing on recent work showing that the global portfolio of hidden financial wealth consists of around 75% securities and 25% cash on bank accounts (Zucman, 2013), our estimates suggest that 6%-10% of oil and gas rents in autocracies are converted into hidden personal wealth. The estimated effect of political events is also sizable. For instance, elections in autocracies are associated with an 8% increase in bank deposits in tax havens in the year preceding the election.

Our paper relates to a number of different literatures. First, we contribute to the strand of the resource curse literature that emphasizes the importance of political institutions (e.g. Mehlum et al., 2006). While we find that petro rents are an important source of hidden wealth in autocracies, we also find that other types of income have essentially no effect on hidden wealth, suggesting that natural resources are, indeed, at the heart of the problem with excessive political rents. Second, we add to a broader literature that attempts to detect and quantify political corruption using indirect methods (e.g. Fisman, 2001; see Alt, Lassen and Ziblatt, 2013 for a survey). Third, the paper is related to the literature on comparative analysis of autocratic regimes by showing that the degree of rent diversion correlates strongly with the type of autocratic political institutions. In particular, despite considerable theoretical interest in extractive autocratic regimes, including recent work on "kleptocracies" (Acemoglu et al., 2004), there is no consensus on how to identify such regimes empirically. By analyzing autocratic *behavior* in the form of rent diversion, our paper bridges the theoretical concepts and empirical typologies, such as those proposed by Geddes (2003) and Cheibub et al. (2010), and takes the first steps towards a quantitative basis for the classification of extractive authoritarian regimes.

The rest of the paper proceeds as follows: The next section describes the conceptual framework and related literature. Section three presents the data and section four the empirical model. Section five presents the main results, section six considers robustness issues, and section seven

provides a discussion of alternative explanations for our findings. Section eight concludes.

2 Background: From petro rents to haven deposits

In this section we discuss why petroleum rents may end up at personal bank accounts in tax havens, and how such a pattern can be expected to be influenced by institutional characteristics. Our argument rests on three main pillars: (*i*) the distinctive characteristics of the petroleum industry; (*ii*) the level of accountability and checks and balances embedded in the political institutions (*iii*) the existence of offshore financial centers characterized by high levels of secrecy.

The petroleum industry has several properties that make it more prone to political rent seeking than other industries. First, compared to non-extractive industries, pure economic rents constitute a large share of the total output in the petroleum industry. Second, reliable information about the size of the resource base, the costs of resource extraction, and the various contracts that regulate the allocation of the rents are often not available to the general public (Ross, 2012). Third, petroleum production is commonly under direct or indirect government control (Smith, 2009). Together, a large rent share, lack of transparency and government control suggest that the scope for rent extraction by political leaders is much larger in the petroleum sector than in other sectors of the economy.

While there is certainly a potential for extraction of political rents from the petroleum sector, the actual level of political rents may be constrained by political institutions through at least two channels: First, institutions may influence which political candidates are selected into political office. Second, institutions may work as effective constraints on the actions that the candidates can take once selected. This suggests that we should observe a higher share of opportunistic candidates and more opportunity to get away with political rents in institutional settings characterized by a lower level of political accountability and fewer political checks and balances.

These mechanisms imply that diversion of petroleum rents is more likely to take place in autocracies than in democracies, but all autocracies are not the same. The literature has long recognized that there is a large variation in institutional practices, and political, social and economic outcomes within the autocratic regimes, and offers a number of classifications of these regimes (Geddes et al., 2012; Cheibub et al., 2010). While these classifications differ both in the criteria used for regime categorization, and in actual regime typology, they all agree that autocratic regimes vary in type, and level, of institutional constraints on the ruling power. In particular, many authoritarian regimes have established institutional mechanisms resembling those of democracies, such as elections, political parties and legislatures. The rationale for these institutions in autocracies would typically differ from the democratic checks and balances. For example, the ruler may need to limit her discretion to keep the loyalty of the selectorate (e.g. Bueno de Mesquita et al., 2003), to alleviate the threat to the regime from potential rivals (e.g., Gandhi and Przeworski, 2006) or the masses (e.g., Acemoglu and Robinson, 2006). In all such cases, institutions are viewed, to a varying degree, as constraints on the choices of the autocratic rulers. This suggests that the institutional setting matters for the extent of political rent extraction also within the sample of autocracies.

The constraints on autocratic rulers may to some extent be circumvented if political rents can be extracted secretly. If invested or consumed domestically, political rents are highly visible, which can provoke resistance against the regime. Additionally, domestically invested rents may be easily appropriated by a new leadership in case the ruler is ousted. This points to two distinct rationales for holding political rents in foreign jurisdictions: secrecy and asset protection. A number of offshore financial centers, commonly known as tax havens, specialize in exactly these two services. Specifically, tax havens typically combine strict bank secrecy rules that ensure almost impenetrable confidentiality and trust laws that enable investors to protect their assets by transferring formal ownership to a trustee while still retaining the ultimate control of the assets. The fact that tax havens are ideal jurisdictions for laundering and hiding political rents

suggests that we should expect a non-trivial share of diverted resource rents to be held exactly here.

Finally, the incentive to extract political rents and hide them in tax havens is likely to depend on the amount of political uncertainty and to change around events associated with a risk of losing power such as elections, mass demonstrations, riots, etcetera. Indeed, the literature on electoral authoritarianism stresses that elections are inherently risky for autocratic rulers (e.g. Cox, 2009; Gandhi and Lust-Okar, 2009). Specifically, elections involve a risk because they can play a role in mobilizing the opposition (Geddes, 2006) and because rulers may unexpectedly lose them (Przeworski et al., 2000). Similarly, events such as demonstrations against the regime, riots and the onset of guerilla warfare arguably represent an increase in the risk of losing power from the perspective of the ruler. While we would expect rulers to react to such adverse signals about the probability of losing power, it is not immediately clear what the reaction should be. On one hand, political risk may induce rulers to engage in 'kleptocratic precautionary saving' by transferring more funds to tax havens. On the other hand, rulers may choose to forego or even repatriate haven funds with the aim of buying support from the selectorate or financing repression. Which effect dominates is an empirical question.

3 Data

3.1 Deposits

The deposit data derive from the Locational Banking Statistics of the Bank for International Settlements ("BIS"). There are currently 43 countries reporting banking statistics to the BIS including all major financial centers. The banking statistics cover the period 1977-2011.[3]

[3] 14 countries have reported since 1977 whereas the remaining 29 countries started reporting later. Switzerland changed their reporting in the fourth quarter of 1989 to include off-balance sheet fiduciary business in their deposit measure, causing a discrete jump in reported deposits held in Swiss banks. This jump is captured by time dummies. All main results continue to hold if we restrict the sample to the period 1990-2008.

The primary source of the deposit data is bank balance sheets. In each of the 43 BIS countries, individual banks furnish the central bank with information about their foreign positions including a decomposition on counterpart countries. The central bank aggregates this information to the bilateral level and report to the BIS. In the BIS statistics, we thus observe the liabilities of banks in country i against residents of country j where i is any one of the 43 BIS countries and j is any one of the more than 200 countries of the world. The vast majority of foreign liabilities take the form of deposits.[4] The BIS data thus provide us with a bilateral measure of foreign bank deposits covering all major international banking centers. For instance, we observe deposits held in Swiss banks by residents of Saudi Arabia, in Luxembourg banks by residents of Nigeria and in Cayman banks by residents of Venezuela.

We classify 19 of the BIS reporting countries as tax havens and the remaining 24 as non-havens.[5] Our classification essentially reflects whether a given country complies with the OECD standard for exchange of banking information.[6] Countries typically fail to comply with the OECD standard because bank secrecy laws or similar provisions prevent them from sharing bank information with foreign governments. We find this particular criterion for distinguishing between havens and non-havens appealing because secrecy is the main institutional feature that is likely to attract hidden wealth. Many of the havens in our sample are indeed known to host significant wealth management industries and in the large majority of the fully investigated cases of political leaders laundering the proceeds from corruption, at least one of the countries we classify as havens (FATF, 2011) is involved.

[4] Starting from 1995, the BIS statistics contain a breakdown of total liabilities on deposits and other liabilities. At the end of 2011, for instance, banks in BIS reporting countries had liabilities against foreign non-banks of around USD 7,700 billion of which around USD 7,000 billion were deposits.

[5] The 19 havens are Austria, Bahamas, Bahrain, Belgium, Bermuda, Cayman Islands, Chile, Cyprus, Guernsey, Hong-Kong, Isle of Man, Jersey, Luxembourg, Macao, Malaysia, Netherlands Antilles (now Curacao), Panama, Singapore and Switzerland.

[6] Our point of departure is the list of countries not complying with the OECD standard on information exchange drawn up by the OECD in April 2009 (OECD, 2009). To this list we add Hong Kong and Macao. These two countries did not comply with the OECD standard (OECD, 2008) and are widely regarded as tax havens (e.g. Hines, 2010). However, they were not included in the OECD list of non-complying countries, allegedly due to Chinese lobbying efforts (Guardian, 2009).

On the basis of the BIS statistics, we define $haven_{it}$ as deposits held by residents of country i in the 19 havens in year t and $nonhaven_{it}$ as deposits held by residents of country i in the 24 non-havens in year t. Since the BIS data derive from statistical reports of banks on their counterparts in foreign countries and not from the latter countries themselves, these variables have the major advantages that coverage is universal and observations are perfectly comparable across countries. It is hard to think of any other country-level measure of political rents that would not be plagued by missing observations and limited comparability.

Several other features of the deposit data deserve mention. First, the BIS data allow us to distinguish between deposits held by banks and deposits held by non-banks such as households, firms and governments. Since interbank deposits are unlikely to play a role in the laundering of political rents, we only include deposits held by non-banks in our deposit measures. Second, the BIS data provide a measure of one form of hidden wealth, deposits, but contain no information on other forms, most importantly securities. According to recent estimates, deposits account for around 25% of the wealth managed in tax havens (Zucman, 2013). Third, the BIS data are based on immediate ownership rather than ultimate ownership. In the case where a resident of Nigeria owns a sham corporation in Panama, which in turn holds a bank account in Switzerland, the BIS statistics therefore wrongly record the Swiss deposit as belonging to a resident of Panama. It is well-known that sham corporations in Panama and other havens are sometimes used by owners of hidden wealth to add a layer of secrecy between themselves and their assets (Sharman, 2010; Sharman et al., 2014). In the BIS statistics, around 25% of all deposits in tax havens are recorded as belonging to other tax havens and there is strong evidence that this reflects the use of sham structures by residents in third countries (Johannesen and Zucman, 2013). We thus exclude deposits in havens assigned to other havens by the BIS statistics from the sample for the simple reason that we cannot credibly identify the residence country of their ultimate owner. This implies that the effect of petroleum rents on haven deposits will tend to be underestimated.

3.2 Other variables

Our measure of oil and gas rents is from the World Bank's Adjusted Net Savings (ANS) database.[7] The rent measure is computed as the market value of the estimated production of oil and gas net of the estimated production costs. We thus define the variable $petrorent_{it}$ as rents from oil and gas production in country i in year t. The variable covers up to 211 countries in the period 1970-2008.

The most important control variable in our regressions is $netgdp_{it}$, which measures income from other sources than oil and gas rents. This control variable allows us to estimate not only whether oil and gas rents are associated with higher foreign deposits but also whether oil and gas rents give rise to larger increases in foreign deposits than other types of income. In the main regressions, $netgdp_{it}$ is constructed by subtracting $petrorent_{it}$ from the measure of gross domestic product from the World Development Indicators.[8]

The key question of the paper is whether the transformation of resource rents into political rents depends on the prevailing political institutions. Our preferred way to address the question is to split the sample according to the type of the political regime and run separate regressions for different regimes. We first categorize regimes on the basis of the Polity 2 index (Marshall and Jaggers, 2009). The Polity 2 index combines ratings on the competitiveness and openness of executive recruitment, constraints on the chief executive, and competitiveness of political participation into a single index running from -10 to 10, where -10 refers to "strongly autocratic" and 10 to "strongly democratic". We categorize country-years with a Polity 2 score greater than 5 as *democracies*, country-years with a Polity 2 score between -5 and 5 as *intermediate regimes* and country-years with a Polity 2 score lower than -5 as *autocracies*.[9]

[7] The ANS dataset is currently the most frequently used source of data on oil and gas rents. For an overview of different oil and gas variables, their strengths and weaknesses, and how they have been employed in the resource curse literature, see van der Ploeg (2011). We show below that another commonly used measure, fuel exports, generates similar results.

[8] The results are robust to using an alternative income measure that captures total value added in all industries except mining and utilities as measured by the National Accounts Database of the United Nations.

[9] The results are not sensitive to the exact threshold values.

We also employ an alternative institutional measure developed by Przeworski et al. (2000) and updated by Cheibub et al. (2010). According to this measure, regimes are classified as democracies if a number of criteria are met, including that the executive is elected, that there is a legal basis for political parties and that a legislature exists, and as non-democracies if not. Since classification as a democracy requires a number of criteria to be met, there is considerable heterogeneity within the group of non-democracies with some regimes meeting none of the criteria and others meeting all but one. We exploit this variation to learn more about the role of political institutions in limiting political rent seeking in autocracies.[10]

In most specifications, we use a number of control variables. We will briefly describe these variables as they are introduced into the model in section 5. We refer to the Appendix for accurate data sources, precise definitions of variables and summary statistics.

3.3 Description of main variables

Deposits in tax havens have increased rapidly, and more rapidly than GDP, over the sample period. In 1977, total deposits in tax havens amounted to around USD 12 billion or less than 0.2% of world GDP whereas in 2008 the corresponding figure was around USD 2,800 billion or around 4.6% of world GDP.

As shown in the first column of Table 1, petroleum rich autocracies accounted for an average of 8% of the global stock of haven deposits over the sample period. However, as shown in the second column, haven deposits were much larger in petroleum rich autocracies than in other countries when measured relative to the size of the economy. In the sample of intermediate and democratic countries, the ratio of haven deposits to GDP was between 1% and 2% with no noticeable difference between petroleum rich and petroleum poor countries. In the sample of

[10] As noted by Przworski et al. (2000, p. 23) some regimes satisfy all the requirements for being a democracy, but the same party nevertheless wins every election. This raises doubt about whether the ruler(s) would in fact be willing to relinquish power should election results go against them. We consider this alternation problem explicitly in the empirical analysis.

autocracies, on the other hand, the ratio was well above 6% for petroleum rich countries and no higher than 0.5% for petroleum poor countries. This striking pattern in the aggregate data is clearly consistent with our main regression result that petroleum rents increase haven deposits in autocracies but not in other regime types.

Table 1 somewhere around here.

The size of oil and gas rents is strongly influenced by the oil price, which has been very volatile over the sample period. Total oil and gas rents as a share of world GDP thus peaked at 7.6% in 1979, reached a bottom of 1% in 1998 and later increased to 5.3% in 2008. In 2008, 95 countries had positive petroleum rents. In some of these countries, the ratio of petroleum rents to GDP was negligible, but in many others it was considerable, for instance around 20% in Norway, 30% in Venezuela and 70% in Angola and Saudi Arabia. Petroleum rents were roughly equally distributed across countries of different regime type: autocracies accounted for an average of around 35% of global petroleum rents over the sample period with around 25% and 40% accruing to intermediate and democratic countries, respectively. However, autocracies depended relatively more on petroleum rents to generate income than other countries: in autocracies petroleum rents constituted around 18% of GDP on average compared to around 6% in intermediate countries and around 1.5% in democracies.

As illustrated in Figures 1a and 1b, there is considerable year-to-year variation in haven deposits and petroleum rents within countries. The figures show the distribution of annual growth rates in haven deposits and petroleum rents, respectively, across all country-years. The median annual growth rate in haven deposits is around 10%, but in almost one third of all country-years, haven deposits declined relative to the previous year. Similarly, the median annual growth rate in petroleum rents is around 6%, but in more than 40% of all country-years, petroleum rents exhibited a negative growth rate.

Figures 1a-1b somewhere around here.

4 Empirical model

Our baseline model is specified in the following way:

$$\Delta havenrat_{it} = \alpha + \rho \Delta havenrat_{it-1} + \beta \Delta petrorentrat_{it} + \gamma \Delta netgdprat_{it} + \varepsilon_{it},$$

where we condition on political institutions by estimating the model for different regime types separately.

The variables *haven*, *petrorent* and *netgdprat* introduced in the previous section are transformed in two ways before they enter the model. First, the variables are differenced as indicated by the operator Δ. The levels of the three variables are all highly trended and non-stationary whereas their first-differences pass standard panel tests for stationarity, making the baseline model in differences amenable to standard panel data techniques.[11] Second, the variables are scaled with the average GDP of the relevant country taken over the sample period as indicated by the extension *rat*. The scaling makes our measures of haven deposits, resource rents and other income comparable across countries of very different sizes, which has several advantages. Most importantly, it will later allow us to augment the model with time dummies necessary to account for common shocks. If the variables were not scaled, time dummies would impose the untenable restriction that countries of very different sizes experience the same underlying time trend in haven deposits in dollar terms. Additionally, the scaling ensures that identification derives from variation in both large and small countries. If the variables were not scaled, the estimates would effectively be identified by the variation in a few countries such as China and

[11] We have conducted a variety of standard panel unit root tests on the first differenced ratio variables and consistently find that the null hypothesis of a unit root in all series can be rejected at conventional levels of statistical significance. The results from the panel unit root tests are reported in the online Appendix.

the U.S. with very large haven deposits and very large resource rents. Note that scaling with average GDP does not change the interpretation of β, which is the dollar increase in haven deposits associated with a dollar increase in petroleum rents.

An obvious alternative to scaling by average GDP would be to scale by current GDP; however, this approach would introduce a mechanical positive correlation between the scaled deposit variables and the scaled petroleum rent variable. Measurement error in GDP, for instance, would not affect the levels of deposits and petro rents but would move their ratios to current GDP in the same direction. Additionally, since current petroleum rents enter current GDP, shocks to petroleum rents would affect $\Delta petrorentrat$ directly but also the other terms of the equation through changes in the scaling factor. Another alternative would be to estimate the model with unscaled variables despite the issues described above. We note that in both cases the effects of petroleum rents are similar in terms of sign and significance levels to our main specification of scaling with average GDP (results available upon request). A final alternative would be to estimate the model in log-levels. We discard this approach because a constant elasticity of haven deposits with respect to petro rents seems much less plausible than the assumption of a constant marginal effect of petroleum rents on haven deposits.[12]

We extend the baseline model in several ways. As mentioned, we include time dummies. This extension addresses the concern that a positive correlation between haven deposits and oil rents in the baseline model may simply reflect that time periods with increasing oil prices happen to coincide with other events causing increases in haven deposits such as advances in wire transfer technology. Moreover, we include a set of covariates including capital controls, inflation, financial deepness and political controls, which we suspect may affect the growth in haven deposits.

[12] To see this, note that in a country with negligible resource rents and large stocks of haven deposits (e.g. Germany), a ten percent increase in petro rents would cause a negligible percentage change in haven deposits even if the entire windfall gain were funneled to haven accounts. On the other hand, in a country with large resource rents (e.g. Saudi Arabia), a ten percent increase in petro rents would constitute an enormous windfall gain that may very well cause a significant percentage change in haven deposits.

Finally, note that our baseline specification implicitly accounts for fixed effects in levels, due to the first-differencing. In our robustness analysis, we also include country fixed effects in our main specification, but here these effectively amount to country-specific linear trends in deposits. On one hand, this extension addresses the issue that a positive correlation between haven deposits and petro rents in the baseline model could reflect that petro-rich countries for other reasons than the petroleum itself happen to have a higher underlying growth in haven deposits than petro-poor countries. On the other hand, to the extent that petro-rich countries have higher growth in haven deposits precisely because they are petro-rich, controlling for trends have the undesirable effect that a potentially important component of the variation in deposits is unnecessarily eliminated. Since it is hard to make a strong *a priori* case for or against controlling for country specific trends, we take a pragmatic approach: most specifications do not include country specific slope dummies, but we test whether the main results are robust to these.

5 Main results

5.1 Petro rents and haven deposits

In the baseline specification we study how changes in haven deposits correlate with changes in petroleum rents and changes in income from other sources.[13] The results are summarized in Table 2. All standard errors are clustered at the country level.

Table 2 somewhere around here.

[13] Throughout, we discard countries with average stocks of haven deposits below USD 10 million because the BIS deposit data are reported in integer number of millions, which is a potential source of measurement error at low deposit stocks. The results are qualitatively unchanged when including these countries in the sample.

As can be seen from column 1, there is a significant correlation between changes in haven deposits and changes in petroleum rents in the full sample of 115 countries. Columns 2-4 show, however, that the coefficient is not uniform across regime types. A dollar increase in petroleum rents is associated with a 1.4 cent increase in haven deposits in autocracies while there is no effect in intermediate and democratic regimes. Conversely, shocks to other types of income have roughly the same effect in the three regime types. A dollar increase in other income is associated with a 0.6 cent increase in haven deposits in autocracies and similar sized increases in the two other regimes. In sum, the results suggest that in autocratic countries oil and gas rents are more likely to be transferred to bank accounts in tax havens than other types of income whereas there are no signs of a similar effect in intermediate and democratic countries.

The baseline model establishes and highlights the key correlations of our paper, but obviously does not account for a number of factors, which can plausibly affect foreign deposits. For instance, it may be that increases in oil and gas prices incidentally coincided with other, perhaps unobserved, developments that caused an increasing trend in cross-border deposits or that countries experiencing large growth in petro rents also share other characteristics, perhaps financial or political instability, that caused relatively large growth in foreign deposits.

In order to control for these factors we extend the model along two lines. First, we include year dummies that flexibly capture any time trend in haven deposits common to all countries of a given regime type. Second, we introduce financial and political covariates with the aim of controlling for the incentives of the private sector to place funds on foreign bank accounts. The financial covariates are: a measure of *de jure* capital account openness, $kaopen_{it}$, which reflects the absence of restrictions on cross-border financial transactions (Chinn and Ito, 2008); a measure of liquid liabilities in the domestic banking sector, $liabilities_{it}$, which is often used to proxy for financial sector development and sophistication (Levine, 1997); and a dummy for inflation rates above 40%, $highinflation_{it}$, which has previously been used as an indicator of a high-inflation environment (Bruno and Easterly, 1998). We expect financial openness and high

inflation to induce more foreign deposits, whereas a more developed financial sector may both facilitate contact with foreign banks and provide an alternative to using them.

The political covariates are: a dummy for domestic presidential or parliamentary elections, $election_{it}$ and a dummy for domestic political conflict, $conflictdum_{it}$, described in more detail below and based on CNTS data (Banks, 2011). Both elections and domestic conflict could be associated with more foreign bank deposits, if political elites attempt to protect assets by moving them abroad in the face of political instability, or with less foreign bank deposits, if political elites spend resources on electoral campaigning, public good provision or military capacity with the aim of influencing the direction of political development.

The results from the extended model are presented in Table 3. The results are similar to those of Table 2. In autocracies, a dollar increase in petroleum rents is associated with a 2.2 cent increase in haven deposits whereas a dollar increase in other types of income increase haven deposits by around 0.6 cents (column 2). In the other regimes, the effect of oil and gas rents on haven deposits is close to zero and not significantly different from the effect of other income shocks (column 3-4).

Table 3 somewhere around here.

As for the covariates, financial openness, high inflation and financial sector development are generally associated with more foreign deposits, the latter result suggesting that the role of domestic financial institutions in facilitating contact with foreign banks is more important than providing an alternative to them. Both elections and conflicts tend to be associated with less haven deposits. The covariates are often not statistically significant although the positive correlation between financial openness and financial sector development on one hand and the change in haven deposits on the other is fairly strong for non-democracies.[14]

[14] Introducing covariates causes a considerable reduction in sample size especially for autocracies. The financial and political variables generally have lower coverage than the main variables in both the time and cross-section dimensions, hence the loss of observations.

5.2 Political risk

The results reported in Table 3 suggest a rather weak effect of elections and conflict on deposits in havens, which is puzzling in view of the ample anecdotal evidence on the relation between political events and capital flight. To further explore the role of political events, we modify the model along two dimensions. First, we account more carefully for the timing of political events. The previous model allowed only for a contemporaneous effect of political events on foreign deposits. It is plausible, however, that political elites move assets abroad *in anticipation* of political events that are expected to cause instability and threaten their political control.[15] Likewise, political events may trigger capital flows in subsequent periods as the tension associated with elections, mass demonstrations or other events resolves. We thus introduce lagged and leaded values of the political variables to allow for anticipatory and delayed effects of political events. Second, we exploit variation in the intensity of domestic conflicts. Specifically, we use changes in the domestic conflict index of the CNTS dataset $\Delta conflictindex_{it}$ as our explanatory variable rather than the simple conflict dummy used above. The index is normalized to take values between 0 and 1, and is a weighted index of instances of assassinations, general strikes, guerilla warfare, government crises, purges, riots, revolutions, and anti-government demonstrations.

The results presented in Table 4 suggest that political events in autocracies are associated with strong anticipatory increases in haven deposits. In the year preceding an election, *havenrat* increases by 0.0022 on average in autocracies (column 1) corresponding to a 8% increase in haven deposits evaluated at the sample mean. In the election year itself and the following year, there are no significant changes in haven deposits. Similarly, in a year preceding a 0.1 increase in the conflict index, *havenrat* increases by 0.0009 on average in autocracies corresponding to a 3% increase in haven deposits evaluated at the sample mean whereas there are no significant

[15] Such anticipation may even be reflected in the market, as evidenced by Fisman's (2001) account of how the stock market value of firms known to be politically connected to the Suharto regime in Indonesia was strongly influenced by rumours of Suharto's death.

contemporaneous or delayed effects; a more detailed investigation of the components of the conflict index shows that these results are driven by future changes in the variables *guerilla warfare* and *revolutions* (results not reported).[16] Reassuringly, the coefficient on petroleum rents remains largely unchanged relative to Table 3. A dollar increase in oil and gas rents is now associated with a 2.4 cent increase in haven deposits in autocracies. Political events have no effect on haven deposits in intermediate and democratic regimes (results not reported).

Table 4 somewhere around here.

In the background section, we discussed how elections and other political events that reduce the probability of political survival could change the incentives for rulers to extract and hide resource rents. The results suggest that the ruling elites anticipate both elections and other events associated with political instability and respond to them by transferring funds to safe havens. The finding that rulers appear to successfully predict political instability is less surprising if one considers that private insurance companies expend considerable resources attempting to forecast the likelihood of future political violence (Jensen and Young, 2009). Assuming that rulers and political elites have access to at least as much information as insurance companies, we should expect them to detect and act upon adverse signals about the probability of regime survival.

In the next step, we study the interaction between petro rents and political events. Until now, we have found that positive shocks to oil and gas rents in autocracies are associated with increases in haven deposits (Table 3) suggesting that part of the petro rents are captured by political elites and hidden in tax havens. We have also found that events giving rise to political uncertainty in autocracies such as elections and mass demonstrations are associated with increases in haven deposits (first column of Table 4) suggesting that political elites respond

[16] Other more narrow conflict measures exist. However, we focus on the CNTS data, since we are interested in capturing non-election replacement risk in the broadest way possible, and not in armed conflict per se.

to uncertainty by hiding part of their wealth in tax havens. These results point to a possible interaction between oil and gas rents and political events. If petro rents are easier to appropriate for political elites than other types of income, then we should expect that political uncertainty gives rise to more capital flight in oil rich countries than in oil poor countries.

We test this hypothesis by constructing dummy variables for high and low oil rents and extending the model with the interaction between these variables and the leaded election and conflict variables. Specifically, we define the dummy variables $highpetro_i$ and $lowpetro_i$ indicating countries with average annual oil and gas rents above and below 5% of GDP respectively. As shown in the second column of Table 4, the effect of political events on haven deposits differ substantially between oil-rich autocracies and oil-poor autocracies. In oil-rich autocracies, *havenrat* increases by around 0.0029 in a year preceding an election while there is no such effect in oil-poor autocracies. Similarly, in oil-rich autocracies, *havenrat* increases by around 0.0014 in a year preceding a 0.1 increase in the conflict index whereas in oil-poor autocracies *havenrat* increases by only around two-thirds of that figure. There are no clear signs of interaction effects in intermediate and democratic regimes (results not reported).

5.3 Political regimes

The measurement of political regimes is not universally agreed upon, and the Polity index is not without critics. In this section, we document that our results extend to another standard measure of political regimes: the democracy-autocracy measure originally developed by Przeworski et al. (2000). In addition to providing assurance that our results on the link between petro rents and political rents are not artifacts of a particular measure of political regimes, the operational rules used by Przeworski et al. for classifying regimes allow us to examine in more detail how political institutions and regime characteristics shape the size of political rents in non-democracies.

We first run the baseline model with covariates on the sample of non-democracies based on

the definition developed by Przeworski et al. As shown in column 1 of Table 5, there is no significant association between petro rents and haven deposits in this sample. The explanation is quite straightforward. Our sample of non-democracies consists of more than 800 country-years whereas our autocracy sample based on the Polity index consists of just over 400 country-years. It seems likely that the former sample encompasses a large number of country-years where institutional constraints are sufficiently strong to deter significant political diversion of petroleum rents. We explore this hypothesis by testing whether differences across non-democracies in the degree to which petroleum rents are transformed into hidden wealth rents can be explained by institutional characteristics.

Table 5 somewhere around here.

We use the operational rules from the definition of democratic regimes in Przeworski et al. (2000, pp. 18-30) to distinguish countries within the group of non-democracies. Specifically, we focus on the following characteristics: Whether the executive is elected or not, whether political parties are legal, whether political parties exist in practice, and whether a legislature exists. There is considerable correlation between these characteristics such that countries without an elected executive are also more likely to have no political parties.

We include indicator variables for each of the four institutional characteristics one by one as well as their interaction with petroleum rents. When interpreting the interaction terms, it should be noted that they are all coded such that the base case is always that of the most autocratic regimes. Results for the full sample of non-democracies are presented in columns 2-5. In countries with no election of the executive increases in petroleum rents are accompanied by significant increases in haven deposits while in countries with indirect and direct election of the executive there is no such effect (column 2). The same pattern is repeated in the following three columns: in countries in which parties are legally banned (column 3), in which there are no

parties in practice (column 4) and in which there is no legislature or a non-partisan legislature (column 5), there is a significant effect of petro rents on deposits in havens.

To check validity with institutional rules from other sources, we use an indicator variable for whether the incumbent leader has a finite term in office from the Database of Political Institutions (Beck et al., 2001). As shown in column (6), there is a positive association between petroleum rents and haven deposits only in the subset of non-democracies where the incumbent leader has no finite term in office.[17]

Finally, we correct directly for the alternation rule problem of Przeworski et al. described above: some regimes formally satisfy the criteria for being a democracy, but since no transfer of power was observed during the regimes, they may in fact be non-democracies and are coded as such. We augment the model with an indicator variable for these cases, reported by Cheibub et al. (2010), as well as its interaction with petroleum rents, to correct for the potential misclassification. Column (7) shows that in countries coded as non-democracies due to the alternation rule, there is no positive association between petroleum rents and haven deposits. In fact, this group of countries behave very much like democracies; in a similar analysis for the full sample of both democracies and non-democracies, there is no statistical difference between countries coded democracies and countries coded non-democracies due to the alternation rule. This suggests that, at least for our outcome, the latter group consists, in fact, of democracies.

Together, these results, by pointing to specific subsets of non-democracies where a significant share of petroleum rents are transformed into hidden wealth and other subsets where this is not the case, are a first step toward developing a quantitative foundation for terms such as kleptocracies, sultanism and neopatrimonialism.

[17] We also examined the basis for our categorization of political regimes. The Polity2 index is comprised of several sub-indices, and our results seem primarily to reflect differences across countries in "constraints on the executive" and "competitiveness of the executive recruitment."

6 Alternative measures and robustness tests

6.1 Deposits in non-havens

So far, we have studied the effect of petroleum rents and political uncertainty on bank deposits in havens, which we consider a relatively clean measure of hidden wealth. After all, what gives havens like Switzerland and Singapore a comparative advantage over other international banking centers is not generous returns or innovative financial products but a legal environment conducive to secrecy. The case-based evidence discussed earlier suggests, however, that a considerable share of illegal political rents is invested in countries that are not usually considered havens such as USA, UK and France. This is confirmed by recent academic studies showing that some anti-money laundering rules are applied more strictly in traditional havens than in the UK and the US (Sharman, 2010; Sharman et al., 2014). It is thus natural to include these countries in our analysis despite the obvious complication that they are also major destinations of funds related to perfectly legitimate transactions driven by, for instance, trade or foreign direct investment. To test whether increases in oil and gas rents are systematically associated with wealth invested in non-havens, we estimate the baseline model with *nonhavenrat* as dependent variable. As reported in column 1 of Table 6, there is no association between petroleum rents and deposits in non-havens.

Table 6 somewhere around here.

6.2 Fuel exports

Our preferred measure of petroleum rents measures the market value of oil and gas production net of production costs. To the extent that the oil and gas is consumed domestically it may be sold below the world market rate, hence *petrorent* can be perceived as a measure of *potential* rather than *realized* petro rents. We use international trade statistics to construct an alternative

measure of petro rents that more closely tracks the cash-flow from petroleum extraction in hard currencies. Specifically, we define $fuelexport$ as the value of exports of mineral fuels, lubricants and related materials as reported in the COMTRADE database.[18]

We estimate the baseline model with fuel exports as the main independent variable instead of petroleum rents. In autocracies, a dollar increase in fuel exports is associated with an increase in haven deposits of 2.4 cents (column 2) whereas there is no such effect in the sample of intermediate regimes and democracies (results not reported). This pattern is strikingly similar to the results from the baseline regression reported in Table 3.

6.3 Corruption

We explore whether the patterns we observe can be explained by differences in another key measure of institutional quality, corruption. For this purpose, we use a commonly employed indicator of perceived corruption, the ICRG index of corruption, where higher values signify less perceived corruption.[19] We note that the Polity2 index and the ICRG index are significantly positively correlated in our sample with a correlation coefficient around 0.41.

We find only weak evidence of an interaction between corruption and the effect of natural resources. When splitting the sample on the basis of the ICRG index of corruption instead of the Polity2 index, we find no systematically different effects of petroleum rents on haven deposits across subsamples (results not reported). When using the full sample, an interaction between the corruption measure and changes in petroleum rents is marginally significant, with more corrupt countries exhibiting a stronger effect of petroleum rents on haven deposits, but this interaction effect vanishes when also including the interaction with the Polity2 index, which is significant in its own right (results not reported).

[18] We use trade data at the 1-digit disaggregation level, which besides exports of oil and gas also comprises exports of coal and electricity, because the more disaggregated 2-digit data, with which we would in principle be able to study only exports of oil and gas, contains many missing values.

[19] Most other commonly used corruption indices are not available for the early part of our sample.

There are several possible explanations for this non-finding: First, countries that place the proceeds of petroleum rents in tax havens may have been perceived as (relatively) less corrupt since such deposits are less salient than other assets because of the lack of transparency in the petroleum sector and the secrecy provided by tax havens. This is related to the more general critique of perception-based corruption indices, such as Treisman (2007). Second, the ICRG index itself may have been more focused on bureaucratic corruption than on the type of grand corruption and rent seeking considered here and, hence, be a more noisy measure of political corruption.

6.4 Patronage

An alternative to transforming petroleum rents into personal wealth is to use them on public goods provision and patronage to secure the political support of the selectorate (Bueno de Mesquita et al. 2003; Robinson et al., 2006; Gandhi and Przeworski, 2006; Blaydes, 2009). To explore this, we estimate regressions similar to those reported in Table 3, replacing offshore bank deposits with changes in government consumption as a share of average GDP as the dependent variable. In results not reported (available as appendix Table A.4 for reviewers), we find that in autocracies, an increase in petro rents of 1 dollar increases government consumption by 10 cent, statistically significant at the 1 % level. However, shocks to other types of income changes, captured by changes in net GDP, have almost exactly the same effect, suggesting that there are no disproportionate responses of government consumption to oil shocks. Indeed, in fixed effects specifications, the effects of petro rents on government consumption is significantly lower than that of other types of income.

6.5 Country-specific trends

Finally, we extend the baseline specifications with country fixed effects. Since the model is in first-differences, this implies that we control for country-specific linear trends in *havenrat* and, consequently, that the coefficient on *petrorent* now measures how shocks to oil and gas rents correlate with deviations from these country-specific trends. As shown in columns 3 and 4, the results are roughly unchanged.

7 Discussion

The main patterns emerging from the data are the following: When autocracies experience a dollar increase in rents from oil and gas production, haven deposits increase by around 2 cents whereas increases in other types of income are associated with much smaller increases in haven deposits, at most 0.7 cent per dollar. When autocracies experience an increase in political risk in the form of upcoming elections and domestic conflict, haven deposits increase significantly, a correlation which is particularly strong in oil rich autocracies. For intermediate and democratic regimes, neither oil and gas rents nor political events correlate with the value of haven deposits.

Under our preferred interpretation, the changes in haven deposits observed around oil shocks and political shocks in autocracies reflect hidden political rents: Windfall gains from oil and gas production are partly captured by political elites and transferred to private bank accounts in havens; and in the face of political instability political elites transfer part of the wealth they have amassed domestically to havens. This interpretation is consistent with the fact that oil and gas production is typically directly or indirectly controlled by governments and with the abundant anecdotal evidence on corrupt rulers in oil-rich autocracies like Nigeria, Libya and Equatorial Guinea accumulating vast private fortunes abroad. It is also in line with the political incentives facing self-interested elites: Moving captured petro rents to secret accounts in havens provides protection against expropriation in case they are ousted from power; and the perceived

risk of expropriation is likely to increase in election years and periods of domestic conflict thus strengthening the incentive to hide funds in havens.[20] Finally, it is consistent with the lack of correlation between windfall gains, political events and haven deposits in intermediate and democratic regimes: a distinguishing feature of autocracies is the lack of political constraints and electoral accountability, which facilitates the conversion of petro rents into personal wealth of political elites.

Other interpretations of the results are, of course, possible but, as we argue in the following, less plausible. First, it may be suspected that the correlation between oil and gas rents and haven deposits is related to the presence of multinational firms in the petro-industry. Hines (2010) argues that developing countries are particularly vulnerable to tax avoidance by multinational firms whereby taxable profits are shifted to tax havens through transfer pricing or thin capitalization. This, seemingly, suggests an alternative explanation for our empirical findings according to which the oil and gas rents transferred to tax havens belong to multinational firms rather than domestic elites. This interpretation, however, can largely be ruled out because of the way the deposit data are constructed. For instance, if a multinational oil company uses transfer pricing to shift profits from a Nigerian affiliate to a Cayman affiliate in order to reduce tax payments in Nigeria, the funds would be legally owned by the Cayman affiliate and therefore assigned to the Cayman Islands and not Nigeria in the BIS statistics.

Second, oil and gas windfall gains may lead to higher incomes more widely in the domestic economy: local suppliers to the petro-industry benefit directly from an oil boom whereas other local firms may benefit from increases in aggregate demand stimulated by increased government spending and demand multipliers. Could the observed increase in haven deposits following

[20] In recent years, international cooperation over freezing and potentially recovering stolen assets has increased; for example, The Stolen Asset Recovery Initiative launched in September 2007 by the World Bank and the United Nations Office on Drugs and Crime aims at assisting developing countries in recovering assets held abroad, typically by former rulers and their political connections. If succesful, such initiatives may make hiding wealth in tax havens a less attractive option for kleptocratic rulers and political elites. So far, however, results have been meager: only USD 5 billion in total have been recovered out of an estimated annual loss of between USD 20 and 40 billion (OECD and the World Bank, 2011).

increases in oil and gas rents reflect that other domestic groups than political elites transfer funds to tax havens in order to evade income taxes? We do not find this explanation plausible. Significant oil producers such as Saudi Arabia, Kuwait, United Arab Emirates and Qatar have no income taxes, hence tax evasion is clearly not an issue. Most of the other autocracies in our sample are developing countries where tax enforcement is typically lax suggesting that much simpler tax evasion techniques are available than those involving foreign bank accounts.

Finally, our empirical results could potentially reflect differences in absorptive capacity across different categories of countries. In particular, investment opportunities may generally be lower in developing countries, which dominate our sample of autocracies, than in developed countries, which could explain why a larger share of petro rents in the former countries is invested abroad. This does not, however, account for the finding that shocks to oil and gas rents are more likely to translate into foreign deposits than other types of income. Moreover, it seems inconsistent with the finding that higher oil and gas rents in autocracies lead to more deposits in havens but not to more deposits in non-havens. If windfall gains in the oil and gas sector would be invested abroad due to lack of domestic investment opportunities, it is not clear why investments would primarily take place in havens. This is especially true because we observe the opposite pattern for the sample of intermediate regimes where political elites face more constraints and some measure of electoral accountability. In this sample, which also comprises many developing countries, windfall gains in the oil and gas sector do not lead to more deposits in havens.

8 Conclusion

We employ new data on bank deposits in tax havens to examine the transformation of petro rents into hidden wealth. We find that increases in oil and gas rents increase the value of a country's bank deposits in havens – jurisdictions typically associated with banking secrecy – but also that this is true only for autocracies. This is consistent with a model where rulers

and political elites in countries with weak political constraints and lack of competitive elections transform petroleum rents into political rents. This interpretation is supported by our findings that the share of petro rents transformed into hidden wealth increases in anticipation of political events – elections and political conflict – and that these political events affect hidden wealth primarily in petroleum rich countries.

References

[1] Alt, J., D.D. Lassen and D. Ziblatt. 2013. "Political Corruption." *Annual Review of Political Science*, forthcoming.

[2] Acemoglu, D. and Robinson, J., 2006. *Economic Origins of Dictatorship and Democracy*, Cambridge University Press.

[3] Acemoglu, D., Robinson, J.A., and Verdier, T., 2004. "Kleptocracy and divide and rule: a theory of personal rule." *Journal of the European Economic Association* vol. 2(2-3), 162-192.

[4] Banks. A. S. 2011. Cross-National Time-Series Data Archive, February 2011 version. Jerusalem: Databanks International.

[5] Beck, T. G. Clarke, A. Groff, P. Keefer, and P. Walsh. 2001. "New tools in comparative political economy: The Database of Political Institutions." *World Bank Economic Review* 15:1, 165-176 (September). Database version: 2012.

[6] Besley, T. and Kudamatsu, M. 2008. "Making Autocracy Work." In E. Helpman (ed.) *Institutions and Economic Performance*. Cambridge, MA: Harvard University Press.

[7] Besley, T. and T. Persson. 2011. Pillars of Prosperity. Princeton University Press, Princeton New Jersey.

[8] Blaydes, L.. 2011. *Elections and Distributive Politics in Mubarak's Egypt.* New York: Cambridge University Press.

[9] Bruno, M. and W. Easterly, 1998. "Inflation crises and long-run growth." *Journal of Monetary Economics* 41, 3-26.

[10] Bueno de Mesquita, B., A. Smith, R. Siverson, and J. Morrow. 2003. *The Logic of Political Survival.* Cambridge, MA: MIT Press.

[11] Cabrales, A. and E. Hauk. 2011. "The Quality of Political Institutions and the Curse of Natural Resources." The Economic Journal 121, 58-88.

[12] Cheibub, J.A., J. Gandhi, and J.R. Vreeland. 2010. "Democracy and Dictatorship Revisited." *Public Choice* 143, 67-101.

[13] Chinn, M.D. and H. Ito, 2008. "A New Measure of Financial Openness." *Journal of Comparative Policy Analysis* 10(3), 309-322.

[14] Cox, G., 2009. "Authoritarian elections and leadership succession, 1975-2004." Paper presented to the 2009 APSA meetings.

[15] FATF, 2011. *Laundering the Proceeds of Corruption.* Financial Action Task Force, OECD, Paris.

[16] Fisman, R. 2001. "Estimating the Value of Political Connections." *American Economic Review*, vol. 91, 1095-1102.

[17] Gandhi, J. and E. Lust-Okar. 2009. "Elections under authoritarianism." *Annual Review of Political Science*, Vol. 12, 403-422.

[18] Gandhi, J. and A. Przeworski. 2006. "Cooperation, Cooptation, and Rebellion under Dictatorships." *Economics and Politics* 18, 1-26.

[19] Geddes, B. 2003. *Paradigms and Sand Castles: Theory Building and Research Design in Comparative Politics.* Ann Arbor: University of Michigan Press.

[20] Geddes, B. 2006. "Why Parties and Elections in Authoritarian Regimes?" Manuscript, UCLA, March.

[21] Geddes, B., J. Wright, and E. Frantz. 2012. "New Data on Autocratic Regimes." Manuscript, September.

[22] Global Witness. 2004. *Time for Transparency: Coming clean on oil, mining and gas revenues.* Washington DC.

[23] Guardian, 2009. G20 declares door shut on tax havens. April 2nd. <http://www.guardian.co.uk/world/2009/apr/02/g20-summit-tax-havens>

[24] Hines, J.R. 2010. "Treasure Islands". Journal of Economic Perspectives, 2010(4), 103-126.

[25] Jensen, N. and D. Young. 2008. "A violent future? Political risk insurance markets and violence forecasts." *Journal of Conflict Resolution* Vol. 52(4), 527-547.

[26] Johannesen, N. and Zucman, G., 2013. "The end of bank secrecy? An Evaluation of the G20 tax haven crackdown." *American Economic Journal: Economic Policy*, forthcoming.

[27] Levine, R., 1997. "Financial Development and Economic Growth: Views and Agenda." *Journal of Economic Literature* 35(2), 688-726

[28] Los Angeles Times, 2011. "As Libya takes stock, Moammar Kadafi's hidden riches astound." October 21st <http://articles.latimes.com/2011/oct/21/world/la-fg-kadafi-money-20111022>

[29] Marshall, M.G and K. Jaggers. 2009. *Polity IV Project. Political Regime Characteristics and Transitions, 1800-2007.* <http://www.systemicpeace.org/polity/polity4.htm>

[30] Mehlum, H., K. Moene, and R. Torvik. 2006. "Institutions and the Resource Curse." *The Economic Journal*, Vol. 116(508), 1-20.

[31] New York Times. 2006. "Oil, Cash and Corruption." November 5th.

[32] OECD. 2008. *Tax co-operation. Towards a level playing field*. Paris.

[33] OECD. 2009. *A progress report on the jurisdictions surveyed by the OECD global forum in impliementing the internationally agreed tax standard*. Paris.

[34] OECD and World Bank Stolen Asset Recovery Initiative. 2011. *Tracking Anti-Corruption and Asset Recovery Commitments: A Progress Report and Recommendations for Action*.

[35] Persson, T. and G. Tabellini. 2000. *Political Economics: Explaining Economic Policy*. Cambridge, MA: MIT Press.

[36] Przeworski, A. M.E. Alvarez, J.A. Cheibub, F. Limongi. 2000. *Democracy and Development*. New York: Cambridge University Press.

[37] Robinson, J.A., Torvik, R and Verdier, T., 2006. "Political foundations of the resource curse." *Journal of Development Economics*, vol. 79 (2), 447–468.

[38] Ross, M.L. 2001. "Does Oil Hinder Democracy." *World Politics*, vol. 53, 325–61.

[39] Ross, M.L. 2012. *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations.* Princeton, NJ: Princeton University Press.

[40] Sharman, J.C., 2010. "Shopping for Anonymous Shell Companies: An Audit Study of Anonymity and Crime in the International Financial System." *Journal of Economic Perspectives* 24(4), 127-140.

[41] Sharman, J.C., M.G. Findley, and D. L. Nielson. 2014. "The Experimental Science of Transnational Relations: A Randomized Study of Anonymous Incorporation." *International Organization*, forthcoming.

[42] Smith, A. 2008. "The Perils of Unearned Income." *Journal of Politics* 70(3), 780-803.

[43] Smith, J. L. 2009. "World Oil: Market or Mayhem?" *Journal of Economic Perspectives* 23(3), 145-64.

[44] Treisman, D. 2007. "What Have We Learned About the Causes of Corruption from Ten Years of Cross-National Empirical Research?" *Annual Review of Political Science* Vol. 10: 211-244

[45] van der Ploeg, F. 2011. "Natural Resources: Curse or Blessing?" *Journal of Economic Literature*, 49(2), 366-420.

[46] Zucman, G., 2013. "The Missing Wealth of Nations: Are Europe and the U.S. net Debtors or net Creditors?" *Quarterly Journal of Economics*, 128(3), 1321-1364.

Table 1. Tax haven deposits: Descriptive statistics

	Share of world haven deposits	Haven deposits as share of GDP
Autocracies	**8.8%**	**2.7%**
- petroleum rich	7.8%	6.7%
- not petroleum rich	1.0%	0.5%
Intermediate	**7.9%**	**1.1%**
- petroleum rich	3.4%	1.3%
- not petroleum rich	4.5%	1.0%
democracies	**83.3%**	**1.9%**
- petroleum rich	2.3%	1.8%
- not petroleum rich	80.9%	1.9%

Note: For the purposes of this table, countries are first divided into regime groups on the basis of the *average* Polity2 score over the sample period and into petroleum producing groups on the basis of the *average* petroleum rent /GDP ratio over the sample period (threshold 5%). To avoid confounding effects of countries entering and exiting the sample, the sample is restricted to countries for which observations are available for all years 1977-2008. The first column is constructed in the following way: The share of total haven deposits of non-havens owned by each of the regime-petroleum groups is computed for each year; then the shares are averaged over the sample period. The second column is constructed in the following way: The ratio of haven deposits to GDP within each of the regime-petroleum groups is computed for each year; then the ratios are averaged over the sample period.

Table 2. Petro rents and tax haven deposits: Basic correlations

	(1)	(2)	(3)	(4)
Dependent variable		Δhavenrat		
Political regime	All	Autocracies	Intermediate	Democracies
Δhavenrat (lagged)	0.2086***	0.1238	0.3355***	0.2104**
	(0.0611)	(0.0905)	(0.1092)	(0.0871)
Δpetrorentrat	0.0074**	0.0137**	0.0003	0.0026
	(0.0038)	(0.0060)	(0.0029)	(0.0042)
Δnetgdprat	0.0069***	0.0063***	0.0080***	0.0055***
	(0.0012)	(0.0023)	(0.0017)	(0.0014)
Constant	0.0015***	0.0015***	0.0013***	0.0016***
	(0.0002)	(0.0004)	(0.0004)	(0.0003)
Observations	2,960	797	550	1,505
Number of panelid	115	60	56	76
Time FE	NO	NO	NO	NO

Note: Robust standard errors clustered at the country level are reported in parentheses. Significance levels are indicated with: *** p<0.01; ** p<0.05; and * p<0.1.

Table 3. Petro rents and tax haven deposits: Extended model

	(1)	(2)	(3)	(4)
Dependent variable		Δhavenrat		
Political regime	All	Autocracies	Intermediate	Democracies
Δhavenrat (lagged)	0.2844***	0.4114***	0.2398***	0.2184**
	(0.0682)	(0.0855)	(0.0698)	(0.1029)
Δpetrorentrat	0.0081	0.0216***	-0.0043	0.0006
	(0.0055)	(0.0061)	(0.0056)	(0.0044)
Δnetgdprat	-0.0001	0.0058**	-0.0003	-0.0020
	(0.0013)	(0.0027)	(0.0027)	(0.0017)
kaopen	0.0002*	0.0005***	0.0007**	0.0002
	(0.0001)	(0.0002)	(0.0004)	(0.0001)
liabilities	0.0021	0.0040***	0.0124***	0.0006
	(0.0018)	(0.0011)	(0.0041)	(0.0014)
highinflation	0.0010*	0.0008	0.0019	0.0009
	(0.0006)	(0.0007)	(0.0014)	(0.0010)
election	-0.0001	-0.0003	-0.0008	0.0003
	(0.0003)	(0.0008)	(0.0005)	(0.0004)
conflictdum	-0.0007*	-0.0010	-0.0011	-0.0002
	(0.0004)	(0.0006)	(0.0010)	(0.0004)
Constant	0.0028*	-0.0060	0.0042	0.0043**
	(0.0015)	(0.0044)	(0.0031)	(0.0017)
Observations	2,336	446	463	1,371
Number of panelid	100	43	48	72
Time FE	YES	YES	YES	YES

Note: Robust standard errors clustered at the country level are reported in parentheses. Significance levels are indicated with: *** p<0.01; ** p<0.05; and * p<0.1.

Table 4. Political risk and tax haven deposits in autocracies

	(1)	(2)
Dependent variable	Δhavenrat	
Δhavenrat (lagged)	0.3533***	0.3479***
	(0.0713)	(0.0699)
Δpetrorentrat	0.0241***	0.0240***
	(0.0061)	(0.0061)
Δnetgdprat	0.0037	0.0032
	(0.0027)	(0.0030)
kaopen	0.0008***	0.0007***
	(0.0002)	(0.0002)
liabilities	0.0040***	0.0039***
	(0.0011)	(0.0011)
highinflation	0.0000	-0.0000
	(0.0007)	(0.0007)
Δconflict (lagged)	-0.0017	
	(0.0032)	
Δconflict	-0.0068	
	(0.0053)	
Δconflict (leaded)	0.0087***	
	(0.0031)	
Δconflictindex (leaded) × highpetro		0.0144**
		(0.0059)
Δconflictindex (leaded) × lowpetro		0.0101**
		(0.0040)
election (lagged)	0.0009	
	(0.0007)	
election	-0.0003	
	(0.0008)	
election (leaded)	0.0022***	
	(0.0007)	
election (leaded) × highpetro		0.0029***
		(0.0011)
election (leaded) × lowpetro		0.0011
		(0.0007)
Constant	0.0032	0.0034
	(0.0067)	(0.0070)
Observations	425	427
Number of panelid	42	42
Time FE	YES	YES

Note: Robust standard errors clustered at the country level are reported in parentheses. Significance levels are indicated with: *** p<0.01; ** p<0.05; and * p<0.1.

Table 5. Dictatorships and Political Institutions

	(1)	(2)	(3)	(4)	(5)	(6)	(6)
Dependent variable				Δhavenrat			
Conditioning variable		Exec selection	De jure parties	De facto parties	Legislative parties	Exec finite term	Classification errors
Δhavenrat (lagged)	0.2491***	0.2336***	0.2378***	0.2492***	0.2458***	0.2707***	0.2370***
	(0.0550)	(0.0558)	(0.0555)	(0.0564)	(0.0543)	(0.0301)	(0.0558)
Δpetrorentrat	0.0096	0.0169**	0.0208**	0.0185*	0.0202**	0.0146**	0.0164**
	(0.0077)	(0.0072)	(0.0088)	(0.0102)	(0.0082)	(0.0071)	(0.0070)
Indirect election		-0.0008					
		(0.0008)					
Direct election		0.0005					
		(0.0007)					
Indirect election * Δpetrorentrat		-0.0580***					
		(0.0112)					
Direct election * Δpetrorentrat		-0.0325***					
		(0.0075)					
Single party legal			-0.0002				
			(0.0008)				
Multiple parties legal			-0.0013				
			(0.0009)				
Single party legal*Δpetrorentrat			-0.0233**				
			(0.0097)				
Multiple parties legal*Δpetrorentrat			-0.0249**				
			(0.0104)				
Single party exists				-0.0002			
				(0.0009)			
Multiple parties exist				-0.0004			
				(0.0009)			
Single party exists*Δpetrorentrat				-0.0315**			
				(0.0130)			
Multiple parties exist*Δpetrorentrat				-0.0143			
				(0.0132)			
Legisl w regime party					-0.0002		
					(0.0006)		
Legisl w mult parties					-0.0001		
					(0.0007)		
Legisl w regime party*Δpetrorentrat					-0.0288**		
					(0.0121)		
Legisl w mult parties*Δpetrorentrat					-0.0239**		
					(0.0111)		
Exec finite term						-0.0010*	
						(0.0006)	
Exec finite term*Δpetrorentrat						-0.0343***	
						(0.0078)	
Potential classif error							0.0003
							(0.0006)
Potential classif error *Δpetrorentrat							-0.0339***
							(0.0075)
Observations	841	841	841	841	841	832	841
Number of panelid	56	56	56	56	56	55	56
Controls	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES

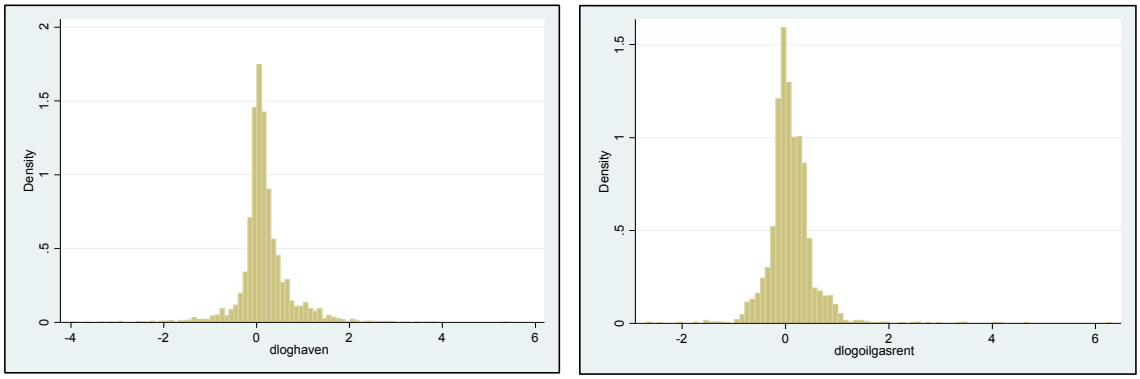
Note: Base categories for institutional variables are: Executive selection - No elections; De jure parties - All parties legally banned; De facto parties - No parties exist; Legislative parties - No legislature or non-partisan legislature; Executive finite term - No finite term. Type II classification error - no error. Robust standard errors clustered at the country level are reported in parentheses. Significance levels are indicated with: *** p<0.01; ** p<0.05; and * p<0.1.

Table 6. Robustness: Non-haven deposits, fuel exports and country fixed effects

	(1)	(2)	(3)	(4)
Political regime	Autocracies	Autocracies	Autocracies	Non-democracies
Measure	Polity	Polity	Polity	Przeworski et al.
Conditioning variable				Executive selection
Robustness	Non-haven deposits	Fuel exports	Fixed effects	Fixed effects
Δnonhavenrat (lagged)	0.1331*			
	(0.0706)			
Δhavenrat (lagged)		0.4650***	0.3396***	0.1845***
		(0.0748)	(0.0589)	(0.0606)
Δpetrorentrat	0.0093		0.0178***	0.0149**
	(0.0107)		(0.0064)	(0.0074)
Δnetgdprat	0.0023	0.0007	0.0058*	-0.0043
	(0.0032)	(0.0036)	(0.0031)	(0.0038)
Δfuelexportrat		0.0238***		
		(0.0049)		
Indirect election				0.0023
				(0.0021)
Direct election				0.0045**
				(0.0022)
Indirect election * Δpetrorentrat				-0.0492***
				(0.0129)
Direct election * Δpetrorentrat				-0.0384***
				(0.0106)
Observations	446	328	446	841
Number of panelid	43	35	43	56
Controls	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
Country FE	NO	NO	YES	YES

Note: Base categories for institutional variables are: Executive selection - No elections. Robust standard errors clustered at the country level are reported in parentheses. Significance levels are indicated with: *** p<0.01; ** p<0.05; and * p<0.1.

Figures 1a-1b: Year-to-year variation in haven deposits and petroleum rents



Note: The figures show the distribution of annual growth rates in haven deposits (Figure 1a) and petroleum rents (Figure 1b) respectively across all country-years.

A Panel unit root testing

In order to test for the presence of panel unit roots in our key variables $\Delta petrorentrat$, $\Delta havenrat$ and $\Delta nonhavenrat$, we employ three different tests: Maddala and Wu (1999) Fisher-type test, Im-Pesaran-Shin (2003) test and Pesaran (2007). All of them allow for unbalanced panels (which is an important feature of our data). We start with Maddala and Wu (1999) test which assumes independence between individual country series. As it is known that unit root tests are often sensitive to the choice of lags, we run the test including one to three lags, with and without trend. As can be seen from Table A1, the null hypothesis of all series being non-stationary is rejected in all cases except the test with 3 lags for $\Delta petrorentrat$. A similar result is obtained for the Im-Pesaran-Shin (2003) test, which also assumes cross-sectional independence. There we try to diminish the lag sensitivity problem by choosing the lags for each individual country series based on the Akaiki information criterion.

However, the assumption of independence between individual series is strong, and likely not true for cross-country data. Therefore, we proceed by utilizing tests that allow us to control for (some) cross-sectional dependence. We first run a modification of the Im-Pesaran-Shin (2003) test which assumes that the correlation between different countries is due entirely to a common time effect. To control for such a heterogeneity, the cross-sectional means are subtracted from the observations in each period of time. The resulting Im-Pesaran-Shin demeaned test rejects the null hypothesis of a unit root for all cases except $\Delta petrorentrat$ without a trend. Still, the assumption about the type of cross-sectional dependence eliminated by such demeaning is, perhaps, quite limiting. Therefore, we also run Pesaran (2007) unit root test which allows for cross-sectional dependence brought by a common factor (with potentially heterogeneous effects of this factor on different country series). We choose the lags based on Akaiki and Schwarz information criteria, and run the test with and without trend. Again, the results are consistently rejecting the unit root hypothesis. In sum, we can conclude that all three variables

do not exhibit a panel unit root.

References

[1] Im, K.; Pesaran, M. & Shin, Y., 2003. Testing for unit roots in heterogeneous panels, *Journal of Econometrics*, 115, 53-74.

[2] Maddala, G. & Wu, S., 1999. A comparative study of unit root tests with panel data and a new simple test, *Oxford Bulletin of Economics and Statistics*, 61, 631-652.

[3] Pesaran, M., 2007. 'A simple panel unit root test in the presence of cross-section dependence', *Journal of Applied Econometrics*, 22, 265-312

Table A.1: Panel Unit Root Tests

	d.petrorentrat	d.haven	d.nonhaven
Maddala and Wu (1999) test, χ^2-stat (P-value)			
1 lag	636.5 (0.00)	935.1 (0.00)	1000.0 (0.00)
1 lag + trend	927.6 (0.00)	810.7 (0.00)	931.0 (0.00)
2 lags	228.3 (0.00)	617.2 (0.00)	557.6 (0.00)
2 lags + trend	316.8 (0.00)	509.7 (0.00)	473.8 (0.00)
3 lags	138.6 (0.95)	450.1 (0.00)	411.6 (0.00)
3 lags + trend	298.4 (0.00)	378.1 (0.00)	359.3 (0.00)
Im-Pesaran-Shin (2003) test, $W_{t\text{-}bar}$ (P-value)			
AIC-based lags	-2.53 (0.01)	-18.30 (0.00)	-18.14 (0.00)
AIC-based lags + trend	-9.68 (0.00)	-15.57 (0.00)	-19.43 (0.00)
AIC-based lags, demeaned	9.09 (1.00)	-21.37 (0.00)	-25.36 (0.00)
AIC-based lags + trend, demeaned	-3.13 (0.00)	-20.65 (0.00)	-25.08 (0.00)
Pesaran (2007) test, $Z_{t\text{-}bar}$ (P-value)			
AIC-based lags	-7.85 (0.00)	-4.82 (0.00)	-5.80 (0.00)
AIC-based lags + trend	-1.75 (0.04)	-2.55 (0.01)	-2.21 (0.01)
SchwarzIC-based lags	-11.44 (0.00)	-11.89 (0.00)	-13.22 (0.00)
SchwarzIC-based lags + trend	-5.91 (0.00)	-10.35 (0.00)	-8.68 (0.00)

*For all tests, H0: All series non-stationary, H1: Some series are stationary. All tests are performed in STATA using xtunitroot and pescadf routines. Since Im-Pesaran-Shin and Pesaran tests do not permit gaps in the data, country series with gaps are excluded for each variable. Also, the tests require sufficient variation in the data for each individual country. Thereby we exclude the countries for which respective variable is identically zero or has high share of zero-valued observations. The estimation results are robust to these exclusions.

Table A.2: Variable description

Variable	Variable description	Comments	Source of data
Main variables:			
$haven_{it}$	Bank deposits in havens held by non-bank residents of country i in year t	Sum of deposit holdings by residents of country i in 19 tax havens (see footnote 5) in year t, quarterly data converted to the annual data by taking simple averages	Locational Banking Statistics, Bank for International Settlements (BIS)
$nonhaven_{it}$	Bank deposits in non-havens held by non-bank residents of country i in year t	Sum of deposit holdings by residents of country i in 24 non-tax havens in year t, quarterly data converted to the annual data by taking simple averages	Locational Banking Statistics, Bank for International Settlements (BIS)
$petrorent_{it}$	Oil and gas rents in country i in year t	Market value of the estimated production of oil and gas net of the estimated production costs, in current dollars	Adjusted Net Savings (ANS) dataset, World Bank
gdp_{it}	Gross domestic product in country i in year t	GDP in current dollars	World Development Indicators (WDI), World Bank
$netgdp_{it}$	GDP net of petro income in country i in year t	computed as gdp_{it} - $petrorent_{it}$	
$averagegdp_i$	Average GDP in country i	gdp_{it} averaged over 1977-2007	
$polity2_{it}$	Type of political regime in country i in year t	Measures the competitiveness and openness of executive recruitment, constraints on executive power and political participation; ranges between -10 (strongly autocratic) to 10 (strongly democratic)	Polity IV dataset, Marshall and Jaggers (2009)
Controls and variables for robustness checks:			
Financial and economic controls:			
$inflation_{it}$	A dummy for inflation exceeding 40% in country i at year t	1 if inflation is above 40%, 0 otherwise	World Development Indicators (WDI), World Bank
$kaopen_{it}$	A dummy for capital account openness in country i in year t	Reflects de-jure restrictions on cross-border financial transactions, based on the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)	Chinn and Ito (2008) Financial Openness Index, 2011 update.

$liabilities_{it}$	Liquid liabilities in country i in year t	A measure of financial intermediation; computed as currency plus demand and interest-bearing liabilities of all banks, bank-like and nonbank financial institutions; in current USD	International Financial Statistics, IMF
$highpetro_i$	A dummy for oil-rich countries	1 iff the average petro rents as a share of GDP are above 5%. That is, $highpetro_i$ =1 if $(1/T)\Sigma_t(petrorent_{it}/gdp_{it})>0.05$ $highpetro_i$ =0, otherwise	
$lowpetro_i$	A dummy for oil-poor countries	Computed as 1- $highpetro_i$	
$fuelexport_{it}$	Trade in oil, gas and related fuels of country i in year t vis-à-vis all world states	The value of exports as reported in category 3 of SITC trade classification (Mineral fuels, lubricants and related materials). The category includes coal, petroleum and petroleum products, gas, natural and manufactured and electric current.	UN COMTRADE database
Political and conflict-related controls:			
$conflict_{it}$	Reflects presence and the intensity of a domestic conflict in country i at year t	$Domestic9_{it}$ from CNTS, normalized to be between 0 and 1. In turn, $Domestic9_{it}$ is a weighted sum of conflict measures, accounting for assassinations, strikes, guerrilla warfare, government crises, purges , riots, revolutions , and anti-government demonstrations.	Based on Cross-National Time-Series Data Archive (CNTS) (Banks and Wilson, 2012)
$conflictdum_{it}$	A dummy for a presence of a domestic conflict in country i at year t	1 if $conflict_{it}$ >0, and 0 otherwise	
$election_{it}$	A dummy for domestic presidential or parliamentary elections in country i at year t	1 if there is any round of a presidential or parliamentary elections in country i in year t, 0 otherwise	Based on National Elections Across Democracy and Autocracy (NELDA), Hyde and Marinov (2012) for 1977-2006, and IFES Election Guide, www.electionguide.org, for 2007
Political regime variables:			
$Nondemocracy_{it}$	A dummy for non-democratic regime in country i at year t	1 if Chebub et al. (2010)'s $democracy_{it}$=1, and 0 otherwise. In turn, $democracy_{it}$ measures the competitiveness of executive selection, de-facto and de-juro presence/number of political parties, their representativeness in the legislature, alternation of the ruler in power, and consolidation of incumbent advantage.	Based on Democracy and Dictatorship (DD) by Przeworski et al. (2000) and extention of it by Chebub et al. (2010)

Direct/indirect election$_{it}$	Dummies reflecting the mode of effective executive selection in country i at year t	*direct election*$_{it}$ =1 if Chebub et al. (2010)'s exselec$_{it}$=1, and 0 otherwise, captures regimes in which election of the effective executive is done by popular vote or the election of committed delegates; *indirect election*$_{it}$ =1 if Chebub et al. (2010)'s exselec$_{it}$ =2, and 0 otherwise, captures regimes in which election of the effective executive is done by elected assembly or uncommitted electoral college;	Based on Przeworski et al. (2000) and extention of it by Chebub et al. (2010)
Single/multiple party legal$_{it}$	Dummies reflecting de-juro existence of parties in country i at year t	*Single party legal*$_{it}$ =1 if Chebub et al. (2010)'s dejure$_{it}$=1, and 0 otherwise, captures regimes with single legal party; *multiple party legal*$_{it}$ =1 if Chebub et al. (2010)'s dejure$_{it}$ =2, and 0 otherwise, captures regimes with multiple legal parties;	Based on Przeworski et al. (2000) and extention of it by Chebub et al. (2010)
Single/multiple party exists$_{it}$	Dummies reflecting de-facto existence of parties in country i at year t	*Single party exists*$_{it}$ =1 if Chebub et al. (2010)'s defacto$_{it}$=1, and 0 otherwise, captures regimes with single legal party; *multiple party exists*$_{it}$ =1 if Chebub et al. (2010)'s defacto$_{it}$ =2, and 0 otherwise, captures regimes with multiple legal parties;	Based on Przeworski et al. (2000) and extention of it by Chebub et al. (2010)
Legisl w regime party/w mult parties$_{it}$	Dummies reflecting the party composition of the legislature in country i at year t	*Legisl w regime party*$_{it}$ =1 if Chebub et al. (2010)'s lparty$_{it}$=1, and 0 otherwise, captures regimes with a legislature with only members of the regime party; *Legisl w mult parties*$_{it}$ =1 if Chebub et al. (2010)'s lparty$_{it}$=2, and 0 otherwise, captures regimes with a legislature with multiple parties;	Based on Przeworski et al. (2000) and extention of it by Chebub et al. (2010)
Exec finite term$_{it}$	A dummy for finite office term for the executive in country i at year t	1 if there is a constitutional limit on the number of years the executive can serve before new elections must be called, 0 otherwise	Beck et al. (2001)
Potential classif error$_{it}$	A dummy for "democratic" regimes in country i at year t with no factual transfer of power	1 if Chebub et al. (2010)'s type2=1, and 0 otherwise. Reflects regimes that are classified as democracies by Chebub et al. (2010), but experience no power transfer.	Przeworski et al. (2000) and extention of it by Chebub et al. (2010)

Table A.3: Summary statistics

Variable name	Mean	Min	Max	Median	Standard Deviation			Number of observations	Number of countries
					overall	between	within		
Main Variables									
Levels									
haven	3.80E+09	0	9.39E+11	6.30E+07	2.66E+10	1.86E+10	1.89E+10	6406	217
nonhaven	5.52E+09	0	9.80E+11	1.77E+08	3.66E+10	2.19E+10	2.90E+10	6406	217
petrorent	5.60E+09	0	4.88E+11	1.53E+08	2.06E+10	1.46E+10	1.37E+10	4031	202
netgdp	2.07E+11	-1.10E+10	1.41E+13	1.90E+10	8.48E+11	6.09E+11	3.98E+11	3724	187
gdp	1.48E+11	2.06E+07	1.44E+13	7.32E+09	7.19E+11	5.99E+11	3.34E+11	5374	198
averagedgp	1.36E+11	5.76E+07	7.13E+12	7.44E+09	6.09E+11	5.99E+11	0	5901	198
polity2	1.10	-10	10	2	7.39	6.29	3.94	4705	168
Normalized first differences									
Δ havenrat	0.04	-6.92	17.01	0.00	0.48	0.19	0.44	5703	198
Δ nonhavenrat	0.13	-5.13	101.85	0.00	2.56	1.36	2.14	5703	198
Δ petrorentrat	0.01	-0.66	1.72	0.00	0.08	0.04	0.08	3696	134
Δ netgdprat	0.07	-1.96	1.57	0.05	0.16	0.04	0.15	3531	134
Controls									
highinflation	0.24	0	1	0	0.43	0.32	0.29	6438	218
kaopen	0.02	-1.84	2.48	-0.26	1.54	1.30	0.86	4883	180
liabilities	0.48	0.00	4.32	0.39	0.37	0.36	0.14	3937	156
highpetro	0.31	0	1	0	0.46	0.47	0	6438	218
Δ.fuelexportrat	0.01	-3.05	3.83	0.00	0.10	0.03	0.10	3458	182
election	0.25	0	1	0	0.43	0.13	0.41	5071	173
conflictdum	0.47	0	1	0	0.50	0.32	0.38	6438	218
conflict	0.04	0	1	0	0.08	0.04	0.06	5682	199

Variable name	Mean	Min	Max	Median	Standard Deviation			Number of observations	Number of countries
					overall	between	within		
Political regime variable									
nondemocracy	0.53	0	1	1	0.50	0.43	0.26	5347	181
Direct election	0.35	0	1	0	0.48	0.41	0.25	5347	181
Indirect election	0.41	0	1	0	0.49	0.44	0.23	5347	181
Single party legal	0.10	0	1	0	0.30	0.18	0.23	5347	181
Mult party legal	0.80	0	1	1	0.40	0.29	0.28	5347	181
Single party exists	0.12	0	1	0	0.33	0.24	0.24	5347	181
Mult party exists	0.79	0	1	1	0.41	0.31	0.27	5347	181
Legisl w regime party	0.15	0	1	0	0.35	0.24	0.26	5347	181
Legisl w mult parties	0.68	0	1	1	0.46	0.35	0.30	5347	181
Exec finite term	0.80	0	1	1	0.40	0.29	0.26	5113	180
Potential classif error	0.16	0	1	0	0.37	0.31	0.22	5347	181

Table A.4. Petro rents and government consumption

VARIABLES	(1) DEPVAR: d.govconsrat REGIME: autocracies broad	(2) DEPVAR: d.govconsrat REGIME: autocracies broad	(3) DEPVAR: d.govconsrat REGIME: autocracies	(4) DEPVAR: d.govconsrat REGIME: autocracies
Δgovconsrat (lagged)	0.1268***	0.0647**	0.1977***	0.0550
	(0.0381)	(0.0306)	(0.0620)	(0.0331)
Δpetrorentrat	0.1042***	0.0756***	0.0937***	0.0600***
	(0.0377)	(0.0228)	(0.0341)	(0.0167)
Indirect election	0.0008	-0.0070*		
	(0.0019)	(0.0039)		
Direct election	-0.0014	-0.0039		
	(0.0014)	(0.0051)		
Indirect election * Δpetrorentrat	-0.1115*	-0.0972		
	(0.0583)	(0.0658)		
Direct election * Δpetrorentrat	-0.0397	-0.0393		
	(0.0426)	(0.0318)		
Δnetgdprat	0.1287***	0.1238***	0.1174***	0.1110***
	(0.0093)	(0.0096)	(0.0110)	(0.0101)
Observations	799	799	405	405
R-squared		0.5137		0.5198
Number of panelid	53	53	40	40
Controls	YES	YES	YES	YES
time FE	YES	YES	YES	YES
country FE	NO	YES	NO	YES

Robust standard errors, clustered at the country level, in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.