Petro Rents, Political Institutions, and Hidden Wealth: Evidence from Offshore Bank Accounts*

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Abstract

Do political institutions limit rent-seeking by politicians? We study the transformation of petroleum rents, almost universally under direct government control, into hidden wealth using unique data on bank deposits in offshore financial centers known to offer secrecy and asset protection to foreign customers. We find that plausibly exogenous shocks to petroleum income are associated with increases in hidden wealth, but only when institutional checks and balances are weak. We find only very limited evidence that shocks to other types of income not directly controlled by governments affect hidden wealth.

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1 Introduction

Political elites can abuse public office, or connections to those in office, to extract rents. Countries with weak democratic governance have, almost by definition, few constraints on the behavior of the ruling elite, and in the presence of large economic rents, from natural resources or other sources, the struggle to reap political rents for private gain can be fierce and have severe economic and political consequences. While current work in political economy is based on the assumption that politicians in both autocracies and democracies are motivated by gaining and keeping access to rents accruing from control of the state,[1] little is known about how and to what extent economic rents are transformed into political rents, and whether the institutional characteristics of the political regime affect this transformation. The key methodological problem is that political rents 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, this challenge is even more obvious.

In this paper, we study the interaction between political institutions and political rents by zooming in on the petroleum industry, which is characterized by significant economic rents, a large share of state ownership and a general lack of transparency (Ross, 2012). Specifically, we investigate whether petroleum rents are converted into private wealth held in havens – offshore financial centers that offer secrecy and asset protection for foreign customers. Our main result is that changes in the oil price translate into changes in hidden wealth owned by autocracies with significant petroleum production, while there is no similar effect for petroleum-rich democracies. We interpret this as evidence that economic rents from the petroleum sector are partly captured by political elites when democratic governance is sufficiently weak.

While no scholarly work linking havens and political rents exists, numerous journalistic accounts and case studies connect political elites and oil money in autocracies to offshore banking. These accounts describe how heads of states and other members of political elites in states with weak checks and balances use bank accounts in foreign financial centers to appropriate and launder public funds often originating from natural resource rents. For

[1] E.g., Persson and Tabellini (2000), Besley and Persson (2011), Bueno de Mesquita et al. (2003) and Acemoglu, Robinson and Verdier (2004). 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.

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 havens (FATF, 2011). In one of these cases, the former autocratic ruler 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 havens Switzerland, Jersey, Liechtenstein and the Cayman Islands.[2]

Our key data 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 about foreign deposits in major havens such as Switzerland, Luxembourg, Cayman Islands, Bahamas, Jersey and Singapore 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 this information, we construct quarterly country-level values of deposits held in havens. This measure of hidden wealth can be computed for more than 200 countries and is comparable across countries because the data source is not the countries themselves but banks in well-regulated financial centers.

Figure 1 illustrates the patterns we find in the data by showing the evolution of the oil price as well as haven deposits owned by petroleum-rich countries over a period with extreme volatility in the oil price and therefore also in the rents earned in the petroleum sector: the 2007-9 oil boom and bust. The hidden wealth of petroleum-rich autocracies tracks the oil price fairly closely, while this tendency is much less pronounced in oil-rich non-autocracies.[3]

Figure 1 here

[2]While details on actual transactions are rarely fully known, recent court cases and attempts to repatriate funds suggest some insights into the workings of corruption under the Abacha regime. For example, oil minister under Abacha, Dan Etete, in 1998 allegedly awarded a Nigerian offshore oil block, with reserves to keep China running for more than two years, to a company controlled by himself and members of the Abacha family for only 2 million dollars. When Sani Abacha died later that year, however, the new government annulled the deal, only to see a decade of dispute over the ownership, ending in a high profile money laundering case against Shell and ENI (Reuters Edition UK: "UK policy probing Shell, ENI Nigerian oil block deal", July 24, 2013).

[3]For each country, we normalize haven deposits at the beginning of the period and take the simple average of this index across all countries in petroleum-rich autocracies and non-autocracies respectively. Figure 1 plots these averages along with the oil price over the time period considered.

Our analytical framework is based on the observation that changes in the world market price of oil create plausibly exogenous variation in petroleum rents. By contrast, production volumes are typically controlled by the same political elites whose political rents we are analyzing and therefore inherently endogenous. In essence, our empirical strategy aims to back out the component of petroleum income that is due to short-term price variation and relate it to hidden savings, that is, the change in wealth hidden on bank accounts in havens. In our main specifications, we effectively compare the hidden savings made by petroleum-rich countries when the oil price changes to those made by petroleum-poor countries and evaluate how this difference correlates with the political regime.

Our main finding is that petroleum windfalls have a significant effect on haven deposits for autocracies but not for non-autocracies. These results are robust to controls for common unobserved factors, such as the global business cycles, as well as country-specific determinants of foreign portfolio investment such as legal restrictions on capital movements, high inflation and the development of the domestic financial sector. They also hold when we control for a general tendency to invest windfalls in foreign portfolios: not only do petroleum rents increase the value of bank deposits in havens, but they increase them significantly more than they increase the value of bank deposits in non-havens. Finally, they extend to more detailed and objective measures of political institutions such as the existence of a legislature, legality of multiple political parties and selection of the executive. Together, these results provide support for the theoretical work in political economy that stresses the importance of political institutions serving both as constraints on political elites' behavior and as a tool for selection of better, or more honest, candidates.

Interestingly, while the association between petroleum rents and haven deposits varies systematically with political institutions, it does not vary with standard measures of corruption. Specifically, we find no relationship between the longest running corruption perceptions index, the ICRG corruption measure, and the tendency of petroleum rents to be transformed into haven deposits suggesting that we identify a novel and distinct measure of political rent diversion. One possible explanation is that corruption perception indices are less well suited for capturing high level corruption, which is hard to observe and make inferences about; indeed, secrecy provided by havens may have worked in the sense that the accumulation of rents on haven accounts has taken place without corruption experts noticing.

While the petro sector is unique in its ownership structure and level of secrecy, it is not the only sector to generate economic rents. Using the same empirical framework as we developed to study petroleum rents, we find some, but not general, evidence that economic rents from the mineral sector are transformed into political rents. As a placebo exercise we investigate whether broader commodity incomes, which are typically not under government control, also generate haven deposits – and we find no evidence of such patterns..

To establish the link between hidden wealth and political elites more firmly, we study how haven deposits evolve in periods of increased political uncertainty. We find that haven deposits owned by autocracies start increasing significantly a few quarters before elections suggesting that political elites anticipate the political risk inherent to elections and respond by hiding wealth in havens. The anticipation effect is more pronounced in autocracies with significant petroleum production suggesting that the increases in hidden wealth derive from the political elites who control the petroleum sector, rather than households and local firms. We find similar effects prior to coups d'état although the limited number of incidents does not allow us to distinguish autocracies from non-autocracies.

A key limitation of our data is the fact that substantial amounts of haven deposits are nominally owned by sham corporations in jurisdictions such as the British Virgin Islands and thus assigned to these jurisdictions in the BIS statistics. Such structures provide owners with an additional layer of secrecy that makes it even more difficult to trace their hidden wealth. We study haven deposits nominally owned by other havens separately and show that they respond to oil price changes in a way that is consistent with our previous results: when the oil price increases, deposits nominally owned by jurisdictions such as the British Virgin Islands increase more in havens used relatively often by petroleum-rich autocracies than in havens used relatively seldom by petroleum-rich autocracies.

Finally, we examine in detail alternative explanations for the observed empirical patterns. Beyond corruption and a general use of foreign portfolios as discussed above, candidates for such explanations include tax avoidance by multinationals, tax evasion by domestic firms and households, and lack of local absorptive capacity. We argue that these interpretations either do not fit the observed empirical patterns or, simply, are much less plausible.

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, this is not the case for commodity income shocks, suggesting that appropriable natural resources are, indeed, at the heart of the problem with excessive political rents. Second, the paper relates to a recent empirical literature investigating how political institutions shape the rent seeking of politicians. While the existing papers focus on diversion of state resources to provide public goods in the leader's home region (Hodler and Raschky, 2014) or in districts that share the leader's ethnicity (Burgess et al, 2015), we study how rents are diverted for the personal use of the political elites. Third, we add to a broader literature that attempts to detect and quantify political corruption using indirect methods (e.g. Fisman, 2001; Olken and Pande, 2012), partly arising out of concerns with corruption perceptions level indices (Treisman, 2007; Olken, 2009). Fourth, 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" (Bueno de Mesquita et al. 2003, 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. Section three presents the data and section four the empirical model. Section five presents the main results, section six considers alternative explanations for our findings and section seven concludes.

2 From petro rents to haven deposits

Why are petroleum rents more at risk of ending up at personal bank accounts in havens, and why do we expect political institutions to influence such a pattern? Our theoretical argument rests on three main pillars: (i) the distinctive characteristics of the petroleum industry; (ii) the constraints on executive power embedded in political institutions; and (iii) the existence of offshore financial centers characterized by high levels of secrecy. Our empirical implementation, in addition, reflects salient features of the international oil market.

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 total output, and even among extractive industries, oil tends to generate more rents due to the relative inelasticity of demand (Karl, 1997). Second, reliable information about the size and allocation of rents is often not available to the general public due to lack of information about the resource base, the costs of resource extraction, and the various contracts that regulate rent flows (Ross, 2012; Victor et al., 2012).[4] Third, petroleum production is commonly under direct or indirect government control; in 2012, ninety-five percent of global oil reserves were controlled by national oil companies, reflecting a cumulative process of nationalizations through the 20th century with a remarkable wave of nationalizations taking place in the 1970s (Mahdavi, 2014), just before our sample begins.[5] Together, a large economic 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 the political elite to extract political rents from the petroleum sector, the actual level of political rents, and high level political corruption, will be constrained by political institutions through at least two channels: First, institutions may work as effective constraints on the amount of rents the ruling elite can appropriate (Persson, Roland and Tabellini, 1997). Second, institutions (and rents) may influence which candidates are selected into politics in the first place (Besley, 2005; Acemoglu and Robinson, 2006). 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

[4] The substantial degree of secrecy in the oil sector is also evidenced by the work of NGOs and international institutions working to increase transparency; for example, The Revenue Watch Institute, an NGO recently renamed the National Resources Governance Institute, was established in the early 2000s, and a more recent effort, the Extractive Industries Transparency Initiative (EITI), which is a global coalition of stakeholders, works with governments and companies to increase information about financial flows between extractive industries and governments.

[5] For comparison, this degree of national control of oil reserves stands in sharp contrast to national control over the mining and mineral industry, where global average public ownership shares in 2008 were 24 and 11 percent with and without China, respectively (Raw Materials Group, 2011, Table 1).

lower level of political accountability, lack of political competition, non-democratic political selection of leaders, and fewer or no political checks and balances in the policy process. In such cases, a leader has almost unlimited control of the state – which, as noted by FATF (2011, p. 26), "is the same control that would allow him to disguise and move his money."

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 within autocratic regimes, and offers a number of classifications of these regimes (e.g., Przeworski et al., 2000; 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 degree, 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 differs from that of checks and balances found in democracies (Francois, Rainer and Trebbi, 2014); 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), or 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 constitute, to a varying degree, constraints on the discretionary choices of autocratic rulers. This suggests that the institutional setting matters for the extent of political rent extraction also within the set of autocracies.

Such constraints on autocratic rulers can, however, 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 (or be used for vote buying). 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, which we refer to as havens, specialize in exactly these two services. Specifically, havens typically combine bank secrecy rules that ensure almost impenetrable confidentiality with legal provisions that enable investors to protect their assets by nominally transferring the ownership to a third party while still retaining the ultimate control. A well-known example is the trust, which exists in most common law countries, whereby wealthy individuals can transfer assets to a trustee, who administers the assets in accordance with a trust deed and in the interest of the designated beneficiaries. In recent decades, many havens have developed trust laws that allow the individual who sets up a trust to also be its sole beneficiary. With this legal innovation, trusts in havens combine *secrecy*, because the only legal document linking the assets to the creator of the trust is the confidential deed, *asset protection*, since creditors with claims on the creator cannot address these claims to the trustee, and *effective control*, because the deed can contain detailed instructions on how the trustee should manage the funds without any of the restrictions that are present in classical trust law (Sterk, 2000). Legal arrangements to the same effect have emerged in havens with a civil law tradition, for instance the fiduciary in Switzerland and the foundation in Liechtenstein.

Finally, the incentive to extract political rents and hide them in 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 and coups. Indeed, the literature on electoral authoritarianism stresses that elections are inherently risky even for autocratic rulers (e.g. Cox, 2009; Gandhi and Lust-Okar, 2009) because they can play a role in mobilizing the opposition or the masses (Geddes, 2006; Magaloni and Kricheli, 2010) and because rulers may unexpectedly lose them (Przeworski et al., 2000). Similarly, events such as uprisings following elections or coups 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 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.

Together, these arguments substantiate why we focus on petroleum rents as a source for political rents, and how political institutions can influence the extent to which such petro rents are transformed into political rents, saved in havens.

To guide our empirical specifications below, we emphasize two specific features of the international oil market: First, oil prices are very volatile and essentially unpredictable in the short run (Hamilton, 2008), meaning that the best estimate of the oil price in the next quarter is the oil price in this quarter. This, in turn, implies that petroleum income following from a price change relative to the previous quarter is *unanticipated*. Second, there has been no pronounced trend in the real price of oil since the mid-1970s (Alquist et al. 2011), presumably reflecting that short-term price shocks cause adjustments of supply and demand that eventually drive the oil price back towards a long-run equilibrium (e.g. U.S. Energy Information Administration, 2013). This implies that petroleum income owing itself to short-run price fluctuations is *temporary*.[6] In the empirical analysis below, we relate such exogenous, temporary and unanticipated components of income deriving from petroleum to savings in the form of deposits held in havens. While we do not know the preferences guiding political elites' savings behavior, the canonical permanent income hypothesis predicts that recipients of temporary and unanticipated income would choose to save a large fraction of such income, everything else equal.

3 Data

3.1 Bank deposits

We obtain information on foreign bank deposits from the Locational Banking Statistics of the Bank for International Settlements ("BIS"). In all countries with a major financial center, individual banks provide information about their foreign positions to the central bank, which aggregates this information and reports to the BIS. The Locational Banking Statistics combine these bilateral reports and thus contain information about the value of bank deposits in each of currently 43 financial centers owned by residents of each of the around 200 countries of the world.[7] Presumably, this bilateral deposit measure covers the vast majority of foreign bank deposits: all significant international banking centers report to the BIS and within these countries the coverage is typically 100% and very rarely below 90% of the banking sector (BIS, 2011). Because the information derives from the balance sheets of highly regulated

[6]The risk of losing power, whether by elections, coups or revolts, is another reason why even permanent income shocks would be temporary from the perspective of ruling elites.

[7]The Locational Banking Statistics did not contain a breakdown of total liabilities on deposits and other liabilities before 1995. We therefore use total liabilities as a measure of deposits. The bulk of total foreign liabilities are indeed deposits: at the end of 2011 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 in the form of deposits.

banks, it is generally believed to be accurate and is widely used in economic research. The literature on foreign wealth, for instance, relies heavily on this data source for information about external assets and liabilities in the form of debt (Lane and Milesi-Ferretti, 2007; Zucman, 2013).

The Locational Banking Statistics include banking information from the following 17 havens: Bahamas, Bermuda, Cayman Islands, Netherlands Antilles, Panama, Bahrain, Hong Kong, Macao, Singapore, Austria, Belgium, Guernsey, Isle of Man, Jersey, Liechtenstein, Luxembourg and Switzerland. Until very recently, these havens all had strict bank secrecy laws or similar provisions that prevented them from sharing bank information with foreign governments (OECD, 2008) and they all offer legal arrangements that nominally sever the tie between the assets and the owner with the purpose of protecting the assets against claims from third parties. Most of them are known to host significant wealth management industries: they attract more than 30% of the global stock of cross-border deposits while accounting for well below 1% of the global population.[8] Finally, anecdotal evidence often link them to money laundering and hidden assets: in the large majority of the fully investigated cases of political leaders laundering the proceeds from corruption, at least one of these havens is involved (FATF, 2011).

Based on the Locational Banking Statistics, we define $haven_{it}$ as deposits held by residents of country i in the 17 havens at time t and, similarly, $nonhaven_{it}$ as deposits held by residents of country i in the non-haven countries at time t. These two variables can be computed for every country in the world for every quarter since 1977 and since the underlying information derives from the same international banking centers, observations are directly comparable across countries. These two features constitute important advantages of $haven_{it}$ over other measures of diverted rents, which are typically plagued by missing observations and limited comparability across countries and are observed at a lower frequency that makes them less suited to study sharp responses to resource windfalls and changes in the political environment.

The main limitation of the BIS data is the fact that deposits are assigned to counterpart countries on the basis of immediate ownership rather than ultimate ownership. If a resident of Nigeria owns a corporation in Panama, which in turn holds a bank account in Switzerland, the BIS statistics wrongly record the Swiss account as belonging to a resident of Panama. It

[8] Locational Banking Statistics, December 2012, Table 3B.

is well-known that corporations, trusts and other similar arrangements are frequently used by owners of hidden wealth to add an additional layer of secrecy between themselves and their assets (see for instance FATF (2011) for case-based evidence).

In our main regressions, we address this issue by excluding deposits recorded as belonging to havens because such deposits are by far the most likely to reflect sham structures. For instance, the Locational Banking Statistics assign foreign deposits of around $250 billion to a group of tiny Caribbean islands comprising well-known havens like the British Virgin Islands, Anguilla and Montserrat with a total population of less than 200.000. It is entirely unlikely that more than a small fraction of these deposits ultimately belong to residents of the islands; the vast majority must belong to residents of other countries, however, since we do not observe the residence countries of the true owners, we exclude the observations from the main analysis. We acknowledge, though, that excluding deposits nominally owned by havens does not fully solve the issue, because hidden wealth may also be funneled through countries that are not havens. Indeed, Sharman (2010) shows that providers of incorporation services in the U.S. and the U.K. enforce anti-money laundering rules more leniently than their colleagues in traditional havens. To the extent that political elites in petroleum-rich countries own foreign bank accounts through corporations and trusts in petroleum-poor countries, we could potentially find spurious effects of oil price changes on the foreign deposits of the latter countries. In a separate analysis, we address the issue of haven deposits held through sham entities more directly by studying how deposits in havens nominally owned by other havens respond to oil price changes.

Three additional features of the deposit data deserve mention. First, we are able 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, our analysis is only concerned with deposits held by non-banks. Second, while the BIS dataset provides a measure of one form of hidden wealth, bank deposits, it contains no information about other forms, most importantly securities. According to Zucman (2013), bank deposits account for roughly 25% of the total wealth managed in havens. Third, countries sometimes modify their reporting practices and new countries occasionally start reporting banking information to the BIS. The resulting noise in our deposit variables is generally quite negligible.[9]

3.2 Other variables

3.2.1 Petroleum data

We measure the economic importance of petroleum production in a given country as the average ratio of petroleum rents to GDP over the sample period where petroleum rents are defined as the market value of the estimated oil and gas production net of the estimated production costs.[10] To back out exogenous time variation in petroleum rents, we rely on changes in the oil price measured as the average quarterly spot price of West Texas Intermediate, which is a standard benchmark in oil pricing.[11]

3.2.2 Political regimes, institutions and corruption

Our preferred measure of political institutions is the Polity index, which combines ratings of the competitiveness and openness of executive recruitment, the constraints on the chief executive, and the competitiveness of political participation in a single index where the lowest score -10 indicates "strongly autocratic" and the highest score 10 indicates "strongly democratic" (Marshall, 2013). In most regressions, we capture the institutional variation with two political regime variables: $autocracy_{it}$ coded one in country-quarters with a Polity score below or equal to -5 and $nonautocracy_{it}$ coded one in country-quarters with a Polity score above -5.

We also employ an alternative institutional measure originally developed by Przeworski et al. (2000), which classifies regimes as democracies if a number of objective criteria are met, for instance that the executive is elected and that multiple political parties are allowed, and as non-democracies if not. We exploit the institutional heterogeneity within the group of non-democracies where some regimes meet none of the criteria for being a democracy and

[9] The main exceptions are the following three quarters: when Switzerland included fiduciary deposits in their reports in 1989q4; when the Cayman Islands, Bahamas, Hong Kong, Singapore, Bahrain and the Netherlands Antilles started reporting in 1983q4; and when Jersey, Guernsey and the Isle of Man started reporting in 2001q4. We exclude these three quarters throughout all the regressions.

[10] Information on petroleum rents is taken from the Adjusted Net Savings dataset of the World Bank. This 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).

[11] The oil price information is taken from the Federal Reserve Economic Data (http://research.stlouisfed.org/fred2/).

others meet all but one. We measure perceptions of corruption using the monthly measure "corruption" from the International Country Risk Guide (PRS Group 2014), a sub-index of their aggregate Political Risk Index, aggregated to quarterly frequency.

3.2.3 Minerals and commodities

We investigate whether other types of windfall gains have effects similar to petroleum rents. To that end, we collect information on rents and prices for 10 different non-fuel minerals, for instance copper, aluminium and gold.[12] For other commodities, information on rents is not available and we therefore measure the economic importance in a given country with export shares. We collect information on export shares and world prices for 35 different non-mineral commodities, for instance wool, rubber and rice.[13]

3.2.4 Elections and coups

To study how political risk translates into hidden savings, we compile a dataset on elections and coups d'état. The advantage of these two variables compared to other measures of political risk is that they correspond to events that can be precisely dated, which makes it possible to leverage the quarterly frequency of the deposit data. Specifically, we have information at the country-quarter level about direct elections of a national executive or a national legislative body including whether the election was planned and on time as well as on successful coups.[14]

3.2.5 Control variables

In most specifications, we use a number of control variables that capture the opportunities and incentives for placing savings on foreign bank accounts facing agents not belonging to the political elite: an index of *de jure* capital account openness capturing restrictions on cross-border financial transactions; liquid liabilities in the domestic banking sector as a share of GDP as a proxy for the development and sophistication of the domestic banking sector (Levine, 1997); a dummy for inflation rates above 40% as an indicator of a high-inflation

[12] Information on mineral rents is taken from the Adjusted Net Savings dataset of the World Bank.

[13] Commodity export shares are from Spatafora and Tytell (2009) whereas commodity prices from the IMF primary commodity prices dataset (1980-2014) and the IMF International Financial Statistics (1977-1979).

[14] The election data originates from National Elections Across Democracy and Autocracy dataset (Hyde and Marinov, 2012) whereas the coup data is constructed on the dated list of coups d'état in Marshall and Marshall (2013).

environment (Bruno and Easterly, 1998); and tax revenue as a share of GDP as a crude measure of the tax rate and thus the incentive to place savings on foreign bank accounts for tax evasion purposes.

– Table 1 here –

Table 1 provides summary statistics for all the variables; detailed information of the construction and sources of variables are available in an online appendix.

3.3 Haven deposits and Petroleum Rents: Descriptive statistics

Bank deposits in havens have increased rapidly, and more rapidly than GDP, over the sample period. In 1977, our measure of total deposits in havens amounted to around USD 12 billion or less than 0.2% of world GDP whereas in 2010 the corresponding figure was around USD 2,600 billion or around 4% of world GDP. As shown in the first column of Table 2, an average of less than 10% of the global stock of haven deposits belonged to autocracies over the sample period, however, as shown in the second column, autocracies owned more haven deposits than other countries when measured relative to the size of the economy. Within the group of autocracies there is a strong correlation between the value of haven deposits and the relative importance of petroleum rents: the ratio of haven deposits to GDP was around 7% in petroleum-rich autocracies but only 0.5% in petroleum-poor autocracies. In other countries, there is no such correlation: the ratio was just below 2% regardless of the relative size of petroleum rents. This striking pattern in the aggregate data is consistent with our main regression result that petroleum rents are partly transformed into haven deposits in autocracies but not in other regime types.

– Table 2 here –

Global petroleum rents have exhibited large swings over the sample period when measured relative to world GDP: they peaked at 7% in 1980, reached a bottom of 1% in 1998 and then peaked again at 5% in 2008. These swings were largely caused by movements in the real oil price: the peaks in 1980 and 2008 both coincided with record-high real oil prices of around $100 per barrel and the bottom in 1998 coincided with a record-low real oil price under $20 per barrel (real oil prices in 2014 dollars).[15] Changes in petroleum production explain much less of the variation in world petroleum rents: total oil production has increased more or less steadily over the sample period from around 60 to around 85 million barrels per day.[16] In our sample period, 102 countries reported positive petroleum rents in at least one year. In many of these countries, the average ratio of petroleum rents to GDP was negligible, but in many others it was very considerable, for instance 12% in Norway, 30% in Venezuela and 50% in Kuwait.

4 Empirical strategy

The aim of the empirical analysis is to investigate whether political institutions effectively constrain the amount of petroleum rents diverted by political elites. As described in more detail above, our strategy amounts to estimating whether temporary petroleum income created by short-term fluctuations in the oil price translate into savings on haven accounts, as should be expected if petroleum rents are partly appropriated by political elites, and whether such hidden savings responses are declining in democratic checks and balances.

An important benefit of this strategy is that the variation in petroleum income deriving from changes in the world market price of oil is plausibly exogenous to political elites in individual countries. While changes in the volume of petroleum production also creates variation in petroleum rents, the production volume is under government control and therefore endogenous to a host of factors. If, for instance, low levels of liquid assets cause rulers to increase petroleum production in order to raise revenue, it would tend to create a negative correlation between liquid assets (including haven deposits) and petroleum rents. We avoid this endogeneity by formulating our empirical specifications so that they only lever the variation in petroleum rents that derives from world market price variation.

In the simplest regressions, we first split the sample on the basis of political institutions and petroleum rents to obtain the following four subsamples: petroleum-rich autocracies, petroleum-poor autocracies, petroleum-rich non-autocracies and petroleum-poor non-

[15] Figures available at http://www.eia.gov/forecasts/steo/realprices/

[16] Figures available at http://www.eia.gov/

autocracies. For each group, we then estimate the correlation between percentage changes in the oil price and percentage changes in the stock of haven deposits:

$$\Delta \log(haven_{it}) = \alpha + \beta \Delta \log(oilprice_t) + \varepsilon_{it} \tag{1}$$

where Δ is the difference-operator. ε_{it} is an error term, and throughout we cluster standard errors at the country level. By defining a petroleum-rich country in terms of the *average* ratio of petroleum rents to GDP over the sample period, we ensure that the composition of the subsamples is not endogenous to changes in petroleum production. The basic intuition for this specification is that oil price changes create significant temporary income in petroleum-rich countries but not in petroleum-poor countries. If this income is appropriated by political elites and saved in havens, β should be positive. Under the hypothesis that political institutions are successful at curbing the transformation of petroleum rents into political rents, we should expect a positive β only in oil-rich autocracies.

While equation (1) is a natural starting point for the analysis, it has certain shortcomings. Most obviously, some potentially important correlates of both haven deposits and the oil price are omitted, including the business cycle. Moreover, while it is straightforward to augment equation (1) with country-specific covariates, we cannot include time dummies to control for unobserved factors that create global trends in offshore deposits, as this would render the oil price coefficient, β, unidentified.

To identify the effect of temporary petroleum rents on hidden savings in a framework that allows for time dummies, we exploit that oil price changes, while being common to all countries, change petroleum rents more for petroleum-rich countries than for petroleum-poor countries. We therefore introduce the *interaction* between oil price changes and petroleum richness as well as a set of time dummies into the model:

$$\Delta \log(haven_{it}) = \alpha + \beta_1 petro_i + \beta_2 petro_i \times \Delta \log(oilprice_t) + X_{it}'\gamma + \mu_t + \varepsilon_{it} \tag{2}$$

where $petro_i$ is a time-invariant measure of petroleum richness and X_{it} is controls, to be discussed below. The interaction term measures the temporary petroleum income created by exogenous oil price movements while the left-hand side measures hidden savings. Since the model effectively compares changes in hidden savings in petroleum-rich countries (treated by oil price changes) and petroleum-poor countries (not treated by oil price changes beyond what is captured by the time dummies), β_2 has the flavor of a difference-in-difference estimator.

All models can be estimated with country fixed effects, which here implies that the effect of oil prices is identified off deviations from a country-specific linear trend in haven deposits. While our baseline models do not include country-specific linear trends, our results are very robust to the inclusion of such trends (that are seldom jointly significant); fixed effect regression results are reported in the online appendix.

We estimate equation (2) for autocracies and non-autocracies separately and thus obtain estimates of how petroleum income translates into hidden savings in each of the two political regime types. Ultimately, we want to investigate whether the transformation of petroleum income into hidden savings is affected by political institutions. We therefore interact all the terms in equation (2) with regime indicators and estimate the resulting model on the full sample of countries. This allows us to ascertain whether the coefficient on temporary petroleum income differs significantly between autocracies and non-autocracies. By adding the regime dimension to equation (2), the resulting estimator gets the flavor of a difference-in-difference-in-difference estimator.

A potential concern with the interpretation of the models above is that any effect we find on savings in havens could reflect a more general effect on foreign savings. When we interpret a positive effect of petroleum rents on bank deposits in havens as evidence that the rents are partly diverted by political elites, we have implicitly assumed that petroleum rents not diverted do not wind up on bank accounts in havens. This assumption is violated if petroleum producing countries even in the absence of any motive to conceal savings allocate part of their petroleum income to haven deposits, for instance, because such deposits form part of a globally well-diversified asset portfolio. To address this concern, we estimate the models with $\Delta \log(haven) - \Delta \log(nonhaven)$ as dependent variable. In effect, we control for general effects on foreign deposits by considering the percentage change in haven deposits over and above the percentage change in non-haven deposits. This strategy correctly identifies the effect of petroleum income on diverted rents under the assumption that savings out of diverted petroleum income are allocated to havens but not to non-havens, whereas savings out of non-diverted petroleum income are allocated proportionately to havens and non-havens. If diverted petroleum income is partly allocated to non-havens, as suggested by anecdotal evidence, or if savings out of non-diverted resource income are allocated disproportionately to non-havens, this strategy will tend to bias our core estimate towards zero.

We draw on the same framework to investigate whether income deriving from non-fuel commodities are transformed into hidden savings. We study the most important minerals in separate regressions, which allows us to apply the models developed above directly while replacing $oilprice_t$ and $petro_i$ with the price of the mineral and the richness in the relevant mineral respectively. We also study broader categories of minerals and non-mineral commodities, which requires the construction of variables capturing the exogenous income component due to price variation. Following Arezki and Brückner (2012), we construct the following variable:

$$commodity_{it} = \sum_j \theta_{ij} \Delta \log(price_{jt})$$

where θ_{ij} is a time-invariant measure of the richness of country i in commodity j and $price_{jt}$ is the world market price of commodity j at time t. When we study minerals, we define θ_{ij} as the average ratio of rents deriving from mineral j to GDP over the sample period, which is completely analogous to $petro_i$ in our analysis of petroleum. When we study non-mineral commodities, information on rents is not available and we therefore define θ_{ij} as the average ratio of exports of mineral j to GDP over the sample period. In both cases, $commodity_{it}$ shares the key features of $petro_i \times \Delta \log(oilprice_t)$ in the main specifications: it measures the income component that is unexpected, temporary and exogenous because it derives exclusively from price variation on global commodity markets.

Finally, we study the effect of elections and coups on hidden savings. Focusing on elections for the sake of concreteness, our framework is as follows: we split the sample on the basis of political institutions and petroleum rents and, for each of the four subsamples, petroleum-rich autocracies, petroleum-poor autocracies, petroleum-rich non-autocracies and petroleum-poor non-autocracies, estimate the following model:

$$\Delta \log(haven_{it}) = \alpha + \beta_1 pre\_election_{it} + \beta_2 election_{it} + \beta_1 post\_election_{it} + X_{it}'\gamma + \mu_t + \varepsilon_{it} \quad (3)$$

where $election_{it}$ is a dummy variable indicating that an election has taken place in the current quarter, $pre\_election_{it}$ is a dummy indicating that an election will take place in of the three following quarters and $post\_election_{it}$ is a dummy indicating that an election has taken place in of the three preceding quarters. The coefficients β_1, β_2 and β_3 can all straightforwardly be interpreted as difference-in-difference estimators in the sense that they capture the hidden savings by a country with a recent, current, or upcoming election over and above the average hidden savings by similar countries in the same quarter (as captured by the time dummies).

We test the robustness of our main results to the inclusion of a vector of covariates, X, which contains the following variables. First, we include the percentage change in GDP, which implies that we are effectively testing whether petroleum rents are *more likely* to be transformed into haven deposits than other types of income because petroleum income is itself part of GDP. Second, we include a set of variables aiming to capture the opportunities and incentives of agents not belonging to the political elite to place savings on foreign bank accounts as described in section 3. We expect financial openness, high inflation and high tax rates to induce more savings on foreign bank accounts, whereas a more developed financial sector may both facilitate contact with foreign banks and provide an alternative to using them.

While the covariates have a reasonable good coverage overall, this is not always the case for the petroleum-rich autocracies, which are at the heart of our study. For instance, information on liabilities in the domestic banking sector and tax revenue is missing for Libya, Yemen, Oman, Qatar and the United Arab Emirates. To avoid that missing covariates affect our results through sample attrition, we follow the approach of Goldin and Rouse (2000) and recode missing covariates as zero while for each covariate introducing a dummy coded one when that particular covariate is missing. This allows us to retain all observations in the sample while controlling for the effect of covariates (when the information is available) and testing whether countries for which covariates are not available exhibit patterns in hidden savings that differ systematically from those of other countries.

A potential concern with our deposit variable is that it aggregates deposits in different currencies into a single U.S. dollar equivalent measure using current exchange rates. This implies that changes in exchange rates mechanically lead to changes in deposits: an appreciation of the U.S. dollar causes a decrease in the observed value of deposits and *vice versa.* To the extent that the currency composition of foreign deposits differs across countries, exchange rate-driven changes in deposits are not perfectly captured by time dummies and may give rise to a bias. Fortunately, the deposit data at our disposal includes a currency decomposition of deposits for the later part of the sample period. We use this information to compute average currency shares of haven deposits for each country. We then use these shares together with exchange rate information to construct a variable, $exchrate_{it}$, that expresses the percentage change in haven deposits caused by exchange rate changes alone and include this variable on the right-hand side in our models.

5 Results

5.1 Petroleum rents

We start the empirical analysis by providing a graphical illustration of the correlation between bank deposits in havens, oil prices and political institutions. We focus on countries that are petroleum-rich in the sense that the average ratio of petroleum rents to GDP exceeds 5%. For each quarter since 1990, we compute the total stock of haven deposits belonging to autocracies and non-autocracies respectively and plot the percentage change in this variable against the percentage change in the oil price. As shown in Figure 2, haven deposits belonging to petroleum-rich autocracies tended to grow more in quarters where the growth in the oil price was relatively high while no such correlation can be observed for other petroleum-rich countries.

– Figure 2 around here –

In the regression equivalent of this exercise (Eq. 1), we estimate how the percentage change in haven deposits at the country-level correlates with the percentage change in the oil price in four subsamples defined according to political regime and petroleum production. The only additional explanatory variable is the control for exchange rate changes, which is particularly important in a model without time dummies. As shown in Table 3, there is a significant positive coefficient on oil price changes in petroleum-rich autocracies, but not in petroleum-rich non-autocracies nor in petroleum-poor countries.

– Table 3 around here –

We then turn to the specification (Eq. 2) where the effect of petroleum income on haven deposits is identified by comparing countries with the same political regime but different levels of petroleum production. The results are reported in Table 4. In the most parsimonious version of the model without controls and with a dummy indicator of petroleum production, the interaction between the oil price change and the petroleum dummy is significantly positive in autocracies and zero in other countries (Panel A, columns 1-2). The coefficient of 0.22 indicates that a 10% increase in the oil price is associated with a 2.2% increase in haven deposits owned by petroleum-rich autocracies. The same pattern prevails when the set of controls is introduced (Panel A, columns 4-5) and when the dummy measure of petroleum production is replaced with the average ratio of petroleum rents to GDP (Panel A, columns 7-8). The inclusion of covariates make no discernible difference for our estimates of interest, and the covariates themselves are rarely significant with the exception of capital account openness; here, increasing openness consistently lead to larger haven savings for non-autocracies. Conversely, changes in tax levels do not manifest themselves in haven deposits.

To test whether the effect of petroleum income on haven deposits differs significantly between autocracies and other countries, we allow the petroleum-related terms in the model to vary by political regime and estimate this augmented model on the full sample (Panel A, columns 3, 6 and 9). In all three specifications, the interaction between $petro\ intensity \times \Delta \log(oilprice)$ and the indicator for autocracy is statistically significant whereas the interaction with the indicator for non-autocracy is far from significance in any of the specifications. An F-test rejects that the two coefficients are identical with a p-value of less than 5% in the first two specifications (Panel A, columns 3 and 6), but not in the third specification (Panel A, column 9).

– Table 4 around here –

To disentangle the effect on savings hidden in havens from any general effect on foreign savings, we estimate the same nine specifications using the percentage change in haven deposits over and above the percentage change in non-haven deposits as the dependent variable. The results are strikingly similar to the main results. When the sample is split on political regime, there is persistently a significant positive effect of petroleum income in autocracies (Panel B, columns 1, 4 and 7) but no such effect in other countries (Panel B, columns 2, 5 and 8). When the petroleum terms are allowed to vary by political regime within a single model, the same qualitative pattern prevails (Panel B, columns 3, 6 and 9) although the difference between the two political regimes is not quite statistically significant.

We expand the analysis along three dimensions – continuous Polity scores, alternative measures of political institutions, and corruption – to learn more about the institutional characteristics that make petroleum income more likely to be transformed into haven deposits. First, we estimate a model where the correlation between petroleum income and haven deposits is allowed to vary flexibly across the full continuum of polity scores. In principle, we would like to construct a dummy variable for each of the 21 possible polity scores (-10 to 10) and include the interaction between each of these dummies and $petro\ intensity \times \Delta\log(oilprice)$ in the model. At certain polity scores, however, there are very few observations of petroleum-rich countries and, hence, we need to consolidate a number of categories, ending up with 8 consecutive polity categories each spanning a little more than two polity scores on average. Figure 3 displays estimated coefficients and confidence intervals for the 8 three-way interactions in two regressions where the dependent variable is $\Delta\log(haven)$ (upper panel) and $\Delta\log(haven) - \Delta\log(nonhaven)$ (lower panel), respectively. In both cases, the interaction terms are statistically significant for the two most autocratic polity categories and insignificant for all other countries suggesting that the results presented above are driven by the very worst autocracies.

– Figure 3 around here –

Second, we conduct an analysis conceptually similar to that presented in Table 4 using information from Przeworski et al. (2000) on institutional dimensions such as executive selection and political parties. Each dimension is captured by a variable that can take three values: 0 and 1 indicate autocratic institutions while 2 indicates democratic institutions. For instance, the variable "de jure parties" takes the value 0 if all parties are legally banned, 1 if a single party is legal and 2 if multiple parties are legal. As a point of departure, we estimate four different variants of Eq. (2) corresponding to four different institutional dimensions: in each specification the term $petro\ intensity \times \Delta\log(oilprice)$ is interacted with each of the three outcomes of the institutional variable, which allows us to estimate how haven deposits in petroleum-rich countries responds to oil price changes in each of the three institutional categories. The results are reported in Table 5.

The results suggest that petroleum windfalls lead to a (borderline significant) surge in savings on haven accounts in countries with no legislature whereas there is no such effect in countries with a legislature regardless of whether it holds only the regime party or multiple parties (Panel A, column 1). There is a larger and more significant effect of petroleum windfalls in countries where all parties are legally banned (Panel A, column 2) and where no parties exist (Panel A, column 3) but no effect in other countries. Finally, there is a significant effect of petroleum windfalls in countries where the executive is not elected (Panel A, column 4) but not in other countries. In all cases but the first, the difference between the most autocratic category and the democratic category is statistically significant at the 5% level. The results continue to apply when we employ the continuous measure of petroleum production (appendix Table 2A) and when we purge the effect on haven deposits from any general effect on foreign deposits by using $\Delta\log(haven) - \Delta\log(nonhaven)$ as dependent variable (Panel B).

– Table 5 around here –

Third, it is possible that our results are already well-explained by known patterns of corruption. While standard measures of corruption are themselves outcomes of complex economic and political processes, and as such not causes of haven deposits, it is nevertheless of interest to examine the correspondence between perception-based corruption measures and haven deposits. Figure 4 shows the results of an analysis similar to that depicted in Figure 3, with corruption (measured such that higher values mean less corruption) taking the place of political regime indicators. Both for haven deposits on their own, and relative to non-haven deposits, the interaction terms between the corruption index and the petro intensity-oil price interaction are never significant.[17] One possible reason for this pattern is that the transformation of petroleum rents into political rents has been a success, in the sense

[17] In the online appendix Table A9, we show results of a regression analysis similar to our main specification as presented in Table 4. The results confirm the impression from Figure 4 that corruption perceptions are never significantly correlated with haven deposits.

that it has been kept off the radar of professional observers of country level corruption.[18]

– Figure 4 around here –

As a robustness tests, we have estimated all of the above models with country fixed effects, that here are equivalent to country specific trends in haven deposits. Generally, the country fixed effects are not jointly significant and other parameter estimates change very little when country fixed effects are employed. These results are available in an online appendix.

The results reported in this section demonstrate a robust correlation between petroleum rents, the value of bank accounts in havens and political institutions: when the oil price goes up, the value of haven deposits owned by petroleum-rich countries also goes up, both in absolute terms, relative to the haven deposits of petroleum-poor countries and relative to the countries' own non-haven deposits, but only when political institutions are sufficiently poor, and in ways uncorrelated with known patterns of corruption. Since petroleum rents are overwhelmingly controlled by governments, we interpret this as evidence of rent diversion by political elites: when political institutions do not create sufficient constraints on the ruling elites, either through selection or behavior once in office, part of the temporary petroleum income created by an oil price increase is appropriated, saved and hidden on bank accounts in havens.

5.2 Rents from minerals and other commodities

Are petroleum rents special, as we contend above, or do our results extend to other forms of minerals and commodities? We first investigate whether rents from non-fuel minerals correlate with deposits in havens in the same way as petroleum rents. Compared to the analysis of petroleum rents, we face two distinct challenges: information on mineral rents is missing for a large number of countries, and where information does exist the reported rents are often quite small relative to the size of the economy. Table 6 contains summary statistics on mineral rents and illustrates both of these points. For instance, information on copper rents exists for 67 countries for an average of 26 years; for other minerals the coverage is lower. The average rent across the countries where information exists is around 1% of GDP for aluminium, 0.81% of

[18] Other corruption indices exist, but the ICRG is, to our knowledge, the only measure that extends back to the 1980s and is available on a quarterly basis.

GDP for copper and 0.5% of GDP or less for other minerals. Only four countries have rents from aluminium and copper exceeding 5% of GDP, and for other minerals this is true only for two countries or less.

– Table 6 around here –

The regression results are presented in Table 7. In a first step, we apply the exact same framework that we used to study petroleum rents to the two types of minerals, aluminium and copper, for which more than 2 countries earn rents in excess of 5% of GDP in an average year. The evidence is mixed. On the one hand, the interaction between copper production and the change in copper prices is significant in the sample of autocracies (Panel A, column 1) and insignificant in the sample of non-autocracies (Panel A, column 2) suggesting that copper income in autocracies is diverted and transferred to haven accounts just like petroleum income. An F-test based on estimation on the full sample (Panel A, column 3) cannot, however, reject that the effect of copper income is the same in the two regimes. Aluminum income does not appear to affect haven deposits neither in autocracies (Panel A, column 4) nor in other countries (Panel A, column 5).

– Table 7 around here –

To address the issue raised above that rents from most individual minerals are relatively small, we estimate a model that exploits the variation in rents from all non-fuel minerals at the same time. As described in section 3, the main variable of interest weighs together price changes for individual minerals using country-specific ratios of mineral rents to GDP as weights and thus expresses the total price-induced variation in mineral rents.[19] The results indicate that the compound of all mineral rents has no significant effect on haven deposits neither in autocracies (Panel A, column 7) nor in other countries.(Panel A, column 8). Generally, the same patterns emerge when we use $\Delta \log(haven) - \Delta \log(nonhaven)$ as dependent variable and thereby control for any general effect on foreign savings (Panel B, columns 1-9).

Overall, these results represent mixed evidence on the ability of political elites to divert rents from non-fuel minerals: while we find that copper rents have a significant effect on

[19] Under this approach, we need to assume that rents are zero when no information is available; without this assumption our sample would only consist of the few countries for which information is non-missing for all mineral rents.

the value of haven deposits, this does not appear to be the case for aluminium rents, just like there are no detectable effects of total minerals rents. The most likely explanation for these patterns is that minerals differ in the degree to which governments can control the rents they generate for geological, political or other reasons; as noted above, government control of mining and mineral extraction is between 24 and 11 % (with and without China), which, while not negligible, is much less pronounced than is the case for petroleum.

Finally, we conduct a similar analysis for non-mineral commodities. It is *a priori* much more unlikely that rents deriving from commodities such as rice, plywood, wool and rubber can be diverted by political elites for the simple reason that governments rarely have direct control over these commodities in the way that they do over petroleum. In a sense, this exercise can therefore be considered as a placebo test of the main mechanism studied in the paper. If increases in world commodity prices create rents that do not accrue directly to the government, we should not expect to see increases in haven deposits through rent diversion by political elites, but perhaps through alternative channels such as tax evasion.

As described in section 3, we rely on ratios of exports to GDP rather than rents to GDP to construct a variable that captures the price-induced variation in commodity rents because information on rents from non-mineral commodities are generally unavailable. The results indicate that rents from non-mineral commodities have no significant effect on haven deposits neither in autocracies (Panel A, column 10) nor in other countries (Panel A, column 11). This is also true when $\Delta \log(haven) - \Delta \log(nonhaven)$ is used as dependent variable (Panel B, columns 10-11).

Together, these results suggest that not all types of income shocks generate savings held in havens – indeed, only shocks to petroleum rents, and to some extent rents from copper production (often linked to corruption in case studies, e.g., OECD, 2012), are transformed into savings held in havens, consistent with the fact the more than 90 % of oil production is controlled by national governments.[20]

[20] Copper is the mineral, after iron ore, with the second highest state ownership share (Raw Materials Group, 2011).

5.3 Political risk

Next, we estimate Eq. (3) to study how elections and coups, both events that involve a measure of risk for the incumbent political elite, affect savings in havens. For elections, we estimate the model for each of the four subsamples defined according to political regime and petroleum production, thus effectively identifying the effect of elections by comparing a country holding an election to a country within the same group not holding an election in the same quarter. The results are reported in Table 8. In petroleum-rich autocracies, there is a statistically significant increase in haven deposits during the three quarters prior to the election while there are no significant changes in the election quarter itself and the three following quarters (Panel A, column 1). The point estimate on the pre-election dummy suggests that haven deposits on average increase by around 2% relative to the general time trend in each of the three quarters preceding the election quarter. In other petroleum-rich countries (Panel A, column 1) and in petroleum-poor countries (Panel A, column 4 and 5), there are no significant deviations from the general time trend before, during or after the election quarter. To test whether the change in haven deposits in pre-election quarters differs significantly between political regimes, we estimate Eq. (3) on the full sample of petroleum-rich countries (Panel A, column 3) and the full sample of petroleum-poor countries (Panel A, column 6) while interacting the pre-election dummy with regime indicators. In the sample of petroleum-rich countries, An F-test cannot reject that the pre-election effect is identical in autocracies and other countries, but comes close with a p-value of 14 %.

– Table 8 around here –

A potential concern with these results is that elections could be endogenous to diversion of political rents. For instance, if periods of excessive rent extraction causes political unrest that ultimately leads to elections, it could produce the exact same patterns in the data as politicians and elites anticipating (and fearing) elections. We address this concern by limiting the analysis to elections that follow a regular electoral cycle. We find that in petroleum-rich autocracies, haven deposits increase by around 4% in each of the three quarters preceding an on-schedule election whereas there is no effect during the election quarter itself or the three following quarters (Panel B, column 1). There are no significant deviations from the general time trend before, during or after quarters where on-schedule elections take place in other petroleum-rich countries (Panel B, column 2). An F-test rejects that the pre-election effects are identical in petroleum-rich autocracies and other petroleum-rich countries with a p-value of 7 % (Panel B, column 3). In petroleum-poor countries, there is also some evidence of pre-election effects, the magnitude of which, however, does not differ significantly between political regimes (Panel B, column 3 and 4).

We conduct a very similar analysis of successful coups d'état, though constrained by the fact that there is an insufficient number of coups in petroleum-rich countries to condition the effect on political regime. Specifically, as shown in Table 9, our sample contains 15 coups in petroleum-rich countries. However, we are unable to use the four coups that took place in Bolivia in 1978-1980 in our regression framework because the short period between the coups makes it impossible to identify their leaded and lagged effects, effectively leaving us with just 11 coups in petroleum-rich countries, of which only 2 occurred in countries that were not autocratic immediately prior to the coup.

– Table 9 around here –

We therefore estimate how haven deposits change around coups for petroleum-rich and petroleum-poor countries separately without conditioning on political regime. The results are reported in Table 10. In petroleum-rich countries, haven deposits on average increase by around 8% relative to the general time trend during each of the three quarters preceding the coup whereas there is no significant deviation from the general trend during the quarter in which a coup takes place and during subsequent quarters (Panel A, column 1). In petroleum-poor countries, there is a significant negative effect on haven deposits during the quarter in which a coup takes place (Panel A, column 2). When purging the effect on haven deposits from any general effect on foreign deposits by using $\Delta \log(haven) - \Delta \log(nonhaven)$ as dependent variable, we find similar results for petroleum-rich countries but with an even larger increase in haven deposits in pre-coup quarters (Panel B, column 1).

– Table 10 around here –

Above, we discussed how 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 the political instability associated with elections and coups and respond to it by transferring funds to safe havens. The finding that rulers appear to successfully predict coups 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, it is not surprising that they detect and act upon adverse signals about the probability of regime survival.

5.4 Indirectly held deposits

Finally, we investigate whether haven deposits owned indirectly through sham structures in the British Virgin Islands or other similar jurisdictions are responsive to changes in petroleum income in the same way as directly owned haven deposits. The obvious challenge is that we do not observe the home country of the ultimate owners for indirectly held deposits.

In a first simple step, we estimate Eq. (1) using only observations for haven deposits assigned to other havens in the BIS statistics. These are the observations that were excluded in section 5.1. The results are presented in Table 11 and show a significant correlation between oil price changes and changes in these haven deposits (Column 1). While this is suggestive of petroleum rents being funneled to bank accounts in havens through sham structures involving other havens, identification is weak because we cannot distinguish deposits ultimately owned by petroleum-rich and petroleum-poor countries.

– Table 11 around here –

To overcome this obstacle, we rely on patterns of directly held deposits, assigned to non-havens in the BIS statistics, to make inferences about who ultimately owns the indirectly held deposits, assigned to havens in the BIS statistics. Specifically, for each BIS-reporting haven we compute the share of directly held deposits belonging to each country and make the assumption that these geographical patterns carry over to indirectly held deposits: for instance, if residents of Saudi Arabia hold X times more money on directly owned Swiss accounts than on directly owned Cayman accounts, we assume that they also hold X times more money on indirectly owned Swiss account than on indirectly owned Cayman accounts. Under this assumption, the share of indirectly held deposits in a given haven that is ultimately owned by petroleum-rich autocracies is simply the share of directly held deposits in that haven owned by the same petroleum-rich autocracies. Importantly, there is substantial variation in these ownership shares across BIS-reporting havens: the share of Swiss deposits owned by petroleum-rich autocracies, for instance, is more than 10 times larger than the share of total Cayman deposits owned by these regimes.[21]

Exploiting this variation, we can test whether haven deposits indirectly held by petroleum-rich countries change in response to changes in the oil price, as one should expect if petroleum rents are diverted and hidden by political elites. We can also test if this correlation is stronger for petroleum-rich autocracies than for other petroleum-rich countries, as one should expect if political institutions successfully limit the amount of diversion.[22]

We thus estimate variants of Eq. (2) where the deposit variable on the left-hand side is at the haven-haven level, for instance the percentage change in deposits in Swiss banks nominally owned by the British Virgin Islands in a given quarter, and the oil price variable on the right-hand side is interacted with the estimated share of these deposits owned by a country group, for instance the share of deposits in Swiss banks ultimately owned by petroleum-rich autocracies. The simplest specification with a single interaction shows that in havens where a larger share of deposits is owned by petroleum-rich autocracies, indirectly held deposits exhibit a significantly stronger correlation with oil price changes (Column 2). The coefficient on the interaction term suggests that a 10% increase in the oil price is associated with a 7.5% increase in indirectly held deposits owned by petroleum-rich autocracies, which compares to the 2.2% increase in directly held deposits estimated in section 5.1.

The finding that deposits owned indirectly by petroleum-rich autocracies are more sensitive to oil price changes than those owned directly lends itself to different interpretations. One distinct possibility is that the political elites who divert petroleum rents are more likely to employ sophisticated holding structures than other individuals in the same countries who own bank accounts in havens. This could be because members of the political elites are more concerned about expropriation, for instance in the context of a regime change, and therefore willing to invest more in concealment, or because indirect ownership is necessary to circum-

[21] We cannot disclose the actual shares for confidentiality reasons.

[22] We are able to include information only from the following eight BIS-reporting havens: Cayman Islands, Austria, Belgium, Guernsey, Isle of Man, Jersey, Luxembourg and Switzerland (including Liechtenstein) in this analysis. This is because the data at our disposal lump together deposits in the remaining BIS-reporting havens in the category "offshore financial centers."

vent the somewhat stricter anti-money laundering rules that apply to individuals involved in politics (FATF, 2011). In any case, if the political elites who benefit from petroleum rents own a larger share of indirectly held deposits than of directly held deposits, it would explain why the former appear to be more oil price sensitive than the latter.

Finally, in a more comprehensive specification that also includes interaction terms between the oil price variable and the deposit shares of petroleum-poor autocracies and petroleum-rich non-autocracies respectively, we again find a significant effect of political institutions on the likelihood that petroleum rents increase hidden savings (Column 3). Specifically, An F-test rejects that the interaction terms relating to petroleum-rich autocracies and other petroleum-rich countries are identical with a p-value of less than 1 %.

6 Discussion

The main patterns emerging from the data are the following: When oil-rich autocracies experience a plausibly exogenous increase in rents from oil and gas production, owing to short run changes in the price of oil, haven deposits increase, both in absolute terms and relative to deposits in non-havens. No similar effects are observed in non-autocracies, or in oil-poor autocracies.

Our interpretation of the patterns is that the changes in haven deposits observed around oil rent shocks and political shocks in autocracies reflect hidden political rents: Unanticipated and temporary increases in petro rents are partly captured by political elites and transferred to private bank accounts in havens, either directly or through sham corporations based in other havens; and in the face of political instability, before scheduled elections and successful coups d'état, 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, or people they are politically connected to, are ousted from power, with the perceived risk of expropriation being likely to increase in election years and periods of domestic conflict thus strengthening the incentive to hide funds in havens.[23] Finally, this interpretation is consistent with the lack of correlation between exogenous increases in petro rents, political events and haven deposits in non-autocratic 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 petro 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 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 havens belong to multinational firms rather than domestic elites. This interpretation can, however, 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, petro rents 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 increases in oil and gas rents reflect that other domestic groups than political elites transfer funds to 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

[23] 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); The Basel Institute of Governance (2007) details the formidable legal challenges in repatriating Nigerian funds saved in havens during the Abacha regime.

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. At the same time, controlling for changes in income tax levels, which themselves are insignificant, makes no difference to results; and income shocks from non-government controlled sources, including commodities, do not seem to matter for haven deposits.

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, including from most minerals and commodities. Moreover, it is inconsistent with the finding that higher oil and gas rents in autocracies lead to more deposits in havens over and above deposits in non-havens. If windfall petro rents would be invested abroad due to lack of domestic investment opportunities, it is not clear why investments would primarily take place in havens.

7 Conclusion

We employ new data on bank deposits in havens to examine the transformation of petro rents into hidden wealth. We find that plausibly exogenous changes in petro rents, following changes in the world price of oil, affects hidden savings in the form of countries' bank deposits in havens – jurisdictions typically associated with banking secrecy – but also that this is true only for autocracies, defined in various ways. This finding is consistent with a theoretical argument that rulers and political elites in countries with weak political constraints and lack of competitive elections transform petroleum rents into political rents, an argument that so far has had little empirical support in cross-national data. One reason for this could be that existing corruption indices do not explain the variation in propensities to transform economic rents in political ones, possibly because political elites have been successful in their main goal with depositing savings in havens: to hide their wealth.

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Table 1: Descriptive Statistics

	All observations				Autocracies				Non-autocracies			
Variable name	Mean	SD	Obs	N of countries	Mean	SD	Obs	N of countries	Mean	SD	Obs	N of countries
Deposit variables, all countries												
dloghaven	0.040	0.406	22677	216	0.045	0.452	5906	104	0.036	0.361	12208	144
dlognonhaven	0.030	0.300	23894	216	0.032	0.297	6443	106	0.026	0.253	12552	144
dlog(haven / nonhaven)	0.011	0.518	22467	216	0.016	0.544	5860	104	0.010	0.468	12168	144
Deposit variables, non-haven sample												
dloghaven	0.038	0.410	17810	170	0.045	0.456	5595	100	0.036	0.357	10785	131
dlognonhaven	0.028	0.302	18825	170	0.033	0.303	6130	102	0.025	0.260	11090	131
dlog(haven / nonhaven)	0.011	0.518	17651	170	0.015	0.551	5549	100	0.010	0.465	10745	131
Price variables (here and thereafter, non-haven sample)												
dlog_oil_price	0.012	0.144	22401	171	0.009	0.139	6469	103	0.015	0.147	11447	131
dlog_mineral_price_index	0.006	0.077	22401	171	0.006	0.077	6469	103	0.008	0.088	11447	131
dlog_copper_price	0.014	0.125	22401	171	0.012	0.114	6469	103	0.015	0.132	11447	131
dlog_aluminum_price	0.004	0.101	22401	171	0.004	0.102	6469	103	0.004	0.100	11447	131
dlog_non-fuel_non-mineral_commodity_price_index	0.004	0.072	18502	142	0.003	0.073	5313	88	0.005	0.070	10976	122
Regime variables												
Polity	0.927	7.263	18042	153	-7.415	1.359	6554	103	5.686	4.410	11488	131
Party composition of legislature	1.506	0.762	17491	151	0.884	0.771	6096	97	1.877	0.459	10455	126
De-jure legal parties	1.685	0.647	17491	151	1.207	0.826	6096	97	1.956	0.281	10455	126
Defacto existing parties	1.680	0.629	17491	151	1.188	0.784	6096	97	1.971	0.222	10455	126
Mode of executive selection	1.140	0.784	17491	151	0.770	0.896	6096	97	1.374	0.618	10455	126
Resource intensities												
Petro rents to GDP	0.083	0.176	20064	152	0.151	0.233	6047	95	0.045	0.097	11253	125
Mineral rents to GDP	0.010	0.026	13860	105	0.009	0.020	4035	66	0.011	0.028	8988	93
Copper rents to GDP	0.007	0.021	8052	61	0.008	0.019	1931	35	0.007	0.022	5836	57
Aluminum rents to GDP	0.009	0.023	4224	32	0.014	0.028	900	16	0.007	0.021	3211	31
Non-fuel_non-mineral commodity exports to GDP	0.030	0.035	19219	146	0.028	0.032	5692	92	0.030	0.032	11139	125
Political risk variables, dummy												
All elections	0.069	0.253	19471	150	0.050	0.219	6407	99	0.087	0.282	11204	127
On-time elections	0.040	0.197	20052	155	0.030	0.170	6550	102	0.052	0.223	11448	129
Successful coups	0.004	0.066	18299	153	0.007	0.084	6552	103	0.003	0.052	11483	131
Covariates												
exchange rate effect	0.000	0.026	17654	166	0.000	0.025	5446	98	0.000	0.025	10762	129
dloggdp	0.064	0.154	17977	159	0.062	0.166	5351	94	0.066	0.148	11102	127
dhighinflation	-0.010	0.234	21888	171	-0.012	0.282	6219	101	-0.009	0.218	11318	131
dkaopen	0.027	0.376	16099	147	-0.005	0.319	5086	88	0.043	0.388	10436	122
dllgdp	0.861	4.639	13481	144	0.799	5.124	3418	73	0.869	4.394	9635	121
dtaxgdp	0.028	1.674	5618	121	0.033	1.706	927	36	0.028	1.670	4600	104

Table 2. Haven deposits: Descriptive statistics

	Share of world haven deposits	Haven deposits as share of GDP
Autocracies	**9.2%**	**2.7%**
- petroleum rich	8.0%	7.0%
- not petroleum rich	1.2%	0.5%
Other countries	**90.8%**	**1.9%**
- petroleum rich	2.5%	1.8%
- not petroleum rich	88.3%	1.9%

Table 3: Simple correlations between the oil price and offshore deposits

	(1)	(2)	(3)	(4)
	Autocracies		Non-autocracies	
	Petroleum rich	Petroleum poor	Petroleum rich	Petroleum poor
Dependent variable is dlog(offdep)				
dlogoilprice	0.08**	-0.13*	0.01	0.01
	(0.03)	(0.07)	(0.05)	(0.02)
Constant	0.02***	0.03***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
Observations	2,226	2,713	2,137	8,151
R-squared	0.01	0.00	0.00	0.01
Exchange rate control	YES	YES	YES	YES
Time dummies	NO	NO	NO	NO
Covariates	NO	NO	NO	NO

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4: Core oil results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Petro intensity: dummy for rents > 5% of GDP			Petro intensity: dummy for rents > 5% of GDP			Petro intensity: rents / GDP		
	Autocracies	Non-autocracies	All	Autocracies	Non-autocracies	All	Autocracies	Non-autocracies	All
PANEL A:									
Dependent variable is dlog(offdep)									
petro intensity	-0.01	-0.00		-0.00	-0.00		-0.00	-0.02	
	(0.01)	(0.00)		(0.01)	(0.00)		(0.01)	(0.01)	
petro intensity × dlog(oilprice)	0.22**	0.01		0.22**	0.01		0.37**	0.15	
	(0.09)	(0.05)		(0.09)	(0.05)		(0.18)	(0.18)	
petro intensity × autocracy × dlog(oilprice)			0.20**			0.20**			0.32*
			(0.08)			(0.08)			(0.16)
petro intensity × nonautocracy × dlog(oilprice)			0.01			0.01			0.16
			(0.05)			(0.05)			(0.18)
nonautocracy × dlog(oilprice)			0.14*			0.14*			0.10
			(0.08)			(0.08)			(0.07)
nonautocracy			-0.00			-0.00			0.00
			(0.01)			(0.01)			(0.01)
petro intensity × autocracy			-0.00			-0.00			-0.00
			(0.01)			(0.01)			(0.01)
petro intensity × nonautocracy			-0.00			-0.00			-0.02
			(0.00)			(0.00)			(0.01)
d4loggdp_allobs				0.01	0.00	0.00	0.01	0.00	0.00
				(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.02)
dllgdp_allobs				0.00	-0.00	0.00	0.00	-0.00	0.00
				(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
dkaopen_allobs				-0.02	0.01	0.00	-0.02	0.01	0.00
				(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
dhighinflation_allobs				-0.01	0.02	0.01	-0.01	0.02	0.01
				(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
d4taxgdp_allobs				-0.00	0.00	0.00	-0.00	0.00	0.00
				(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	4,939	10,288	15,227	4,939	10,288	15,227	4,939	10,288	15,227
R-squared	0.04	0.03	0.02	0.04	0.03	0.02	0.04	0.03	0.02
F-test: petro intensity × autocracy × dlogoilprice= petro intensity × nonautocracy × dlogoilprice			0.0378			0.0407			0.487

Table 4: Core oil results (continued)

	Petro intensity: dummy for rents > 5% of GDP			Petro intensity: dummy for rents > 5% of GDP			Petro intensity: rents / GDP		
	Autocracies	Non-autocracies	All	Autocracies	Non-autocracies	All	Autocracies	Non-autocracies	All
PANEL B:									
Dependent variable is dlog(offdep/ondep)									
petro intensity	-0.01	-0.00		-0.00	-0.00		-0.01	-0.02	
	(0.01)	(0.00)		(0.01)	(0.01)		(0.02)	(0.01)	
petro intensity × dlog(oilprice)	0.23**	0.03		0.24**	0.03		0.39**	0.11	
	(0.10)	(0.07)		(0.10)	(0.07)		(0.19)	(0.23)	
petro intensity × autocracy × dlog(oilprice)			0.20**			0.21**			0.31*
			(0.09)			(0.09)			(0.17)
petro intensity × nonautocracy × dlog(oilprice)			0.03			0.03			0.12
			(0.07)			(0.07)			(0.23)
nonautocracy × dlog(oilprice)			0.21**			0.21**			0.17**
			(0.09)			(0.09)			(0.08)
nonautocracy			-0.00			-0.00			-0.00
			(0.01)			(0.01)			(0.01)
petro intensity × autocracy			-0.01			-0.00			-0.01
			(0.01)			(0.01)			(0.02)
petro intensity × nonautocracy			-0.00			-0.00			-0.02
			(0.00)			(0.00)			(0.01)
Observations	4,895	10,249	15,144	4,895	10,249	15,144	4,895	10,249	15,144
R-squared	0.04	0.02	0.01	0.04	0.02	0.02	0.04	0.02	0.02
F-test: petro intensity × autocracy × dlogoilprice= petro intensity × nonautocracy × dlogoilprice			0.127			0.120			0.511
Exchange rate control	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Covariates	NO	NO	NO	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table 5: Alternative measures of political institutions

	(1)	(2)	(3)	(4)
	Petro intensity: dummy			
	LEGPARTY	DEJURE	DEFACTO	EXSELEC
Panel A:				
Dependent variable dlog(offdep)				
Petro intensity × Institution = 0 × dlog(oilprice)	0.23*	0.39**	0.52***	0.22**
	(0.13)	(0.15)	(0.20)	(0.10)
Petro intensity × Institution = 1 × dlog(oilprice)	0.08	0.13	0.17	0.17
	(0.14)	(0.24)	(0.15)	(0.10)
Petro intensity × Institution = 2 × dlog(oilprice)	0.07	0.05	0.04	-0.01
	(0.05)	(0.04)	(0.04)	(0.05)
Institution = 1	0.00	0.03***	0.02	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Institution = 2	0.01	0.02***	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Petro intensity × Institution = 0	-0.01	0.01	-0.00	-0.02**
	(0.01)	(0.01)	(0.01)	(0.01)
Petro intensity × Institution = 1	-0.01	-0.02**	-0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Petro intensity × Institution = 2	-0.00	-0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.01)
Institution = 1 × dlog(oilprice)	-0.06	-0.03	0.18	0.08
	(0.16)	(0.22)	(0.22)	(0.11)
Institution = 2 × dlog(oilprice)	0.09	0.24	0.33	0.12
	(0.13)	(0.15)	(0.20)	(0.11)
Observations	14,259	14,259	14,259	14,259
R-squared	0.02	0.02	0.02	0.02
Ftest: Petro intensity x Institution = 0 x dlog(oilprice) = Petro intensity x Institution = 2 x dlog(oilprice)	0.217	0.0266	0.0169	0.0484
Panel B:				
Dependent variable dlog(offdep/ondep)				
Petro intensity × Institution = 0 × dlog(oilprice)	0.28*	0.41**	0.58**	0.23*
	(0.15)	(0.17)	(0.25)	(0.12)
Petro intensity × Institution = 1 × dlog(oilprice)	0.04	0.14	0.16	0.22
	(0.15)	(0.25)	(0.16)	(0.17)
Petro intensity × Institution = 2 × dlog(oilprice)	0.07	0.05	0.05	-0.03
	(0.08)	(0.07)	(0.07)	(0.07)
Institution = 1	-0.01	0.02	0.00	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Institution = 2	-0.00	0.01	-0.01	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Petro intensity × Institution = 0	-0.01	0.01	-0.01	-0.02*
	(0.01)	(0.01)	(0.01)	(0.01)
Petro intensity × Institution = 1	-0.01	-0.01	-0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Petro intensity × Institution = 2	-0.00	-0.00	-0.00	-0.01
	(0.01)	(0.00)	(0.00)	(0.00)
Institution = 1 × dlog(oilprice)	0.03	-0.03	0.23	0.13
	(0.16)	(0.23)	(0.26)	(0.12)
Institution = 2 × dlog(oilprice)	0.16	0.33**	0.46*	0.20
	(0.15)	(0.16)	(0.24)	(0.13)
Observations	14,176	14,176	14,176	14,176
R-squared	0.02	0.02	0.02	0.02
Ftest: Petro intensity x Institution = 0 x dlog(oilprice) = Petro intensity x Institution = 2 x dlog(oilprice)	0.207	0.0430	0.0361	0.0767
Exchange rate control	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
Covariates	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: Institutional variables categories 0, 1, 2 are defined as follows: legislative parties (0 = No legislature or non-partisan legislature; 1 = Legislature with regime party; 2 = Legislature with multiple parties); de jure parties (0 = All parties legally banned; 1 = Single party legal; 2 = Multiple parties legal); de facto parties (0 = No parties exist; 1 = Single party exists; 2 = Multiple parties exist); Executive selection (0 = No elections; 1 = Indirect election; 2 = Direct election).

Table 6. Mineral rents: Descriptive statistics

Mineral type	Number of countries with information	Average number of (annual) observations per country	Average mineral rent, percent of GDP	Number of countries with mean of mineral rent > 5% of GDP
Aluminium (Bauxite)	35	27	1.08	4
Copper	67	26	0.81	4
Iron	65	27	0.47	2
Nickel	56	24	0.32	1
Gold	62	30	0.3	1
Phosphate	34	30	0.1	0
Zinc	56	28	0.04	0
Lead	55	27	0.03	0
Tin	37	27	0.04	0
Silver	55	29	0.01	0

Table 7: Non-fuel minerals and commodities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Copper			Aluminum			All Minerals			Non-fuel, non-mineral commodities		
	Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for exports > 5% of GDP		
	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes
PANEL A:												
Dependent variable is dlog(offdep)												
dlog(commodity price)							-0.01	-0.06		0.19	-0.10	
							(0.09)	(0.05)		(0.12)	(0.07)	
commodity intensity	-0.00	0.00		-0.04	0.01		-0.01	0.01		-0.02***	0.01	
	(0.01)	(0.01)		(0.03)	(0.01)		(0.01)	(0.01)		(0.01)	(0.00)	
commodity intensity × dlog(commodity price)	0.51**	0.12		-0.28	-0.05		0.05	-0.03		-0.25	0.04	
	(0.21)	(0.21)		(0.56)	(0.11)		(0.22)	(0.19)		(0.18)	(0.13)	
comm. intensity × autocracy × dlog(comm. price)			0.50**			-0.17			0.06			-0.18
			(0.23)			(0.47)			(0.22)			(0.17)
comm. intensity × nonautocracy × dlog(comm. price)			0.12			-0.03			-0.03			0.02
			(0.21)			(0.12)			(0.18)			(0.13)
nonautocracy			0.00			-0.02*			0.00			-0.00
			(0.01)			(0.01)			(0.00)			(0.00)
dlog(commodity price) × autocracy									0.00			0.15
									(0.07)			(0.10)
dlog(commodity price) × nonautocracy			0.01			-0.20			-0.07			-0.08
			(0.08)			(0.18)			(0.05)			(0.07)
comm. intensity × autocracy			-0.01			-0.03			-0.01			-0.02**
			(0.01)			(0.03)			(0.01)			(0.01)
comm. intensity × nonautocracy			0.01			0.00			0.01**			0.01
			(0.01)			(0.01)			(0.01)			(0.00)
Observations	1,693	5,478	7,171	749	3,013	3,762	4,939	10,288	15,227	4,492	10,143	14,635
R-squared	0.07	0.04	0.03	0.14	0.07	0.06	0.04	0.03	0.02	0.04	0.03	0.02
Ftest: comm. intensity × autocracy × dlog(comm. price)= comm. intensity × nonautocracy × dlog(comm. price)			0.232			0.797			0.745			0.342

Table 7: Non-fuel minerals and commodities (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Copper			Aluminum			All Minerals			Non-fuel, non-mineral commodities		
	Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for exports > 5% of GDP		
	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes
PANEL B:												
Dependent variable is dlog(offdep/ondep)												
dlog(commodity price)							-0.01	-0.07		0.24	-0.11	
							(0.10)	(0.06)		(0.15)	(0.09)	
commodity intensity	-0.00	-0.01		-0.06	0.02		-0.01	0.00		-0.02**	0.01*	
	(0.02)	(0.01)		(0.04)	(0.01)		(0.02)	(0.01)		(0.01)	(0.01)	
commodity intensity × dlog(commodity price)	0.54**	0.07		-0.54	-0.14*		0.03	-0.07		-0.43*	0.11	
	(0.21)	(0.36)		(0.56)	(0.07)		(0.21)	(0.25)		(0.23)	(0.18)	
comm. intensity × autocracy × dlog(comm. price)			0.54***			-0.36			0.02			-0.33
			(0.17)			(0.49)			(0.21)			(0.22)
comm. intensity × nonautocracy × dlog(comm. price)			0.07			-0.11			-0.06			0.07
			(0.36)			(0.08)			(0.24)			(0.18)
nonautocracy			0.00			-0.02*			-0.00			-0.01*
			(0.01)			(0.01)			(0.00)			(0.00)
dlog(commodity price) × autocracy									0.04			0.20
									(0.08)			(0.12)
dlog(commodity price) × nonautocracy			0.04			-0.37			-0.09			-0.09
			(0.10)			(0.22)			(0.06)			(0.09)
comm. intensity × autocracy			-0.01			-0.05**			-0.02			-0.02**
			(0.02)			(0.02)			(0.01)			(0.01)
comm. intensity × nonautocracy			-0.01			0.02*			0.01			0.01**
			(0.01)			(0.01)			(0.01)			(0.01)
Observations	1,682	5,473	7,155	738	3,013	3,751	4,895	10,249	15,144	4,448	10,104	14,552
R-squared	0.07	0.03	0.03	0.15	0.06	0.05	0.04	0.02	0.01	0.04	0.02	0.02
Ftest: comm. intensity × autocracy × dlog(comm. price)= comm. intensity × nonautocracy × dlog(comm. price)			0.248			0.573			0.788			0.161
Exchange rate control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Covariates	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8: Elections

Dependent variable is dlog(offdep)	(1)	(2)	(3)	(4)	(5)	(6)
	Petroleum rich			**Petroleum poor**		
	Autocracies	Non-autocracies	All	Autocracies	Non-autocracies	All
PANEL A: All elections						
pre-election	0.02**	0.01		0.01	0.01*	
	(0.01)	(0.01)		(0.02)	(0.01)	
pre-election × nonautocracy			0.00			0.01*
			(0.01)			(0.01)
pre-election × autocracy			0.03**			0.02
			(0.01)			(0.02)
election	0.03	-0.00	0.01	-0.04	-0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.04)	(0.01)	(0.01)
post-election	0.00	0.01	0.00	-0.02	-0.01	-0.01
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)
autocracy			-0.00			-0.00
			(0.01)			(0.01)
Observations	2,226	2,137	4,363	2,660	7,964	10,624
R-squared	0.08	0.08	0.04	0.07	0.03	0.03
Ftest: pre-election x nonautocracy= pre-election x autocracy			0.142			0.704
PANEL B: On-time elections						
pre-election	0.04**	-0.00		0.04	0.02**	
	(0.01)	(0.02)		(0.02)	(0.01)	
pre-election × nonautocracy			-0.00			0.02**
			(0.02)			(0.01)
pre-election × autocracy			0.04**			0.05*
			(0.02)			(0.03)
election	0.02	0.00	0.01	-0.08	-0.00	-0.01
	(0.03)	(0.03)	(0.02)	(0.06)	(0.01)	(0.01)
post-election	-0.01	-0.01	-0.01	-0.03	-0.01	-0.01
	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
autocracy			-0.00			-0.00
			(0.01)			(0.01)
Observations	2,226	2,137	4,363	2,660	7,964	10,624
R-squared	0.08	0.08	0.04	0.07	0.03	0.03
Ftest: pre-election x nonautocracy= pre-election x autocracy			0.0708			0.275
Exchange rate control	YES	YES	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES	YES	YES
Covariates	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9: Successful coup d'etats in petroleum-rich countries

Country	Year	Quarter	Regime
Bolivia	1978	3	Autocracy
Bolivia	1978	4	Non-autocracy
Bolivia	1979	4	Non-autocracy
Bolivia	1980	3	Autocracy
Congo, Rep.	1997	4	Autocracy
Equatorial Guinea	1979	3	Autocracy
Nigeria	1983	4	Non-autocracy
Nigeria	1985	3	Autocracy
Nigeria	1993	4	Autocracy
Qatar	1995	2	Autocracy
Sudan	1985	2	Non-autocracy
Sudan	1989	2	Non-autocracy
Chad	1982	2	Non-autocracy
Chad	1990	4	Autocracy
Tunisia	1987	4	Autocracy

Table 10: Coups

	(1) Petroleum rich All regimes	(2) Petroleum poor All regimes	(3) All oil intensities All regimes
PANEL A:			
Dependent variable is dlog(offdep)			
pre-coup	0.08**	-0.00	
	(0.03)	(0.03)	
coup	0.02	-0.07*	-0.05
	(0.12)	(0.04)	(0.04)
post-coup	-0.03	0.04	0.03
	(0.05)	(0.04)	(0.04)
pre-coup x petro-rich			0.07**
			(0.03)
pre-coup x petro-poor			-0.00
			(0.03)
Observations	4,237	10,420	14,657
R-squared	0.04	0.03	0.02
Ftest: pre-coup x petro rich= pre-coup x petro poor			0.125
PANEL B:			
Dependent variable is dlog(offdep/ondep)			
pre-coup	0.10***	0.02	
	(0.03)	(0.04)	
coup	0.05	-0.13**	-0.10**
	(0.14)	(0.06)	(0.05)
post-coup	-0.03	0.07	0.05
	(0.05)	(0.04)	(0.04)
pre-coup x petro-rich			0.09***
			(0.02)
pre-coup x petro-poor			0.02
			(0.04)
Observations	4,235	10,340	14,575
R-squared	0.04	0.02	0.02
Ftest: pre-coup x petro rich= pre-coup x petro poor			0.139
Exchange rate control	YES	YES	YES
Time dummies	YES	YES	YES
Covariates	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 11: Indirectly held deposits

	(1) Havens	(2) Havens	(3) Havens
Dependent variable is dlog(offdep)			
dlogoilprice	0.12***		
	(0.02)		
deposit share of petro-rich non-haven autocracies		0.02	-0.02
		(0.03)	(0.05)
deposit share of petro-rich non-haven autocracies x dlogoilprice		0.75**	1.93***
		(0.36)	(0.58)
deposit share of petro-rich non-haven non-autocracies			0.08
			(0.06)
deposit share of petro-rich non-haven non-autocracies x dlogoilprice			-1.78***
			(0.49)
deposit share of petro-poor non-haven autocracies			0.08
			(0.16)
deposit share of petro-poor non-haven autocracies x dlogoilprice			1.80
			(2.01)
Observations	19,226	19,226	19,226
R-squared	0.00	0.02	0.02
Ftest: deposit share of petro-rich non-haven autocracies x dlogoilprice= deposit share of petro-rich non-haven non-autocracies x dlogoilprice			0.0003
Time dummies	NO	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure 1: Haven deposits in petro rich autocracies and non-autocracies during the 2007-9 oil boom and bust.

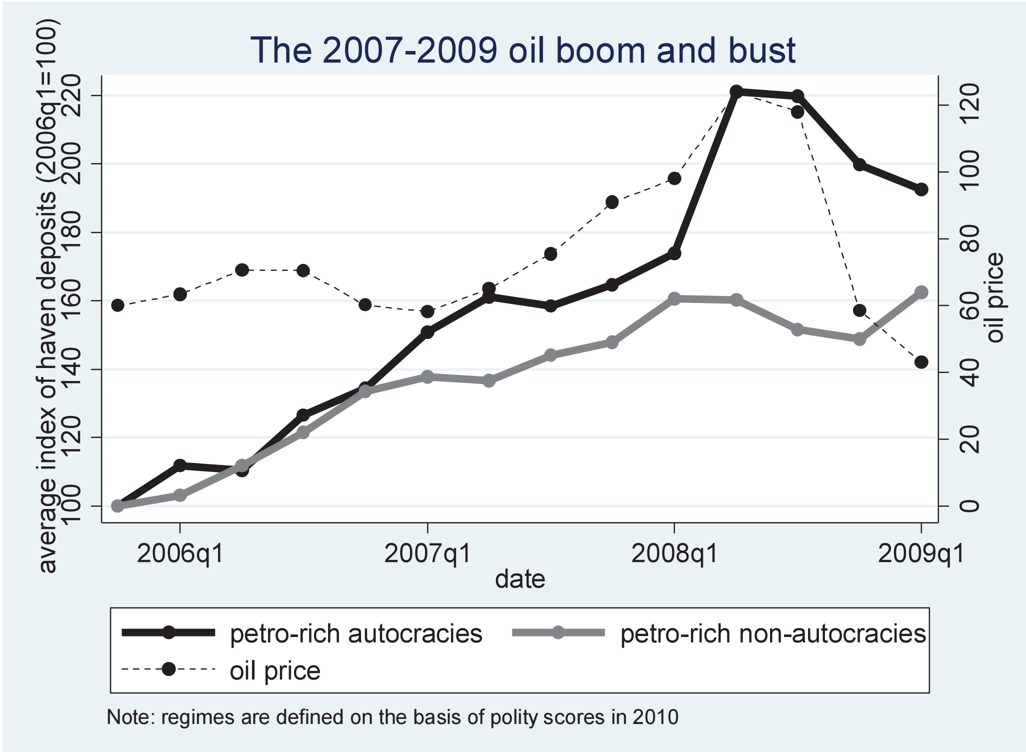
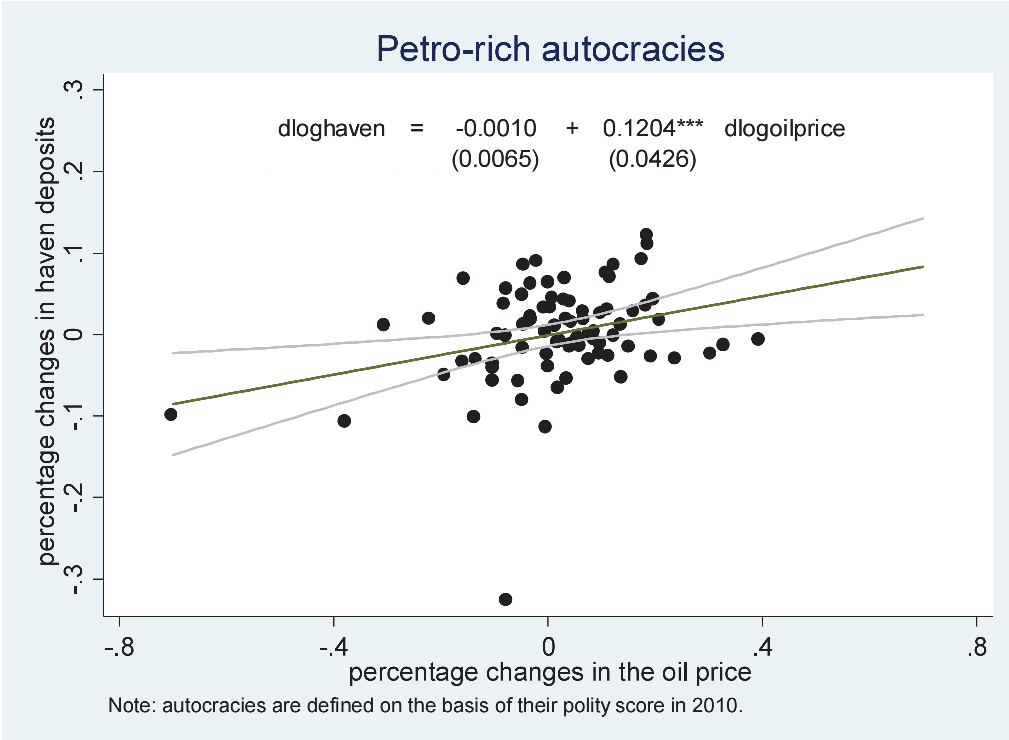


Figure 2: Oil price changes and changes in haven deposits.



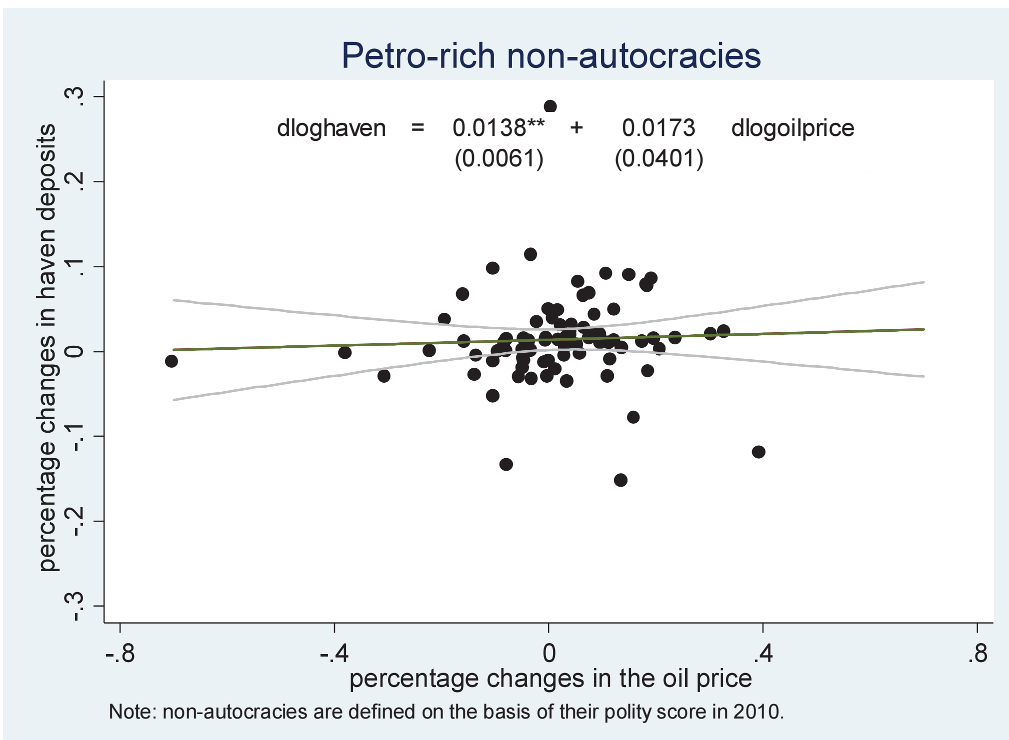
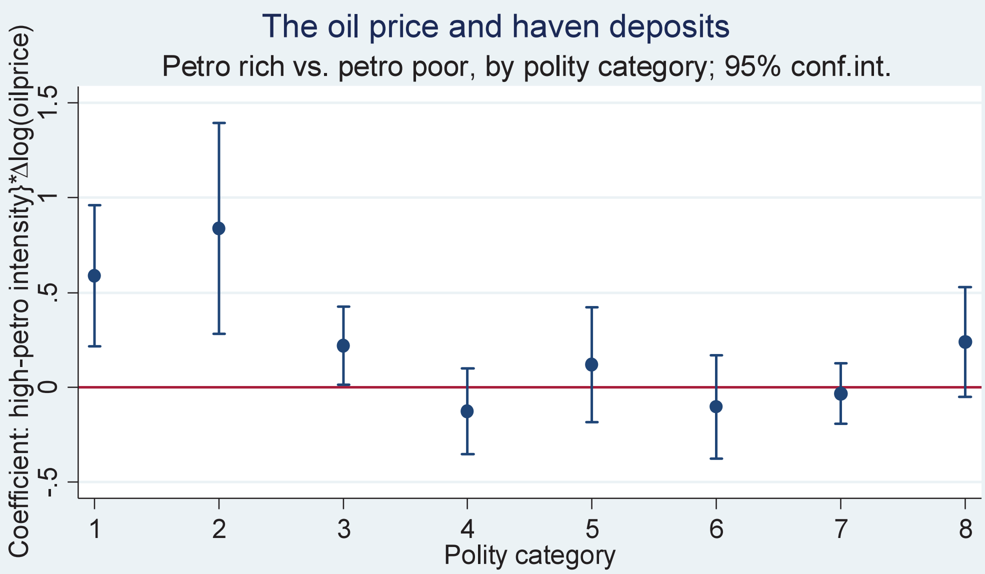
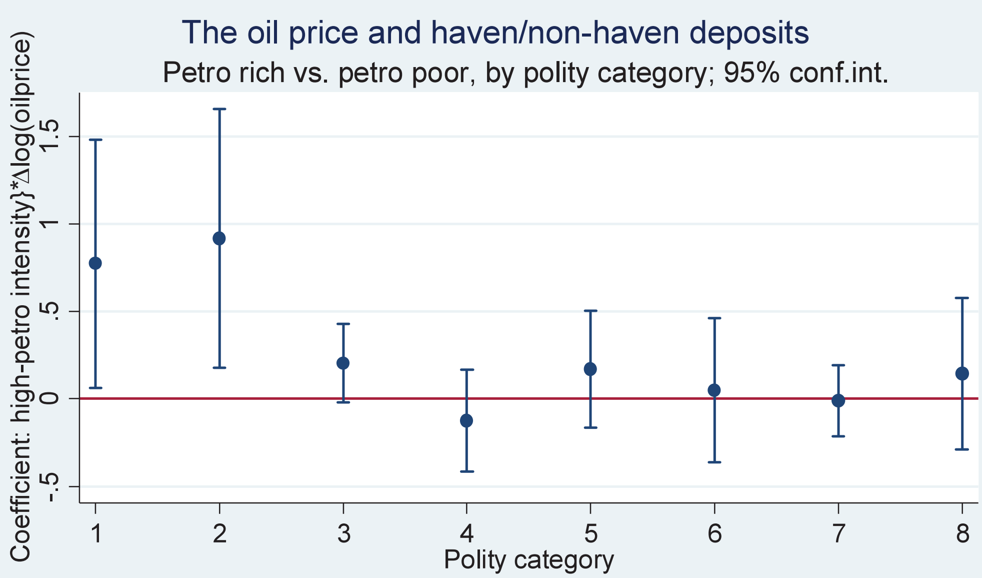


Figure 3. The relationship between oil price changes and changes in haven deposits by Polity score.

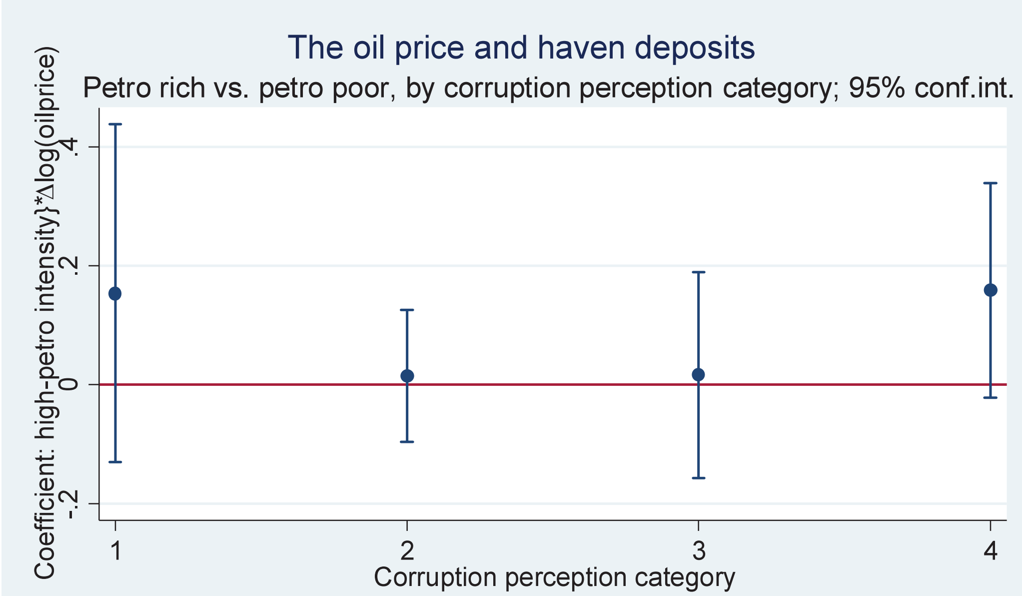


Note: The coefficents are difference-in-difference-in-difference estimates of the percentage change in haven deposits from a one percentage change in the oil price (diff. 1) in petro rich countries relative to petro poor autocracies (diff. 2), by polity category (diff. 3). The polity categories are constructed such that each subsequent category has at least as many high-petro intensity observations as the most autocratic category, category 1 (≥416 high-petro observations).

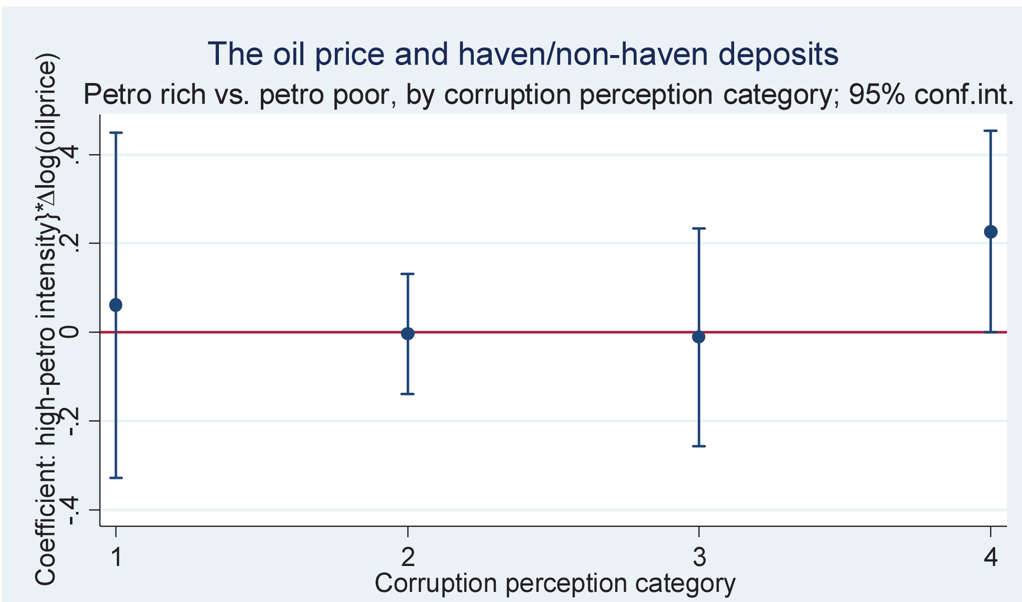


Note: The coefficents are difference-in-difference-in-difference estimates of the percentage change in haven/non-haven deposits from a one percentage change in the oil price (diff. 1) in petro rich countries relative to petro poor autocracies (diff. 2), by polity category (diff. 3). The polity categories are constructed such that each subsequent category has at least as many high-petro intensity observations as the most autocratic category, category 1 (≥416 high-petro observations).

Figure 4: The relationship between oil price changes and changes in haven deposits by ICRG corruption score.



Note: The coefficents are difference-in-difference-in-difference estimates of the percentage change in haven deposits from a one percentage change in the oil price (diff. 1) in petro rich economies relative to petro poor, high-corruption countries (diff. 2), by corruption perception category (diff. 3). The corruption perception categories are constructed such that each subsequent category has at least as many high-petro intensity observations as the high-corruption category, category 1 (585 high-petro observations).



Note: The coefficents are difference-in-difference-in-difference estimates of the percentage change in haven/non-haven deposits from a one percentage change in the oil price (diff. 1) in petro rich economies relative to petro poor, high-corruption countries (diff. 2), by corruption perception category (diff. 3). The corruption perception categories are constructed such that each subsequent category has at least as many high-petro intensity observations as the high-corruption category, category 1 (585 high-petro observations).

Appendix

Table A1: Data Sources and Variable Description

Variable name	Short description, Frequency	Source	Comments on construction
Deposit variables			
haven	Bank deposits in havens held by non-bank residents of country i, quarterly	Locational Banking Statistics, Bank for International Settlements	Sum of deposit holdings by residents of country i in 19 tax havens
nonhaven	Bank deposits in non-havens held by non-bank residents of country i, quarterly	Locational Banking Statistics, Bank for International Settlements	Sum of deposit holdings by residents of country i in 24 tax havens
haven / nonhaven	Ratio of haven to nonhaven		
Price variables			
dlog_oil_price	change in log of oil price, quarterly	Federal Reserve Economic Data, West Texas Intermediate	For data aggregation method, see: http://research.stlouisfed.org/fred2/series/OILPRICE/downloaddata?cid=98
dlog copper_price	change in log of copper price, quarterly	GEM Commodities, World Bank.	Means of monthly price data, by quarter.
dlog_aluminum_price	change in log of aluminum (bauxite) price, quarterly	GEM Commodities, World Bank.	Means of monthly price data, by quarter.
dlog_mineral_price_index	change in log of mineral price index, quarterly	GEM Commodities, World Bank.	Weighted sum of change in log of mineral prices, with weights given by the average rent share of respective mineral in GDP of country i. Minerals included are: aluminium (bauxite), copper, gold, lead, nickel, phosphate, tin, zinc, silver. (Iron is not included due to low number of iron price observations).
dlog_non-fuel_non-mineral_commodity_price_index	change in lof of non-fuel_non-mineral_commodity_price_index, quarterly	IMF primary commodity prices dataset (1980-2014) and the IMF International Financial Statistics (1977-1979).	Weighted sum of change in log of commodity prices, with weights given by the average share of respective commodity in exports of country i. Non-fuel commodities include bananas, barley, beef, chicken, cocoa, coconut oil, coffee, corn, cotton, fish, fishmeal, groundnuts, hard log, hard sawnwood, hides, lamb, lead, rubber, olive oil, orange, palm oil, pork, rapeseed oil, rice, shrimp, soft log, soft sawnwood, soybean meal, soybean oil, soybeans, sugar, sunflower oil, tea, uranium, wheat, wool. Monthly, aggregated into quarterly data
Regime variables			
polity	Type of political regime, quarterly	Marshall, 2013	Based on "polity-case" version of the database (so-called Polity-IVd) to obtain a quarterly frequency for polity score. Revised by converting the instances of irregular authority scores (such as "interregnum" or "transition") into the conventional polity score range, using the rule by (Marshall, 2013) in creating annual polity2 score from polity score.
regime	Cathegorical variable for autocracy/non-autocracy, quarterly		Country-quarters with a polity score lower than -5 are classified as autocracies, country-quarters with a polity score between -5 and 10 as non-autocratic regimes.
De-jure legal parties (singlepartylegal/mulpartylegal)	Cathegorical variable + dummies reflecting de-juro existence of parties,annual	Przeworski et al. (2000) and extention of it by Cheibub et al. (2010)	Based on Cheibub et al.(2010) dejure (0 = All parties legally banned; 1 = Single party legal; 2 = Multiple parties legal); Single party legal =1 if dejure=1, and 0 otherwise, captures regimes with single legal party; multiple party legal =1 if dejure =2, and 0 otherwise, captures regimes with multiple legal parties

Table A1: Data Sources and Variable Description (continued)

Variable name	Short description, Frequency	Source	Comments on construction
Defacto existing parties (singlepartyexists/multpartyexists)	Cathegorical variable + dummies reflecting de-facto existence of parties, annual	Przeworski et al. (2000) and extention of it by Cheibub et al. (2010)	Based on Cheibub et al.(2010) defacto (0 = No parties exist; 1 = Single party exists; 2 = Multiple parties exist); Single party exists =1 if defacto=1, and 0 otherwise, captures regimes with single legal party; multiple party exists =1 if defacto =2, and 0 otherwise, captures regimes with multiple legal parties
Party composition of legislature (legislature_w_regime_party/ legislature_w_mult_parties)	Cathegorical variable + dummies reflecting the party composition of the legislature, annual	Przeworski et al. (2000) and extention of it by Cheibub et al. (2010)	Based on Cheibub et al. (2010)'s lparty (0 = No legislature or non-partisan legislature; 1 = Legislature with regime party; 2 = Legislature with multiple parties); Legisl w regime party =1 if lparty=1, and 0 otherwise, captures regimes with a legislature with only members of the regime party; Legisl w mult parties=1 if lparty=2, and 0 otherwise, captures regimes with a legislature with multiple parties
Mode of executive selection (direct_election_executive/ indirect_election_executive)	Cathegorical variable + dummies reflecting the mode of executive selection, annual	Przeworski et al. (2000) and extention of it by Cheibub et al. (2010)	Based on Cheibub et al.(2010) exselec (0 = No elections; 1 = Indirect election; 2 = Direct election); direct election =1 if exselec=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=1 if exselec =2, and 0 otherwise, captures regimes in which election of the effective executive is done by elected assembly or uncommitted electoral college
Resource intensities			
Petro rents to GDP	Ratio of oil and gas rents to GDP	Adjusted Net Savings dataset, WDI, World Bank.	Averaged over the observation period
Mineral rents to GDP	Ratio of total mineral rents to GDP	Adjusted Net Savings dataset, WDI, World Bank.	Averaged over the observation period
Copper rents to GDP	Ratio of copper rents to GDP	Adjusted Net Savings dataset, WDI, World Bank.	Averaged over the observation period
Aluminum rents to GDP	Ratio of aluminum rents to GDP	Adjusted Net Savings dataset, WDI, World Bank.	Averaged over the observation period
Non-fuel_non-mineral commodity exports to GDP	Ratio of non-fuel non-mineral exports to GDP	Spatafora and Tytell (2009), primary commodity prices dataset (1980-2014) and International Financial Statistics (1977-1979), IMF	Averaged over the observation period
Political risk variables, dummy			
All elections	equals 1 in quarters with direct elections of a national executive or a national legislative body, and zero otherwise, quarterly	NELDA dataset (Hyde and Marinov, 2012).	Based on election-round version of the data to create country-quarters dummy variable
On-time elections	equals 1 in quarters with elections that were planned and on time, quarterly	NELDA dataset (Hyde and Marinov, 2012).	Based on election-round version of the data to create country-quarters dummy variable
Successful coups	equal to 1 in quarters with at least one sucessful coup détat event, quarterly	Marshall and Marshall (2013)	Based on event-list version of the data to create country-quarters dummy variable

Table A1: Data Sources and Variable Description (continued)

Variable name	Short description, Frequency	Source	Comments on construction
Covariates, first differences			
mechanical exchange rate effect	mechanical percentage change in haven deposits caused by exchange rate changes	Locational Banking Statistics, Bank for International Settlements	Expresses the weighted average of exchange rate changes (relative to USD) using country-specific currency shares in haven deposits (average for the period 1995-2010) as weights.
dloggdp	change in log GDP, annual	WDI, World Bank	As no quarterly information is available, year-to-year log differences are taken
dhighinflation	change in dummy for inflation exceeding 40%, annual	WDI, World Bank	As no quarterly information is available, year-to-year differences are taken
dkaopen	change in capital account openness, annual	Chinn and Ito (2008) Financial Openness Index, 2011 update.	As no quarterly information is available, year-to-year differences are taken
dllgdp	change in liquid liabilities to GDP, annual	International Financial Statistics, IMF	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. As no quarterly information is available, year-to-year differences are taken
dtaxgdp	change in tax revenue (% of GDP), annual	WDI, World Bank	Tax revenue refers to compulsory transfers to the central government for public purposes. For details, see: http://data.worldbank.org/indicator/GC.TAX.TOTL.GD.ZS. As no quarterly information is available, year-to-year differences are taken

Table A2: Alternative measures of political institutions, continuous petro intensity (see Table 5)

	(1)	(2)	(3)	(4)
		Petro intensity: continuous		
	LEGPARTY	DEJURE	DEFACTO	EXSELEC
Panel A:				
Dependent variable dlog(offdep)				
Institution = 1	0.00	0.03***	0.02	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Institution = 2	0.01	0.03***	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Petro intensity × Institution = 0	-0.01	0.04*	0.00	-0.03*
	(0.02)	(0.02)	(0.03)	(0.02)
Petro intensity × Institution = 1	-0.00	-0.06**	0.00	-0.01
	(0.02)	(0.03)	(0.01)	(0.03)
Petro intensity × Institution = 2	0.00	0.00	-0.01	0.02
	(0.02)	(0.01)	(0.01)	(0.01)
Institution = 1 × dlog(oilprice)	-0.06	-0.04	0.20	0.06
	(0.14)	(0.21)	(0.20)	(0.10)
Institution = 2 × dlog(oilprice)	0.10	0.23*	0.33*	0.11
	(0.12)	(0.13)	(0.19)	(0.10)
Petro intensity × Institution = 0 × dlog(oilprice)	0.65**	0.95***	1.33***	0.54**
	(0.29)	(0.33)	(0.46)	(0.24)
Petro intensity × Institution = 1 × dlog(oilprice)	0.18	0.33	0.26	1.23**
	(0.19)	(0.60)	(0.18)	(0.48)
Petro intensity × Institution = 2 × dlog(oilprice)	0.26*	0.16*	0.12	0.03
	(0.15)	(0.09)	(0.13)	(0.13)
Observations	14,259	14,259	14,259	14,259
R-squared	0.02	0.02	0.02	0.02
Ftest: Petro intensity × Institution = 0 × dlog(oilprice) = Petro intensity × Institution = 2 × dlog(oilprice)	0.218	0.0184	0.0117	0.0577
Panel B:				
Dependent variable dlog(offdep/ondep)				
Institution = 1	-0.01	0.02*	0.00	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Institution = 2	-0.00	0.01	-0.00	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Petro intensity × Institution = 0	-0.01	0.03	-0.02	-0.02
	(0.02)	(0.03)	(0.03)	(0.02)
Petro intensity × Institution = 1	-0.00	-0.02	-0.00	0.04
	(0.02)	(0.04)	(0.01)	(0.04)
Petro intensity × Institution = 2	-0.02	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Institution = 1 × dlog(oilprice)	-0.01	-0.05	0.22	0.11
	(0.15)	(0.22)	(0.24)	(0.11)
Institution = 2 × dlog(oilprice)	0.16	0.30**	0.47**	0.18
	(0.14)	(0.14)	(0.23)	(0.11)
Petro intensity × Institution = 0 × dlog(oilprice)	0.68*	0.93**	1.45**	0.52*
	(0.35)	(0.38)	(0.59)	(0.27)
Petro intensity × Institution = 1 × dlog(oilprice)	0.32	0.31	0.42*	1.42**
	(0.24)	(0.67)	(0.24)	(0.63)
Petro intensity × Institution = 2 × dlog(oilprice)	-0.03	0.12	-0.01	-0.03
	(0.26)	(0.18)	(0.20)	(0.26)
Observations	14,176	14,176	14,176	14,176
R-squared	0.02	0.02	0.02	0.02
Ftest: Petro intensity × Institution = 0 × dlog(oilprice) = Petro intensity × Institution = 2 × dlog(oilprice)	0.0963	0.0448	0.0183	0.150
Exchange rate control	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
Covariates	YES	YES	YES	YES

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Note: Institutional variables categories 0, 1, 2 are defined as follows: legislative parties (0 = No legislature or non-partisan legislature; 1 = Legislature with regime party; 2 = Legislature with multiple parties); de jure parties (0 = All parties legally banned; 1 = Single party legal; 2 = Multiple parties legal); de facto parties (0 = No parties exist; 1 = Single party exists; 2 = Multiple parties exist); Executive selection (0 = No elections; 1 = Indirect election; 2 = Direct election).

Table A3: Simple correlations between the oil price and offshore deposits, FE

	(1)	(2)	(3)	(4)
	Autocracies		Non-autocracies	
	Petroleum rich	Petroleum poor	Petroleum rich	Petroleum poor
Dependent variable is dlog(offdep)				
dlogoilprice	0.08**	-0.13*	0.01	0.01
	(0.04)	(0.07)	(0.05)	(0.02)
Constant	0.02***	0.03***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
Observations	2,226	2,713	2,137	8,151
R-squared	0.01	0.00	0.00	0.01
Number of panelid	30	62	27	97
Exchange rate control	YES	YES	YES	YES
time dummies	NO	NO	NO	NO
covariates	NO	NO	NO	NO

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A4: Core oil results, FE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Petro intensity: dummy for rents > 5% of GDP			Petro intensity: dummy for rents > 5% of GDP			Petro intensity: rents / GDP		
	Autocracies	Non-autocracies	All	Autocracies	Non-autocracies	All	Autocracies	Non-autocracies	All
PANEL A:									
Dependent variable is dlog(offdep)									
petro intensity × dlog(oilprice)	0.22**	0.01		0.22**	0.01		0.36*	0.15	
	(0.09)	(0.05)		(0.09)	(0.05)		(0.18)	(0.18)	
petro intensity × autocracy × dlog(oilprice)			0.20**			0.20**			0.31*
			(0.08)			(0.08)			(0.16)
petro intensity × nonautocracy × dlog(oilprice)			0.01			0.01			0.16
			(0.05)			(0.05)			(0.18)
nonautocracy × dlog(oilprice)			0.14*			0.14*			0.10
			(0.08)			(0.08)			(0.07)
nonautocracy			0.00			0.00			-0.00
			(0.01)			(0.01)			(0.01)
petro intensity × autocracy			0.00			0.00			-0.01
			(0.01)			(0.01)			(0.03)
d4loggdp_allobs				-0.01	-0.00	-0.00	-0.01	-0.01	-0.00
				(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.02)
dllgdp_allobs				-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
				(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
dkaopen_allobs				-0.02	0.01	0.00	-0.02	0.01	0.00
				(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
dhighinflation_allobs				-0.01	0.02	0.01	-0.01	0.02	0.01
				(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
d4taxgdp_allobs				-0.00	0.00	0.00	-0.00	0.00	0.00
				(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Observations	4,939	10,288	15,227	4,939	10,288	15,227	4,939	10,288	15,227
R-squared	0.04	0.03	0.02	0.04	0.03	0.02	0.04	0.03	0.02
Number of panelid	92	124	142	92	124	142	92	124	142
F-test: petro intensity × autocracy × dlog(oilprice)= petro intensity × nonautocracy × dlog(oilprice)			0.0423			0.0439			0.519

Table A4: Core oil results, FE (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Petro intensity: dummy for rents > 5% of GDP			Petro intensity: dummy for rents > 5% of GDP			Petro intensity: rents / GDP		
	Autocracies	Non-autocracies	All	Autocracies	Non-autocracies	All	Autocracies	Non-autocracies	All
Dependent variable is dlog(offdep/ondep)									
petro intensity × dlog(oilprice)	0.24**	0.03		0.25**	0.03		0.40**	0.11	
	(0.10)	(0.07)		(0.10)	(0.07)		(0.20)	(0.24)	
petro intensity × autocracy × dlog(oilprice)			0.21**			0.21**			0.31*
			(0.09)			(0.09)			(0.18)
petro intensity × nonautocracy × dlog(oilprice)			0.03			0.03			0.12
			(0.07)			(0.07)			(0.23)
nonautocracy × dlog(oilprice)			0.21**			0.21**			0.17**
			(0.09)			(0.09)			(0.08)
nonautocracy			0.00			0.01			0.01
			(0.01)			(0.01)			(0.01)
petro intensity × autocracy			0.01			0.01			0.04
			(0.01)			(0.01)			(0.03)
Observations	4,895	10,249	15,144	4,895	10,249	15,144	4,895	10,249	15,144
R-squared	0.04	0.02	0.01	0.04	0.02	0.02	0.04	0.02	0.02
Number of panelid	92	124	142	92	124	142	92	124	142
F-test: petro intensity × autocracy × dlog(oilprice)= petro intensity × nonautocracy × dlog(oilprice)			0.119			0.110			0.496
Exchange rate control	YES	YES	YES	YES	YES	YES	YES	YES	YES
time dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
covariates	NO	NO	NO	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A5: Alternative measures of political institutions, FE

	(1)	(2)	(3)	(4)
		Petro intensity: dummy		
	LEGPARTY	DEJURE	DEFACTO	EXSELEC
Panel A:				
Dependent variable dlog(offdep)				
Petro intensity × Institution = 0 × dlog(oilprice)	0.24*	0.39**	0.53***	0.22**
	(0.13)	(0.15)	(0.20)	(0.11)
Petro intensity × Institution = 1 × dlog(oilprice)	0.07	0.13	0.16	0.18
	(0.14)	(0.24)	(0.15)	(0.11)
Petro intensity × Institution = 2 × dlog(oilprice)	0.07	0.05	0.04	-0.01
	(0.05)	(0.04)	(0.04)	(0.05)
Institution = 1	-0.00	0.03**	0.03***	-0.02
	(0.01)	(0.01)	(0.01)	(0.01)
Institution = 2	-0.01	0.02*	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Petro intensity × Institution = 0	-0.00	0.03*	0.02	0.05**
	(0.02)	(0.02)	(0.02)	(0.02)
Petro intensity × Institution = 2	-0.00	0.02	0.02*	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Institution = 1 × dlog(oilprice)	-0.06	-0.03	0.18	0.08
	(0.16)	(0.22)	(0.22)	(0.11)
Institution = 2 × dlog(oilprice)	0.09	0.24	0.33	0.12
	(0.13)	(0.15)	(0.20)	(0.11)
Observations	14,259	14,259	14,259	14,259
R-squared	0.02	0.02	0.02	0.02
Number of panelid	142	142	142	142
Ftest: Petro intensity x Institution = 0 x dlog(oilprice) = Petro intensity x Institution = 2 x dlog(oilprice)	0.204	0.0265	0.0168	0.0493
Panel B:				
Dependent variable dlog(offdep/ondep)				
Petro intensity × Institution = 0 × dlog(oilprice)	0.29*	0.42**	0.61**	0.23*
	(0.15)	(0.18)	(0.25)	(0.12)
Petro intensity × Institution = 1 × dlog(oilprice)	0.03	0.14	0.15	0.23
	(0.15)	(0.25)	(0.16)	(0.17)
Petro intensity × Institution = 2 × dlog(oilprice)	0.07	0.05	0.05	-0.03
	(0.08)	(0.07)	(0.07)	(0.07)
Institution = 1	-0.01	0.02	0.02	-0.02
	(0.02)	(0.02)	(0.01)	(0.01)
Institution = 2	-0.00	0.02	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Petro intensity × Institution = 0	-0.01	0.01	-0.02	0.04
	(0.02)	(0.02)	(0.02)	(0.03)
Petro intensity × Institution = 2	-0.01	-0.00	-0.00	-0.01
	(0.02)	(0.02)	(0.01)	(0.02)
Institution = 1 × dlog(oilprice)	0.05	-0.01	0.26	0.14
	(0.16)	(0.24)	(0.26)	(0.12)
Institution = 2 × dlog(oilprice)	0.17	0.35**	0.49*	0.21
	(0.15)	(0.17)	(0.25)	(0.13)
Observations	14,176	14,176	14,176	14,176
R-squared	0.02	0.02	0.02	0.02
Number of panelid	142	142	142	142
Ftest: Petro intensity x Institution = 0 x dlog(oilprice) = Petro intensity x Institution = 2 x dlog(oilprice)	0.191	0.0416	0.0314	0.0729
Exchange rate control	YES	YES	YES	YES
time dummies	YES	YES	YES	YES
covariates	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: Institutional variables categories 0, 1, 2 are defined as follows: legislative parties (0 = No legislature or non-partisan legislature; 1 = Legislature with regime party; 2 = Legislature with multiple parties); de jure parties (0 = All parties legally banned; 1 = Single party legal; 2 = Multiple parties legal); de facto parties (0 = No parties exist; 1 = Single party exists; 2 = Multiple parties exist); Executive selection (0 = No elections; 1 = Indirect election; 2 = Direct election).

Table A6: Non-fuel minerals and commodities, FE

	Copper			Aluminum			All Minerals			Non-fuel, non-mineral commodities		
	Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for exports > 5% of GDP		
	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes
PANEL A:												
Dependent variable is dlog(offdep)												
dlog(commodity price)							-0.03	-0.06		0.19	-0.10	
							(0.09)	(0.05)		(0.12)	(0.07)	
commodity intensity × dlog(commodity price)	0.55**	0.11		-0.25	-0.05		0.06	-0.03		-0.25	0.04	
	(0.21)	(0.21)		(0.55)	(0.11)		(0.23)	(0.19)		(0.19)	(0.13)	
comm. intensity × autocracy × dlog(comm. price)			0.51**			-0.15			0.06			-0.18
			(0.23)			(0.47)			(0.22)			(0.18)
comm. intensity × nonautocracy × dlog(comm. price)			0.11			-0.03			-0.03			0.02
			(0.21)			(0.13)			(0.18)			(0.13)
nonautocracy			0.01			0.01			-0.00			-0.01
			(0.01)			(0.01)			(0.01)			(0.01)
dlog(commodity price) × autocracy									-0.00			0.15
									(0.07)			(0.10)
dlog(commodity price) × nonautocracy			0.02			-0.19			-0.07			-0.08
			(0.08)			(0.18)			(0.05)			(0.07)
comm. intensity × autocracy			0.00			-0.02			-0.01			0.03**
			(0.01)			(0.03)			(0.02)			(0.01)
Observations	1,693	5,478	7,171	749	3,013	3,762	4,939	10,288	15,227	4,492	10,143	14,635
R-squared	0.07	0.04	0.04	0.13	0.07	0.06	0.04	0.03	0.02	0.04	0.03	0.02
Number of panelid	34	57	61	16	31	32	92	124	142	86	122	136
Ftest: comm. intensity × autocracy × dlog(comm. price)= comm. intensity × nonautocracy × dlog(comm. price)			0.220			0.821			0.739			0.343

Table A6: Non-fuel minerals and commodities, FE (continued)

	Copper			Aluminum			All Minerals			Non-fuel, non-mineral commodities		
	Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for rents > 5% of GDP			Commodity intensity: dummy for exports > 5% of GDP		
	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes	Autocracies	Non-autocracies	All regimes
PANEL B:												
Dependent variable is dlog(offdep/ondep)												
dlog(commodity price)							-0.02	-0.07		0.24	-0.11	
							(0.10)	(0.06)		(0.15)	(0.09)	
commodity intensity × dlog(commodity price)	0.56***	0.07		-0.49	-0.14**		0.01	-0.07		-0.42*	0.11	
	(0.20)	(0.36)		(0.55)	(0.07)		(0.22)	(0.25)		(0.23)	(0.18)	
comm. intensity × autocracy × dlog(comm. price)			0.54***			-0.34			0.01			-0.31
			(0.17)			(0.49)			(0.21)			(0.22)
comm. intensity × nonautocracy × dlog(comm. price)			0.07			-0.11			-0.06			0.07
			(0.36)			(0.08)			(0.24)			(0.18)
nonautocracy			0.02*			0.01			0.00			-0.00
			(0.01)			(0.01)			(0.01)			(0.01)
dlog(commodity price) × autocracy									0.04			0.20
									(0.08)			(0.12)
dlog(commodity price) × nonautocracy			0.04			-0.37			-0.10			-0.09
			(0.10)			(0.22)			(0.06)			(0.09)
comm. intensity × autocracy			-0.01			-0.05			-0.03			0.03*
			(0.02)			(0.03)			(0.02)			(0.01)
Observations	1,682	5,473	7,155	738	3,013	3,751	4,895	10,249	15,144	4,448	10,104	14,552
R-squared	0.07	0.03	0.03	0.15	0.06	0.05	0.04	0.02	0.01	0.04	0.02	0.02
Number of panelid	34	57	61	16	31	32	92	124	142	86	122	136
Ftest: comm. intensity × autocracy × dlog(comm. price)= comm. intensity × nonautocracy × dlog(comm. price)			0.244			0.601			0.805			0.183
Exchange rate control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
time dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
covariates	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A7: Elections, FE

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable is dlog(offdep)		**Petroleum rich**			**Petroleum poor**	
	Autocracies	Non-autocracies	All	Autocracies	Non-autocracies	All
PANEL A:						
All elections						
pre-election	0.02**	0.01		0.01	0.01	
	(0.01)	(0.01)		(0.01)	(0.01)	
pre-election × nonautocracy			0.01			0.01
			(0.01)			(0.01)
pre-election × autocracy			0.03**			0.02
			(0.01)			(0.02)
election	0.03	-0.00	0.01	-0.04	-0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.04)	(0.01)	(0.01)
post-election	0.00	0.01	0.00	-0.03	-0.01	-0.01
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)
autocracy			0.00			-0.01
			(0.01)			(0.01)
Observations	2,226	2,137	4,363	2,660	7,964	10,624
R-squared	0.08	0.08	0.04	0.07	0.03	0.03
Number of panelid	30	27	39	60	95	100
Ftest: pre-election x nonautocracy= pre-election x autocracy			0.180			0.607
PANEL B:						
On-time elections						
pre-election	0.04**	-0.00		0.04	0.01*	
	(0.02)	(0.02)		(0.02)	(0.01)	
pre-election × nonautocracy			-0.00			0.01*
			(0.02)			(0.01)
pre-election × autocracy			0.04**			0.04*
			(0.02)			(0.03)
election	0.02	-0.00	0.01	-0.08	-0.01	-0.01
	(0.03)	(0.03)	(0.02)	(0.06)	(0.01)	(0.01)
post-election	-0.01	-0.01	-0.01	-0.04	-0.01	-0.01
	(0.03)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
autocracy			0.00			-0.01
			(0.01)			(0.01)
Observations	2,226	2,137	4,363	2,660	7,964	10,624
R-squared	0.08	0.08	0.04	0.07	0.03	0.03
Number of panelid	30	27	39	60	95	100
Ftest: pre-election x nonautocracy= pre-election x autocracy			0.0905			0.279
Exchange rate control	YES	YES	YES	YES	YES	YES
time dummies	YES	YES	YES	YES	YES	YES
covariates	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A8: Coups, FE

	(1) Petroleum rich All regimes	(2) Petroleum poor All regimes	(3) All oil intensities All regimes
PANEL A:			
Dependent variable is dlog(offdep)			
pre-coup	0.09**	0.00	
	(0.04)	(0.03)	
coup	0.02	-0.06	-0.05
	(0.11)	(0.04)	(0.04)
post-coup	-0.03	0.05	0.03
	(0.05)	(0.05)	(0.04)
pre-coup x petro-rich			0.08**
			(0.04)
pre-coup x petro-poor			0.00
			(0.03)
Observations	4,237	10,420	14,657
R-squared	0.04	0.03	0.02
Number of panelid	39	102	141
Ftest: pre-coup x petro rich= pre-coup x petro poor			0.138
PANEL B:			
Dependent variable is dlog(offdep/ondep)			
pre-coup	0.10**	0.02	
	(0.04)	(0.04)	
coup	0.05	-0.12**	-0.10*
	(0.14)	(0.06)	(0.05)
post-coup	-0.03	0.07	0.06
	(0.06)	(0.05)	(0.04)
pre-coup x petro-rich			0.10***
			(0.03)
pre-coup x petro-poor			0.02
			(0.04)
Observations	4,235	10,340	14,575
R-squared	0.04	0.02	0.02
Number of panelid	39	102	141
Ftest: pre-coup x petro rich= pre-coup x petro poor			0.148
Exchange rate control	YES	YES	YES
time dummies	YES	YES	YES
covariates	YES	YES	YES
Robust standard errors in parentheses			0.148

*** p<0.01, ** p<0.05, * p<0.1

Table A9: ICRG corruption as mediating variable

	(1)	(2)	(3)	(4)
	Petro intensity: dummy			
	Autocracies	All regimes	Autocracies	All regimes
	dlog(offdep)		dlog(offdep/ondep)	
Petro intensity × ICRG corruption × dlog(oilprice)	-0.0730	-0.0061	-0.0426	0.0043
	(0.1617)	(0.0391)	(0.1929)	(0.0487)
Petro intensity × ICRG corruption	-0.0139	-0.0045	-0.0153	-0.0008
	(0.0099)	(0.0040)	(0.0108)	(0.0040)
Petro intensity × dlog(oilprice)	0.3454	0.0598	0.2798	0.0189
	(0.4280)	(0.1238)	(0.5092)	(0.1439)
ICRG corruption × dlog(oilprice)	0.0460	-0.0009	0.0401	-0.0206
	(0.1496)	(0.0234)	(0.1578)	(0.0278)
Petro intensity	0.0213	0.0036	0.0321	-0.0061
	(0.0302)	(0.0114)	(0.0318)	(0.0114)
ICRG corruption	0.0015	0.0008	-0.0018	-0.0039**
	(0.0074)	(0.0016)	(0.0081)	(0.0019)
Observations	2,710	11,016	2,708	11,009
Number of panelid	63	117	63	117
Exchange rate control	YES	YES	YES	YES
time dummies	YES	YES	YES	YES
covariates	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1