Elites, Financial Networks, and Constraints on Dictators: Evidence from the Panama Papers[*]

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Abstract

A large literature argues that dictatorships can achieve high levels of economic growth if dictators can commit to not expropriate elites. Extant research has focused on the role of formal institutions—legislatures and parties—in helping elites constrain dictators' predation. I complement this literature by documenting the role of an informal institution, financial networks, in constraining the dictator. I argue that dense financial ties among elites serve to diffuse private information on the economy, hence facilitating elites' monitoring—if the dictator reneges on his commitment, informed elites are able to infer and punish his defection. This credible threat deters the dictator from predation and commits him to sharing rents with elites. Accordingly, I hypothesize that dictatorships where elites' financial network allows for greater diffusion of private information enjoy stronger property rights. To test my claims, I uncover networks of elites' co-ownership of offshore companies—a strong type of financial tie—using the largest leak of financial information to date, the Panama Papers. A statistical analysis of all cases during 1990-2015 supports my hypothesis.

Keywords: dictatorships, property rights, elites, financial networks

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1 Introduction

The importance of secure property rights to economic growth is one of the few consensus facts in economics (Barro, 1989; Acemoglu, Johnson and Robinson, 2001). A related consensus fact is that property rights protection requires limited government (North and Weingast, 1989; North, 1990). Most theories of limited government view it as product of elites' efforts to punish predatory behavior by the sovereign. Thus, at the core of the literature on economic growth, property rights, and limited government lies the question: how do elites constrain dictators?

Scholars of authoritarian regimes[1] have focused on the role of political institutions.[2] For example, Boix and Svolik (2013) argue that interaction within legislatures enables elite monitoring of the dictator, hence deterring him from defecting on rent-sharing pacts. Similarly, Gehlbach and Keefer (2012) claim that authoritarian parties increase the observability of expropriation against party supporters, thereby tying the dictator's hands. In short, the literature sees political institutions as an antidote to dictator-elite information asymmetries and a catalyst for elite coordination.

However, formal political institutions are only one medium through which elites can acquire, share, and act on private information regarding the dictator's predation. As Boix and Svolik (2013) acknowledge, "several institutions may serve to reduce asymmetries of information between the ruler and his allies [...] less formal, idiosyncratic, or traditional institutions may perform this function" (p. 307). Informal institutions may matter most where formal ones are ineffective or controlled by the dictator; in "personalist" or "established" regimes (Geddes, 1999; Svolik, 2009).[3] Therefore, by studying elites' interaction within informal institutions we can advance our understanding of how elites constrain dictators.

In this article, I investigate the role of one informal institution, financial networks. I argue that the structure of the elite's financial network affects the diffusion of—otherwise private—information on the true size of the regime's rents. This information allows some elites to infer whether they received low rents because the dictator reneged on his commitment to share rents, or because of a negative economic shock. Elites holding this information no longer have to threaten to punish the dictator whenever he delivers low rents—a threat that is non-credible, as elites prefer to not reallocate their capital during an economic downturn. Instead, informed elites can credibly threaten to punish the dictator only when rents are

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[1] I use the terms "authoritarian regime", "dictatorship", "autocracy", and "non-democracy" interchangeably. The same holds for the terms "dictator" and "autocrat".

[2] See Pepinsky (2014) for a general critique of the institutionalist approach to the study of dictatorships.

[3] Geddes, Wright and Frantz (2014) show that the share of all dictatorships that are personalist has been increasing near-steadily since 1950.

high but he does not share them. Crucially, when more elites learn the true state of the regime's rents, more elites can credibly threaten the dictator, and he commits to higher rent-sharing. Hence, I hypothesize that, in countries where elites' financial network enables larger diffusion of private information about the economy, economic predation by the dictator should be lower.

To test this hypothesis, I first derive my independent variable, *diffusion*, directly from my theoretical framework: the share of elites' network to which private information about the economy can spread. To take this variable to the data, I tap into the largest public source of private financial information to date, the Panama Papers (ICIJ, 2016). This unique, previously unused data includes information on offshore companies belonging to tens of thousands of individuals from autocratic countries during the period 1990-2015.[4] Since this information was leaked from a firm that charges large fees for its services and holds "special expertise in creating tax shelters for wealthy global elite", I assume that the individuals in its records are, indeed, economic elites (Graham, 2016). Thus, for each dictatorial country-year since 1990, I treat the names associated with country k in year t as its elites, and I code elites i and j in kt as financially tied if they are both associated with the same offshore(s). Through this method, I construct the elite financial networks needed to calculate diffusion for a large sample of dictatorships.

To test my hypothesis, I estimate the effect of diffusion on an index of property rights protection. My sample includes 101 dictatorships in the period $1990-2015$. Panel regressions with country-fixed effects, year-fixed effects, and country-clustered standard errors show a statistically significant and substantively strong positive association in the hypothesized direction. At its largest size, the coefficient implies that going from a network with no diffusion to one with full diffusion predicts an increase in property rights protection equal to the difference between Uganda and the United Arab Emirates. Other variables in my regressions mostly have an inconsistent or statistically insignificant effect.

This study contributes to several literatures. The first literature is that from political economy and economic history, on the emergence of property rights and contract enforcement vis-á-vis limited government (North and Weingast, 1989; North, 1990). The economic interdependence of elites and ruler has featured heavily in that literature; I expose how elites' economic interdependence affects their interaction with the ruler. A second literature this study builds on is that from comparative politics, on power-sharing and elite politics in dictatorships (Bueno De Mesquita et al., 2005; Gandhi, 2008; Svolik, 2012). Though elites' bargains with dictators have been thoroughly examined—along with the role of private in-

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[4]To my knowledge, only one other research paper has used this information to date, to study the effects of offshoring on firm valuation (O'Donovan, Wagner and Zeume, 2016).

formation in those bargains—this study explores how the diffusion of private information advantages elites' position. A third literature related to this article is the international political economy literature on foreign direct investment and expropriation (Jensen, 2008; Jensen, Malesky and Weymouth, 2014). That literature looks at how political institutions—dictatorial or democratic—protect investors from economic predation. Instead, I focus on a non-institutional safeguard against predation, networks. A related body of work is the literature on *de facto* property rights that arise through the action of guilds, business associations, and supply chains (Greif, Milgrom and Weingast, 1994; Doner and Schneider, 2000; Johns and Wellhausen, 2016). These studies take the role of informal institutions in creating property rights seriously, but do not examine networks.[5] Methodologically, my approach belongs to a large literature in sociology, political science, and economics, which studies the effects of various types of networks on individual-level and network-level outcomes (see Jackson (2008) for a review). Finally, in terms of subject matter, a relevant literature is that on the causes and effects of tax haven and shell company usage (Johannesen and Zucman, 2014; Findley, Nielson and Sharman, 2014).

The remainder of this study proceeds as follows. Section 2 briefly reviews the literature. Section 3 lays out my argument in the form of a model sketch and derives its main empirical implication. Section 4 introduces the financial network data. Section 5 presents my empirical approach and the results of my analysis. Section 6 summarizes and points to directions for future research.

2   Literature

A number of literatures relate to this study: the literature on property rights, contract enforcement, and limited government; the literature on foreign investment and expropriation; the literature on business associations and lobbies; the literature on power-sharing and elite politics in dictatorships.

Reviewing these literatures is a gargantuan task. Fortunately, all share a common theoretical structure: an agent in a position of authority, A, interacts with a group of agents in a position of lesser authority, B, in a sometimes competitive, sometimes co-operative manner. A is usually the state, government, ruler, elected leader, or dictator, and members of B are elites, domestic or international firms, or investors. When cooperative, their relationship involves A protecting B's property rights, committing to announced policies, or sharing rents and power. A cooperative relationship also involves B supporting A's rule, by lending capital to A, not aiding coup/rebellions against A, or not defecting to a challenger. When their

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[5]One exception is Razo (2009).

relationship becomes competitive, A and B engage in the opposite actions from the above.

For example, the property rights theory of North and Weingast (1989) features the English crown and the landed gentry. The crown first expropriates the gentry, then commits to protecting its property—by increasing the powers of parliament and judiciary—in order to secure loans. In Svolik (2009) and Boix and Svolik (2013), the dictator interacts with a coalition of allies; the dictator shares or withholds rents from allies, and allies support or rebel against the dictator. Similarly, in Guriev and Sonin (2009), the players are a ruler and oligarchs, with the former having the power to expropriate the latter and the latter having the power to replace the former. Examining a very different setting, Johns and Wellhausen (2016) study the interaction of a government with foreign firms, where the government can honor or break contracts, and firms invest in protecting themselves from expropriation. A number of other studies from international political economy adopt a similar theoretical framework (Jensen, 2008; Jensen, Malesky and Weymouth, 2014; Wilson and Wright, 2017; Graham, Johnston and Kingsley, Forthcoming).

Within the above unifying framework, there is often a role for an intervening force that conditions the relationship between A and B: for example, an economic shock, conflict, or technological change. However, this force might also operate through changing the way actors *within* B interact, which, in turn, affects B's interaction with A. A prominent example in the literature is political institutions. In Boix and Svolik (2013), institutionalized power-sharing allows allies in the dictator's coalition to monitor his compliance with their rent-sharing pact. Similarly, in Gehlbach and Keefer (2012), the creation of a ruling party enables the dictator's supporters to observe expropriations against party members. In both theories, institutions facilitate coordination among the actors in B to change the behavior of A—in a welfare-improving manner. However, institutions are only one among a myriad of factors that can alter the interaction of the actors in B.

An understudied factor that affects the way firms, investors, or elites interact are *networks*—the ties that bind them. A large literature in sociology and economics shows that networks impact how rational actors coordinate joint actions, commit to reciprocate in certain actions, and build social capital (Jackson, 2008). Actors can have different ties (e.g. ethnicity, religion, nationality, education), both cooperative and competitive. For firms, investors, and elites, arguably the most important are *financial ties*—after all, these are primarily economic actors. A key function that financial ties serve is to diffuse valuable private information on the economy. This is particularly the case in dictatorships, where policy-making is more arbitrary and political connections especially valuable (Fisman, 2001). As such, one way to advance our understanding of how firms, investors, or elites coordinate with each other in interacting with dictators, is to study financial networks among these

actors.

3   Theory

Elites I focus on the network of actors most likely to hold, share, and act on private information about the economy, elites. Elites are also the group most likely to benefit from constraining the dictator—they are the main target of predation.

   Setup I present my argument in the form of a sketch model; an infinitely repeated game between a dictator and a set of n elites.[6] Elites form an (exogenous) financial network—a set of bilateral financial ties—that determine their communication (more below). In the initial time period, dictator and elites form an agreement; to share a fraction $0 < \beta < 1$ of total rents from their joint rule in each subsequent period. In all subsequent periods, the following sequence of plays takes place. First, the total value of rents, r, is determined by stochastic economic forces (Nature): $r = 1$ with probability π (good times), and $r = 0$ with probability $1 - \pi$ (bad times). Crucially, only the dictator observes r, along with a randomly chosen elite—label her i.[7] In the next step, i decides to which elites, if any, to reveal r (costlessly). Then, the dictator chooses what value of r to report to *each* elite (0 or 1), and pays each elite (including i) the agreed-upon share of that value (β/n or 0). Subsequently, elites observe their share of rents, and each elite decides whether or not to financially punish the dictator. Financial punishment can take the form of capital flight, tax evasion, or any type of capital reallocation. However, by punishing the dictator, elites incur a cost $c(r)$, which depends on the state of the economy. All else equal, elites prefer not to punish the dictator in bad times, because by doing so they misallocate their capital when they need it the most.

   Predation Equilibrium To show how predation occurs in equilibrium, I begin by ignoring the informed elite's (i) role. Note that, because other elites do not observe the true size of rents, they can only adopt one strategy that deters the dictator from predation: to threaten to punish him whenever they receive 0 rents. However, to carry out this threat, elites have to punish the dictator even when he has not defected on their pact and times are simply bad. And since by doing so, elites have to sometimes misallocate their resources (during bad times), their strategy contains a non-credible threat. Knowing this, the dictator is not deterred from predation, keeps all of the rents to himself (when there are any), and elites always get 0. In short, *when there is a complete information asymmetry between dictator and elites regarding the true size of rents, the unique equilibrium involves complete*

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[6]I borrow some non-network-related elements from the formal models in Svolik (2009) and Boix and Svolik (2013).

[7]The theory's predictions are substantively similar if we allow more than one elite to observe r.

predation.

Information How does the presence of an informed elite i alter this equilibrium? Because i can condition her response on the economy's state, she is able to avoid costly, unnecessary punishments—i will know when times are bad, and will not blame the dictator for delivering low rents. Conversely, inferring a defection, i will punish the dictator when times are good yet she receives low rents. Thus, i's threat to punish the dictator if he defects is credible, and the dictator will share the agreed-upon rents with i (β/n). i's threat secures her a *selective* commitment by the dictator (Haber, Maurer and Razo, 2003; Razo, 2009).[8] For the dictator to make additional selective commitments, though, more elites need to join i in making credible threats. This requires that i communicates her information about the economy's true state, enabling additional elites to infer and punish defection.

Communication How does communication between elites occur? Recall that, after observing the true size of rents r, i can costlessly reveal r to other elites. However, i's incentive to *truthfully* reveal r to another elite will depend on their financial relationship— whether they are competitors or partners. Truthful communication between competitors is not possible. In particular, i has an incentive to lie to a competitor when times are bad and claim that the dictator defected; the competitor will then reallocate her capital, thinking that she is punishing the dictator, which will hurt her and benefit i.[9] On the contrary, i has no incentive to lie to a financial partner, say j, when times are bad. If i lies, j's capital reallocation can adversely impact i; for example, capital might be moved out of a joint venture.[10] Thus, I limit my attention to communication between informed elites and their financial partners (if any).[11]

Network Structure Communication between informed elites and their partners depends on the financial network's structure: how many partners i has, how many partners they have, and so on and so forth. To illustrate the importance of network structure, I analyze two toy

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[8]A richer implication would involve the dictator sharing rents equal to the punishment i can inflict on him—a form of "rent discrimination" by the dictator towards elites. In this manner, informed elites would be able to extract larger rents share from the dictator the more capital they have. This feature can be incorporated without changing the core features of the model, but it would complicate the analysis.

[9]i cannot gain by lying to a competitor when times are good and the dictator is able to defect; lying would make the competitor less likely to punish the dictator, while i wants others to punish the dictator.

[10]In addition, if i lies, j will soon infer the lie, when i fails to punish the dictator herself. Note that, even though j will only observe i's lie in the next time period, j might punish i then, by terminating their financial tie—a tie that i presumably derives value from. And because financial partners play a repeated game, i should be deterred from lying to j. Another reason, though more difficult to insert in a rational choice model, might be trust between i and j. Indeed, much sociological research records higher levels of trust between links in different kinds of social networks (REF). An altogether different motivation for the assumption that only financial partners can communicate is informational: elites that are not fincancially tied might not even be aware of each other's existence. This assumption is more realistic for large, populous, and/or ethnically diverse countries, where there are many, heterogenous elites.

[11]If i has no ties, the unique equilibrium is the same as with no communication: complete predation.
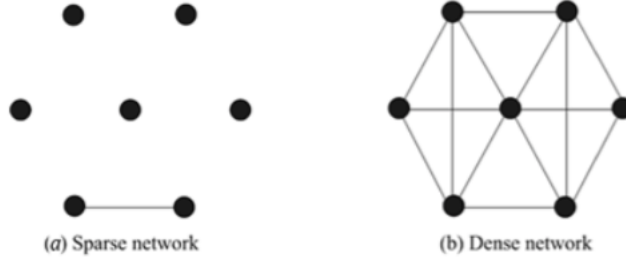
(a) Sparse network   (b) Dense network

Figure 1: Two examples of elite networks

examples, depicted in Figure 1. Both networks have 7 elites, but vary significantly in how interconnected elites are.[12] The left network has 5 elites with no ties and 2 elites that are only tied to each other, while in the right network every elite is tied to at least 3 others. Given my assumptions about communication between elites, in the left network 1 or 2 elites learn the true size of rents, versus 4 or 7 elites in the right network. Recalling that, in every period, one elite i randomly observes the true size of total rents r, we can derive the *average* number of elites to which i communicates r: including i, it equals $\frac{5}{7}(1) + \frac{2}{7}(2) = \frac{9}{7}$ elites in the left network and $\frac{6}{7}(4) + \frac{1}{7}(7) = \frac{31}{7}$ elites in the right network. This means that, on average, more than 3 additional elites learn r in the right network, and will infer and punish any defection by the dictator, thus committing him to sharing rents with them.

Hypothesis The above example illustrates the core of my theory and its key comparative static: *where the elite is more financially interconnected, the dictator is less likely to renege on commitments to elites.* A dense financial network among elites diffuses information about the true size of the regime's rents more widely, allowing more elites to infer whether the dictator defected and punish him. A credible threat of a larger punishment, in turn, should act as a larger deterrent against predation and a stronger safeguard of elites' property rights.

4   Elites & Financial Networks

Independent Variable As hinted in Section 3, my theoretical framework produces a specific empirical quantity that can be used to test my argument: the average fraction of the elite network to which private information can spread. Labelling this quantity *diffusion*, for

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[12]Throughout, I model and measure ties as undirectional; that is, for all i and j, if i is tied to j, then j is tied to i.

network k in period t it can be calculated as

$$d_{kt} = \frac{1}{n_{kt}} \sum_{i}^{n_{kt}} \frac{x_i + 1}{n_{kt}} = \frac{\bar{x}_{kt} + 1}{n_{kt}} \tag{1}$$

where x_i denotes the number of financial ties of elite i, $\bar{x}$ the average number of elites' ties, and n the number of elites.[13] Unlike other independent variables used in statistical analyses, we cannot calculate this variable from existing data. To calculate diffusion for a sample of K countries or T years, we first need to construct an equal number of networks of elites' financial ties.

Network Data Collecting network data on elites' financial ties is far from straightforward, especially in dictatorships. It requires defining who the elites are and recording every elite's ties to every other elite. For a large country like China, this could mean hundreds of thousands of nodes (elites) and millions of potential edges (financial ties). If time were not a constraint, one approach would be to use primary and secondary sources that identify economic elites and their financial ties in a sample of dictatorship-years. However, this would introduce bias, stemming from the disproportionate media coverage of prominent elites. Less prominent elites and ties between them are more likely to be omitted from news reports, which would result in networks that are smaller (fewer elites) and, possibly, sparser (fewer ties per elite) than reality.

In addition, if we want to compare networks across countries and years, we need data on elites' financial ties that is recorded in the same way for all units. To see why this is crucial, imagine that elites' financial network is identical in two dictatorships, k and k', yet k receives more coverage than k' due to its alliance with the US. In addition, imagine that the US's alliance with k also causes its dictator to expropriate less. The above data-collection approach will produce a network that is denser for k than k', which will lead us to spuriously attribute k's lower expropriation to its higher network density instead of its alliance to the US. Clearly, traditional techniques of network data-collection—observing or surveying the network's nodes (elites)—are of no use here (Wasserman and Faust, 1994). Equally blunt are the methods used to study other networks of political actors, such as co-sponsorship networks in Congress (Fowler, 2006).[14]

Panama Papers To resolve obstacles in network data-collection, I exploit a new, unique,

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[13]The division by n_{kt} within the summation accounts for the probability that elite i observes the size of the regime's rents. The second division by n_{kt} converts the summation into the fraction of elites to which information diffuses.

[14]Mahdavi (2016) proposes a method to construct affiliation networks of political elites via joint appearances in gala events, while Mahdavi and Ishiyama (2016) construct an affiliation network of N. Korean party elites via joint appearances in state-sponsored factory inspections.

and untapped source of information on hidden financial ties. Constituting the largest leak of private information to date—11.5 million files adding up to 2.6 terabytes of data—the so-called Panama Papers are the full body of documents of one of the largest provider of offshore legal services, Mossack Fonseca (Mossfon) (ICIJ, 2016). These documents were leaked by an anonymous source to journalists in 2015. After more than a year of preparatory work by a team of 400 individuals from 100 news organizations in 80 countries, a reduced version of the documents were made available for public download.[15] In the words of the team behind the leak: "the real value of the database is that it strips away the secrecy that cloaks companies and trusts incorporated in tax havens and exposes the people behind them" (ICIJ, 2016). This is the data I use to construct elites' financial networks in all dictatorships since 1990.

Elites To use this data to record elites' financial ties, we must assume Mossfon's clients are elites. According to reports familiar with the market for offshore services, Mossfon has "special expertise in creating tax shelters for the *wealthy global elite* [emphasis added]" (Graham, 2016). This is evident in the company's reported fees: depending on the service required, charges range from $1,500 per year for setting-up an offshore company in a not-so-costly jurisdiction to $17,500 per year for providing a nominee director that acts on the beneficiary's behalf (Harding, 2016a). Though the data does not indicate which services were purchased by each elite, some of Mossfon's fees exceed the median per capita income of the vast majority of post-1990 dictatorships.[16] In other words, merely purchasing Mossfon's services is an expense that only the very wealth in dictatorships can incur.[17] Thus, I safely assume that Mossfon's clients are, indeed, economic elites, and I use the data leaked from Mossfon to record their financial ties. Note a direct benefit of using the Panama Papers to identify elites: we do not have to identify elites individually, for a large number of countries. Their wealth, as implicitly revealed through purchasing Mossfon's services, renders them

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[15]See https://offshoreleaks.icij.org/pages/about for further information on the data. The vast majority of Mossfon's leaked documents are excluded from the public dataset—email exchanges, bank account numbers, and financial transactions. However, for the purposes of this study, the excluded information is not necessary to record elites' financial ties (see Financial Ties paragraph). The public version of the data includes all clients' information on: their nationality, address, the companies they are associated with and their role in those companies, intermediaries used to establish the account (if any), and various dates relevant to the companies' status. In some cases, some of this information is missing, though there is no obvious pattern to this missingness.

[16]Mossfon's fees exceed dictatorships' median per capita income even more for clients that maintain multiple companies. The real GDP per capita data used for this calculation is from Bolt and van Zanden (2013).

[17]A simple back-of-the-envelope calculation adds further weight to my assumption—particularly for poorer dictatorships. Assume there is a 1% probability that, in any year, client i will lose a particular asset—through expropriation, imprisonment, etc—if she does not register it in an offshore company. Further assume that the annual fee Mossfon charges for incorporating i's asset in offshore company is $2,000. This implies that, for i to be making a rational decision in seeking Mossfon's service, her asset must be worth at least $200,000. And, given that i is highly unlikely to have a single asset and no source of income, i's net worth must arguably be in the top percentile of the distribution in most post-1990 dictatorships.

elites, and no researcher discretion is needed to classify them as such.[18]

Financial Ties To lend itself to testing my hypothesis, the Panama Papers must also measure elites' financial *ties*; that is, meaningful and cooperative financial relations. The data includes information on the companies associated with each client—the companies' names, jurisdictions (which countries they are registered in)[19], incorporation dates, and inactivation dates (if applicable)—and clients' positions in those companies (e.g. director, beneficiary, shareholder, secretary, etc). I use this information to record financial ties between clients (elites). Namely, I code elites i and j from country k[20] as tied in year t if they are both associated with the same company, m, and m is active in t.[21] Given that clients associated with a company have veto power over its activity, I assume that i and j have a strong, cooperative financial tie if they both have a substantive position in the same company.[22] This allows me to construct a financial network through elites' joint association with one or more offshore companies. Again, note that no researcher discretion is needed to code elites' financial ties—they are revealed to us through elites' own actions, and these actions are recorded by an agent with no incentive to misreport them (Mossfon). Another advantage of this approach is that elites' ties are recorded in a uniform way across countries and years, because a single agent records these ties (Mossfon), using the same standard across countries.

Ties Example The following is an example of a typical entry in the raw data: New Russia Venture Partners Inc is an entity incorporated in the British Virgin Islands on 5/23/2003, and

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[18]Due to the desire of Mossfon's clients' for anonymity, in a large fraction of companies it is not possible to discern the ultimate beneficiaries. Anonymity is usually achieved through the use of bearer shares, which award beneficiary status to their (physical) holder. Accounts that use bearer shares show "The Bearer"— or some variation of that title—as the account name. I do not use information from such accounts in constructing my networks.

[19]Though a key feature of offshore companies is their jurisdiction, it does not play a role in constructing my elite networks. I code elites' ties based on their own nationality or country of residence, not the country where their companies are registered. In this manner, elites i and j that are nationals of country k will appear in k's network, independent of where their companies are registered.

[20]Note that there can be other elites that are associated with company m but are not nationals of country k—indeed, this occurs frequently in the data. Though, these elites are financially tied to elites i and j—via their joint association with m—I do not include them in the network for country k, but in the network for their own country.

[21]For a company to be active in year t, its incorporation date must precede t and its inactivation date (if applicable) must be later than t. Also, note that two elites can be tied through more than one company. I plan to account for this feature of the data in future versions of the analysis, by allowing the strength of elites' ties to vary: the more companies elites i and j are jointly associated with, the stronger their tie.

[22]There is a large number of positions a client can have in an offshore company, and some positions do not grant real power over the company. For example, if a name appears as the company's "nominee director" (or a variation of that title), that name is not the true beneficiary of the company, but usually an employee of Mossfon that acts on the beneficiary's account. As such, there is no reason to code that name as an elite and code its ties to other elites. To ensure that I record only substantive ties between Mossfon's clients (elites), I researched the legal powers of every position, and I retain only the positions that grant real powers over companies.

whose officers are Russian nationals Anna Baskakova, Igor Kubanov, and Sergey Vykhodtsev. I code these names as three of the nodes (elites) in the Russia 2003 network, and I add 3 edges (financial ties) between them. To complete the Russia 2003 network, I repeat this process for all other Russian nationals in the data that are associated with companies incorporated in 2003 or earlier. To complete the Russian network for my whole period of study, I repeat this process for all other years during 1990-2015 that Russia was a dictatorship. The same process is applied for all other dictatorship-year observations.

Networks Example Figure 2 shows the financial networks for two countries in the year 2015, Chad (left) and Botswana (right). Note the richer structure of Botswana's network. At the graph's 9 o'clock position there is a very large clique—a group of nodes that are all tied to each other directly—formed by a single company of many officers. Also, in the graph's center there is a very large component—a group of nodes that are all tied (in)directly—formed by several companies with overlapping members. On the contrary, roughly 80% of Chad's elites have no ties, while connected elites only have 1 or 3 ties. These differences are reflected in a range of statistics, aside from the network size (48 nodes in Chad vs. 96 in Botswana). Most relevant to testing my hypothesis is their difference in diffusion: Chad's diffusion measure is roughly 2.8%, whereas Botswana's is a triple of 8.5%.[23] Moreover, diffusion is associated with property rights protection in Chad and Bostwana as predicted by my theory—Botswana is hailed as an all-around economic miracle, while Chad's property rights are among the world's worst.[24]

Data Coverage How representative of elites' financial networks is this data? Obtaining estimates of Mossfon's market share in offshore legal services is difficult, due to the obscure nature of that market. The only available estimates place the firm's share at $5 - 10\%$ (Economist, 2016), with one report labeling Mossfon the "industry leader" (Economist, 2012), and others calling it the "fourth largest" provider (Harding, 2016*b*). Clearly, the Panama Papers by no means capture the universe of elites' financial ties—there are elites that do not use Mossfon for their financial activities, as their are elites that do use Mossfon but have some financial ties that are not established through Mossfon. That said, the data includes information on roughly $136,000$ individuals and $310,000$ companies from all 101 countries that had one or more dictatorial spells during the period 1990-2015.[25] Moreover,

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[23]The difference between the two countries becomes much larger if we allow for indirect diffusion of information, due to the large component in the Botswanan network. That is, if elite i can communicate with j via their mutual tie with l, whenever an elite within the component acquires private information, it will diffuse to the whole component, which constitutes half the Botswanan network.

[24]See Acemoglu, Johnson and Robinson (2002) on Botswana.

[25]These statistics are produced after cleaning the original data to include only individuals—and their offshore companies—from countries that had dictatorial spells during the period 1990-2015. The original data includes many more individuals and their companies from democracies and/or from earlier years, as well as many
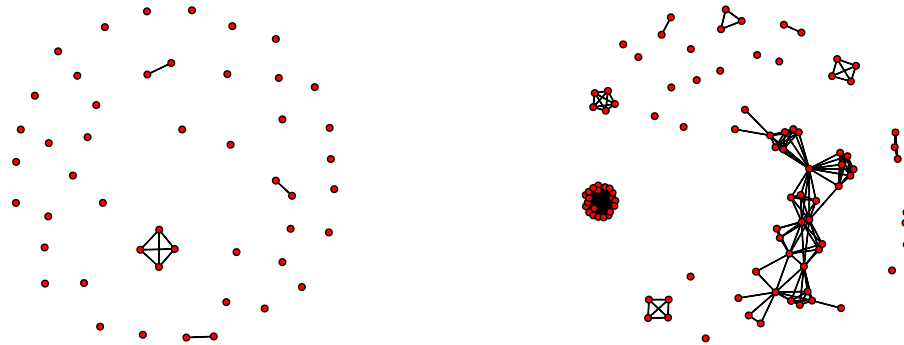
Figure 2: Elite's financial network in Chad 2015 (left) vs. Botswana 2015 (right)

there is no reason to expect that the pattern of elites' financial ties that would be revealed through leaks of other offshore service providers is systematically different.[26] In short, I proceed to use the Panama Papers as a unique source of data on elites' financial ties, with adequate coverage, albeit inevitably reduced external validity.

5 Analysis

In this section, I describe the approach used in my statistical analysis and present my results.

5.1 Approach

Statistical Model My data is structured as a cross-section time-series (101 countries, 26 years). The regression I estimate for country k and year t is

$$y_{kt} = \beta d_{kt} + \boldsymbol{x}_{kt}\boldsymbol{\gamma} + z_k + \tau_t + \epsilon_{kt} \tag{2}$$

observations that cannot be attributed to specific countries. I use an extended version of the Geddes-Wright-Frantz data to identify which countries are dictatorships during 1990-2015 (Geddes, Wright and Frantz, 2014).

[26]I return to this issue when discussing potential sources of bias in my regression estimates.

where d is my measure of diffusion described in Section 4, $\boldsymbol{x}$ a row-vector of controls, z the country intercept, τ the year intercept, and ϵ the error term clustered at the country level.[27] I include country- and year-fixed effects to absorb variation from within-country time-invariant and within-year country-invariant unobservables, respectively.

Dependent Variable My dependent variable is an index of *property rights protection* from the Heritage Foundation.[28] The index is "an assessment of the ability of individuals to accumulate private property, secured by clear laws that are fully enforced by the state" (Holmes, Feulner and OGrady, 2015). The variable lies in the $0 - 100$ range, with a mean of 35 for the country-years in my sample.

Control Variables To control for spurious correlations between property rights and the density of elites' financial ties I include several control variables. The first is the number of nodes (elites) in each network (country-year), logged, to account for the variable's right-skewed distribution. The number of nodes enters the formula for my independent variable, diffusion, and it might also affect the dictator's predation directly—for example, in larger networks there might be more elites to punish the dictator.[29] For a similar reason, I control for (logged) population. I also control for per capita income, as it might increase elites' coordination (e.g. more social capital) while decreasing dictators' incentive to prey (e.g. dictator collects more in taxes).[30] Finally, I control for authoritarian regime-type using Geddes' typology, because the organizational structures associated with different regime-types can affect elites' coordination while also altering the dictator's calculus regarding predation (Geddes, Wright and Frantz, 2014).

5.2 Results

Diffusion Table 1 displays the results from estimating several variations of my regression equation (Equation 2). In line with my hypothesis, the only consistent pattern is the statistically significant and substantively strong positive association between diffusion and property rights protection. Diffusion's statistical significance ranges from above the 99% level to just below the 94% level, while its coefficient ranges from just below 6 to above 20. In the latter case, the substantive effect is large: going from a network with no diffusion ($d = 0$) to one with full diffusion ($d = 1$) is associated with an increase in property rights equal to the

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[27]Country-clustered standard errors account for within-country cross-year correlation of unobservables.

[28]I obtain this index from the latest version of the Quality of Government dataset (Teorell et al., 2011) at the time of analysis (1/16/2017).

[29]Note that the direction of n's effect on d is not unconditional (Equation 1)—the partial derivative depends on x, the number of ties.

[30]Population and GDP/capita data is from the QoG dataset Teorell et al. (2011).

difference between Uganda ($\bar{y} = 43$) and the United Arab Emirates ($\bar{y} = 64$).[31]

Other Variables The coefficients on most control variables have inconsistent signs and/or lack statistical significance. The only exceptions are population and the regime-type indicators for monarchies and personalist regimes. Monarchies have better property rights than party-based regimes (reference category); this may be owed to the strong familial ties between the political and economic elite in monarchies, which constrain the dictator. The opposite pattern holds for personalist regimes, where dictator often fragment the elite in order to undermine its threat (Geddes, Wright and Frantz, Forthcoming).

Table 1: Main Results

	(1)	(2)	(3)	(4)	(5)
Diffusion	16.15***	20.64***	16.54***	9.00**	5.83*
	(5.03)	(4.95)	(4.78)	(3.80)	(3.12)
Log Nodes		2.96***	2.72***	−2.45***	−0.73
		(0.74)	(0.75)	(0.80)	(0.88)
Log GDP/capita		3.17***	1.65.	0.06	0.23
		(0.94)	(0.94)	(1.18)	(1.27)
Log Population		−4.25***	-3.93***	−34.3***	−27.33***
		(0.75)	(0.83)	(4.65)	(5.10)
Military			−1.55		
			(2.59)		
Monarchy			10.35***		
			(2.29)		
Personalist			−7.185***		
			(1.604)		
Country FE				✓	✓
Year FE					✓
N	826	644	641	584	568
Adj R^2	0.01	0.24	0.30	0.88	0.88

NOTES: *p < .1; **p < .05; ***p < .01. Country-clustered standard errors in parentheses. All predictors except regime-type dummies are lagged by 1 year. See text for data sources.

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[31] The average property rights value ($\bar{y}$) for the two countries is calculated using the respective length of their dictatorial spell.

6 Conclusion

In this study, I have argued that an informal institution—financial networks—aid elites in constraining dictators, much like formal political institutions do. The strong, positive ties elites form within financial networks allow them to share private information on the true state of the economy and infer whether the dictator has reneged on his commitment to share rents with them. Where financial networks are more dense, information diffuses more effectively, and elites present a larger credible threat to the dictator if he preys on their shared rents. As such, dense elite networks deter economic predation and constrain dictators, thus strengthening property rights protection. To provide evidence of the positive effect of elite network density on economic institutions, I uncovered the structure of one dimension of elites' financial networks in all dictatorships post 1990, using the largest leak of information on offshore financial ties. Controlling for a host of factors and country- and year-level effects, I find that dictatorships where elites' financial network allows for greater diffusion of information have stronger property rights. I interpret these results as evidence that, though dense ties between elites are usually associated with corruption, nepotism, and patronage, in dictatorships, where the main threat to economic institutions are unchecked dictators, a densely connected elite is the lesser of two evils—it counters dictators' predation.

Directions for future research could revolve around the broader role of networks in dictatorships. Since most networks of political importance are endogenous to politics, one could develop an integrated theory on how networks' role varies, depending on such factors as the dictator's strength, institutional environment, and level of development. Furthermore, in addition to financial ties among economic elites, one could study the role of familial, ethnic, religious, or other ties. Similarly, one could extend the focus to networks among other key players in dictatorships, such as party elites in regimes with dominant parties, ruling families in monarchies, and officers in military regimes.[32] In all of these cases, the main empirical challenge is capturing ties among the actors of interest—in a comparable way within and across countries and/or time. Thus, students of networks in dictatorships will have to combine innovative data-collection with contextual knowledge of the case(s) under study.

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[32]In Derpanopoulos (2017) I study how ties among high-level military officers prior to Greece's 1967 coup affected participation in the coup.

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