Social Origins of Dictatorships: Elite Networks and Political Transitions in Haiti

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Abstract

Existing theories of coups against democracy emphasize that elite incentives to mount a coup depend on the threat that democracy represents to them and what they stand to gain from dictatorship. But holding interests constant, some potential plotters, by the nature of their social networks, have much more influence over whether or not a coup succeeds. We develop a model of elite social networks and show that the likelihood of an elite participating in a coup is increasing in their network centrality and results in rents during a dictatorship. We empirically explore the model using an original dataset of Haitian elite social networks which we linked to firm-level data on importing firms. We show that highly central families are more likely to participate in the 1991 coup against the democratic Aristide government. We then find that the retail prices of the staple goods imported by coup participators differentially increase during subsequent periods of non-democracy. Finally, we find that urban children born during periods of non-democracy are more likely to experience adverse health outcomes.

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1 Introduction

Between 1960 and 2010, 51 countries have experienced a total of 71 democratic reversals (Acemoglu et al., 2014). Existing theories suggest that coups against democracy tend to occur in two circumstances. Firstly, democracy can be very adverse or threatening for some group in society, usually appropriately described as an elite, who have the power to overthrow it. Second, when this group can expect to do well under a dictatorship and democratic regimes cannot commit to keep democracy friendly to them. The first may be true if there is a great deal of inequality in society and the elite are the rich or when elites happen to be invested in activities which can easily be taxed. The second tends to happen when elites face transitory opportunities to challenge or overthrow democracy, perhaps because of economic crises or because of idiosyncratic opportunities to solve the collective action problem.

Ultimately, coups take place because a group of people get together and make a collective decision to overthrow a government. The identity of this group can differ. They may be members of the military, factions within the government, or they could be economic elites who own land, businesses or other assets whose value is threatened by democracy. Within these broad groups, however, there is substantial variation in the level of effort and participation put into the coup. Elites may try harder to overthrow a government when they have more at stake economically or ideologically, but it is also true that there may be variation in their capacity to successfully organize. Social and family networks could be important for organizational reasons or spreading information and helping to coordinate coup activities. In weakly institutionalized environments, family and marriage networks are likely to be particularly important. In any network, however, some people will be more influential or more "powerful" in the sense that their behavior will influence a greater number of other people.

In this paper we undertake to our knowledge the first investigation of the role of social networks in coups against democracy. We begin with the plausible hypothesis that network structures amongst potential coup plotters are important in understanding to what extent individuals participate in a coup, even holding constant interests. To study this issue we develop a dynamic game theoretic model of coups in the spirit of Acemoglu and Robinson (2001, 2006*a*,*b*, 2008) extended to include social networks as modeled by Ballester, Calvó-Armengol and Zenou (2006). There are two types of agents: citizens and elites. There are a fixed number of industries each inhabited by a subset of economic elites. In a democracy the median voter, a citizen, prefers to have competitive markets but is threatened by a coup which can be staged by the elites. Elites choose to exert effort strategically and non-cooperatively to make a coup happen ('coup effort') and they are inter-connected via a social network. We assume that elite actions are strategic complements along the network and the incentive to mount a coup is that if democracy is replaced by dictatorship, the elite can levy 'taxes' on competitors to generate rents for themselves (alternatively one can interpret this as barriers to entry). Though all elites have an incentive to exert effort to induce a coup, we assume that this effort has to be sufficiently large for a particular elite to be observably taking part in the coup (we refer to such an elite as a 'coup participant').

The model has a number of implications we take to the data. First, the willingness of an elite agent to exert coup effort is an increasing function of their network centrality. Intuitively, the more central an elite is in the elite network the more impact his actions have on the action choices of others and the more likely it is that he will be a coup participant. Second, the model predicts that coup participants should gain economically from the coup and in particular should see their prices rise. Third, the model predicts that coups are economically inefficient and that the higher prices which result from less competitive goods markets should have adverse effects on citizens welfare.

To test these hypotheses we constructed several original Haitian datasets which we describe in detail in section 5 of the paper. There were a number of motivations for testing the ideas in Haiti. Haiti is archetypical of many politically unstable countries. The case study literature on Haiti overwhelmingly details the power of elite families to make or break democracy and the immense economic and social inequality in Haiti is certainly consistent with substantial political inequality. Second, after the 1991 coup against the democratically-elected government of Jean-Bertrand Aristide, the U.S. Treasury Department published a targeted sanctions list which named individual official and unofficial leaders in the coup government in power during the early 1990s. The U.S. had sanctions against Haiti from 1991 until the restoration of democracy in 1994 based on an executive order by President Bush in 1991 which was subsequently updated with specific sanctioned individuals by the Office of Foreign Assets Control. This list was created on the basis of rigorous intelligence efforts by the United States government to determine who had provided material or non-material support to the 1991 coup. This gives us a rare objective list of people who participated in a coup. Third, there are rich genealogical sources for Haiti of a type which are rare in coup prone countries which allow us to understand the social networks of elite families and map elite family involvement in business, political and social life back to the 19th century. Moreover, Haiti is sufficiently small that one has some hope of constructing a relatively complete network. Fourth, given our focus, it is advantageous that there is variation in the key dependent variable because of frequent coups and transitions. Finally, it is much easier to access data on imports than on domestic production because goods are tracked when they enter the country. Because much of the Haitian elite's wealth stems from imports, and because many Haitian households' consumption baskets, particularly in urban areas, are highly import-dependent, a relatively large portion of the Haitian economy is visible to us.

We use this data in several ways. First we use our data at the family level to estimate the probability that a particular elite family participated in the 1991 coup. We do this for our whole sample of elites and a sub-sample that we matched to detailed data on imports. This importing data allows us to examine the impact of centrality on coup participation conditional on various product attributes, as well as a number of other variables such as immigration history, and past political involvement. Our main results here are very consistent with the model: the probability that a family participated in the coup is increasing in a range of centrality measures, including degree, Bonacich, and eigenvector centrality. We also find that families with histories of being military elites are more likely to take part in the coup.

Next we turn to the issue of the impact of coup participation on retail prices. We test whether the domestic prices of the goods imported by those who took part in the 1991 coup went up more than the prices of goods imported by non-participants in a subsequent, but highly similar, period of autocracy. In 2001 Aristide was elected again but on February 29 2004 was ousted by a coup for a second time. Democratization came only in 2006 with the election of René Préval. We obtained monthly data, underlying the Haitian CPI, on the retail prices of 18 goods in Haiti between January 2001 and December 2012. This data does not cover the coup of 1991, but does cover the second coup against Aristide in 2004, and the 2006 re-democratization. We estimate a dynamic panel data model and use a difference in differences approach where we interact the proportion of the market that is controlled by families who participated in the 1991 coup with an indicator which is one for an autocratic period. We find robust evidence that the prices of goods imported by coup participants increased relative to others during autocracy.

Finally, we look directly at welfare, in particular child health. We use data from four waves of the Demographic and Health Survey (DHS) which took place in 1995, 2000, 2006 and 2012. We use child height- and weight-for-age Z-scores (measured against the WHO standard distribution). We again use a difference in difference approach because we hypothesize that the price rises induced by the coup would hit people much harder in urban areas where people are more reliant on purchased food. We find robust evidence that urban children born during autocratic reversions are smaller both in terms of height and weight over time and relative to rural children born at the same time. Together, our results suggest that network structure is important for non-democratic transitions, and, via imports, ultimately important for welfare and development.

We take several steps to minimize endogeneity concerns, and explore robustness of our estimates to many different sets of controls and specifications. In examining the impact of network centrality on coup participation we treat the network as exogenous. Nevertheless, our results are similar using measures of network centrality using historical rather than contemporary marriages, minimizing reverse causality. Beyond excludability, network variables create many issues around spillovers that we only deal with partially. In examining the impact of coup participation on commodity prices we also treat as exogenous the particular sector that an elite is invested in. However we conduct a number of falsification exercises to show that it is in fact autocracy that raises the price of goods in sectors with coup-participating elites. In our specification for prices we include product-level fixed effects, which controls for time-invariant omitted variables which influence the prices such as the fact that a more powerful or connected elite family may have invested heavily in a particular sector in the past. Finally, with respect to welfare, though it could be that there are omitted variables correlated both with dictatorship and child health that explain the larger effects in the urban areas, the negative effect seen both in the countryside and the city suggest that prices may have been the more important mechanism.

Our paper is related to quite a few other contributions. Our basic theoretical results on the connection between network centrality and coups are applications of ideas first proposed by Ballester, Calvó-Armengol and Zenou (2006) (see Calvó-Armengol, Patacchini and Zenou (2009) for an empirical application to peer effects in education) and Galeotti, Goyal, Jackson, Vega-Redondo and Yariv (2010). Our model is also related to the broader literature which has developed models of coups, in particular Acemoglu, Ticchi and Vindigni (2010) who show how the military tends to support coups since this generates repression rents which democracy cannot match. A more recent literature has focused on strategies that autocrats use to maintain themselves in power, but has examined mostly the structure of institutions (e.g. Gandhi, 2008, and Svolik, 2012). More closely related to our work is the research of Carter (2014) who shows how the president of Congo-Brazzaville, Denis Sassou-Nguesso, used various types of strategies to maintain himself in power which include building social networks.

With respect to more qualitative work, though Moore's (1966) great book, which inspired our title, did talk about the "social origins" of dictatorship, he was more concerned with class structures and coalitions than with social networks as we understand them (and work that directly built on his, such as Luebbert (1991) had a similar emphasis). Existing research on coups and democratic collapse dates to the seminal books of O'Donnell (1973), Linz and Stepan (1978) and Collier (1979) but never advanced the hypothesis that the structure of social networks of potential coup plotters were an important determinant of coups.

On the empirical side to our knowledge nobody has estimated a micro model of participation in a coup before. Indeed, most of the empirical work on political regime transitions has been very macro (an exception is the pioneering work of Aidt and Franck (2013), who estimated a micro model of the decision to extend voting rights in 19th century Britain). Existing empirical work on the determinants of regime transitions is quite agnostic about the main driving forces. Acemoglu, Johnson, Robinson and Yared (2008, 2009) found no support for any version of the modernization hypothesis,[1] though crises do seem to robustly trigger transitions (see Brückner and Ciccone (2012)). Other empirical work has substantiated the assumption that coups have

[1] The results of Przeworski, Alvarez, Cheibub and Limongi (2000) were shown by Acemoglu, Johnson, Robinson and Yared (2008, 2009) to come only from the cross-section and are likely due to omitted variables bias.

materialistic motivations. Dube, Kaplan and Naidu (2011), for example, examine the impact of coups and their anticipation on firm's asset prices and Mitra, Thomakos and Ulubaşŏglu (2002) show that special interests do better under dictatorship than democracy. Naidu (2012) showed how disenfranchisement in the US South raised land prices and reduced public good provision and Dasgupta and Ziblatt (2014) show that the 1832 Reform Act in Britain led to lower bond prices, consistent with the idea that democracy was anticipated to be more redistributive.

Our finding that autocracy in Haiti is bad for welfare is also consistent with other recent empirical work. Closest to our results here, Kudamatsu (2012) finds that democracy lowers child mortality in Africa, Besley and Kudamatsu (2006) find that democracy is associated with higher life expectancy and lower infant mortality, and Blaydes and Kayser (2011) find that nutrition improves with democratization. Others show that democracy leads to more efficient provision of public goods (Burgess et al., 2015). More broadly, Acemoglu, Naidu, Restrepo and Robinson (2015, 2014) find robust evidence that coups lead to lower economic growth and lower public good provision in several dimensions (see also Myersson (2013)).

Our research is also related to a great deal of research on networks. In particular our approach to measuring the power of elite agents builds on a rich tradition in sociology, e.g. Padgett and Ansell's (1993) seminal study of the power of the Medici family in medieval Florence (see also Puga and Trefler, 2014). In particular we use the important work of Bonacich (1987) to measure power and influence in networks. The literature of social movements has also stressed the importance of network structure in understanding the potential for and impact of collective action (Oberschall, 1973, Zald and McCarthy, 1987, McAdam, McCarthy and Zald, 1988, and the essays in Diani and McAdam, 2003). This literature also contains many rich empirical studies of the relationship between networks and collective action (e.g. Barkey and van Rossem, 1997, Gould, 1993, 1995). Nevertheless, to our knowledge these ideas have not been applied to the study of coups and nobody has estimated a model of the relationship between network position and participation of the kind we analyze here.[2]

[2] Interestingly there is controversy in this literature about whether or not central actors play a critical role in fomenting collective action. While Zald and McCarthy (1987) argue that leaders tend to be people who are central in networks others argue that peripheral or marginal people tend to more important. Our results, albeit in one particular context, are consistent with the hypothesis of Zald and McCarthy (1987).

Network analysis has also been used in recent political science research (see Ward, Stovel and Sacks, 2011, for a survey), for example to look at linkages between politicians and clients (Calvo and Murillo, 2013), between legislators (Alemán and Calvo, 2013) and between citizens (see Campbell, 2013, for an overview). The social connections between politicians and firms have also been studied, for example in Indonesia during the rule of President Suharto (Mobarak and Purbasari, 2006; Fisman, 2001). A recent paper by König et al. (2014) also conducts a political economy extension of Ballester, Calvó-Armengol and Zenou (2006), but the model and empirical context is civil war, while we study transitions between democracy and non-democracy. Most related to our study Cruz, Labonne and Querubín (2014) examine the social networks of politicians in the Philippines showing that people with higher network centrality are more likely to become politicians, they get more votes when they do so, and that this works through a greater ability to buy votes.

2 Background on Haiti

Haiti is underdeveloped and unequal with 65% of its population below the poverty line and a likely underestimated Gini coefficient of income inequality of 0.6. Much of the wealth derives from international trade, the ownership and control of which has historically been very concentrated. The roots of this appear to be the entry of foreign merchants in the late 19th century who typically stayed in Haiti as resident aliens to maintain the protection of foreign governments, but often married into elite Haitian society to circumvent restrictions on foreign ownership of Haitian property (Plummer, 1988, 53-54, 63). Beginning in the 1890s groups of Syrians and Lebanese began arriving, reaching an estimated population of six thousand in 1903. By that time, these more recent immigrants owned the major trading houses, as well as transportation and communication systems (Plummer, 1988, 25, 49). According to the Haiti "Blue Book", produced by the U.S. forces during the occupation in the 1910s and 1920s, "The provisional heart, lungs and stomach of the Republic of Haiti, which means literally, agriculture, commerce and industries, from 1804 to 1915 were largely foreigners: Germans, French, Syrians, Belgians and English, with importance in the order named, who cared very little what became of

Haiti so long as they got their 'bit' " (1919, 23).

The Duvalier dictatorship after 1957 preserved this concentrated economic structure, but reallocated ownership rights from foreign companies to domestic elites. Monopolies were a common reward for economic elites who worked with the government. A long list of industries became monopolies by presidential decree during the 1950s and 1960s: "mineral and petroleum exploration and exploitation, the construction and operation of television stations, the planting and processing kenaf, sesame, and ramie, the processing of guano, the manufacture of chocolate, a fertilizer industry, the development of casinos and hotels, the construction of a sugar factory, the improvement of the telephone system, etc." (Rotberg, 1971, 210). By 1985, some 19 families held almost exclusive rights to import many of the most commonly consumed products in Haiti, as detailed in Figure 1. Another twenty to thirty families held import licenses for another 92 items (Fass, 1990, 30).

[Figure 1 about here.]

Democratization threatened the economic interests of these elites. The 1990 election brought to power Jean-Bertrand Aristide with almost 70% of the vote. Aristide had campaigned on a platform of pro-poor redistribution, and began putting in place policies to give the state a more "interventionist, dirigiste, and even protectionist role in economic development" (Fatton, 2002, 113). During the first period of democracy in 1991, the Aristide regime increased enforcement of tax collection, including import fees and arrears (Hallward, 2010, 33). As a result, the *Direction Générale des Impôts* "registered a historic increase in total revenues, thereby reversing the opposite tendency of previous governments" (Dupuy, 2007, 118). It also put into place price controls on products of first necessity such as rice and wheat (Hallward, 2010; Dupuy, 2007; Farmer, 1994). Last, the government attempted to pass legislation raising the minimum wage to about $3 per day (National Labor Committee, 1993; Farmer, 1994; Dupuy, 2007).

Although the 1990 elections were unprecedented in Haiti, there was a long history of private sector participation in transitions between autocratic governments. Fass (1990, 26) writes that "commercial interests were often sufficiently wealthy that in alliance they could buy a segment of the official army, a private army, or crowds of demonstrators, and thereby unseat a faction holding control of government." When the democratic government proved unwilling to continue providing the benefits that these elites had enjoyed under past regimes, the "few powerful families" that were "most closely allied with the neo-Duvalierists" began working to overthrow Aristide (Dupuy, 2007, 120).

The first coup occurred in September 1991 just eight months after Aristide took office, and put into power a military government under the authority of Raoul Cédras. As soon as Aristide was elected, several of the wealthiest families in Haiti began "collecting the millions of dollars they would need in order to pay the army to conduct another coup" during the summer of 1991 (Hallward, 2010, 34). The *New York Times* reported that some wealthy Haitians offered as much as $5,000 apiece to selected soldiers and policemen for their participation in the coup (French, Howard. *The New York Times*., October 13 1991). Farmer (1994, 150) quotes one rich businessmen as saying that "'everyone who is anyone is against Aristide... except the people'." The U.S. government, opposed to Aristide's policies but nevertheless concerned with the accounts of political violence and streams of migrants pouring out of Haiti, imposed sanctions onto the military junta and its economic backers.

Aristide returned in 1994 and served out the rest of his term to be replaced by the election of René Préval in 1996. Aristide was re-elected in 2001 but ousted by a second coup in 2004. Again, economic elites partnered with armed groups to push Aristide from power. Although much less is known about which specific families participated in this coup, the top private sector backers were largely the same network of individuals. Andy Apaid, who had played a catalyzing role in 1991, is credited with having the most control of any member of the private sector on the gangs and rebels that precipitated Aristide's departure from power. Apaid, along with his brother-in-law Charles Baker (also a sponsor of the 1991 coup), began offering to pay gang leaders in Cité Soleil, a poor suburb of Port-au-Prince, to turn against Aristide. One gang leader who took up the offer was paid $30,000 and offered a U.S. visa (Hallward, 2010; Podur, 2013). It also appears that Apaid had control over the rebels (the National Revolutionary Front for the Liberation and Reconstruction of Haiti) who advanced on Port-au-Prince in 2004: Colin Powell reportedly called Apaid in late February 2004 after the rebels took control of Cap Haitien and asked him personally to restrain them (Hallward, 2010, 224-225).

Shortly after the 2004 coup, "the collection of income taxes was suspended for three years, supposedly to compensate members of the elite who had suffered property damage during the elite-sponsored insurgency" (Hallward, 2010, 261). Schuller (May-June 2008) reports that this three-year tax break was directed on large importers only, and that the interim government formed under Prime Minister Gérard Latortue after Aristide's overthrow, also lowered the tariff for imported rice. After the February 2004 coup, "as the last remaining price controls and import regulations were lifted after Aristide's departure, the handful of leading comprador families who dominate Haiti's ruling class took advantage of the decline of local agricultural production to help push food prices up by around 400 percent; the price of rice had already doubled just five months after the February coup" (Hallward 2010, 261, Weiner, Tim. *The New York Times*. June 1 2004).

3 Model

3.1 Demographics, Preferences and Production Structure

We develop a simple model to formalize the connection between coup participation and network position. There are two types of agents which play roles in the model, citizens and elites, and all of whom live forever. Let $\mathscr{C}$ and $\mathscr{E}$ denote the sets of citizens and elites respectively. There are E elites in total, so $|\mathscr{E}| = E$, where $|S|$ denotes the cardinality of set S, and we use $e \in \mathscr{E}$ to refer to a representative elite. Similarly, $|\mathscr{C}| = L > E$ to ensure that the median voter will be a citizen and for convenience normalize so that $L + E = 1$. Citizen/consumers have a per-period standard Cobb-Douglas utility function defined over M different goods:

$$U_i = \prod_{m=1}^{M} x_{im}^{\alpha_m} \tag{1}$$

where x_{im} is the consumption of good m by agent i and α_m is the share of income spent on good m where $\sum_{m=1}^{M} \alpha_m = 1$. Since it does not play an important role in the analysis we let $\alpha_m = \alpha$ for all m and thus $\alpha = 1/M$. Let x_m be the aggregate demand for good m. There are no intertemporal economic linkages and no saving or accumulation. The only economic decisions citizens take is to allocate their exogenous income between the different goods. Each agent maximizes this utility function subject to the budget constraint $\sum_{m=1}^{M} p_m x_{im} \leq Y$ where p_m is the price of good m and Y is the income of citizen i in terms of the numeraire which we treat as exogenous and identical for all citizens. Standard arguments imply that the Marshallian demand function for good m can be written as, $x_m = Lx_{im} = \frac{LY}{Mp_m}$ since there is mass L of citizens.

The other type of agent we call elites who own firms distributed across the different sectors and who can also take actions to overthrow democracy and create a dictatorship. Let $\mathscr{E}_m \subseteq \mathscr{E}$ denote the set of elites who are active in sector m. We assume that each good is produced by a sector and that there are multiple elites in each sector of the economy, but this varies across sectors and is fixed. We assume that each good can be produced with a constant returns to scale technology with fixed marginal cost κ. However, elite producers are also capacity constrained and can produce in total q_m units of output in a sector m. We assume later that for all sectors total elite supply is less than the total demand for that good so we do not have to consider rationing schemes across elites.

In addition to the elite producers in a sector there is also a competitive fringe of firms who have access to the same technology. The equilibrium in each sector without any government intervention therefore will involve elites limit pricing and setting their prices equal to κ and profits are zero for each elite in each sector. However, we allow the government to set a 'tax' of $\tau_m \geq 1$ which varies across sectors which raises the marginal cost of the fringe producers only, which increases the prices that the elite can set. One can interpret this tax in various ways. Historically in Haiti, as we have seen, elites were given privileged access to imports and forms of monopoly or oligopoly control over different sectors supported by entry barriers and various types of government regulations. We can interpret τ_m as an entry barrier which makes it more costly for fringe producers to produce good m thus allowing incumbent elites to raise prices and extract rents. Thus with government intervention the limit price will be $p_m = \tau_m \kappa \geq \kappa$ and profits of a particular elite member e who produces in sector m will be $p_m q - \kappa q$ or $(\tau_m - 1) q \kappa \geq 0$, and clearly profits of elite agent e in sector m are increasing in the tax levied on the fringe producers in that sector. The total profits of the elite in sector m is $\pi(\tau_m) = (\tau_m - 1) q_m \kappa$ and define $\pi_e = \sum_{m=1}^{M} w_{em} \pi(\tau_m)$, where w_{em} is the share of total profits in industry m that accrues to elite e. Total elite profits will be $\sum_{e=1}^{E} \pi_e = \sum_{e=1}^{E} \sum_{m=1}^{M} w_{em} \pi(\tau_m)$.

Though levying taxes creates profits for elites it is costly. Specifically we assume that there is an administrative cost of $C(\tau_m)$ associated with levying the tax rate τ_m in sector m. C is a strictly increasing, differentiable and strictly convex function with $C(0) = 0$. The total cost of levying the tax vector $\tau(s) = (\tau_1(s), \tau_2(s), ..., \tau_M(s))$ would be $\sum_{m=1}^{M} C(\tau_m)$.

We can now write the indirect utility of a citizen as a function of the policy vector $\tau(s)$ which depends on the state, to be defined shortly, which is

$$W^i(\tau(s)) = \prod_{m=1}^{M} \left(\frac{Y}{M\tau_m(s)\kappa} \right)^{\frac{1}{M}} - \mathbf{1}_D \sum_{m=1}^{M} C(\tau_m(s)). \tag{2}$$

Here $\mathbf{1}_D$ is an indicator function such that $\mathbf{1}_D = 1$ if the political state is democracy and $\mathbf{1}_D = 0$ otherwise. Hence (2) says that the indirect utility of citizens is made up of a part which is based on their consumption decisions minus an equal share of the deadweight losses from taxation in a democracy (we assume below that in a dictatorship that any deadweight losses are shared amongst the elite coup participants). All agents aim to maximize the expected present discounted value of utility where future payoffs are discounted by the factor $\beta \in (0,1)$. For consumers their per-period payoff in each period is simply (2). For members of the elite it is profits minus the cost of taking actions to mount a coup which we will discuss below.

3.2 Political Regimes, Network Structure and Transitions

There are two possible political regimes, denoted by D and N, corresponding to democracy and dictatorship (nondemocracy). At any point in time, the "state" of this society will be represented by $s_t \in \{D, N\}$, which designates the political regime that applies at that date. Irrespective of the political regime (state), the identity of elites and citizens do not change. In a democracy we will assume that policy is chosen by the median voter, a citizen/consumer, while in a dictatorship it will be chosen collectively by the elite who have taken part in a coup. We model this collective choice by assuming that tariffs are set to maximize the sum of utilities of a sub-set of the elite, who we call the 'coup participants' (to be defined shortly), minus the administration costs of the tariffs.

Transitions between democracy and dictatorship and back can occur because the elite can use their 'de facto power' to try to overthrow democracy or maintain dictatorship. In particular, suppose that elite $e \in \mathscr{E}$ spends an amount $a_e \in [0,1]$ as a contribution to activities to create or sustain dictatorships. We can interpret this action in different ways, for example it could involve bribing the army, or in hiring paramilitaries directly, both of which have certainly played a role in Haiti. If the elite take actions in this way then their aggregate 'power' is

$$P^{\mathscr{E}}(a_e, a^{-e}(s)) = \frac{1}{E}\left(a_e + \sum_{e' \neq e} a_{e'}\right) \tag{3}$$

where a_e is the action choice of elite member e, $a^{-e}(s)$ the vector of actions of elite members other than e and the notation $\sum_{e' \neq e} a_{e'}$ means summation over all elite agents except agent e. The scaling factor $\frac{1}{E}$ is added simply to make sure we have a well defined probability of a coup below since it guarantees that the sum of the actions is always between 0 and 1. There is a cost associated with action a_e which is captured by the function $\chi(a_e)$ which takes the specific form

$$\chi(a_e) = -\sum_{e' \neq e} \omega_{ee'} a_{e'} a_e + \delta \frac{a_e^2}{2} \tag{4}$$

where δ is a positive constant which are the same for all agents. (4) has a usual quadratic term in the own action of elite e, the term $\delta \frac{a_e^2}{2}$, but it also includes an interaction term so that if the action of player e increases, the marginal cost of exerting effort for player e' falls if the two agents are connected in the elite social network. This is so if $\omega_{ee'} \neq 0$ and we shall assume that $\omega_{ee'} > 0$ for all ee' which guarantees that the action choices of the elite are strategic complements. The $E \times E$ matrix whose entries are the individual $\omega_{ee'}$ is the adjacency matrix which shows the network interactions between the elites. The combination of equation (3) and (4) means that our model is an adaption of the preferences proposed by Ballester, Calvó-Armengol and Zenou (2006) (see also Jackson (2008), Section 9.5.2) to the technology for generating de facto political power. We assume this technology is the same in democracy and non-democracy.[3] The formula in (4)

[3]There may be a number of reasons for why the elite's ability to lobby and bribe politicians or use paramilitaries may be more restricted in democracy, Acemoglu and Robinson (2006*b*) allow this technology to differ between democracy and non-democracy.

brings out the network interactions between the actions of the different elite members and the formula builds in that these actions are strategic complements. We do not take a strong stand on the source of the complementarity in actions among the elite. Information flows, trust, or altruism could all generate situations where elite actions were strategic complements.

Whether or not a coup succeeds depends on whether the power of the elite is greater than the power of the citizens (as in Acemoglu and Robinson, 2008). Since we assume that the citizens are too numerous to solve the collective action problem this power is not systematically articulated but nevertheless in idiosyncratic circumstances the citizens may have some power. We model this as a shock θ which is drawn every period from a distribution function H with density function h on support $[0,1]$. Thus the power of the citizens is

$$P^{\mathscr{C}}(a(s)) = \theta \tag{5}$$

Denote the probability that there is a dictatorship next period by $p(a_e, a^{-e}(s))$. This is the probability that the power of the elite is greater than the power of the citizens, or the probability that $P^{\mathscr{E}}(a_e, a^{-e}(s)) \geq P^{\mathscr{C}}(a(s))$, which is simply

$$p(a_e, a^{-e}(s)) = H\left(\frac{1}{E}\left(a_e + \sum_{e' \neq e} a_{e'}\right)\right)$$

For simplicity and since we want to maintain a linear quadratic structure of payoffs we assume that H is uniform with constant unit density. Shortly it will be usedul to use the notation $p(a(s))$ for $p(a_e, a^{-e}(s))$ with $a(s)$ referring to the vector of elite action choices in state s.

3.3 Timing of Events

We now explain the timing of events in this basic environment.

At each date t, society starts with an inherited political state $s_t \in \{D, N\}$. Given this, the following sequence of events take place:

1. Each elite agent $e \in \mathscr{E}$ simultaneously chooses $a_e \in [0,1]$ and $P^{\mathscr{E}}(a_e, a^{-e}(s))$ is determined according to (3).

2. The random variable θ is drawn from the distribution H, and $P^{\mathscr{C}}$ is determined according to (5).

3. If $s_t = D$ and $P^{\mathscr{E}} \geq P^{\mathscr{C}}$ democracy collapses, the coup participants collectively decide the tax vector τ and $s_{t+1} = N$; if $P^{\mathscr{E}} < P^{\mathscr{C}}$ the tax vector is chosen by the median voter and $s_{t+1} = D$. Consumption takes place.

4. If $s_t = N$ and $P^{\mathscr{E}} \geq P^{\mathscr{C}}$ then dictatorship survives, the coup participants collectively decide the tax vector τ and $s_{t+1} = N$; if $P^{\mathscr{E}} < P^{\mathscr{C}}$ dictatorship collapses, the tax vector is chosen by the median voter and $s_{t+1} = D$. Consumption takes place.

5. The following date, $t+1$, starts with state s_{t+1}.

The stage game follows Acemoglu and Robinson (2008) though they also allow the decision makers to directly choose the next political state s_{t+1}. We suppress this for simplicity though it could easily be brought into the analysis.

4 Analysis of the Model

We now analyze the model described in the previous section. We focus on the pure strategy Markov Perfect Equilibria (MPE). An MPE imposes the restriction that equilibrium strategies are mappings from payoff-relevant states, which here only include $s \in \{D, N\}$ (dropping time subscripts). In particular, in an MPE strategies are not conditioned on the past history of the game over and above the influence of this past history on the payoff-relevant state s. Nevertheless, this is an interesting concept here because the game is dynamic with state transitions. An MPE will consist of decisions by the median voter $\tau(D)$ about whether or not set positive taxes and also which political state to choose if he wins the contest; decisions by the elite $\tau(N)$ on what taxes to set and what political state to choose; and contribution functions $\{a_e(s)\}_{e \in \mathscr{E}}$ for each elite agent (potentially as a function of the political state). The focus on MPE is natural in this context as a way of modeling the potential collective action problem among the elite.[4]

[4]It is worth emphasizing here that the timing of the game and the restriction to Markov strategies rules out in a simple way the median voter trying to set (or promise) positive taxes in order to avoid a coup. There are different

The MPE can be characterized by backward induction within the stage game at some arbitrary date t, given the state $s \in \{D,N\}$. Let $V^i(s)$ for $s \in \{D,N\}$ be the value function of player of type i in state s. Since all citizens are the same we use the generic notation c for citizens. A generic elite is denoted e.

We can now write down the optimization problem of a representative citizen in democracy

$$\begin{aligned} & V^c(D \mid a(D), a(N), \tau(N)) \qquad (6) \\ = & \max_{\tau(D)\geq 1} \{p(a(D))(W^c(\tau(N)) + \beta V^c(N \mid a(D), a(N), \tau(N))) \\ & + (1 - p(a(D)))(W^c(\tau(D)) + \beta V^c(D \mid a(D), a(N), \tau(N)))\}, \end{aligned}$$

Here $V^c(D \mid a(D), a(N), \tau(N))$ defines the expected present discounted value of the citizen in a democracy when elite agents choose actions $a(D)$ and $a(N)$ in democracy and dictatorship, respectively, and when the elite coup participants choose action $\tau(N)$. The probability a coup succeeds and democracy collapses is $p(a(D))$. In this event we assume, as mentioned above, that the policy is chosen collectively by the participating elite which gives an indirect utility to the citizens of $W^c(\tau(N))$. A citizen then gets the continuation value $V^c(N \mid a(D), a(N), \tau(N))$ which is discounted back to the present. With probability $1 - p(a(D))$ the coup fails, the median voter receives the payoff $W^c(\tau(D))$ corresponding to the policy chosen $\tau(D)$ (recall we defined this net of administrative costs) and the value $V^c(D \mid a(D), a(N), \tau(N))$ recurs since democracy survives.

Applying backward induction within the stage game it is clear that if the coup fails then in a MPE the median voter will set $\tau(D) = 1$. Taxes create deadweight administrative costs and lower consumer welfare so it cannot be optimal in an MPE to set a tax rate greater than one. Nevertheless, this is not the case if a coup happens since the participating elite will then collectively set the tax rate and since higher taxes generates higher prices and profits for them,

ways this can be modelled. For example, in Acemoglu and Robinson (2001) such promises may not be credible with Markov strategies when the opportunity to mount a coup is transitory. Acemoglu and Robinson (2006a) show that even using history dependent strategies can only partially overcome this problem. An alternative approach would be to allow the median voter to make such offers but focus on the part of the parameter space where it is not optimal to do so (given the fact that they generate current costs and future benefits - in terms of fewer coups - for high enough discount factors it will not be worthwhile to make concessions).

they may have an incentive to set $\tau(N) > 1$.

Let's now examine the problem of the elite about what level of tax to set if the coup succeeds. Though in equilibrium every member of the elite will have an incentive to exert effort to make a coup happen we assume that only some sub-set of these, the coup participants, actually get to decide on the taxes after the coup. The motivation of this is that the case study literature suggests that it is unlikely that everyone who supported the coup and even contributed resources to it, was able to exercise real decisionmaking power after the coup succeeded. It is plausible that our list of coup participants is better thought of as being something akin to the leaders of the coup. To model this distinction between coup participants, who are on our list, and other elites who put effort into the coup but not enough to get onto the list we assume that even if all elite agents exert positive effort, only elite agents with $a_e \geq \bar{a}$ get to decide on the tax rate, where $\bar{a}$ is an exogenous parameter. Denote the sub-set of the elite who are coup participants by $\mathscr{E}_{a_e \geq \bar{a}} \subseteq \mathscr{E}$ and the subset that are invested in sector m (have $w_{em} > 0$) who chose $a_e \geq \bar{a}$ by $\mathscr{E}_{m,a_e \geq \bar{a}}$ where $\mathscr{E}_{m,a_e \geq \bar{a}} \subseteq \mathscr{E}_{a_e \geq \bar{a}}$. We assume that this situation is the same in dictatorship as in democracy so that when the elite are defending dictatorship it is again the same coup participants who benefit from this if dictatorship survives and $\bar{a}$ does not depend on the political state.

Note that this assumption means that for a given set of coup participants, we have to check that no agent e' who chose $a_{e'} < \bar{a}$ would wish to change their action and increase it to become a participant and have their preferences taken into account in the tax setting stage. Intuitively, this would not happen if the marginal benefit to participating was low compared to the cost of distorting the action choice. In the Lemma in the Appendix we show that, under a sufficient condition, for a given $\bar{a}$ there exists an $\hat{a}_e^* \in (0, \bar{a})$ such that no elite who optimally choose $a_e \leq \hat{a}_e^*$ will wish to distort their action choice upwards to become a participant. For simplicity we assume that elite agents are sufficiently different in terms of their parameters that there exists no elite agent whose action choices fall into the interval $(\hat{a}_e^*, \bar{a})$ (to rule out a mass of agents at exactly $\bar{a}$). The next assumption is a sufficient condition which also ensures that all elite agents make interior choices, in particular ruling out a corner solution at $a_e = 1$. (Note that we cannot have a corner solution with $a_e = 0$ because at the origin the marginal cost of actions is zero while the marginal benefit for all elite agents is strictly positive.)

Assumption 1:

$$\delta > \max\left\{2\sum_{m=1}^{M}\left(\left(C'^{-1}(q_m\kappa)-1\right)q_m\kappa - C(C'^{-1}(q_m\kappa))\right), \right.$$
$$\left.\frac{1}{E}\sum_{m=1}^{M}\left(\left(C'^{-1}(q_m\kappa)-1\right)q_m\kappa - C(C'^{-1}(q_m\kappa))\right) + \sum_{e'\neq e}\omega_{ee'}\right\}$$

The two expressions on the right-hand side are respectively an upper bound on the maximal marginal payoff possible by becoming a coup participant, when you are not one already, and getting to help determine the tax rate, and an upper bound on the maximal payoff possible to a coup participant. In addition to guaranteeing that elite choices are interior, this assumption guarantees, as the Lemma in the Appendix shows, that there exists an $\bar{a} < 1$ which, as discussed, allows us to distinguish between the two sub-sets of the elite, in particular conceive of a separate set of coup participants who enjoy the benefits of getting to set the tax vector. It guarantees in effect that the marginal profits for becoming a coup leader that an elite member who chose an $a_e \leq \hat{a}_e^*$ would enjoy are not large enough to overcome the disutility of distorting a_e to $\bar{a}$.

With this assumption we can proceed to find the optimal tax vector for a given set of coup participants. This is a vector $\tau(N)$ which solves the maximization problem

$$\max_{\tau(N)\geq 1}\sum_{e\in\mathscr{E}_{m,a_e\geq\bar{a}}}\left(\sum_{m=1}^{M}w_{em}\left(\pi_m(\tau_m(N)) - \frac{C(\tau_m(N))}{\sum_{e\in\mathscr{E}_{m,a_e\geq\bar{a}}}w_{em}}\right)\right). \qquad (7)$$

The term $\sum_{m=1}^{M}w_{em}\pi_m(\tau_m(N))$ in (7) is the profits of elite member e from levying tax τ_m in the sectors he is active in. The term $\sum_{m=1}^{M}w_{em}\frac{C(\tau_m(N))}{\sum_{e\in\mathscr{E}_{m,a_e\geq\bar{a}}}w_{em}}$ is the share of the deadweight administrative losses that elite coup participant e incurs in each of the sectors she is active in. Note that the presence of $\sum_{e\in\mathscr{E}_{m,a_e\geq\bar{a}}}w_{em}$ in the denominator is to make sure the shares of the cost amongst the coup participants add up to one. Finally we sum this over all elite agents who are in the set of coup participants.

The solution to this problem is a recursive system of M equations in M unknowns given by the first-order conditions

$$q_m \kappa \sum_{e \in \mathscr{E}_{m, a_e \geq \bar{a}}} w_{em} = C'(\tau^*_m(N)) \text{ for } m = 1, .., M \tag{8}$$

The left-hand side of (8) is the marginal impact of an increase in the tax rate in sector m, which is increasing in the extent to which the elite invested in sector m took part in the coup. The right side is the marginal cost. At the optimum the tax, denoted $\tau^*_m(N)$, the rate is set by the coup participants so that the marginal deadweight administrative loss is equal to the marginal benefit in terms of higher profits.

(8) generates a simple observable implication. It implies, since the cost function C is strictly convex, that the greater the proportion of output in sector m controlled by elites who took part in the coup, the higher the tax levied in that sector will be and consequently the higher the price of that good will be. An alternative way of saying this is that given the demand structure, the higher the share of market m controlled by the elite, the higher the tax and price will be.

It is important to note that this way of modelling the collective choices of elites implies that the tax rate that a particular elite gets does not depend on the amount of effort they put into the coup. Our motivation for this is similar to that in the incomplete contracting literature (e.g. Grossman and Hart, 1986) or matching and search literature (Mortensen and Pissarides, 2011). Putting effort into a coup is non-contractible effort, like making a specific investment in a firm, or searching for a job vacancy. Ex post, once this non-contractable effort has been made, the relevant set of agents, a firms and its workers, or here an elite which has overthrown a democratic government, have to decide on the allocation of the surplus. That this does not necessarily happen in a way which is closely tied to initial investments is a key part of the incomplete contracting and search literatures and we believe a realistic way to model what happens after a coup. The particular form of (7) characterizing taxes is inessential however, any type of multi-lateral bargaining solution would generate similar results.

We now make the following sufficient condition to guarantee that the competitive fringe will always be active in any sector (even if all the elite are invested in it) and we never have to consider situations where elite producers are rationed

Assumption 2: $Y > \frac{MC'^{-1}\left(q_m \kappa \sum_{e \in \mathscr{E}_{m,a_e \geq \bar{a}}} w_{em}\right) \kappa q_m}{L}$ for all m.

We can now analyze the decision of the elites about how much effort to allocate to overthrowing democracy. A member of the elite e faces the problem

$$\begin{aligned}
& V^e\left(D \mid a^{-e}(D), a^{-e}(N), \tau(D), \tau(N)\right) \qquad (9) \\
= & \max_{a_e(D) \in [0,1]} \left\{-\chi(a_e) + p\left(a_e, a^{-e}(D)\right) \times \right. \\
& \left[\sum_{m=1}^{M} w_{em}\left(\tau_m^*(N) - 1\right) q_m \kappa - \mathbf{1}_{\mathscr{E}_{m,a_e \geq \bar{a}}} \sum_{m=1}^{M} w_{em} \frac{C(\tau_m^*(N))}{\sum_{e \in \mathscr{E}_{m,a_e \geq \bar{a}}} w_{em}} \right. \\
& \left. + \beta V^e\left(N \mid a^{-e}(D), a^{-e}(N), \tau(D), \tau(N)\right)\right] \\
& \left. + \left(1 - p\left(a_e, a^{-e}(D)\right)\right) \beta V^e\left(D \mid a^{-e}(D), a^{-e}(N), \tau(D), \tau(N)\right)\right\}
\end{aligned}$$

where $\mathbf{1}_{\mathscr{E}_{m,a_e \geq \bar{a}}} = 1$ if $e \in \mathscr{E}_{m,a_e \geq \bar{a}}$ and $= 0$ otherwise, and where we have used backward induction within the stage game to impose that if the elite win the contest then $s_{t+1} = N$, in addition $\tau(D) = 1$ and $\tau_m(N) = \tau_m^*(N)$ for $m = 1,..,M$.

Here $V^e\left(D \mid a^{-e}(D), a^{-e}(N), \tau(D), \tau(N)\right)$ is the value of an elite in sector m when all other elites take the actions $a^{-e}(D)$ and $a^{-e}(N)$ in democracy and dictatorship and when the median voter chooses the policy vector $\tau(D)$ and the elite chooses the policy vector $\tau(N)$. This notation allows for non-symmetric action choices since as we shall see elite agents will make different decisions depending on their network position (see Acemoglu and Robinson, 2006b, for a treatment of non-symmetric equilibria in a related model). If a coup takes place then the participating elite choose the tax vector as above and a dictatorship is created. The payoff to every elite member e is $\sum_{m=1}^{M} w_{em}\left(\tau_m^*(N) - 1\right) q_m \kappa$ which is the sum across all sectors of the economy in which that elite member is active, taking into account the tax set in those different sectors. Note that even if a member of the elite is not a coup participant, they still benefit from increases in taxes if they happen to be invested in a sector which has many participants in it. The term $\mathbf{1}_{\mathscr{E}_{m,a_e \geq \bar{a}}} \sum_{m=1}^{M} w_{em} \frac{C(\tau_m^*(N))}{\sum_{e \in \mathscr{E}_{m,a_e \geq \bar{a}}} w_{em}}$ captures the fact that if elite agent e is a coup participant so that $\mathbf{1}_{\mathscr{E}_{m,a_e \geq \bar{a}}} = 1$ then they have to pay a share of the deadweight administrative costs of levying taxes. Finally, if a coup does not take place then the elite will get a flow payoff of zero and the value $V^e(D \mid a^{-e}(D), a^{-e}(N), \tau(D), \tau(N))$ recurs.

Having formulated the payoffs to citizens and elites in a democracy it is straightforward to specify them in dictatorship and we consign these expressions to the Appendix.

The most interesting part of the analysis from our point of view is the decision by elites about whether or not to allocate effort to mounting a coup and what determines this. Consider the optimal action choice of the elite in the two states of the world. From (9) we have the first order condition for elite agent e

$$\sum_{e' \neq e} \omega_{e'e} a_{e'} - \delta a_e + \frac{1}{E}\left[\sum_{m=1}^{M} w_{em}\left(\tau_m^*(N) - 1\right) q_m \kappa - \mathbf{1}_{\mathscr{E}_{m,a_e \geq \bar{a}}} \sum_{m=1}^{M} w_{em} \frac{C(\tau_m^*(N))}{\sum_{e \in \mathscr{E}_{m,a_e \geq \bar{a}}} w_{em}} + \beta \Delta V^e(N)\right] = 0 \quad (10)$$

with an interior solution by Assumption 1. Here $\Delta V^e(N) \equiv V^e(N \mid a^{-e}(D), a^{-e}(N), \tau(D), \tau(N)) - V^e(D \mid a^{-e}(D), a^{-e}(N), \tau(D), \tau(N))$.

As the Appendix shows, the decision problem for an elite in a dictatorship is identical in the sense that the ‘prize’ is the same in both states and the cost function is the same. Moreover, the set of coup participants in a dictatorship is identical to that in a democracy. This implies that for elite agent e, $a_e(N) = a_e(D)$. Nevertheless, since elite agents differ in their network positions this does not imply that their action choices will be the same, hence $a_e(s) \neq a_{e'}(s)$ for some elite agent $e' \neq e$. However, it does imply that $p(a(N)) = p(a(D))$ which greatly simplifies the analysis. Indeed, using this observation we have that $\Delta V^e(N) = 0$.

Now we can write (10) for all elite agents as a matrix equation where elite agents are ordered from 1 to E

$$a = \Pi + \frac{1}{\delta}\omega a$$

where $a = (a_1, .., a_E)$ is a column vector of action choices by the elites (which is not state dependent as discussed above), Π is the (weighted) elite net profit vector defined as:

$$\Pi \equiv \frac{1}{\delta E}\left[\sum_{m=1}^{M} w_{em}\left(\tau_m^*(N) - 1\right) q_m \kappa - \mathbf{1}_{\mathscr{E}_{m,a_e \geq \bar{a}}} \sum_{m=1}^{M} w_{em} \frac{C(\tau_m^*(N))}{\sum_{e \in \mathscr{E}_{m,a_e \geq \bar{a}}} w_{em}}\right] \quad (11)$$

and recall that ω is the adjacency matrix. We can write the solution to 10 in matrix notation as

$$a = \left(\mathbf{I} - \frac{1}{\delta}\omega\right)^{-1}\Pi \tag{12}$$

where $\mathbf{I}$ is the identity matrix.

As Ballester, Calvó-Armengol and Zenou (2006) show (Theorem 1 and Remark 1) this implies that the action choice of agent e can be written as their weighted Bonacich centrality with weights given by profits $\left(\sum_{m=1}^{M} w_{em}\left(\tau_m^*(D)-1\right)q_m\kappa - \mathbf{1}_{\mathscr{E}_{m,a_e\geq\bar{a}}}\sum_{m=1}^{M} w_{em}\frac{C(\tau_m^*(N))}{\sum_{e\in\mathscr{E}_{m,a_e\geq\bar{a}}} w_{em}}\right)/\delta E$ and decay factor $1/\delta$.

From this the first result, which is a direct consequence of Ballester, Calvó-Armengol and Zenou (2006) Theorem 1, follows

Proposition 1: The equilibrium action of elite agent e is increasing in his weighted Bonacich centrality.

This result is one of the main things we test in this paper. A related result which we can also examine empirically was provided by Galeotti, Goyal, Jackson, Vega-Redondo and Yariv (2010):

Proposition 2: The equilibrium action of elite agent e is non-decreasing in his degree.

Where the degree of a player is simply the numbers of nodes to which he is linked directly.

We are now in a position to sum up the nature of pure strategy MPE of this game.

Proposition 3: There is a unique MPE in the game specified where in each period elite agents choose the vector a which satisfies (12). In this equilibrium in democracy there is a coup with probability $p(a)$ and if the coup fails $\tau(D) = 1$. If the coup succeeds then the coup participants set the tariff vector $\tau^*(N)$ which satisfies (8) and dictatorship is created. In a dictatorship the regime survives with the same probability $p(a)$ and the coup participants again set $\tau^*(N)$. With probability $1 - p(a)$ democratization occurs and citizens set $\tau(D) = 1$.

Obviously there are other types of equilibria in this model. Our intention here is only to show that this equilibria can occur for an open set of parameter values and we believe it has plausible properties. Several features are noteworthy which we can take to the data. First, the higher is an elite agent's Bonacich centrality, the greater effort they put into making a coup happen. This is not because their centrality influences their power within the elite after a coup succeeds, but rather because they are able to have a greater impact on the outcome of the coup. Elite agents with high centrality can influence more elite agents aside from themselves to take actions to make a coup happen. Thus our model predicts that agents with greater Bonacich centrality put more effort into a coup and would be more likely to be seen to take part in such a coup if this was observable (to be a coup participant). Second, the model predicts that elites who take part in a coup should be rewarded by higher prices for the goods they produce. Since most elites are diversified, the Haitian one included, the model predicts that the greater a particular market is dominated by elites which took part in the coup, the higher prices should rise after a coup takes place (this is immediate from (8)). Finally, given this increase in prices, the consumption and welfare of citizens falls after a coup and in a dictatorship if it persists (relative to democracy).

Besides the comparative static on prices, this model can also approximate the regression specification that we implement below. Fix $C(\tau) = C_0 \frac{\tau^2}{2}$, and recall that the price of product m is given by $p_m = \tau_m \kappa$. Tariffs under democracy are equal to 1, and with this particular $C()$ function $\tau_m(N) = \frac{q_m}{C_0} \kappa \sum_{e \in \mathscr{E}_{m, a_e \geq \bar{a}}} w_{em}$. If we denote by Ω_e an indicator for being a coup participant, we get that the change in log price following a transition to autocracy will be:

$$\log p_m(N) - \log p_m(D) = \log \frac{1}{C_0} (q_m \sum_e w_{em} \Omega_e) \approx \sum_e w_{em} \Omega_e + A \qquad (13)$$

where $A = 1 + \log \frac{q_m}{C_0}$ is a constant, and the $\log(x) = 1 + x$ approximation holds if the elite is relatively small (since Ω_e and w_{em} are both bounded between 0 and 1, see Table 5 below). We will proxy w_{em} with shares of imports, and together with measures of p_m and Ω_e we will use this as the basis of the regression specification we estimate below.

5 Data

To test the predictions of our model we constructed a dataset that brings together information on families, firms, and products from more than 15 different sources. In the process, we draw on genealogical data going back to the mid-19th century, contemporary firm-level data on shipments of specific products, and information on ownership of hundreds of businesses. We describe the data assembly process in detail in Appendix A, and in this section detail the construction of the two most distinctive variables: the coup participation list and the network centrality measure, both of which vary at the family level.

We first draw in data on participation in the 1991 coup against the democratically-elected government of Aristide. This information comes from the U.S. Treasury Department's targeted sanctions list, which named individual official and unofficial leaders in the coup government in power during the early 1990s. The U.S. had sanctions against Haiti from 1991 until the restoration of democracy in 1994 based on an executive order by President Bush in 1991 and updated with specific sanctioned individuals by the Office of Foreign Assets Control. Participation in coups is an illicit activity that most participants prefer to hide, and the existence of this list for Haiti is one of the reasons that we chose to test this general theory of elite resistance to democracy in Haiti.

The sequence of events in the 1990s suggests that this list represents the U.S. government's best information on which elites were instrumental on installing and supporting the coup government.[5] Elites were added to the list of "specially designated nationals" (SDN), or sanctioned individuals, not as a symbolic gesture but to pressure a regime that had begun to renege on agreements that it had made with the U.S. government. Over the first half of 1994, as it became clear to the U.S. that the Cedras government did not intend to comply with the terms of a political agreement signed at Governor's Island, a number of individuals were added to the sanctions list, which involved freezing assets and barring entry into the U.S. These individuals included military officers, political elites in the Cedras government, and civilian backers of the coup (Pezzullo,

[5]Executive Order 12775 defines the list as "A. They are persons who seized power illegally from the democratically elected governmet of President Jean-Bertrand Aristide on September 30, 1991. or who. since October 4. 1991 (the effective date of Executive Order 12775). have acted or purported to act directly or indirectly on behalf of, or under the asserted authority of, such persons or of any agencies, lnstrumentalities, or entities purporting to act on behalf of the defacto regime in Haiti. or under the asserted authority thereof, or any extraconstitutional successor thereto: B. They are Haitian nationals (as defined in Executive Order 12853) who have provided substantial financial or material contributions to the defacto regime in Haiti or done substantial business with the de facto regime in Haiti; or C. They have (s) contributed to the obstruction of the implementation of UNSCR Resolution 843 end 873, the Governors Island Agreement of July 3. 1993. or the activities of the United Nations Mission in Haiti. (2) perpetuated or contributed to the violence in Haiti, or (3) materially or financially supported any of the activities described in items (1) or (2) of this paragraph." Discussions with Haitian academics suggest that the names were obtained through the US embassy in Haiti. One suggested to us that the criteria are a) public statements from those individuals; b) open affiliation with the coup leaders; c) open support to the armed anti-Aristide FRAPH and d) human rights reports that documented their involvements.

1994; French, Howard. *The New York Times.*, June 3 1994; Hull, 1997). From this list, we create a measure of coup participation by family that indicates whether one or more members of a family were identified as coup participators by the U.S. government. Again, this information is linked to the rest of our family data by last name (link f in A.1).

For the second coup in 2004 we do not have a similar list but as we mentioned, the historical and case study data that exists suggests that the main instigators and supporters of the coup were the same between the two coups, and that many were connected by kinship and social ties. We therefore use the same list of elites when we examine the consequences of the second coup and subsequent autocratic period.

Our unit of analysis for the family data is the last name, which we take to represent a family dynasty. Our data on the social structure is taken from the *Association Généalogique d'Haïti*, a nonprofit effort to collect genealogical data from Haitian and American archives and the personal records of Haitian families run by a business leader in Haiti.[6] We use the Collective Genealogy of Haitian Families, which includes information on more than 64000 individual members of Haitian families beginning in the 17th century. We restrict this data to cohorts born between 1850 and 1975 to ensure that our measure of the social network is relevant, and also show robustness to earlier cohorts. We collapse the genealogical data into a network of marriage links between families.

An important variable in our model is Π_i, the profits of an elite family i under dictatorship. We use the sum of values of imports across products p and across businesses j, with the latter divided by the number of owners $nown_j$, as our proxy for this, so $\Pi_i = \sum_p \sum_j \frac{value_{ijp}}{nown_j}$. This is an imperfect proxy given the demands of our model, which calls for the ownership share of elite family i in industry p. Given lack of information about shares of ownership or even costs of importing, this is the closest that can be done with available data. We show robustness to a variety of other ways of constructing Π_i below.

We calculate several network statistics implied by our theory. We show that our results are robust to a range of measures of network centrality that are based on the idea that a node's centrality is dependent on the centrality of its neighbors. Specifically, we show that our results

[6] Accessible at `http://www.agh.qc.ca/`.

are robust to three types of centrality that place different weight on close versus distant ties: degree, Bonacich centrality, and eigenvector centrality.[7] The most general expression of the centrality measures that we use is the weighted Bonacich centrality, corresponding to expression (12) above:

$$B(\frac{1}{\delta},\Pi,\omega) = \left(\mathbf{I} - \frac{1}{\delta}\omega\right)^{-1}\Pi = \sum_{k=0} \frac{1}{\delta}^{k} g_{em}^{k}\Pi$$

where ω is the adjacency matrix and $\frac{1}{\delta}$ is a parameter that determines the emphasis put on close versus distant nodes, and Π is defined as above. We use a version of the adjacency matrix where links between families are weighted by the size of each family such that a link between a large family with another large family with many potential marriages contributes less to the family's centrality than a link with a small family. This takes into account the value of the marriage ties to each family. g is the number of paths of length k that link nodes e and m, multiplied by $\frac{1}{size_e \times size_m}$ where $size_e$ is the number of individuals in family e and $size_m$ is the number of individuals in family m. Bonacich (1987) suggests that δ take the value in the range $(0,\lambda)$, where λ is the largest eigenvalue of the adjacency matrix ω, in a network with complementarities. Thus, at one extreme, when $\frac{1}{\delta} = 0$, this measure is equivalent to the degree centrality. At the other, when $\delta = \lambda$, it is equivalent to the eigenvector centrality. To determine the appropriate weighted parameter $\frac{1}{\delta}$, we estimate the relationship between centrality in the network of coup participators and participation in the coup (see Appendix C.1 for a discussion and the results). Our primary measure of network centrality is the Bonacich centrality where $\frac{1}{\delta} = 0.02$, but we also show as a robustness check that our results hold when we parameterize the Bonacich centrality with values in the range $\frac{1}{\delta} = [\frac{9}{10\lambda}, \frac{1}{10\lambda}]$ as well as the degree where $\frac{1}{\delta} = 0$.[8]

[7] For another discussion of these related measures, see Banerjee et al. (2016) or Jackson (2008).

[8] Bonacich centrality with $\frac{1}{\delta} = \frac{1}{5\lambda}$ is approximately equivalent to our preferred measure.

6 Results

6.1 Who participates in coups?

In this section we test our model's prediction that central elites will be more likely to participate in non-democratic regime change. We estimate the following specification:

$$Coup_i = \beta Centrality_i + \eta FamilySize_i + Social_i' \theta + Economic_i' \gamma + \varepsilon_i$$

where $Coup_i$ is an indicator variable for whether a family participated in the 1991 coup against the democratically elected Aristide government. $Centrality_i$ is a measure of a family's centrality in the historical marriage network. $Social_i$ is a vector of social characteristics of each family including historical military and political service as well as whether the family immigrated to Haiti after independence, and whether they immigrated from the Middle East. We also control for the size of the family during the period of our network data. $Economic_i$ is a vector of characteristics that define the economic interest of a family in having a coup. $Economic_i$ includes a measure of the value of a family's trade from the AGEMAR data and the average share of Haitian consumption that the family's imports represent from Jensen, Johnson and Stampley (1990), as well as five other product-level characteristics that may make importers more vulnerable to predation or taxation.

Estimating models with network statistics as independent variables is challenging due to the presence of obvious spillover effects. Any exogenous change to the network shared by family i and j will change both families' centrality scores. The results should be interpreted with this caveat in mind.

We use two separate datasets at the family level for this analysis: one that includes all elites, meaning any family that appears in our records of historical political or military service or in one of our business ownership databases, and one that covers only importers. The data on political and military service is taken from Supplice (2001), and immigration histories are coded from Supplice (2009). Consumption share is calculated from Jensen, Johnson and Stampley's (1990) data on household consumption, and the value of trade is from AGEMAR. The product measures cover five characteristics, described in the data section, that have been found in other contexts to affect the vulnerability of economic actors to government predation and taxation. They include divisibility, bulkiness (de la Sierra, 2014), time sensitivity (Hummels, 2007), reference price (Rauch, 1999), and complexity (Hausmann et al., 2013). When families import more than one product, these characteristics are aggregated up to the family level weighted by the value of the family's import portfolio that each product comprises.

Tables 1 and 2 show the means and standard deviations of the variables in our family datasets for all elites and our importer subsample, respectively. In the all elite sample, we include any family that has ever held political office or a high military rank, or that shows up in our business ownership data. In the importer subsample, we include only families that can be matched to companies that show up in our imports data.

[Table 1 about here.]

In the all elite sample, coup participators are slightly more likely to be every type of elite: business, political, and military. They are more likely to be immigrants and they are more likely to be immigrants from the Middle East. They are more central in the marriage network, and have a higher degree. They also tend to have larger families and slightly lower quality genealogical data.

[Table 2 about here.]

The importer sample exhibits similar patterns. Coup participators are more likely to be immigrants, both from the Middle East and in general. They are more likely to have past political and military elites in their families. Their weighted Bonacich centrality and degree is higher, and they have larger families and lower reachability.

Table 2 also shows summary statistics on product characteristics of coup participators vs. non-participators. Their average market share is similar to that of non-participators, but the total value of trade of participators in our 2009 and 2011 trade data is higher: $19.05 million for coup participators and $13.42 million for non-participators.[9] There are no meaningful differences across any product characteristics.

[9]The value of trade is calculated using prices from the U.S. Census Bureau and quantities from the AGEMAR data.

Finally, it is important to note that our sample sizes change for some of the variables due to missingness. In particular, some families listed as political, military, or business elites did not show up in the genealogical database. For political elites, 77% of families could be matched to the genealogical data, but for business and military elites the figure is slightly lower at 71%.

Table 3 examines the correlates of centrality. We regress family centrality on a variety of covariates to examine possible sources of endogeneity. As per our model, we use a measure of centrality in which nodes are weighted by the value of their business interests, and we also weight edges by family size to take into account the fact that larger families have more opportunities to form marriage ties. Within the sample of all elite families in Columns 1 and 2, centrality is correlated with being from a family that immigrated to Haiti during the 20th century, and even more so if that family immigrated from the Middle East. Business elites are also more central. In the importer only sample in Columns 3-6, in addition to a family's immigration history, the value of their contemporary imports is positively related to centrality, as are some product characteristics. Specifically, central families are more likely to import products that are more time sensitive, less bulky, and less divisible.

[Table 3 about here.]

Table 4 shows the results of regressions of coup participation on a combination of social and economic characteristics. Columns 1-3 show the results using data from our all elite sample, while Columns 4-8 use the importer sample. Columns 1 and 4 show the bivariate relationship between coup participation and centrality. Columns 2 and 5 add a control for the number of members in each family, and Columns 3 and 6-8 add our four other measures of social characteristics, namely whether a family has any historical military and political service, whether a family migrated to Haiti post-independence, and whether they migrated from the Middle East. Columns 7-8 include our two most important measures of economic interest: the value of a families' trade and our proxy for demand inelasticity, and Column 8 includes the five product characteristics. Models are estimated using OLS with robust standard errors.

[Table 4 about here.]

Table 4 is consistent with the theoretical result that central families, both in the general population of elites and in our subset of importers, are more likely to participate in coups. This result is robust to the inclusion of a wide range of economic measures that one would expect would make a family more interested in installing an autocratic regime. While measures of immigrant, political and military elite status are likely endogenous to the network position of elites, the centrality coefficient remains significant with all the social controls in the importer-only sample, but falls in magnitude and loses significance with these added in Column 3 in the all-elite sample when we include all of the social controls together with family size.

Substantively, we find that a one standard deviation increase in centrality is associated with a 10-21 percentage point change in the probability of participating in the coup. The estimates in Column 8 imply that a family at the average level of all the control variables has a 46% probability of participation in the coup at the mean level of centrality, increasing to 59% with one standard deviation increase in centrality.

A number of our control variables are also significant and substantively interesting predictors of coup participation, particularly in the all elite sample. The indicator variables for being an immigrant from the Middle East is consistently positive but only significant in the broader sample. Families that are historically larger are also more likely to participate. Past political service is not significantly related to participation in the coup, though past military service is.

Last, we find that a wide range of product characteristics that should predict vulnerability of business elites to government predation and taxation have little explanatory power compared to our social and political variables. Even our measures of demand inelasticity or the value of trade are not significantly related to coup participation.

Overall, this analysis shows that there is strong and fairly robust evidence that network centrality is related to coup participation conditional on a family's other characteristics. In addition, the importer-only analysis suggests that economic characteristics that should make coups more attractive have very little explanatory power.

Next we test whether the relationship between centrality and coup participation is robust to a range of other measures of network centrality. As discussed in Section 5, our preferred measure of centrality is a case of Bonacich centrality where the $\frac{1}{\delta}$ parameter that sets the weight of close over distant ties is equal to 0.02, which we choose based on our estimation of the relationship between coup degree and coup participation in Appendix C.1. In Figure 2, we recalculate each family's network centrality allowing this δ parameter to increasingly vary between the largest eigenvalue in the adjacency matrix by multiplying this $\frac{1}{\delta}$ by a constant in the range of $[0.9, 0.1]$. This puts increasing weight on close over distant connections. We also show robustness to $\frac{1}{\delta} = 0$, which equals the degree. The models estimated for this graph do not include controls and so are similar to Columns 1 and 4 in Table 4. Models are estimated using OLS. Figure 2 plots the coefficient on centrality ($Cent_i$ above).

[Figure 2 about here.]

Figure 2 shows that the magnitude and significance of the estimate of interest is very similar when we use alternative measures of family centrality that place increasing weight on close or distant ties. The central estimate called Bon 0.5 is the closest to the parameters in our main tables. The remaining estimates to the left of Bon 0.5 show the results when we put increasing weight on distant ties, and to the right of Bon .5 show the results when our centrality measure puts increasing weight on close ties. All estimates are well within the confidence intervals of our original estimate using weighted Bonacich centrality with $\frac{1}{\delta}$ set to 0.02.

Second, we test whether the relationship is robust to constructions of centrality based on versions of the network further back in history. Moving further back in history causes us to lose observations as the genealogy database generally has better coverage in later periods, but the results are quite similar in magnitude and significance if we cut off the network at cohorts born before 1950 and 1925. These results are presented in Appendix C.2.

Our third robustness check tests whether our results are robust to down-weighting data that appears to be of lower quality, based on the reachability of individuals with the same last name. Reachability measures the average probability that individuals with the same last name can reach each other in the subgraph of a single family. This analysis is discussed in depth in Appendix C.3. Our estimates of the importance of network centrality remain similar in magnitude and significance if we weight observations by this measure of data quality.

Finally, in C.5 we show Table 4 augmented with "community" fixed effects. Communities are groups of vertices with many connections within them and relatively few outside. While there are many methods for calculating communities in networks, we use a walktrap algorithm (Pons and Latapy 2006), which groups vertices of the network based on the number of length-l random walks that connect them. This controls for coarse endogenous network formation, as there may be groups of families that share many marriages due to some unobservable variable (such as ethnicity or wealth), and thus share a community. The fact that centrality continues to predict coup participation even within these clusters of tightly intermarried families suggest that endogeneity of marriage clusters is not driving our results.

6.2 Elite benefits of coup participation

In this section we estimate the differential increase in prices that coup participators enjoy during periods of autocracy. This analysis explores the implication of our model that coup participators will enjoy rents from less competitive markets during the autocratic regimes that they put in power. We use a difference-in-difference design that controls for all time-invariant differences between products imported by coup participators and non-participators and compares changes in prices during periods of autocracy. We also estimate specifications that include four lagged measures of our dependent variable measuring prices to control for dynamic responses of prices to regime type over time. We estimate variants of the following specification:

$$\log(p_{it}) = \sum_{k=1}^{4} \rho_k \log(p_{it-k}) + \theta Coup_i \times Autocracy_t + X_{it}'\beta + \mu_t + \psi_i + \varepsilon_{it}$$

where p_{it} measures retail prices during period t for product i. We control for all time-varying common shocks with a time fixed effect μ_t and we also add a product fixed effect ψ_i to control for time invariant product differences. X_{it}' is a vector of time-varying product-specific controls, including the interaction of $Coup_i$ and $Quake_t$, an indicator for the month after the January 2010 earthquake, and the world supply price for each product. We also control for the other factors that affect profits in addition to retail and supply prices: the number of firms importing each product and the inelasticity of demand, which we proxy for with the share each product represents of household consumption.[10]

[10]We measure inelasticity of demand using the share of household consumption for each product. Under CES, a

All prices (retail and supply) are measured as levels in the log price indexed to August 2004. The data used in this analysis are inputs into the consumer price index collected by the *Institut Haïtien de Statistiques et Information* and cover 18 of the most commonly consumed products in Haiti. The data on supply prices comes from the U.S. Census Bureau data on international trade between the U.S. and the rest of the world by 10-digit HS Code. $Coup_i$ is a continuous measure of the proportion of the market for a specific product that is controlled by families who participated in the 1991 coup. All data from families are aggregated up to the product level with the weighted mean described in Section 5.

Table 5 shows summary statistics for our product-level data. There is considerable variation in the number of firms and families across sectors. Importantly for our analysis, the level of coup participation varies considerably across sectors, from 30% to 100%, as does the expenditure share in consumption.

[Table 5 about here.]

We estimate this model using ordinary least squares with standard errors clustered at the product level. Column 1 in Table 6 estimates the effect of the interaction of $Coup_i \times Autocracy_t$ with product and month fixed effects. We also estimate the differential increase of being a coup participator during the month after the January 2010 earthquake, when government capacity was diminished and markets were disrupted. Column 2 adds one lagged measure of our dependent variable in levels to control for dynamic trends in prices. Column 3 adds three additional lags of the dependent variable. Column 4 adds the change in the world supply price as a control. Controlling for the supply price ensures that we are not picking up increases in the retail price that are driven by differential increases in the supply price of goods imported by coup participators. Column 5 adds the interaction of two other product-specific characteristics and a dummy for being in an autocratic period. We control for the interaction of the number of firms per product and autocracy and the interaction of the inelasticity of demand and autocracy because these are the factors other than retail and supply prices that affect a firm's profits. Columns 6 and 7 change the dependent variable to the supply price of each good imported into Haiti and the supply price

products share of household consumption is proportional to the inelasticity of demand for that product.

of each good globally as placebos to check that supply prices of goods being imported are not changing differentially for coup participators.

[Table 6 about here.]

Columns 1-5 in Table 6 show that retail prices of goods imported by coup participators rise significantly during periods of autocracy. During autocratic periods, a product that is imported by only coup participators grows by about 1.8% per month faster than products imported by no coup participators.[11] Accounting for the price dynamics, this translates to a 33% increase in the price of the good. This relationship is robust to including lagged measures of the retail price, the supply price of each good, time-variant measures of product characteristics that have been found to affect vulnerability to government predation, and the interaction of product dummies and the number of conflict events.

Substantively, this means that moving from the sample mean of 60% coup participation by one standard deviation to 80% is associated with a 0.51% increase in short-run prices, increasing to 6.3% taking price dynamics into account. Taking as our benchmark product rice, which cost on average 7.7 HTG per pound[12] in the pre-coup period, and a coup participation rate of 88%, our estimates imply that the transition to dictatorship increased the price of rice by 34% to 10.3 HTG per pound. Given that many of the other staple goods like corn meal, sugar, and chicken also have high levels of coup participation, price increases of this magnitude would have had a large impact on the budgets of the average Haitian household.

Furthermore, there is no evidence that the supply price of goods imported into Haiti or of goods globally is changing differentially for coup participators during autocratic periods. The null results in Columns 6 and 7 show that the observed increases in retail prices are unlikely to be driven by increases in the costs born by importers who participate in coups. In addition, adding the global supply price as a control variable in Columns 3-5 does not change the coefficient on coup participation.

[11] There are two products in our price data where 100% of the identified business owners participated in the 1991 coup, but no products where none of the identified owners participated. The lowest product by coup participation in this data is medicine, with 31% of the market controlled by coup participators.

[12] The average exchange rate during this first democratic period (Jan 1, 2001, to Feb 29, 2004) is 30.9 HTG per 1 USD.

Because our specification includes both time fixed effects and lagged measures of our dependent variable, our estimates may suffer from bias when the number of periods is small.[13] Nickell (1981) shows that this bias is not large when the number of time periods t is large. We have a long panel of 145 months, so this bias is unlikely to be large. For additional robustness checks and tests of the assumptions required for our specification, please see Appendix D.1, where we show robustness to GMM estimators as well as different assumptions on a fixed autocorrelation parameter in OLS.

Another difficulty in our estimation strategy is the small number of clusters. To account for this, we calculate wild bootstrap clustered standard errors according to the formula proposed by Cameron, Gelbach and Miller (2008), who show that their method corrects for the tendency of studies with a small number of clusters (fewer than 30) to over-estimate the certainty of the estimates. Those standard errors are reported for our main coefficient of interest in square brackets underneath the estimates and for some specifications are actually slightly smaller than the standard errors calculated through traditional clustering.

One concern is that the results in our analysis may be driven by one particularly influential product. To address this concern, we test whether the coefficient on $Coup_i \times Autocracy_t$ is also robust to dropping each product in turn. Figure 3 plots the coefficients on $Coup_i \times Autocracy_t$ with 90 and 95% confidence intervals. These regressions also include four price lags, controls for the number of firms and consumption share, and the global supply price, as in Column 5 of Table 6. The legend indicates which product is excluded from each specification.

[Figure 3 about here.]

This analysis shows that the effect sometimes drops in significance when we drop products, but remains similar in magnitude. The products that result in the biggest drops in the coefficient are edible oil, medicine, and beauty care.

As a second check on the validity of our results, we conduct a placebo exercise where we arbitrarily move the 26-month window of autocracy. When we move the window of autocracy forward by one month, it includes the one month prior to the coup and the first 25 months of

[13] For a summary of this discussion, see Angrist and Pischke (2009, pp.182-185), or original analysis in Holtz-Eakin, Newey and Rosen (1988), Arellano and Bond (1991), and Blundell and Bond (1998).

the actual autocratic period. We conduct this exercise for the 48 months before and after the true onset of autocracy. If we see that there are many time periods during democracy where, by chance, we would find a significant interaction between coup participation and this placebo autocratic period, our results would be less credible. Again, we include all the controls as in Column 5 of Table 6. Figure 4 plot the coefficients from this placebo analysis. The red line indicates the magnitude of the estimated coefficient on $Coup_i \times Autocracy_t$, while the shaded red area marks 90% confidence intervals on each coefficient.

[Figure 4 about here.]

Figure 4 shows that the only windows of time where we would conclude that coup participators increase their prices more than non-participators is the true autocratic period or small window that begins four months before and mostly consists of the true autocratic period. Indeed, when the 26-month window falls entirely in the second Aristide regime beginning in February 2001, there are five windows in which we find that coup participators increase their prices *less* than their non-participating peers. Importantly, in December 2001 there was a failed coup attempt against Aristide. This failed coup had no effect on the prices of coup participators' products. This placebo test suggests that it is extremely unlikely that our results are obtained purely by chance: it is only during the true autocratic period that we estimate that coup participation has high payoffs.

Table 7 examines an assumption of our model, namely that centrality only matters via coup participation. This table adds $Cent_i \times Autocracy_t$ to table 6 for different measures of centrality. While the main effect of the coup is virtually unchanged, the independent effect of centrality is significant only when centrality is calculated using node weights based on the value of goods traded by each family. For measures of centrality that do not include our proxy for the private incentive to participate in the coup, there is no effect on the prices. This again suggests that family structure matters via its effects on increasing the impact of participation, not via increasing the economic returns, which are concentrated among the coup participants who decide policy in our model.

[Table 7 about here.]

6.3 Impact of autocracy on child health

In this section we test the implication of our model that citizen welfare should decline during autocracy. While the price increase evidence presented above is suggestive of welfare losses, it is possible that the CPI prices are far from the prices households face, or that easy substitutes are available. We again use a difference-in-difference design that looks at the effect of autocracy on urban vs. rural children. Urban children are more likely to be affected by increases in the prices of products like rice and maize because they are more dependent on imported products than rural children, who get a larger portion of their calories from home production of agricultural goods.

To test this hypothesis, we estimate the following specification:

$$h_{it} = \theta Urban_i \times Autocracy_t + \gamma \times Urban_i + X_{it}'\beta + \mu_t + \varepsilon_{it}$$

where $Urban_i \times Autocracy_t$ represents the interaction between being born in an urban area and during an autocratic period. X' includes an indicator for whether a child is female, one for being born in an urban area, and first and second degree age polynomials. μ_t is a birth-month fixed effect controlling for all time-specific shocks that might affect the heights and weights of an entire cohort of children.[14]

This empirical strategy has a number of shortcomings. First, it is likely an under-estimate of the true impact of autocracy on the health and welfare of children in Haiti. Our theory in fact predicts that the general welfare in Haiti should decline in both urban and rural areas. Many of our high-coup products, including edible oil, kerosene, cigarettes, and cola, are consumed in rural areas but are rarely or ever home produced, suggesting that increases in import prices should also affect rural households. Thus, to the extent that rural areas are also affected by price increases, the estimates presented here under-represent the true negative impact of autocracy on public welfare. Nevertheless, we choose this difference-in-difference specification because it enables us to control for other time-specific shocks to children's health that occur during autocracy

[14] In our preferred specifications, we do not include a dummy for being born in an autocratic period because the birth-month fixed effects are perfectly collinear with this variable. In specifications where we include a linear time trend rather than birth-month fixed effects, however, we do include a dummy that takes a value of 1 for children born during an autocratic period.

throughout the country, such as shocks to social services or political violence. However, to the extent that these other factors also differentially affect urban households, our coefficient will pick up multiple ways in which autocracy is related to changes in welfare. We therefore also show a specification estimating the time-series effect of the coup on the entire child population, replacing the time fixed-effects with flexible functions.

The data used in this section covers children born across Haiti between the beginning of the first democratic period in 1991 and 2012 and is taken from the Demographic and Health Surveys (DHS) conducted in Haiti in 1995, 2000, 2006, and 2012. The measures of height and weight are taken by the DHS enumerator. We use the standardized weight-for-age and height-for-age Z-scores, which are calculated based on global reference data. These Z-scores are recommended for measuring nutritional status of children under 5 by the WHO (WHO Working Group, 1986; De Onis and Lobstein, 2010). Children who fall two standard deviations below the global reference point in the distribution are considered wasted or stunted. Table 8 shows the summary statistics for this data.

[Table 8 about here.]

Table 8 shows that children born during autocracy and democracy are roughly equally urban and female. Children born during autocracy are on average younger at the time of the DHS survey. This is a function of the timing of the DHS, as children are weighed and measured by DHS enumerators at four different points in time in our panel, making it important to control carefully for age in our specification. Last, children born during autocracy are shorter and lighter than their democratic peers. Our measure of the weight-for-age and height-for-age Z-scores are multiplied by 100, so a value of -100 means that a child is one standard deviation below the global reference mean. The average weight-for-age Z-score of children born during democracy is 0.90 standard deviations below the global reference, while during autocracy it is 1.03 standard deviations below the reference. Similarly, the height-for-age Z-scores of children born during democracy are 1.02 standard deviations below the global reference mean, while in autocracy they are -1.12 standard deviations below the mean.

Table 9 first examines whether the heights and weights of children in urban areas do differentially worse during autocracy. Columns 1-4 use the weight Z-score (multiplied by 100) as the dependent variable. In Column 1 and 5, we include a linear time trend based on month of birth, while in Columns 2-4 and 6-8 we include dummies for each month of birth and control for two age terms. All columns also include as a control variable the interaction of being born in an urban area and the number of conflict events except those organized by the Haitian elite in the GDELT data. Columns 5-8 use the same set of independent variables as Columns 1-4, but use as the dependent variable the height Z-score of Haitian children multiplied by 100. Columns 1-2, 4-6, and 8 use data from the beginning of the series in 1991 through 2012, while Columns 3 and 7 restrict the data to the 2001-2012 period starting with the beginning of Aristide's second mandate where we have data on retail prices. Because we use being born during an autocratic period as our measure of autocracy, this measure picks up the effect of autocracy during the first two years of life, which is the developmental phase when nutrition has the biggest impact on stunting and wasting (Shrimpton et al., 2001; Victora et al., 2008). Columns 4 and 8 eliminate children under the age of six months who spent only a small number of months living under autocracy.

[Table 9 about here.]

Table 9 shows that being born in urban areas during autocracy is associated with a decline in the weight-for-age and height-for-age Z-scores of children under five. The impact of autocracy on height in Columns 5-8 is substantively large and robust. In the full 1991-2012 sample with birthdate fixed effects (which is a stronger control for time-invariant changes in nutritional status than the birthdate linear trend in Column 5), urban children during autocracy are 0.14 standard deviations shorter than their rural peers. This effect is even stronger (-0.16 standard deviation) in the 2001-2012 sample in Column 7 and stronger still (-.18 standard deviation) when we restrict the sample to children over the age of six months in Column 8.

Substantively, this negative effect on height is quite large. The negative effect of autocracy on the heights of urban children is approximately the same magnitude as the difference in height between boys and girls. It is approximately 8-14% of the difference in heights between Haitian children and the global reference mean.

The impact of $Urban_i \times Autocracy_t$ on weight is less robust, but in the full sample it has a similar magnitude and significance on weight-for-age Z-scores as on height-for-age. In Column

2 children born in urban areas during autocracy are 0.12 standard deviations shorter than their rural peers, and this effect grows to 0.14 standard deviations shorter when we exclude children under six months old in Column 4. In the post-2001 sample, however, there is no significant effect of autocracy on the weight-for-age Z-scores of children under 5.

Columns 1 and 5 use a birthdate time trend rather than birthdate fixed effects to allow us to estimate the direct effect of autocracy in addition to the interaction $Urban_i \times Autocracy_t$. In both Columns 1 and 5, we see that autocracy has a substantively large and significant negative effect on children's nutritional status. During periods of autocracy, children are more than 0.25 standard deviations lighter than peers born during democracy and 0.23 standard deviations shorter. In both cases, this effect is stronger for urban children born during autocracy. Thus, while we draw identification from the differential impact of autocracy on urban compared to rural children, it is important to note that this under-estimates the full impact of autocracy, which also negatively affects the nutritional indicators of rural children.

In addition to the outcomes of child heights and weights, we also tested for an impact of autocracy on infant and under-five mortality. We again use data on all children covered in the four DHS rounds, as well as a limited sample of children born between the start of the second Aristide regime in January 2001 and 2012. Here however we create a time series for each birthdate-gender-urban cohort, and create a measure of the percentage of that birth cohort that died during each month up to the point where the cohort reached five years of age. Our dependent variable is this measure of the percentage of the remaining birth cohort that died during each month. To this, we merge in a measure of whether Haiti was democratic or autocratic during that particular month of life. We found no significant impacts of autocracy on under-5 mortality.

Conclusion

In this paper we have developed and empirically explored a theory of the role of elite social networks in coups against democracy. To our knowledge no previous work has proposed that the social networks of elites should matter in explaining who participates in a coup and ultimately why a coup happens. Nevertheless, research in social network theory makes it very plausible that they do. Indeed, a large literature in sociology has studied notions of power and influence in social networks and how they influence collective action. Social networks have been shown to influence participation in collective action in social movements, civil war, and electoral politics, but have not been used to study elite collective action in anti-democratic coups.

We developed a model of coups based on actions taken by elites and derived three basic sets of results which we can examine in the data. First, the propensity to take part in a coup is positively related to the network centrality and network degree of an elite agent; second after a successful coup, coup participants should gain material rewards, in our specific context they should experience differential increases in the prices of the goods they import; finally, coups should have negative effects on social welfare. Using a variety of different data sources we found support for all of these hypotheses in Haiti.

More broadly, our results have implications for democratization and democratic consolidation. While previous theories have focused on reforming institutions or redistributing assets as mechanisms for consolidating democracy, our results suggest that transforming elite networks during democracy may be an important component of reducing the likelihood of future coups. Indeed, elite social capital may have to decay for democratic capital to accumulate. Stepping back from Haiti, our results suggest that the density of elite networks may be an important factor in explaining the relative incidence of coups and whether or not democracy is consolidated.

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Appendix (Not For Publication)

A Data Construction Appendix

In this Appendix we provide an overview of how we constructed these datasets and describe the source and construction of each variable. The core of our dataset is a linkage between families, the firms they own, and the products that they import into Haiti. To this base, we draw in additional information on the political and social histories of Haitian families, as well as the characteristics of products. Figure A.1 provides an overview of our data structure.

[Figure A.1 about here.]

We first link families to firms (link a in Figure A.1) with three databases of contemporary firm ownership. The first, a commercial dataset called Orbis produced by the Bureau van Dijk corporation, has information on 626 unique families that own 345 Haitian corporations; however, the majority of these are not importing firms.[15] The second is a database of Haitian firms assembled by a nonprofit organization called Haiti Building Markets after the 2010 earthquake to encourage aid agencies to buy goods and services from local firms.[16] This data includes information on more than 3,400 firms owned by 1,951 unique families. Third, we draw on information in an online database of firms registered with the Haitian Ministry of Commerce and Industry.[17] In a few cases, when a firm did not appear in any of these databases but is a major importer of a staple good in Haiti, we also use public information on the web or the knowledge of experts on Haiti's import sector. We conducted this additional research for all of the firms that import one of the 18 products on which we have consumer price data, if the owners were not identified in one of the three existing databases. From these four sources, we constructed a table of which families owned each firm that appears in our data.

The second key link in our data is from firms to products (link b in Figure A.1). To make this link, we use data on shipping patterns by firm in 2009 and 2011 provided by AGEMAR, a

[15] Accessed through a Columbia University Library portal at `https://orbis.bvdinfo.com/version-2014812/home.serv?product=orbisneo`.

[16] Accessed at `http://haiti.buildingmarkets.org/en_af/supplier-search`.

[17] Accessed at `http://registre.mci.gouv.ht/`.

Haitian shipping firm that collects and sells data from the port authority. We exclude the year of 2010 because the catastrophic earthquake that hit Port-au-Prince in January 2010 dramatically changed shipping patterns by shocking demand, changing the most common suppliers of many goods (in particular, causing an influx of goods imported by NGOs), and destroying the primary Haitian port. We also exclude that bottom 10% of firms importing each product to ease the matching process and to exclude tiny or one-off shipments of goods. Using the 2009 and 2011 data, we construct a measure of the portion of trade in each good that is controlled by specific firms. Each of our products is ultimately identified by a four-digit Harmonized System (HS) code.

Linking the two datasets involves merging by firm name. To accurately match firms across multiple sources, we use a combination of approximate string matching and manual identification of alternative spellings. We first strip out some words and standardize spelling, including accents on French words, and common terms.[18] We also eliminate NGOs using a combination of key word search (ex. firm names that include "foundation") and manual identification (ex. large, well-known NGOs such as "World Vision"). Next we strip out individuals only shipping items for personal use, marked by a special tariff code. After this first round of processing, we implement an approximate string matching algorithm across all the firm names with more than eight letters to match firms with a generalized Levenshtein edit distance of two or lower. Last, we identify a number of alternative spellings manually.

From this base, we merge in additional data at the level of the family and product. Our unit of analysis for the family data is the last name, which we take to represent a family dynasty. Our data on the social structure is taken from the *Association Généalogique d'Haïti*, a nonprofit effort to collect genealogical data from Haitian and American archives and the personal records of Haitian families run by a business leader in Haiti.[19] We use the Collective Genealogy of Haitian Families, which includes information on more than 64000 individual members of Haitian families beginning in the 17th century. We restrict this data to cohorts born between 1850 and 1975 to ensure that our measure of the social network is relevant, and also show robustness to

[18] For example, "shpg" becomes "shipping", and words like "S.A.", the abbreviation of "societé anonyme", a type of Haitian corporation, are stripped.

[19] Accessible at `http://www.agh.qc.ca/`.

earlier cohorts. We collapse the genealogical data into a network of marriage links between families.

An important variable in our model is Π_i, the profits of an elite family i under dictatorship. We use the sum of values of imports across products p and across businesses j, with the latter divided by the number of owners $nown_j$, as our proxy for this, so $\Pi_i = \sum_p \sum_j \frac{value_{ijp}}{nown_j}$. This is an imperfect proxy given the demands of our model, which calls for the ownership share of elite family i in industry p. Given lack of information about shares of ownership or even costs of importing, this is the closest that can be done with available data. We show robustness to a variety of other ways of constructing Π_i below.

We also draw in data on the history of political and military service of each family, as well as the date and country of immigration for families that immigrated to Haiti after independence in 1804, using data collected by Daniel Supplice. This researcher and politician published a *Dictionnaire biographique des personnalités politiques de la République d'Haïti* that includes dictionary entries for all known individuals who held political office in Haiti, from executives to citizens who served single terms in constituent assemblies or were rewarded with titles of nobility during the 19th century. We coded all of the entries of Supplice (2001) and then restricted this data to individuals who served prior to the end of the Duvalier regime in 1986 in the executive, legislative, or judicial branch.[20] From this, we created binary variables for whether any member of a family served in any of the three main branches of government, and whether any member of a family held a commanding role in the military between 1804 and 1986. Political histories are linked to our other family-level data by last name (link d in Figure A.1).

Immigration histories are coded from another of Supplice's books and also linked by last name (link e in Figure A.1) (Supplice, 2009). This 750-page tome notes the date of naturalization and country of origin of foreign immigrants who took Haitian nationality after independence. We coded it to create an indicator variable noting whether a family immigrated to Haiti from a foreign country post-independence, and whether they immigrated from a Middle Eastern country including Syria, Lebanon, Palestine, or Egypt. Haitians reclaiming Haitian nationality after

[20] We excluded the categories of nobility, constituent assembly, party leadership, and "other", which often denoted voluntary or unofficial positions.

marriages to foreigners or being stripped of their nationality are not coded as immigrants.

In addition to this family-level data, we also use data at the level of the product. Product information is linked to our product data by four-digit HS Code or six-digit Standard Industrial Classification (SIC) codes. We use the HS-SIC crosswalk developed by Schott and Pierce (2009) as a base for merging information by SIC and HS codes (Pierce and Schott, 2009). For data that does not include HS or SIC codes, we match text product descriptions based on a combination of an exact match to a key word, approximate string matching among the possible matches, and hand matching the most common products by volume and value.

Our primary source of price data comes from the *Institut Haïtien des Statistiques et Information* (IHSI), the Haitian statistical bureau. IHSI publishes a monthly price bulletin that includes individual prices of around 20 of the top goods in the Haitian consumption basket that go into the consumer price index. We link the text descriptions of these products to 4-digit HS Codes with the help of the Office of the *Direction des Statistiques* in the *Administration Generale des Douanes*, or Haitian customs bureau. We exclude goods like public transportation fees, water provisions, and manufactured textiles that are typically not imported. This data ultimately includes monthly consumer prices of 18 goods from 2001 to 2012.

We also include product-level data on trade flows from two primary sources: first, information by product on the volume of trade between Haiti and the rest of the world collected by the Haitian shipping firm AGEMAR. As mentioned above, this data is used to link products to specific Haitian firms. Second, we draw in information on goods traded between the U.S. and Haiti from the international trade database maintained by the U.S. Census Bureau. We use this information on trade flows to construct measures of supply prices of goods traded between the U.S. and Haiti, and the U.S. and the rest of the world. Our measures are indexed to August 2004 and standardized to ease interpretation.

We also draw in information on product characteristics that may shape the incentives of firm owners to put a sympathetic autocrat in power. First, we proxy for the inelasticity of demand, which affects the extent to which monopolists could increase their profits by raising prices, using the share of the average Haitian's consumption that goods make up. Under constant elasticity of substitution, consumption share and demand elasticity are inversely related. We measure consumption share using household expenditure data collected by Jensen, Johnson and Stampley (1990). Other research has shown that elite resistance to democracy is shaped in part by the ease with which a democratic government can tax and redistribute assets (Acemoglu and Robinson, 2006*a*). We draw from this insight, plus the literature on corruption, to identify characteristics that might make certain imported goods easier for the government to effectively tax. First, we use data from PIERS to construct measures of the bulkiness and divisibility of each product to test the prediction that products that are harder to move or easier to divide should be easier to informally tax. Divisibility is measured as units per twenty-foot equivalent unit (TEU), while bulkiness is measured as value per TEU to test the prediction that bulkier products, which may be easier to identify and tax, should be associated with more resistance to democracy. Second, we merge our products with existing product-level datasets of product complexity from (Hausmann et al., 2013), time sensitivity from (Hummels, 2007), and scope for quality differentiation from Rauch (1999). These measures will be used as controls for the differential vulnerability to tariffs based on specific-skills, high discount rates, and custom agent discretion.

From this linkage, we construct two primary datasets: family-level and product-level. In our family data, we aggregate the product characteristics up to the level of the family (for families who are involved in importing more than one product) by calculating a weighted sum based on the value of a family's trade in each product. This weighted sum takes into account the price and volume of the trade by each firm that the family owns as well as the number of other owners. Thus, our measure of product-level data by family is determined by:

$$x_i = \frac{\sum\limits_{j=1} \sum\limits_{k=1} \frac{value_{jk}}{nown_j} x_k}{\sum\limits_{j=1} \sum\limits_{k=1} \frac{value_{jk}}{nown_j}}$$

where i represents each unique family in our family-level dataset, j represents each business that they own, and k represents each product that they import. In this formula x_k is the value of the product characteristic such as divisibility for each product k and x_i is the average product characteristic for each family.

For our product-level data, we aggregate family-level characteristics up to the level of the firm using a similar weighted measure that takes into account the share of trade in each product that is owned by a particular family. Again, this takes into account the share of imports controlled by a firm and the number of families that own each firm. In this way, we calculate measures of the proportion of firm owners who participated in the 1991 coup and the average network centrality by product.

$$x_k = \frac{\sum\limits_{j=1}\sum\limits_{i=1} \frac{value_{ij}}{nown_j} x_i}{\sum\limits_{j=1}\sum\limits_{i=1} \frac{value_{ij}}{nown_j}}$$

where i again represents each family, j each firm, and k each product. In this case, because values are calculated using a monthly, product-level price, using the value or weight of each good results in the same product-level average. Ultimately the product-level values take into account the share of imports controlled by each firm and the share of each firm controlled by a particular family.

Last, for our analysis of the impact of autocracy on the general welfare, we use data on child health outcomes from the Demographic and Health Surveys (DHS) conducted in Haiti in 1995, 2000, 2006, and 2012. This data covers all children under five whose anthropometric data on height and weight was measured during the DHS from the onset of democracy in 1991 through 2012. This information is not linked to the rest of our data.

B Model Appendix

In this appendix we collect a result used in the analysis in Section 3. The first important issue is to check that Assumption 1 is sufficient to guarantee that no elite agent with action choice $a_e \leq \hat{a}_e^* < \bar{a}$ would wish to distort upwards their choice so as to become a coup participant. We state this in the following result.

Lemma 1 *Under Assumption 1 there exists an $\bar{a} \in (0,1)$ which defines a critical value of the action choice $\hat{a}_e^* \in (0,\bar{a})$ such that no elite agent for whom $a_e \leq \hat{a}_e^*$ wishes to change their action* *choice to $\bar{a}$ in order to become a coup participant.*

Proof. First note that it is clear that every agent who chooses $a_e \geq \bar{a}$ has no incentive to chose any other action since they are a coup participant and get to determine the tax rate. Thus we can restrict attention to agents who are not coup participants and who optimally set $a_e^* < \bar{a}$ given that they are not coup participants. The maximized value of agent e when she chooses an optimal level $a_e^* < \bar{a}$ is

$$\sum_{e' \neq e} \omega_{e'e} a_{e'}^* a_e^* - \frac{\delta}{2} (a_e^*)^2 + \frac{1}{E} \left(\sum_{i \in \mathscr{E}} a_i^* \right) \Pi$$

where $\Pi = \sum_{m=1}^{M} w_{em} (\tau_m^*(D) - 1) q_m \kappa$. While the maximized value of her payoff when he chooses some $b_e \geq \bar{a}$ is

$$\sum_{e' \neq e} \omega_{e'e} a_{e'}^* b_e - \frac{\delta}{2} (b_e)^2 + \frac{1}{E} \left(\sum_{i \in \mathscr{E}} a_i^* - a_e^* + b_e \right) [\Pi + \Delta\Pi]$$

where $\Delta\Pi$ is the extra profits (net of administration costs) that the elite member gets by becoming a coup participant. Re-arranging and cancelling terms, such a deviation will not be desirable if

$$\begin{aligned} & \sum_{e' \neq e} \omega_{e'e} a_{e'}^* a_e^* - \frac{\delta}{2} (a_e^*)^2 + \frac{1}{E} \left(\sum_{i \in \mathscr{E}} a_i^* \right) \Pi \\ > & \sum_{e' \neq e} \omega_{e'e} a_{e'}^* b_e - \frac{\delta}{2} (b_e)^2 + \frac{1}{E} \left(\sum_{i \in \mathscr{E}} a_i^* - a_e^* + b_e \right) [\Pi + \Delta\Pi] \end{aligned}$$

or,

$$(a_e^* - b_e) \frac{1}{E} \Pi + \sum_{e' \neq e} \omega_{e'e} a_{e'}^* (a_e^* - b_e) - \frac{\delta}{2} (a_e^{*2} - b_e^2) > \frac{1}{E} \left(\sum_{i \in \mathscr{E}} a_i^* - a_e^* + b_e \right) \Delta\Pi$$

which gives,

$$(a_e^* - b_e) \left[\frac{1}{E} \Pi + \sum_{e' \neq e} \omega_{e'e} a_{e'}^* - \frac{\delta}{2} (a_e^* + b_e) \right] > \frac{1}{E} \left(\sum_{i \in \mathscr{E}} a_i^* - a_e^* + b_e \right) \Delta\Pi.$$

Note however that since a_e^* is chosen optimally, the first-order condition implies that $\frac{1}{E}\Pi + \sum_{e' \neq e} \omega_{e'e} a_{e'}^* - \delta a_e^* = 0$ and substituting this into the square brackets on the left side of the previous inequality we find the expression reduces to

$$\frac{\delta}{2}(a_e^* - b_e)^2 > \frac{1}{E}\left(\sum_{i \in \mathscr{E}} a_i^* - a_e^* + b_e\right)\Delta\Pi. \tag{14}$$

Now letting $b_e = \bar{a}$ (14) has an intuitive interpretation. The left-side is the extent to which the elite agent has to distort his choice to become a coup participant, times the marginal disutility of effort. The right-side is that marginal benefit from doing so. Therefore, (14) can be used to define a critical value of a_e^*, denoted $\hat{a}_e^* \in (0, \bar{a})$ such that at $\hat{a}_e^*$ an elite agent is indifferent between distorting upwards her action choice to become a coup participant. To see that such an $\hat{a}_e^*$ exists note that as $\hat{a}_e^* \to \bar{a}$ the left side of (14) goes to zero and the inequality cannot hold, implying that deviating to become a coup participant must pay. However, when $\hat{a}_e^* = 0$ (14) becomes

$$\bar{a} > \sqrt{\frac{2}{\delta E}\left(\sum_{i \in \mathscr{E}} a_i^* - a_e^* + \bar{a}\right)\Delta\Pi}. \tag{15}$$

Assumption 1 is a sufficient condition for the right side of (15) to be less than one. Therefore, we can pick an $\bar{a} < 1$ such that (15) holds and by the Intermediate Value Theorem there exists as $\hat{a}_e^* \in (0, \bar{a})$ such that (14) holds as an equality and therefore (14) is satisfied for all elite members who optimally choose $a_e^* \in (0, \hat{a}_e^*]$. ■

To complete the development of the model in the text we now present the value functions for the players when the political state is a dictatorship. Let's now consider the payoffs to citizens first.

$$\begin{aligned} & V^c(N \mid a(N), a(D), \tau(D)) \qquad (16) \\ = \; & \max_{\tau(N) \geq 1} \{p(a(N))(W^c(\tau(N)) + \beta V^c(N \mid a(N), a(D), \tau(D))) \\ & + (1 - p(a(N)))(W^c(\tau(D)) + \beta V^c(D \mid a(N), a(D), \tau(D)))\}, \end{aligned}$$

We can now write the value function for a member of the elite as

$$
\begin{aligned}
& V^e\left(N \mid a^{-e}(D), a^{-e}(N), \tau(D), \tau(N)\right) && (17)\\
= \quad & \max_{a_e(N)\in[0,1]} \left\{-\chi(a_e) + p\left(a_e, a^{-e}(N)\right) \times \right. \\
& \left[\sum_{m=1}^{M} w_{em}\left(\tau_m^*(N) - 1\right) q_m \kappa - \mathbf{1}_{\mathscr{E}_{m,a_e \geq \bar{a}}} \sum_{m=1}^{M} w_{em} \frac{C(\tau_m^*(N))}{\sum_{e\in\mathscr{E}_{m,a_e\geq\bar{a}}} w_{em}} \right. \\
& \left. + \beta V^e\left(N \mid a^{-e}(D), a^{-e}(N), \tau(D), \tau(N)\right)\right] \\
& \left. + \left(1 - p\left(a_e, a^{-e}(N)\right)\right) \beta V^e\left(D \mid a^{-e}(D), a^{-e}(N), \tau(D), \tau(N)\right)\right\}.
\end{aligned}
$$

The important point about (17) is that the decision problem facing members of the elite who are trying to gain control over the tax rate and preserve dictatorship is identical to that they face when they are trying to overthrow democracy in the first place. This implies that the optimal action vectors are the same because the costs and the 'prize' is the same.

C Robustness checks: Coup participation

C.1 Methodology to determine weighting parameter

To determine the appropriate weighting parameter, we regress coup participation on the number of connections that a family has to coup participators. The coefficient on this measure of coup degree is the appropriate weighting parameter to calculate Bonacich centrality in the entire network. Table C.1 shows the results of this analysis.

[Table C.1 about here.]

C.2 Robustness to alternative periods of the network data

In this section we test whether our results are robust to stricter temporal cutoffs. One source of concern in our analysis is that reverse causality could be driving our results if families that participate in the coup are more likely to marry into each other post-coup. Using older versions of the network data that are more likely to temporally predate the coup mitigates against the risk of such reverse causality. The specifications presented in each column of Table C.2 have the same controls as the corresponding specifications in Table 4. Panel A of Table C.2 presents the results from the main table. Panel B presents results using a version of the network that is truncated at cohorts born in 1950, and Panel C truncates the network at cohorts born in 1925.

[Table C.2 about here.]

C.3 Robustness to weighting by measures of data quality

One source of noise in our data comes from misattribution of families with the same last name to family dynasties. We have interpreted all individuals with the same last name as members of the same dynasty. However, in some cases common names can be shared across families. In the following table we weight the degree to which individuals with the same last name can reach each other in the sub-graph consisting of only that last name.

To examine robustness to the possibility that last names are not capturing family dynasties, we calculate an additional statistic using the subgraph of individuals that share a last name as a measure of data quality, which we call reachability. Reachability is the probability that an individual with a certain last name is connected through some path of marriage or parentage to another individual with the same last name. We calculate this probability for each node in a last-name subgraph and then take the average across all nodes in the subgraph to get a family reachability. Reachability is a good measure of the quality of our network data because it picks up two types of measurement error in the social network: first, if there are two separate family dynasties in Haiti that share the same last name but are not actually connected by kinship. Second, if we are missing marriage links between some individuals due to missing data. A longer discussion of our network data quality and several examples of last name subgraphs are presented in Appendix C.3.

A dynasty with reachability of less than one could be due to our misattribution of two families with the same last name to the same dynasty, or it could be due to missing links in our network data. In either case, it introduces measurement error. Figures C.1a and C.1b show examples of dynasties with high and low measures of reachability. These two figures use data from actual families in our database that have the same number of individual members but differ in their reachability. The size of the nodes shows the cohort of each individual, with smaller nodes indicating earlier family members. Links represent parent-child relationships.

Figures C.1c and C.1d show the distribution of reachability in our sample of all elites and our importer sample.

[Figure C.1 about here.]

We deal with this measurement error by testing whether our coefficients are robust to least squares regression weighted by the quality of the network data, as measured by each family's reachability score. Table C.3 shows the results of this analysis. In this table, we use the standardized weighted Bonacich centrality with $\frac{1}{\delta} = 0.02$ as our independent variable of interest and an adjacency matrix that takes into account the size of each family.

[Table C.3 about here.]

Table C.3 shows that the relationship between centrality and coup participation is similar in magnitude and more significant once we take variation in data quality into account.

C.4 Robustness to ranked centrality

The next robustness check tests whether the coup participation results are robust to a measure of centrality that has been ranked to reduce the influence of outliers. Table C.4 compares the results of the specifications in Columns 1, 3, 4 and 8 of Table 4 to the same specifications with a ranked and standardized measure of centrality.

[Table C.4 about here.]

Table C.4 shows that the results are largely similar using a ranked measure of centrality. These results suggest that the estimated effects are not driven by the skewed nature of the centrality measure.

C.5 Robustness to community fixed effects

[Table C.5 about here.]

C.6 Robustness to varying weights in centrality calculation

We also assess the robustness of our results to various ways of calculating centrality. As discussed in Section 6.1, our main results are based on a measure of centrality that is calculated using weights for both the nodes and the edges. Our theory implies that an agent's action should be increasing in his Bonacich centrality, where nodes are weighted by the profits that the agent would make during autocracy. To take into account the fact that the probability of a link between two families is also a function of the number of members in each family, we downweight large families by also weighting the network edges by the inverse of the product of each family's size, $\frac{1}{size_e * size_m^{\frac{1}{2}}}$. In this section we recreate our analysis of the determinants of coup participation in Table 4 using various alternative node and edge weights to calculate centrality. Table C.6 presents the coefficients on the centrality measure from regressions that also include all of the controls from the corresponding specifications in Table 4.

[Table C.6 about here.]

The coefficients presented here are on the measure of centrality calculated by varying the node and edge weights. The first results presented are our original results, with node weight based on the value of a families trade calculated using prices in 2002 and edge weights based on the inverse of the product of the sizes of the connected families. The second row of results present the coefficient on centrality calculated with no node or edge weights. The third and fourth row vary the node weights by calculating the value of a family's trade using the average prices between 2002 and 2012, or during the autocratic period from March 2004 to January 2006, respectively. The final set of results replace the edge weights based on the product of the two family sizes with the inverse sum.

Table C.6 shows that the results on centrality are quite similar in magnitude, and in most cases remain significant, when we vary the node and edge weights used to calculate centrality.

D Robustness Checks: Prices

D.1 Serial Correlation

Our preferred specification includes four lags of the dependent variable. These lags are necessary to take into account dynamic processes in prices, but under some circumstances they can also raise difficulties in estimation. In this section we discuss these potential estimation problems and present the results of empirical tests of our additional assumptions.

One concern when estimating models with both fixed effects and lagged dependent variables is Nickell bias (Nickell, 1981; Alvarez and Arellano, 2003). However, this bias decreases as the number of time periods in a model go up: Judson and Owen (1999) show using simulations that this bias is around 1% when $T = 30$, so in our case with around 140 time periods it will be negligible. An alternative is to use the standard GMM estimators that are consistent in the presence of a lagged dependent variable, but these become biased for large T as they will run into the “many instruments" problem, as the instruments increase with T^2, leading to a worst case of 19600 instruments with only 2250 observations. This can be overcome by restricting the number of moments used in the estimation which we do in Table D.2. Again results are broadly consistent, if less precise, than our main OLS specification.

Models with lagged dependent variables can also be biased if the lagged dependent variable is a unit root. In these cases, the sampling distributions of the coefficients are not normal. To test for whether our time series has a unit root, we test for whether the linear combination of the lags is equal to one. The lags in columns 2-5 of Table 6 add up to 0.96 (with only one lag), 0.946, 0.945, and 0.944, respectively. The coefficients from tests of whether the linear combination of the coefficients on the lagged dependent variables equal one are all significant at the 1% level, which means that we can reject the null hypothesis that there is a unit root in all four of the specifications in Columns 2-5 of Table 6.

Last, we test whether our coefficient of interest is robust to assuming autocorrelation parameters between 0.9 and 1. Assuming an autocorrelation coefficient eliminates the threat of bias that exists in the specifications where we estimate both the autocorrelation and our coefficient of interest. In Table D.1 we test whether our preferred specification of Column 5 in Table 6 is robust to autocorrelation coefficients in this range of parameters around our estimated getting increasingly close to 1.

[Table D.1 about here.]

Table D.1 shows that the estimate of the coefficient of interest on $Coup_i \times Autocracy_t$ remains statistically significant up to an imposed autocorrelation of 1 (equivalent using the price growth rates as the dependent variable). This is well above our estimated autocorrelation of around 0.945. At an imposed autocorrelation of 0.95, our estimated coefficient of 0.016 is statistically indistinguishable from the result of 0.015 reported in Column 5 of our main Table 6.

[Table D.2 about here.]

D.2 Robustness to inclusion of product controls

Table D.3 tests whether the price regressions shown above are robust to including the interactions of product characteristics and autocracy.

[Table D.3 about here.]

Table D.3 shows that the effect of coup participation during autocratic periods is robust to including three of five product characteristics, in addition to the product-level measures of Consumption Share and Number of Firms, interacted with Autocracy. There are no robust relationships between the product characteristics and prices during autocracy.

D.3 Robustness to weights for data quality

We also run a test to estimate the sensitivity of our results to non-random missingness in our data. There are three kinds of missingness that we are most worried about. First, there is non-random missingness in our data on which firms import which products. Specifically, for each product we have data on the firm that imports around 90% of the volume of trade. Missingness is concentrated in products that are imported in bulk such as sugar, kerosene, rice, and edible oil.

Second, there is non-random missingness in the extent to which we could identify the families that own each firm. For our CPI products, we are able to identify on average 64-65% of the importing families by quantity, weight or value of imports. Generally, we are less able to identify the owners of firms that import less, so missingness tends to be higher for products with lower market concentration such as sandals, furniture, and beauty care. Though this means that we have non-random measurement error it also suggests that we are able to identify a higher proportion of large and influential importers, who we find are the most likely to participate in coups. Last, we may have measurement error in the extent to which our data from 2009 and 2011 represents shipping historical shipping patterns in Haiti, which we were unable to obtain. As a measure of this potential error, we calculate the volume of shipments by shipper in 2009 that also occurred in 2011.

We use a series of regressions in which we weight observations by these measures of data quality to test the sensitivity of our results to these data limitations. Table D.4 shows the results of an analysis of the relationship between prices during autocracy and coup participation using weights based on our measures of data quality. Each of these weights is a measure that varies between 0 and 1 and is calculated at the product level.

[Table D.4 about here.]

Table D.4 shows that our results are generally stronger when we weight the data by measures of our confidence in its quality. Column 1 presents the results from our preferred specification in our original table of results, Table 6, without any weights. Column 2 presents this same specification estimated using weighted OLS with the proportion of the volume of trade in each product where we identified the family as the weight. The coefficient in this specification is slightly smaller in magnitude but more significance than in the original specification. Column 3 presents the results using the proportion of firms that we were able to identify in each product as the weight. The coefficient on Coup $\times$ Autocracy is slightly smaller than in Column 1 but still significant at the 5% level. In Column 4 we use a weighted specification where the weights are the proportion of firm-product trade in 2009 that is also imported in 2011. In this specification, the coefficient increases in magnitude to 0.023 and gains in significance. In the last column, we use a "combined weight" that is the product of the three weights in columns 2-4. Again, the coefficient on Coup × Autocracy is larger in magnitude once we take our measures of data quality into account and significant at the 5% level.

E Does market share change over time?

Our analysis assumes that the market share of firms within specific products is stable over time. Specifically, we use data on firm-specific shipping patterns from 2009 and 2011 to link firms to products. In this section, we discuss the validity of this assumption by analyzing whether firm-specific shipping patterns changed in the years around the 2010 earthquake. The January 2010 earthquake was a huge shock to the Haitian economy and trade infrastructure, and thus although this is a relatively short time period testing for continuity in shipments in 2009 and 2011 is a tough test of whether shipping patterns are stable over time. We exclude 2010 from this analysis to eliminate shipments of emergency relief items coming into Haiti immediately after the earthquake.

To test whether shipping patterns change from 2009 to 2011, we plot the log quantity or value shipped by each importer for each product in 2009 against the log quantity or value for the same product and importer in 2011. We use a log transformation because the data in both years is strongly right skewed.[21] In the figures that follow, we present the analysis on three subsets of data. First, we show the relationship between 2009 and 2011 shipments using all the data. Second, we show the analysis for shipments of firms for which we have identified the owners. This is the sample for our family-level analysis of coup participation. Third, we show the analysis for shipments of firms for which we have identified the owners and for which we have retail price data (i.e. the 18 consumer price index products). This is our sample of firms in the price analysis. Figure E.1 shows the results of this analysis for the full sample.

[Figure E.1 about here.]

Figure E.1 shows that the products that a firm ships in 2009 are strong predictors of the products that it ships in 2011. This relationship gets increasingly strong as we restrict the

[21] We log the quantity plus 1 to avoid missing data for shipments with zero values or quantities.

firm-product pairs to only firms for which we have identified the names of the owners, and only firms for which we have identified the owners and import products for which we have price data.

In later robustness checks in Appendix D.3 we test whether our results are robust to down-weighting data for products that have lower levels of consistency in shipments between 2009 and 2011.

Tables

Table 1: Summary Statistics: Family-level data - All elite sample

		Coup			Non-coup		
		N	Mean	St. Dev.	N	Mean	St. Dev.
Social	Political elite	212	0.71	0.45	828	0.62	0.49
	Military elite	212	0.42	0.49	828	0.29	0.45
	Business elite	212	0.43	0.50	828	0.34	0.47
	Immigrant	212	0.22	0.42	828	0.08	0.27
	Middle Eastern	212	0.10	0.31	828	0.02	0.15
	Bonacich centrality	202	50.68	160.36	514	21.40	69.95
	Degree	202	19.23	21.89	514	13.54	16.55
	Family size	202	25.38	29.78	514	18.84	24.73
	Reachability	202	0.35	0.27	514	0.53	0.30

Table 2: Summary Statistics: Family-level data - Importer sample

		Coup			Non-coup		
		N	Mean	St. Dev.	N	Mean	St. Dev.
Social	Immigrant	76	0.38	0.49	225	0.17	0.38
	Middle Eastern	76	0.22	0.42	225	0.08	0.27
	Political elite	76	0.46	0.50	225	0.21	0.41
	Military elite	76	0.24	0.43	225	0.08	0.28
	Bonacich centrality	73	139.75	243.29	144	75.68	115.88
	Degree	73	26.37	29.59	144	16.60	19.81
	Family size	73	33.93	39.41	144	22.18	27.87
	Reachability	73	0.36	0.28	144	0.57	0.30
Economic	Market share	76	0.07	0.11	225	0.08	0.12
	Value (mil USD)	76	16.31	47.95	225	7.89	21.89
	Consumption share	52	0.46	0.63	131	0.37	0.56
	All inputs	76	0.87	0.28	225	0.87	0.27
	Bulkiness	76	3.62	2.99	225	3.98	2.83
	Divisibility	76	4.90	2.23	225	4.98	2.20
	Reference price	76	1.32	0.55	225	1.25	0.53
	Time sensitivity	76	0.00	0.01	225	0.00	0.01
	Complexity	76	1.66	1.69	225	1.72	1.77

Table 3: Determinants of Centrality

	Dependent variable:					
	Centrality					
	(1)	(2)	(3)	(4)	(5)	(6)
Middle Eastern	0.32**	0.33**	0.29	0.31*	0.20	0.22
	(0.14)	(0.14)	(0.18)	(0.18)	(0.16)	(0.15)
Immigrant	0.08**	0.08*	0.21**	0.19**	0.20**	0.19**
	(0.04)	(0.04)	(0.09)	(0.09)	(0.08)	(0.08)
Reachability	0.04	0.04	0.10	0.11	0.14	0.11
	(0.03)	(0.03)	(0.09)	(0.10)	(0.09)	(0.09)
Military	−0.01	−0.01	0.01	−0.01	−0.05	−0.09
	(0.02)	(0.02)	(0.08)	(0.08)	(0.07)	(0.08)
Political	−0.01	−0.01	0.07	0.05	0.03	0.04
	(0.03)	(0.03)	(0.06)	(0.06)	(0.06)	(0.05)
Business	0.15***	0.15***				
	(0.02)	(0.02)				
Family Size (Log)		0.01		0.03	0.02	0.02
		(0.01)		(0.02)	(0.02)	(0.02)
Business Value (Mil USD)					0.005***	0.004***
					(0.001)	(0.001)
Consumption Share						0.01
						(0.02)
All Inputs						−0.05
						(0.11)
Reference Price						−0.03
						(0.02)
Complexity						0.02
						(0.03)
Time Sensitivity						0.04**
						(0.02)
Bulkiness						−0.06**
						(0.02)
Divisibility						−0.06**
						(0.03)
Constant	−0.79***	−0.81***	−0.69***	−0.79***	−0.82***	−0.83***
	(0.03)	(0.04)	(0.06)	(0.09)	(0.09)	(0.11)
Observations	716	716	217	217	217	217
R^2	0.23	0.23	0.14	0.15	0.31	0.37
Sample	All Elite		Importers			
Note:				$^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$		

Table 4: Coup Participation

	Dependent variable:							
	Coup							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Centrality	0.207***	0.188***	0.097	0.185***	0.169***	0.194***	0.125*	0.133*
	(0.055)	(0.054)	(0.064)	(0.060)	(0.058)	(0.065)	(0.071)	(0.072)
Family Size		0.058***	0.046***		0.084***	0.084***	0.073***	0.070***
		(0.013)	(0.014)		(0.021)	(0.021)	(0.026)	(0.026)
Business Elite			0.051					
			(0.043)					
Political Elite			0.059				0.052	0.051
			(0.044)				(0.084)	(0.085)
Military Elite			0.117***				0.065	0.074
			(0.037)				(0.101)	(0.104)
Middle Eastern			0.248***				0.169	0.173
			(0.095)				(0.121)	(0.124)
Immigrant			0.058				0.080	0.089
			(0.059)				(0.098)	(0.099)
Value						−0.018	−0.020	−0.003
						(0.030)	(0.030)	(0.036)
Consumption Share						0.026	0.024	0.019
						(0.052)	(0.046)	(0.050)
All Inputs						−0.015	0.012	0.173
						(0.139)	(0.143)	(0.183)
Reference Price								0.043
								(0.057)
Complexity								−0.043
								(0.047)
Divisibility								0.054
								(0.047)
Bulkiness								−0.030
								(0.047)
Time Sensitivity								−0.052
								(0.047)
Constant	0.425***	0.204***	0.067	0.431***	0.112	0.157	0.061	−0.031
	(0.042)	(0.061)	(0.073)	(0.044)	(0.084)	(0.143)	(0.150)	(0.167)
Observations	716	716	716	217	217	217	217	217
R^2	0.016	0.041	0.075	0.031	0.086	0.091	0.124	0.141
Sample		All Elite				Importers		

Robust standard errors in parentheses.
*p<0.1; **p<0.05; ***p<0.01
The outcome variable is a binary measure of whether a family participated in the coup, as measured by whether the family is on the 1991 U.S. Treasury targeted sanctions list. The measure of centrality is the standardized weighted Bonacich centrality of a family in the marriage network where the parameter $\frac{1}{\delta}$ is set to 0.02. The adjacency matrix used to calculate centrality is weighted by the number of members in each family to take into account the higher propensity of large families to connect with each other and the value of a family's trade. Immigrant measures whether a family is recorded as having naturalized as a citizen after independence. Middle Eastern takes a value of 1 if the immigrant came from Lebanon, Syria, Egypt, or Palestine. Military Elite and Political Elite take a value of 1 if a member of the family held a position in government or the military between independence and the end of the Duvalier era in 1986 (Supplice, 2001). Business elite takes a value of 1 if a member of the family is an owner in our business database. The social distance measures are calculated using data on the marriage network from the *Association Genéalogique d'Haïti*. The measure of a family's interest in autocracy is the total value of each family's trade in the AGEMAR trade data. Models are estimated using OLS.

Table 5: Summary Statistics: Product data

Product	Firms	Fams	Coup	Cent.	Middle Eastern	Share Consumption
	N			Weighted Mean		Percent
Beauty care	56	42	0.57	11.00	0.81	0.20
Bread	18	14	0.58	10.82	0.83	0.53
Chicken	12	9	0.92	3.15	0.92	0.22
Cigarettes	2	6	1.00	8.77	1.00	0.37
Cola	12	17	0.69	4.82	0.60	0.16
Corn meal	6	6	0.66	3.97	0.36	0.45
Dry peas	5	6	0.55	13.55	0.88	0.00
Edible oil	5	10	0.43	6.08	1.00	3.10
Evaporated milk	10	12	0.49	14.83	0.59	0.38
Fabric	23	15	0.52	7.89	0.67	1.15
Fresh fish	10	7	0.42	9.55	0.67	1.28
Furniture	19	19	0.38	11.10	0.63	0.01
Kerosene	5	3	0.76	7.65	1.00	0.85
Laundry soap	24	19	0.35	7.42	0.81	0.00
Medicine	11	12	0.31	5.10	0.50	0.73
Raw sugar	8	6	0.70	7.35	0.85	0.51
Rice	7	6	0.88	5.51	1.00	2.26
Sandals	23	7	0.65	0.63	0.00	0.00

Table 6: Prices of goods imported by coup participators during autocratic periods

	Dependent variable:						
	Haiti retail price					Haiti supply price	World supply price
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Coup × Autocracy	0.188**	0.022***	0.021***	0.021***	0.018**	0.190	0.066
	(0.073)	(0.006)	(0.005)	(0.006)	(0.007)	(0.332)	(0.066)
Coup × Quake	0.102	0.074	0.072	0.072	0.068*	0.717***	−0.218
	(0.150)	(0.047)	(0.047)	(0.047)	(0.041)	(0.270)	(0.157)
World Supply Price				0.001	−0.0004		
				(0.004)	(0.004)		
Number Firms × Autocracy					−0.003		
					(0.002)		
Consumption Share × Autocracy					−0.0005		
					(0.001)		
Month FE	✓	✓	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓	✓	✓
Number of Lagged DVs		1	4	4	4	4	4
Product × Conflict Events					✓		
Observations	2,538	2,448	2,250	2,214	2,214	1,938	2,304
Clusters	18	18	18	18	18	18	18
Breusch-Godfrey test (p-value)	0	0	0.82	0.86	0.644	0.159	0
Joint Signif. of Lags (p-value)		0	0	0	0	0	0
Unit Root (p-value)		0	0.0001	0.0001	0.0001	0	0.0001

Standard errors clustered at the product level in parentheses. Cameron, Gelbach and Miller's (2008) wild bootstrap clusters in square brackets below the main coefficient of interest to account for the small number of clusters.
* significant at $p < .10$; $^{**}p < .05$; $^{***}p < .01$
In Columns 1-5, the dependent variable is the retail price from the Haitian statistical institute *Institut Haïtien des Statistiques et Information*. In Columns 6-7 outcome variable is the supply price from the U.S. Census Bureau. In Column 6 the dependent variable is the supply price for goods imported to Haiti and in Column 7 it is the supply price for all goods in the world. All prices are indexed to Aug 2004. The interaction term Coup × Autocracy is the interaction between an indicator for being in an autocratic period and the proportion of the market that is controlled by families who participated in the 1991 coup, according to the US Office of Foreign Assets Control. Coup participation is calculated for each product as the average over all business owners that import that product, weighted by the value of their share of the product. The interaction term Coup × Quake is the interaction between the coup proportion and being in the month after the January 2010 earthquake. World supply price is the log world supply price of each good by month from the U.S. Census Bureau in levels. The unit is the product-month and the sample covers January 2001 to December 2012 with some missingness. In addition to the supply price, in Column 5 we control for the number of firms importing a particular product from the AGEMAR trade data and the consumption share of each good from Jensen, Johnson and Stampley (1990). Both controls are logged and interacted with the Autocracy dummy. In Column 5 we also add the interaction of the product and the logged number of conflict events not involving the Haitian elite from the GDELT data. Models are estimated using OLS.

Table 7: Prices of goods imported by coup participators during autocratic periods, controlling for centrality

	Dependent variable:				
	Coup				
	(1)	(2)	(3)	(4)	(5)
Panel A: Centrality with value node weights and family size edge weights					
Coup × Autocracy	0.215***	0.026***	0.025***	0.025***	0.023***
	(0.066)	(0.007)	(0.005)	(0.006)	(0.008)
Centrality × Autocracy	0.0048	0.0006**	0.0007**	0.0007**	0.0007**
	(0.0042)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
	2538	2448	2250	2214	2214
Panel B: Centrality with no node weights and no edge weights					
Coup × Autocracy	0.16**	0.024***	0.021***	0.021***	0.019**
	(0.078)	(0.006)	(0.006)	(0.006)	(0.007)
Centrality × Autocracy	-0.0141	0.0011	-0.0001	0	0.0003
	(0.0138)	(0.0015)	(0.0013)	(0.0013)	(0.0014)
	2538	2448	2250	2214	2214
Panel C: Centrality with no node weights and family size edge weights					
Coup × Autocracy	0.171**	0.024***	0.021***	0.021***	0.018**
	(0.081)	(0.006)	(0.006)	(0.006)	(0.008)
Centrality × Autocracy	-0.0187	0.0019	-0.0001	0	0.0001
	(0.0257)	(0.0028)	(0.0023)	(0.0024)	(0.003)
	2538	2448	2250	2214	2214

Columns correspond to Columns 1-5 of Table 6. The dependent variable is the retail price from the Haitian statistical institute *Institut Haïtien des Statistiques et Information*. The interaction term Coup × Autocracy is the interaction between an indicator for being in an autocratic period and the proportion of the market that is controlled by families who participated in the 1991 coup, according to the US Office of Foreign Assets Control. Coup participation is calculated for each product as the average over all business owners that import that product, weighted by the value of their share of the product. The unit is the product-month and the sample covers January 2001 to December 2012 with some missingness. Models are estimated using OLS.

Table 8: Summary Statistics: Child health outcomes data

	Democracy			Autocracy		
	N	Mean	St. Dev.	N	Mean	St. Dev.
Urban	11643	0.3	0.5	3207	0.4	0.5
Female	11643	0.5	0.5	3207	0.5	0.5
Age	11643	29.9	17.0	3207	16.5	10.7
Weight (tenths kg)	11482	114.6	35.4	3034	89.5	35.6
Height (tenths cm)	11469	842.7	139.5	3026	734.5	104.8
Weight (Z-score)	11229	-90.3	122.8	2893	-102.8	139.5
Height (Z-score)	11229	-102.3	137.3	2893	-112.7	146.7

Table 9: Impact of autocracy on child welfare

	Dependent variable:							
	Weight				Height			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Urban × Autocracy	−12.78*	−11.96***	−5.88	−14.41***	−13.90*	−12.08***	−13.92**	−16.08***
	(7.62)	(4.45)	(7.32)	(4.77)	(7.42)	(4.66)	(6.63)	(5.11)
Urban × Quake	−9.44	−12.21	−6.79	−14.94*	−14.76	−14.47*	−10.27	−17.48**
	(10.20)	(7.85)	(8.09)	(7.99)	(11.84)	(7.94)	(8.48)	(8.07)
Urban × Conflict (Log)	−5.22	−3.91*	−10.96***	−3.20	−10.33***	−9.61***	−14.95***	−9.24***
	(3.52)	(2.08)	(3.94)	(2.11)	(3.41)	(2.17)	(3.44)	(2.20)
Urban	53.58***	49.09***	79.05***	49.70***	83.89***	80.35***	102.90***	81.75***
	(12.54)	(7.60)	(15.86)	(7.63)	(12.68)	(8.15)	(13.97)	(8.19)
Autocracy	−25.33***				−24.77***			
	(5.91)				(5.30)			
Quake	−9.02				−13.70			
	(6.45)				(8.90)			
Conflict (Log)	0.97	−52.95**	−52.82	2.28	4.01*	24.98	−34.37	138.38**
	(2.57)	(24.31)	(75.99)	(56.98)	(2.39)	(25.91)	(81.50)	(57.39)
Female	6.51***	6.30***	4.08	5.41**	12.71***	12.51***	9.88***	12.38***
	(2.08)	(2.03)	(3.05)	(2.16)	(2.23)	(2.26)	(3.34)	(2.40)
Age	−7.40***	−9.45***	−5.11***	−6.90***	−6.26***	−8.03***	−4.08**	−7.78***
	(0.41)	(1.22)	(1.80)	(1.65)	(0.38)	(1.31)	(1.92)	(1.70)
Age^2	0.10***	0.10***	0.04	0.07***	0.08***	0.08***	0.02	0.08***
	(0.01)	(0.02)	(0.03)	(0.02)	(0.01)	(0.02)	(0.03)	(0.03)
Birth Linear Trend	✓				✓			
Birth Month FE		✓	✓	✓		✓	✓	✓
Observations	14,122	14,122	6,888	12,612	14,122	14,122	6,888	12,612
R^2	0.11	0.15	0.14	0.08	0.10	0.13	0.12	0.10
Mean Dep. Var	-92.8	-92.8	-86.9	-106	-104.4	-104.4	-96	-114.6
Clusters	482	482	256	438	482	482	256	438
Sample	1991+	1991+	2001+	6 month+	1991+	1991+	2001+	6 month+

Standard errors clustered at the birth month-area (urban vs. rural) level in parentheses
*p<0.1; **p<0.05; ***p<0.01
The data in this table is taken from the Demographic and Health Surveys in 1995, 2000, 2006, and 2012 and covers all children under age 5 at the time of the survey born between the start of the first Aristide regime in 1991 (Columns 1-2, 4-6, and 8) or the second starting in 2001 (Columns 3 and 7) and the last DHS round in 2012. The data is the weights (Columns 1-4) and heights (Columns 5-8) of children under 5 in levels. The dependent variable in Columns 1-4 is a weight-for-age Z-score calculated by the WHO from data measured during the survey in tenths of kilograms. The dependent variable in Columns 5-8 is a height-for-age Z-score calculated by the WHO from data measured during the survey in tenths of centimeters. Models are estimated using OLS.

Table C.1: Centrality in the Network of Coup Participators

	(1)	(2)	(3)	(4)	(5)	(6)
Coup Degree	0.229**	0.123	0.253*	0.231	0.230	0.068
	(0.089)	(0.093)	(0.146)	(0.151)	(0.155)	(0.158)
Business Elite		0.084*				
		(0.044)				
Political Elite		0.084*				0.121
		(0.044)				(0.080)
Military Elite		0.128***				0.104
		(0.037)				(0.105)
Middle Eastern		0.260***				0.159
		(0.095)				(0.127)
Immigrant		0.086				0.144
		(0.060)				(0.099)
Value				0.021	0.040	0.027
				(0.028)	(0.035)	(0.035)
Consumption Share				0.028	0.022	0.017
				(0.049)	(0.054)	(0.048)
All Inputs				0.010	0.128	0.196
				(0.148)	(0.180)	(0.189)
Reference Price					0.080	0.077
					(0.061)	(0.059)
Complexity					−0.029	−0.039
					(0.047)	(0.047)
Divisibility					0.033	0.055
					(0.049)	(0.047)
Bulkiness					−0.025	−0.036
					(0.046)	(0.047)
Time Sensitivity					−0.052	−0.039
					(0.053)	(0.050)
Constant	0.241***	0.101**	0.280***	0.254*	0.179	0.055
	(0.022)	(0.045)	(0.043)	(0.132)	(0.149)	(0.159)
Observations	716	716	217	217	217	217
R^2	0.011	0.062	0.015	0.020	0.037	0.104
Sample	All elite		Importers			

Robust standard errors in parentheses.
*p<0.1; **p<0.05; ***p<0.01
The outcome variable is a binary measure of whether a family participated in the coup, as measured by whether the family is on the 1991 U.S. Treasury targeted sanctions list. The measure Coup Degree is the number of connections that a family has to coup participators. Immigrant measures whether a family is recorded as having naturalized as a citizen after independence. Middle Eastern takes a value of 1 if the immigrant came from Lebanon, Syria, Egypt, or Palestine. The measures of political eliteness Military Elite and Political Elite take a value of 1 if a member of the family held a position in government or the military between independence and the end of the Duvalier era in 1986 (Supplice, 2001). The social distance measures are calculated using data on the marriage network from the *Association Genealogique d'Haïti*. The measure of a family's interest in autocracy is the total value of each family's trade in 2009 and 2011, which is calculated from the AGEMAR trade data. Models are estimated using OLS.

Table C.2: Robustness to earlier versions of the network

	Dependent variable:							
	Coup							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: 1850-1975 Marriage Network								
Centrality	0.207***	0.188***	0.097	0.185***	0.169***	0.194***	0.125*	0.133*
	(0.055)	(0.054)	(0.064)	(0.060)	(0.058)	(0.065)	(0.071)	(0.072)
Observations	716	716	716	217	217	217	217	217
R^2	0.016	0.041	0.075	0.031	0.086	0.091	0.124	0.141
Panel B: 1850-1950 Marriage Network								
Centrality	0.203***	0.178***	0.081	0.175***	0.154**	0.182***	0.106	0.118
	(0.057)	(0.056)	(0.066)	(0.062)	(0.061)	(0.067)	(0.074)	(0.074)
Observations	699	699	699	209	209	209	209	209
R^2	0.014	0.040	0.078	0.027	0.079	0.083	0.123	0.139
Panel C: 1850-1925 Marriage Network								
Centrality	0.156***	0.126**	0.067	0.125**	0.096	0.123*	0.084	0.105
	(0.053)	(0.055)	(0.058)	(0.061)	(0.063)	(0.073)	(0.072)	(0.075)
Observations	659	659	659	191	191	191	191	191
R^2	0.014	0.032	0.077	0.021	0.050	0.055	0.113	0.135
Sample		All elite				Importers		

Robust standard errors in parentheses.
*p<0.1; **p<0.05; ***p<0.01
The outcome variable is a binary measure of whether a family participated in the coup, as measured by whether the family is on the 1991 U.S. Treasury targeted sanctions list. The measure of centrality is the standardized weighted Bonacich centrality of a family in the marriage network where the parameter $\frac{1}{\delta}$ is set to 0.02. In Panel A, the network is restricted to nodes born between 1850 and 1975, in Panel B to nodes born between 1850 and 1950, and in Panel C to nodes born between 1850 and 1925. The adjacency matrix used to calculate centrality is weighted by the number of members in each family to take into account the higher propensity of large families to connect with each other. Data quality weights are constructed using network data from all time periods and represent for each last name the average proportion of other nodes with that last name that can be reached from a single node of that last name, or the reachability within each last name across nodes. Immigrant measures whether a family is recorded as having naturalized as a citizen after independence. Middle Eastern takes a value of 1 if the immigrant came from Lebanon, Syria, Egypt, or Palestine. The measures of political eliteness Military Elite and Political Elite take a value of 1 if a member of the family held a position in government or the military between independence and the end of the Duvalier era in 1986 (Supplice, 2001). The social distance measures are calculated using data on the marriage network from the *Association Genealogique d'Haïti*. The measure of a family's interest in autocracy is the total value of each family's trade in 2009 and 2011, which is calculated from the AGEMAR trade data. Models are estimated using OLS.

Table C.3: Robustness to weights based on quality of network data

	Dependent variable:							
	Coup							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Centrality	0.229***	0.214***	0.189***	0.229***	0.203***	0.198***	0.149**	0.147**
	(0.056)	(0.055)	(0.063)	(0.061)	(0.059)	(0.066)	(0.072)	(0.073)
Family Size		0.030**	0.028**		0.059***	0.053**	0.053**	0.047*
		(0.013)	(0.014)		(0.022)	(0.022)	(0.027)	(0.027)
Constant	0.363***	0.252***	0.223***	0.363***	0.144*	0.044	−0.053	−0.173
	(0.042)	(0.063)	(0.076)	(0.044)	(0.087)	(0.151)	(0.165)	(0.185)
Observations	716	716	716	217	217	217	217	217
R^2	0.022	0.032	0.044	0.048	0.087	0.106	0.129	0.161
Social controls			✓			✓	✓	✓
Product controls							✓	✓
Observations	716	716	716	217	217	217	217	217
R^2	0.011	0.019	0.036	0.044	0.071	0.084	0.108	0.141
Sample		All elite				Importers		

Robust standard errors in parentheses.

*p<0.1; **p<0.05; ***p<0.01

The outcome variable is a binary measure of whether a family participated in the coup, as measured by whether the family is on the 1991 U.S. Treasury targeted sanctions list. The measure of centrality is the standardized weighted Bonacich centrality of a family in the marriage network where the parameter $\frac{1}{\delta}$ is set to 0.02. The adjacency matrix used to calculate centrality is weighted by the number of members in each family to take into account the higher propensity of large families to connect with each other. Data quality weights are constructed using network data from all time periods and represent for each last name the average proportion of other nodes with that last name that can be reached from a single node of that last name, or the reachability within each last name across nodes. Immigrant measures whether a family is recorded as having naturalized as a citizen after independence. Middle Eastern takes a value of 1 if the immigrant came from Lebanon, Syria, Egypt, or Palestine. The measures of political eliteness Military Elite and Political Elite take a value of 1 if a member of the family held a position in government or the military between independence and the end of the Duvalier era in 1986 (Supplice, 2001). The social distance measures are calculated using data on the marriage network from the *Association Genealogique d'Haïti*. The measure of a family's interest in autocracy is the total value of each family's trade in 2009 and 2011, which is calculated from the AGEMAR trade data. Models are estimated using OLS.

Table C.4: Robustness to ranked centrality

	Dependent variable:							
	Coup							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Centrality	0.21***		0.10		0.18***		0.13*	
	(0.06)		(0.06)		(0.06)		(0.07)	
Centrality (Rank)		0.10***		0.01		0.13**		0.08
		(0.03)		(0.05)		(0.06)		(0.09)
Constant	0.42***	0.38***	0.07	0.01	0.43***	0.39***	−0.03	−0.06
	(0.04)	(0.04)	(0.07)	(0.09)	(0.04)	(0.04)	(0.17)	(0.17)
Social controls			✓	✓			✓	✓
Product controls							✓	✓
Observations	716	716	716	716	217	217	217	217
R^2	0.02	0.01	0.08	0.07	0.03	0.02	0.14	0.14
Sample	All elite				Importers			

Robust standard errors in parentheses.

*p<0.1; **p<0.05; ***p<0.01

The outcome variable is a binary measure of whether a family participated in the coup, as measured by whether the family is on the 1991 U.S. Treasury targeted sanctions list. The measure of centrality is the standardized weighted Bonacich centrality of a family in the marriage network where the parameter $\frac{1}{\delta}$ is set to 0.02. The adjacency matrix used to calculate centrality is weighted by the number of members in each family to take into account the higher propensity of large families to connect with each other. The social controls include Family size, Immigrant, Middle Eastern, and dummies for each type of elite (Military, Political, and in the All Elite sample, Business). The product controls include the Value of trade, All Inputs, Consumption Share, Reference Price, Complexity, Divisibility, Bulkiness, and Time Sensitivity. The social distance measures are calculated using data on the marriage network from the *Association Genealogique d'Haïti*. Models are estimated using OLS.

Table C.5: Robustness to Network Community FE

	Dependent variable:							
	Coup							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Centrality	0.192***	0.171***	0.075	0.162**	0.145**	0.187***	0.119	0.131*
	(0.060)	(0.058)	(0.069)	(0.065)	(0.063)	(0.068)	(0.076)	(0.076)
Family Size		0.064***	0.051***		0.103***	0.104***	0.089***	0.080***
		(0.014)	(0.015)		(0.024)	(0.024)	(0.029)	(0.030)
Community FE	✓	✓	✓	✓	✓	✓	✓	✓
Social controls			✓			✓	✓	✓
Product controls							✓	✓
Observations	716	716	716	217	217	217	217	217
Number of Fixed Effects	71	71	71	21	21	21	21	21
R^2	0.095	0.122	0.151	0.145	0.208	0.218	0.252	0.270
Sample		All elite				Importers		

Robust standard errors in parentheses.

*p<0.1; **p<0.05; ***p<0.01

The outcome variable is a binary measure of whether a family participated in the coup, as measured by whether the family is on the 1991 U.S. Treasury targeted sanctions list. The measure of centrality is the standardized weighted Bonacich centrality of a family in the marriage network where the parameter $\frac{1}{\delta}$ is set to 0.02. The adjacency matrix used to calculate centrality is weighted by the number of members in each family to take into account the higher propensity of large families to connect with each other. Data quality weights are constructed using network data from all time periods and represent for each last name the average proportion of other nodes with that last name that can be reached from a single node of that last name, or the reachability within each last name across nodes. Immigrant measures whether a family is recorded as having naturalized as a citizen after independence. Middle Eastern takes a value of 1 if the immigrant came from Lebanon, Syria, Egypt, or Palestine. The measures of political eliteness Military Elite and Political Elite take a value of 1 if a member of the family held a position in government or the military between independence and the end of the Duvalier era in 1986 (Supplice, 2001). The social distance measures are calculated using data on the marriage network from the *Association Genealogique d'Haïti*. The measure of a family's interest in autocracy is the total value of each family's trade in 2009 and 2011, which is calculated from the AGEMAR trade data. The communities are calculated using the walktrap algorithm with a walk distance of 3. Models are estimated using OLS.

Table C.6: Robustness to varying node and edge weights in the centrality measure

Weights		Specification							
Nodes	Edges	1	2	3	4	5	6	7	8
$log(value_{2002})$	$\frac{1}{(size_e * size_m)^{\frac{1}{2}}}$	0.21***	0.19***	0.1	0.18***	0.2***	0.21***	0.14*	0.13*
		(0.06)	(0.06)	(0.07)	(0.06)	(0.07)	(0.07)	(0.08)	(0.08)
None	None	0.09***	0.02	0	0.1***	0.1***	0.09***	0.07*	0
		(0.02)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.06)
$log(value_{2002-2012})$	$\frac{1}{(size_e * size_m)^{\frac{1}{2}}}$	0.21***	0.19***	0.1	0.18***	0.2***	0.21***	0.13*	0.13*
		(0.06)	(0.06)	(0.07)	(0.06)	(0.07)	(0.07)	(0.08)	(0.08)
$log(value_{autocracy})$	$\frac{1}{(size_e * size_m)^{\frac{1}{2}}}$	0.21***	0.19***	0.1	0.18***	0.2***	0.21***	0.14*	0.13*
		(0.06)	(0.06)	(0.07)	(0.06)	(0.07)	(0.07)	(0.08)	(0.08)
$log(price_{2002})$	$\frac{1}{(size_e * size_m)^{\frac{1}{2}}}$	0.15***	0.13***	0.09	0.14***	0.15**	0.16***	0.12*	0.11
		(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.07)	(0.07)
$log(value_{2002})$	$\frac{1}{(size_e + size_m)}$	0.21***	0.19***	0.1	0.18***	0.2***	0.21***	0.14*	0.13*
		(0.06)	(0.06)	(0.07)	(0.06)	(0.07)	(0.07)	(0.08)	(0.08)
Observations		716	716	716	716	217	217	217	217
Sample		All elite				Importers			

Robust standard errors in parentheses.

*p<0.1; **p<0.05; ***p<0.01

This table presents the coefficients on centrality calculating using different node and edge weights from eight specifications (controls not shown). The outcome variable is a binary measure of whether a family participated in the coup, as measured by whether the family is on the 1991 U.S. Treasury targeted sanctions list. The measure of centrality is the standardized weighted Bonacich centrality of a family in the marriage network where the parameter $\frac{1}{\delta}$ is set to 0.02. The social controls include Family size, Immigrant, Middle Eastern, and dummies for each type of elite (Military, Political, and in the All Elite sample, Business). The product controls include the Value of trade, All Inputs, Consumption Share, Reference Price, Complexity, Divisibility, Bulkiness, and Time Sensitivity. The social distance measures are calculated using data on the marriage network from the *Association Genealogique d'Haïti*. Models are estimated using OLS.

Table D.1: Robustness to imposed autocorrelation coefficients

	Imposed autocorrelation:				
	$\rho = 0.9$	$\rho = 0.925$	$\rho = 0.95$	$\rho = 0.975$	$\rho = 1$
	(1)	(2)	(3)	(4)	(5)
Coup × Autocracy	0.024***	0.021***	0.018**	0.016**	0.013
	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)
Coup × Quake	0.077*	0.073*	0.069*	0.065	0.061
	(0.041)	(0.041)	(0.041)	(0.040)	(0.040)
World Supply Price	0.005	0.004	0.002	0.0001	−0.002
	(0.006)	(0.004)	(0.003)	(0.002)	(0.003)
Number Firms × Autocracy	−0.004	−0.004	−0.003	−0.002	−0.002
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Consumption Share × Autocracy	−0.0005	−0.0004	−0.0002	−0.0001	−0.00001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Month FE	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓
Product × Conflict Events	✓	✓	✓	✓	✓
Observations	2,322	2,322	2,322	2,322	2,322
Clusters	18	18	18	18	18

Standard errors clustered at the product level in parentheses

* significant at $p < .10$; ** $p < .05$; *** $p < .01$

The dependent variable is the retail price from the Haitian statistical institute *Institut Haïtien des Statistiques et Information*. All prices are indexed to Aug 2004. In Columns 1-4, we impose an autocorrelation coefficient of 0.90, 0.925, 0.95, and 0.975, respectively. The interaction term Coup × Autocracy is the interaction between an indicator for being in an autocratic period and the proportion of the market that is controlled by families who participated in the 1991 coup, according to the US Office of Foreign Assets Control. Coup participation is calculated for each product as the average over all business owners that import that product, weighted by the value of their share of the product. The interaction term Coup × Quake is the interaction between the coup proportion and being in the month after the January 2010 earthquake. World supply price is the log world supply price of each good by month from the U.S. Census Bureau in levels. In addition to the supply price, we control for the number of firms importing a particular product from the AGEMAR trade data and the consumption share of each good from Jensen, Johnson and Stampley (1990). The unit is the product-month and observations cover January 2001 to December 2012 with some missingness. Models are estimated using OLS.

Table D.2: Robustness to GMM estimators

	(1)	(2)	(3)	(4)	(5)
Coup × Autocracy	0.0212	0.0221	0.0260	0.0256	0.0255
	(0.0174)	(0.0153)	(0.0173)	(0.0157)	(0.0157)
N	1278	1278	1278	1278	1278
Clusters	18	18	18	18	18
Lags of prices	4	4	4	4	4
Lags used for instruments	1-6	2-6	1-8	2-8	2-10
Month FE	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓

Robust Standard errors in parentheses
$^{*}p < .1$, $^{**}p < .05$, $^{***}p < .01$

Table D.3: Robustness of price results to controls for product characteristics

	Dependent variable:				
	Haiti Retail Price				
	(1)	(2)	(3)	(4)	(5)
Coup × Autocracy	0.019**	0.015**	0.015**	0.010	0.008
	(0.008)	(0.008)	(0.008)	(0.008)	(0.010)
Coup × Quake	0.068*	0.068*	0.068*	0.068*	0.068*
	(0.041)	(0.041)	(0.041)	(0.041)	(0.041)
World Supply Price	−0.0003	−0.001	−0.001	−0.001	−0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Number Firms × Autocracy	−0.003***	−0.004	−0.003	−0.003	−0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Consumption Share × Autocracy	−0.0005	−0.0003	−0.0002	−0.0003	−0.0003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Bulkiness × Autocracy	0.0004	0.001	0.001	−0.001	−0.001
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Time Sensitivity × Autocracy		−0.002	−0.001	−0.001	−0.001
		(0.001)	(0.001)	(0.001)	(0.001)
Complexity × Autocracy			−0.001	−0.001	−0.001
			(0.002)	(0.001)	(0.001)
Divisibility × Autocracy				0.002	0.002
				(0.002)	(0.002)
Reference Price × Autocracy					0.001
					(0.002)
Month FE	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓
Product × Conflict Events	✓	✓	✓	✓	✓
Lagged Dep. Var.	4	4	4	4	4
Observations	2,214	2,214	2,214	2,214	2,214
Clusters	18	18	18	18	18

Standard errors clustered at the product level in parentheses
* significant at $p < .10$; ** $p < .05$; *** $p < .01$
The dependent variable is the retail price from the Haitian statistical institute *Institut Haïtien des Statistiques et Information*. All prices are indexed to Aug 2004. The interaction term Coup × Autocracy is the interaction between an indicator for being in an autocratic period and the proportion of the market that is controlled by families who participated in the 1991 coup, according to the US Office of Foreign Assets Control. Coup participation is calculated for each product as the average over all business owners that import that product, weighted by the value of their share of the product. The interaction term Coup × Quake is the interaction between the coup proportion and being in the month after the January 2010 earthquake. World supply price is the log world supply price of each good by month from the U.S. Census Bureau in levels. In addition to the supply price, we control for three other terms that affect an import firm's profits: the interaction of being in an autocratic period and the number of firms importing a particular profit from the AGEMAR trade data as well as the consumption share of each good from Jensen, Johnson and Stampley (1990). The third control is the interaction of product dummies and the number of conflict events not involving the Haitian elite from the GDELT data. The last five controls in the specification are product characteristics interacted with being in an autocratic period. The product measures Bulkiness and Divisibility are calculated from the PIERS trade data. Complexity is taken from the Hausmann et al. (2013). Reference Price is from Rauch (1999). Time Sensitivity is from Hummels (2007). The unit is the product-month and observations cover January 2001 to December 2012 with some missingness. Models are estimated using OLS.

Table D.4: Prices of goods imported by coup participators during autocratic periods using weights based on measures of data quality

	Weights:				
	None	Fams id'd (%)	Firms id'd (%)	$\frac{Import11}{Import09}$	Combined weights
	(1)	(2)	(3)	(4)	(5)
Coup × Autocracy	0.018**	0.017***	0.017**	0.025***	0.023**
	(0.007)	(0.006)	(0.007)	(0.009)	(0.009)
Coup × Quake	0.068*	0.060*	0.045	0.198***	0.077*
	(0.041)	(0.033)	(0.029)	(0.058)	(0.040)
World Supply Price	−0.0004	0.002	0.002	−0.002	0.004
	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
Number Firms × Autocracy	−0.003	−0.003	−0.003	−0.004	−0.005
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Consumption Share × Autocracy	−0.0005	−0.001	−0.0004	−0.0002	−0.0003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Lagged Dep. Var.	4	4	4	4	4
Month FE	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓
Observations	2,214	2,214	2,214	2,214	2,214
Clusters	18	18	18	18	18

Standard errors clustered at the product level in parentheses
* significant at $p < .10$; $^{**}p < .05$; $^{***}p < .01$
The dependent variable is the retail price from the Haitian statistical institute *Institut Haïtien des Statistiques et Information*. All prices are indexed to Aug 2004. The interaction term Coup × Autocracy is the interaction between an indicator for being in an autocratic period and the proportion of the market that is controlled by families who participated in the 1991 coup, according to the US Office of Foreign Assets Control. Coup participation is calculated for each product as the average over all business owners that import that product, weighted by the value of their share of the product. The interaction term Coup × Quake is the interaction between the coup proportion and being in the month after the January 2010 earthquake. World supply price is the log world supply price of each good by month from the U.S. Census Bureau in levels. The unit is the product-month and observations cover January 2001 to December 2012 with some missingness. In addition to the supply price, we control for two other terms that affect an import firm's profits: the number of firms importing a particular profit from the AGEMAR trade data and the consumption share of each good from Jensen, Johnson and Stampley (1990). Both controls are logged and interacted with the Autocracy dummy. We also control for the interaction of the product dummies and the number of conflict events not involving the Haitian elite from the GDELT data. Models are estimated using OLS.

Figures

Figure 1: Import quotas for 19 major families, 1984-1985 (Fass, 1990)

	SHARE OF QUOTA ALLOCATED TO IMPORTER (%)																			Total Share (%)	Total Importers
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S		
Household utensils, metal	7	92																		99	2
Household utensils, plastic	2	2	15	26	49															94	5
Shoes						70														70	1
Slippers	92																			92	1
Nails						65														65	1
V-8 juice	29							71												100	2
Vegetable and fruit juices	48							48												96	2
Toothpaste	3								62											65	2
Liquid disinfectant	11				14			14		39										78	4
Wrapping paper, cardboard	66							16												82	2
Paper and plastic bags	94																			94	1
Irons for pressing clothes		43		28			28													99	3
Paint											44	22	22							88	3
Hand soap	10		18						45											73	3
Candies	65							32												97	2
Textiles														31	12	37				80	3
Milk																	63	28		91	2
Spaghetti, macaroni, etc.	44																		56	100	2

Source: Reveco (1984).

Figure 2: Coefficients on centrality placing increasing weight on close ties

(a) All elite

(b) Importers

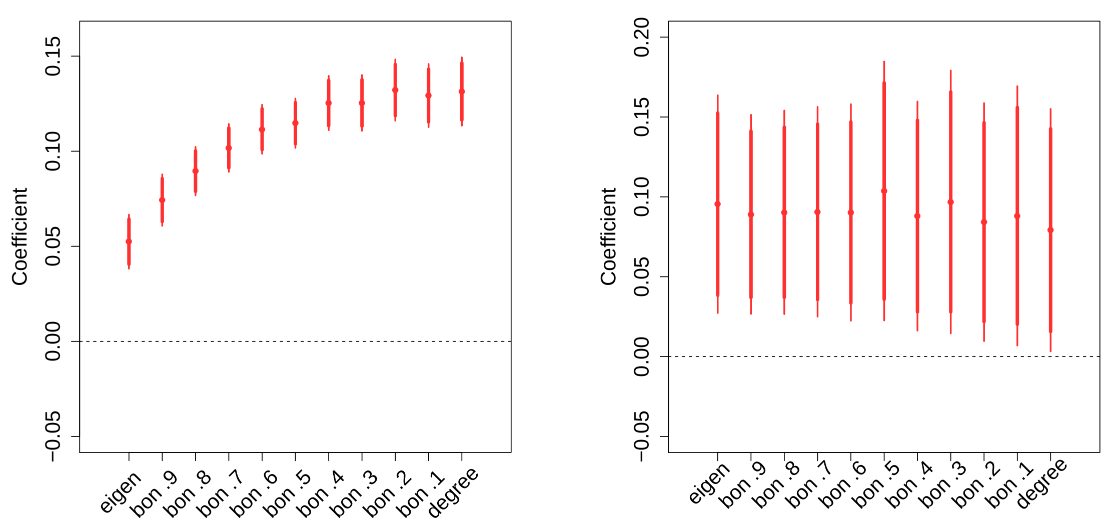


Figure 3: Robustness: Coefficient on Coup × Autocracy dropping each product

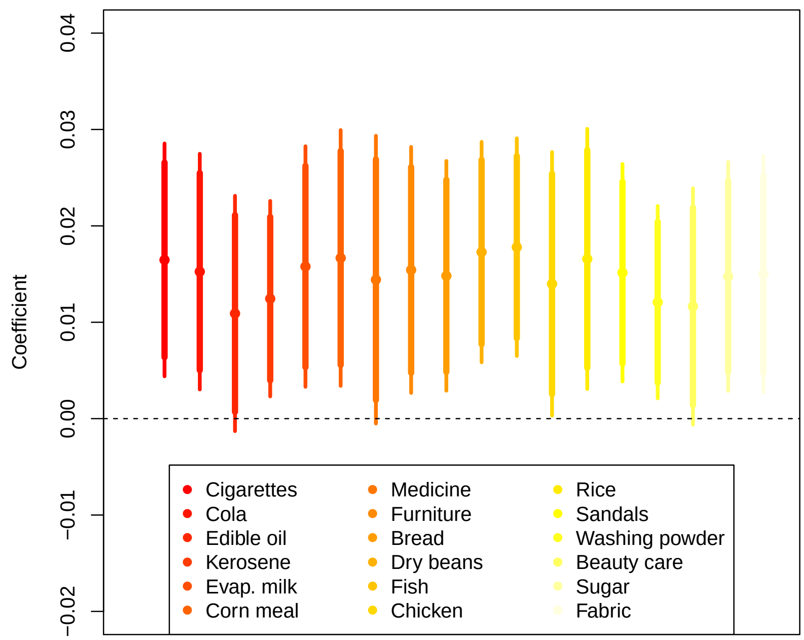


Figure 4: Placebo: Coefficient on Coup × Autocracy after arbitrarily moving the window of autocracy

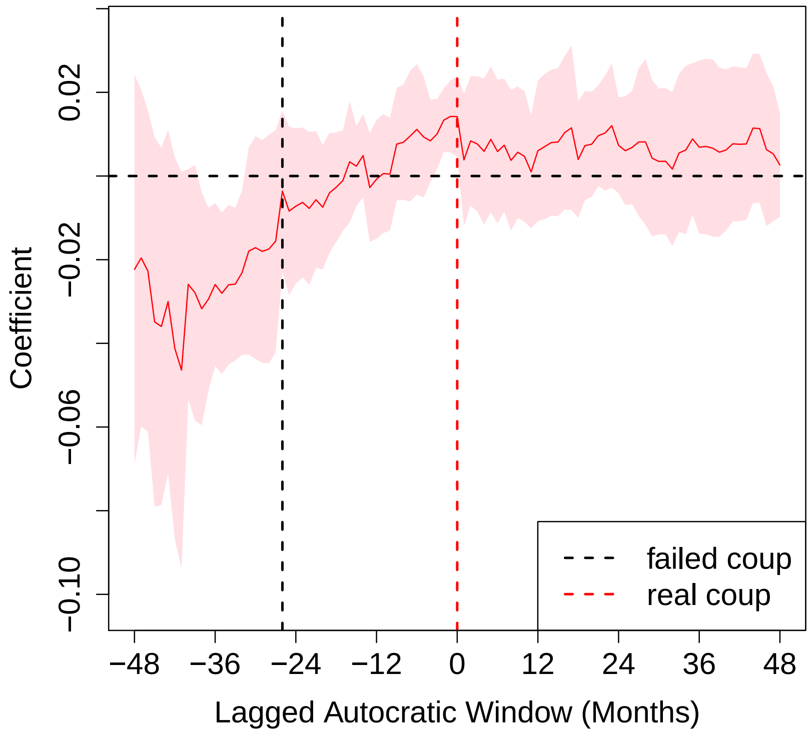


Figure A.1: Diagram of dataset construction

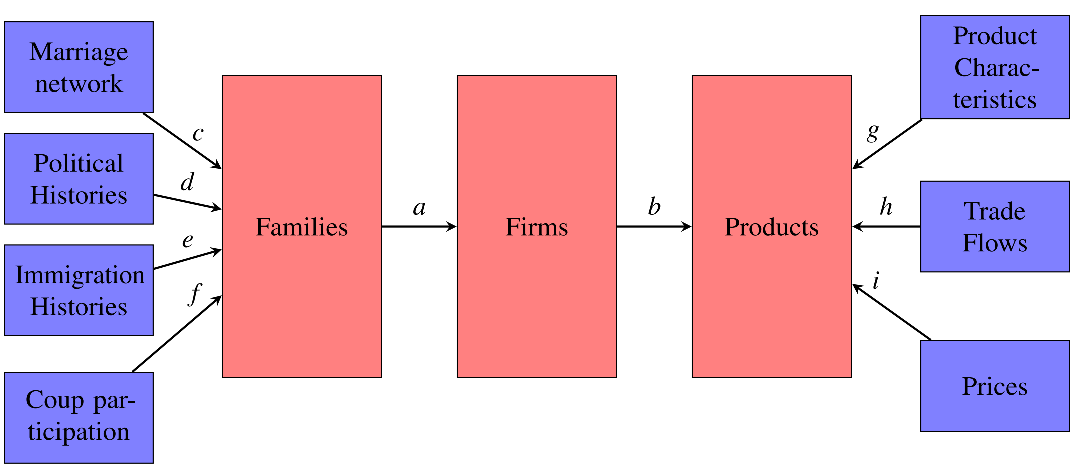
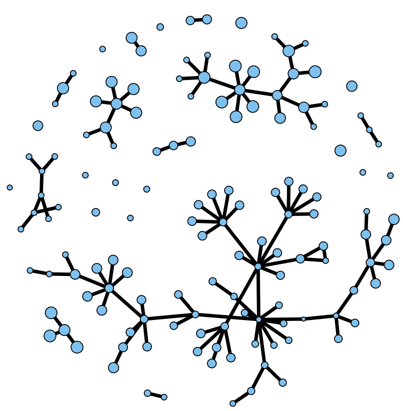
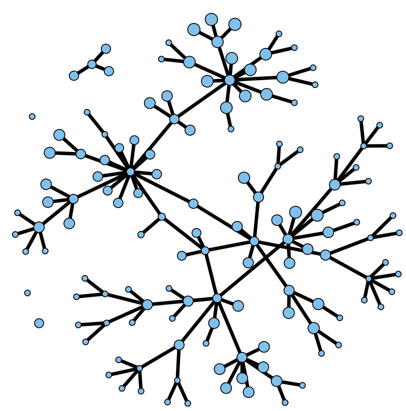


Figure C.1: Examples and Distribution of Reachability in the Haitian Marriage Network

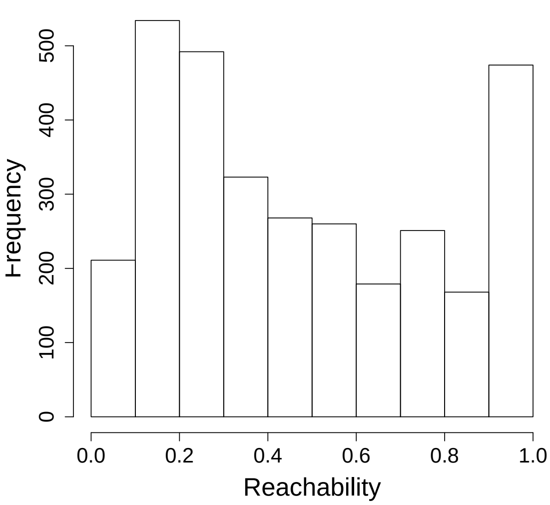
(a) Low reachability family



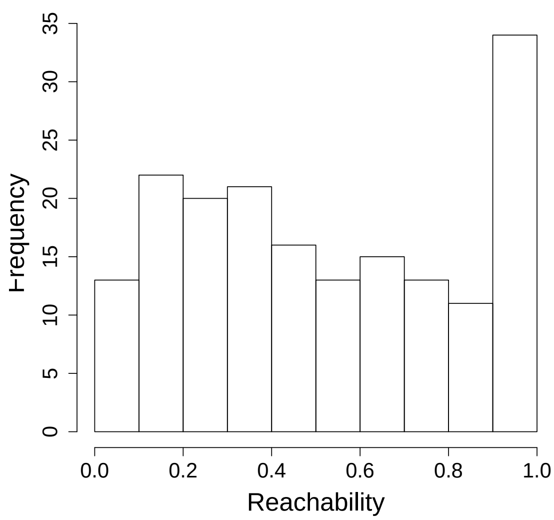
(b) High reachability family

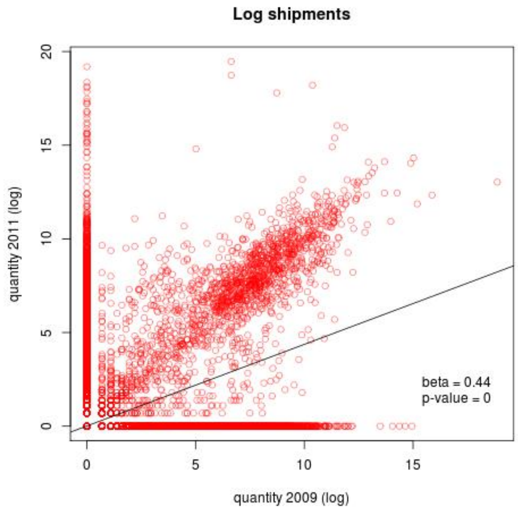


(c) Histogram of reachability: All elite sample

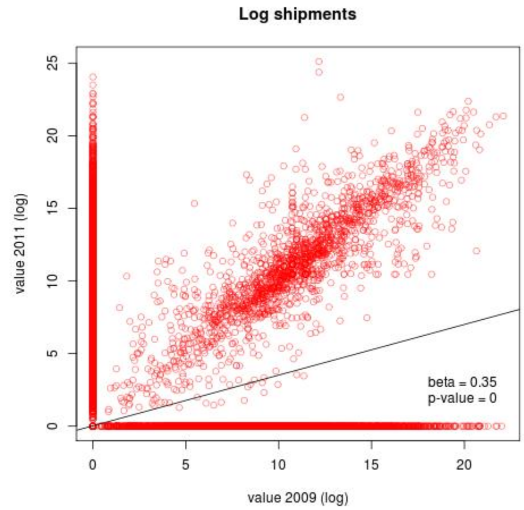


(d) Histogram of reachability: Importer sample

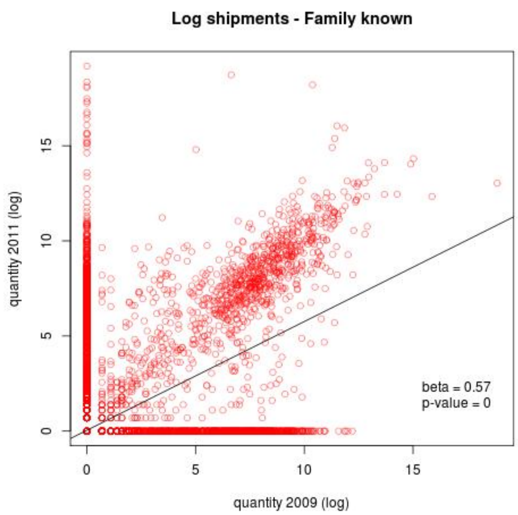




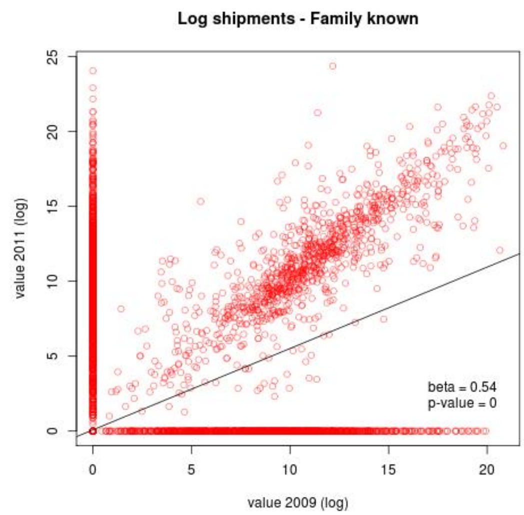
(a) Quantity (log) - All



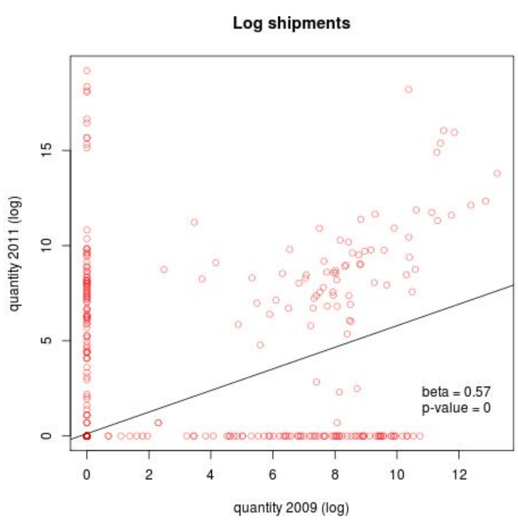
(b) Value (log) - All



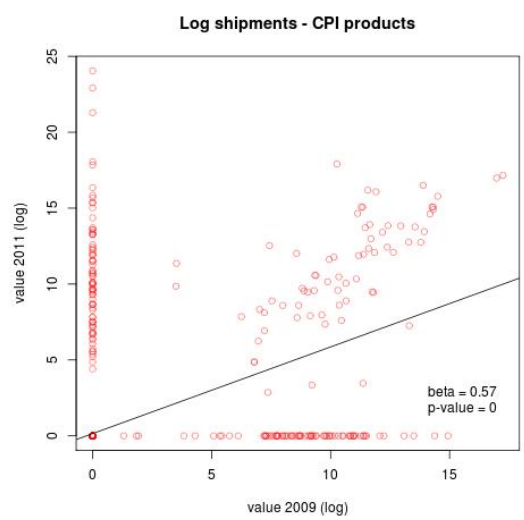
(c) Quantity (log) - Family identified



(d) Value (log) - Family identified



(e) Quantity (log) - CPI product



(f) Value (log) - CPI product

Figure E.1: Relationship between 2009 and 2011 shipments for firm-product pairs